TOGE TSM Multiground
Female threaded screw for various substrates

Easy Installation
Easy, fast and safe installation with a impact screwdriver. This makes overhead work in particular much easier.

Flush with surface
The flush surface installation results in a clean installation appearance without any interfering elements.

Internal thread
The practical internal thread enables use for a wide range of applications.

Demountable
If required, the TOGE TSM Multiground can be quickly and easily dismounted.

High load values
The special thread geometry ensures secure hold and high loads in concrete.

Small edge distances
Small edge distances and spacing allow particularly close-edge and closely spaced installation.

Approval

Approval
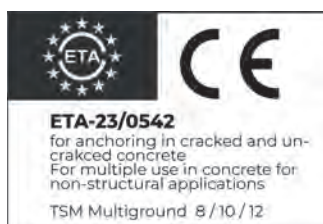European technical assessment ETA-23/0542.

Base Material
Approved for concrete strenght classes from C20/25 to C50/60.

Cracked and non-cracked concrete.

Suitable for masonry, aerated concrete and wood.

Material
Steel, zinc-plated.

ETA-23/0542
for anchoring in cracked and un-crakced concrete
For multiple use in concrete for non-structural applications

TSM Multiground 8 / 10 / 12

R 30 - R 120

Technical characteristics

Multiple fastening without fire exposure, Steel

Screw size TSM M			TSM 8 M	TSM 10 M	TSM 12 M
Nominal embedment depth	h_{nom}	[mm]	40	40	40
Nominal diameter of drill bit	d_0	[mm]	8	10	12
Depth of drill hole	h_1 min	[mm]	50	50	50
Effective anchorage depth	h_{ef}	[mm]	31	31	30
Diameter of clearance hole in the fixture	d_f max	[mm]	7	9	12
Minimum edge distance	C_{min}	[mm]	40	40	40
Minimum spacing	S_{min}	[mm]	30	40	40
Minimum base material thickness	h_{min}	[mm]	80	80	80
Installation torque (for metrical thread)	T_{inst}	[Nm]	4	8	15
Minimum screw-in depth metrical thread		[mm]	8	8	8
Maximum torque (with impact screwdriver)		[Nm]	180	180	180
Permissible load for metrical thread of tension class 4.8					
Permissible tension load in cracked concrete [1] [3]	N_{per} 4.8	[kN]	2,6	2,8	1,8
Permissible shear load in cracked concrete [2] [3]	V_{per} 4.8	[kN]	2,3	2,8	2,3
Persmissible tension load in uncracked concrete [1] [3]	N_{per} 4.8	[kN]	3,1	3,8	2,2
Persmissible shear load in uncracked concrete [2] [3]	V_{per} 4.8	[kN]	2,3	4,0	3,2
Persmissible bending moment [2] [3]	M_{per} 4.8	[kN]	2,9	7,1	13,7
Permissible load for metrical thread of tension class 5.8					
Permissible tension load in cracked concrete [1] [3]	N_{per} 5.8	[kN]	2,6	2,8	1,8
Permissible shear load in cracked concrete [2] [3]	V_{per} 5.8	[kN]	2,8	2,8	2,3
Permissible tension load in uncracked concrete [1] [3]	N_{per} 5.8	[kN]	3,1	3,8	2,2
Persmissible shear load in uncracked concrete [2] [3]	V_{per} 5.8	[kN]	2,9	4,0	3,2
Persmissible bending moment [2] [3]	M_{per} 5.8	[kN]	3,6	8,8	13,7
Permissible load for metrical thread of tension class 8.8					
Permissible tension load in cracked concrete [1] [3]	N_{zul} 8.8	[kN]	2,6	2,8	1,8
Permissible shear load in cracked concrete [2] [3]	V_{zul} 8.8	[kN]	2,8	2,8	2,3
Persmissible tension load in uncracked concrete [1] [3]	N_{zul} 8.8	[kN]	3,1	3,8	2,2
Persmissible shear load in uncracked concrete [2] [3]	V_{zul} 8.8	[kN]	3,4	4,0	3,2
Persmissible bending moment [2] [3]	M_{zul} 8.8	[kN]	5,0	8,8	13,7

[1] For the determination of the approved loads, the partial safety factor from the approval γM=1,5 was taken into account for material resistance and a partial safety factor of γF=1,4 for load actions.

[2] For the determination of the approved loads, the partial safety factor from the approval γM=1,25 was taken into account for material resistance and a partial safety factor of γF=1,4 for load actions.

[3] These values apply without influence of the spacing and edge distances.

