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CLASSIFICATION OF FIRE RESISTANCE
FIRES-CR-115-24-AUPE

Loadbearing wall constructed of PAECO straw modules covered with clay plaster on the inside and lime plaster on the outside

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FIRES
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SNAS
Reg. No. 041/S-159

CLASSIFICATION OF FIRE RESISTANCE IN ACCORDANCE WITH EN 13501-2: 2023

with direct field of application

FIRES-CR-115-24-AUPE

Name of the product: Loadbearing wall constructed of PAECO straw modules covered with clay plaster on the inside and lime plaster on the outside

Sponsor:
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1. INTRODUCTION

This classification report defines the resistance to fire classification assigned to element loadbearing wall constructed of PAECO straw modules covered with clay plaster on the inside and lime plaster on the outside in accordance with the procedures given in EN 13501-2: 2023.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, loadbearing wall constructed of PAECO straw modules covered with clay plaster on the inside and lime plaster on the outside, is defined as a load-bearing wall with fire separating function.

2.2 PRODUCT DESCRIPTION

Dimensions

Overall dimensions of the tested product	3000 x 3000 x 450 mm (height x width x thickness)
Overall dimensions of the bare panels (without plaster)	2900 x 800 x 400 mm (height x width x thickness) 2900 x 700 x 400 mm (height x width x thickness)

Construction of the module

The double timber frame construction (back and front) of each module is made from 50 x 100 mm C24 spruce timber profiles (studs, top and bottom beams). The beams and studs are fixed together at the corners with two Ø 8 x 140 mm screws. The outer studs of the edge modules are doubled. The back and front frames of the module are joined together with 400 mm long 50 x 50 mm spruce transverse profiles fixed to the studs with two Ø 6 x 100 mm screws. The transverse profiles are positioned in the corners of the module and at 660 mm, 1370 mm and 2080 mm from the bottom edge of the module on both vertical edges. The transverse profiles in the module space are joined together with two longitudinal profiles (noggins) 50 x 50 mm placed at the front and back edges of the module and are fixed to them with two Ø 5 x 90 mm screws. The corners of the module are enclosed with 200 mm long spruce timber profiles of 50 x 100 mm placed on the top/bottom edge of the module and 50 x 50 mm placed on the side of the module and are fixed to the transverse timber profile with three Ø 6 x 100 mm screws.

Two 50 mm thick and 400 mm wide timber plates are fixed along the upper and lower edge of the modules with Ø 8 x 100 mm and Ø 8 x 140 mm screws to ensure uniformly distribution of the load.

Joining of the modules

The individual modules are fixed to each other on both sides (back and front frame of the modules) with Ø 8 x 100 mm placed at maximum 400 mm centres.

Insulation (filling) of the modules

The core of the modules consists of the compressed straw with a nominal bulk density of 110 kg/m^3.

Covering of the wall

The external face of the wall is covered with CL 90-S lime hydrate calcium plaster (CaO + MgO ≥ 90%, MgO ≤ 5%) applied to the surface in the following layers (from the panel to outwards):

- 15 mm thick layer,
- glass fibre reinforcement mesh,
- 5 mm thick layer,
- 5 mm thick fine lime plaster with 0 – 1 mm sand.

The internal face of the wall is covered with clay plaster applied to the surface in the following layers (from the panel to outwards):

- 15 mm thick clay plaster (sand with 0 – 4 mm grain size, apparent density 1,6 g/cm^3)
- glass fibre reinforcement mesh,
- 5 mm thick clay plaster,
- 5 mm thick fine clay plaster (sand with 0 – 0,4 mm grain size, apparent density 1,42 g/cm^3).

More detailed information on the product construction is given in the drawings in Appendix 1 of this document.

