

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

ETA-09/0237  
of 4 September 2014

### General Part

Technical Assessment Body issuing the  
European Technical Assessment:

Trade name of the construction product

Product family  
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment  
contains

This European Technical Assessment is  
issued in accordance with Regulation (EU)  
No 305/2011, on the basis of

Deutsches Institut für Bautechnik

TOGE metal frame anchor TU 10

Torque controlled expansion anchor made of galvanised  
steel of size 10 for anchorage in non-cracked concrete

TOGE Dübel GmbH & Co. KG  
Illesheimer Straße 10  
90431 Nürnberg  
DEUTSCHLAND

TOGE Dübel GmbH & Co. KG

12 pages including 3 annexes which form an integral part  
of this assessment

Guideline for European technical approval of "Metal  
anchors for use in concrete", ETAG 001 Part 2: "Torque  
controlled expansion anchors", Edition April 2013,  
used as European Assessment Document (EAD)  
according to Article 66 Paragraph 3 of Regulation (EU)  
No 305/2011.

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## Specific Part

### 1 Technical description of the product

The Toge metal frame anchor TU 10 in size M10 is an anchor made of galvanised steel which is placed into a drilled hole and anchored by torque-controlled expansion.

Product and product description is given in Annex A.

### 2 Specification of the intended use in accordance with the applicable EAD

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 provisions made in this European technical assessment are based on an assumed working life of the anchor of 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)

Essential characteristic	Performance
Characteristic resistance for tension and shear loads	See Annex C 1
Edge distances and spacing	See Annex C 1
Characteristic resistance for bending moments	See Annex C 1
Displacements under tension and shear loads	See Annex C 2

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

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	No performance determined (NPD)

#### 3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances contained in this European technical assessment, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

#### 3.4 Safety and accessibility (BWR 4)

For Basic requirement Safety and accessibility in use the same criteria are valid as for Basic Requirement Mechanical resistance and stability.

**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)**

For the sustainable use of natural resources no performance was investigated for this product.

**3.8 General aspects**

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

**4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base**

According to Decision 96/582/EC of the Commission of 24 June 1996 (Official Journal of the European Communities L 254 of 08.10.1996, p. 62–65) the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use(s)	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting concrete structural elements or heavy units such as cladding and suspended ceilings	—	1

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

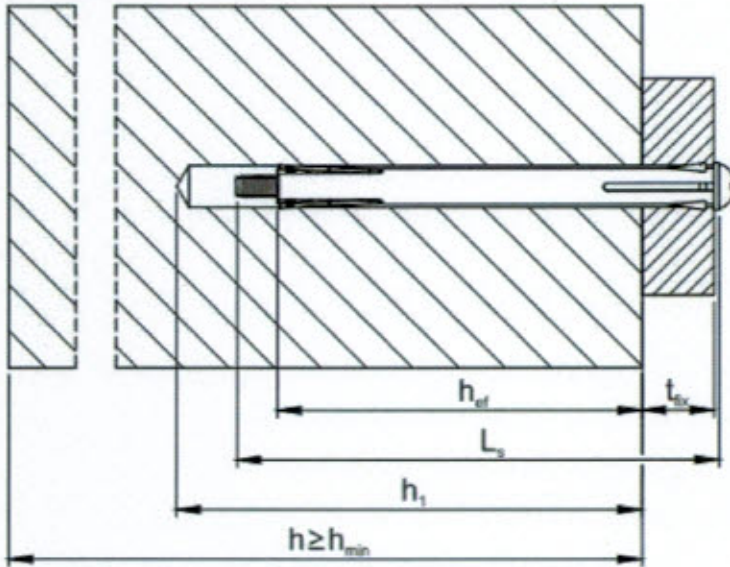
Issued in Berlin on 4 September 2014 by Deutsches Institut für Bautechnik

