

**DECLARATION OF PERFORMANCE**

DEMU Fixing anchor T-FIXX

**CONF-DOP\_T-FIXX 04/14-E**

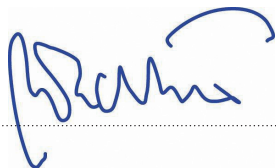
No. H03-13/0222

1.	Unique identification code of the product-type	<b>DEMU Fixing anchor T-FIXX</b>
2.	Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4)	<b>DEMU Fixing anchor T-FIXX</b> <b>See ETA-13/0222, Annex 3</b>
3.	Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:	
	Generic type and use	Cast-in fixing anchor with an internal threaded socket
	Product size covered	M10×50, M10×65, M10×75, M12×50, M12×70, M12×95, M12×115, M16×60, M16×80, M16×100, M16×110, M16×125, M20×70, M20×100, M20×125, M20×145
	For use in	Cracked and non-cracked concrete C20/25 to C50/60 according EN 206-1:2000-12
	Anchor material and intended use	<ul style="list-style-type: none"> <li>• Electroplated steel for dry internal conditions</li> <li>• Stainless steel for medium corrosion exposure</li> </ul>
	Loading	Static & quasi static tension and shear loads or the combination of tension and shear loads
4.	Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5)	Manufacturing plant: DEMU Metaalindustrie B.V., Atoomweg 1, 3542 Utrecht, Netherlands Holder of the approval: Halfen GmbH, Liebigstraße 14, 40764 Langenfeld, Germany
5.	Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2)	-
6.	System or systems of assessment and verification of consistency of performance of the construction product as set out in Annex V	System 1
7.	In case the declaration of performance is for a construction product covered by a harmonised standard	-

8.	In case the declaration of performance is for a construction product for which a European Technical Assessment has been issued	Deutsches Institut für Bautechnik (DIBt) issued ETA-13/0222 on the basis of CUAP 06.01/23, Version May 2010, the notified body 0620 performed under system 1 (i) Determination of the product type on the basis of type testing (including sample-testing), type calculation, tabulated values or descriptive documentation of the product; (ii) Initial inspection of the manufacturing plant and of factory production control; (iii) Continuous surveillance, assessment and evaluation of factory production control and issued certificate of conformity K78157/01		
Declared performance				
Essential characteristics		Design method	Performance	Harmonised technical specification
Characteristic resistance for tension		CEN/TS 1992-4-1 and CEN/TS 1992-4-2	ETA-13/0222, Annex 6	CUAP 06.01/23, Version May 2010
Characteristic resistance for shear			ETA-13/0222, Annex 7	
Minimum spacing, minimum edge distance and minimum member thickness			ETA-13/0222, Annex 5	
Maximum torque moment and minimum / maximum screw-in length of screws			ETA-13/0222, Annex 4	
Displacement for serviceability limit state			ETA-13/0222, Annex 6 and 7	
Where pursuant to Article 37 or 38 the Specific Technical Documentation has been used, the requirements with which the product complies			-	
10.	The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.			
This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.				

Langenfeld, 29.04.2014

Signed for and on behalf of the manufacturer by



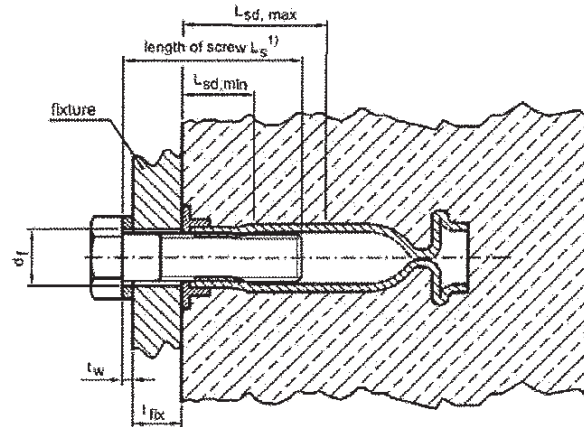
Richard Wachter  
(Managing Director)