3. TEST REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS

No.	Name of laboratory	Name of sponsor	Test report No.	Date of the test	Test method	Type of the test
[1]	FIRES, s.r.o., Batizovce, SR	PAECO VISION S.R.L., RO	FIRES-FR-152-24-AUNE	02. 07. 2024	EN 1365-1: 2012/ AC:2013	Accredited

3.2 TEST SPECIMENS

Test report No.	Samples information	Conditioning	Pre-fire tests
[1]	-	The test specimen was stored in the hall of the testing laboratory and was conditioned according to EN 1363-1. The fire resistance test was carried out after 28 days of conditioning.	-

3.3 TEST RESULTS

No./ Test method	Parameter		Results
[1] EN 1365-1: 2012/AC: 2013	applied load		axial load 70,0 kN/m
	temperature curve		standard temperature/time curve
	loadbearing capacity (R)	vertical contraction [mm]	67 minutes
		rate of vertical contraction [mm/min]	67 minutes
	integrity (E)	cotton pad	67 minutes
		gap gauges	67 minutes
		sustained flaming	67 minutes
	thermal insulation (I)	average temperature (140 K)	67 minutes
		maximal temperature (180 K)	67 minutes
	thermal radiation (W) - 15 kW.m^{-2}		67 minutes
	mechanical action		-
	specimen orientation		Internal face of the wall exposed to fire, the wall face with clay plaster exposed to fire

The performance criteria of insulation and integrity shall automatically be assumed not to be satisfied when the loadbearing capacity criterion ceases to be satisfied.

[1] The test was discontinued in 68th minute because of the specimen loadbearing capacity failure

4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 REFERENCE OF CLASSIFICATION

This classification has been carried out in accordance with clause 7.3.2 of EN 13501-2: 2023.

4.2 CLASSIFICATION

The element, **Loadbearing wall constructed of PAECO straw modules covered with clay plaster on the inside and lime plaster on the outside**, is classified according to the following combinations of performance parameters and classes as appropriate.

Fire resistance classification:

Note: valid only for fire action on the internal face of the wall – face of the wall with clay plaster.

RE 60 / REI 60 / REW 60

4.3 FIELD OF APPLICATION

This classification is valid according to EN 1365-1: 2012/AC: 2013 for the following end use applications:

Height	– increase in the height above 3000 mm is not allowed, – decrease in the height is allowed,
Width	– change in the wall width is allowed, – extension in the width of wall is allowed only as a replication of modules as tested, – decrease in the module width is allowed, but not increase, – maximum width of module is 800 mm,
Thickness of wall and materials	– increase in the thickness of the wall and individual component materials is allowed,
Fixation of materials	– decrease in distance of fixing centres is allowed,
Size and method of loading	– maximum load 70,0 kN/m,
	– decrease in the applied load is allowed,
	– method of loading - axial loading is not allowed to be change for eccentric loading.

5. LIMITATIONS

This classification document does not represent type approval or certification of the product.

The classification is valid provided that the product, field of application and standards and regulations are not changed.

