

FIRE RESISTANCE CLASSIFICATION REPORT No. 12341E

Owner of the classification report

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Introduction

This classification report defines the classification assigned to a non-loadbearing glazed wall (type: PYROBEL 16 in a JANISOL 2 (Jansen) frame), 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 11 pages and 7 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The element, PYROBEL 16 in a JANISOL 2 (Jansen) frame, is defined as a non-loadbearing glazed wall.

1.2 Description

The element, PYROBEL 16 in a JANISOL 2 (Jansen) frame, 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 5 of this classification report.

1.2.1 Composition of the test specimen as tested

The test specimen is an unloaded glass wall. The wall has been mounted into a vertical concrete frame [1], having as inner dimensions 3100 mm x 3000 mm. An aerated concrete sill [2] has been installed at the bottom of the frame so that the inner dimensions are 3000 mm x 3000 mm. One vertical edge of the wall has not been attached to the concrete frame. This is called the free edge.

The glass wall consists of a window framework made of steel and glass panels.

The test specimen has the following dimensions:

height: 2950 mm;

width: 2950 mm;

thickness: 59 mm.

1.3.1 Composition of the framework:

The window framework (JANISOL 2 system) consists of two vertical posts [3] and two horizontal slats [3]. The vertical posts and the horizontal slats consist of steel profiles, the corners of which have been welded to one another. The profiles have partly been filled with plaster [4] and fibre-reinforced strips [5] so that the profiles form one whole. The fibre-reinforced strips have been connected to one another by means of a small aluminium plate. A fire-resistant laminate strip [6] has been glued on this fibre-reinforced strip. For technical reasons inherent to the test, steel angle profiles have been secured to the concrete frame. The vertical post on the fixed edge and the top horizontal slat have been secured to the steel profiles by means of mounting brackets [7] and screws [8]. The

bottom horizontal slat has been secured to the aerated concrete sill [2] by means of mounting brackets and screws [9]. The mounting brackets have been welded to the profiles [3]. The exact dimensions are given in annex 2. A layer of rockwool [10] has been applied and compressed between the profiles and the frame on the one hand and between the profiles and the aerated concrete sill on the other hand. The gap between the profiles and the frame is 18 mm on the one hand and the gap between the profiles and the aerated concrete sill is 12 mm on the other hand.

Mineral wool [11] has been applied and compressed to a thickness of 32 mm at the height of the free edge.

A vertical intermediate post [12] has been mounted at a distance of 942 mm from the vertical post on the free edge. This post has a number of notches so that the post fits into the horizontal slats [3], to which it has been welded.

A horizontal intermediate slat [12] has been mounted at a distance of 542 mm from the horizontal slat at the floor connection. The slat has a number of notches so that it fits into the vertical posts [3] and [12], to which it has been welded.

One more vertical intermediate post [12] and two horizontal intermediate slats [12] have been mounted the same way in order to create six openings for glass panels. The exact location of all the profiles is indicated in annex 2.

The profiles have been equipped with screws [13] over which the glazing beads have been clipped.

1.3.2 Composition of the glass elements:

Six glass elements [14] have been installed. The glass elements are composed. The exact composition has been communicated confidentially to the laboratory.

The dimensions of the glass elements are as follows:

Glass element A:	900 mm x 2836 mm x 17 mm;
Glass elements B - C - D - E:	904 mm x 1104 mm x 17 mm;
Glass element F:	1872 mm x 500 mm x 17 mm.

The exposed dimensions of the glass elements are as follows:

Glass element A:	874 mm x 2812 mm;
Glass elements B - C - D - E:	878 mm x 1078 mm;
Glass element F:	1846 mm x 474 mm.

The glass has been placed between the steel profiles [3], [12] and the glazing beads [15]. Adjusting blocks [17] have been installed underneath the glass. A ceramic fibre strip [16] has been used by way of sealing between the glass and the glazing beads on the one hand and between the glass and the profiles on the other hand. The fibre strip has been compressed to a thickness between 4 and 5 mm. In case of glass elements B and D, a silicone paste [18] has equally been applied by way of sealing. The glazing beads are all on the exposed side.

The gaps between the glass and the profiles are indicated in annexes 4 and 5.

The glazing beads have been clipped around screws [13], which have been secured to the profiles [3] and [12] approximately every 250 mm.

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	12341C	AGC Glass Europe	31/07/2006	EN 1364-1:1999
WFRGENT nv	12341D	AGC Glass Europe	-	EN 15254-4:2008+A1:2011

Exposure conditions during the fire resistance test:

Temperature/time curve: standard as in EN 1363-1:1999 and EN 1363-1:2012.

Direction of exposure: The fire resistant glass is symmetrical.

The glazing system is asymmetrical: glazing beads are positioned at the exposed side.

The framing system is asymmetrical: fixing to the concrete frame is positioned at the unexposed side.

One vertical edge is free, the other edges are fixed.

2.2 Test results

Parameters	Results
Thermal insulation – I	
$\Delta T_m = 140^\circ\text{C}$	37 minutes
$\Delta T_M = 180^\circ\text{C}$	32 minutes
Integrity – E	
Spontaneous and sustained flaming	67 minutes, no failure ⁽³⁾
Failure with gap gauge \varnothing 6 mm	67 minutes, no failure ⁽³⁾
Failure with gap gauge \varnothing 25 mm	66 minutes
Ignition of cotton pad	67 minutes, no failure ⁽²⁾
Radiation – W	
Radiation intensity = 15 kW/m ²	67 minutes, no failure ⁽¹⁾

⁽¹⁾ Classification according to EN 13501-2.

⁽¹⁾ The test was stopped after 67 minutes at the request of the sponsor.

⁽²⁾ No failure until thermal insulation failure.

