

PRESTATIEVERKLARING
DEMU bevestigingsankers T-FIXX

CONF-DOP_T-FIXX 02/17-NL
Nr. H03-13/0222

1.	Unieke identificatiecode van het producttype	DEMU bevestigingsankers T-FIXX
2.	Type-, partij- of serienummer of een ander code voor de identificatie van het bouwproduct conform artikel 11, lid 4	DEMU bevestigingsanker T-FIXX zie ETA-13/0222, annex A3
3.	Door de fabrikant beoogd gebruik van het bouwproduct, overeenkomstig de toepasselijke geharmoniseerde technische specificatie, zoals door de fabrikant bepaald:	
	Type en gebruik	Ingebetonneerd anker met interne schroefdraad
	Beschikbare product afmetingen	M10x50, M10x65, M10x75, M12x50, M12x70, M12x95, M12x115, M16x60, M16x80, M16x100, M16x110, M16x125, M20x70, M20x100, M20x125, M20x145
	Voor gebruik in	Gescheurd en ongescheurd beton C20/25 tot C90/105 conform EN 206:2013
	Ankermateriaal en -sterkte	- Galvanisch verzinkt staal voor droge binnenruimtes - Roestvaststaal voor gemiddelde blootstelling aan corrosie
4.	Naam, geregistreerde handelsnaam of geregistreerd handelsmerk en het contactadres van de fabrikant conform artikel 11, lid 5	HALFEN GmbH (handelt als Leviat), Liebigstraße 14, 40764 Langenfeld, Duitsland
5.	Indien van toepassing, naam en contactadres van de gemachtigde wiens mandaat de in artikel 12, lid 2, vermelde taken bestrijkt	-
6.	Systeem of systemen voor de beoordeling en verificatie van de prestatiebestendigheid van het bouwproduct als vermeld in annex V	Systeem 1
7.	Prestatieverklaring met betrekking tot een bouwproduct onder een geharmoniseerde norm	-
8.	Prestatieverklaring met betrekking tot een bouwproduct waarvoor een Europees technische beoordeling is afgegeven	Het Duitse Instituut voor Bouwtechniek (DIBt) heeft de ETA-13/0222 afgegeven op basis van EAD 330012-00-0601, versie september 2015. De aangewezen instantie 2323 heeft volgens systeem 1 uitgevoerd: (i) Bepaling van het producttype op basis van een typekeuring (inclusief bemonstering), typeberekening, waardetabellen of documentatie van het product; (ii) Initiële inspectie van de productiefabriek en van de productiecontrole in de fabriek; (iii) Permanente bewaking, beoordeling en evaluatie van de productiecontrole in de fabriek en heeft het certificaat 2323-CPR-0014 afgegeven.

9.	Aangegeven prestaties			
	Belangrijkste kenmerken	Berekeningsmethode	Prestatie	Geharmoniseerde technische specificatie
	Karakteristieke weerstand bij trekbelasting	CEN/TS 1992-4-1 en CEN/TS 1992-4-2	ETA-13/0222, annex C1	EAD 330012-00-0601, versie september 2015
	Karakteristieke weerstand bij dwarskrachten		ETA-13/0222, annex C2	
	Vervormingen in bruikbaarheidsgrenstoestand		ETA-13/0222, annex C1 en C2	
	Karakteristieke weerstand bij brandbelasting		ETA-13/0222, annex C3	
	Indien overeenkomstig artikel 37 of 38 in de specifieke technische documentatie is gebruikt, moet het product voldoen aan de eisen		-	
10.	De prestaties van het product volgens punt 1 en 2 komen overeen met de aangegeven prestaties in punt 9.			
Deze prestatieverklaring wordt verstrekt onder volledige verantwoordelijkheid van de fabrikant genoemd in punt 4.				

Langenfeld, 01.10.2020

Ondertekend voor en namens de fabrikant door

Richard Wachter
(Managing Director)

ppa. Dr.-Ing. Dirk Albartus
(Manager Engineering)

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	$\gamma_{Ms}^{1)}$	[-]	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	$\gamma_{Ms}^{1)}$	[-]	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	$\gamma_{Ms}^{1)}$	[-]	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	$\gamma_{Ab}^{1)}$	[-]	1.50							
Concrete cone failure										
Effective anchorage depth	h_{ef}	[mm]	M10x50:	43.7	M12x50:	42.5	M16x60:	51.3	M20x70:	61.2
			M10x65 ²⁾ :	58.7	M12x70:	62.5	M16x80 ²⁾ :	71.3	M20x100:	91.2
			M10x75 ³⁾ :	68.7	M12x95 ³⁾ :	87.5	M16x100 ³⁾ :	91.3	M20x125 ³⁾ :	116.2
			-	M12x115 ²⁾ :	107.5	M16x110 ²⁾ :	101.3	M20x145 ³⁾ :	136.2	
Factor to take into account the influence of load transfer mechanisms in cracked and uncracked concrete	k_{ct}		[-]	8.5						
	k_{ucr}		[-]	11.9						
Characteristic spacing	$s_{ct,N}$	[mm]	3.0 • h_{ef}							
Characteristic edge distance	$c_{ct,N}$	[mm]	1.5 • h_{ef}							
Partial safety factor	$\gamma_{Mc}^{1)}$	[-]	1.50							
Splitting										
Minimum thickness of concrete member	$h \geq$	[mm]	2.0 • h_{ef}							
Characteristic spacing	$s_{cr,sp}$	[mm]	6.0 • h_{ef}							
Characteristic edge distance	$c_{cr,sp}$	[mm]	3.0 • h_{ef}							
Partial safety factor	$\gamma_{Msp}^{1)}$	[-]	1.50							

¹⁾ In absence of other national regulations; ²⁾ only stainless steel; ³⁾ only galvanised steel

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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

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Performances
Characteristic values for tension loads, displacements under tension loads

Annex C1

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 _{Rk,s} ⁰	[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 _{Rk,s} ⁰	[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 _{Rk,s} ⁰	[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 _{Rk,s} ⁰	[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 _{Rk,s} ⁰	[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 _{Rk,s} ⁰	[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	M12x50: 1.0	M16x60: 1.0	M20x70: 1.0
			M10x65 ²⁾ : 1.0	M12x70: 2.0	M16x80 ²⁾ : 2.0	M20x100: 2.0
			M10x75 ³⁾ : 2.0	M12x95 ³⁾ : 2.0	M16x100 ³⁾ : 2.0	M20x125 ²⁾ : 2.0
			-	M12x115 ²⁾ : 2.0	M16x110 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	M12x50: 29.0	M16x60: 37.0	M20x70: 46.0
			M10x65 ²⁾ : 45.0	M12x70: 49.0	M16x80 ²⁾ : 57.0	M20x100: 76.0
			M10x75 ³⁾ : 55.0	M12x95 ³⁾ : 74.0	M16x100 ³⁾ : 77.0	M20x125 ²⁾ : 101.0
			-	M12x115 ²⁾ : 81.4	M16x110 ²⁾ : 87.0	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

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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

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Performances
Characteristic values for shear loads, displacements under shear loads

Annex C2

Table C5: Characteristic values for resistance to fire

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

DEMU Fixing anchor T-FIXX

Performances
Characteristic values for resistance to fire

Annex C3