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Evaluation Report of

**ETA 19/0435
issued on 21/07/2019**

Trade name

STAVBLOX

Manufacturer

STAVSI, s.r.o.
Boudova 590,
Praha 5 – Lipence,
15531, Czech Republic

Product family

Dry masonry construction system with vertical elements

This Evaluation Report contains

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1 Introduction

The company STAVSI, s.r.o. has applied for the granting of a European Technical Assessment for Dry masonry construction system with vertical elements according EAD 340297-00-0203.

The masonry units are already certified according to EN 771-3:2011+A1:2015 by Notified Body 1020.

2 References

- EAD 340297-00-0203

Test Reports:

- Zkušební protokol 181008/2014 – Statická zatěžovací zkouška: pevnost v tahu za ohybu zděných zkušebních těles, pevnost ve smyku zděných zkušebních těles, soudržnost ve smyku zdicích prvků, vydaný zkušební laboratoří akreditovanou ČIA pod č. 1048
Test report 181008/2014 - Static loading test: flexural strength of masonry samples, shear strength of masonry samples, shear cohesion of masonry units, issued by testing laboratory accredited by ČIA under No. 1048
- Zkušební protokol 050/2013 – Zdicí tvarovky STAVSI L20 z lehkého betonu: stanovení rozměrů, objemové hmotnosti a pevnosti v tlaku, vydaný zkušební laboratoří akreditovanou ČIA pod č. 1209
Test report 050/2013 - STAVSI L20 lightweight concrete masonry units: determination of dimensions, volume weight and compressive strength, issued by testing laboratory accredited ČIA under No. 1209
- Zkušební protokol 0302/2013 – Zdivo z betonových tvarovek – systém STAVSI: stanovení rozměrů, objemové hmotnosti a pevnosti v tlaku, stanovení pevnosti zdiva v tlaku, vydaný zkušební laboratoří akreditovanou ČIA pod č. 1209
Test report 0302/2013 - Masonry of concrete units - system STAVSI: determination of dimensions, volume weight and compressive strength, determination of compressive strength of masonry, issued by testing laboratory accredited by ČIA under No. 1209
- Zkušební protokol Pr-13-2.076 – Protokol o zkoušce požární odolnosti: Nosná obvodová stěna STAVSI, vydaný zkušební laboratoří akreditovanou ČIA pod č. 1026
Test report Pr-13-2.076 - Resistance to fire test report: load-bearing wall STAVSI, issued by testing laboratory accredited by ČIA under No. 1026
- Protokol o klasifikaci požární odolnosti PK2-02-13-008-C-1 - Nosná obvodová stěna STAVSI, vydaný oznámeným subjektem č. 1391
Fire resistance classification report PK2-02-13-008-C-1 - STAVSI load-bearing wall, issued by Notified Body No. 1391
- Výpočet tepelně-technických a akustických vlastností zdiva z tvarovek systému STAVSI, dokument vydaný Zkušební laboratoří stavebních konstrukcí a hmot MCT spol. s r.o.
Determination of thermal-technical and acoustic properties of system STAVSI masonry units, issued by Testing laboratory of building structures and materials MCT Ltd.

Standards:

- EN 771-3:2011+A1:2015 *Specification for masonry units - Part 3: Aggregate concrete masonry units (Dense and light-weight aggregates)*
- EN 1052-1:1998 *Methods of test for masonry - Part 1: Determination of compressive strength*
- EN 1052-2:2016+AC:2017 *Methods of test for masonry - Part 2: Determination of flexural strength*
- EN 1052-3:2002+A1:2007 *Methods of test for masonry - Part 3: Determination of initial shear strength*
- EN 13501-2:2016 *Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services*
- EN ISO 717-1:2013 *Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation*

- EN ISO 10140-2:2010 *Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation*
- EN 1745:2012 *Masonry and masonry products - Methods for determining thermal properties*

3 Description of product and intended use

STAVBLOX is dry masonry construction system with vertical elements.

For purposes of this ER, dry masonry construction system with vertical elements is abbreviated as DMCS.

DMCS consists of elements used for vertical supporting and non-supporting structures: masonry units for vertical supporting structures and masonry units for vertical non-supporting structures.

Mutual bonding of masonry units is provided by four types of connecting elements. First type is made of rubber and is reinforced with steel rod. Second type is made of timber. Third type is made of reinforced concrete. Steel profiles are used as fourth type of connecting element.

Mutual connection of masonry units is established only in vertical direction by the connecting elements. All four types of connecting elements can be used for inner connection between masonry units. All four types, except the rubber type, of connecting elements can be used for connection between masonry units on the face of the masonry units.

The masonry units are made of porous aggregate concrete.

DMCS is intended for use in supporting structures up to 5 floors and in non-supporting structures in buildings for residential, administrative, social use etc. Build-up is not limited with actual weather. In place with higher moisture, it is recommended to substitute wooden vertical elements with RC ones.