⁽³⁾ No failure until failure with gap gauge \varnothing 25 mm.

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, PYROBEL 16 in a JANISOL 2 (Jansen) frame, 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.

EI 30, EI 20, EI 15

EW 60, EW 30, EW 20

E 60, E 30, E 20

3.3 Field of direct application

This classification is valid for the following end use applications according to EN 1364-1:1999.

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) unlimited increase and decrease of the width of the wall;
- b) unlimited decrease in height of the wall of 3 m;
- c) decrease in the linear dimensions of panes;
- d) change in the aspect ratio of panes provided that the largest dimension of the pane and its area are not increased;
- e) decrease in the distance between mullions and transoms;

- f) decrease in distance between fixing centres;
- g) increase in the dimensions of framing members;
- h) the use of screwed-on glazing beads;
- i) allowances for expansion;
- j) change in the angle of installation of up to 10° from the vertical.

3.4 Field of extended application

This classification is valid for the following end-use applications according to EN 15254-4:2008+A1:2011.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made. Other changes are not permitted.

3.4.1 Exchange of the fire resistant glass

The fire resistant glass is symmetrical and can be used in both directions.

The glazing system is asymmetrical and can only be used in the direction it was tested: glazing beads are positioned at the exposed side.

3.4.2 (A)symmetrical fire resistant glass

The fire resistant glass is symmetrical and can be used in both directions.

The glazing system is asymmetrical and can only be used in the direction it was tested: the sizes of the glazing beads are different at the exposed- and unexposed side.

3.4.3 Individual rectangular glass panes: integrity and terminal insulation

The maximum dimensions of the circular, triangular and four sided shaped glass panes are represented by the thickest lines in annex 6, for the indicated E and EI classifications.

The maximum dimensions of the other non-rectangular glass panes are represented by the thinnest lines in annex 6, for the indicated E and EI classifications.

3.4.4 Individual rectangular glass panes: radiation

The maximum dimensions of the circular, triangular and four sided shaped glass panes are represented by the thickest lines in annex 6, for the indicated EW classifications.

The maximum dimensions of the other non-rectangular glass panes are represented by the thinnest lines in annex 6, for the indicated EW classifications.

3.4.5 Exchange of metal glazing beads

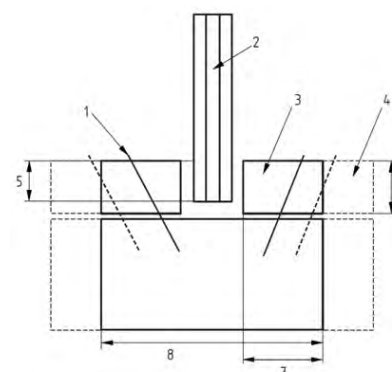
It is not allowed to exchange the type of material used for the glazing beads.

Changes in bead shape are only allowed if it can be demonstrated not to have a detrimental effect on the fire performance.

Clipped beads can be replaced by screw fixed or riveted beads.

Bead depth (see schematic drawing 1, item 7) can be increased. The bead depth must be at least 30 mm.

The bead height can be increased provided that the edge cover does not change or the increase in edge cover can be shown, that it does not have a detrimental effect on the fire performance. The bead height (see schematic drawing 1, item 6) must be at least 20 mm.



Key

- 1 bead fixing e.g. screws, nails etc;
- 2 glass;
- 3 bead;
- 4 bead extended in depth;
- 5 edge cover;
- 6 bead height;
- 7 bead depth;
- 8 frame section depth.

Schematic drawing 1

3.4.6 Exchange of glazing materials

Except for glazing beads, exchange of one glazing material (Gaskets/glazing, strips/setting blocks, ...) for another is allowed. But only if it can be demonstrated that the exchange does not have a detrimental effect on the fire performance within a comparable glazing system of the same product group.

3.4.7 Bead surface coverings

Decorative surface coverings of the glazing beads may be added where one does not exist, provided it can be demonstrated that the covering material achieves at least Class A2 when tested according to EN 13501-1. In addition it must be shown that they do not adversely affect the fire resistance performance of the fire resistant glazed element.

If the surface covering is not Class A2 then it has to be proven that it does not negatively affect the fire performance.

Any coverings on glazed elements classified EI shall be secured using only fixing method(s) proven in the reference test and/or by previously existing test data.

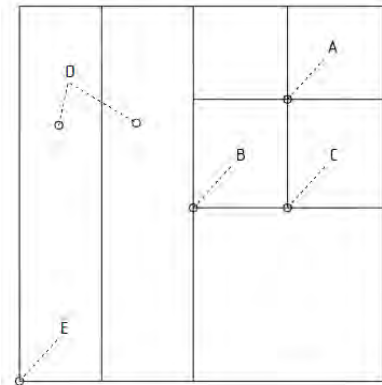
3.4.8 (A)symmetrical framing systems

The framing system is asymmetrical and can only be used in the direction it was tested: fixing to the concrete frame is positioned at the unexposed side.

3.4.9 Exchange of frames

Frames can be manufactured using all or some of the following allowed junction types:

- | | |
|-------------------------------|---|
| type A is allowed: | four panes joining together; |
| type B is allowed: | three panes joining together at one point including a full height vertical pane; |
| type C is allowed: | three panes joining together at one point including a full width horizontal pane; |
| type D <u>not</u> is allowed: | two full panes side by side; |
| type E is allowed: | corner junction. |



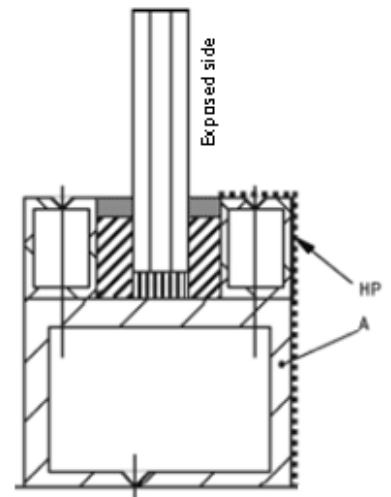
Schematic drawing 2

3.4.10 Metal frames

It is not allowed to exchange the type of material used to construct the frame.

