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

UK Technical Assessment	UKTA-0836-22/6549 of 20/12/2022
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	TOGE Insulation screw TIS
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:	12 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

1. Technical description of the product

The TOGE Insulation screw TIS 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 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)

Not relevant.

3.2. Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C2

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

Essential characteristic	Performance
Characteristic resistance to tension load (Static and quasi-static loading)	See Annex C1
Characteristic resistance to shear load (Static and quasi-static loading)	See Annex C1
Durability	See Annex B1

3.4. Safety and accessibility in use (BWR 4)

Not relevant.

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

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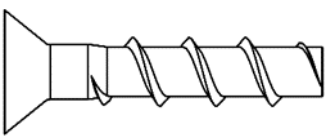
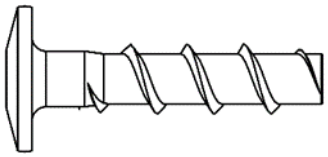
ANNEX A1 Product description, product in installed condition

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

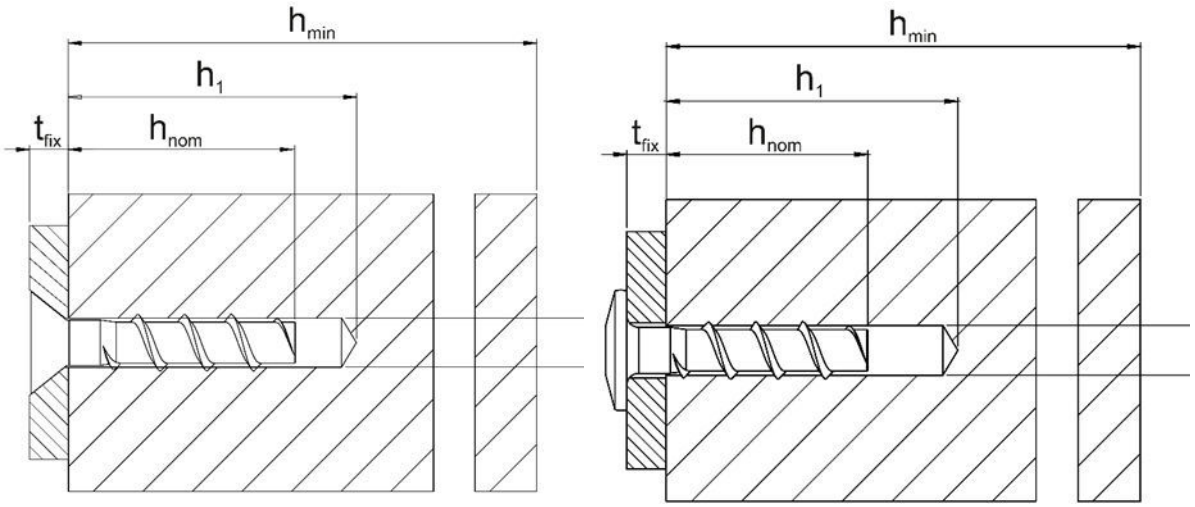
TOGE Insulation screw TIS

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





e.g. TOGE Insulation screw TIS, configuration with countersunk head and TORX drive

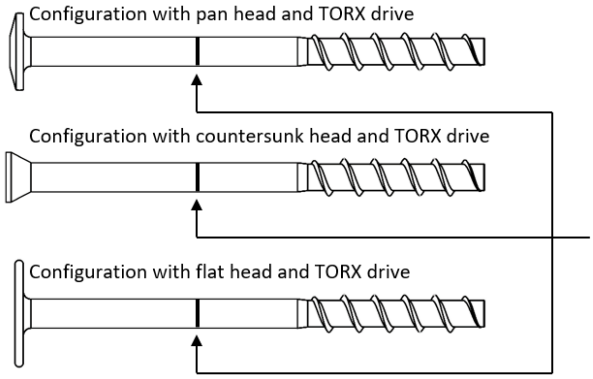


d_0 = nominal drill hole diameter
t_{fix} = thickness of fixture
h_1 = drill hole depth

