

DECLARATION OF PERFORMANCE
DoP No. 2873-CPR-401-14 / 01.21-EN

1. Unique identification code of the product-type: **Toge concrete screw TSM multiground 8,10,12**
2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):

Annex A 3

Batch number: see packaging of the product.

3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

generic type	concrete screw
for use in	Cracked and non-cracked concrete C 20/25-C 50/60 (EN 206), only for multiple use of non-structural applications covered sizes: 8,10 and 12
option / category	Part 6
loading	static or quasi-static
material	<u>zinc-plated steel, steel with zinc flake coating:</u> dry internal conditions only covered sizes: 8,10and 12

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):
Toge Dübel GmbH & Co. KG, Illesheimer Strasse 10, 90431 Nuernberg
5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2): --
6. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V: **System 2+**
7. In case of the declaration of performance concerning a construction product covered by a harmonised standard: --
8. In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued:

Deutsches Institut für Bautechnik, Berlin

has issued the following:

ETA-23/0542

on the basis of

EAD 330747-00-0601

The notified body **2873-CPR** performed

ii) factory production control.

iii) testing of samples taken at the factory in accordance with a prescribed test plan.

and has issued the following: certificate of conformity 2873-CPR-401-14.

9. Declared performance:

Essential Characteristics	Design Method	Performance	Harmonized Technical Specification
Characteristic resistance for tension load (static and quasi static)	DIN EN 1992-4 EOTA TR 055	Annex C 1 and C2	EAD 330747-00-0601
Characteristic resistance for shear load (static and quasi static)		Annex C 1 and C2	
fire behavior	DIN EN 1992-4	Class A1	
fire resistance		Annex C 3	

Where pursuant to Article 37 or 38 in the Specific Technical Documentation has been used, the requirements with which the product complies: --

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:



Waldemar Gunkel

Waldemar Gunkel
Dipl.-Wirtsch.-Ing. (FH)
Application Engineering and
Technical documents

Nuernberg, 2024-02-08

Andreas Gerhard

Andreas Gerhard
CEO

Nuernberg, 2024-02-08

Table 5: Steel failure for tension and shear loading

TSM concrete screw size			TSM 8 M	TSM 10 M	TSM 12 M
Nominal embedment depth	h_{nom}	[mm]	40	40	40
Characteristic resistance to steel failure, strength class 4.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	8,0	9,5	10,0
Partial factor	$\gamma_{Ms,N}$	[-]	1,5		
Characteristic resistance	$V_{Rk,s}$	[kN]	4,0	7,3	9,0
Partial factor	$\gamma_{Ms,V}$	[-]	1,25		
Ductility factor	k_7	[-]	0,8		
Characteristic bending load	$M^0_{Rk,s}$	[Nm]	5,0	12,5	23,9
Characteristic resistance to steel failure, strength class 5.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	8,0	9,5	10,0
Partial factor	$\gamma_{Ms,N}$	[-]	1,5		
Characteristic resistance	$V_{Rk,s}$	[kN]	5,0	7,5	9,0
Partial factor	$\gamma_{Ms,V}$	[-]	1,25		
Ductility factor	k_7	[-]	0,8		
Characteristic bending load	$M^0_{Rk,s}$	[Nm]	6,3	15,4	23,9
Characteristic resistance to steel failure, strength class 8.8					
Characteristic resistance	$N_{Rk,s}$	[kN]	8,0	9,5	10,0
Partial factor	$\gamma_{Ms,N}$	[-]	1,5		
Characteristic resistance	$V_{Rk,s}$	[kN]	6,0	7,5	9,0
Partial factor	$\gamma_{Ms,V}$	[-]	1,25		
Ductility factor	k_7	[-]	0,8		
Characteristic bending load	$M^0_{Rk,s}$	[Nm]	8,8	15,4	23,9

