



## Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

<b>UK Technical Assessment</b>	<b>UKTA-0836-22/6548 of 20/12/2022</b>
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	TOGE concrete screw TSM L 6
Product family to which the construction product belongs:	Fasteners for use in concrete for redundant non-structural systems
Manufacturer:	TOGE Dübel GmbH & Co. KG Illesheimer Straße 10 90431 Nürnberg DEUTSCHLAND
Manufacturing plant(s):	TOGE Dübel GmbH & Co. KG
This UK Technical Assessment contains:	13 pages including 3 annexes which form an integral part of this assessment
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330747-00-0601 Fasteners for use in concrete for redundant non-structural systems

**Communication of this UK Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may be made with the written consent of the British Board of Agrément. Any partial reproduction must be identified as such.**

### **1. Technical description of the product**

The TOGE concrete screw TSM L in size of 6 mm is an anchor made of galvanized steel (steel with zinc flake coating), stainless steel or high-corrosion resistant steel. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by a mechanical interlock in the special thread.

The product description is given in Annex A.

### **2. Specification of the intended use(s) in accordance with the applicable UK Assessment Document (hereinafter UKAD)**

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this UK Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### **3. Performance of the product and references to the methods used for its assessment**

#### **3.1. Mechanical resistance and stability (BWR 1)**

<b>Essential characteristic</b>	<b>Performance</b>
Reaction to fire	Class A1
Resistance to fire	See Annex C 2

#### **3.2. Safety in case of fire (BWR 2)**

Not relevant.

#### **3.3. Health, hygiene and the environment (BWR 3)**

Not relevant.

#### **3.4. Safety and accessibility in use (BWR 4)**

<b>Essential characteristic</b>	<b>Performance</b>
Characteristic resistance to tension load (static and quasi-static loading)	See Annex C 1
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C 1
Durability	See Annex B 1

#### **3.5. Protection against noise (BWR 5)**

Not relevant.

#### **3.6. Energy economy and heat retention (BWR 6)**

Not relevant.

#### **3.7. Sustainable use of natural resources (BWR 7)**

No performance assessed.

**4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied**

**4.1. System of assessment and verification of constancy of performance**

According to UKAD No. 330747-00-0601 and Annex V of the Construction Products Regulation (Regulation (EU) 305/2011) as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 2+ applies.

**5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable UKAD**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

**5.1. UKCA marking for the product/ system must contain the following information:**

- Identification number of the Approved Body
- Name/address of the manufacturer of the product/ system
- Marking with intention of clarification of intended use
- Date of marking
- Number of certificate of constancy of performance (where applicable)
- UKTA number.

On behalf of the British Board of Agrément



Date of Issue: 20 December 2022

**Hardy Giesler**  
Chief Executive Officer



**British Board of Agrément,**  
1<sup>st</sup> Floor Building 3,  
Hatters Lane,  
Croxley Park  
Watford  
WD18 8YG

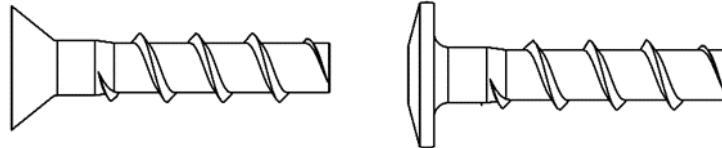
## ANNEX A1 Product in installed condition

This annex applies to the product described in the main body of the UK Technical Assessment.

