Deutsches Institut für Bautechnik

Member of EOTA
www.eota.eu

Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment

ETA-13/0222 of 4 December 2015

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	DEMU Fixing anchor T-FIXX
Product family to which the construction product belongs	Cast-in anchor with internal threaded socket
Manufacturer	Halfen GmbH Liebigstraße 14 40764 Langenfeld DEUTSCHLAND
Manufacturing plant	HALFEN Herstellwerke
This European Technical Assessment contains	15 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) 330012-00-0601

The European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction shall be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission in accordance with Article 25(3) of Regulation (EU) No 305/2011.

Specific part

1 Technical description of the product

The DEMU Fixing anchor T-FIXX in the size of M10, M12, M16 and M20 is an anchor consisting of an internal threaded socket deformed at one end. The socket is made of galvanised steel or stainless steel. The anchor is imbedded surface-flush or sunk in the concrete. The anchorage is characterised by mechanical interlock at the deformed end of the socket.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

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 European 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)

Essential characteristic	Performance
Characteristic values for resistance for static and quasi-static loads and displacements	See Annex C1 and C2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	See Annex C3

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

In accordance with EAD No. 330012-00-0601, the applicable European legal act is: [96/582/EC].

The system to be applied is: 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 with Deutsches Institut für Bautechnik.

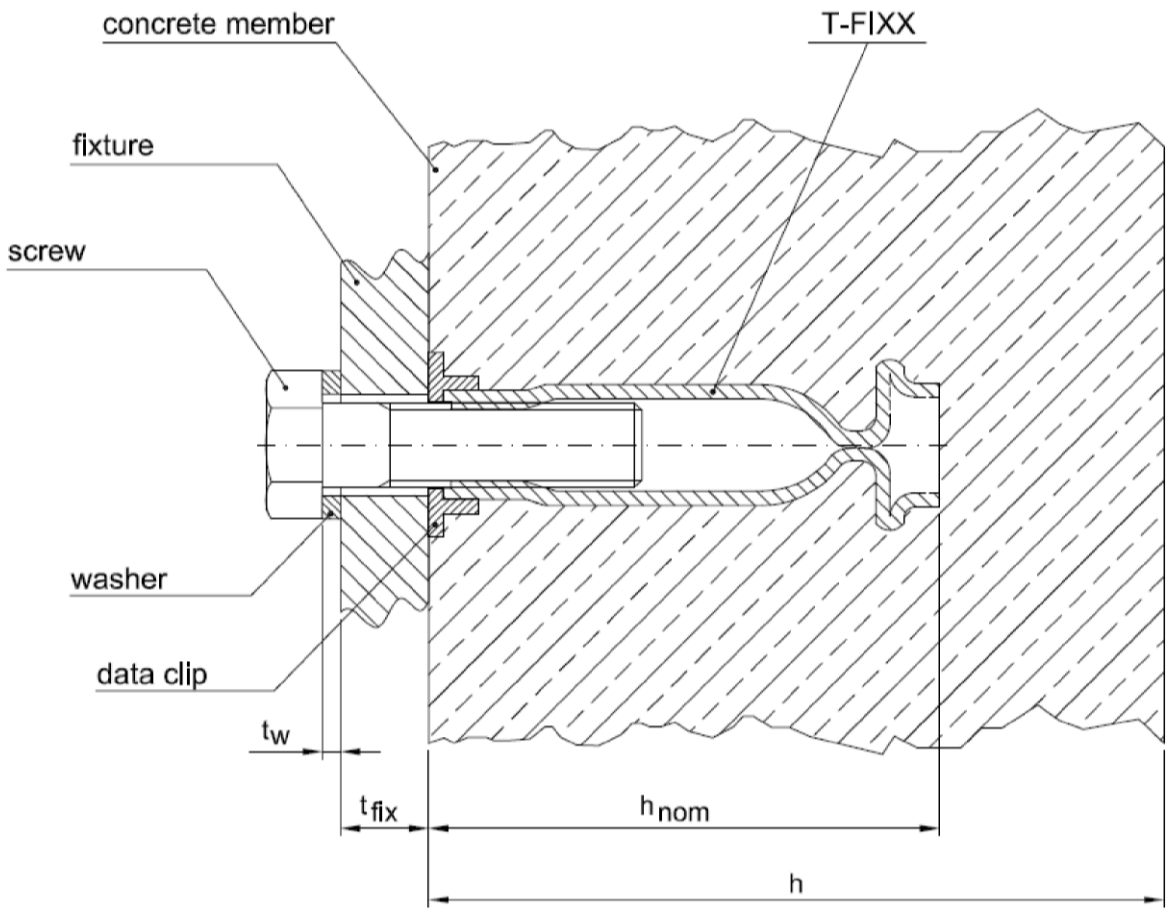
Issued in Berlin on 4 December 2015 by Deutsches Institut für Bautechnik

