Trutek Fasteners Polska Sp. z o.o.
Al. Krakowska 38, Janki
05-090 Raszyn
NIP: PL 5342256188 REGON: 015722173

Declaration of Performance

Nr: TCM_PRO+/01/20230803/ETA-23/0051

Revision No:	1
Revision carried out by:	***Ben Beardon***
Revision date:	03.08.2023

1.	**Unique identyfiaction code of product-type:**	
	Bonded injection type anchor for use in concrete TCM PRO+	
2.	**Indended use/es:**	
	Reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013 + A1:2016. Strength classes C20/25 to C50/60 according to EN 206:2013 + A1:2016. Cracked and non-cracked concrete: M8 to M24, Rebar Ø8 to Ø25	
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 EOTA 330499-01-0601, “Bonded fasteners for use in concrete”	
	European Technical Assessment	ETA-23/0051
	Issued by:	ETA-DANMARK A/S
6.	**Notyfied body/ies:**	
	Name:	ZAG ZAWOD ZA GRADBENIŠTVO SLOWENIJE
	Notified body/ies No:	1404
	No of Certificate of Constancy of Performance:	1404-CPR-3614
7.	**Declared performance/es:**	
	Mechanical resistance and stability (BWR 1)	
	Essential chracteristic	**Performance**
	Characteristic values for tensile and shear strength of steel for threaded rods	Table C1
	Characteristic values of tensile loads under static and quasi-static conditions for threaded rods	Table C2
	Displacements under tensile load	Table C3
	Displacements under shear load for all types of drilling for threaded rods	Table C4
	Characteristic values for steel tensile strength and tensile load values for rebars	Table C5
	Displacements under tensile load for rebars	Table C6
	Characteristic steel shear strength for rebars	Table C7
	Displacements under shear load for rebars	Table C8
	Safety in case of fire (BWR 2)	
	Essential chracteristic	**Parameters**
	Resistance to fire	Table C9
	Reaction to fire	Table C10

The performance of the product indentified 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.

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Janki, 03th of August 2023
Signed for and on behalf of the manufacturer by:

Ben Beardon
Operatiosn Director

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Table C1: Characteristic values for steel tension resistance and steel shear resistance of threaded rods

