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

Declaration of Performance

Nr: TCM_PE/01/20200430/ETA-20/0150

Revision No:	1
Revision carried out by:	Tomasz Golon
Revision date:	30. 04. 2020

1.	**Unique identifiaction code of product-type:**	
	TCM PE injection system for post-installed rebar connections	
2.	**Indended use/es:**	
	The subject of this assessment are the post-installed connections, by anchoring or overlap connection joint consisting of steel reinforcing bars (rebars) in existing structures made of normal weight concrete, using injection mortar TCM PE in accordance with the regulations for reinforced concrete construction.	
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 330087-00-0601, “	
	European Technical Assessment:	ETA-20/0150 issued 7th of February 2020
	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-3276
7.	**Declared performance/es:**	
	Mechanical resistance and stability (BWR 1)	
	Essential chracteristic	**Performance**
	Design values of the ultimate bond stress	See table No C3 in annex C1
	Safety in case of fire (BWR 2)	
	Essential chracteristic	**Performance**
	Reaction to fire	Rebar connections satisfy requirements for Class A1
	Ressistant to fire	See annex C2

The performance of the product specified 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, 30th of April 2020
Signed for and on behalf of the manufacturer by:

Tomasz Golon

Kierownik Produktu / Product manager

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Minimum anchorage length and minimum lap length

The minimum anchorage length $\ell_{b,min}$ and the minimum lap length $\ell_{0,min}$ according to EN 1992-1-1:2004+AC:2010 ($\ell_{b,min}$ acc. to Eq. 8.6 and Eq. 8.7 and $\ell_{0,min}$ acc. to Eq. 8.11) shall be multiply by the amplification factor α_{lb} according to Table C1.
The design bond strength f_{bd} according to EN 1992-1-1:2004+AC:2010 (Eq.8.3) shall be multiplied by the factor k_b according to Table C2 to determine the design values of the ultimate bond stress for post installed rebars $f_{bd,PIR}$, which are given in Table C3.

Table C1: Amplification factor α_{lb} related to concrete class and drilling method

Concrete class	Drilling method	Rebar size	Amplification factor α_{lb}
C12/15 to C45/55	Hammer drilling (HD) and compressed air drilling (CD)	8 mm to 25 mm	1,0
C50/60	Hammer drilling (HD) and compressed air drilling (CD)	8 mm to 25 mm	1,1
C12/15 to C50/60	Hammer drilling (HD) and compressed air drilling (CD)	28 mm to 40 mm	1.0

Table C2: Bond efficiency factor k_b

Rebar - Ø	Concrete class								
ϕ	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
8 to 25 mm	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
28 to 36 mm								0,93	0,93
40 mm						0,88	0,81	0,85	0,79

Table C3: Design values of the ultimate bond stress $f_{bd, PIR}$ in N/mm² for all drilling methods for good conditions

according to EN 1992-1-1:2004+AC:2010 for good bond conditions
(for all other bond conditions multiply the values by 0.7)

Rebar - Ø	Concrete class								
ϕ	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
8 to 25 mm	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
28 to 36 mm								3,7	4,0
40 mm						3,0	3,0	3,4	3,4

TCM PE injection system for rebar connection	Annex C1
Performances Amplification factor α_{lb} Design values of ultimate bond resistance $f_{bd,PIR}$	

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Design value of the ultimate bond stress $f_{bd,fi}$ under fire exposure for concrete classes C12/15 to C50/60, (all drilling methods):

The design value of the bond strength $f_{bd,fi}$ under fire exposure has to be calculated by the following equation:

$$f_{bd,fi} = k_{fi}(\theta) \cdot f_{bd,PIR} \cdot \gamma_c / \gamma_{M,fi}$$

$f_{bd,fi}$ Design value of the ultimate bond stress in case of fire in N/mm²

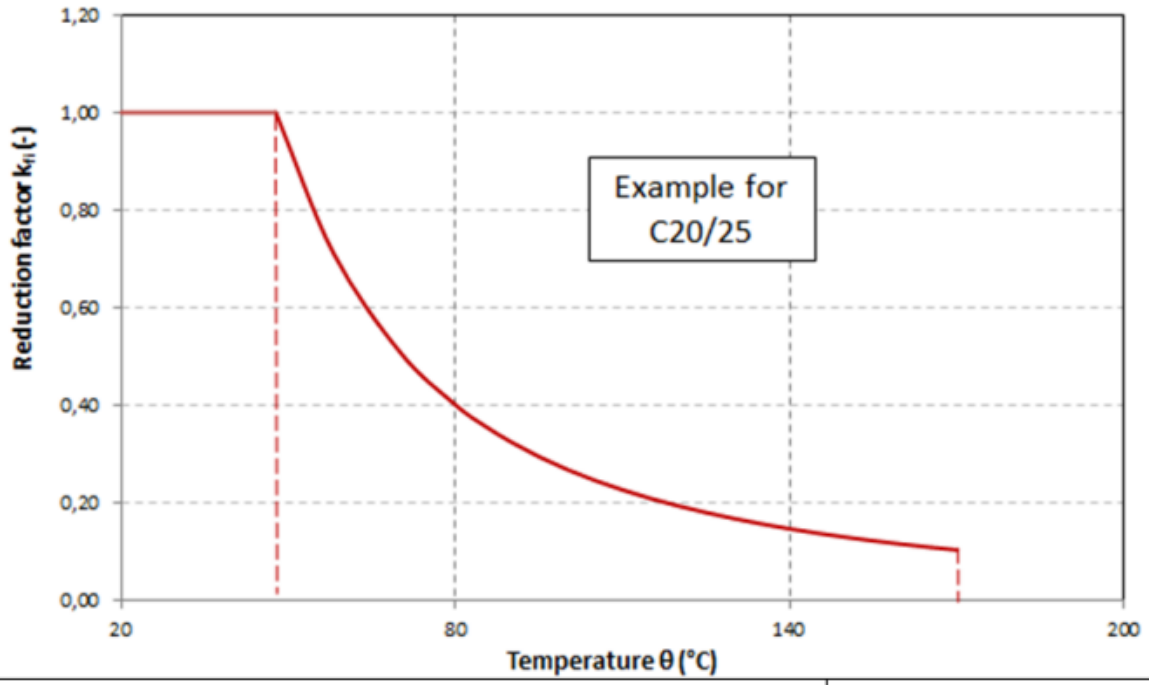
$$k_{fi}(\theta) = \frac{10151 \cdot \theta^{-1,791}}{f_{bd,PIR} \cdot 4,3} \leq 1,0 \qquad \theta \leq 172°C$$

$$k_{fi}(\theta) = 0 \qquad \theta > 172°C$$

θ	Temperature in °C in the mortar layer.
$k_{fi}(\theta)$	Reduction factor under fire exposure.
$f_{bd,PIR}$	Design value of the ultimate bond stress in N/mm² in cold condition according to Table C3 considering the concrete classes, the rebar diameter, the drilling method and the bond conditions according to EN 1992-1-1.
γ_c	partially safety factor according to EN 1992-1-1
$\gamma_{M,fi}$	partially safety factor according to EN 1992-1-2

For evidence under fire exposure the anchorage length shall be calculated according to EN 1992-1-1:2004+AC:2010 Equation 8.3 using the temperature-dependent ultimate bond stress $f_{bd,fi}$.

Example graph of Reduction factor $k_{fi}(\theta)$ for concrete classes C20/25 for good bond conditions:



TCM PE injection system for rebar connection	**Annex C2**
Performances Design value of bond strength $f_{bd,fi}$ under fire exposure	