Uwe Bender
Head of Department

beglaubigt:
Tempel

Deutsches Institut für Bautechnik DIBt

DEMU T-FIXX



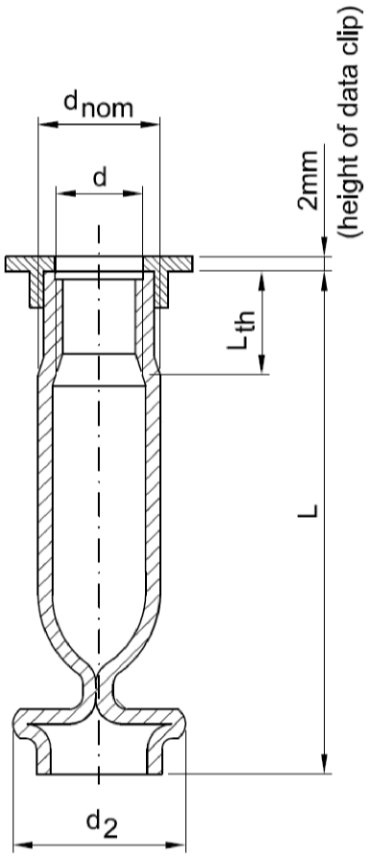
h = thickness of concrete member

t_{fix} = thickness of fixture

t_w = thickness of washer

h_{nom} = embedment depth

DEMU Fixing anchor T-FIXX	Annex A1
Product description Installed condition	



There are two different materials available for the DEMU Fixing anchor T-FIXX:

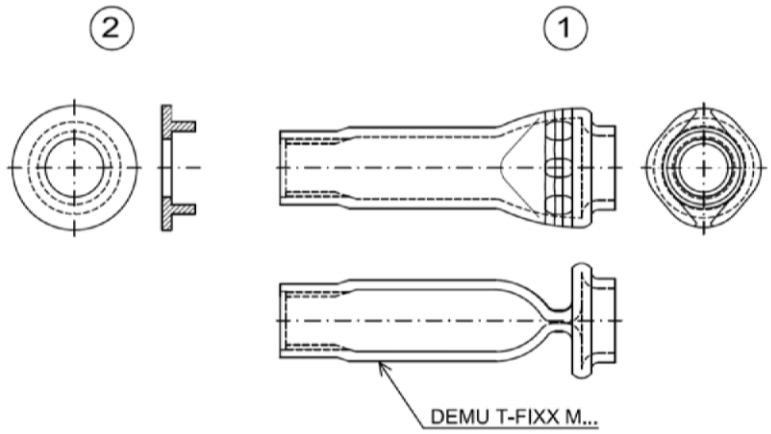
Material 1: Fixing anchor in galvanised steel

Material 2: Fixing anchor in stainless steel

Table A1: **Dimensions of DEMU Fixing anchor T-FIXX**

d	d_{nom}		L_{th}	d_2		L	
Thread	Material 1	Material 2	Material 1 + 2	Material 1	Material 2	Material 1	Material 2
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
M10	13.5	13.5	10.4 - 13.6	18.1	17.3	50 / 75	50 / 65
M12	17.0	17.2	12.5 - 16.1	23.0	23.0	50 / 70 / 95	50 / 70 / 115
M16	21.3	21.3	16.1 - 22.1	29.1	28.0	60 / 100 / 125	60 / 80 / 110
M20	26.9	26.9	20.2 - 27.6	34.7	33.5	70 / 100 / 145	70 / 100 / 125

DEMU Fixing anchor T-FIXX	Annex A2
Product description Dimensions	



Marking:

e.g.: DEMU T-FIXX M10x50 GV

DEMU: identifying mark of the producer

T-FIXX: name of the anchor

M10x50: size

GV: material

Material:

GV: galvanised steel

A4: stainless steel

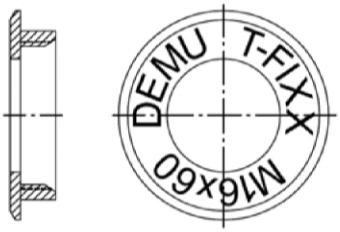
Table A2: **Specification and material of fixing anchor**

Item	Component	Material 1 Fixing anchor in galvanised steel (GV)	Material 2 Fixing anchor in stainless steel (A4)
1	Fixing anchor	1.0308 (E235) / 1.0122, 1.0038 (S235) / 1.0225 (E275) / 1.0044 (S275) / 1.0533 (E295) / 1.0570 (S355) / 1.0580 (E355) / 1.0255 (P235TR2) acc. EN 10305-1, -2 or -3, all delivery condition +N, galvanised [1)]	Stainless steel 1.4401 / 1.4404 / 1.4571 / 1.4362 / 1.4578 / 1.4062 / 1.4162 / 1.4662 / 1.4439 / 1.4462 / 1.4539 / 1.4565 / 1.4529 / 1.4547 acc. EN 10217-7
2	Data clip	for fixing anchor made of material 1: HDPE / RAL 7035 / (light-) grey for fixing anchor made of material 2: HDPE / RAL 9003 / (signal-) white	

