

FIRE RESISTANCE CLASSIFICATION REPORT No. 16781B

Owner of the classification report

BCCA vzw
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1040 Brussel
Belgium

Introduction

This classification report defines the classification assigned to a loadbearing hollow brick wall provided with insulating construction blocks (type: Marmox) – in accordance with the procedures given in EN 13501-2:2007+A1:2009: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 8 pages and 2 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The element, type: Marmox, is defined as a loadbearing hollow brick wall provided with insulating construction blocks.

1.2 Product description

The element, Marmox, is fully described below, in support of this classification. The drawings of the test element as it was tested, are enclosed in the annexes 1 till 2 of this classification report.

1.2.1 Composition of the test specimen as tested

Outer dimensions of the test specimen:

- height: 3000 mm;
- width: 3000 mm;
- total thickness: 150 mm.

1.2.1.1 Masonry

[1] Insulating construction block – brand and type: Marmox Thermoblock® – height: 100 mm – width: 140 mm – useful length: 600 mm – density: 300 kg/m³ (NV).

- composition:
 - insulating layer [1a]; between
 - protection layers [1b]; and
 - internally reinforced by means of cylinders [1c].
- position: on top of a levelling layer of cement mortar [2], as the first masonry layer;
- quantity: 1 layer;
- upper bed joints: cement mortar [2].

- [1a] Insulating layer – material: extruded polystyrene XPS – thickness: 94 mm (NV) – density: 36 kg/m³ (NV).
- volume quantity: 85% (NV) compared to 15% (NV) polymeric cement mortar and polymeric cement concrete.
- [1b] Protection layer – material: (nano) polymeric cement mortar – thickness: 5 mm – reinforced with a double-layer fibreglass mesh.
- position: on top and below the insulating layer.
- [1c] Load-bearing cylinder – material: (nano) polymeric cement concrete – diameter: 29.9 mm (NV) – height: 90 mm.
- position: in the insulating layer, vertically between the 2 protection layers.
 - quantity: 2 rows, symmetrically;
 - c/c distances:
 - width-wise: 80.1 mm (NV);
 - length-wise: 70 mm.
- [2] Cement mortar – brand and type: Marmox Thermoblock mortar.
- [3] Ceramic perforated brick – brand and type: Porotherm Thermobrick – thickness: 138 mm – height: 138 mm – length: 288 mm – gross dry density: 850 kg/m³ (NV) – perforation degree: 50%.
- position: 2nd masonry layer;
 - quantity: 1 layer;
 - upper bed joint and head joints: cement mortar [2b].
- [2b] Cement mortar – brand cement: Heidelberg – width: 12 mm.
- [4] Water-repellent membrane – material: PE – thickness: 500 µm – width: 150 mm.
- position: on top of the 2nd masonry layer.
- [5] Ceramic perforated brick – brand and type: Porotherm Thermobrick – thickness: 138 mm – height: 188 mm – length: 288 mm – gross dry density: 850 kg/m³ (NV) – perforation degree: 50%.
- position: all other masonry layers;
 - bed and head joints: cement mortar [2b].

1.2.1.2 Floor element

- [6] Insulating material – brand and type: Recticel Insulation EUROFLOOR – material: PU – thickness: 100 mm – width: 355 mm – length: 2950 mm – density: 30 kg/m³.
- position: at the bottom, against the exposed side of the wall.
- [7] Foam strip – material: PE – thickness: 5 mm – width: height concrete layer – density: 20 kg/m³.
- position: against the exposed side of the wall, at the concrete layer.
- [8] Film – material: PE – thickness: 200 µm.
- position: horizontally between the layer of insulating material [6] and the concrete layer [9] and vertically between the transversal edge of the concrete layer [9] and the foam strip [7], at the exposed side of the wall.
- [9] Concrete screed – fast drying – thickness: 125 mm – width: 350 mm – length: 2950 mm – density: 1851 kg/m³ (MV).
- position: on top of the insulating layer with film, against the exposed side of the wall.

