FIRE RESISTANCE CLASSIFICATION REPORT No. 12857C

Owner of the classification report:

AGC Glass Europe
166, Chaussée de la Hulpe
1170 Brussels
Belgium

Introduction:

This classification report defines the classification assigned to an unloaded glazed wall, type: Pyrobel 16 - IGU, 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 nine pages and eleven annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The specimen is defined as an unloaded glazed wall – type: Pyrobel 16 - IGU. It is evaluated in respect of the fire performance characteristics given in clause 5 of EN 13501-2: 2007+A1: 2009.

1.2 Description

The element is fully described in the test report provided in support of this classification listed in clause 2.1. The drawings and the legend of this test report are enclosed in the annexes 1 till 5 of this classification report.

Composition of the test specimen:

The glass wall consists of a wooden framework and glass panels.

1.2.1 Composition of the framework:

The frame consists of two parts. Each part has two vertical posts [3] and two horizontal slats [4]. The two parts have been screwed to each other [5] every 500 mm. At the height of the floor and ceiling connection, the horizontal slats have been attached to the frame every 500 mm by means of concrete plugs [6]. A strip of mineral wool [7] has been applied between the horizontal slats and the concrete frame at the bottom and the top. At the height of the fixed vertical edge, the post has been fixed with concrete plugs [6] to the frame every 500 mm. Mineral wool [7] has also been applied between the fixed vertical post and the concrete frame. The gap between the framework and the concrete frame has been filled with rock wool [8] at the free edge.

1.2.2 Composition of the glass specimens:

Two glass specimens have been installed. The glass specimens are composites. The exact composition has been communicated confidentially to the laboratory.

The dimensions of the glass specimens are as follows:

Glass specimen [9]: 1700 mm x 2874 mm x 37 mm;
Glass specimen [10]: 1098 mm x 2874 mm x 37 mm.

The exposed dimensions of the glass specimens are as follows:

Glass specimen [9]: 1654 mm x 2828 mm;
Glass specimen [10]: 1052 mm x 2828 mm.

The glass specimens are placed between the wooden frame [11] and the wooden glazing beads [12]. The glazing beads of the specimens [9], [10] are on the exposed side.

Three adjusting blocks [13] have been installed underneath each glass specimen and the frame. Ceramic paper [14] has been used as a sealant between the glass specimens and the frame. Subsequently, it has been finished off with a silicone kit [15]. The glazing beads have been secured to the wooden frame [11] every 250 mm by means of screws [16] and have also been finished off with a silicone kit.

On both sides, the vertical joint between the two parts of the frame has been covered with a wooden lath [17], that has been screwed [18] to the frame alternately every 250 mm.

In case of glass specimen [9], the protective glass layer (PYROBEL 16) is positioned on the exposed side. In case of glass specimen [10], the protective glass layer (PYROBEL 16) is positioned on the unexposed side.

2 Test reports and test results in support of the classification

2.1 Test reports

Name of the laboratory that carried out the test	Identification number of the reports	Owner of the report	Date of the test	Test method
WFRGENT nv	12857A	ACG Flatt Glass Europe	22/08/2007	EN 1363-1:1999 EN 1364-1:1999
WFRGENT nv	12857B	ACG Flatt Glass Europe	22/08/2010	EN 15254-4:2008+A1:2011

<u>Exposure conditions during the fire resistance test:</u>

Temperature/time curve: standard as in EN 1364-1:1999.

Direction of exposure:

- The glazing system is asymmetrical: the glass panes are tested in both directions.
- The framing system is symmetrical.

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

2.2 Test results

Parameter	Results
Loadbearing capacity	Not applicable
Integrity	
Time of ignition of a cotton pad	No failure at test termination
Time of occurrence of sustained flaming	No failure at test termination
Time of failure of gap gauge criterion	No failure at test termination
Thermal insulation	
Time after which the mean temperature at the unexposed side exceeds 140 °C	After 34 minutes
Time after which the maximum temperature rise at the unexposed side exceeds 180 °C	After 38 minutes
Radiation	
Time after which the radiation intensity exceeds 15 kW/m²	No failure at test Termination
Mechanical action	Not applicable

The test duration was 49 minutes.

3 Classification and field of application

3.1 Reference of classification

This classification has been carried out in accordance with clause 7.5.2 of EN 13501-2:2007+A1:2009.

3.2 Classification

The element is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classifications are only valid for the direction of exposure as described in clause 2.1.

