FIRE RESISTANCE CLASSIFICATION REPORT No. 17761B

Revision 1

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 54_Foster Fuego Light frame), in accordance with the procedures given in EN 13501-2:2016: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 12 pages and 8 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The element, Pyrobel 54_Foster Fuego Light frame, is defined as a non-loadbearing glazed wall.

1.2 Description

The element, Pyrobel 54_Foster Fuego Light 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 6 of this classification report.

1.2.1 Composition of the test specimen as tested

The test specimen is a non-loadbearing glazed wall composed of glass panes in a steel frame.

Outer dimensions of the test specimen:

- height: 3000 mm;
- width: 3000 mm;
- thickness: 110 mm.

1.2.1.1 Glazing system

The glazing system includes the glass, the glazing beads and sealing components.

[1a]-[1g] Glass pane – type: Pyrobel 54 – thickness: 54.0 mm ± 3.0 mm (NW).

- dimensions and weight: shown in Table 1;
- position: shown in annexes 1 and 2;
- fixing: clasped between the steel frame and the glazing beads;
- glass structure: see annex 4;
- orientation: the glass panes are symmetrical and can be used in both directions.

Table 1

	Dimensions of the glass panes (width x height)	Dimensions of the exposed area (width x height)	Weight (NW)	Reference
[1a]	1300 mm x 2860 mm	1270 mm x 2830 mm	416.64 kg	BX22395-42-501
[1b]	500 mm x 2860 mm	470 mmx 2830 mm	160.16 kg	BX22395-43-501
[1c]	428 mm x 970 mm	398 mmx 940 mm	47.04 kg	BX22395-45-501
[1d]	428 mm x 970 mm	398 mmx 940 mm	47.04 kg	BX22395-45-502
[1e]	428 mm x 970 mm	398 mmx 940 mm	47.04 kg	BX22395-45-503
[1f]	428 mm x 970 mm	398 mmx 940 mm	47.04 kg	BX22395-45-504
[1g]	915 mm x 800 mm	885 mmx 770 mm	91.76 kg	BX22395-44-501

[2] Glazing strip – material: ceramic paper tape – type: Odice Superwool X607 – section dimensions: 20 mm x 6 mm – density: 210 kg/m³ (NV).

- position:
  - between the glass panes and the clip-on beads;
  - between the glass panes and the frame;
- fixing: self-adhesive.

[3] Setting block – material: hardwood – dimensions: 80 mm x 30 mm x 5 mm.

- number: two per glass pane;
- position: under the glass pane.

[4] Clip-on bead – material: steel – brand: Forster – reference: 901248 – section dimensions: 40 mm x 20 mm – steel thickness: 1.25 mm.

- position: at the exposed side;
- fixing:
  - with fastening studs [13];
  - c/c distance: 200 mm;
- length-wise clearance: 2 to 5 mm at either side.

[5] Fastening stud – material: steel – brand: Forster – reference: 906577 – diameter: 4.6 mm (MV) – total length: 15 mm.

[6] Sealant – material: neutral silicone – brand and type: Dow Corning Firestop 700.

- position: around the full circumference of the glass pane, on top of the glazing strip, at the exposed and unexposed side.

1.2.1.2 Framing system

The framing system includes the frame components and the fixing parts.

The composite profiles of the frame are composed of 3 steel tube profiles filled with mineral-based strips [12], interlaced with 2 layers of blank mineral-based product [13].

[7] Edge composite profile – material: steel – brand and type: Forster Fuego Light – reference: 739.592 – section dimensions: 70/50 mm x 110 mm – steel thickness: 1.5 mm (NV).

- position: at the outer edges;
- fixing to the concrete furnace frame;
    - with fixing anchors [8];
    - to the edges of the concrete furnace frame;
    - centre-to-centre distance: 850 mm;
- interfixing: the horizontal and the vertical profiles are welded together at the extremities.

[8] Fixing anchor – material: steel – brand and type: Hilti 100 HT – diameter: 10 mm – length: 112 mm.

[7b] Intermediate composite profile – materials: steel – brand and type: Forster Fuego Light – reference: 739.593 – section dimensions: 90/50 mm x 110 mm – steel thickness: 1.5 mm (NV).

- position: between the glass panes;
- fixing: the intermediate profiles are welded to the adjacent (intermediate-) profiles.

[9] Intumescent product – material: graphite-based strip – brand and type: Forster fire resistant laminate – section dimensions: 24.5 mm x 1.5 mm (MW) – reference: 948000.

- position: around the full circumference of the glass;
- quantity: 2, 1 per blank mineral-based layer of the steel frame;
- fixing:
    - self-adhesive;
    - to the side of a blank mineral-based layer of the steel frame.

[10] Setting block – brand and type: Promatect-H – material: calcium silicate – dimensions: 110 mm x 47 mm – thickness: 15 mm – oven dry density: 870 kg/m³ (NV).

- position: between the composite edge profiles and the concrete furnace frame.

[11] Mineral wool – type: Thermal insulation Promat Promaglaf HTK1100 – initial density: 96 kg/m³ (NV) – initial thickness: 25 mm.

- position: between the steel frame and the concrete furnace frame, at the fixed edges.

[12] Mineral based product – material: not communicated to the laboratory.

[13] Mineral based product – material: not communicated to the laboratory.

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	17761A	AGC Glass Europe	29/06/2016	EN 1364-1:2015

Exposure conditions during the fire resistance test:

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

Direction of exposure:
- The glass panes are symmetrical;

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

- The framing system is asymmetrical: fixing for the glazing beads at the exposed side.

No extra load supplementary to the own weight of the non-loadbearing glazed wall was applied during the test.