1.2.1.3 Finishing products

- [10] Plaster – material: Knauf mp 75 – thickness: 15 mm.
- position: at the exposed side, the part above the water-repellent membrane.
- [11] Plinth – material: MDF – outer section dimensions: 68 mm x 12 mm – mass per unit length: 0.611 kg/m.
- position: on top of the screed and against the plaster, at the floor connection with the expose side of the wall;
 - fixing: with mastic [12] to the plaster.
- [12] Mastic – brand and type: Tec7 – material: solvent free MS polymeric glue.

2 Test reports/EXAP reports and test results in support of the classification

2.1 Test reports/EXAP reports

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	16781A	BCCA vzw	03/11/2014	EN 1365-1:2012

Exposure conditions during the fire resistance test:

Temperature/time curve: standard as in EN 1363-1:2012.

Direction of exposure: The test specimen is an asymmetrical construction. The side of the loadbearing hollow brick wall with the simulated floor and the plastering, was exposed to the fire.

Applied load supplementary to the own weight: $0.28 \text{ N/mm}^2 = 39 \text{ kN/m}$.

Both vertical edges were free.

2.2 Testresultaten

Parameters	Results
Thermal insulation – I	
$\Delta T_m = 140^\circ\text{C}$	132 minutes
$\Delta T_M = 180^\circ\text{C}$	134 minutes, no failure ⁽¹⁾
Integrity – E	
Spontaneous and sustained flaming	134 minutes, no failure ⁽¹⁾
Failure with gap gauge $\varnothing 6 \text{ mm}$	134 minutes, no failure ⁽¹⁾
Failure with gap gauge $\varnothing 25 \text{ mm}$	134 minutes, no failure ⁽¹⁾
Ignition of cotton pad	134 minutes, no failure ⁽¹⁾
Radiation – W	
Radiation intensity = 15 kW/m^2	134 minutes, no failure ⁽¹⁾
Loadbearing capacity – R	
Axial contraction $C = h/100 = 30 \text{ mm}$	134 minutes, no failure ⁽¹⁾
Rate of axial contraction $dC/dt = 3 \text{ h}/1000 = 9 \text{ mm/min}$	134 minutes, no failure ⁽¹⁾

⁽¹⁾ The test was stopped after 134 minutes at the request of the sponsor.

3 Classification and field of application

3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2007+A1:2009.

3.2 Classification

The element, loadbearing hollow brick wall – type: Marmox, is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classifications are valid for the direction as stated in clause 2.1: The side of the loadbearing hollow brick wall with the floor and the plastering exposed to the fire.

REI 120, REI 90, REI 60, REI 45, REI 30, REI 20, REI 15

REW 120, REW 90, REW 60, REW 30, REW 20

RE 120, RE 90, RE 60, RE 30, RE 20

R 120, R 90, R 60, R 45, R 30, R 20, R 15

3.3 Field of direct application

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

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability.

- a) decrease in height of the wall of 3 m;
- b) increase or decrease of the width of the wall;
- c) increase in the thickness of the wall (≥ 153 mm);
- d) increase in the thickness of component materials of the wall:
 - thickness of the insulating construction blocks (≥ 140 mm):
 - diameter load-bearing cylinder (≥ 29.9 mm), c/c distance width-wise (≤ 80.1 mm), c/c distance length-wise (≤ 70 mm).
 - thickness of the Ceramic hollow brick (≥ 138 mm);
 - thickness of the layer of plaster at the ceramic hollow bricks (≥ 15 mm).
- e) decrease of the axial, uniform load applied on the wall (≤ 0.28 N/mm² = 39 kN/m).

4 Limitations


This classification report does not represent type approval nor certification of the product.

According to the information mentioned by the sponsor on the technical information sheet there was no product standard for CE marking available at the time the classification report for the tested material/product was drafted.


When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for CE marking.

Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonised standards and technical specifications.