Size				**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Cross section area		A_s	[mm²]	36.6	58	84.3	157	245	353
Characteristic tension resistance, Steel failure									
Steel, Property class 4.6 and 4.8		$N_{Rk,s}$	[kN]	15	23	34	63	98	141
Steel, Property class 5.6 and 5.8		$N_{Rk,s}$	[kN]	18	29	42	78	122	176
Steel, Property class 8.8		$N_{Rk,s}$	[kN]	29	46	67	125	196	282
Steel, Property class 10.9		$N_{Rk,s}$	[kN]	37	58	84	157	245	353
Steel, Property class 12.9		$N_{Rk,s}$	[kN]	44	70	101	188	294	424
Stainless steel A2, A4 and HCR, Property class 50		$N_{Rk,s}$	[kN]	18	29	42	79	123	177
Stainless steel A2, A4 and HCR, Property class 70		$N_{Rk,s}$	[kN]	26	41	59	110	171	247
Stainless steel A4 and HCR, Property class 80		$N_{Rk,s}$	[kN]	29	46	67	126	196	282
Characteristic tension resistance, Partial factor									
Steel, Property class 4.6 and 5.6		$\gamma_{Ms,N}$ [1)]	[-]	2,0					
Steel, Property class 4.8, 5.8 and 8.8		$\gamma_{Ms,N}$ [1)]	[-]	1,5					
Steel, Property class 10.9 and 12.9		$\gamma_{Ms,N}$ [1)]	[-]	1.4					
Stainless steel A2, A4 and HCR, Property class 50		$\gamma_{Ms,N}$ [1)]	[-]	2,86					
Stainless steel A2, A4 and HCR, Property class 70		$\gamma_{Ms,N}$ [1)]	[-]	1,87					
Stainless steel A4 and HCR, Property class 80		$\gamma_{Ms,N}$ [1)]	[-]	1,6					
Characteristic shear resistance, Steel failure									
Without lever arm	Steel, Property class 4.6 and 4.8	$V^0_{Rk,s}$	[kN]	7	12	17	31	49	71
	Steel, Property class 5.6 and 5.8	$V^0_{Rk,s}$	[kN]	9	15	21	39	61	88
	Steel, Property class 8.8	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141
	Steel, Property class 10.9	$V^0_{Rk,s}$	[kN]	18	29	42	79	123	177
	Steel, Property class 12.9	$V^0_{Rk,s}$	[kN]	22	35	51	94	147	212
	Stainless steel A2, A4 and HCR, Property class 50	$V^0_{Rk,s}$	[kN]	9	15	21	39	61	88
	Stainless steel A2, A4 and HCR, Property class 70	$V^0_{Rk,s}$	[kN]	13	20	30	55	86	124
	Stainless steel A4 and HCR, Property class 80	$V^0_{Rk,s}$	[kN]	15	23	34	63	98	141
With lever arm	Steel, Property class 4.6 and 4.8	$M^0_{Rk,s}$	[Nm]	15	30	52	133	260	449
	Steel, Property class 5.6 and 5.8	$M^0_{Rk,s}$	[Nm]	19	37	65	166	324	560
	Steel, Property class 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	896
	Steel, Property class 10.9	$M^0_{Rk,s}$	[Nm]	37	75	131	333	649	1123
	Steel, Property class 12.9	$M^0_{Rk,s}$	[Nm]	45	90	157	400	778	1347
	Stainless steel A2, A4 and HCR, Property class 50	$M^0_{Rk,s}$	[Nm]	19	37	66	167	325	561
	Stainless steel A2, A4 and HCR, Property class 70	$M^0_{Rk,s}$	[Nm]	26	52	92	232	454	784
	Stainless steel A4 and HCR, Property class 80	$M^0_{Rk,s}$	[Nm]	30	59	105	266	519	896
Characteristic shear resistance, Partial factor									
Steel, Property class 4.6 and 5.6		$\gamma_{Ms,V}$ [1)]	[-]	1,67					
Steel, Property class 4.8, 5.8 and 8.8		$\gamma_{Ms,V}$ [1)]	[-]	1,25					
Steel, Property class 10.9 and 12.9		$\gamma_{Ms,V}$ [1)]	[-]	1,50					
Stainless steel A2, A4 and HCR, Property class 50		$\gamma_{Ms,V}$ [1)]	[-]	2,38					
Stainless steel A2, A4 and HCR, Property class 70		$\gamma_{Ms,V}$ [1)]	[-]	1,56					
Stainless steel A4 and HCR, Property class 80		$\gamma_{Ms,V}$ [1)]	[-]	1,33					

[1)] in absence of national regulation

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Table C2: Characteristic values of tension loads under static and quasi-static for threaded rods