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

2.2 Test results

Parameters	Results
Thermal insulation glass – I	
ΔT_m = 140°C	132 minutes, no failure(1)
ΔT_M = 180°C	132 minutes, no failure(1)
Thermal insulation frame – I	
ΔT_m = 140°C	132 minutes, no failure(1)
ΔT_M = 180°C	*121 minutes
Integrity – E	
Spontaneous and sustained flaming	132 minutes, no failure(1)
Failure with gap gauge ∅ 6 mm	132 minutes, no failure(1)
Failure with gap gauge ∅ 25 mm	132 minutes, no failure(1)
Ignition of cotton pad	132 minutes, no failure(1)
Radiation – W	
Radiation intensity = 15 kW/m²	132 minutes, no failure(1)

(1) The test was stopped after 132 minutes at the request of the sponsor.

*The results of the thermocouple on the vertical full length pane to pane connection is not taken in to account in this classification report. This connection type is therefore also not allowed in practice (see 3.3.1.3 for the allowed connection types).

3 Classification and field of application

3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2016.

3.2 Classification

The element, Pyrobel 54_Foster Fuego Light 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 120, EI 90, EI 60 , EI 45, EI 30, EI 20, EI 15

EW 120, EW 90, EW 60, EW 30, EW 20

E 120, E 90, 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 1364-1:2015

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:

3.3.1 Glazed element

3.3.1.1 Installation angle

A change in the angle of installation of up to ± 10° from the vertical plane is allowed, provided the height of the glazed element is not larger than 3000 mm.

3.3.1.2 Height of the glazed element with overrun

For the classification times:

- EI 90, EI 60 , EI 45, EI 30, EI 20, EI 15;
- EW 120, EW 90, EW 60, EW 30, EW 20;
- E 120, E 90, E 60, E 30, E 20.

An increase in height up to a maximum of 3600 mm is allowed, provided that the allowances for thermal expansion of the construction are increased pro-rata.

For the classification time:

- EI 120.

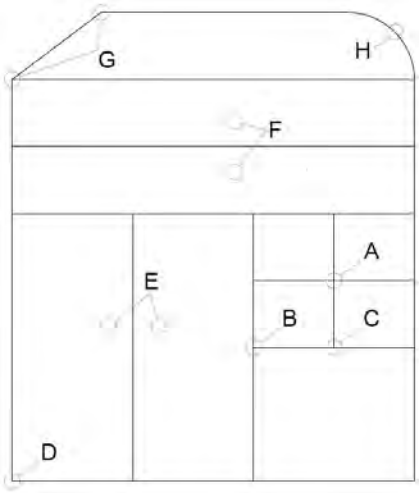
An increase in height up to a maximum of 3300 mm is allowed, provided that the allowances for thermal expansion of the construction are increased pro-rata.

3.3.1.3 Width of the glazed element

A greater width is allowed by replication the tested glazed elements or parts thereof, provided that the framing system is identical to the one tested and the connection joints between the glazed elements have been tested.

Allowed connection joints:

- Type A: four panes joining together;
- Type B: three panes joining together at one point including a full height vertical pane;
- Type C: three panes joining together at one point including a full width horizontal pane;
- Type D: corner junction.



3.3.2 Glazing system

3.3.2.1 Linear dimensions

An unlimited decrease in height and/or width of the panes is allowed.

3.3.2.2 Dimensions and area of individual rectangular glass panes with overrun

Result:

For the classification times:

- EI 90, EI 60 , EI 45, EI 30, EI 20, EI 15;
- EW 120, EW 90, EW 60, EW 30, EW 20;
- E 120, E 90, E 60, E 30, E 20.

The following table shows the calculated extended size/area:

Tested sizes/areas			**Extended sizes/areas**		
Width (mm)	**Height** (mm)	**Area** (m²)	**Width** (mm)	**Height** (mm)	**Area** (m²)
1300	2860	3.718	1560	3432	4.499

The results are given in following annex:

Annex 7: the maximum allowed dimensions of rectangular shaped glass panes are represented by the outer lines.

For the classification times:

- EI 120.

The following table shows the calculated extended size/area:

Tested sizes/areas			Extended sizes/areas		
Width (mm)	**Height** (mm)	**Area** (m²)	**Width** (mm)	**Height** (mm)	**Area** (m²)
1300	2860	3.718	1560	3300	4.499

The results are given in following annex:

Annex 8: the maximum allowed dimensions of rectangular shaped glass panes are represented by the outer lines.

In order to accommodate the increase in glass dimensions, it is permitted to increase the distance between mullions and/or transoms.

3.3.2.3 glazing beads

Test results on 'clip-on' beads cover screwed-on glazing beads, applied with the same or smaller centre to centre distance (≤ 40 mm).

The tested bead depth may be increased (≥ 40 mm). the bead height may not be changed.

3.3.2.4 Framing system

The distance between mullions and/or transoms may be decreased from that tested.

The distance between fixing centres may be decreased from that tested (≤ 850 mm).

The cross sectional dimensions of the frame profiles may be increased from the dimensions tested (≥ 70/50 mm x 110 mm).

3.3.2.5 Supporting constructions

The classification is valid for following standard supporting constructions in accordance with EN 1363-1 with at least the same fire resistance as the test specimen:

- High density rigid standard supporting construction.

4 Limitations

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

The classification assigned to the product in this report is appropriate to a Declaration of Performance (DoP) of the essential characteristics of the construction product by the manufacturer within the context of System 1 Assessment and Verification of Constancy of Performance (AVCP).

Under the Construction Products Regulation (CPR: EU 305/2011), such a Declaration of Performance (DoP) is a requirement for affixing the CE marking.

The test laboratory has played no part in sampling the product for the test, although it holds appropriate references, supplied by the manufacturer, to provide evidence for the traceability of the samples tested.

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.