Technical characteristics

Multiple fastening under fire exposure, Steel

Screw size TSM M				TSM 8 M	TSM 10 M	TSM 12 M
Nominal embedment depth		h_{nom}	[mm]	40	40	40
Permissible load under tensile and shear use ($F_{per,fi} = N_{per,fi} = V_{per,fi}$) [1] [2]						
Fire resistance class						
R 30	Approved load	$F_{per,fi\,30}$	[kN]	0,9	0,9	0,8
R 60		$F_{perl,fi\,60}$	[kN]	0,9	0,9	0,8
R 90		$F_{per,fi\,90}$	[kN]	0,9	0,9	0,8
R 120		$F_{per,fi\,120}$	[kN]	0,7	0,7	0,7
R 30		$M_{per,fi\,30}$	[Nm]	0,63	1,81	4,28
R 60		$M_{per,fi\,60}$	[Nm]	0,49	1,36	3,12
R 90		$M_{per,fi\,90}$	[Nm]	0,34	0,91	1,97
R 120		$M_{per,fi\,120}$	[Nm]	0,27	0,68	1,39
Edge distance						
R 30 to R 120		$C_{cr,fi}$	[mm]	2 x h_{ef}		
The edge distance must be at least 300 mm, if the fire load attacks from more than one side.						
Spacing						
R 30 to R 120		$S_{cr,fi}$	[mm]	4 x h_{ef}		
Concrete pry-out failure						
R 30 to R 120		k	[-]	1,0		
In wet concrete, the embedment depth must be increased by at least 30 mm.						

[1] For the determination of the approved loads, the partial safety factor from the approval γM=1,0 was taken into account for material resistance and a partial safety factor of γF=1,0 for load actions.

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

Installation Instruction
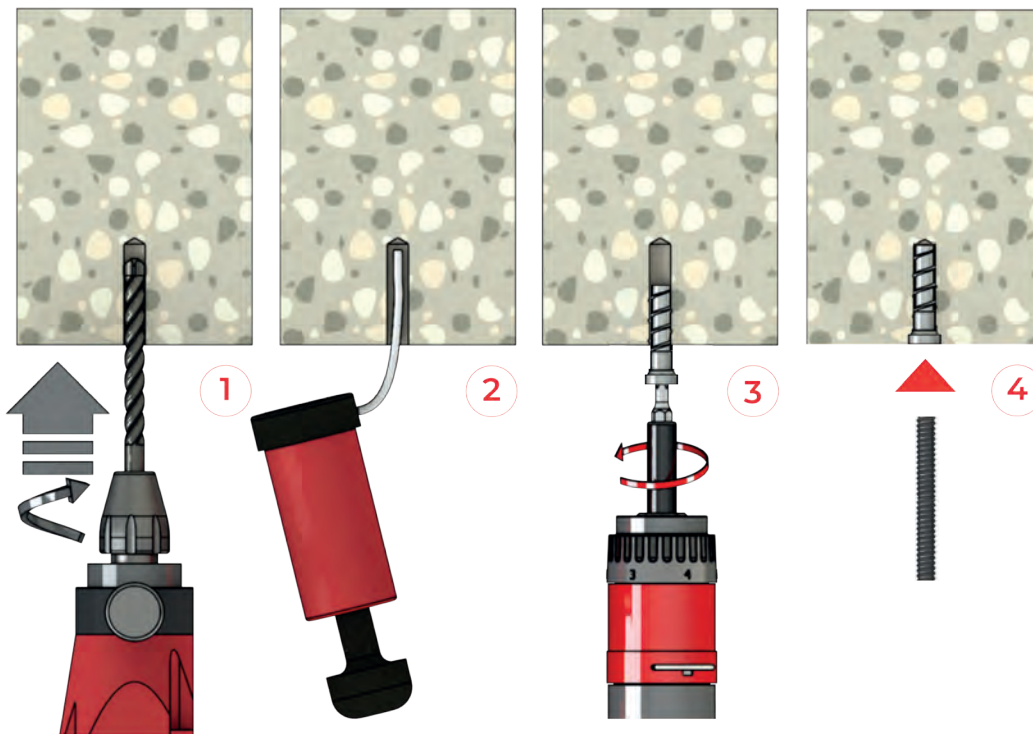
1)   Create drill hole with hammerdrill or hollow drill bit.

2)   Thoroughly clean drill hole.

3)   Screw in TOGE TSM Multiground with impact screwdriver or wrench.

4)   Screw must be screwed in flush with the surface of the concrete. The attachment part is fastened with a standard metric screw or threaded rod. The tightening torque of the metric thread must be observed.