



DECLARATION OF PERFORMANCE
DoP no. 1219-CPR-0181 EN

Version: 1

print date: 06.02.2018

1. Unique identification code of the product-type: **TOX S-Fix Pro W, TOX S-Fix Pro WF and TOX S-Fix Pro**

2. Intended use/es:

Product	Intended use
Metal anchors for use in concrete	For fixing and/or supporting to concrete structural elements (which contributes to the stability of the works) or heavy units

3. Manufacturer: **TOX-Dübel-Technik GmbH, Brunnenstraße 31, D-72505 Krauchenwies Ablach**

4. Authorised representative: --

5. System/s of AVCP: **1**

6. a) Harmonised standard: --

Notified body/ies: --

6. b) European Assessment Document: **EAD 330232-00-0601, Oct. 2016**

European Technical Assessment: **ETA-17/0829; 06.02.2018**

Technical Assessment Body: **IETcc; Instituto Eduardo Torroja de ciencias de la construcción**

Notified body/ies: **1219**

7. Declared performance/s:

Mechanical resistance and stability (BWR1)

Essential characteristics	Performances
Characteristic resistance under static or quasi static loading	See annex C1 - C3
Displacements under tension and shear loads	See annex C4
Characteristic resistance under seismic loading categories C1 and C2	See annex C5 - C6

Safety in case of fire (BWR 2)

Essential characteristics	Performances
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	See Annex C7

8. Appropriate Technical Documentation and/or Specific Technical Documentation: --

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

i.A Daniel Wilhelm (Applications Engineering)

Krauchenwies-Ablach, 06.02.2018

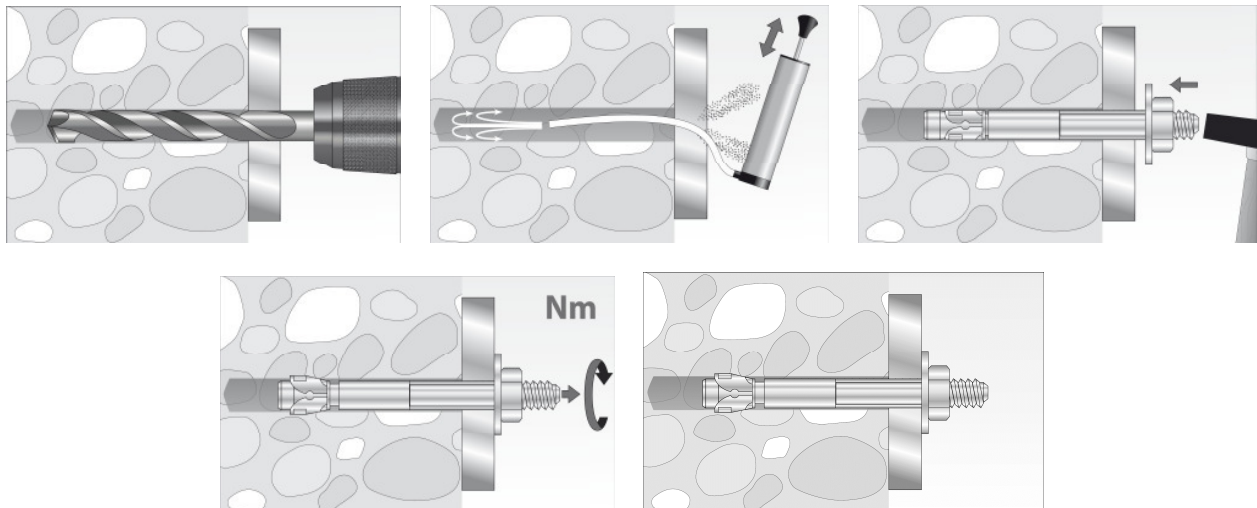
Table C1: Installation parameters for S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Installation parameters			Performances					
			M8	M10	M12	M16	M20	M24
d_0	Nominal diameter of drill bit:	[mm]	8	10	12	16	20	24
d_f	Fixture clearance hole diameter:	[mm]	9	12	14	18	22	26
T_{inst}	Nominal installation torque:	[Nm]	20/15 ¹⁾	40	60	100	200	250
L_{min}	Total length of the bolt:	[mm]	68	82	98	119	140	175
L_{max}		[mm]	200	200	250	250	300	400
h_{min}	Minimum thickness of concrete member:	[mm]	100	120	140	170	200	250
h_1	Depth of drilled hole:	[mm]	60	75	85	105	125	155
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	55	68	80	97	114	143
h_{ef}	Effective anchorage depth:	[mm]	48	60	70	85	100	125
t_{fix}	Thickness of fixture ²⁾ :	[mm]	L - 66	L - 80	L - 96	L - 117	L - 138	L - 170
s_{min}	Minimum allowable spacing:	[mm]	50	60	70	85/128 ¹⁾	100/150 ¹⁾	125
c_{min}	Minimum allowable distance:	[mm]	50	60	70	85/128 ¹⁾	100/150 ¹⁾	125