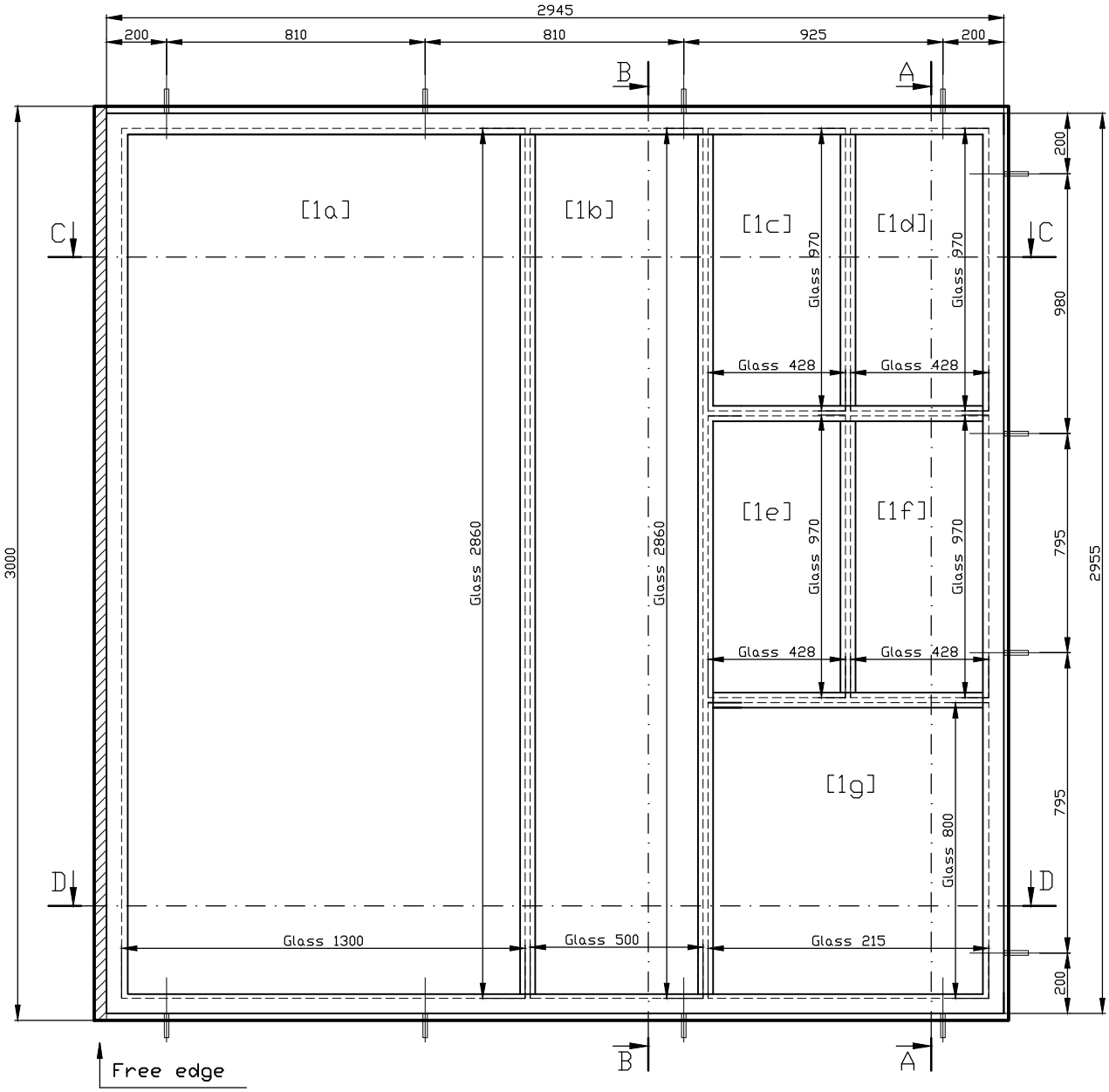
SIGNED	APPROVED
Seppe Van Damme (Signature) Project leader Ghent 2017.01.23 12:58:05 +01'00'	Peter Tack (Signature) Project leader Ghent 2017.01.23 13:00:11 +01'00'

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

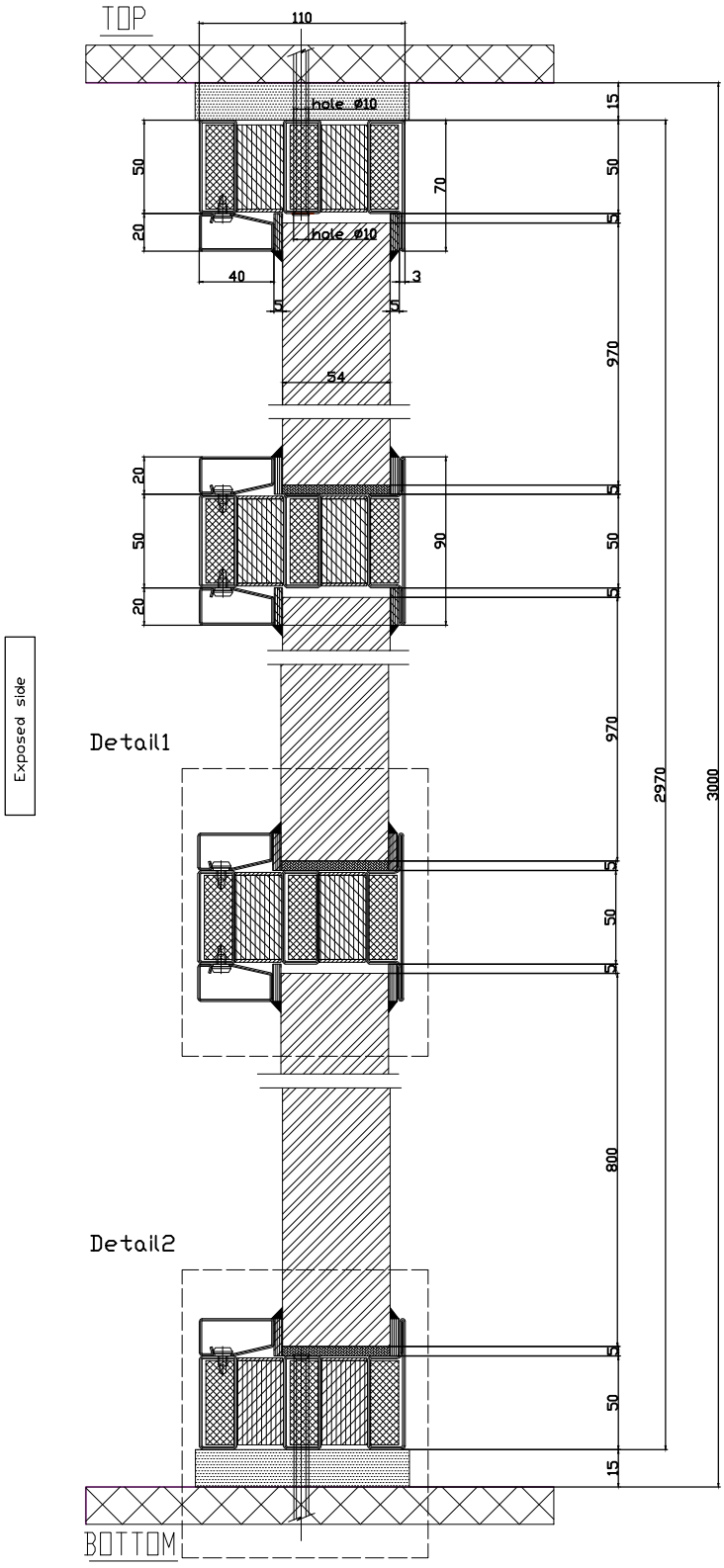
In case of doubt, the most recent version prevails.