Uwe Bender  
Head of Department

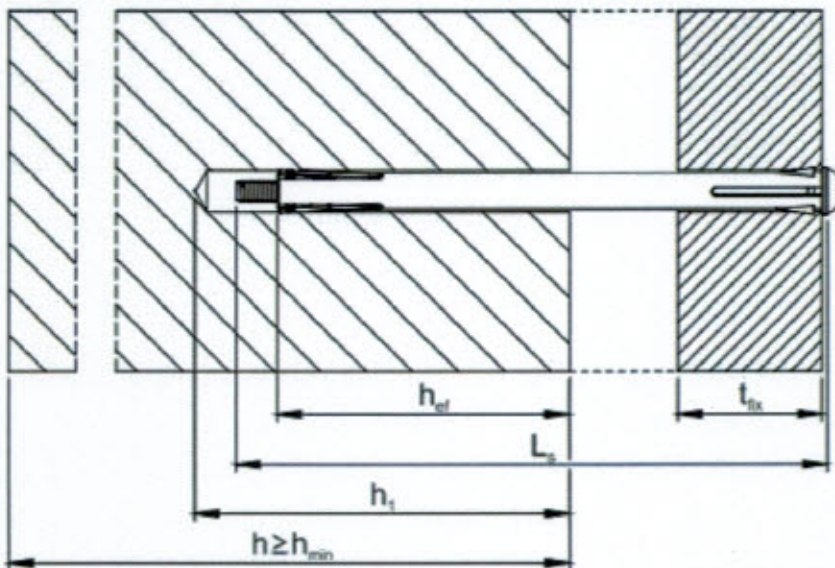
*beglaubigt:*  
Tempel

**product and installed condition**

installed anchor – fixture attached to concrete



installed anchor – fixture mounted with distance to concrete



- |           |   |                           |
|-----------|---|---------------------------|
| $h_{ef}$  | = | effective anchorage depth |
| $h_1$     | = | depth of the drill hole   |
| $h$       | = | thickness of member       |
| $t_{fix}$ | = | thickness of fixture      |






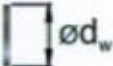

**Toge metal frame anchor TU 10**

**Product description**

Installed condition

**Annex A 1**

**Table A 1: parts and materials**

part	name	Material								
1,2,3,4	screw	steel acc. DIN EN ISO 896-1, zinc coated $\geq 5 \mu\text{m}$ DIN EN ISO 4042 A2K								
		<table border="1"> <tr> <td>charakteristische Streckgrenze</td> <td><math>f_{yk}</math></td> <td>[N/mm<sup>2</sup>]</td> <td>400</td> </tr> <tr> <td>charakteristische Zugfestigkeit</td> <td><math>f_{uk}</math></td> <td>[N/mm<sup>2</sup>]</td> <td>240</td> </tr> </table>	charakteristische Streckgrenze	$f_{yk}$	[N/mm <sup>2</sup> ]	400	charakteristische Zugfestigkeit	$f_{uk}$	[N/mm <sup>2</sup> ]	240
charakteristische Streckgrenze	$f_{yk}$	[N/mm <sup>2</sup> ]	400							
charakteristische Zugfestigkeit	$f_{uk}$	[N/mm <sup>2</sup> ]	240							
		1) screw with counter sunk cross head								
		2) screw with pan cross head								
		3) screw with washer and hexagonal head								
		4) screw with hexagonal head and connection thread								
5	clamping sleeve	steel acc. EN 10327 DX51D								
		5) clamping sleeve								
6	washer (optional) DIN-EN-ISO-887-7C	steel, zinc coated acc. DIN ISO 4042 A2K								
	 $\varnothing d_w$	6) washer								
7	cone nut	steel acc. DIN 1651								
		7) cone nut								