¹⁾ Respective values for anchors S-Fix Pro W / S-Fix Pro WF, S-Fix Pro

²⁾ L = total anchor length

Installation process



S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Performances

Installation parameters and installation procedure

Annex C1

English translation prepared by IETcc

Table C2: Characteristic values to tension loads of design method A according to ETAG 001, Annex C, CEN/TS 1992-4 o prEN1992-4 for S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Characteristic values of resistance to tension loads of design according to design method A		Performances							
		M8	M10	M12	M16	M20	M24		
Tension loads: steel failure									
$N_{Rk,s}$	Characteristic resistance:	[kN]	18.1	31.4	40.4	72.7	116.6	179.2	
γ_{Ms}	Partial safety factor:	[-]	1.5	1.5	1.5	1.5	1.5	1.5	
Tension loads: pull-out failure in concrete									
S-Fix Pro W anchor									
$N_{Rk,p,ucr}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	9	16	20	35	50	50	
$N_{Rk,p,cr}$	Characteristic resistance in C20/25 cracked concrete:	[kN]	5	9	12	25	30	30	
S-Fix Pro WF anchor									
$N_{Rk,p,ucr}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	9	16	30	35	50	--	
$N_{Rk,p,cr}$	Characteristic resistance in C20/25 cracked concrete:	[kN]	6	9	16	25	30	--	
S-Fix Pro anchor									
$N_{Rk,p,ucr}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	9	16	25	35	50	--	
$N_{Rk,p,cr}$	Characteristic resistance in C20/25 cracked concrete:	[kN]	6	9	16	25	30	--	
$\gamma_{ins}^{1)}$ $\gamma_2^{2)}$	Installation safety factor:	[-]	1.2	1.0	1.0	1.0	1.0	1.2	
ψ_c	Increasing factor for $N_{Rk,p}^0$:	C30/37	[-]	1.22	1.16	1.22	1.22	1.16	1.22
		C40/50	[-]	1.41	1.31	1.41	1.41	1.31	1.41
		C50/60	[-]	1.55	1.41	1.55	1.55	1.41	1.55
Tension loads: concrete cone and splitting failure									
h_{ef}	Effective embedment depth:	[mm]	48	60	70	85	100	125	
$k_{ucr,N}^{1)}$	Factor for uncracked concrete:	[-]	11.0						
$k_{cr,N}^{1)}$	Factor for cracked concrete:	[-]	7,7						
$k_{ucr,N}^{2)}$	Factor for uncracked concrete:	[-]	10.1						
$k_{cr,N}^{2)}$	Factor for cracked concrete:	[-]	7,2						
$\gamma_{ins}^{1)}$ $\gamma_2^{2)}$	Installation safety factor:	[-]	1.2	1.0	1.0	1.0	1.0	1.2	
$s_{cr,N}$	Concrete cone failure:	[mm]	3 x h_{ef}						
$c_{cr,N}$		[mm]	1.5 x h_{ef}						
$s_{cr,sp}$	Splitting failure:	[mm]	288	300	350	425/510 ³⁾	500/600 ³⁾	560	
$c_{cr,sp}$		[mm]	144	150	175	213/255 ³⁾	250/300 ³⁾	280	

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009, prEN 1994-2

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ Respective values for anchors S-Fix Pro W / S-Fix Pro WF, S-Fix Pro