The authenticity of the electronic signatures is assured by Belgium Root CA.

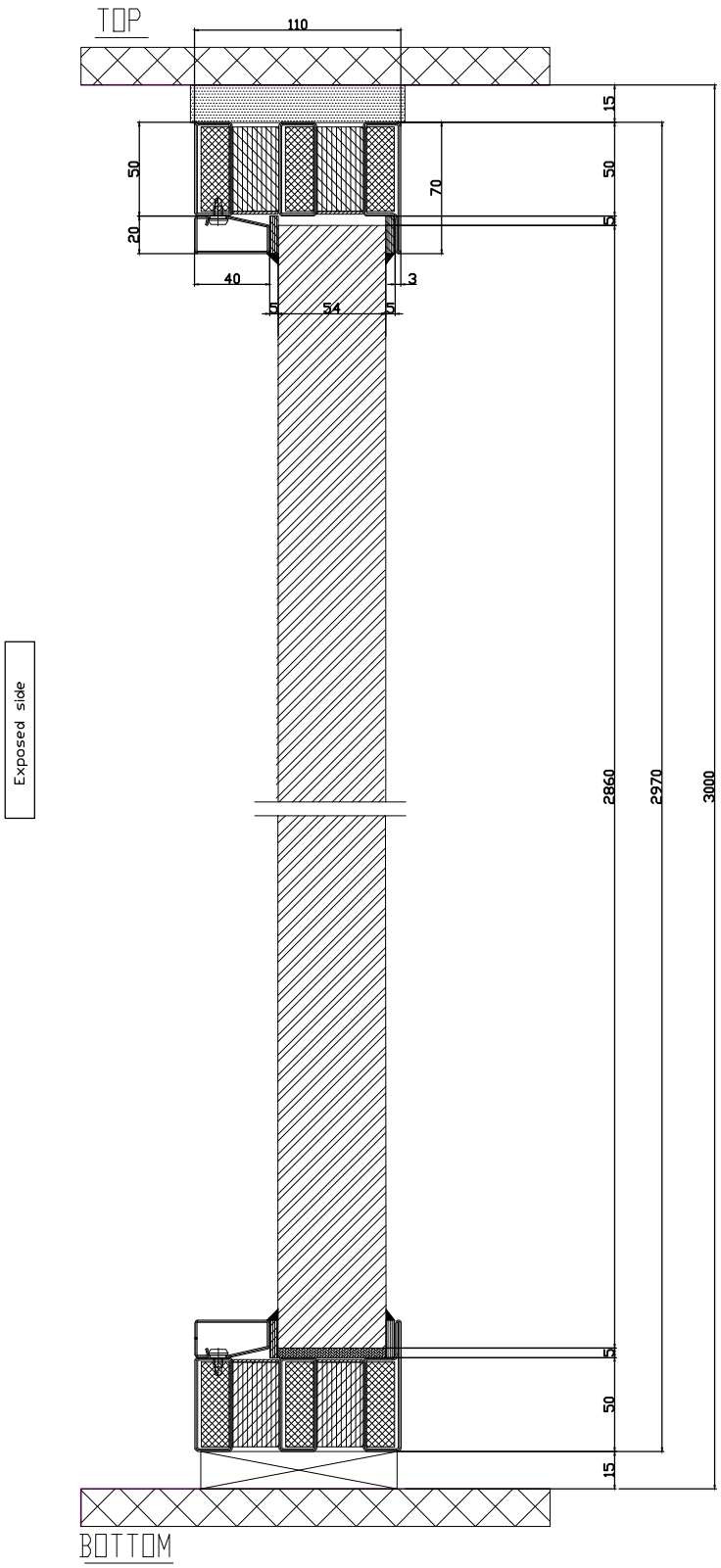
Front view (unexposed side) - dimensions.