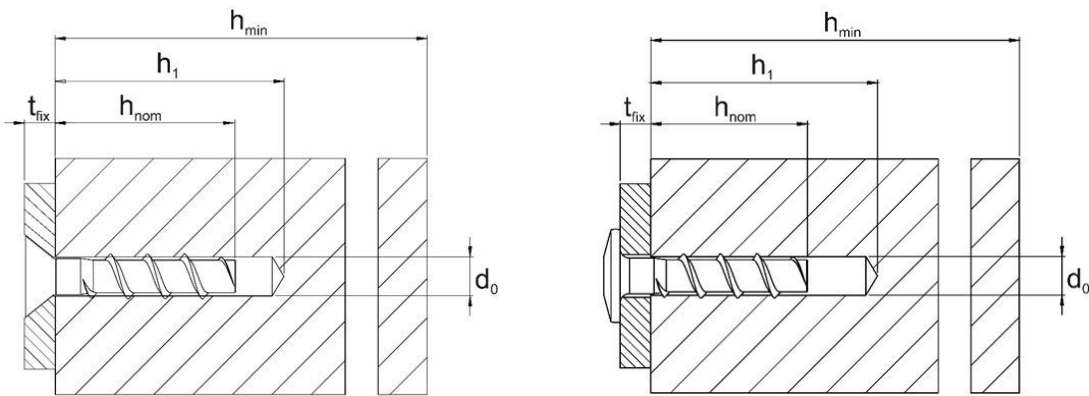
### Product in installed condition

TOGE concrete screw TSM L

- Galvanized carbon steel
- Zinc flakes coated carbon steel
- Stainless steel A4
- Stainless steel HCR



e.g. TOGE concrete screw TSM L, configuration with countersunk head and TORX drive

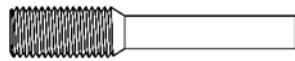


$d_0$  = nominal drill hole diameter  
 $t_{fix}$  = thickness of fixture  
 $h_1$  = drill hole depth

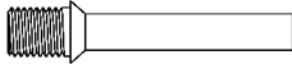
$h_{min}$  = minimum thickness of member  
 $h_{nom}$  = nominal embedment depth

## ANNEX A2 Screw types and Material

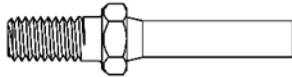
This annex applies to the product described in the main body of the UK Technical Assessment.



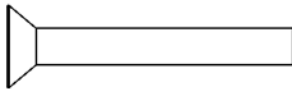
Configuration with metric connection thread and TORX drive e.g. TSM L 6x30 M10 SW5



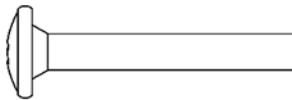
Configuration with countersunk head and metric connection thread e.g. TSM L 6x30 AG M8



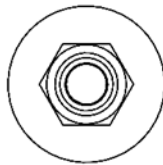
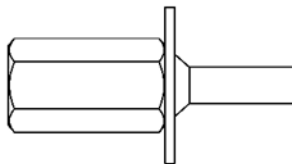
Configuration with hexagon drive and metric connection thread e.g. TSM L 6x30 M8 SW10



Configuration with countersunk head and TORX drive e.g. TSM L 6x30 C VZ 40



Configuration with pan head and TORX drive e.g. TSM L 6x30 P VZ 40



Configuration with internal thread and hexagon drive e.g. TSM L 6x30 IM M8/10

**Table 1: Material**

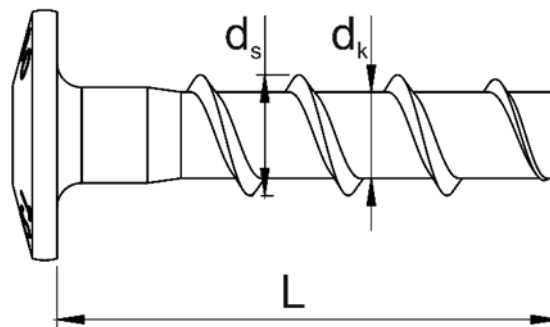
Part	Product name	Material		
all types	TSM L	- Steel BS EN 10263-4:2017 galvanized acc. to BS EN ISO 4042:2022 - Zinc flake coating according to BS EN ISO 10683:2018 ( $\geq 5\mu\text{m}$ )		
	TSM L A4	1.4401; 1.4404; 1.4571; 1.4578		
	TSM L HCR	1.4529		
Part	Product name	Nominal characteristic steel		Rupture elongation $A_5$ [%]
		Yield strength $f_{yk}$ [ $\text{N}\cdot\text{mm}^{-2}$ ]	Ultimate strength $f_{uk}$ [ $\text{N}\cdot\text{mm}^{-2}$ ]	
all types	TSM L	400	600	$\leq 8$
	TSM L A4			
	TSM L HCR			