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

Direct contact between fixture and data clip

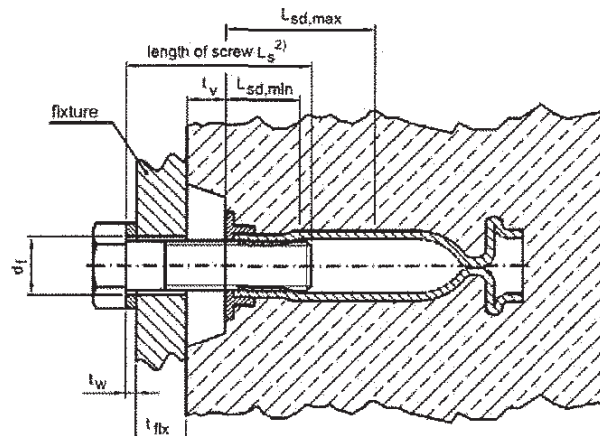
The fixture is braced to the data clip, if necessary by suitable washers.



$$^1) t_w + t_{fix} + L_{sd,min} \leq L_s \leq t_w + t_{fix} + L_{sd,max}$$

General application

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

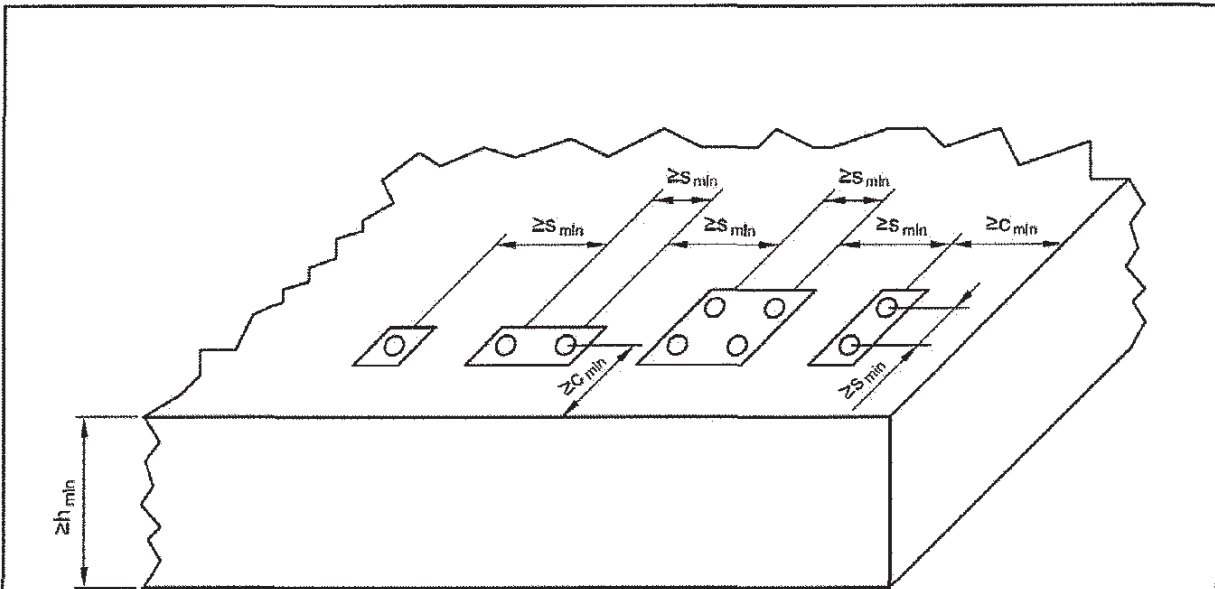


$$^2) t_w + t_{fix} + t_v + L_{sd,min} \leq L_s \leq t_w + t_{fix} + t_v + L_{sd,max}$$