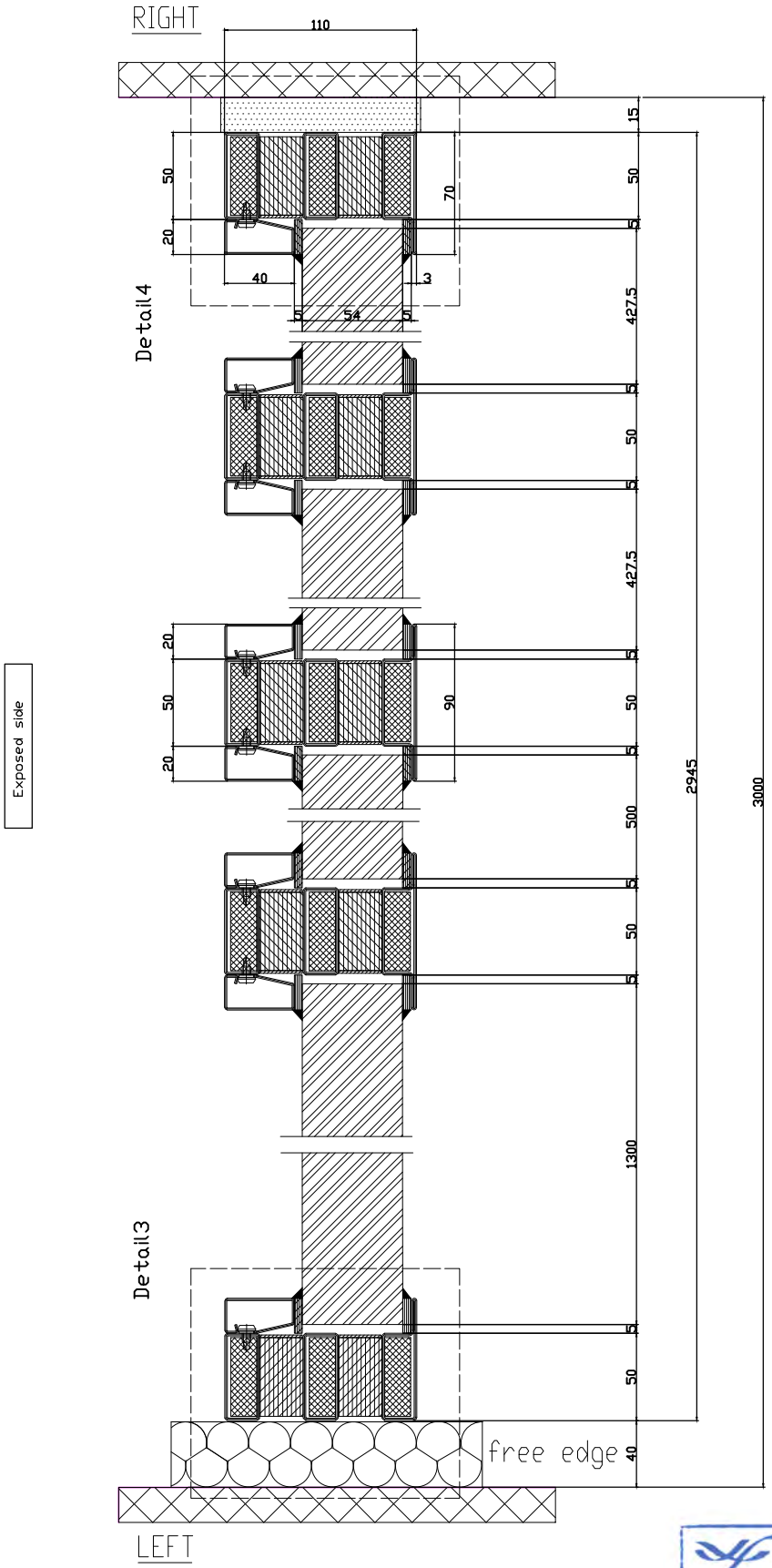
Section A-A - dimensions.



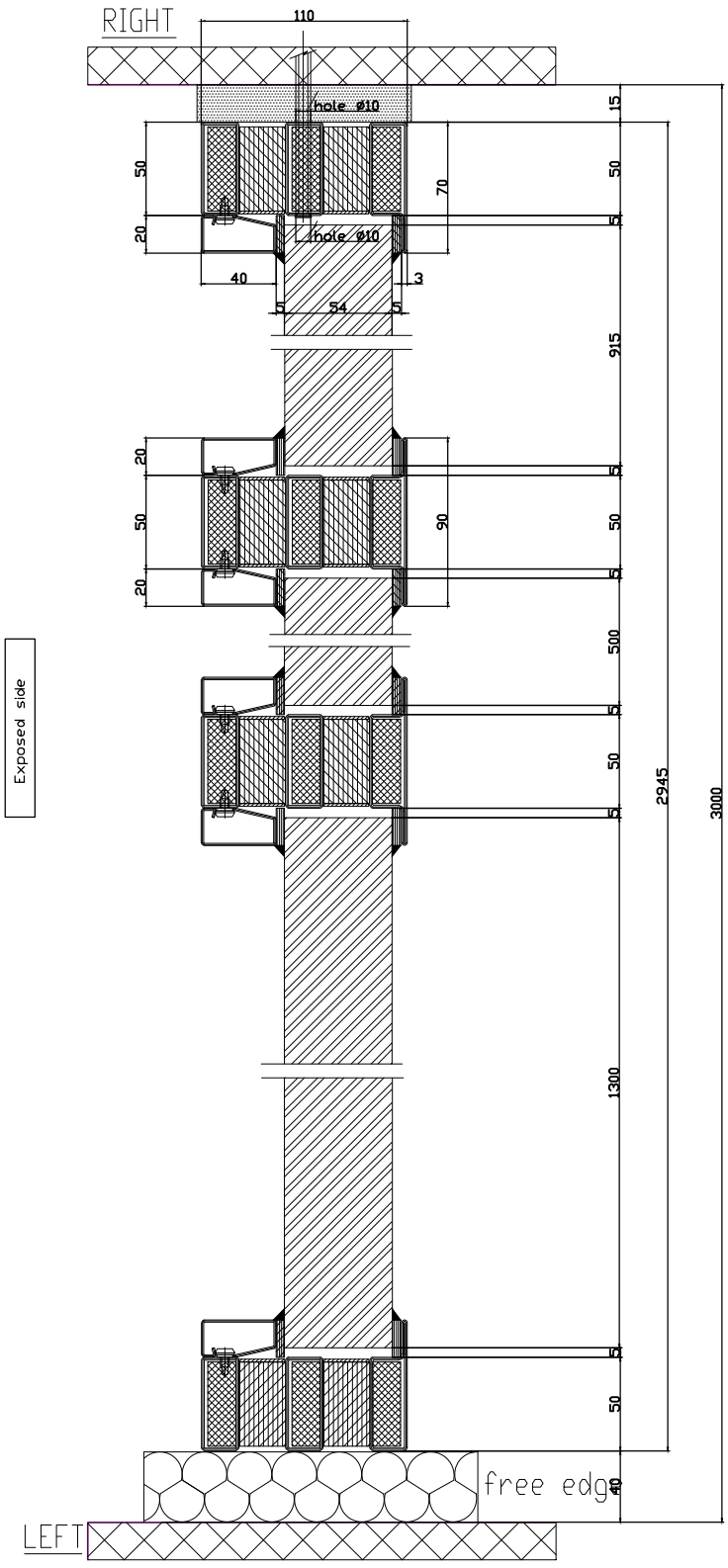
Section B-B - dimensions.



