



**DECLARATION OF PERFORMANCE**  
**DoP no. 1488-CPR-0554/W EN**

Version: 1

print date: 19.10.2016

1. Unique identification code of the product-type: **Sumo Pro 1**
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: **ETAG 001-Part 3; April 2013**  
European Technical Assessment: **ETA 16/0259; 12.08.2016**  
Technical Assessment Body: **ITB Instytut Techniki Budowlanej**  
Notified body/ies: **1488**
7. Declared performance/s:

**Mechanical resistance and stability (BWR1)**

Essential characteristics	Performances
Characteristic resistance for tension loads	See Annex C1
Edge distance and spacing	See Annex C1
Displacements under tension loads	See Annex C1
Characteristic resistance for shear loads	See Annex C2
Characteristic resistance for bending moments	See Annex C2
Displacements under shear loads	See Annex C2

**Safety in case of fire (BWR 2)**

Essential characteristics	Performances
Reaction to fire	Anchors satisfy requirements for Class A1
Resistance to fire	See Annexes C3 and C4

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, 19.10.2016

**Table C1:** Characteristic resistance for tension loads in cracked and non-cracked concrete C20/25 to C50/60 (design acc. to ETAG 001, Annex C, design method A)

Anchor size		8			10			12			14		
Nominal anchorage depth	$h_{nom}$ [mm]	45	50	65	50	60	75	50	60	95	60	70	115
<b>Steel failure</b>													
Characteristic resistance	$N_{Rk,s}$ [kN]	42,4			67,2			99,4			134,0		
Partial safety factor	$\gamma_{Ms}^{1)}$	1,4											
<b>Pullout failure</b>													
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$ [kN]	6	6	12	6	9	16	6	9	25	9	12	35
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$ [kN]	3	4	7,5	4	6	9	4	6	16	5	7,5	20
Increasing factors for $N_{Rk,p}$	C30/37	1,17			1,17			1,17			1,22		
	C40/50	1,32			1,32			1,32			1,41		
	C50/60	1,42			1,42			1,42			1,55		
Partial safety factor for cracked and non-cracked concrete	$\gamma_{Mp}^{1)}$	1,8											
<b>Concrete cone and splitting failure</b>													
Effective anchorage depth	$h_{ef}$ [mm]	30	34	47	33	42	54	33	42	71	40	48	86
Spacing	$s_{cr,N}$ [mm]	90	102	141	100	124	162	100	124	213	118	144	258
Edge distance	$c_{cr,N}$ [mm]	45	51	71	50	62	81	50	62	107	59	72	129
Spacing	$s_{cr,sp}$ [mm]	90	102	141	100	124	162	100	124	213	118	144	258
Edge distance	$c_{cr,sp}$ [mm]	45	51	71	50	62	81	50	62	107	59	72	129

<sup>1)</sup> in the absence of other national regulations

**Table C2:** Displacements under tension loads

Anchor size			8		10		12		14	
Non-cracked concrete C20/25 to C50/60	Tension load	N [kN]	5,8		8,5		12,6		15,6	
	Displacement	$\delta_{N0}$ [mm]	0,3		0,4		0,4		0,6	
		$\delta_{N\infty}$ [mm]	1,4		1,5		1,8		1,9	
Cracked concrete C20/25 to C50/60	Tension load	N [kN]	3,2		4,0		6,9		9,6	
	Displacement	$\delta_{N0}$ [mm]	0,4		0,5		0,5		0,6	
		$\delta_{N\infty}$ [mm]	2,0		2,0		2,0		2,0	

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**Performances**  
Characteristic resistance for tension loads. Displacements

**Annex C1**  
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**Table C3:** Characteristic resistance for shear loads in cracked and non-cracked concrete C20/25 to C50/60 (design acc. to ETAG 001, Annex C, design method A)

Anchor size			8			10			12			14		
Nominal anchorage depth	$h_{nom}$ [mm]		45	50	65	50	60	75	50	60	95	60	70	115
<b>Steel failure without lever arm</b>														
Characteristic resistance	$V_{Rk,s}$ [kN]		17,0			26,9			39,8			53,5		
Partial safety factor	$\gamma_{Ms}^{1)}$		1,5											
<b>Steel failure with lever arm</b>														
Characteristic bending resistance	$M_{Rk,s}^0$ [Nm]		46,8			93,2			167,7			261,8		
Partial safety factor	$\gamma_{Ms}^{1)}$		1,5											
<b>Concrete pryout failure</b>														
Factor in equation (5.6) of ETAG 001 Annex C, 5.2.3.3	k		1,0						2,0					
<b>Concrete edge failure</b>														
Effective length of anchor	$l_f$ [mm]		30	34	47	33	42	54	33	42	71	40	48	86
Effective diameter of anchor	$d_{nom}$ [mm]		8			10			12			16		
Partial safety factor	$\gamma_{Mc}^{1)}$		1,5											

