

CLASSIFICATION OF FIRE RESISTANCE FIRES-CR-103-11-AUPE

**Load-bearing external wall of assembled house with timbered construction
made of panels type ZIP**



This is an electronic version of a classification report which was made as a copy of classification report officially issued in a paper form. The electronic version of a classification report shall be used only for informative purpose. Any information listed in this classification report is the property of the sponsor and shall not be used or published without written permission. Contents of this file may only be modified by the editor i.e. FIRES, s.r.o., Batizovce. Sponsor is allowed to publish this classification report in parts only with written permission of the editor.



CLASSIFICATION OF FIRE RESISTANCE IN ACCORDANCE WITH EN 13501-2 + A1: 2009 with direct field of application

FIRES-CR-103-11-AUPE

Name of the product: Load-bearing external wall of assembled house with timbered construction made of panels type ZIP

Sponsor: IDOPS družstvo,
Hýrošova 3,
811 04 Bratislava,
Slovak Republic

Prepared by: FIRES, s.r.o.
Autorizovaná osoba MVRR SR SK01
Osloboditeľov 282
059 35 Batizovce
Slovak Republic

Task No.: PR-12-0066

Date of issue: 08. 02. 2012

Reports: 3
Copy No.: 2

Distribution list:

Copy No. 1 FIRES, s. r. o., Osloboditeľov 282, 059 35 Batizovce, Slovak Republic
(electronic version)

Copy No. 2 IDOPS družstvo, Hýrošova 3, 811 04 Bratislava, Slovak Republic
(electronic version)

Copy No. 3 IDOPS družstvo, Hýrošova 3, 811 04 Bratislava, Slovak Republic

This classification report consists of 5 pages and may only be used or reproduced in its entirety.

This report includes accreditation mark SNAS with additional mark ILAC-MRA. SNAS is signatory of ILAC-MRA, Mutual recognition agreement (of accreditation), which is focused on promoting of international acceptance of accredited laboratory data and reducing technical barriers to trade, such as the retesting of products on markets of signatories. More information about ILAC-MRA is on www.ilac.org. Signatories of ILAC-MRA are e.g. SNAS (Slovakia), CAI (Czech Republic), PCA (Poland), DakS (Germany) or BMWA (Austria). Up to date list of ILAC-MRA signatories is on www.ilac.org/documents/mra_signatories.pdf. FIRES, s.r.o. Batizovce is full member of EGOLF also, more information www.egolf.org.uk.



1. INTRODUCTION

This classification report defines the resistance to fire classification assigned to element Load-bearing external wall of assembled house with timbered construction made of panels type ZIP in accordance with the procedures given in EN 13501-2 + A1: 2009.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, Load-bearing external wall of assembled house with timbered construction made of panels type ZIP, is defined as an external wall with fire resistance.

2.2 PRODUCT DESCRIPTION

Dimensions

Dimensions of product	(3000 x 3000 x 260) mm (width x height x thickness)
Thickness of wall panels	170 mm
Thickness of the thermal insulating facade system	70 mm

Construction of the wall

The wall is made of panels marked ZIP, with maximal width of 1250 mm and minimal width of 500 mm. Panels are made of chipboards type OSB, 15 mm thick, with bulk density 580 kg/m³ – 750 kg/m³ (Kronospan). Expanded polystyrene EN 16113 EPS 100 S, 140 mm thick (Styrosaur, Bulharsko), is placed between OSB boards as core of the wall panel. Overhang of OSB boards is 40 mm around the perimeter of wall panels. OSB boards are glued to the expanded polystyrene EN 16113 EPS 100 S by the two-component polyurethane glue Macroplast.

The joint of panels (tongue-groove joint) is created by the double timbered rectangular profile, 80 mm thick made of spruce wood in accordance with ČSN 732824-1 – S 10 (STN 491531-1 – SI) 2 x (40 x 140) mm. Profiles are jointed together by the low expansion polyurethane (PUR) glue (adhesion to the polystyrene $\geq 0,1$ MPa, reaction to fire B-s1, d0) and steel nails \varnothing 3 mm x 65 mm, placed alternated in two rows, in spacing 100 mm.

One component PUR foam (thermal conductivity $\lambda=0,03$ W/mK (DIN 52 612), tensile strength 140 kPa (DIN 53 455), shearing strength 40 kPa (DIN 53 422), bulk density 25-33 kg/m³, power of expansion <30%, tensile strength min. 3,5 N/cm², compression strength min. 3,5 N/cm²) is applied in the groove of wall panels, on the edge of EPS and edges of OSB boards. The low-expansion PUR glue (adhesion to the polystyrene $\geq 0,1$ MPa, reaction to fire B-s1, d0) is applied on edges of OSB boards. OSB boards of wall panels are jointed together by steel nails \varnothing 3 mm x 65 mm placed alternated around the panels joint, in spacing 150 mm, and by the steel ties (44 x 2) mm to the double timbered rectangular profile placed inside panels joints.