Section C-C - dimensions.

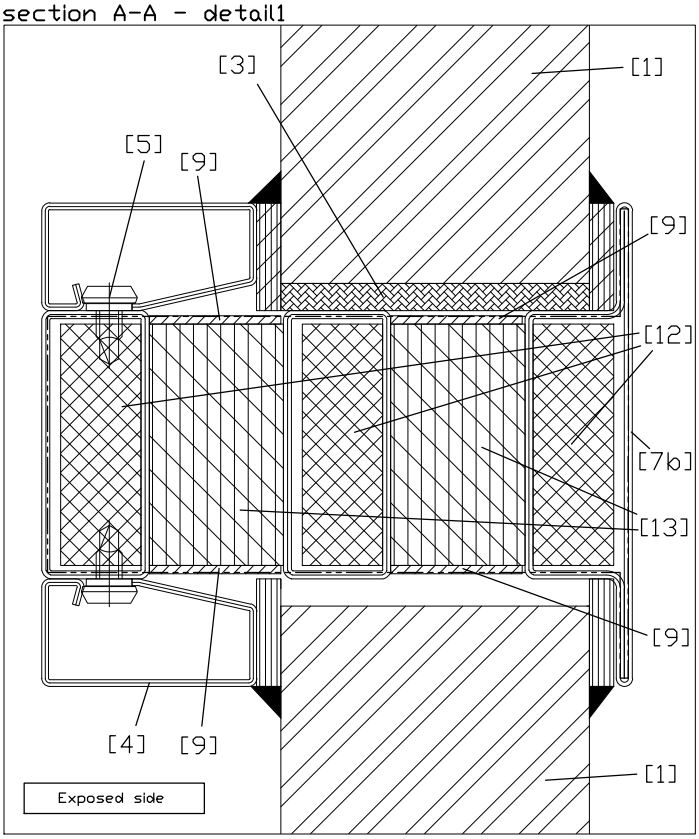


Section D-D - dimensions.

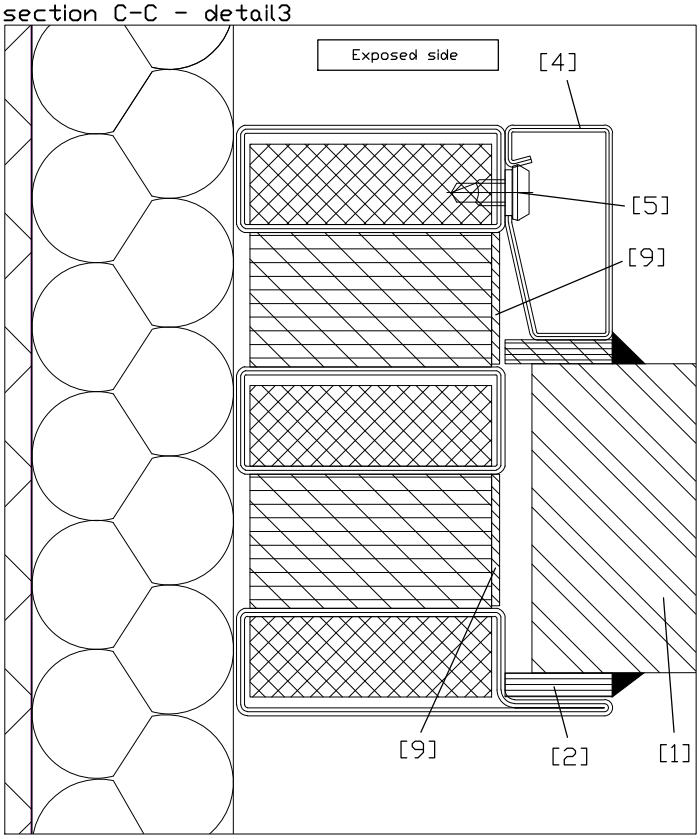


Sections A-A and C-C - details.

