

TOGE TSM Adhesive Screw Anchor

Concrete screw in combination with injection mortar -
for highest loads



Highest loads

Highest loads in concrete due to the combination of concrete screw with suitable injection mortar.

Instantly loadable

Immediately loadable directly after installation.

Frost proof

Sealing the borehole prevents water penetration and frost damage in winter.

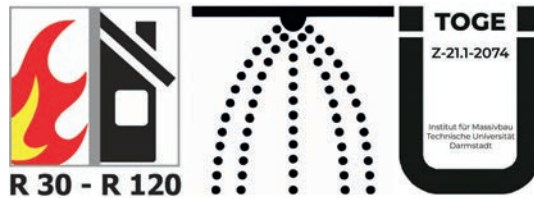
Variable

Versatile due to variable anchoring depths.

Approval

Approval

General type approval / General technical approval Z-21.1-2074.


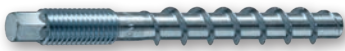



Base Materials

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



Headshapes & Materials

		Steel, zinc-plated	Steel, zinc flake-coated	Steel, stainless A4
	Version with hexagonal head an pressed on washer	✓	✓	
	Metric connction thread M12	✓		✓
	Injection mortar and accessories			

Application Examples



Fastening railings



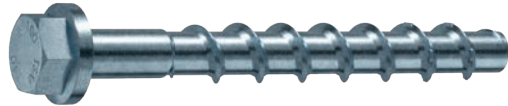
Fastening heavy duty shelving



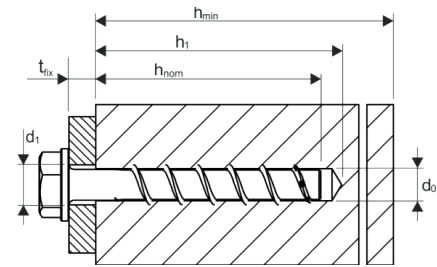
Product Overview

Steel - zinc-plated

Version with hexagonal head and pressed on washer

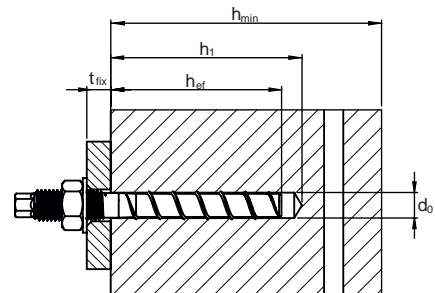


Size	Disc-Ø
10	20,0 mm
12	23,5 mm
14	28,5 mm



Item nr.	Designation	Depth of drill hole h_o	Embedment depth of anchor h_{ef}	Max. thickness of fixture t_{fix}	Packing Unit
300 010 090	TSM 10x90 SW15	≥ 80 mm	≥ 80 mm	10 mm	50
300 010 100	TSM 10x100 SW15	≥ 80 mm	≥ 80 mm	20 mm	50
300 010 120	TSM 10x120 SW15	≥ 80 mm	≥ 80 mm	40 mm	50
300 010 140	TSM 10x140 SW15	≥ 80 mm	≥ 80 mm	60 mm	50
300 010 150	TSM 10x150 SW15	≥ 80 mm	≥ 80 mm	70 mm	50
300 010 160	TSM 10x160 SW15	≥ 80 mm	≥ 80 mm	80 mm	50
300 010 180	TSM 10x180 SW15	≥ 80 mm	≥ 80 mm	100 mm	25
300 010 200	TSM 10x200 SW15	≥ 80 mm	≥ 80 mm	120 mm	25
300 010 240	TSM 10x240 SW15	≥ 80 mm	≥ 80 mm	160 mm	25
300 010 280	TSM 10x280 SW15	≥ 80 mm	≥ 80 mm	200 mm	25
300 010 320	TSM 10x320 SW15	≥ 80 mm	≥ 80 mm	240 mm	25
300 010 360	TSM 10x360 SW15	≥ 80 mm	≥ 80 mm	280 mm	25
300 010 400	TSM 10x400 SW15	≥ 80 mm	≥ 80 mm	320 mm	25
300 012 110	TSM 12x110 SW17	≥ 100 mm	≥ 100 mm	10 mm	25
300 012 130	TSM 12x130 SW17	≥ 100 mm	≥ 100 mm	30 mm	25
300 012 150	TSM 12x150 SW17	≥ 100 mm	≥ 100 mm	50 mm	25
300 014 130	TSM 14x130 SW21	≥ 100 mm	≥ 100 mm	30 mm	25
300 014 150	TSM 14x150 SW21	≥ 100 mm	≥ 100 mm	50 mm	25