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

ANNEX A2 Product description, screw types and material

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



Marking:
TIS: no marking on the shaft
TIS HCR: 1 ring on the shaft
TIS A4: 2 rings on the shaft

Table 1: Material

Part	Product name	Material
all types	TIS	- Steel BS EN 10263-4:2017 galvanized according to BS EN ISO 4042:2018 - Zinc flake coating according to BS EN ISO 10683 :2018 (≥5µm)
	TIS A4	1.4401; 1.4404; 1.4571; 1.4578
	TIS HCR	1.4529

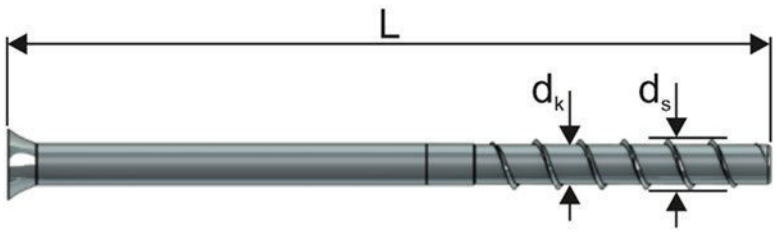
Part	Product name	Nominal characteristic steel		Rupture elongation A_5 [%]
		Yield strength f_{yk} [N·mm^{-2}]	Ultimate strength f_{uk} [N·mm^{-2}]	
all types	TIS	400	600	≤ 8
	TIS A4			
	TIS HCR			

ANNEX A3 Product description, dimensions and markings

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 ≥	[mm]	50
	L ≤	[mm]	325
Thread outer diameter	d_s	[mm]	7,0
Core diameter	d_k	[mm]	5,5



Marking:

TSM TIS

Screw type: TSM TIS
Screw size: 6
Screw length: 100

ANNEX B1 Intended use, specification

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

Specification of Intended use

Anchorages 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 fibers 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 condition where no aggressive conditions exist: nominal embedment depth h_{nom2}, 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 condition if particular aggressive conditions exist: nominal embedment depth h_{nom2} 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 B2, 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 3: Installation parameters

Insulation screw TIS			**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	$d_f \leq$	[mm]	8	