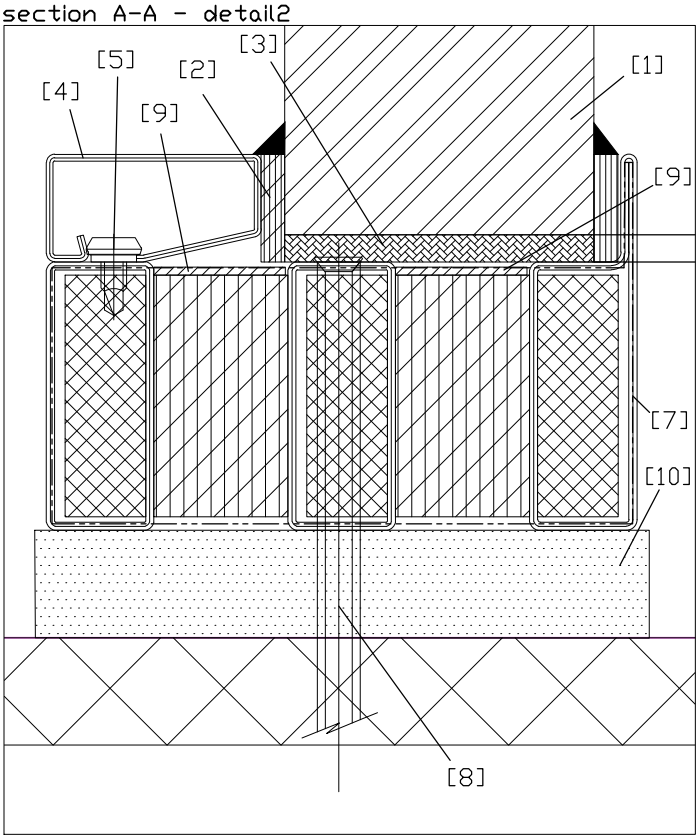
section A-A - detail1



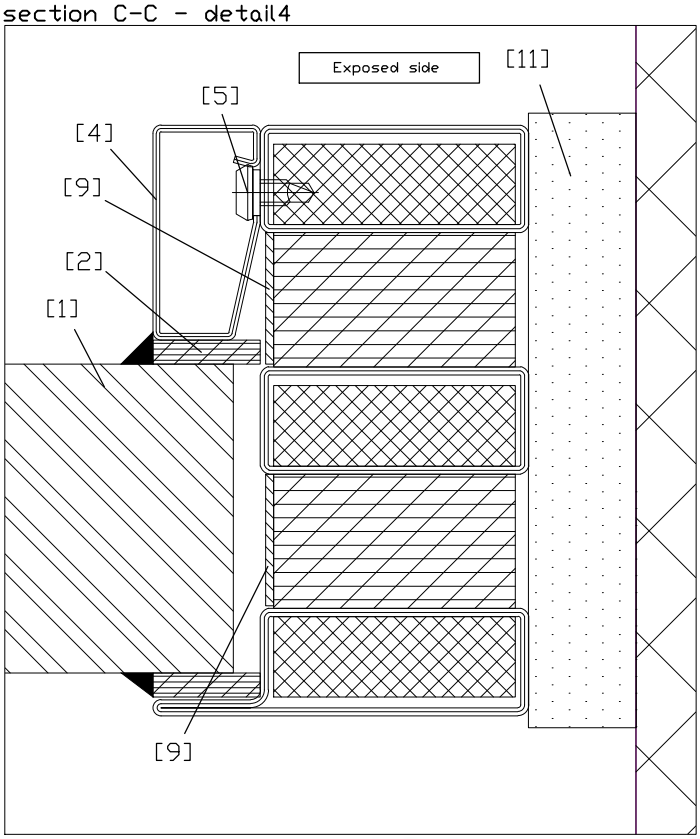
section C-C - detail3



section A-A - detail2



section C-C - detail4



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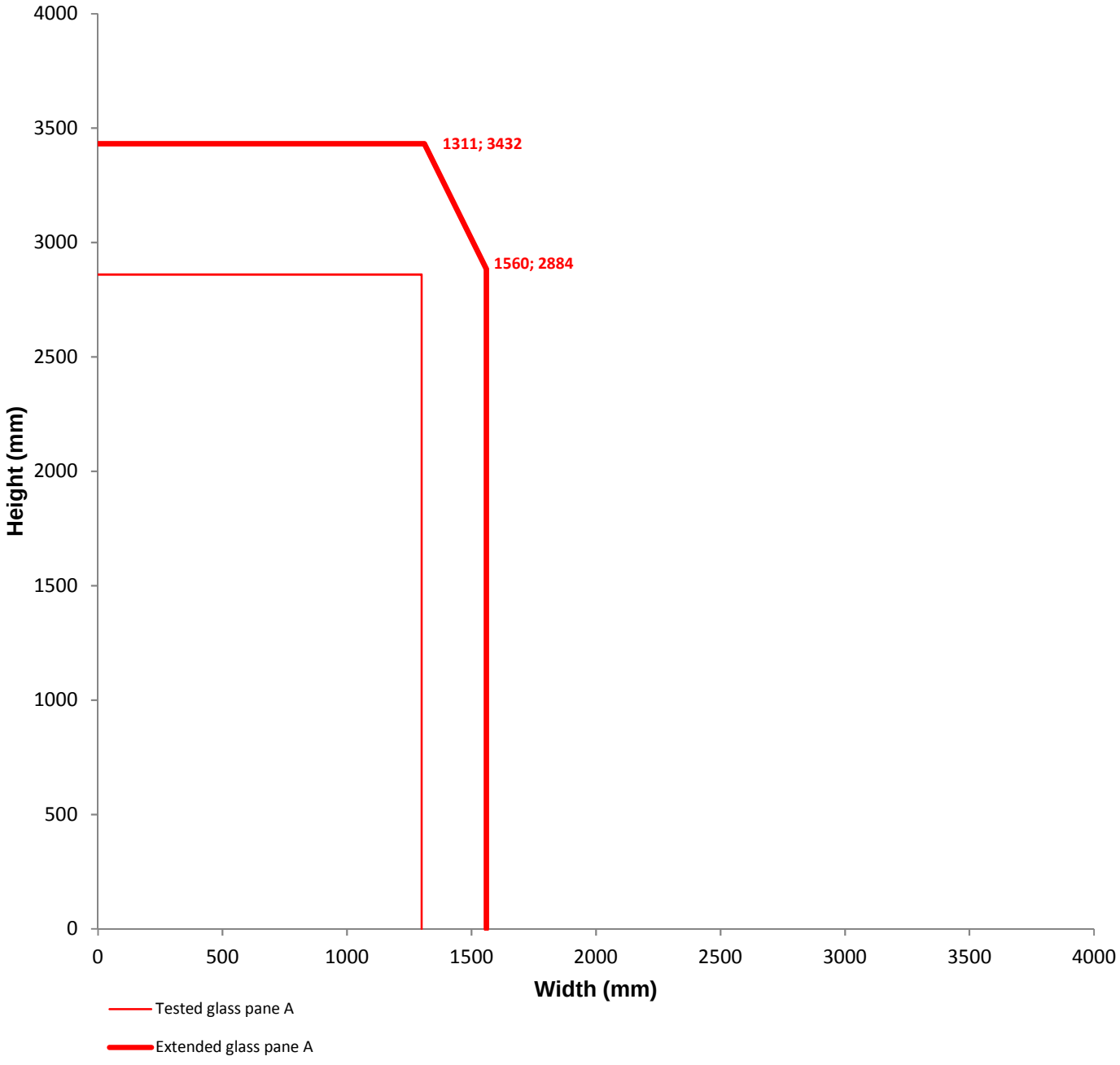
Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:
- **EI 90, EI 60, EI 45, EI 30, EI 20, EI 15;**
- **E 120, E 90, E 60, E 30, E 20;**
- **EW 120, EW 90, EW 60, EW 30, EW 20.**