Table A3: **Specification and material of fixing components / suppl. reinforcement (not included with the fixing system)**

Appr. Component	Material for use with fixing anchors made of material 1	Material for use with fixing anchors made of material 2
Washer	Steel acc. EN 10025, galvanised [1)]	Stainless steel 1.4401 / 1.4404 / 1.4571 / 1.4362 / 1.4578 / 1.4062 / 1.4162 / 1.4662 / 1.4439 / 1.4462 / 1.4539 / 1.4565 / 1.4529 / 1.4547, acc. EN 10088
	Dimensions acc. EN ISO 7089/7093-1	
Screw	Steel acc. EN ISO 898-1, galvanised [1)], strength grade 4.6, 5.6 or 8.8	Stainless steel 1.4401 / 1.4404 / 1.4571 / 1.4362 / 1.4578 / 1.4062 / 1.4162 / 1.4662 / 1.4439 / 1.4462 / 1.4539 / 1.4565 / 1.4529 / 1.4547, acc. EN ISO 3506-1, strength grade A4-50, A4-70 or A4-80
Suppl. reinforcement	B500A or B500B	Stainless reinforcement steel respect. B500A or B500B meeting the requirements for concrete cover c_{nom} acc. EN1992-1
	Detailing acc. CEN/TS 1992-4:2009	

[1)] thickness of coating ≥ 5µm acc. EN ISO 4042



Data clip: section and top view (with example for marking)

DEMU Fixing anchor T-FIXX

Product description
Marking and materials

Annex A3

Deutsches Institut für Bautechnik DIBt

Specifications of Intended use

Anchorages subject to:
- Static and quasi-static loads.
- Fire exposure: only for concrete C20/25 to C50/60.

Base materials:
- Reinforced or unreinforced normal weight concrete according to EN 206:2013.
- Strength classes C20/25 to C90/105 according to EN 206:2013.
- Cracked or uncracked concrete.

Use conditions (Environmental conditions)
- Anchorages subject to dry internal conditions (material 1 and 2 acc. Annex A3).
- External atmospheric exposure (including industrial and marine environment), or exposure in permanently damp internal conditions, if no particular aggressive conditions exist (material 2 acc. Annex A3).
  Note: Particularly aggressive conditions are e.g. permanent alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulfurization plants or road tunnels, where de-icing materials are used).

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 in accordance with:
  - CEN/TS 1992-4:2009, part 1 and 2
- Anchorages under fire exposure are designed in accordance with:
  - CEN/TS 1992-4:2009, part 1, Annex D
    (local spalling of the concrete cover must be avoided)
- The screw is chosen with corresponding screw-in length acc. to Annex B2, Table B1 and with the strength class acc. to Annex C1 and C2 subject to the required steel resistance and with the material acc. to Annex A3, Table A3.

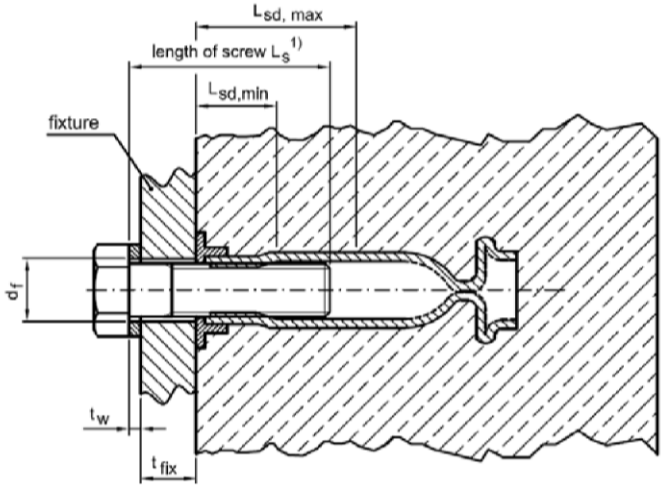
Installation:
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without any manipulation or exchanging the components.
- The anchors are fixed on the formwork so that no movement of the anchors will occur during the time of laying the reinforcement and of placing and compacting the concrete.
- Adequate compaction close to the anchor particularly at head of the bolt, e. g. without significant voids. The cast-in anchor is protected against ingress of concrete into the threaded socket.
- The setting torques given in Annex B2 are not exceeded.
- The inner area of the socket of the anchor made of galvanised steel has to be protected against ingress water.