S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Performances

Characteristic values for tension loads

Annex C2

English translation prepared by IETcc

Table C3: Characteristic values to shear loads of design method A according to ETAG 001, Annex C, CEN/TS 1992-4 or prEN1992-4 for S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Characteristic values of resistance to shear loads of design according to design method A			Performances					
			M8	M10	M12	M16	M20	M24
Shear loads: steel failure without lever arm								
$V_{Rk,s}$	Characteristic resistance:	[kN]	11.0	17.4	25.3	47.1	73.1	84.7
$k_2^{1)}$	k_2 factor:	[-]	1.0					
$k_7^{2)}$	k_7 factor:	[-]	1.0					
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25	1.25
Shear loads: steel failure with lever arm								
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	22.5	44.8	78.6	199.8	389.4	673.5
γ_{Ms}	Partial safety factor:	[-]	1.25	1.25	1.25	1.25	1.25	1.25
Shear loads: concrete pryout failure								
$k_3^{1)}=k_8^{2)}$ $k_3^{3)}$	k factor:	[-]	1	2	2	2	2	2
$\gamma_{ins}^{1) 2)}$ $\gamma_2^{3)}$	Installation safety factor:	[-]	1.0					
Shear loads: concrete edge failure								
l_f	Effective length of anchor under shear loads:	[mm]	48	60	70	85	100	125
d_{nom}	Outside anchor diameter:	[mm]	8	10	12	16	20	24
$\gamma_{ins}^{1) 2)}$ $\gamma_2^{3)}$	Installation safety factor:	[-]	1.0					

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

²⁾ Parameter relevant only for design according to prEN 1992-4

³⁾ Parameter relevant only for design according to ETAG 001, Annex C

S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Performances

Characteristic values for shear load.

Annex C3

Table C4: Displacements under tension load for S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Displacements under tension loads			Performances					
			M8	M10	M12	M16	M20	M24
S-Fix Pro W anchor								
N	Service tension load:	[kN]	2.5	4.3	6.3	10.4	13.9	18.0
$\bar{\delta}_{N0}$	Short term displacement:	[mm]	1.1	0.7	1.0	0.4	1.6	0.4
$\bar{\delta}_{N\infty}$	Long term displacement:	[mm]	1.9	1.9	1.9	1.9	1.9	2.0
S-Fix Pro WF anchor								
N	Service tension load:	[kN]	2.5	4.3	6.3	10.4	13.9	--
$\bar{\delta}_{N0}$	Short term displacement:	[mm]	1.0	1.1	0.9	1.5	1.2	--
$\bar{\delta}_{N\infty}$	Long term displacement:	[mm]	1.9	1.9	1.9	1.9	1.9	--
S-Fix Pro anchor								
N	Service tension load:	[kN]	2.5	4.3	7.6	11.9	14.3	--
$\bar{\delta}_{N0}$	Short term displacement:	[mm]	1.0	1.1	0.9	1.5	1.3	--
$\bar{\delta}_{N\infty}$	Long term displacement:	[mm]	1.6	1.6	1.6	1.6	1.6	--

Table C5: Displacements under shear load for S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Displacements under shear loads			Performances					
			M8	M10	M12	M16	M20	M24
S-Fix Pro W anchor								
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6	33.6
$\bar{\delta}_{V0}$	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1	1.4
$\bar{\delta}_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7	2.1
S-Fix Pro WF anchor								
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6	-
$\bar{\delta}_{V0}$	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1	--
$\bar{\delta}_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7	--
S-Fix Pro anchor								
V	Service shear load:	[kN]	4.9	6.8	8.5	15.1	24.6	--
$\bar{\delta}_{V0}$	Short term displacement:	[mm]	1.0	1.5	1.8	1.9	3.1	--
$\bar{\delta}_{V\infty}$	Long term displacement:	[mm]	1.5	2.3	2.7	2.9	4.7	--

S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Performances

Displacements under tension and shear loads

Annex C4

English translation prepared by IETcc

Table C6: Design information for seismic performance C1 S-Fix Pro W, S-Fix Pro anchor