Anchor size threaded rod			M8	M10	M12	M16	M20	M24
Steel failure								
Characteristic tension resistance	$N_{Rk,s}$	[kN]	see Table C1					
Partial factor	$\gamma_{Ms,N}$	[-]	see Table C1					
Combined Pull-out and Concrete cone failure 2)								
Characteristic bond resistance in concrete C20/25 – **dry or wet** concrete for **hammer drilling (HD) and CD**								
Temperature range 40°C/24°C **non-cracked** concrete	$\tau_{Rk,ucr}$	[N/mm²]	11	10	10	9,5	9	8,5
Temperature range 40°C/24°C **cracked** concrete	$\tau_{Rk,cr}$	[N/mm²]	3,5	3,5	3	3,5	3,5	3,5
Partial safety factor – dry or wet concrete	γ_{inst}	[-]	1,2			1,4		
Characteristic bond resistance in non-cracked concrete C20/25 – **flooded** holes for **hammer drilling (HD)**								
Temperature range 40°C/24°C **non-cracked** concrete	$\tau_{Rk,ucr}$	[N/mm²]	11	10	10	9	7,5	7
Temperature range 40°C/24°C **cracked** concrete	$\tau_{Rk,cr}$	[N/mm²]	3,5	3,5	3	3,5	3	3
Partial safety factor – flooded holes	γ_{inst}	[-]	1,2		1,4			
Characteristic bond resistance in non-cracked concrete C20/25 – **dry or wet** concrete for **hollow drill bits (HDB) – dust free system**								
Temperature range 40°C/24°C **non-cracked** concrete	$\tau_{Rk,ucr}$	[N/mm²]	7	7	7.5	8	8	8.5
Temperature range 40°C/24°C **cracked** concrete	$\tau_{Rk,cr}$	[N/mm²]	3,5	3,5	4	3,5	3,5	3,5
Partial safety factor – dry or wet concrete	γ_{inst}	[-]	1,2					1,4
Increasing factor for $\tau_{Rk,ucr}$ in non-cracked for hammer drilling	ψ_c	C30/37	1,08					1,00
		C40/50	1,15					1,00
		C50/60	1,20					1,00
Increasing factor for $\tau_{Rk,cr}$ in cracked concrete for hammer drilling	ψ_c	C30/37	1,08	1,00				
		C40/50	1,15	1,00				
		C50/60	1,20	1,00				
Increasing factor for $\tau_{Rk,ucr}$ in non-cracked concrete for hollow drilling	ψ_c	C30/37	1,00					
		C40/50	1,00					
		C50/60	1,00					
Increasing factor for $\tau_{Rk,cr}$ in cracked concrete for hollow drilling	ψ_c	C30/37	1,20	1,00				
		C40/50	1,36	1,00				
		C50/60	1,50	1,00				
Reduction factor in cracked or non-cracked concrete C20/25 for all drilling methods	ψ^0_{sus}	[-]	0,794					
Factor for determination of the concrete cone failure	$k_{ucr,N}$	[-]	11,0 (based on concrete cylinder strength f_{ck})					
Factor for determination of the concrete cone failure	$k_{cr,N}$	[-]	7,7					
Edge distance for concrete cone failure	$c_{cr,N}$	[mm]	1,5 h_{ef}					
Axial distance for concrete cone failure	$s_{cr,N}$	[mm]	2 $c_{cr,N}$					

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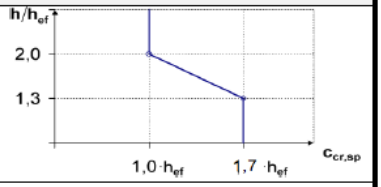
Table C2 : continuation

Splitting failure[2]				
Edge distance $c_{cr,sp}$ [mm] for	h / h_{ef} [4] $\geq 2,0$		$1,0\ h_{ef}$	
	$2,0 > h / h_{ef}$ [4] $> 1,3$		$3\ h_{ef} - 1\ h$	
	h / h_{ef} [4] $\leq 1,3$		$1,7\ h_{ef}$	
Spacing	$s_{cr,sp}$	[mm]	$2\ c_{cr,sp}$	

[1] In absence of national regulations
[2] Calculation of concrete and splitting, see annex B1
[3] Explanations, see annex B1
[4] h concrete member thickness, h_{ef} effective anchorage depth

Table C3: Displacements under tension load

TCM PRO+ with threaded rods With Hammer drilling (HD) or compressed air drilling (CD)			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Temperature range a [5]**: 40°C / 24°C**								
Displacement	δ_{N0}	[mm/(N/mm²)]	0,11	0,11	0,10	0,11	0,12	0,10
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,28	0,18	0,82	0,76	0,22	0,30
TCM PRO+ with threaded rods for Hollow drilling HDB (dust-free system)			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Temperature range a [5]**: 40°C / 24°C**								
Displacement	δ_{N0}	[mm/(N/mm²)]	0,10	0,12	0,15	0,14	0,14	0,13
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,49	0,19	0,38	0,52	0,14	0,19