EI 30, EI 20, EI 15

EW 30, EW 20

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 decrease in the partition width.
b) Unlimited increase in partition width.
c) Unlimited decrease in partition height. No extension in height is allowed above 3 m.
d) Decrease in linear dimensions of panes.
e) Change in the aspect ratio of the panes provided that the largest dimension of the pane and its area are not increased.
f) Decrease in distance between mullions and/or transoms.
g) Decrease in distance between fixing centres.
h) Increase of dimensions of framing members.
i) Allowances for expansion if none were incorporated in the test specimen.
j) Change in angle of installation 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.

The justification and the calculations are given in the extended application report no.12857C.

3.4.1 Exchange of the fire resistant glass

The “Pyrobel 16 - EG” glass panes can be replaced by thicker “Pyrobel *xx* -EG” glass panes, considering the rules listed in the extended application report.

(*xx*: nominal thickness of the “Pyrobel” component)

3.4.2 Asymmetrical fire resistant glass

Tested glass:

The glass pane can be used in both directions, as long as the maximum dimensions for each direction are not exceeded. Attention: the maximum dimensions are different for each direction (see following paragraphs).

Exchanged glass with increased nominal thickness:

The thicker asymmetrical glass pane can be used in both directions as long as the maximum dimensions for each direction are not exceeded .

3.4.3 Individual rectangular glass panes: aspect ratio and increase in area

The maximum dimensions of the rectangular, triangular and four sided shaped glass panes are represented by the thickest lines in annexes 6, 7, 8 and 9 of this classification report, for the indicated classifications (E - EI) and glass orientation.

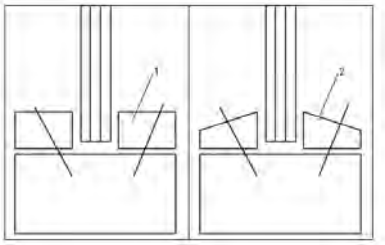
The maximum dimensions of the other non-rectangular glass panes are represented by the thinnest lines in annexes 6, 7, 8 and 9 of this classification report, for the indicated classifications (E – EI) and glass orientation.

3.4.4 Individual panes in a wall: radiation

The maximum dimensions of the rectangular, triangular and four sided shaped glass panes are represented by the thickest lines in annex 6 and 8 of this classification report, for the indicated EW classifications and glass orientation.

The maximum dimensions of the other non-rectangular glass panes are represented by the thinnest lines in annex 6 and 8 of this classification report, for the indicated EW classifications and glass orientation.

3.4.5 Exchange of timber glazing beads



Principal drawing 1

- In all cases, the exchange of timber species should be on the basis of density and/or comparative char rate tests (when available), calculations according to EN 1395-1-2 or reference values. These shall demonstrate that the fire performance of the replacement timber bead is either the same or better than of that used in the reference test.
- For EI classification of fire resistant glazed elements, exchange of the bead profile from a sloped or chamfered bead to a flat bead of the same height is allowed.
- The bead depth may be increased without restraint: the bead depth must be at least 25 mm.
- The glazing beads shall only be used in the configuration in which it was tested: beads at the exposed side.

3.4.6 Bead surface coverings

Decorative surface coverings of the glazing beads may be added 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 performance of the fire resistant glazed element, e.g. in the case of replacement of coverings that provide a contribution to insulation performance.

3.4.7 Asymmetrical framing systems

The framing system is completely symmetrical and can be used in both directions.

3.4.8 Exchange of frames

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

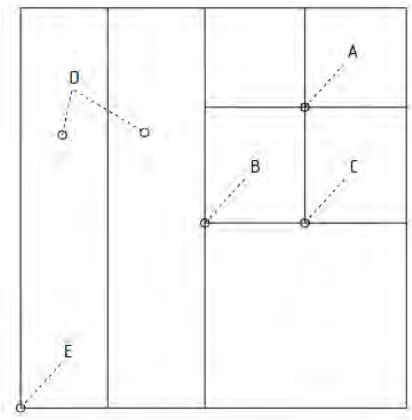
The following junction types are allowed:

Type D: two full size panes, side by side (mullion)

Type E: corner junctions

The following junction types are not allowed:

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: two full size panes, above each other (transom).



Principal drawing 2

3.4.9 Timber frames

Exchange of the type of timber species used for the frame is allowed for fire resistant glass from the same glass product group as follows:

- timber with the same or higher density and/or moisture content, with the same or lower char rate and identical profile: the density must have at least a nominal value of 526 kg/m³;
- increased thickness of the frame: the thickness of the frame must be at least 97 mm.

3.4.10 Frame surface coverings

Decorative surface coverings of the framing members may be added 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 element, e.g. in the case of replacement of coverings that provide a contribution to insulation performance.

3.4.11 Increase in overall dimensions and area of the partition

The maximum dimensions of the fire resistant glazed partition are represented by the thickest lines in annexes 10 and 11 of this classification report, for the indicated E and EI classifications.