The frame section may be changed provided that it can be demonstrated that:

- the axial stress levels in the vertical elements and the bending stress are not increased in cold state;
- the HP/A factor for the frame and bead is not increased; (HP = Heated perimeter [mm]; A = Heated cross section [mm²])
- the depth of the section is not reduced;
- the wall thickness and number of chambers in the frame are not reduced.



Schematic drawing 3

3.4.11 Frame surface coverings

Decorative surface coverings of the framing members may be added where one does not exist, provided it can be demonstrated that the covering material achieves at least Class A2 when classified according to EN 13501-1. In addition it must be shown that they do not adversely affect the fire performance of the fire resistant glazed partition, e.g. in the case of replacement of coverings that provide a contribution to insulation performance. Any coverings on glazed partitions classified EI shall only be secured using fixing methods that do not impair the fire performance of the partition.

3.4.12 Increase in overall dimensions and area of the partition

The maximum overall dimensions of the fire resistant glazed partition are represented by the thickest lines in annex 7, for the indicated E and EI classifications.

3.4.13 Increase in dimensions for the fire resistant glazed partitions: radiation

The maximum overall dimensions of the fire resistant glazed partition are represented by the thickest lines in annex 7, for the indicated EW classifications

3.4.14 Replication of the fire resistant glazed partition with reference to radiation

A wider construction achieved by replicating the fire resistant glazed partition as tested, by adding more units of the same fire resistant glazed partition side by side is allowed for the classifications listed in paragraph 3.2.

3.4.15 Changing in installation angle

A change in the angle of installation of up to ± 10 degrees from the vertical is allowed. No further increase in the installation angle is allowed.

4 Limitations

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

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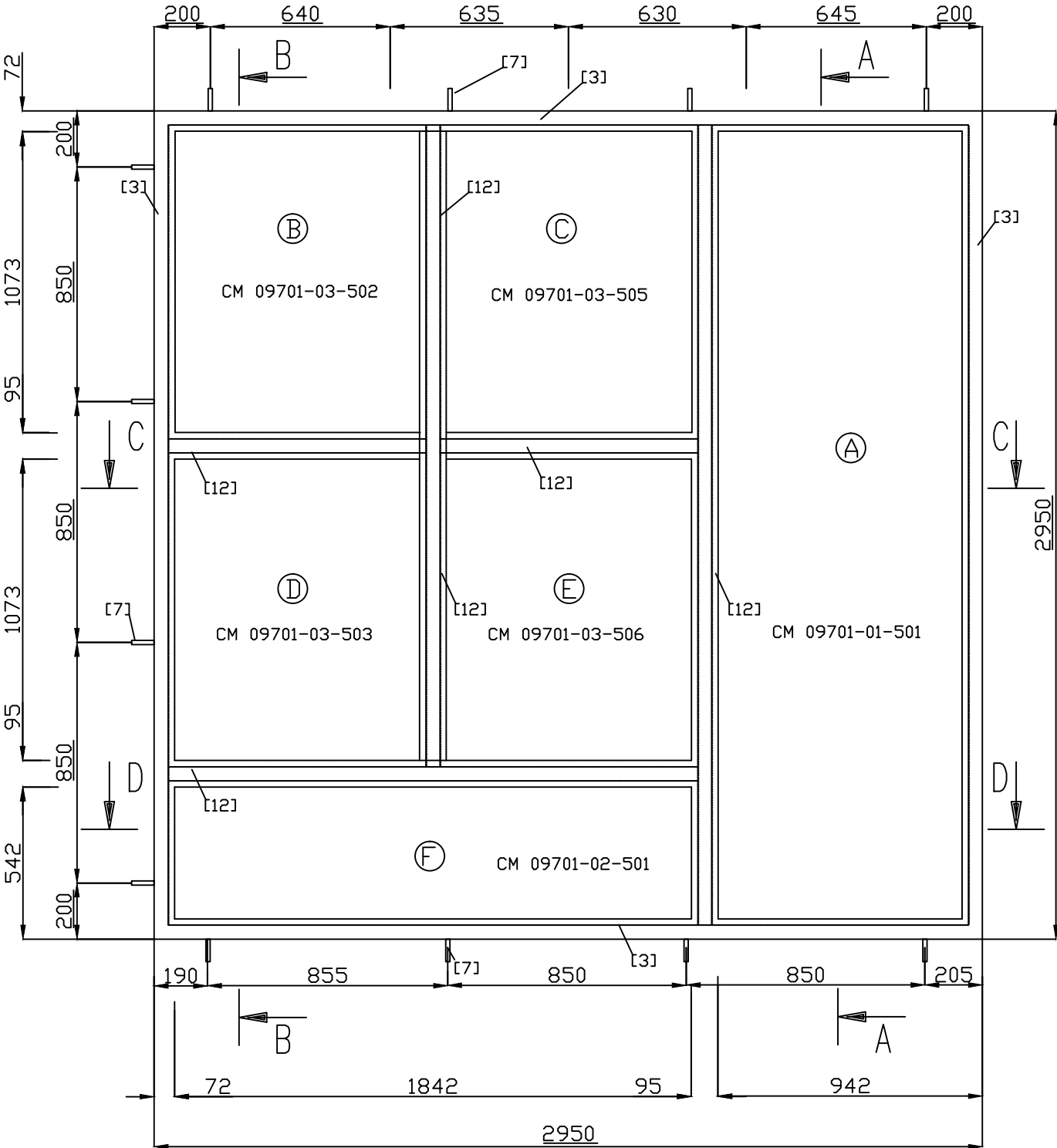
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This document is the original version of this classification report and is written in English.