DEMU Fixing anchor T-FIXX	Annex B1
Intended use Specifications	

Deutsches Institut für Bautechnik DIBt

Direct contact between fixture and data clip

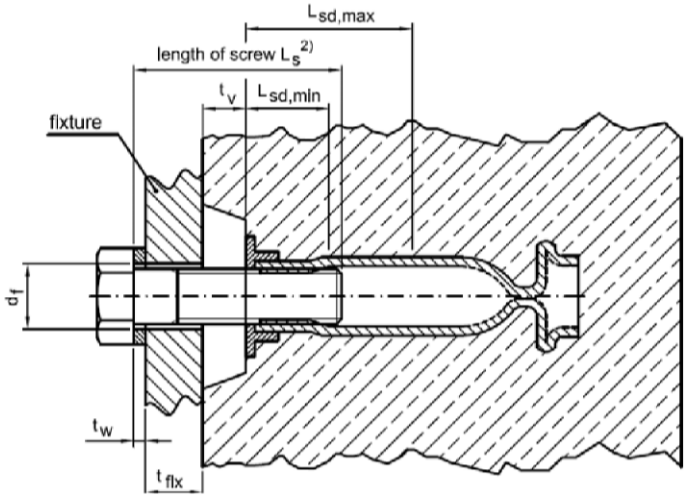
The fixture is braced to the data clip, if necessary by suitable washers.



1) $t_w + t_{fix} + l_{sd,min} \le l_s \le t_w + t_{fix} + l_{sd,max}$

General application

The fixture is braced to the concrete, the fixing anchor being embedded flush or recessed in the concrete.



2) $t_w + t_{fix} + t_v + l_{sd,min} \le l_s \le t_w + t_{fix} + t_v + l_{sd,max}$

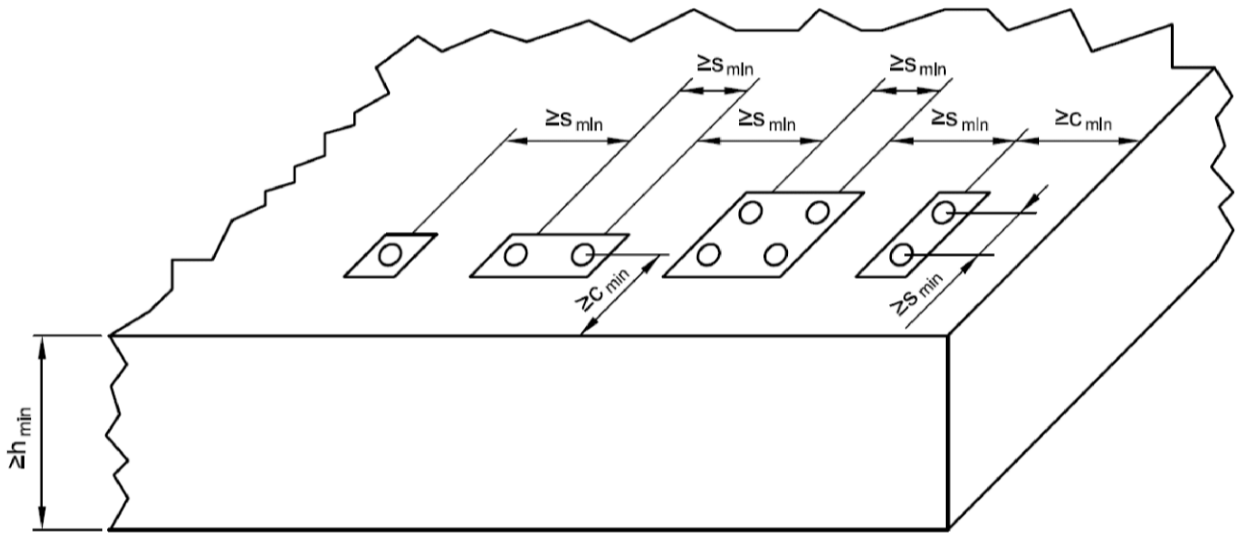
Table B1: **Installation parameters**

Thread	d	[mm]	M10	M12	M16	M20
Maximum torque moment	max. T_{inst}	[Nm]	≤ 8	≤ 10	≤ 30	≤ 60
Minimum screw-in length	$l_{sd,min}$	[mm]	17.0	20.0	26.0	32.0
Maximum screw-in length	$l_{sd,max}$	[mm]	32.0	M12x50: 30.0	M16x60: 32.0	M20x70: 44.0
				M12x70: 38.0	M16x80: 50.0	M20x100: 62.0
				M12x95: 38.0	M16x100: 50.0	M20x125: 62.0
				M12x115: 38.0	M16x110: 50.0	M20x145: 62.0
				-	M16x125: 50.0	-
Diameter of clearance hole in fixture	d_f	[mm]	12.0	14.0	18.0	22.0

DEMU Fixing anchor T-FIXX

Intended use
Positions of the fixture, installation parameters

Annex B2



The mentioned spacings, edge distances and member thicknesses apply also for fixing anchors installed in the front edge.