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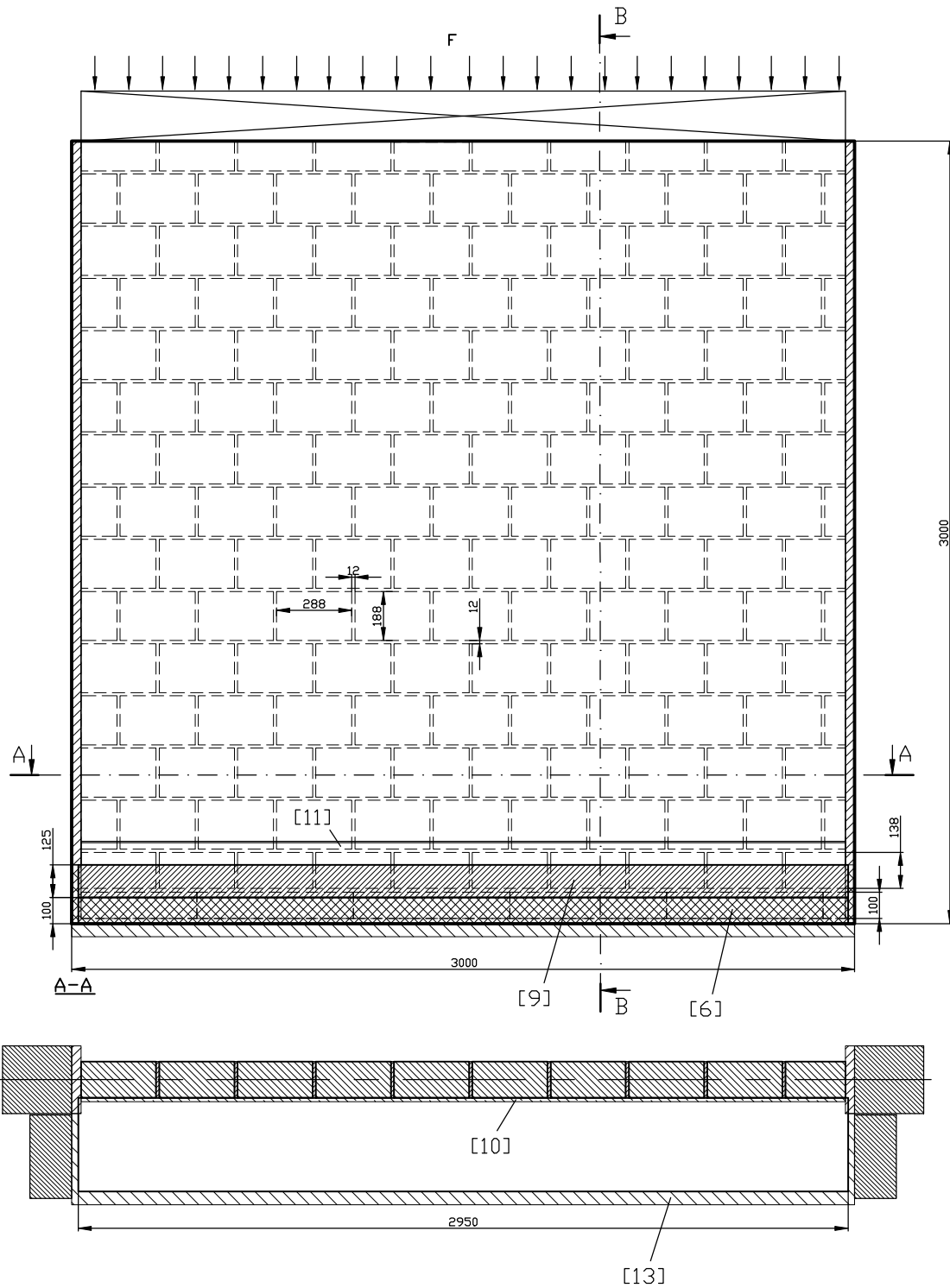
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In case of doubt, the most recent version prevails, originally issued in Dutch.