## ANNEX A3 Dimensions, markings and installation parameters

This annex applies to the product described in the main body of the UK Technical Assessment

**Table 2: Dimensions**

Anchor size			6
Screw length	$L \geq$	[mm]	26
Thread outer diameter	$d_s$	[mm]	7,0
Core diameter	$d_k$	[mm]	5,5



**Marking:**

**TSM L**

Screw type: TSM L  
Screw size: 6  
Screw length: 30

**TSM L A4**

Screw type: TSM L  
Screw size: 6  
Screw length: 30  
Material: A4

**TSM L HCR**

Screw type: TSM L  
Screw size: 6  
Screw length: 30  
Material: HCR



## ANNEX B1 Specification

This annex applies to the product described in the main body of the UK Technical Assessment

### Specification of Intended use

#### Anchorage subject to:

- Static and quasi-static loads.
- Used only for anchorages with requirements related to resistance of fire.
- Used only for multiple use for non-structural application according to BS EN 1992-4:2018.

#### Base materials:

- Compacted reinforced and compacted unreinforced concrete without fibres according to BS EN 206:2013.
- Strength classes C20/25 to C50/60 according to BS EN 206:2013.
- Cracked and uncracked concrete.

#### Use conditions (Environmental conditions):

- Concrete screws subject to dry internal conditions: all screw types with  $h_{nom1}$  and  $h_{nom2}$
- Structure subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal conditions where no particularly aggressive conditions exist; nominal embedment depth  $h_{nom2}$  for screw types made of stainless steel with marking A4.
- Structure subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal conditions if particularly aggressive conditions exist; nominal embedment depth  $h_{nom2}$  for screw types made of stainless steel with marking HCR.

Note: Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

#### Design:

- Anchorages are to be designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed according to BS EN 1992-4:2018.  
The design for shear load according to BS EN 1992-4:2018, Section 6.2.2 applies for all specified diameters  $d_f$  of clearance hole in the fixture in Annex A3, Table 3.

#### Installation:

- Only hammer drilling.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on site.
- In case of aborted hole: new drilling must be drilled at a minimum distance of twice the depth of aborted hole or closer if the aborted hole is filled with high strength mortar and only if the hole is not in the direction of the oblique tensile or shear load.
- After installation further turning of the anchor must not be possible. The head of the anchor is supported in the fixture and is not damaged.



**ANNEX B2 Intended use****Installation parameters****Minimum thickness of member, minimum edge distance and minimum spacing**

This annex applies to the product described in the main body of the UK Technical Assessment

**Table 1: Installation parameters**

Toge concrete screw TSM L			6	
Nominal embedment depth	$h_{nom}$		$h_{nom1}^{1)}$	$h_{nom2}$
	[mm]		25	35
Nominal drill hole diameter	$d_0$	[mm]	6,0	
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,35	
Drill hole depth	$h_1 \geq$	[mm]	28	38
Clearance hole diameter	$d_r \leq$	[mm]	8	
Installation torque (version with connection thread)	$T_{inst}$	[Nm]	10	