Design information for seismic performance C1			Performances					
			M8	M10	M12	M16	M20	M24
Steel failure for tension and shear failure								
$N_{Rk,s,seis}$	Characteristic tension steel failure:	[kN]	--	31.4	40.4	72.7	116.6	--
$\gamma_{Ms,N}$	Partial safety factor:	[-]	--	1.5	1.5	1.5	1.5	--
$V_{Rk,p,seis}$	Characteristic shear steel failure:	[kN]	--	12.2	17.8	33.0	58.5	--
$\gamma_{Ms,V}$	Partial safety factor:	[-]	--	1.25	1.25	1.25	1.25	--
Pull out failure								
S-Fix Pro W anchor								
$N_{Rk,p,seis}$	Characteristic pull out failure:	[kN]	--	5.3	8.4	17.5	--	--
S-Fix Pro anchor								
$N_{Rk,p,seis}$	Characteristic pull out failure:	[kN]	--	3.9	16.0	25.0	30.0	--
$\gamma_{ins}^{1)}$ $\gamma_2^{2)}$	Installation safety factor:	[-]	--	1.0	1.0	1.0	1.0	--
Concrete cone failure								
h_{ef}	Effective embedment depth:	[mm]	--	60	70	85	100	--
$s_{cr,N}$	Spacing:	[mm]	--	3 x h_{ef}				--
$c_{cr,N}$	Edge distance:	[mm]	--	1.5 x h_{ef}				--
$\gamma_{ins}^{1)}$ $\gamma_2^{2)}$	Installation safety factor:	[-]	--	1.0	1.0	1.0	1.0	--
Concrete pryout failure								
$k_3^{1)}$ $k_2^{2)}$	k factor:	[-]	--	2	2	2	2	--
Concrete edge failure								
l_f	Effective length of anchor:	[kN]	--	60	70	85	100	--
d_{nom}	Outside anchor diameter:	[-]	--	10	12	16	20	--

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009, prEN 1992-4

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

S-Fix Pro W, S-Fix Pro anchor	Annex C5
Performances	
Design information for seismic performance C1	

Table C7: Design information for seismic performance C2 S-Fix Pro W, S-Fix Pro anchor

Design information for seismic performance C2			Performances					
			M8	M10	M12	M16	M20	M24
Steel failure for tension and shear failure								
$N_{Rk,s,seis}$	Characteristic tension steel failure:	[kN]	--	--	40.4	72.7	116.6	--
$\gamma_{Ms,N}$	Partial safety factor:	[-]	--	--	1.5	1.5	1.5	--
$V_{Rk,p,seis}$	Characteristic shear steel failure:	[kN]	--	--	17.8	33.0	58.5	--
$\gamma_{Ms,V}$	Partial safety factor:	[-]	--	--	1.25	1.25	1.25	--
Pull out failure								
S-Fix Pro W anchor								
$N_{Rk,p,seis}$	Characteristic pull out failure:	[kN]	--	--	5.2	8.9	--	--
S-Fix Pro anchor								
$N_{Rk,p,seis}$	Characteristic pull out failure:	[kN]	--	--	9.1	--	21.0	--
$\gamma_{ins}^{1)}$ $\gamma_2^{2)}$	Installation safety factor:	[-]	--	--	1.0	1.0	1.0	--
Concrete cone failure								
h_{ef}	Effective embedment depth:	[mm]	--	--	70	85	100	--
$s_{cr,N}$	Spacing:	[mm]	--	--	3 x h_{ef}			--
$c_{cr,N}$	Edge distance:	[mm]	--	--	1.5 x h_{ef}			--
$\gamma_{ins}^{1)}$ $\gamma_2^{2)}$	Installation safety factor:	[-]	--	--	1.0	1.0	1.0	--
Concrete pryout failure								
$k_3^{1)}$ $k_2^{2)}$	k factor:	[-]	--	--	2	2	2	--
Concrete edge failure								
l_f	Effective length of anchor:	[kN]	--	--	70	85	100	--
d_{nom}	Outside anchor diameter:	[-]	--	--	12	16	20	--
Displacements								
S-Fix Pro W anchor								
$\bar{O}_{N,seis}$ (DLS)	Displacement Damage Limitation State: ^{3) 4)}	[mm]	--	--	2.34	3.99	--	--
$\bar{O}_{V,seis}$ (DLS)		[mm]	--	--	5.53	5.96	--	--
$\bar{O}_{N,seis}$ (ULS)	Displacement Ultimate Limit State: ³⁾	[mm]	--	--	9.54	10.17	--	--
$\bar{O}_{V,seis}$ (ULS)		[mm]	--	--	9.08	10.66	--	--
S-Fix Pro anchor								
$\bar{O}_{N,seis}$ (DLS)	Displacement Damage Limitation State: ^{3) 4)}	[mm]	--	--	5.57	--	6.82	--
$\bar{O}_{V,seis}$ (DLS)		[mm]	--	--	5.53	--	6.37	--
$\bar{O}_{N,seis}$ (ULS)	Displacement Ultimate Limit State: ³⁾	[mm]	--	--	20.31	--	29.12	--
$\bar{O}_{V,seis}$ (ULS)		[mm]	--	--	9.08	--	12.32	--

