



Instytut Techniki Budowlanej (ITB)

Group of Testing Laboratories

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TEST REPORT

LZK01-02844/25/R63NZK

Client:	Trutek Fasteners Polska Sp. z o.o. ul. Wojska Polskiego 3 39-300 Mielec, Poland
Product name: (as specified by the Client)	Steel anchors - metal frame
Date of issue:	30.05.2025

Construction Elements, Geotechnics and Concrete Laboratory (LZK)
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1. Information on the tests

Other parties to the agreement: Trutek Fasteners Polska Sp. z o.o.
ul. Wojska Polskiego 3
39-300 Mielec

Test start date: 21.05.2025

Test completion date: 28.05.2025

Test location:

In the laboratory LZK, in the following location: Al. Korfantego 191, 40-153 Katowice.

2. Product

2.1. Information provided by the Client

Product: Steel anchors - metal frame TFCS

Declared range of application: Installation of door frames and window frames

Other product information:

Materials (Tab. 1.).

Tab. 1. Materials

Anchor	Materials
TFCS	Carbon steel

3. Test item, sample

3.1. Information provided by the Client

Sample origin:

Samples provided by the Ordering Party with installation parameters (Tab. 2).

Tab. 2. Installation parameters

Anchor	TFCS
Nominal diameter of drill bit d_{nom} [mm]	6
Depth of drilled hole h_1 [mm]	35 / 60 / -
Embedment anchorage depth h_{nom} [mm]	30 / 50 / 60
Effective anchorage depth h_{ef} [mm]	30 / 50 / 60
Minimum thickness of concrete member h_{min} [mm]	80
Spacing s [mm]	250
Edge distance c [mm]	60 / 150 / 150

3.2. Information obtained based on visual inspection in the Laboratory

Acceptance of the test item into the laboratory:

Date: 21.05.2025

Acceptance protocol: LZK00-02844/25/R63NZK

Condition of the test item:

A sample was provided in a condition and quantity suitable for testing.

Description of the test item:

A photo/drawing of the anchors supplied is shown in Tab. 3.

Tab. 3. Description of the anchors

Anchors	Number of samples	Photo/drawing
TFCS 7,5x132	50 pieces Batch: not specified	

4. Test results

4.1. Test: tension tests

4.1.1. Test method

EAD 330232-01-0601

The implementation of the test, the accuracy of the measuring devices used is in accordance with the requirements acc. EAD.

4.1.2. Results

The anchors were installed in the base materials, the detailed specification are given in Tab. 4. . The test results are given in Tab. 5. Examples of test standing and failure mode is given in Tab. 9.

Tab. 4. Dimensions, compressive strengths and bulk densities of the materials

Material	Min. compressive strength [N/mm ²]	Bulk density [kg/dm ³]
Concrete C20/25	≥ 28	≥ 2,3

Tab. 5. Tension tests acc. EAD 330232-01-0601

Material	Anchor	F _u [kN]	s [kN]	c _{vF} [%]	U [kN]	F _{u,m} [kN]	F _{u,5%} [kN]
Concrete C20/25	TFCS	8,09 7,38 6,99 8,00 7,70	0,45	6	0,10	6,69	5,34

F_u - ultimate load in a test [kN]

s - standard deviation [kN]

c_{vF} - coefficient of variation [%]

U - uncertainty of the measurement is for a confidence level of 95 % and uncertainty factor k = 2; uncertainty has been estimated on the basis of available data, including data on the accuracy of the measurement system; the uncertainty value refers to the individual test results; the value of uncertainty can not be assigned directly to the characteristics of a given product, because the laboratory does not have knowledge about the variability of product population, but only about the tested sample [kN]

F_{u,m} - mean ultimate load in a test series in concrete [kN]

f_{ct} - compressive strength concrete [N/mm²]

F_{u,5%} - 5%-fractile of the ultimate load in a test series [kN]

4.2. Test: pull-out resistance from the substrate without cracks: solid ceramic substrate, ceramic substrate with holes, solid lightweight concrete, lightweight concrete with holes

4.2.1. Test method

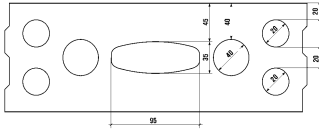
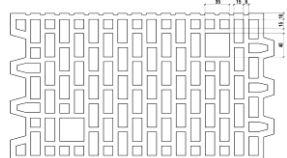
PB LOK-B01/5/03-2018

The implementation of the test, the accuracy of the measuring devices used is in accordance with the requirements acc. PB LOK.

4.2.2. Results

The anchors were installed in the base materials, the detailed specification are given in Tab. 6. The test results are given in Tab. 7 ÷ 8. Examples of test standing and failure mode is given in Tab. 9.