4 Performance of the product and references to the methods used for its assessment

4.1 General

The tests and verifications were performed in accordance with EAD 340297-00-0203. Table 1 shows how the performance of DMCS is assessed in relation to the essential characteristics.

Table 1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

No	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)
Basic Works Requirement 1: Mechanical resistance and stability			
1	Determination of compressive strength	EAD 340297-00-0203, 2.2.1	<i>Description</i>
2	Determination of flexural strength	EAD 340297-00-0203, 2.2.2	<i>Description</i>
3	Determination of initial shear strength	EAD 340297-00-0203, 2.2.3	<i>Description</i>

No	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)
Basic Works Requirement 2: Safety in case of fire			
4	Resistance to fire	EAD 340297-00-0203, 2.2.4	<i>Class</i>
5	Reaction to fire	EAD 340297-00-0203, 2.2.5	<i>Class</i>
Basic Works Requirement 5: Protection against noise			
6	Airborne sound insulation	EAD 340297-00-0203, 2.2.6	<i>Description</i>
Basic Works Requirement 6: Energy economy and heat retention			
7	Determination of thermal properties	EAD 340297-00-0203, 2.2.7	<i>Description</i>

4.2 Determination of compressive strength

Determination of compressive strength is tested and assessed according to EAD 340297-00-0203, 2.2.1 with reference to procedure described in EN 1052-1:1998.

There were three test samples. Average values are $f = 2,4 \text{ MPa}$ and $f_y = 2,0 \text{ MPa}$.

4.3 Determination of flexural strength

Determination of flexural strength is tested and assessed according to EAD 340297-00-0203, 2.2.2 with reference to procedure described in EN 1052-2:2016+AC:2017.

There were five test samples for each direction. Average values for parallel direction are $f_{mean} = 0,81 \text{ MPa}$ and $f_{xk} = 0,54 \text{ MPa}$. Average values for perpendicular direction are $f_{mean} = 1,52 \text{ MPa}$ and $f_{xk} = 1,01 \text{ MPa}$.

4.4 Determination of initial shear strength

Determination of initial shear strength is tested and assessed according to EAD 340297-00-0203, 2.2.3 with reference to procedure described in EN 1052-3:2002+A1:2007.

There were six test samples. Average values are $f_{vo} = 0,45 \text{ MPa}$ and $f_{vok} = 0,36 \text{ MPa}$.

4.5 Resistance to fire

Resistance to fire is assessed according to EAD 340297-00-0203, 2.2.4 with reference to procedure described in EN 13501-2:2016.

Fire classification of DMCS is REI 180 (i↔o) / REW 180 (i↔o)

4.6 Reaction to fire

Reaction to fire is assessed according to EAD 340297-00-0203, 2.2.5 with reference to Commission Delegated Regulation (EU) 2016/364 and EN 13501-1:2007+A1:2009.

Reaction to fire for DMCS is currently assessed "NPD"

4.7 Airborne sound insulation

Airborne sound insulation is determined according to EAD 340297-00-0203, 2.2.6 with reference to EN ISO 717-1:2013. The result is: $R_w (C; C_{tr}) = 42 (-1; -5) \text{ dB}$

4.8 Determination of thermal properties

Determination of thermal properties is performed according to EAD 340297-00-0203, 2.2.7 with reference to EN 1745:2012. The result is: $\lambda_{\text{design,mas}} = 0,31 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$

5 Summary

Results are expressed in Table 2

Table 2 Performance of the product

No	Essential characteristic	Assessment method	Expression of product performance
Basic Works Requirement 1: Mechanical resistance and stability			
1	Determination of compressive strength	EAD 340297-00-0203, 2.2.1	f = 2,4 MPa f_y = 2,0 MPa
2	Determination of flexural strength	EAD 340297-00-0203, 2.2.2	A) parallel direction f_{mean} = 0,81 MPa f_{xk} = 0,54 MPa B) perpendicular direction f_{mean} = 1,52 MPa f_{xk} = 1,01 MPa
3	Determination of initial shear strength	EAD 340297-00-0203, 2.2.3	f_{vo} = 0,45 MPa f_{vok} = 0,36 MPa
Basic Works Requirement 2: Safety in case of fire			
4	Resistance to fire	EAD 340297-00-0203, 2.2.4	REI 180 (i↔o) / REW 180 (i↔o)
5	Reaction to fire	EAD 340297-00-0203, 2.2.5	NPD
Basic Works Requirement 5: Protection against noise			
6	Airborne sound insulation	EAD 340297-00-0203, 2.2.6	R_w (C;C_{tr}) = 42 (-1;-5) dB
Basic Works Requirement 6: Energy economy and heat retention			
7	Determination of thermal properties	EAD 340297-00-0203, 2.2.7	$\lambda_{\text{design,mas}} = 0,31 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$