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009, prEN 1992-4

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ The listed displacements represent mean values

⁴⁾ A small displacement may be required in the design in the case of displacements sensitive fastening of "rigid" supports. The characteristics resistance associated with such small displacements may be determined by linear interpolation or proportional reduction.

S-Fix Pro W, S-Fix Pro anchor

Performances

Design information for seismic performance C2

Annex C6

Table C8: Characteristic values for resistance to fire S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Characteristic values for resistance to fire			Performances					
			M8	M10	M12	M16	M20	M24
Steel failure								
$N_{Rk,s,fi}$	Characteristic tension resistance:	R30 [kN]	0,4	0,9	1,7	3,1	4,9	7,1
		R60 [kN]	0,3	0,8	1,3	2,4	3,7	5,3
		R90 [kN]	0,3	0,6	1,1	2,0	3,2	4,6
		R120 [kN]	0,2	0,5	0,8	1,6	2,5	3,5
$V_{Rk,s,fi}$	Characteristic shear resistance:	R30 [kN]	0,4	0,9	1,7	3,1	4,9	7,1
		R60 [kN]	0,3	0,8	1,3	2,4	3,7	5,3
		R90 [kN]	0,3	0,6	1,1	2,0	3,2	4,5
		R120 [kN]	0,2	0,5	0,8	1,6	2,5	3,5
$M^0_{Rk,s,fi}$	Characteristic bending resistance:	R30 [kN]	0,4	1,1	2,6	6,7	13,0	22,5
		R60 [kN]	0,3	1,0	2,0	5,0	9,7	16,8
		R90 [kN]	0,3	0,7	1,7	4,3	8,4	14,6
		R120 [kN]	0,2	0,6	1,3	3,3	6,5	11,2
Pull out failure								
$N_{Rk,p,fi}$	Characteristic resistance:	R30 [kN]	1,3/1,5 ³⁾	2,3	3,0/4,0 ³⁾	6,3	7,5	7,5
		R60 [kN]						
		R90 [kN]						
		R120 [kN]	1,0/1,2 ³⁾	1,8	2,4/3,2 ³⁾	5,0	6,0	6,0
Concrete cone failure ⁴⁾								
$N_{Rk,p,fi}$	Characteristic resistance:	R30 [kN]	2,9	5,0	7,4	12,0	18,0	31,4
		R60 [kN]						
		R90 [kN]						
		R120 [kN]	2,3	4,0	5,9	9,6	14,4	25,2
$S_{cr,N,fi}$	Critical spacing:	R30 to R120 [mm]	4 x h_{ef}					
$S_{min,fi}$	Minimum spacing:	R30 to R120 [mm]	50	60	70	85/128 ³⁾	100/150 ³⁾	125
$C_{cr,N,fi}$	Critical edge distance:	R30 to R120 [mm]	2 x h_{ef}					
$C_{min,fi}$	Minimum edge distance:	R30 to R120 [mm]	$C_{min} = 2 \times h_{ef}$; if fire attack comes from more than one side, the edge distance of the anchor has to be ≥ 300 mm and $\geq 2 \times h_{ef}$					
Concrete pry out failure								
$k_3^{1)}$	k factor:	R30 to R120 [-]	1	2	2	2	2	2
$k_2^{2)}$								

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009, prEN 1992-4

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ Respective values for anchors S-Fix Pro W / S-Fix Pro WF, S-Fix Pro

⁴⁾ As a rule, splitting failure can be neglected since cracked concrete and reinforcement is assumed.

In absence of other national regulations the partial safety factor for resistance under fire exposure $\gamma_{m,fi} = 1,0$ is recommended

S-Fix Pro W, S-Fix Pro WF, S-Fix Pro anchor

Performances

Characteristic values for resistance to fire

Annex C7