

Declaration of Performance

Nr: TDX/01/20190424/1488-CPR-0617/W



Revision No:	1
Revision carried out by:	Tomasz Golon
Revision date:	24.04.2019

1. Unique identification code of product-type:	DROP IN ANCHOR TDX	
2. Intended use/es:	Deformation-controlled expansion anchors for use in non-cracked concrete. For fixing and/or supporting to concrete structural elements (which contributes to the stability of the works) or heavy units.	
3. Manufacturer:	Name:	Trutek Fasteners Polska Sp. z o.o.
	Address:	Al. Krakowska 38, Sękocin Janki 05-090 Raszyn, Polska
4. System/s of AVCP:	System:	1
5. European Assessment Document:	In accordance with regulation (EU) No 305/2011 on the basis of European Assessment Document (EAD) 330232-00-0601 "Mechanical fasteners for use in concrete"	
	European Technical Assessment	ETA-17/0678 of 17th of August 2017
	Issued by:	ITB - Building Research Institute in Warsaw
6. Notified body/ies:	Name:	Cerification Department of ITB - Building Research Institute in Warsaw
	Notified body/ies No:	1488
	No of Certificate of Constancy of Performance:	1488-CPR-0617/W
7. Declared performance/es:	Mechanical resistance and stability (BWR 1)	
	Essential characteristic	Performance
	Characteristic resistance to tension load in non-cracked concrete (static and quasi-static loading)	Annex C1
	Characteristic resistance to shear load in non-cracked concrete (static and quasi-static loading)	Annex C2
	Characteristic resistance and displacements (static and quasi-static loading)	Annex C3
	Safety in case of fire (BWR 2)	
	Essential characteristic	Performance
	Reaction to fire	Anchor satisfy requirements for Class A1
	Resistance to fire	No performance assessed

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

Janki, 24th of April 2019

Signed for and on behalf of the manufacturer by:

Tomasz Golon


Kierownik Produktu / Product Manager



Table C1: Characteristic resistance to tension load in non-cracked concrete (static and quasi-static loading)

Anchor			DROP IN ANCHOR TDX						
Size			TDX08	TDX10	TDX12TS	TDX12	TDX16	TDX20	
Steel failure									
Steel failure with threaded rod grade 4.6									
Characteristic resistance	$N_{Rk,s}$	[kN]	14,6	23,2	33,7	33,7	62,8	98,0	
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	2,0	2,0	2,0	2,0	2,0	2,0	
Steel failure with threaded rod grade 4.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	14,6	23,2	33,7	33,7	62,8	98,0	
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5	
Steel failure with threaded rod grade 5.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	18,3	29,0	42,2	42,2	78,5	122,5	
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5	
Steel failure with threaded rod grade 6.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	22,0	34,8	50,6	50,6	94,2	147,0	
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5	
Steel failure with threaded rod grade 8.8									
Characteristic resistance	$N_{Rk,s}$	[kN]	29,3	46,4	67,4	67,4	125,6	196,0	
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5	
Pullout failure									
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	1)	1)	1)	1)	25	30	
Installation safety factor	$\gamma_2^{3)} = \gamma_{inst}^{4) 5)}$	[-]	1,2	1,2	1,4	1,2	1,2	1,2	
Increasing factor	concrete C30/37	ψ_c	[-]	1,22	1,22	1,22	1,22	1,22	
	concrete C40/50		[-]	1,41	1,41	1,41	1,41	1,41	
	concrete C50/60		[-]	1,55	1,55	1,55	1,55	1,55	
Concrete cone failure and splitting failure									
Effective embedment depth	h_{ef}	[mm]	30	40	50	50	65	80	
Factor for non-cracked concrete	$k_1^{3)} = k_{ucr}^{4)}$	[-]	10,1	10,1	10,1	10,1	10,1	10,1	
Factor for non-cracked concrete	$k_{ucr,N}^{5)}$	[-]	11,0	11,0	11,0	11,0	11,0	11,0	
Installation safety factor	$\gamma_2^{3)} = \gamma_{inst}^{4) 5)}$	[-]	1,2	1,2	1,4	1,2	1,2	1,2	
Increasing factor	concrete C30/37	ψ_c	[-]	1,22	1,22	1,22	1,22	1,22	
	concrete C40/50		[-]	1,41	1,41	1,41	1,41	1,41	
	concrete C50/60		[-]	1,55	1,55	1,55	1,55	1,55	
Characteristic resistance to splitting	$N_{Rk,sp}^0$	[kN]	1)	1)	1)	1)	25	30	
Characteristic spacing	concrete cone failure	$s_{cr,N}$	[mm]	90	120	150	150	195	240
	splitting failure	$s_{cr,sp}$	[mm]	210	280	350	350	455	560
Characteristic edge distance	concrete cone failure	$c_{cr,N}$	[mm]	45	60	75	75	97	120
	splitting failure	$c_{cr,sp}$	[mm]	105	140	175	175	227	280