Table B2: **Min. allowed thickness of concrete member, min. edge distances and spacing**

Thread	d	[mm]	M10	M12	M16	M20
Minimum spacing	s_{min}	[mm]	100	100	100	120
Minimum edge distance	c_{min}	[mm]	50	50	50	60
Minimum thickness of concrete member	h_{min}	[mm]	$h_{nom} + c_{nom}$ [1)]			
[1)] c_{nom} acc. EN 1992-1 with $c_{nom} \geq 20$mm						
For fixing anchors made of stainless steel a minimum concrete cover $c_{nom} = 20$mm is sufficient.						

DEMU Fixing anchor T-FIXX	Annex B3
Intended use Arrangement of fixing anchors and member thickness	

Deutsches Institut für Bautechnik DIBt

Installation instruction - part 1

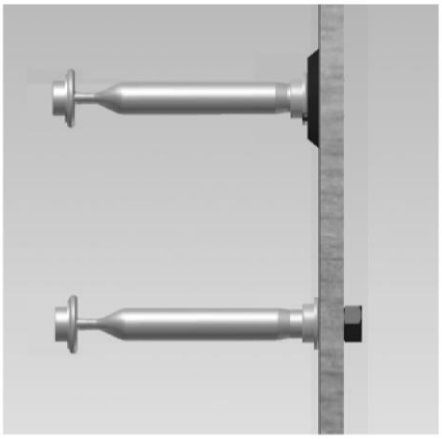
1. Scope of delivery

1) Selection of fixing anchor in accordance with the planning documents.

1a) DEMU T-FIXX made of galvanised steel (GV) or stainless steel (A4)

1b) Data clip for T-FIXX GV,
colour: grey
Data clip for T-FIXX A4,
colour: white

2. Fixing of the anchor to the formwork



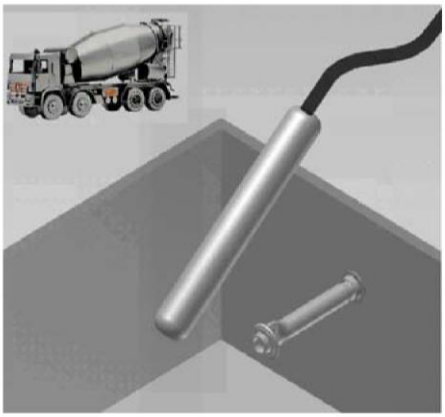
1) Attach data clip to the fixing anchor.

2) Fix the anchor to the formwork with the help of DEMU assembly accessories (e. g. nailing plate) or alternatively by hexagon bolts.

→ The inside of the threaded socket must be protected against ingress of dirt and water.

3) If necessary, supplementary reinforcement has to be placed according to the planning documents.

3. Pouring and compacting of concrete



1) Pour concrete carefully, make sure the anchor stays in place!

2) Compact concrete carefully, avoid direct contact between compacting device and anchor.

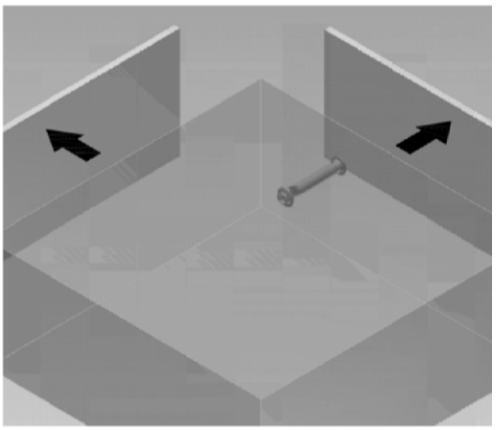
→ The anchor must not be moved by force or damaged!

DEMU Fixing anchor T-FIXX	
Intended use Installation instruction – part 1	Annex B4

Deutsches Institut für Bautechnik DIBt

Installation instruction - part 2

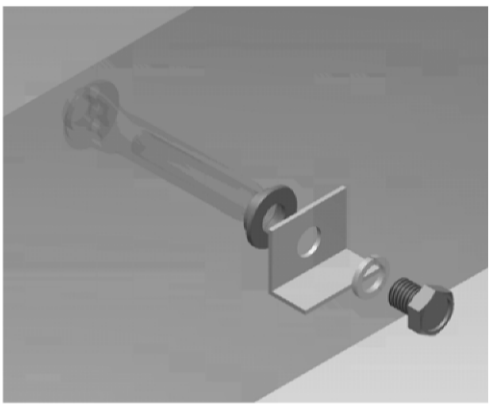
4. Hardening of the concrete, striking the formwork



1) Remove assembly accessories and formwork.

2) Check if the inside of the threaded socket is free from dirt, otherwise clean it;
further protection against ingress of water, dirt, etc. until required for use.