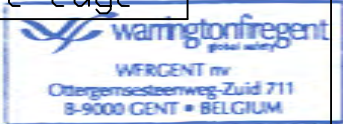
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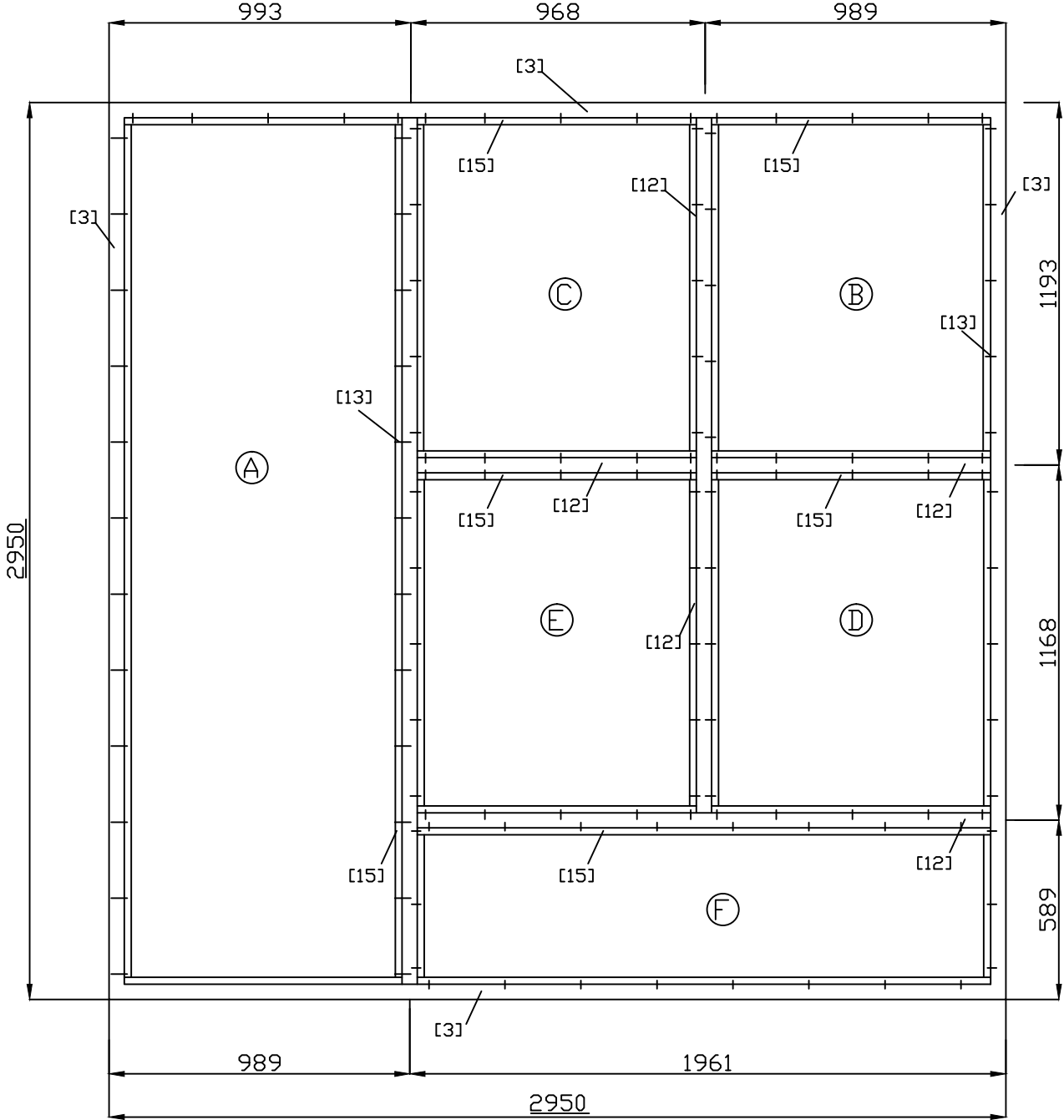
Front view - Unexposed side



