

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.

Frost proof

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



Instantly loadable

Immediately loadable directly after installation.

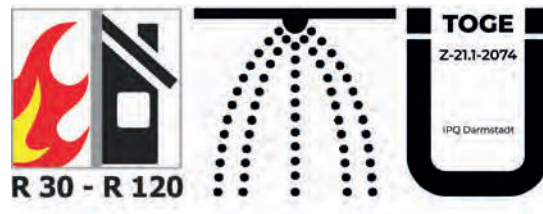
Variable

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 TOGE ZFC Solid 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



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

Screw size TSM high performance	h _{ef} [mm]		TSM 10			TSM 12			TSM 14	
			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 ₀	[mm]	10			12			14	
Depth of drill hole	h ₀ 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.

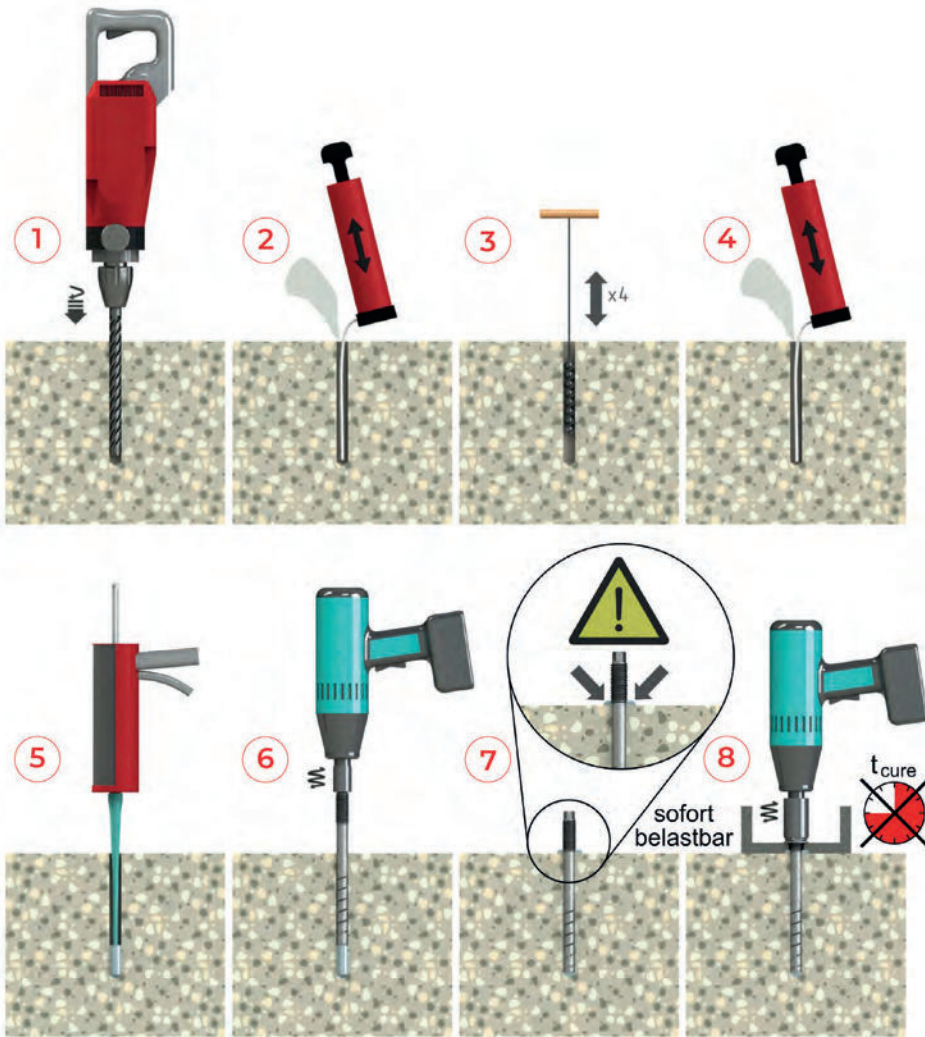
²⁾ These values apply without the influence of the spacing and edge distances.

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.