5. Mounting of fixture

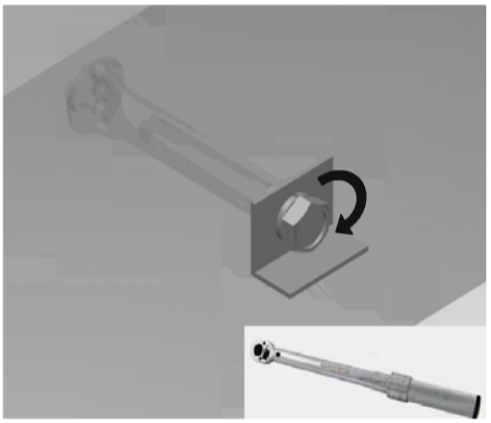


1) Make sure that the concrete has reached its final strength.

2) Check the length of the required bolt.
→ Maximum / minimum screw-in length according Annex B2!

3) Mounting of the fixture
→ Use fixing components according Annex A3, Table A3.
→ Maximum torque moments, see table below!
→ Take additionally care of assembly advices for the fixture.

6. Maximum torque moments



Apply torque moment with the help of a torque wrench.
T_{inst} must not be exceeded.

Maximum torque moment T_{inst}

Thread	d	[mm]	M10	M12	M16	M20
Max. torque moment	max. T_{inst}	[Nm]	≤ 8	≤ 10	≤ 30	≤ 60

DEMU Fixing anchor T-FIXX

Intended use
Installation instruction – part 2

Annex B5

Table C1: **Characteristic values for tension loads**

Thread		d	[mm]	M10	M12	M16	M20
Steel failure, fixing anchor and screw (min. steel strength 4.6) made of galvanised steel							
Characteristic resistance		$N_{Rk,s}$	[kN]	17.5	29.2	47.4	61.4
Partial safety factor		γ_{Ms} [1]	[-]	1.74			
Steel failure, fixing anchor and screw (min. steel strength A4-50) made of stainless steel							
Characteristic resistance		$N_{Rk,s}$	[kN]	24.9	42.2	69.7	90.3
Partial safety factor		γ_{Ms} [1]	[-]	2.79	2.86	2.79	
Steel failure, fixing anchor and screw (min. steel strength A4-70) made of stainless steel							
Characteristic resistance		$N_{Rk,s}$	[kN]	24.9	43.5	69.7	90.3
Partial safety factor		γ_{Ms} [1]	[-]	2.79			
Pull-out failure							
Fixing anchor electrolytically galvanised							
Charact. resistance in cracked concrete	C20/25	$N_{Rk,p}$	[kN]	17.1	28.3	46.3	56.6
Charact. resistance in uncracked concrete	C20/25	$N_{Rk,p}$	[kN]	24.0	39.6	64.8	79.2
Fixing anchor in stainless steel							
Charact. resistance in cracked concrete	C20/25	$N_{Rk,p}$	[kN]	13.8	27.5	38.9	47.0
Charact. resistance in uncracked concrete	C20/25	$N_{Rk,p}$	[kN]	19.3	38.5	54.5	65.7
Increasing factors for $N_{Rk,p}$ in cracked and uncracked concrete	C25/30	ψ_c	[-]	1.20			
	C30/37	ψ_c	[-]	1.48			
	C35/45	ψ_c	[-]	1.80			
	C40/50	ψ_c	[-]	2.00			
	C45/55	ψ_c	[-]	2.20			
	C50/60	ψ_c	[-]	2.40			
Partial safety factor		γ_{Mp} [1]	[-]	1.50			
Concrete cone failure							
Effective anchorage depth		h_{ef}	[mm]	M10x50: 43.7 M10x65 [2]: 58.7 M10x75 [3]: 68.7 -	M12x50: 42.5 M12x70: 62.5 M12x95 [3]: 87.5 M12x115 [2]: 107.5 -	M16x60: 51.3 M16x80 [2]: 71.3 M16x100 [3]: 91.3 M16x110 [2]: 101.3 M16x125 [3]: 116.3	M20x70: 61.2 M20x100: 91.2 M20x125 [2]: 116.2 M20x145 [3]: 136.2 -
Factor to take into account the influence of load transfer mechanisms in cracked and uncracked concrete		k_{cr}	[-]	8.5			
		k_{ucr}	[-]	11.9			
Characteristic spacing		$s_{cr,N}$	[mm]	$3.0 \cdot h_{ef}$			
Characteristic edge distance		$c_{cr,N}$	[mm]	$1.5 \cdot h_{ef}$			
Partial safety factor		γ_{Mc} [1]	[-]	1.50			
Splitting							
Minimum thickness of concrete member		$h \geq$	[mm]	$2.0 \cdot h_{ef}$			
Characteristic spacing		$s_{cr,sp}$	[mm]	$6.0 \cdot h_{ef}$			
Characteristic edge distance		$c_{cr,sp}$	[mm]	$3.0 \cdot h_{ef}$			
Partial safety factor		γ_{Msp} [1]	[-]	1.50			