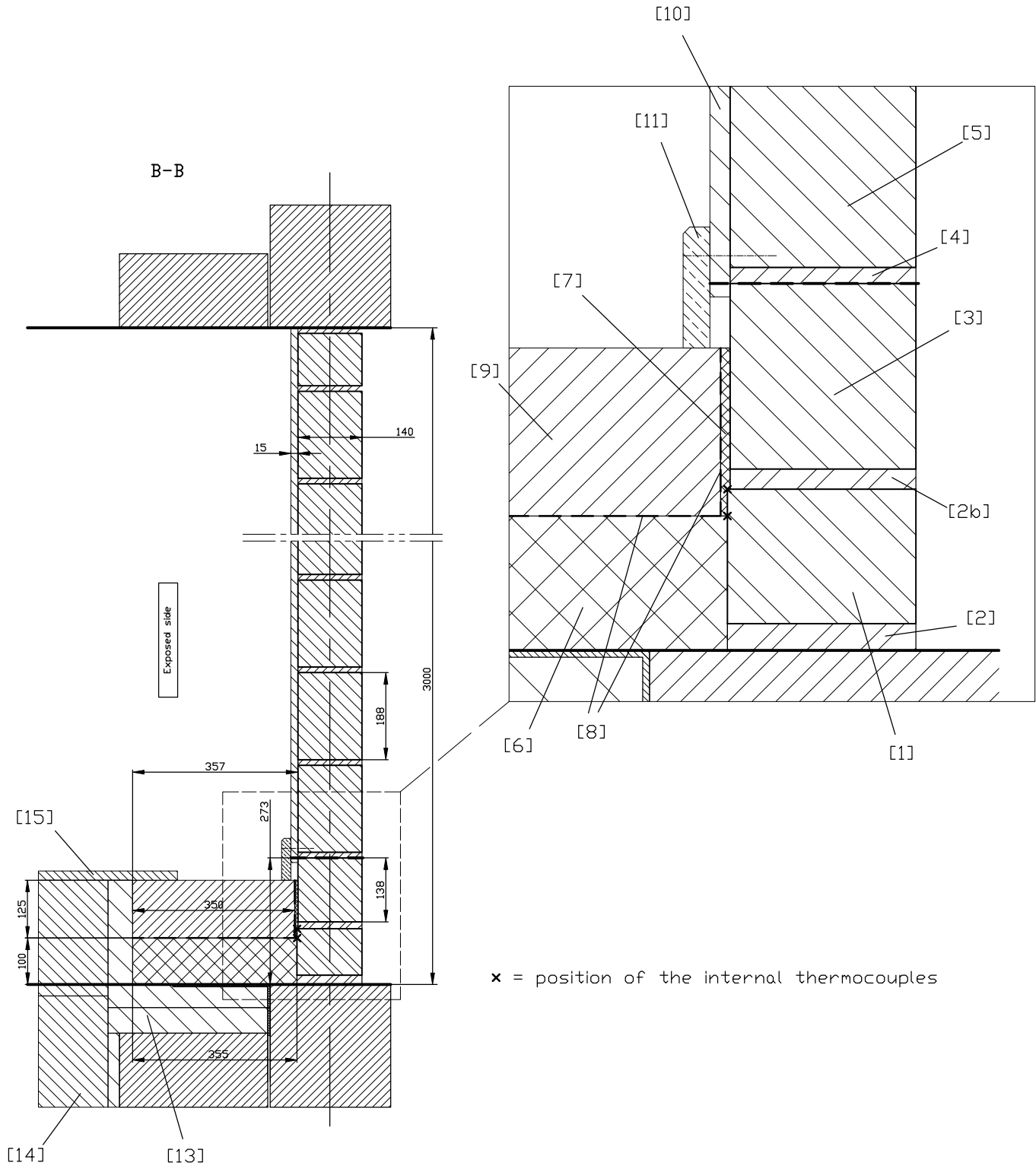
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Rear view (exposed side) - section A-A - dimensions.



Section B-B - dimensions detail.



x = position of the internal thermocouples