TOGE concrete screw TSM Multiground

Performances

Steel failure for tension and shear loading

Annex C1

Table 6: Characteristic values for static and quasi-static loading

TSM concrete screw size			TSM 8 M	TSM 10 M	TSM 12 M	
Nominal embedment depth	h_{nom}	[mm]	40	40	40	
Pull-out failure in uncracked concrete						
Characteristic resistance to tension load in C20/25		$N_{RK,p}$	[kN]	6,5	8,0	5,5
Increasing factor for $N_{RK,p} = N_{RK,p (C20/25)} \cdot \psi_c$ with $\psi_c = \left(\frac{f_{ck}}{20}\right)^m$	C25/30	m	[-]	0,213	0,146	0,147
	C30/37					
	C40/50					
	C50/60					
Pull-out failure in cracked concrete						
Characteristic resistance to tension load in C20/25		$N_{RK,p}$	[kN]	5,5	6,5	4,5
Increasing factor for $N_{RK,p} = N_{RK,p (C20/25)} \cdot \psi_c$ with $\psi_c = \left(\frac{f_{ck}}{20}\right)^m$	C25/30	m	[-]	0,209	0,121	0,281
	C30/37					
	C40/50					
	C50/60					
Concrete failure: splitting failure, concrete cone failure and pry-out failure						
Effective embedment depth		h_{ef}	[mm]	31	31	30
k-Faktor	cracked	k_{cr}	[-]	7,7		
	uncracked	k_{ucr}	[-]	11,0		
Concrete cone failure	spacing	$s_{cr,N}$	[mm]	$3,0 \times h_{ef}$		
	edge distance	$c_{cr,N}$	[mm]	$1,5 \times h_{ef}$		
Splitting failure	resistance	$N^0_{RK,sp}$		6,5	8,0	5,5
	spacing	$s_{cr,sp}$	[mm]	$\geq 200 \text{ mm und } \geq 4 \times h_{ef}$		
	edge distance	$c_{cr,sp}$	[mm]	$\geq 100 \text{ mm und } \geq 3 \times h_{ef}$		
Factor for pry-out failure	k_8	[-]		1,0		
Installation factor		γ_{inst}	[-]	1,0	1,0	1,2
Concrete edge failure						
Effective length in concrete		$l_f = h_{nom}$	[mm]	40	40	40
Nominal outer diameter of screw		d_{nom}	[mm]	8	10	12
TOGE concrete screw TSM Multiground					Annex C2	
Performances Characteristic values for static and quasi-static loading						

Table 7: Fire exposure – characteristic values of resistance

TSM concrete screw size			TSM 8 M	TSM 10 M	TSM 12 M	
Nominal embedment depth	h_{nom}	[mm]	40	40	40	
Steel failure for tension and shear load						
Characteristic Resistance	R30	$N_{Rk,s,fi30}$	[kN]	1,01	2,11	3,92
	R60	$N_{Rk,s,fi60}$	[kN]	0,77	1,58	2,86
	R90	$N_{Rk,s,fi90}$	[kN]	0,54	1,05	1,81
	R120	$N_{Rk,s,fi120}$	[kN]	0,43	0,79	1,28
	R30	$V_{Rk,s,fi30}$	[kN]	1,01	2,11	3,92
	R60	$V_{Rk,s,fi60}$	[kN]	0,77	1,58	2,86
	R90	$V_{Rk,s,fi90}$	[kN]	0,54	1,05	1,81
	R120	$V_{Rk,s,fi120}$	[kN]	0,43	0,79	1,28
	R30	$M^0_{Rk,s,fi30}$	[Nm]	0,63	1,81	4,28
	R60	$M^0_{Rk,s,fi60}$	[Nm]	0,49	1,36	3,12
	R90	$M^0_{Rk,s,fi90}$	[Nm]	0,34	0,91	1,97
	R120	$M^0_{Rk,s,fi120}$	[Nm]	0,27	0,68	1,39
	Pull-out failure					
Characteristic Resistance	R30-R90	$N_{Rk,p,fi}$	[kN]	1,38	1,63	1,13
	R120	$N_{Rk,p,fi}$	[kN]	1,10	1,30	0,90
Concrete cone failure						
Characteristic Resistance	R30-R90	$N^0_{Rk,c,fi}$	[kN]	0,9	0,9	0,8
	R120	$N^0_{Rk,c,fi}$	[kN]	0,7	0,7	0,7
Edge distance						
R30 - R120	$c_{cr,fi}$	[mm]	$2 \times h_{ef}$			
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm.						
Spacing						
R30 - R120	$s_{cr,fi}$	[mm]	$4 \times h_{ef}$			
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value.						
TOGE concrete screw TSM Multiground					Annex C3	
Performances Fire exposure - characteristic values of resistance						