Tab. 6. Dimensions, compressive strengths and bulk densities of the materials

Material	Min. compressive strength [N/mm ²]	Bulk density [kg/dm ³]
Clay bricks MZ	≥ 20	≥ 2,0
Calcium silicate bricks KS	≥ 20	≥ 2,0
Calcium silicate hollow block KSL 	≥ 12	≥ 1,6
Vertical perforated porosited block Porotherm 25 P+W 	≥ 15	≥ 0,8
Autoclaved concrete blocks AAC2	≥ 2	≥ 0,35
Autoclaved concrete blocks AAC7	≥ 5	≥ 0,65

Tab. 7. Tension tests acc. PB LOK-B01/5/03-2018

Material	Anchor	F _u [kN]	s [kN]	c _{vF} [%]	U [kN]	F _{u,m} [kN]	F _{u,5%} [kN]
Clay bricks MZ	TFCS	3,00	0,18	6	0,10	2,95	2,35
		2,76					
		2,80					
		3,20					
		3,00					
Calcium silicate bricks KS		3,33	0,14	4	0,10	3,12	2,65
		3,17					
		3,00					
		3,00					
		3,10					

F_u - ultimate load in a test [kN]

s - standard deviation [kN]

c_{vF} - coefficient of variation [%]

U - uncertainty of the measurement is for a confidence level of 95 % and uncertainty factor k = 2; uncertainty has been estimated on the basis of available data, including data on the accuracy of the measurement system; the uncertainty value refers to the individual test results; the value of uncertainty can not be assigned directly to the characteristics of a given product, because the laboratory does not have knowledge about the variability of product population, but only about the tested sample [kN]

F_{u,m} - mean ultimate load in a test series in concrete [kN]

f_{ct} - compressive strength concrete [N/mm²]

F_{u,5%} - 5%-fractile of the ultimate load in a test series [kN]

Tab. 8. Tension tests acc. PB LOK-B01/5/03-2018

Tab. 6: Tension tests according to EN 12617/3/85 2010

Material	Anchor	F _u [kN]	s [kN]	c _{vF} [%]	U [kN]	F _{u,m} [kN]	F _{u,5%} [kN]
Calcium silicate hollow block KSL	TFCS	2,80 3,00 3,20 3,00 3,00	0,14	5	0,10	3,00	2,52
Vertical perforated porosited block Porotherm 25 P+W		1,00 1,07 0,90 1,12 1,20	0,11	11	0,10	1,06	0,67
Autoclaved concrete blocks AAC2		0,70 0,66 0,68 0,77 0,70	0,04	6	0,10	0,70	0,56
Autoclaved concrete blocks AAC7		1,20 1,33 1,27 1,33 1,28	0,05	4	0,10	1,28	1,10

F_u - ultimate load in a test [kN]
s - standard deviation [kN]
c_{vF} - coefficient of variation [%]
U - uncertainty of the measurement is for a confidence level of 95 % and uncertainty factor k = 2; uncertainty has been estimated on the basis of available data, including data on the accuracy of the measurement system; the uncertainty value refers to the individual test results; the value of uncertainty can not be assigned directly to the characteristics of a given product, because the laboratory does not have knowledge about the variability of product population, but only about the tested sample [kN]
F_{u,m} - mean ultimate load in a test series in concrete [kN]
f_{c,t} - compressive strength concrete [N/mm²]
F_{u,5%} - 5%-fractile of the ultimate load in a test series [kN]

Tab. 9. Examples of test standing and failure mode

Test standing	Examples of failure mode
	

4.3. Test: zinc plating

4.3.1. Test method

PB-LOK-B52/2/11-2018

The implementation of the test, the accuracy of the measuring devices used is in accordance with the requirements acc. PB-LOK.

4.3.1. Results

The test results are given in Tab. 10. Examples of test standing is given in Tab. 11.

Tab. 10. Zinc plating acc. PB-LOK-B52/2/11-2018

Anchor	U _{zp} [μm]										M _{zp} [μm]	s [μm]	v [%]	U [μm]
TFCS	6,74	7,48	5,67	6,60	6,25	6,98	6,77	7,73	7,08		6,92	0,59	9	0,87
	7,23	6,22	6,84	6,75	6,91	6,40	6,89	7,05	7,63					
	7,59	7,56	7,36	5,37	7,02	7,36	7,78	6,99	6,59					

U_{zp} - ultimate zinc plating a test [μm]
M_{zp} - mean zinc plating in a test series [μm]
s - standard deviation [μm]
v - coefficient of variation [%]
U - uncertainty of the measurement is for a confidence level of 95 % and uncertainty factor k = 2; uncertainty has been estimated on the basis of available data, including data on the accuracy of the measurement system; the uncertainty value refers to the individual test results; the value of uncertainty can not be assigned directly to the characteristics of a given product, because the laboratory does not have knowledge about the variability of product population, but only about the tested sample [μm]

Tab. 11. Examples of test standing and failure mode

Test standing	
	

5. Disclaimers

The Testing Laboratory declares that the test results relate only to the sample received.

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The Test Report does not replace documents required for placing construction products on the market or making them available.

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6. Annex

Characteristic parameters.

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Head of the Laboratory LZK
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END OF THE REPORT

Annex

Characteristic parameters.

Tab. 1. Characteristic parameters.

Anchor	h_1 [mm]	h_{nom} [mm]	h_{ef} [mm]	Rodzaj podłoża	N_{Rk} [kN]	V_{Rk} [kN]
TFCS 7,5x52 ÷302	40	30	30	Concrete C20/25 ÷ C50/60	5,00	
	60	50	50	Clay bricks MZ 20	2,00	
	60	50	50	Calcium silicate bricks KS 20	2,50	
	60	50	50	Calcium silicate hollow block KSL 12	2,50	
	60	50	50	Vertical perforated porosited block Porotherm 25 P+W 15	0,65	
	-	60	60	Autoclaved concrete blocks AAC2	0,55	
	-	60	60	Autoclaved concrete blocks AAC7	1,10	