Free edge



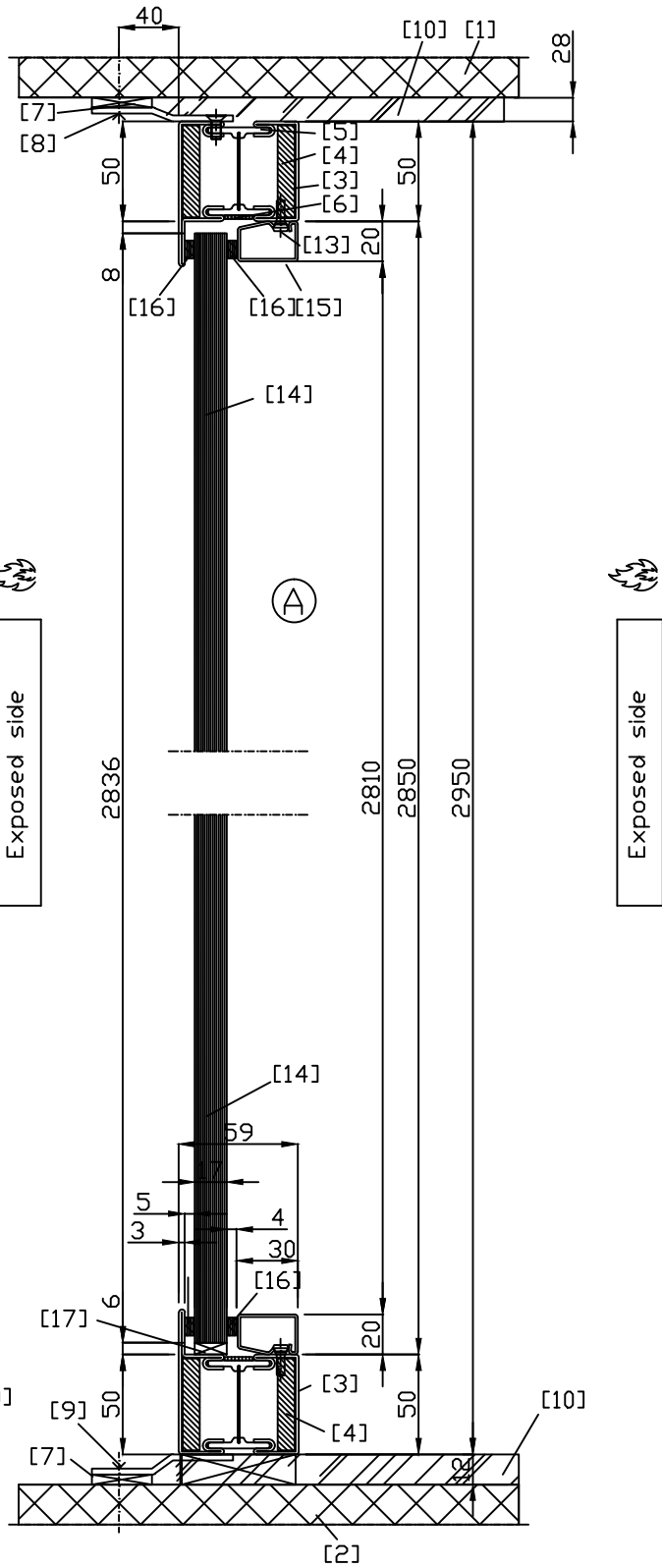
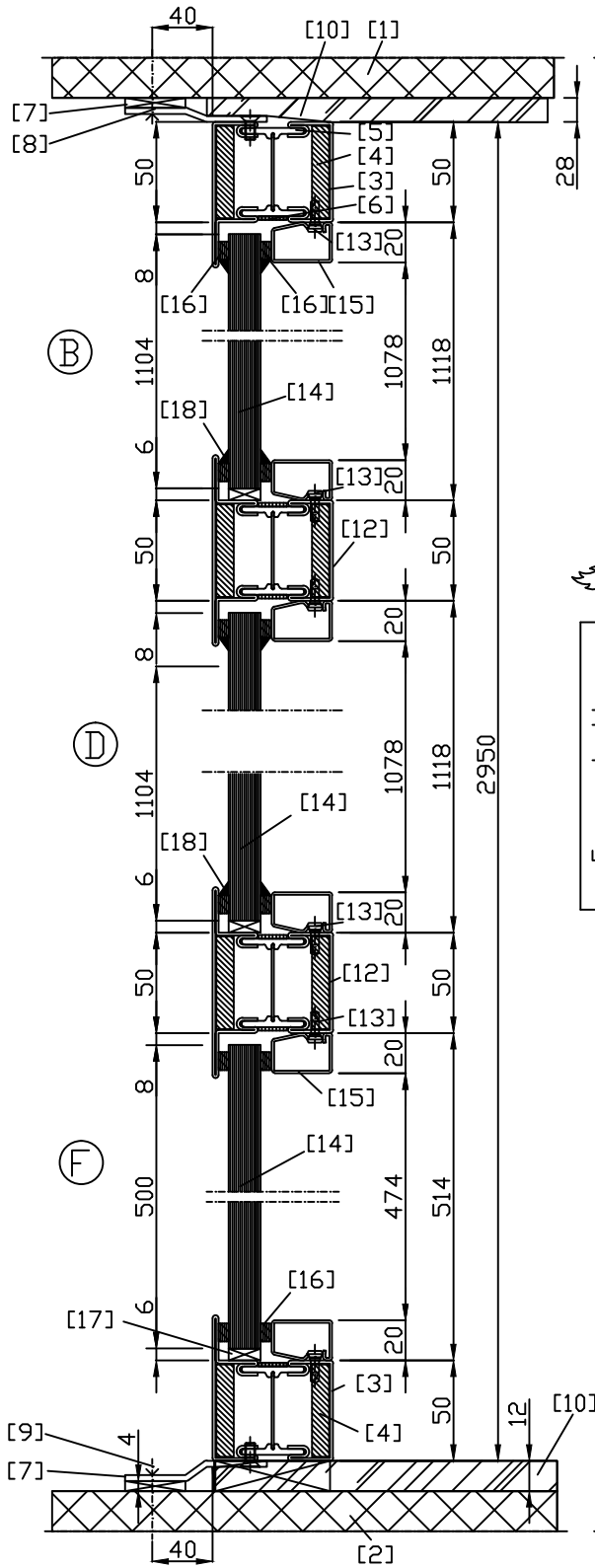
Front view - Exposed side