[1] in absence of other national regulations; [2] only stainless steel; [3] only galvanised steel

Table C2: **Displacements under tension loads**

Thread	d	[mm]	M10	M12	M16	M20
Tension load	N	[kN]	7	12	19	25
Short time displacements	δ_{N0}	[mm]	0.3	0.5	0.3	0.2
Long time displacements	$\delta_{N\infty}$	[mm]	0.6	1.0	0.6	0.4

DEMU Fixing anchor T-FIXX

Performances
Characteristic values for tension loads, displacements under tension loads

Annex C1

Deutsches Institut für Bautechnik DIBt

Table C3: **Characteristic values for shear loads**

Thread	d	[mm]	M10	M12	M16	M20
Shear loads without lever arm						
group factor (CEN/TS 1992-4-2, 6.3.3.1)	k_2	[-]	1.0			
Steel failure, fixing anchor and screw (min. steel strength 4.6) made of galvanised steel						
Characteristic resistance	$V_{Rk,s}$	[kN]	8.8	14.6	23.7	30.7
Partial safety factor	γ_{Ms} 1)	[-]	1.45			
Steel failure, fixing anchor and screw (min. steel strength A4-50) made of stainless steel						
Characteristic resistance	$V_{Rk,s}$	[kN]	12.5	21.1	34.8	45.1
Partial safety factor	γ_{Ms} 1)	[-]	2.33	2.38	2.33	
Steel failure, fixing anchor and screw (min. steel strength A4-70) made of stainless steel						
Characteristic resistance	$V_{Rk,s}$	[kN]	12.5	21.8	34.8	45.1
Partial safety factor	γ_{Ms} 1)	[-]	2.33			
Shear loads with lever arm						
Steel failure, fixing anchor and screw (min. steel strength 4.6) made of galvanised steel						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	29.9	52.4	133.2	259.6
Partial safety factor	γ_{Ms} 1)	[-]	1.67			
Steel failure, fixing anchor and screw (min. steel strength 5.6) made of galvanised steel						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	37.4	65.5	166.5	324.5
Partial safety factor	γ_{Ms} 1)	[-]	1.67			
Steel failure, fixing anchor and screw (min. steel strength 8.8) made of galvanised steel						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	68.9	104.8	263.8	541.4
Partial safety factor	γ_{Ms} 1)	[-]	1.45	1.25	1.45	
Steel failure, fixing anchor and screw (min. steel strength A4-50) made of stainless steel						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	37.4	65.5	166.5	324.5
Partial safety factor	γ_{Ms} 1)	[-]	2.38			
Steel failure, fixing anchor and screw (min. steel strength A4-70) made of stainless steel						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	52.3	91.7	233.1	454.4
Partial safety factor	γ_{Ms} 1)	[-]	1.56			
Steel failure, fixing anchor and screw (min. steel strength A4-80) made of stainless steel						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	101.3	104.8	388.0	796.2
Partial safety factor	γ_{Ms} 1)	[-]	2.33	1.33	2.33	
Pry-out failure						
Factor	k_3	[-]	M10x50: 1.0 M10x65 2): 1.0 M10x75 3): 2.0 -	M12x50: 1.0 M12x70: 2.0 M12x95 3): 2.0 M12x115 2): 2.0 -	M16x60: 1.0 M16x80 2): 2.0 M16x100 3): 2.0 M16x110 2): 2.0 M16x125 3): 2.0	M20x70: 1.0 M20x100: 2.0 M20x125 2): 2.0 M20x145 3): 2.0 -
Partial safety factor	γ_{Mcp} 1)	[-]	1.50			
Concrete edge failure (without suppl. reinforcement)						
Effective length of fixing anchor (for shear loads)	l_f	[mm]	M10x50: 30.0 M10x65 2): 45.0 M10x75 3): 55.0 -	M12x50: 29.0 M12x70: 49.0 M12x95 3): 74.0 M12x115 2): 81.4 -	M16x60: 37.0 M16x80 2): 57.0 M16x100 3): 77.0 M16x110 2): 87.0 M16x125 3): 102.0	M20x70: 46.0 M20x100: 76.0 M20x125 2): 101.0 M20x145 3): 121.0 -
Effective outside diameter	d_{nom}	[mm]	13.5	17.0 / 17.2 4)	21.3	26.9
Partial safety factor	γ_{Mce} 1)	[-]	1.50			

1) in absence of other national regulations; 2) only stainless steel; 3) only galvanised steel; 4) higher value applies for stainless steel