<sup>1)</sup> in the absence of other national regulations

**Table C4:** Displacements under shear loads

Anchor size			8			10			12			14		
Non-cracked and cracked concrete C20/25 to C50/60	Shear load	V [kN]	6,9			11			15			15,5		
	Displacement	$\delta_{v0}$ [mm]	1,5			1,7			2,0			2,7		
		$\delta_{v\infty}$ [mm]	2,3			2,6			3,0			4,1		

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**Performances**  
Characteristic resistance for shear loads. Displacements

**Annex C2**  
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**Table C5:** Characteristic resistance for tension loads under fire exposure in cracked and non-cracked concrete C20/25 to C50/60 (acc. to TR 020)

Anchor size		8	10	12	14	
Nominal anchorage depth	$h_{nom}$ [mm]	65	75	95	115	
<b>Steel failure</b>						
Characteristic resistance	R30	$N_{Rk,s,fi}$ [kN]	0,64	1,34	1,99	2,68
	R60	$N_{Rk,s,fi}$ [kN]	0,55	1,01	1,49	2,01
	R90	$N_{Rk,s,fi}$ [kN]	0,42	0,87	1,29	1,74
	R120	$N_{Rk,s,fi}$ [kN]	0,34	0,67	0,99	1,34
<b>Pullout failure</b>						
Characteristic resistance	R30	$N_{Rk,p,fi}$ [kN]	1,9	2,2	4,0	5,0
	R60	$N_{Rk,p,fi}$ [kN]	1,9	2,2	4,0	5,0
	R90	$N_{Rk,p,fi}$ [kN]	1,9	2,2	4,0	5,0
	R120	$N_{Rk,p,fi}$ [kN]	1,5	1,8	3,2	4,0
<b>Concrete cone failure</b>						
Characteristic resistance	R30	$N_{Rk,c,fi}$ [kN]	2,7	3,9	7,6	12,3
	R60	$N_{Rk,c,fi}$ [kN]	2,7	3,9	7,6	12,3
	R90	$N_{Rk,c,fi}$ [kN]	2,7	3,9	7,6	12,3
	R120	$N_{Rk,c,fi}$ [kN]	2,2	3,1	6,1	9,9
<b>Edge distance</b>						
	R30	$c_{cr,N,fi}$ [mm]	$2 \cdot h_{ef}$			
	R60	$c_{cr,N,fi}$ [mm]				
	R90	$c_{cr,N,fi}$ [mm]				
	R120	$c_{cr,N,fi}$ [mm]				
<b>Spacing</b>						
	R30	$s_{cr,N,fi}$ [mm]	$4 \cdot h_{ef}$			
	R60	$s_{cr,N,fi}$ [mm]				
	R90	$s_{cr,N,fi}$ [mm]				
	R120	$s_{cr,N,fi}$ [mm]				

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**Performances**  
 Characteristic resistance for tension loads under fire exposure

**Annex C3**  
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**Table C6:** Characteristic resistance for shear loads under fire exposure in cracked and non-cracked concrete C20/25 to C50/60 (acc. to TR 020)

Anchor size		8	10	12	14	
Nominal anchorage depth	$h_{nom}$ [mm]	65	75	95	115	
<b>Steel failure without lever arm</b>						
Characteristic resistance	R30	$V_{Rk,s,fi}$ [kN]	0,64	1,34	1,99	2,68
	R60	$V_{Rk,s,fi}$ [kN]	0,55	1,01	1,49	2,01
	R90	$V_{Rk,s,fi}$ [kN]	0,42	0,87	1,29	1,74
	R120	$V_{Rk,s,fi}$ [kN]	0,34	0,67	0,99	1,34
<b>Steel failure with lever arm</b>						
Characteristic bending resistance	R30	$M_{Rk,s,fi}^0$ [Nm]	0,70	1,86	3,36	5,24
	R60	$M_{Rk,s,fi}^0$ [Nm]	0,61	1,40	2,52	3,93
	R90	$M_{Rk,s,fi}^0$ [Nm]	0,47	1,21	2,18	3,40
	R120	$M_{Rk,s,fi}^0$ [Nm]	0,37	0,93	1,68	2,62
<b>Concrete pry-out failure</b>						
	R30	k [-]	1	1	2	2
	R60	k [-]				
	R90	k [-]				
	R120	k [-]				
<b>Concrete edge failure</b>						
	R30	$V_{Rk,c,fi}^0$ [kN]	$0,25 \cdot V_{Rk,c}^*$			
	R60	$V_{Rk,c,fi}^0$ [kN]				
	R90	$V_{Rk,c,fi}^0$ [kN]				
	R120	$V_{Rk,c,fi}^0$ [kN]	$0,20 \cdot V_{Rk,c}^*$			
* $V_{Rk,c}^0$ - initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature acc. to ETAG 001, Annex C						

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**Performances**  
 Characteristic resistance for shear loads under fire exposure

**Annex C4**  
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