Free edge

Vertical section BB

Vertical section AA

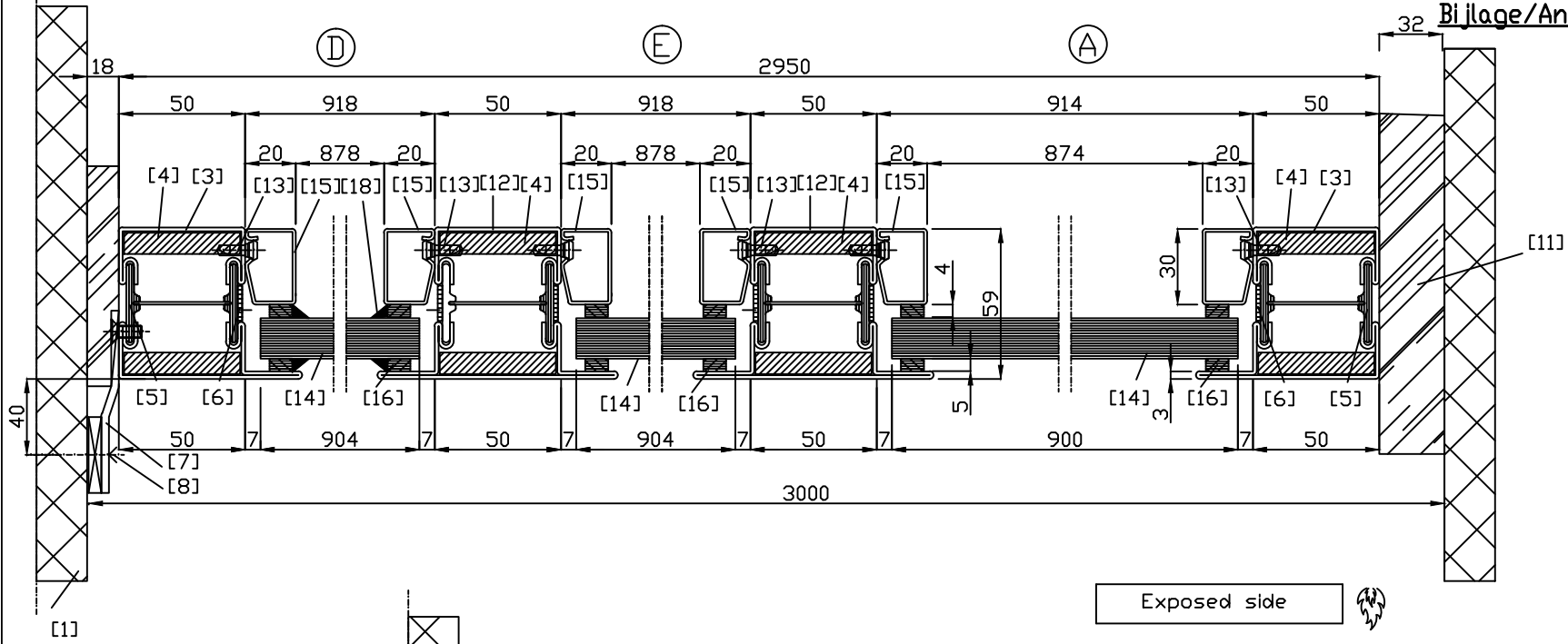


Horizontal section CC

Exposed side

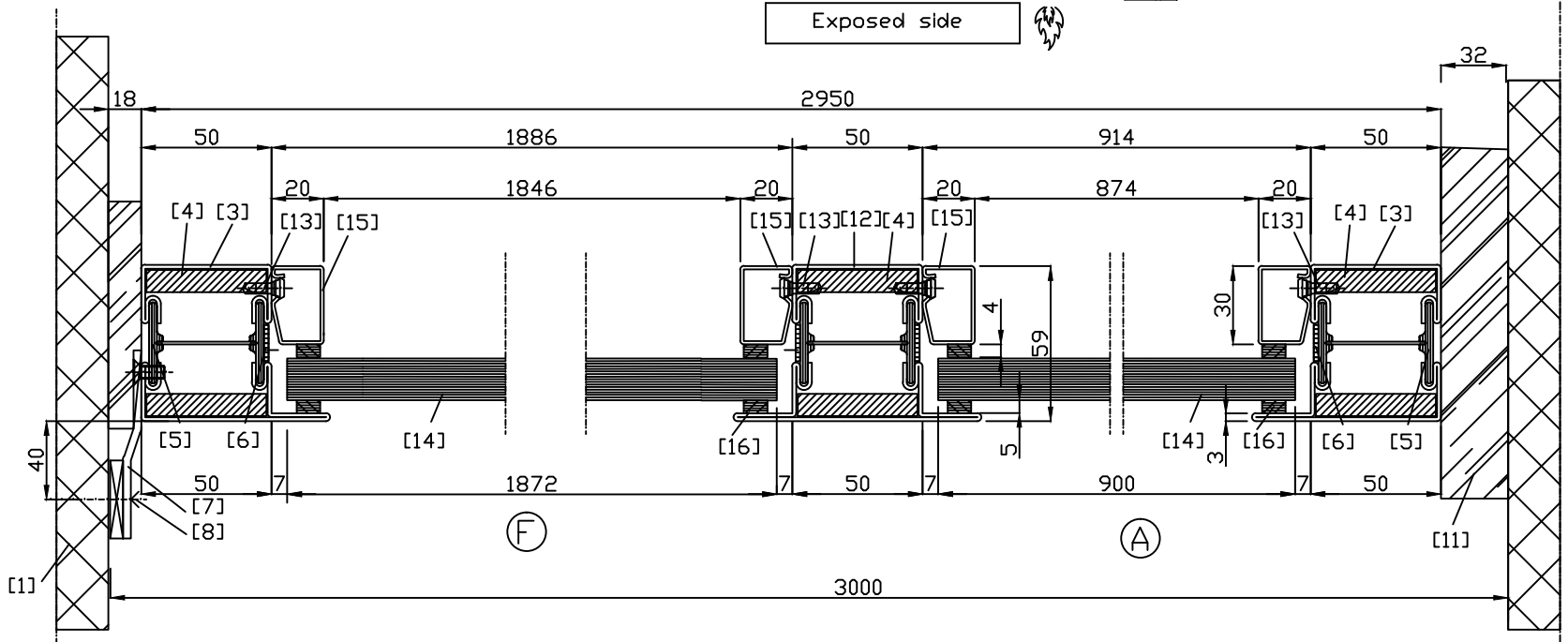
Classification report N° 12341E

Bijlage/Annexe/Annex/Anlage: 4



Horizontal section DD

Exposed side



Legend:

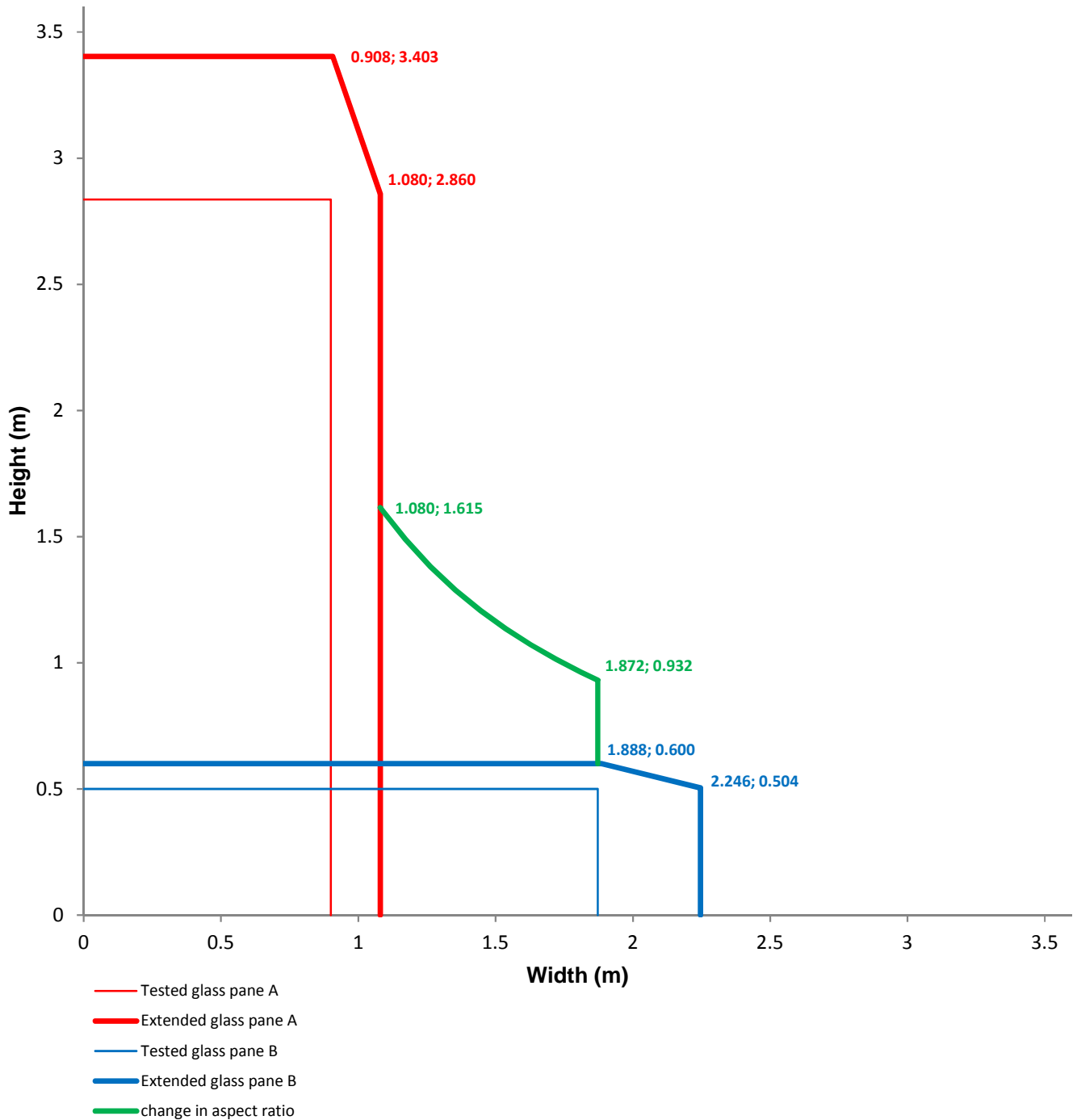
- [1] Concrete furnace frame – inner dimensions: 3100 mm x 3000 mm.
- [2] Aerated concrete sill – thickness: 100 mm.
- [3] Vertical post and horizontal slat – steel – JANISOL 2 system – outside dimensions of the section: 72 mm x 59 mm x 50 mm – length: 2950 mm – thickness: 1.6 mm (MV).
- [4] Plaster – fire-resistant ceramic filling (according to the client) – JANISOL 2 system – the exact composition was not communicated to the laboratory.
- [5] Fibre-reinforced strip – manufacturer: JANSEN – JANISOL 2 system – outside dimensions of the section: 31 mm x 5 mm.
- [6] Fire-resistant laminate – manufacturer: JANSEN – JANISOL 2 system – dimensions of the section: 14.4 mm x 1.5 mm.
- [7] Mounting bracket – steel – dimensions: 35 mm x 126 mm – thickness: 3 mm (MV) – with four round perforations: Ø 11 mm.
- [8] Screws – steel – type: Allen M8 – diameter: 8 mm – length: 30 mm with accompanying bolt.
- [9] Screws – yellow galvanized – brand and type: pgb fasteners frame plug – diameter: 8 mm – length: 30 mm with accompanying bolt.
- [10] Rockwool – brand and type: ROCKWOOL 504 – initial thickness: 50 mm – compressed to a thickness between 12 and 18 mm – mass by volume: 140 kg/m³ (MV).
- [11] Mineral wool – initial thickness: 50 mm – mass by volume: 96 kg/m³ (NV).
- [12] Intermediate post and cross slat – steel – outside dimensions of the section: 95 mm x 59 mm x 50 mm – thickness: 1.6 mm (MV).
- [13] Screws – galvanized – 3.5 x 15 mm.