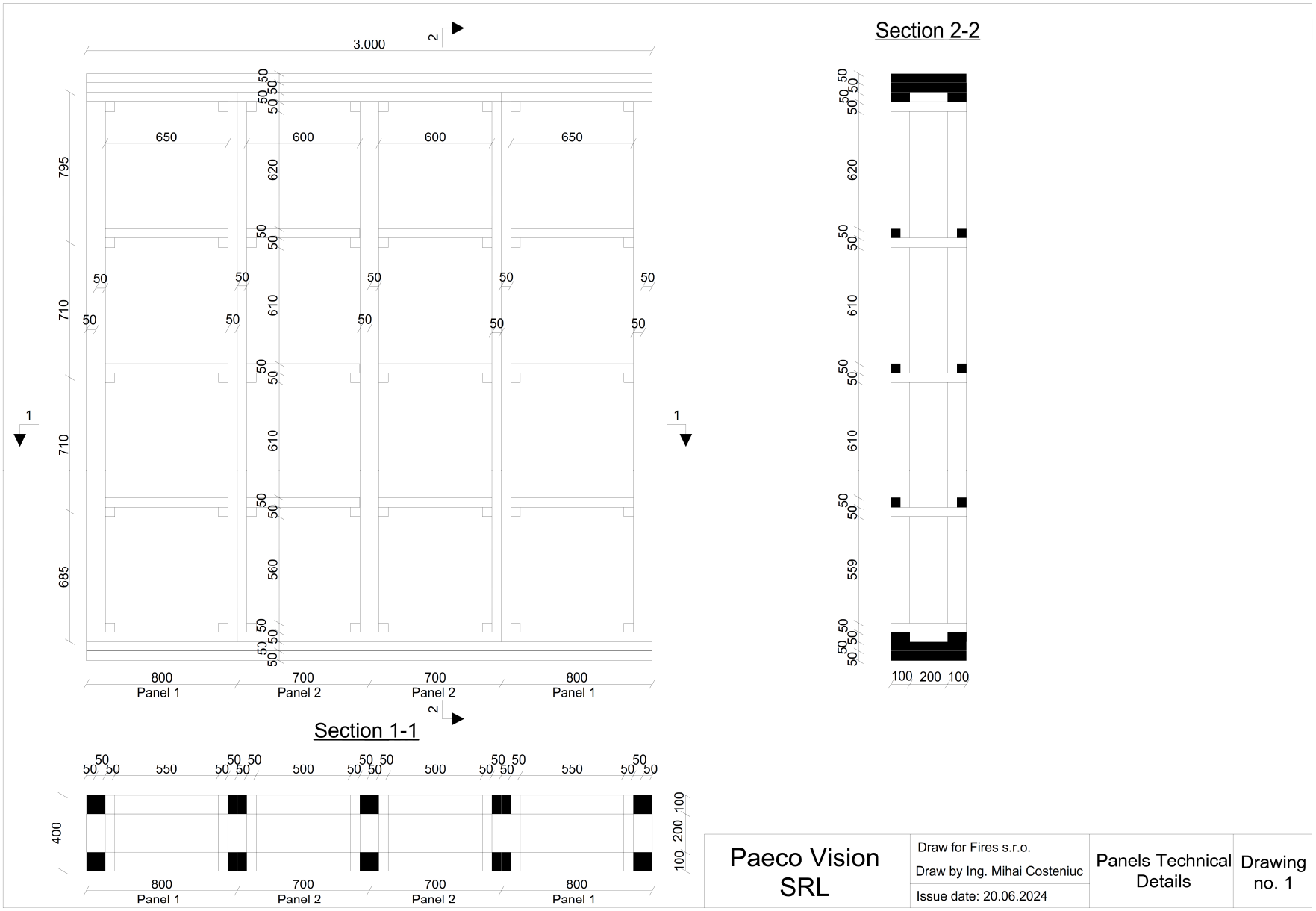
Approved by:

Ing. Marek Gorlický
Head of the Testing Laboratory

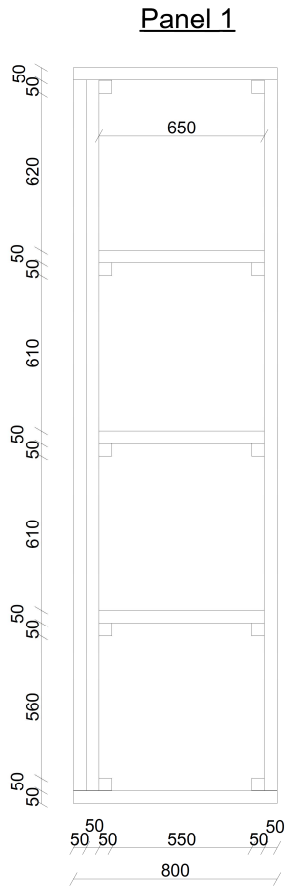
Prepared by:

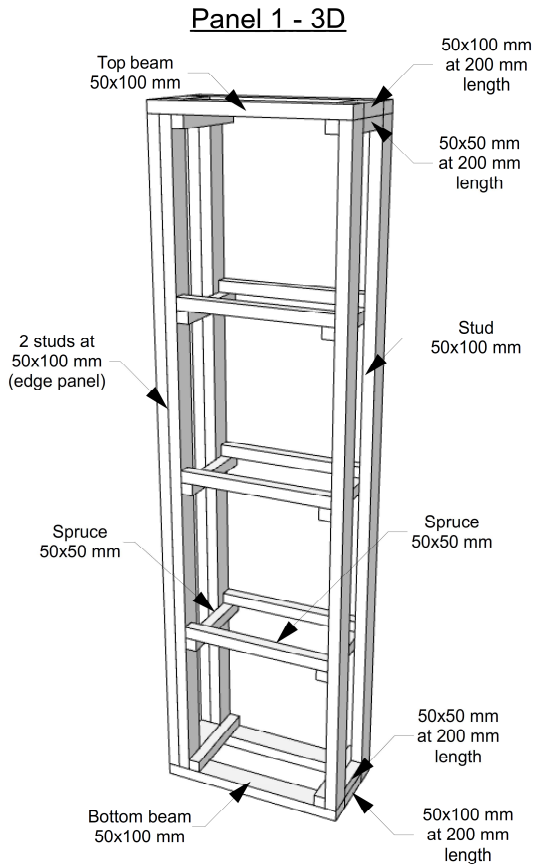
Dávid Šubert
Technician of the Testing Laboratory

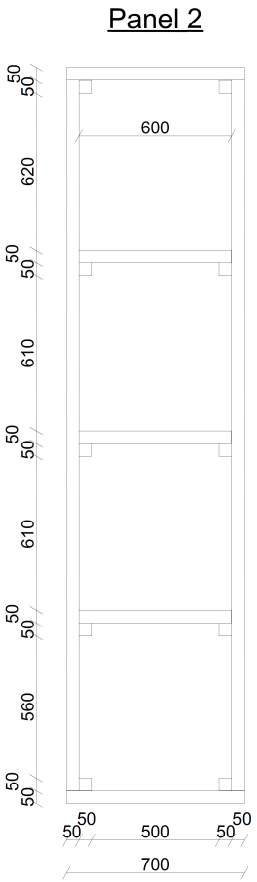
APPENDIX 1: DRAWINGS OF THE PRODUCT CONSTRUCTION

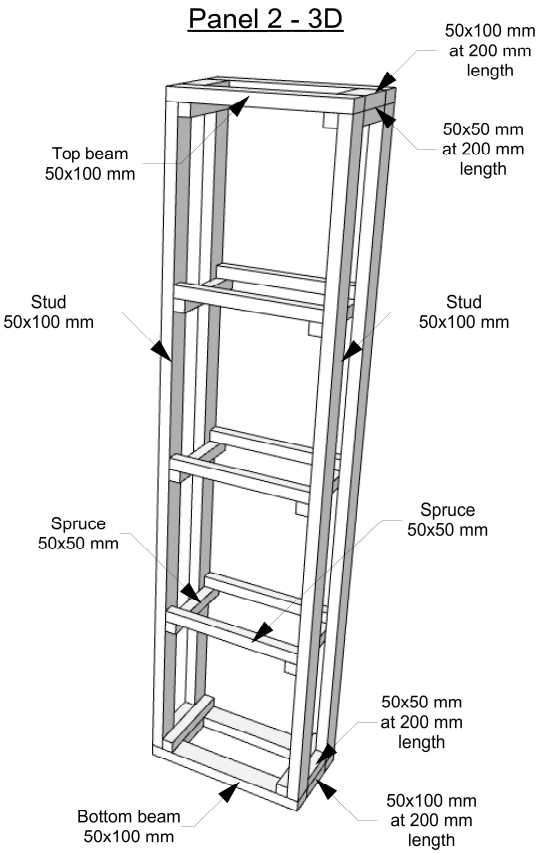


APPENDIX 1: DRAWINGS OF THE PRODUCT CONSTRUCTION









Paeco Vision SRL	Draw for Fires s.r.o. Draw by Ing. Mihai Costeniuc Issue date: 20.06.2024	Panels Technical Details	Drawing no. 3