Version with metric connection thread M12



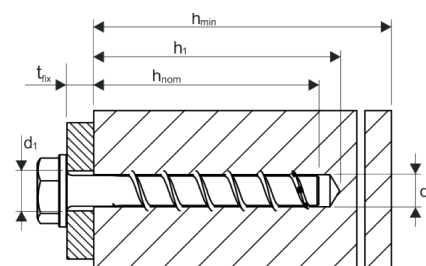
Item nr.	Designation	Depth of drill hole h_o	Embedment depth of anchor h_{ef}	Max. thickness of fixture t_{fix}	Packing Unit
366 010 120	TSM 10x120 M12x20 SW9	≥ 80 mm	≥ 80 mm	5 - 15 mm	50

Steel - zinc flake-coated

Version with hexagonal head and pressed on washer



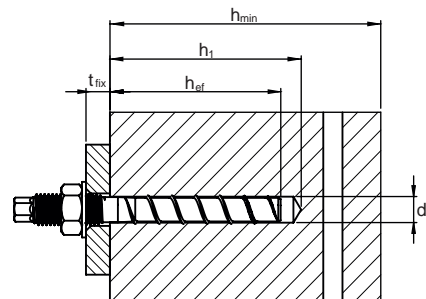
Size	Disc-Ø
10	20,0 mm
12	23,5 mm
14	28,5 mm



Item nr.	Designation	Depth of drill hole h_o	Embedment depth of anchor h_{ef}	Max. thickness of fixture t_{fix}	Packing Unit
400 010 090	TSM 10x90 SW15 ZFC	≥ 80 mm	≥ 80 mm	10 mm	50
400 010 100	TSM 10x100 SW15 ZFC	≥ 80 mm	≥ 80 mm	20 mm	50
400 010 120	TSM 10x120 SW15 ZFC	≥ 80 mm	≥ 80 mm	40 mm	50
400 010 140	TSM 10x140 SW15 ZFC	≥ 80 mm	≥ 80 mm	60 mm	50
400 010 150	TSM 10x150 SW15 ZFC	≥ 80 mm	≥ 80 mm	70 mm	50
400 010 160	TSM 10x160 SW15 ZFC	≥ 80 mm	≥ 80 mm	80 mm	50
400 010 180	TSM 10x180 SW15 ZFC	≥ 80 mm	≥ 80 mm	100 mm	25
400 010 200	TSM 10x200 SW15 ZFC	≥ 80 mm	≥ 80 mm	120 mm	25
400 010 240	TSM 10x240 SW15 ZFC	≥ 80 mm	≥ 80 mm	160 mm	25
400 010 280	TSM 10x280 SW15 ZFC	≥ 80 mm	≥ 80 mm	200 mm	25
400 010 320	TSM 10x320 SW15 ZFC	≥ 80 mm	≥ 80 mm	240 mm	25
400 010 360	TSM 10x360 SW15 ZFC	≥ 80 mm	≥ 80 mm	280 mm	25
400 010 400	TSM 10x400 SW15 ZFC	≥ 80 mm	≥ 80 mm	320 mm	25
400 012 110	TSM 12x110 SW17 ZFC	≥ 100 mm	≥ 100 mm	10 mm	25
400 012 130	TSM 12x130 SW17 ZFC	≥ 100 mm	≥ 100 mm	30 mm	25
400 012 150	TSM 12x150 SW17 ZFC	≥ 100 mm	≥ 100 mm	50 mm	25
400 014 130	TSM 14x130 SW21 ZFC	≥ 100 mm	≥ 100 mm	30 mm	25
400 014 150	TSM 14x150 SW21 ZFC	≥ 100 mm	≥ 100 mm	50 mm	25

Steel, stainless - A4

Version with metric connection thread M12



Item nr.	Designation	Depth of drill hole h_o	Embedment depth of anchor h_{ef}	Max. thickness of fixture t_{fix}	Packing Unit
866 010 140	TSM 10x140 M12x35 SW9 A4	≥ 80 mm	≥ 80 mm	5 - 34 mm	50
866 010 160	TSM 10x160 M12x55 SW9 A4	≥ 80 mm	≥ 80 mm	5 - 34 mm	50