[1)] only subject to dry internal conditions

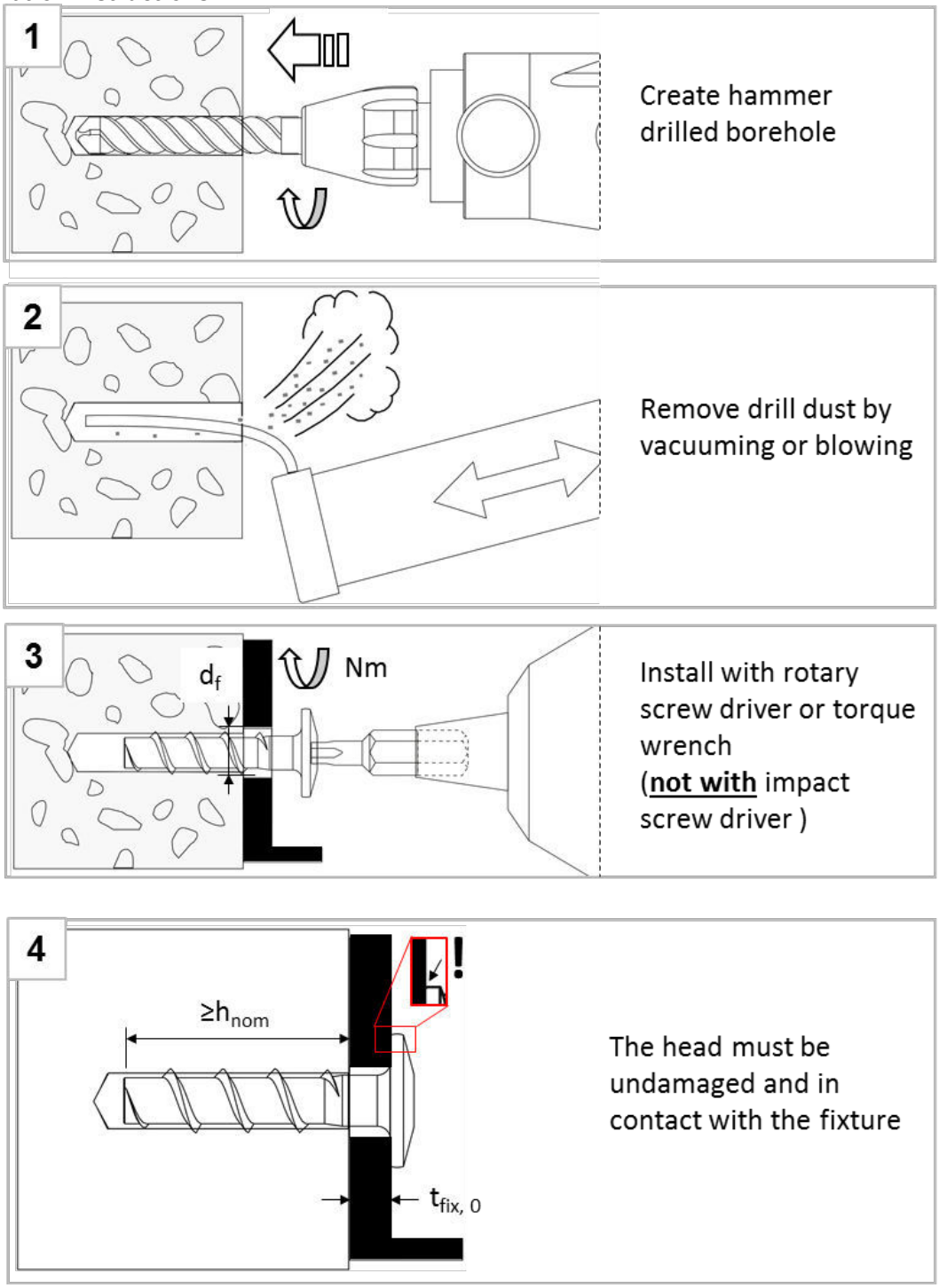
Table 4: Minimum thickness of member, minimum edge distance and minimum spacing

Insulation screw TIS			**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	

ANNEX B3 Intended use, installation instructions

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

Installation Instructions



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 5: Characteristic values for static and quasi-static loading

Insulation screw TIS				**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 safety factor		$\gamma_{Ms,N}$	[-]	1,5	
Characteristic shear load		$V_{Rk,s}$	[kN]	6,9	
Partial safety 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 Ψ_c factor for $N_{Rk,p}$ = $N_{Rk,p\ (C20/25)} \cdot \Psi_c$	C25/30	Ψ_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 x h_{ef}	
	edge distance	$c_{cr,N}$	[mm]	1,5 x h_{ef}	
Splitting failure	resistance	$N^0_{Rk,sp}$	[kN]	0,9	
	spacing	$s_{cr,sp}$	[mm]	3 x h_{ef}	
	edge distance	$c_{cr,sp}$	[mm]	1,5 x h_{ef}	
Factor for pry-out failure		k_8	[-]	1,0	
Installation factor		γ_{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	

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 6: Fire exposure – characteristic values of resistance

Insulation screw TIS				**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 x h_{ef}	
In case of fire attack from more than one side, the minimum edge distance shall be ≥300mm.					
Spacing					
R30 - R120		$s_{cr,fi}$	[mm]	4 x h_{ef}	
Pry-out failure					
R30 - R120		k_8	[-]	1,0	
The anchorage depth must be increased for wet concrete by at least 30 mm compared to the given value.					

1) only subject to dry internal condition

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