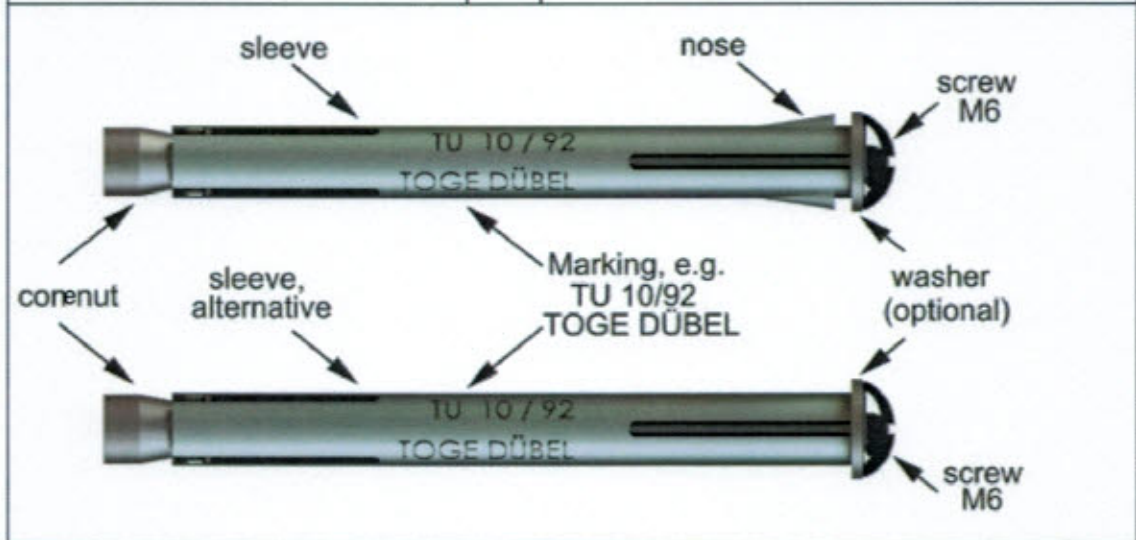
**Toge metal frame anchor TU 10**

**Product description**  
parts and materials

**Annex A 2**

**Table A 2: dimensions and markings**

anchor name			TU 10
length of the clamping sleeve	$L \geq$	[mm]	52
diameter of the clamping sleeve	$d$	[mm]	6,40
screw length	$L_s \geq$	[mm]	66
diameter of the washer	$d_w \geq$	[mm]	14



**Toge metal frame anchor TU 10**

**Product descriptions**

Dimensions and markings

**Annex A 3**

## Intended use

### Anchorage subject to:

- static and quasi static loads

### Base materials:

- reinforced and unreinforced concrete according to EN 206-1:2000-12,
- strength classes C 20/25 to C 50/60 according to EN 206-1:2000-12,
- non-cracked concrete.

### Use conditions (Environmental conditions):

- anchorage subject to dry internal conditions.

### Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work,
- Verifiable calculation notes and drawings are 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 under static or quasi-static actions are designed for design method A in accordance with:
  - ETAG 001, Annex C, Edition August 2010 or
  - CEN/TS 1992-4:2009.

### Installation:

- Hammer drilling only,
- Anchor installation carried out by appropriately qualified personal and under the supervision of the person responsible for technical matters of the site,
- After installation further turning of the anchor is not possible. The head of the anchor is supported on the fixture and is not damaged.

**Toge metal frame anchor TU 10**

**Intended use**

Specifications

**Annex B 1**

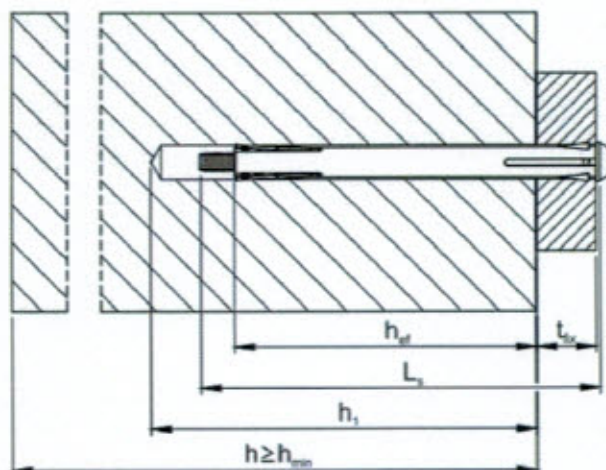


**Table B 1: Installation parameters**

anchor identity			TU 10
nominal drill bit diameter	$d_0$	[mm]	10,0
cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45
depth of drill hole	$h_1 \geq$	[mm]	55
effective anchorage depth	$h_{ef} \geq$	[mm]	40
diameter of clearing hole in the fixture	$d_f \geq$	[mm]	10
Installation torque	$T_{inst}$	[Nm]	8

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

anchor identity			TU 10
minimum thickness of member	$h_{min}$	[mm]	100
minimum edge distance	$c_{min}$	[mm]	70
minimum spacing	$s_{min}$	[mm]	60