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 for 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	Min. curing time in dry borehole	Min. 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
≥ 40°C	4 min	20 min	40 min

Strokes & Cartridge Coverage

Depth of borehole [mm]	Strokes / TSM screws Ø			Drills per cartridge / TSM screws Ø		
	10	12	14	10	12	14
80 - 90	0,8			44		
90 - 100	0,9			40		
100 - 110	1,0	1,1	1,3	37	32	28
110 - 120		1,2	1,4		30	26
120 - 130		1,3	1,5		27	24
130 - 140			1,6			22

Single fastening without fire exposure, TSM high performance according Z-21.1-2074

Screw size TSM high performance			TSM 10			TSM 12			TSM 14			
			h_{ef} [mm]		$h_{ef,1}$	$h_{ef,2}$	$h_{ef,3}$	$h_{ef,1}$	$h_{ef,2}$	$h_{ef,3}$	$h_{ef,1}$	$h_{ef,2}$
			90	120	280	110	130	150	130	150		
Diameter of drill bit	d_o	[mm]	10			12			14			
Depth of drill hole	h_o min	[mm]	90	120	280	110	130	150	130	150		
Effective anchorage depth	h_{ef}	[mm]	90	120	280	110	130	150	130	150		
Diameter of clearance hole in the fixture	d_f max	[mm]	14			16			18			
Diameter of the brush	d_b max	[mm]	11			13			15			
Approved tension load in cracked concrete ^{1) 2)}	N_{zul}	[kN]	14,0	18,9	18,9	18,9	24,3	28,7	24,3	30,1		
Approved shear load in cracked concrete ^{1) 2)}	V_{zul}	[kN]	19,4	19,4	19,4	24,0	24,0	24,0	32,0	32,0		
Approved tension load in non-cracked concrete ^{1) 2)}	N_{zul}	[kN]	18,9	18,9	18,9	27,0	28,7	28,7	32,1	32,1		
Approved shear load in non-cracked concrete ^{1) 2)}	V_{zul}	[kN]	19,4	19,4	19,4	24,0	24,0	24,0	32,0	32,0		
Approved bending resistance	M_{zul}	[kN]	32,0			64,6			105,7			
Minimum edge distance	C_{min}	[mm]	40			50			60			
Minimum spacing	S_{min}	[mm]	40			50			60			
Minimum base material thickness	h_{min}	[mm]	150	180	340	170	190	210	200	220		
Installation torque for connection thread version	T_{inst}	[Nm]	40			60			80			
Maximum torque (with Impact screw driver)		[Nm]	400			650			650			

¹⁾ For the determination of the allowable load, the partial safety factor from the approval $\gamma_M=1.4$ was taken into account for material resistance and a partial safety factor $\gamma_F=1.4$ for load actions.