[5] Explanation see annex B1

Table C4: Displacements under shear load for all types of drilling for threaded rods

TCM PRO+ with threaded rods			**M8**	**M10**	**M12**	**M16**	**M20**	**M24**
Displacement	δ_{V0}	[mm/kN]	0,06	0,06	0,05	0,04	0,04	0,03
Displacement	$\delta_{V\infty}$	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05

SYSTEM TCM PRO+	**Annex C3** of European Technical Assessment ETA-23/0051
Performance for static, quasi-static and seismic loads: Displacements	

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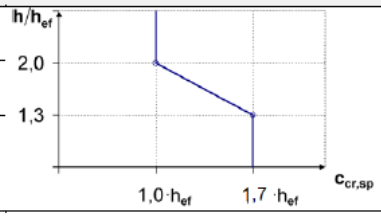
Table C5: Characteristic values for steel tension resistance and tension load values for rebar

TCM PRO+ with rebar				ϕ 8	ϕ 10	ϕ 12	ϕ 14	ϕ 16	ϕ 20	ϕ 24	ϕ 25
Steel failure											
Characteristic tension resistance	$N_{Rk,s}$	[kN]		$A_s \cdot f_{uk}$ [1]							
Cross section area	A_s	[mm²]		50	79	113	154	201	314	452	491
Partial safety factor	$\gamma_{Ms,N}$ [2]	[-]		1,4							
Combined Pull-out and Concrete cone failure [3]											
Diameter of rebar	d	[mm]		8	10	12	14	16	20	24	25
Characteristic bond resistance in non-cracked concrete C20/25 – dry or wet concrete for **hammer drilling (HD) and CD**											
Temperature range a [4] : 40°C/24°C	$\tau_{Rk,ucr}$	[N/mm²]		6	6	6	5,5	5,5	5,5	5,5	5,5
Partial safety factor – dry or wet concrete	γ_{inst} [2]	[-]		1,2			1,4				
Characteristic bond resistance in non-cracked concrete C20/25 – flooded holes for **hammer drilling (HD) and CD**											
Temperature range a [4] : 40°C/24°C	$\tau_{Rk,ucr}$	[N/mm²]		6	6	6	5,5	5,5	4,5	4,5	4,5
Partial safety factor – flooded holes	γ_{inst}	[-]		1,2		1,4					
Characteristic bond resistance in non-cracked concrete C20/25 – dry or wet concrete for **hollow drill bits (HDB) – dust free system**											
Temperature range a [4] : 40°C/24°C	$\tau_{Rk,ucr}$	[N/mm²]		5	5	5,5	5,5	5,5	5,5	5,5	5,5
Partial safety factor – dry or wet concrete	γ_{inst}	[-]		1,2						1,4	
Increasing factor for $\tau_{Rk,ucr}$ in non-cracked concrete	ψ_c		C30/37	1,00	1,04	1,08				1,13	
			C40/50	1,00	1,07	1,15				1,23	
			C50/60	1,00	1,10	1,20				1,32	
Factor for determination of the concrete cone failure	$k_{ucr,N}$	[-]		11,0 (based on concrete cylinder strength f_{ck})							
Factor for determination of the concrete cone failure	$k_{cr,N}$	[-]		7,7							
Splitting failure [3]											
Edge distance $c_{cr,sp}$ [mm] for			h / h_{ef} [5] ≥ 2,0	1,0 h_{ef}							
			2,0 > h / h_{ef} [5] > 1,3	3 h_{ef} - 1 h							
			h / h_{ef} [5] ≤ 1,3	1,7 h_{ef}							
Spacing	$s_{cr,sp}$	[mm]		2 $c_{cr,sp}$							