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Performances
Characteristic resistance to tension load

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Table C2: Characteristic resistance to shear load in non-cracked concrete (static and quasi-static loading)

Anchor			DROP IN ANCHOR TDX					
			TDX08	TDX10	TDX12TS	TDX12	TDX16	TDX20
Steel failure without lever arm								
Steel failure with threaded rod grade 4.6								
Characteristic resistance	$V_{Rk,s}^{3/4} = V_{Rk,s}^{0/5}$	[kN]	7,3	11,6	31,4	16,9	31,4	49,0
Factor considering ductility	$k^{3)} = k_2^{4)} = k_7^{5)}$	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,67	1,67	1,67	1,67	1,67	1,67
Steel failure with threaded rod grade 4.8								
Characteristic resistance	$V_{Rk,s}^{3/4} = V_{Rk,s}^{0/5}$	[kN]	7,3	11,6	31,4	16,9	31,4	49,0
Factor considering ductility	$k^{3)} = k_2^{4)} = k_7^{5)}$	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 5.8								
Characteristic resistance	$V_{Rk,s}^{3/4} = V_{Rk,s}^{0/5}$	[kN]	9,2	14,5	39,3	21,1	39,3	61,3
Factor considering ductility	$k^{3)} = k_2^{4)} = k_7^{5)}$	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 6.8								
Characteristic resistance	$V_{Rk,s}^{3/4} = V_{Rk,s}^{0/5}$	[kN]	11,0	17,4	47,1	25,3	47,1	73,5
Factor considering ductility	$k^{3)} = k_2^{4)} = k_7^{5)}$	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 8.8								
Characteristic resistance	$V_{Rk,s}^{3/4} = V_{Rk,s}^{0/5}$	[kN]	14,6	23,2	62,8	33,7	62,8	98,0
Factor considering ductility	$k^{3)} = k_2^{4)} = k_7^{5)}$	[-]	0,8	0,8	0,8	0,8	0,8	0,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with lever arm								
Steel failure with threaded rod grade 4.6								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	15,0	29,9	52,4	52,4	133,3	259,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,67	1,67	1,67	1,67	1,67	1,67
Steel failure with threaded rod grade 4.8								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	15,0	29,9	52,4	52,4	133,3	259,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 5.8								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	18,8	37,4	65,6	65,6	166,6	324,8
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 6.8								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	22,5	44,9	78,7	78,7	199,9	389,7
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25
Steel failure with threaded rod grade 8.8								
Characteristic bending resistance	$M_{Rk,s}^0$	[Nm]	30,0	59,9	104,9	104,9	266,6	519,7
Partial safety factor	$\gamma_{Ms}^{2)}$	[-]	1,25	1,25	1,25	1,25	1,25	1,25

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Characteristic resistance to shear loads

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Table C3: Characteristic resistance and displacements (static and quasi-static loading)

Anchor			DROP IN ANCHOR TDX					
Size			TDX08	TDX10	TDX12TS	TDX12	TDX16	TDX20
Resistance to pry-out failure								
Factor for non-cracked concrete	$k^{3)} = k_3^{4)} = k_8^{5)}$	[-]	1,0	1,0	1,0	1,0	2,0	2,0
Partial safety factor	$\gamma_{M6}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Resistance to concrete edge failure								
Outside diameter of anchor	d_{nom}	[mm]	10	12	15	16	20	25
Effective length of anchor under shear loads	l_f	[mm]	30	40	50	50	65	80
Partial safety factor	$\gamma_{M6}^{2)}$	[-]	1,5	1,5	1,5	1,5	1,5	1,5
Minimum member thickness	h_{min}	[mm]	100	100	100	100	130	160
Minimum edge distance	c_{min}	[mm]	41	54	68	68	88	108
Minimum spacing	s_{min}	[mm]	41	54	68	68	88	108
Displacements under static and quasi-static loading								
Tension and shear load in non-cracked concrete C20/25 to C50/60								
Tension load and shear load	$N = V$	[kN]	4,44	6,91	6,40	9,92	11,46	23,86
Short term tension displacement	δ_{N0}	[mm]	0,98	3,54	3,06	2,73	1,15	4,26
Long term tension displacement	δ_{N-}	[mm]	0,50	0,50	0,38	0,50	0,50	0,50
Short term shear displacement	δ_{V0}	[mm]	0,98	3,54	3,06	2,73	1,15	4,26
Long term shear displacement	δ_{V-}	[mm]	0,50	0,50	0,38	0,50	0,50	0,50

¹⁾ Pull-out failure mode is not decisive

^{2) 3)} Parameter for design acc. to ETAG 001 Annex C

⁴⁾ Parameter for design acc. to CEN/TS 1992-4-4:2009

⁵⁾ Parameter for design acc. to prEN 1992-4:2016

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Performances
Characteristic resistance and displacements

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