**Table 4: Installation parameters**

Thread	d	[mm]	M10	M12	M16	M20
Maximum torque moment	max. T <sub>inst</sub>	[Nm]	≤ 8	≤ 10	≤ 30	≤ 60
Minimum screw-in length	L <sub>sd,min</sub>	[mm]	17.0	20.0	26.0	32.0
Maximum screw-in length	L <sub>sd,max</sub>	[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
Diameter of clearance hole in fixture	d <sub>f</sub>	[mm]	12.0	14.0	18.0	22.0

DEMU Fixing anchor T-FIXX	Annex 4
Installation parameters	



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

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]	$h_{nom} + c_{nom}^{1)}$			
<sup>1)</sup> $c_{nom}$ acc. EN 1992-1 with $c_{nom} \geq 20\text{mm}$						
For fixing anchors made of stainless steel a minimum concrete cover $c_{nom} = 20\text{mm}$ is sufficient.						

DEMU Fixing anchor T-FIXX	Annex 5
Arrangement of anchors and member thickness	

Table 6: Characteristic values for tension loads

Thread	d	[mm]	M10	M12	M16	M20				
<b>Steel failure, fixing anchor and screw (min. steel strength 4.6, 5.6 or 8.8) made of galvanised steel</b>										
Characteristic resistance	$N_{Rk,s}$	[kN]	17.5	29.2	47.4	61.4				
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1.74							
<b>Steel failure, fixing anchor and screw (min. steel strength A4-50) made of stainless steel</b>										
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					
<b>Steel failure, fixing anchor and screw (min. steel strength A4-70 or A4-80) made of stainless steel</b>										
Characteristic resistance	$N_{Rk,s}$	[kN]	24.9	43.5	69.7	90.3				
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2.79							
<b>Pull-out failure</b>										
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	$\psi_c$	[-]	1.20						
	C30/37	$\psi_c$	[-]	1.48						
	C35/45	$\psi_c$	[-]	1.80						
	C40/50	$\psi_c$	[-]	2.00						
	C45/55	$\psi_c$	[-]	2.20						
	C50/60	$\psi_c$	[-]	2.40						
Partial safety factor		$\gamma_{Mp}^{1)}$	[-]	1.50						
<b>Concrete cone failure</b>										
Effective anchorage depth	$h_{ef}$	[mm]	M10x50:	43.7	M12x50:	42.5	M16x60:	51.3	M20x70:	61.2
			M10x65 <sup>2)</sup> :	58.7	M12x70:	62.5	M16x80 <sup>2)</sup> :	71.3	M20x100:	91.2
			M10x75 <sup>3)</sup> :	68.7	M12x95 <sup>3)</sup> :	87.5	M16x100 <sup>3)</sup> :	91.3	M20x125 <sup>2)</sup> :	116.2
			-	-	M12x115 <sup>2)</sup> :	107.5	M16x110 <sup>2)</sup> :	101.3	M20x145 <sup>3)</sup> :	136.2
					M16x125 <sup>3)</sup> :	116.3				
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		$\gamma_{Mc}^{1)}$	[-]	1.50						
<b>Splitting</b>										
Verification of splitting is not relevant <sup>4)</sup>										
<sup>1)</sup> in absence of other national regulations; <sup>2)</sup> only stainless steel; <sup>3)</sup> only galvanised steel										
<sup>4)</sup> reinforcement to resist splitting forces acc. to CEN/TS 1992-4-2:2009, section 6.2.6.2 b)										

Table 7: Displacements under tension loads

Thread	d	[mm]	M10	M12	M16	M20
Tension load	N	[kN]	7	12	19	25
Short time displacements	$\delta_{N0}$	[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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Characteristic values for tension loads  
Displacements under tension loads