- [14] Glass – brand and type: PYROBEL 16 – dimensions:
- 2836 mm x 900 mm (glass element A – reference: CM 09701-01-501)
 - 904 mm x 1104 mm (glass element B – reference: CM 09701-03-502)
 - 904 mm x 1104 mm (glass element C – reference: CM 09701-03-505)
 - 904 mm x 1104 mm (glass element D – reference: CM 09701-03-503)
 - 904 mm x 1104 mm (glass element E – reference: CM 09701-03-506)
 - 500 mm x 1872 mm (glass element F – reference: CM 09701-02-501)
- thickness: 17 mm.
- [15] Glazing bead – steel – outside dimensions of the section: 30 mm x 20 mm – thickness: 1.3 mm (MV).
- [16] Ceramic fibre strip – brand and type: SUPERWOOL PAPER (X607) – manufacturer: ODICE – 5 mm x 20 mm.
- [17] Adjusting block – brand and type: PROMATECT® H – dimensions: 70 mm x 20 mm x 6 mm (MV).
- [18] Silicone paste – brand and type: Firestop 700 – manufacturer: DOW CORNING.

Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:

- EI 20, EI 15;
- E 60, E 30, E 20;
- EW 60, EW 30, EW 20.



Note:

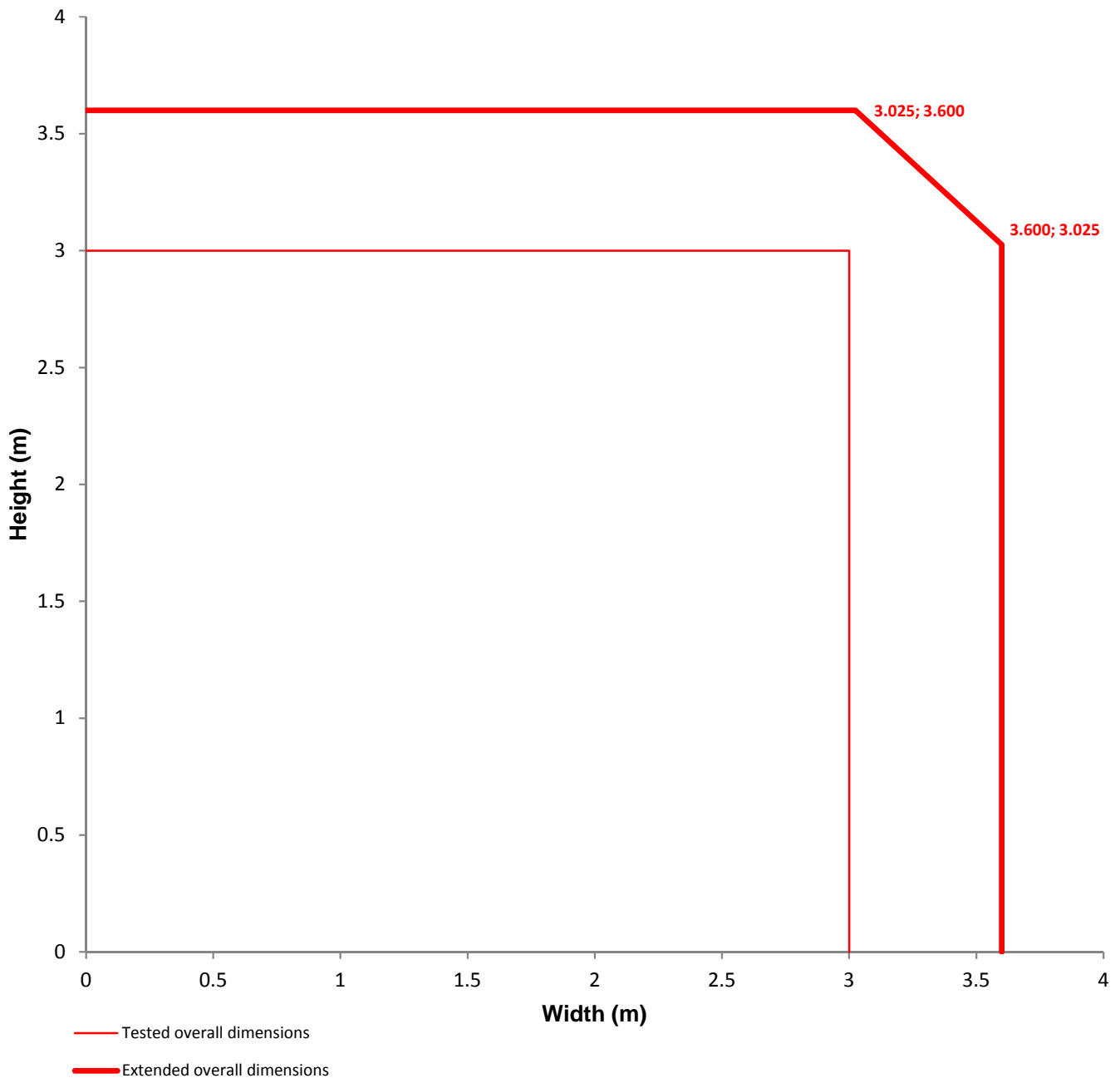
The maximum dimensions of circular, triangular and four sided shaped glass panes are represented by the thickest lines (extended dimensions). The maximum dimensions of the other non rectangular glass panes are represented by the thinnest lines (tested dimensions).



Increase in overall dimensions and area of the partition

The extended dimensions are only valid for the following classifications:

- EI 20, EI 15;
- E 60, E 30, E 20;
- EW 60, EW 30, EW 20.



Note:

The maximum overall dimensions of the fire resistant glazed partition are represented by the thickest lines. A wider construction achieved by replicating the extended fire resistant glazed partition is allowed.