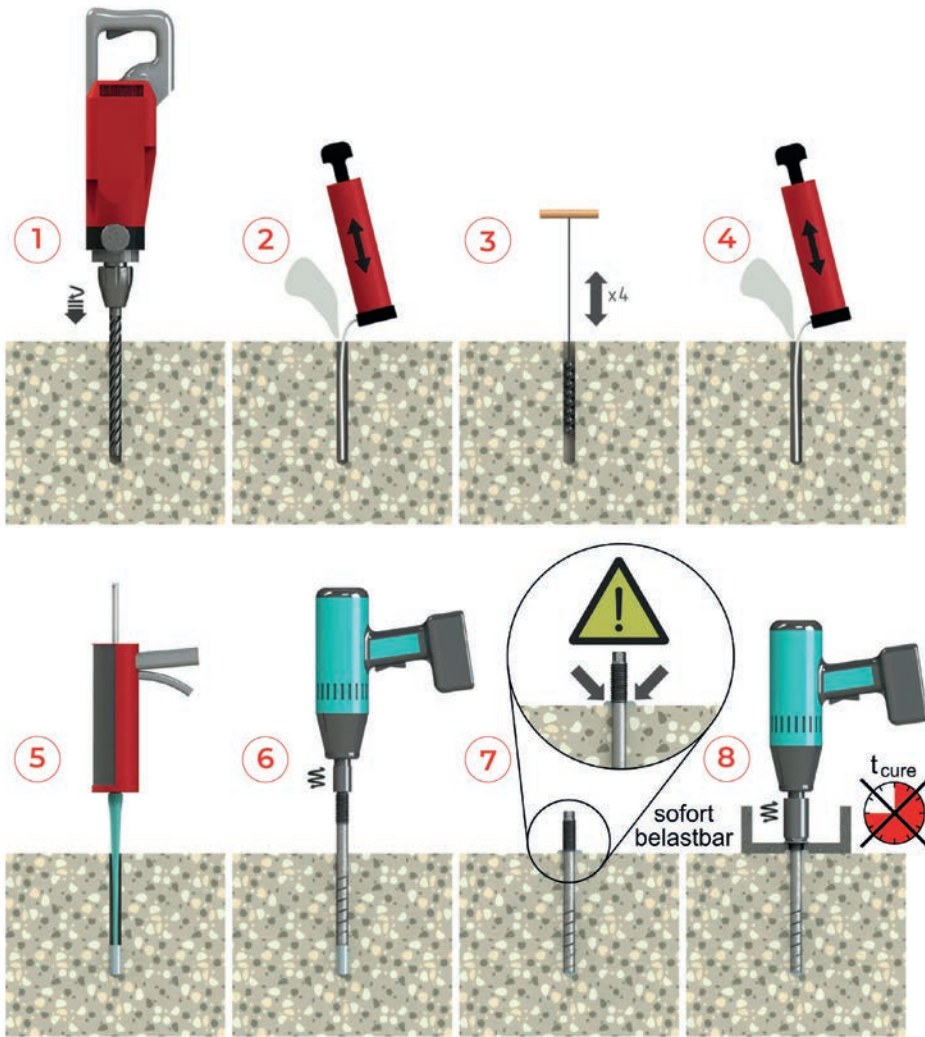
²⁾ These values apply without the influence of the spacing and edge distances.

Single fastening under fire exposure TSM high performance according Z-21.1-2074

Screw size TSM high performance		TSM 10			TSM 12			TSM 14	
Embedment depth	h_{ef} [mm]	$h_{ef,1}$	$h_{ef,2}$	$h_{ef,3}$	$h_{ef,1}$	$h_{ef,2}$	$h_{ef,3}$	$h_{ef,1}$	$h_{ef,2}$
		90	120	280	110	130	150	130	150
Approved load under tensile and shear use ($F_{zul} = N_{zul,fi} = V_{zul,fi}$)									
Fire resistance class									
R30	Approved load	$F_{zul, fi30}$ [kN]	4,4		6,2		7,6		
R60		$F_{zul, fi60}$ [kN]	3,3		5,8		7,6		
R90		$F_{zul, fi90}$ [kN]	2,3		4,2		5,9		
R120		$F_{zul, fi120}$ [kN]	1,7		3,4		4,8		
R30		$M_{zul, fi30}$ [kN]	5,9		12,3		20,4		
R60		$M_{zul, fi60}$ [kN]	4,5		9,7		15,9		
R90		$M_{zul, fi90}$ [kN]	3,0		7,0		11,6		
R120		$M_{zul, fi120}$ [kN]	2,3		5,7		9,4		
Edge distance									
R30 to R120	$C_{cr,fi}$ [mm]	$2 \times h_{ef}$							
The edge distance must be at least 300 mm, if the fire load attacks from more than one side.									
Spacing									
R30 to R120	$S_{cr,fi}$ [mm]	$4 \times h_{ef}$							
Concrete pry-out failure									
R30 to R120	k [-]	2,0							
For wet concrete, increase the anchorage depth by at least 30 mm.									

¹⁾ For the determination of the allowable load, the partial safety factor from the approval $\gamma_M=1.0$ was taken into account for material resistance and a partial safety factor $\gamma_F=1.0$ for load actions.

Installation Instructions



- 1) Create borehole.
- 2) Clean the borehole thoroughly.
- 3) Brush the borehole 4x.
- 4) Thoroughly clean the borehole again.
- 5) Discard three full strokes of composite mortar – then inject composite mortar.
- 6) Screw in concrete screw.
- 7) After reaching the embedment depth, the composite mortar must emerge at the concrete surface.
- 8) The attachment can be installed immediately – there is no need to observe the curing time of the composite mortar.