<sup>1)</sup> only subject to dry internal conditions

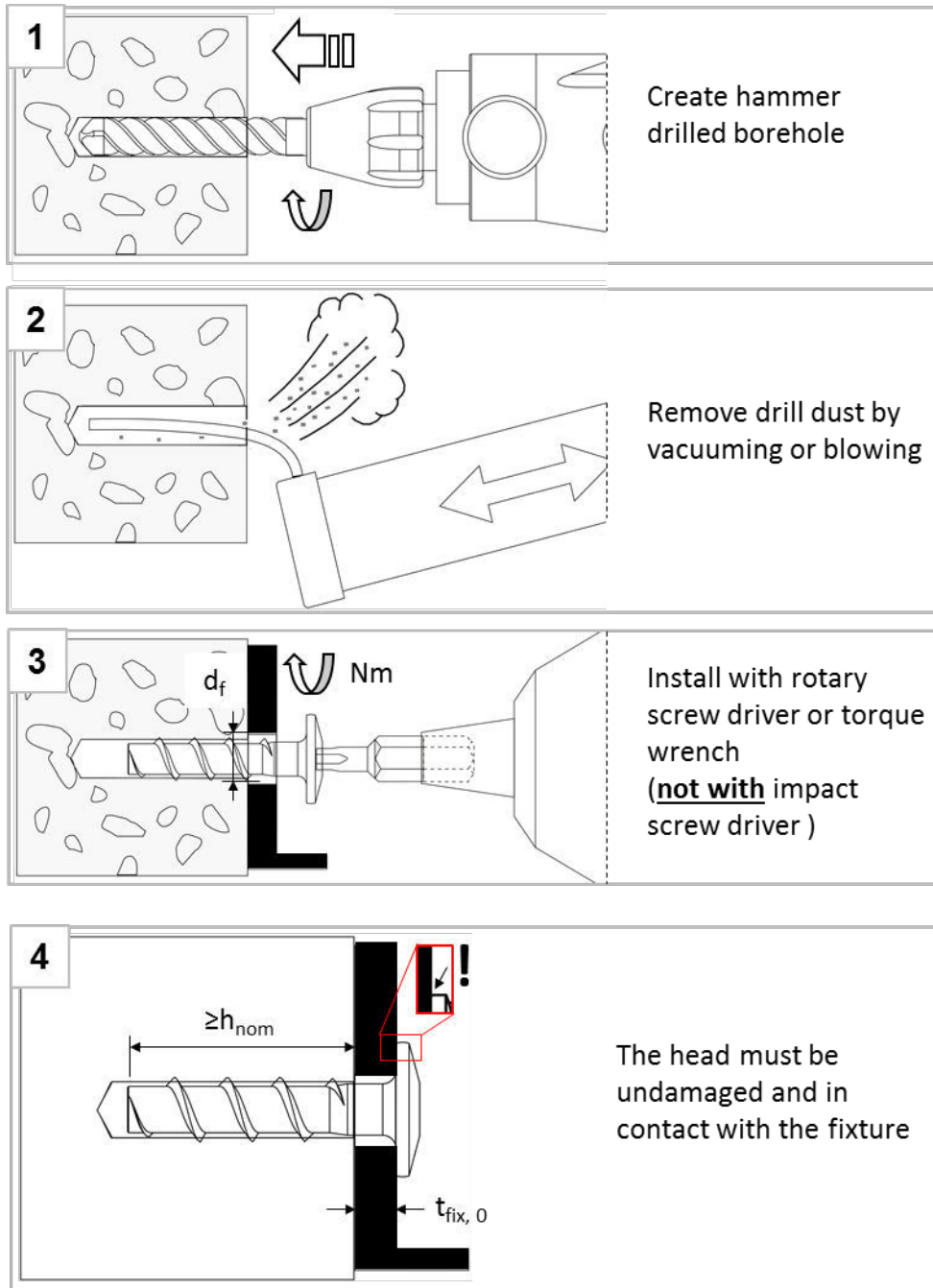
**Table 2: Minimum thickness of member, minimum edge distance and minimum spacing**

TSM concrete screw TSM L			6	
Nominal embedment depth	$h_{nom}$		$h_{nom1}^{1)}$	$h_{nom2}$
	[mm]		25	35
Minimum thickness of member	$h_{min}$	[mm]	80	
Minimum edge distance	$c_{min}$	[mm]	30	
Minimum spacing	$s_{min}$	[mm]	30	

<sup>1)</sup> only subject to dry internal conditions

**ANNEX B3 Intended use  
Installation instructions**

This annex applies to the product described in the main body of the UK Technical Assessment



**The use of impact screwdriver is not allowed.**

**The anchor is correctly installed if the head is supported on the fixture.**

**Further turning of the anchor is not possible.**

## ANNEX C1

### Performances

#### Characteristic values for static and quasi-static loading

This annex applies to the product described in the main body of the UK Technical Assessment