Table C4: **Displacements under shear loads**

Thread	d	[mm]	M10	M12	M16	M20
Shear load	V	[kN]	13	19	24	28
Short time displacements	δ_{V0}	[mm]	2.0	2.0	2.0	3.0
Long time displacements	$\delta_{V\infty}$	[mm]	3.0	3.0	3.0	4.5

DEMU Fixing anchor T-FIXX

Performances
Characteristic values for shear loads, displacements under shear loads

Annex C2

Deutsches Institut für Bautechnik DIBt

Table C5: **Characteristic values for resistance to fire**

Thread size		d	[mm]	M10	M12	M16	M20
Steel failure for tension and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$), fixing anchor and screw made of galvanised steel							
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	0.8	1.7	2.8	3.6
	R60	$F_{Rk,s,fi}$	[kN]	0.7	1.3	2.1	2.7
	R90	$F_{Rk,s,fi}$	[kN]	0.5	1.1	1.8	2.3
	R120	$F_{Rk,s,fi}$	[kN]	0.4	0.8	1.4	1.8
Partial safety factor		$\gamma_{Ms,fi}$ [1)]	[-]	1.00			
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	1.1	2.6	6.7	13.0
	R60	$M^0_{Rk,s,fi}$	[Nm]	1.0	2.0	5.0	9.7
	R90	$M^0_{Rk,s,fi}$	[Nm]	0.7	1.7	4.3	8.4
	R120	$M^0_{Rk,s,fi}$	[Nm]	0.6	1.3	3.3	6.5
Partial safety factor		$\gamma_{Ms,fi}$ [1)]	[-]	1.00			
Steel failure for tension and shear load ($F_{Rk,s,fi} = N_{Rk,s,fi} = V_{Rk,s,fi}$), fixing anchor and screw made of stainless steel							
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	1.2	2.5	4.2	5.4
	R60	$F_{Rk,s,fi}$	[kN]	1.0	2.1	3.5	4.5
	R90	$F_{Rk,s,fi}$	[kN]	0.8	1.7	2.8	3.6
	R120	$F_{Rk,s,fi}$	[kN]	0.7	1.3	2.2	2.9
Partial safety factor		$\gamma_{Ms,fi}$ [1)]	[-]	1.00			
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	1.9	3.9	10.0	19.5
	R60	$M^0_{Rk,s,fi}$	[Nm]	1.5	3.3	8.3	16.2
	R90	$M^0_{Rk,s,fi}$	[Nm]	1.2	2.6	6.7	13.0
	R120	$M^0_{Rk,s,fi}$	[Nm]	1.0	2.1	5.3	10.4
Partial safety factor		$\gamma_{Ms,fi}$ [1)]	[-]	1.00			
Pull-out failure							
Characteristic resistance	R90	$N_{Rk,p,fi}$	[kN]	$N_{Rk,p,fi(90)} = 0.25 \cdot N_{Rk,p}$			
	R120	$N_{Rk,p,fi}$	[kN]	$N_{Rk,p,fi(120)} = 0.20 \cdot N_{Rk,p}$			
Partial safety factor		$\gamma_{Mp,fi}$ [1)]	[-]	1.00			
Concrete cone failure							
Characteristic resistance	R90	$N_{Rk,c,fi}$	[kN]	$N^0_{Rk,c,fi(90)} = h_{ef}/200 \cdot N^0_{Rk,c} \le N^0_{Rk,c}$			
	R120	$N_{Rk,c,fi}$	[kN]	$N^0_{Rk,c,fi(120)} = 0.8 \cdot h_{ef}/200 \cdot N^0_{Rk,c} \le N^0_{Rk,c}$			
Characteristic spacing		$s_{cr,N,fi}$	[mm]	$4.0 \cdot h_{ef}$			
Characteristic edge distance		$c_{cr,N,fi}$	[mm]	$2.0 \cdot h_{ef}$			
Partial safety factor		$\gamma_{Mc,fi}$ [1)]	[-]	1.00			
Concrete pry-out failure							
Characteristic resistance	R90	$V_{Rk,cp,fi}$	[kN]	$V_{Rk,cp,fi(90)} = k_3 \cdot N_{Rk,c,fi(90)}$			
	R120	$V_{Rk,cp,fi}$	[kN]	$V_{Rk,cp,fi(120)} = k_3 \cdot N_{Rk,c,fi(120)}$			
Partial safety factor		$\gamma_{Mc,fi}$ [1)]	[-]	1.00			
Concrete edge failure							
Characteristic resistance	R90	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi(90)} = 0.25 \cdot V^0_{Rk,c}$			
	R120	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi(120)} = 0.20 \cdot V^0_{Rk,c}$			
Partial safety factor		$\gamma_{Mc,fi}$ [1)]	[-]	1.00			

[1)] in absence of other national regulations

DEMU Fixing anchor T-FIXX

Performances
Characteristic values for resistance to fire

Annex C3