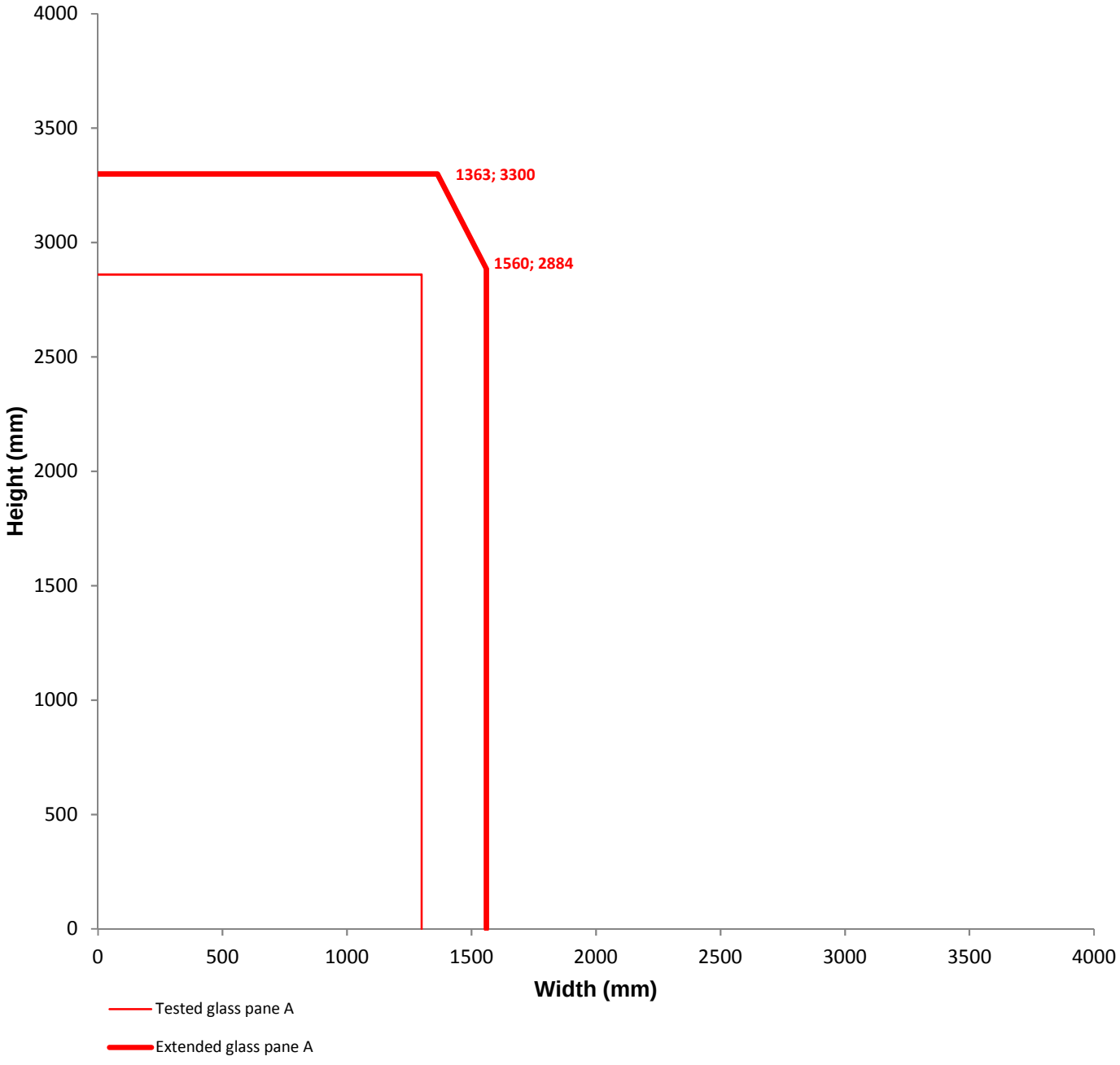


Note:

The maximum dimensions of rectangular glass panes are represented by the outer lines.

Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:
- **EI 120.**



Note:

The maximum dimensions of rectangular glass panes are represented by the outer lines.