Interior wall side

Plasterboards SDK-A in dimension of (1250 x 1000) mm, 12,5 mm thick (EN 520, A, reaction to fire class A2-s1, d0), with bulk density 750 kg/m³ are fixed to the wall panels by steel self-drill screws \varnothing 3 mm x 35 mm. Screws are placed on the perimeter of plaster boards and in the middle of their width, in distance á 150 mm. Joints of plasterboards SDK-A are cemented by standard mastic for plasterboards with using of reinforcement tape.



Exterior wall side

Thermal insulating facade system Baumit, 70 mm thick is applied on the exterior wall side. Construction of the thermal insulating facade system applied as follows:

- external facade polystyrene boards EPS 60 F, 60 mm thick, bulk density 13,5 kg/m³. Boards of EPS 60 F are glued to the wall by the mastic Baumit Duo Contact, 1,5 mm thick and fixed by plugs Baumit SD 8 (5 pc on one EPS board);
- adhesive mortar Baumit, 6 mm thick with a Baumit Fiberglass Mesh;
- ground paint Baumit universal;
- silicate plaster Baumit Granopor Plaster, 4 mm thick.

More detailed information about product construction is shown in the test report [1] acc. to paragraph 3.1 of the 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
[1]	FIRES, s.r.o. Batizovce, Slovak Republic	Výzkumný a vývojový ústav dřevařský, Praha, s.p., Czech Republic	FIRES-FR-122-11-AUNS	07.06.2011	STN EN 1365-1: 2001

[1] Test specimen was conditioned according to EN 1363-1 before the fire resistance test

3.2 TEST RESULTS

No./ Test method	Parameter	Results	
[1] EN 1365-1	applied load	30 kN/m	
	supporting construction	supporting construction made of aerated concrete blocks, 250 mm thick with bulk density 613 kg. m ⁻³	
	temperature curve	external fire exposure curve	
	loadbearing capacity	45 minutes no failure	
	integrity	cotton pad	45 minutes no failure
		gap gauges	45 minutes no failure
		sustained flaming	45 minutes no failure
	thermal insulation	average temperature (140 K)	45 minutes no failure
		maximum temperature (180 K)	45 minutes no failure
	radiation 15 kW.m ⁻²	46 minutes no failure *	
mechanical action	–		
other closing	exterior side of the specimen exposed		
[1] EN 1365-1	applied load	30 kN/m	
	supporting construction	supporting construction made of aerated concrete blocks, 250 mm thick with bulk density 613 kg. m ⁻³	
	temperature curve	standard temperature/time curve	
	loadbearing capacity	46 minutes no failure	
	integrity	cotton pad	46 minutes no failure
		gap gauges	46 minutes no failure
sustained flaming		46 minutes no failure	



No./ Test method	Parameter		Results
	thermal insulation	average temperature (140 K)	46 minutes no failure
		maximum temperature (180 K)	46 minutes no failure
	radiation 15 kW.m ⁻²		46 minutes no failure *
	mechanical action		-
	other closing		interior side of the specimen exposed

* Measurement of radiation was not carried out because average temperatures on the specimen surface did not exceed 300 °C and measurement of radiation is not required by STN EN 1363-2 in this case.

- [1] The fire test with external fire exposure curve (o→i) was terminated in 46th minute at request of the sponsor of the test
 The fire test with standard temperature / time curve (i→o) was terminated in 47th minute at request of the sponsor of the test

4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 REFERENCE OF CLASSIFICATION

The classification is carried out in accordance with EN 13501-2:2007+A1:2009, clause 7.3.2.

4.2 CLASSIFICATION

The element, **Load-bearing external wall of assembled house with timbered construction made of panels type ZIP** is classified according to the following combinations of performance parameters and classes as appropriate:

<p>Fire resistance classification (exterior side of the wall): REI 45-ef (o→i)</p> <p>Fire resistance classification (interior side of the wall): REI 45 (i→o)</p>
--

4.3 FIELD OF APPLICATION

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

- decrease in wall height (< 3 000 mm);
- increase in wall thickness;
- increase in thickness of component materials;
- decrease in linear dimensions of boards and / or dimensions of wall panels, decrease in thickness is no allowed;
- decrease in applied load (< 30 kN/m);
- increase in wall width;



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:

Signed:

A handwritten signature in blue ink, appearing to read 'Štefan Rástocký'.

Ing. Štefan Rástocký
leader of the testing laboratory



A handwritten signature in blue ink, appearing to read 'Michaela Gorlická'.

Michaela Gorlická
technician of the testing laboratory