**Toge metal frame anchor TU 10**

**Intended use**

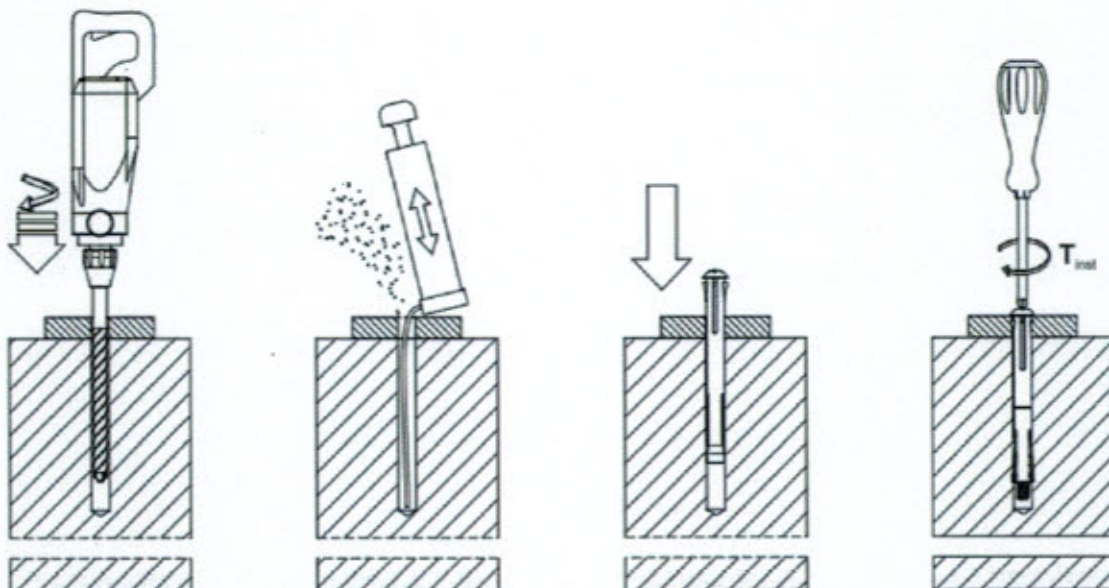
Installation parameters

**Annex B 2**

**Table B 3: Length of the anchor and maximum thickness of the fixture  $t_{fix}$**

anchor identity	TU 10
length of the anchor [mm]	maximum thickness of the fixture $t_{fix}$ [mm]
52	10
72	30
92	50
112	70
132	90
152	110
182	140
202	160

**Installation instructions**



**Toge metal frame anchor TU 10**

**Intended use**

Installation parameters / installation instruction

**Annex B 3**

**Table C 1: Characteristic values for design method A**

anchor identity			TU 10
<b>steel failure for tension- and shear load</b>			
characteristic load	$N_{Rk,s}$	[kN]	8,0
	$V_{Rk,s}$	[kN]	4,0
	$M^0_{Rk,s}$	[Nm]	6,1
<b>pull-out failure</b>			
characteristic tension load in concrete C20/25 to C50/60	$N_{Rk,p}$	[kN]	7,5
<b>concrete cone and splitting failure</b>			
effective anchorage depth	$h_{ef}$	[mm]	44
factor for	cracked	$k_{cr}^{1)}$	[-]
	non cracked	$k_{ocr}^{1)}$	[-]
concrete cone failure	spacing	$s_{cr,N}$	[mm]
	edge distance	$c_{cr,N}$	[mm]
splitting failure	spacing	$s_{cr,sp}$	[mm]
	edge distance	$c_{cr,sp}$	[mm]
<b>concrete pry out failure (pry-out)</b>			
k-Factor	$k^{1)} = k_3^{2)}$	[-]	1,0
<b>concrete edge failure</b>			
effective length of anchor	$l_f = h_{ef}$	[mm]	40
outside diameter of anchor	$d_{nom}$	[mm]	10
installation safety factor	$\gamma_2^{1)} = \gamma_{inst}^{2)}$	[-]	1,0 <sup>2)</sup>

<sup>1)</sup> Parameter relevant only for design according to CEN/TS 1992-4:2009

<sup>2)</sup> Parameter relevant only for design according ETAG 001 Annex C

**Toge metal frame anchor TU 10**

**Performances**

Characteristic values for design method A

**Annex C 1**

**Table C 2: Displacements under tension load**

anchor identity			TU 10
tension load	N	[mm]	3,6
displacement	$\delta_{N0}$	[mm]	0,4
	$\delta_{\infty}$	[mm]	3,0

**Table C 3: Displacements under shear load**

anchor identity			TU 10
shear load	V	[mm]	1,7
displacement	$\delta_{N0}$	[mm]	3,0
	$\delta_{\infty}$	[mm]	4,5

**Toge metal frame anchor TU 10**

**Performances**

Displacements under tension and shear loads

**Annex C 2**