**Table 3: Characteristic values for static and quasi-static loading**

TSM concrete screw TSM L				6	
Nominal embedment depth	$h_{nom}$		$h_{nom1}^{1)}$	$h_{nom2}$	
	[mm]		25	35	
Steel failure for tension and shear loading					
Characteristic tension load	$N_{Rk,s}$	[kN]	13,7		
Partial factor	$\gamma_{Ms,N}$	[-]	1,5		
Characteristic shear load	$V_{Rk,s}$	[kN]	6,9		
Partial factor	$\gamma_{Ms,V}$	[-]	1,25		
Ductility factor	$k_7$	[-]	0,8		
Characteristic bending load	$M^0_{Rk,s}$	[Nm]	11,1		
Pull-out failure					
Characteristic tension load C20/25	cracked	$N_{Rk,p}$	[kN]	0,9	2,0
	uncracked	$N_{Rk,p}$	[kN]	2,0	4,0
Increasing factor for $N_{Rk,p}$	C25/30	$\psi_c$	[-]	1,12	
	C30/37			1,22	
	C40/50			1,41	
	C50/60			1,58	
Concrete failure: Splitting failure, concrete cone failure and pry-out failure					
Effective embedment depth	$h_{ef}$	[mm]	19	27	
k-factor	cracked	$k_{cr}$	[-]	7,7	
	uncracked	$k_{ucr}$	[-]	11,0	
Concrete cone failure	spacing	$s_{cr,N}$	[mm]	$3 \times h_{ef}$	
	edge distance	$c_{cr,N}$	[mm]	$1,5 \times h_{ef}$	
Splitting failure	resistance	$N^0_{Rk,Sp}$	[kN]	0,9	
	spacing	$s_{cr,Sp}$	[mm]	$3 \times h_{ef}$	
	edge distance	$c_{cr,Sp}$	[mm]	$1,5 \times h_{ef}$	
Factor for pry-out failure	$k_8$	[-]	1,0		
Installation factor	$\gamma_{inst}$	[-]	1,0		
Concrete edge failure					
Effective length in concrete	$l_f = h_{ef}$	[mm]	19	27	
Nominal outer diameter of screw	$d_{nom}$	[mm]	6		

<sup>1)</sup> only subject to dry internal conditions

**ANNEX C2**  
**Performances**  
**Fire exposure – characteristic values of resistance**

This annex applies to the product described in the main body of the UK Technical Assessment

**Table 4: Fire exposure – characteristic values of resistance**

TSM concrete screw TSM L				TSM 6	
Nominal embedment depth		$h_{nom}$		$h_{nom1}^{1)}$	$h_{nom2}$
		[mm]		25	35
Steel failure for tension and shear load					
Characteristic Resistance	R30	$N_{Rk,s,fi30}$	[kN]	0,27	
	R60	$N_{Rk,s,fi60}$	[kN]	0,27	
	R90	$N_{Rk,s,fi90}$	[kN]	0,22	
	R120	$N_{Rk,s,fi120}$	[kN]	0,17	
	R30	$V_{Rk,s,fi30}$	[kN]	0,27	
	R60	$V_{Rk,s,fi60}$	[kN]	0,27	
	R90	$V_{Rk,s,fi90}$	[kN]	0,22	
	R120	$V_{Rk,s,fi120}$	[kN]	0,17	
	R30	$M^0_{Rk,s,fi30}$	[Nm]	0,22	
	R60	$M^0_{Rk,s,fi60}$	[Nm]	0,22	
	R90	$M^0_{Rk,s,fi90}$	[Nm]	0,18	
	R120	$M^0_{Rk,s,fi120}$	[Nm]	0,14	
Pull-out failure					
Characteristic Resistance	R30-R90	$N_{Rk,p,fi}$	[kN]	0,23	0,50
	R120	$N_{Rk,p,fi}$	[kN]	0,18	0,40
Concrete cone failure					
Characteristic Resistance	R30-R90	$N^0_{Rk,c,fi}$	[kN]	0,27	0,65
	R120	$N^0_{Rk,c,fi}$	[kN]	0,22	0,52
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 $\geq 300$ mm.					
Spacing					
R30 - R120		$S_{cr,fi}$	[mm]	$4 \times h_{ef}$	
Pry-out failure					
R30 - R120		$k_8$	[-]	1,0	
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value.					

1) only subject to dry internal condition



**British Board of Agrément,**  
1<sup>st</sup> Floor Building 3,  
Hatters Lane,  
Croxley Park  
Watford  
WD18 8YG