[1] f_{uk} shall be taken from the specifications of reinforcing bars
[2] in absence of national regulation
[3] Calculation of concrete and splitting, see annex B1
[4] Explanations, see annex B1
[5] h concrete member thickness, h_{ef} effective anchorage depth

SYSTEM TCM PRO+	**Annex C4** of European Technical Assessment ETA-23/0051
Performance for static and quasi-static loads: Resistances	

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Table C6: Displacements under tension load for rebar

TCM PRO+ with rebar for hammer drilling (HD) and CD			ϕ 8	ϕ 10	ϕ 12	ϕ 14	ϕ 16	ϕ 20	ϕ 24/ ϕ 25
Temperature range a [4]: 40°C / 24°C									
Displacement	δ_{N0}	[mm/(N/mm²)]	0,03	0,03	0,04	0,04	0,07	0,07	0,10
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,11	0,11	0,15	0,21	0,26	0,26	0,38
TCM PRO+ with rebar for hollow drilling dust free system (HDB)			**ϕ 8**	**ϕ 10**	**ϕ 12**	**ϕ 14**	**ϕ 16**	**ϕ 20**	**ϕ 25**
Temperature range a [4]: 40°C / 24°C									
Displacement	δ_{N0}	[mm/(N/mm²)]	0,16	0,10	0,03	0,03	0,04	0,04	0,04
Displacement	$\delta_{N\infty}$	[mm/(N/mm²)]	0,75	0,45	0,15	0,16	0,17	0,18	0,19

Table C7: Characteristic steel shear resistance for rebar

TCM PRO+ with rebar			ϕ 8	ϕ 10	ϕ 12	ϕ 14	ϕ 16	ϕ 20	ϕ 25
Steel failure without lever arm									
Characteristic shear resistance	$V_{Rk,s}$	[kN]	$0{,}50 \cdot A_s \cdot f_{uk}$ [1]						
Cross section area	A_s	[mm²]	50	79	113	154	201	314	491
Partial safety factor	$\gamma_{Ms,N}$ [2]	[-]	1,5						
Steel failure with lever arm									
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	$1.2 \cdot W_{el} \cdot f_{uk}$ [1]						
Elastic section modulus	W_{el}	[Nm]	50	98	170	269	402	785	1534
Partial safety factor	$\gamma_{Ms,N}$ [2]	[-]	1,5						
Concrete pryout failure									
Factor	k_8	[-]	1,0 for $h_{ef} < 60$mm 2,0 for $h_{ef} \geq 60$mm						
Partial safety factor	γ_{Mc}	[-]	1,5						
Concrete edge failure									
Partial safety factor	γ_{Mc} [1]	[-]	1,5						

[1] f_{uk} shall be taken from the specifications of reinforcing bars
[2] In absence of national regulations

Table C8: Displacements under shear load for rebar

TCM PRO+ with rebar			ϕ 8	ϕ 10	ϕ 12	ϕ 14	ϕ 16	ϕ 20	ϕ 25
Displacement	δ_{V0}	[mm/kN]	0,05	0,05	0,05	0,04	0,04	0,04	0,03
Displacement	$\delta_{V\infty}$	[mm/kN]	0,08	0,08	0,07	0,06	0,06	0,05	0,05

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Table C9: Resistance to fire

ESSENTIAL CHARACTERISTICS	PERFORMANCE
Resistance to fire	No performance assessed

Table C10: Reaction to fire

ESSENTIAL CHARACTERISTICS	PERFORMANCE
Reaction to fire	In the final application, the thickness of the mortar layer is about 1 to 2 mm and most of the mortar is material classified class A1 according to EC Decision 96/603/EC. Therefore, it may be assumed that the bonding material (synthetic mortar or a mixture of synthetic mortar and cementitious mortar) in connection with the metal anchor in the end use application do not contribute to fire growth or to the fully developed fire and they have no influence on the smoke hazard.

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