Annex 6

Table 8: Characteristic values for shear loads

Thread	d	[mm]	M10	M12	M16	M20
<b>Shear loads without lever arm</b>						
group factor (CEN/TS 1992-4-2, 6.3.3.1)	$k_2$	[-]	1,0			
<b>Steel failure, fixing anchor and screw (min. steel strength 4.6, 5.6 or 8.8) made of galvanised steel</b>						
Characteristic resistance	$V_{Rk,s}$	[kN]	8,8	14,6	23,7	30,7
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,45			
<b>Steel failure, fixing anchor and screw (min. steel strength A4-50) made of stainless steel</b>						
Characteristic resistance	$V_{Rk,s}$	[kN]	12,5	21,1	34,8	45,1
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2,33	2,38	2,33	
<b>Steel failure, fixing anchor and screw (min. steel strength A4-70 or A4-80) made of stainless steel</b>						
Characteristic resistance	$V_{Rk,s}$	[kN]	12,5	21,8	34,8	45,1
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2,33			
<b>Shear loads with lever arm</b>						
<b>Steel failure, fixing anchor and screw (min. steel strength 4.6) made of galvanised steel</b>						
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	29,9	52,4	133,2	259,6
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,67			
<b>Steel failure, fixing anchor and screw (min. steel strength 5.6) made of galvanised steel</b>						
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	37,4	65,5	166,5	324,5
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,67			
<b>Steel failure, fixing anchor and screw (min. steel strength 8.8) made of galvanised steel</b>						
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	68,9	104,8	263,8	541,4
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,45	1,25	1,45	
<b>Steel failure, fixing anchor and screw (min. steel strength A4-50) made of stainless steel</b>						
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	37,4	65,5	166,5	324,5
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2,38			
<b>Steel failure, fixing anchor and screw (min. steel strength A4-70) made of stainless steel</b>						
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	52,3	91,7	233,1	454,4
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	1,56			
<b>Steel failure, fixing anchor and screw (min. steel strength A4-80) made of stainless steel</b>						
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	101,3	104,8	388,0	796,2
Partial safety factor	$\gamma_{Ms}^{1)}$	[-]	2,33	1,33	2,33	
<b>Pry-out failure</b>						
Factor	$k_3$	[-]	M10x50: 1.0 M10x65 <sup>2)</sup> : 1.0 M10x75 <sup>3)</sup> : 2.0	M12x50: 1.0 M12x70: 2.0 M12x95 <sup>3)</sup> : 2.0 M12x115 <sup>3)</sup> : 2.0	M16x60: 1.0 M16x80 <sup>3)</sup> : 2.0 M16x100 <sup>3)</sup> : 2.0 M16x110 <sup>3)</sup> : 2.0 M16x125 <sup>3)</sup> : 2.0	M20x70: 1.0 M20x100: 2.0 M20x125 <sup>2)</sup> : 2.0 M20x145 <sup>3)</sup> : 2.0
Partial safety factor	$\gamma_{Mcp}^{1)}$	[-]	1,50			
<b>Concrete edge failure (without suppl. reinforcement)</b>						
Effective length of fixing anchor (for shear loads)	$l_f$	[mm]	M10x50: 30.0 M10x65 <sup>2)</sup> : 45.0 M10x75 <sup>3)</sup> : 55.0	M12x50: 29.0 M12x70: 49.0 M12x95 <sup>3)</sup> : 74.0 M12x115 <sup>3)</sup> : 81.4	M16x60: 37.0 M16x80 <sup>2)</sup> : 57.0 M16x100 <sup>3)</sup> : 77.0 M16x110 <sup>2)</sup> : 87.0 M16x125 <sup>3)</sup> : 102.0	M20x70: 46.0 M20x100: 76.0 M20x125 <sup>2)</sup> : 101.0 M20x145 <sup>3)</sup> : 121.0
Effective outside diameter	$d_{nom}$	[mm]	13,5	17,0 / 17,2 <sup>4)</sup>		21,3
Partial safety factor	$\gamma_{Mce}^{1)}$	[-]	1,50			

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

Table 9: Displacements under shear loads

Thread	d	[mm]	M10	M12	M16	M20
Shear load	V	[kN]	13	19	24	28
Short time displacements	$\delta_{v0}$	[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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Characteristic values for shear loads  
Displacements under shear loads

Annex 7