3.4.12 Increase in dimensions for fire glazed partitions: radiation

The maximum dimensions of the fire resistant glazed partition are represented by the thickest lines in annexes 10 and 11 of this classification report, for the indicated EW classifications.

3.4.13 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 all the classification times listed in §3.2 of this classification report.

3.4.14 Change 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.

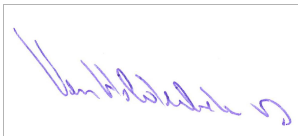
4 Duration of the validity of the classification report

At the time the standard EN 13501-2:2007+A1:2009 was published, no decision was made concerning the duration of validity of the classification document.

5 Limitations

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

SIGNED



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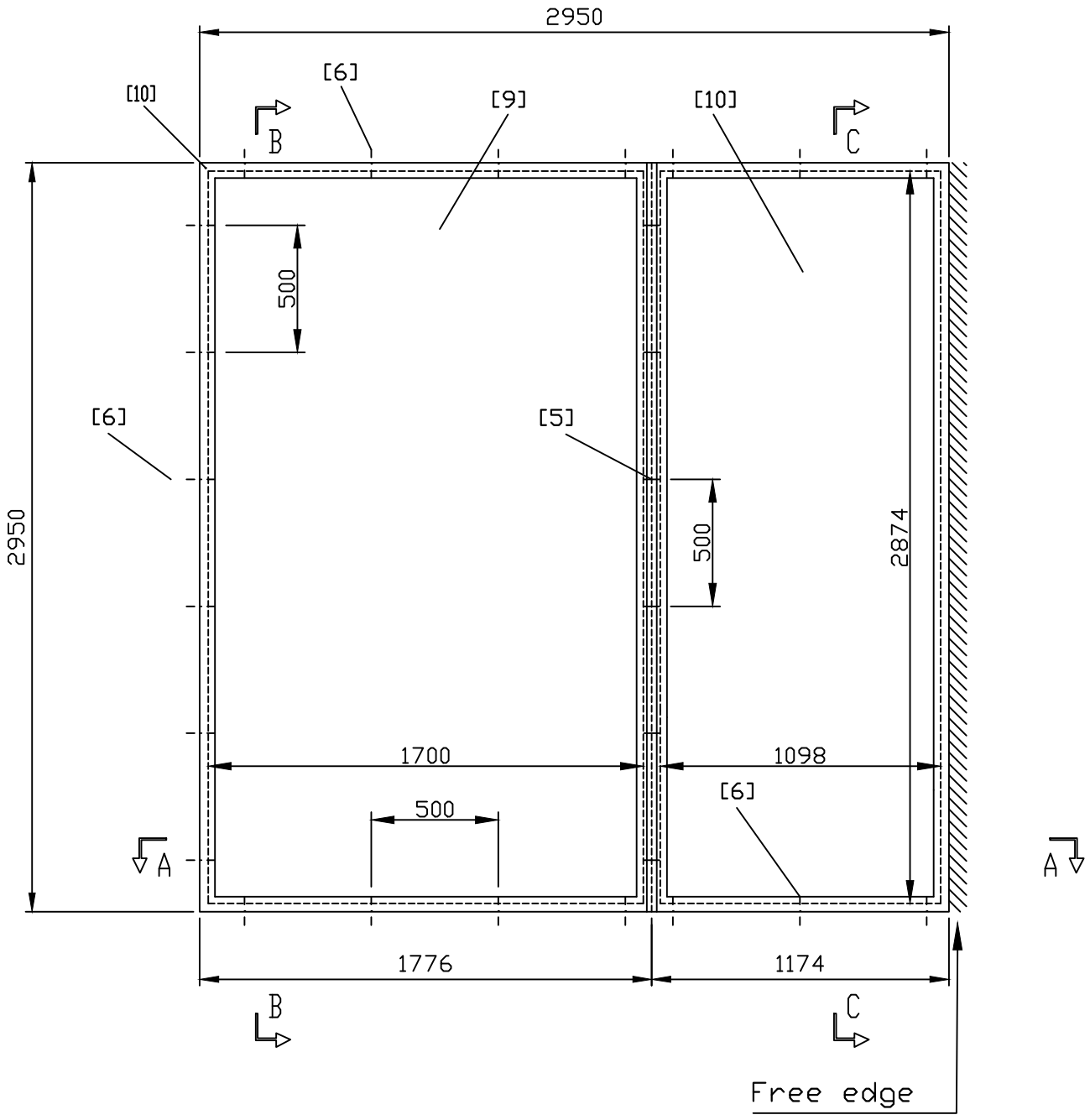
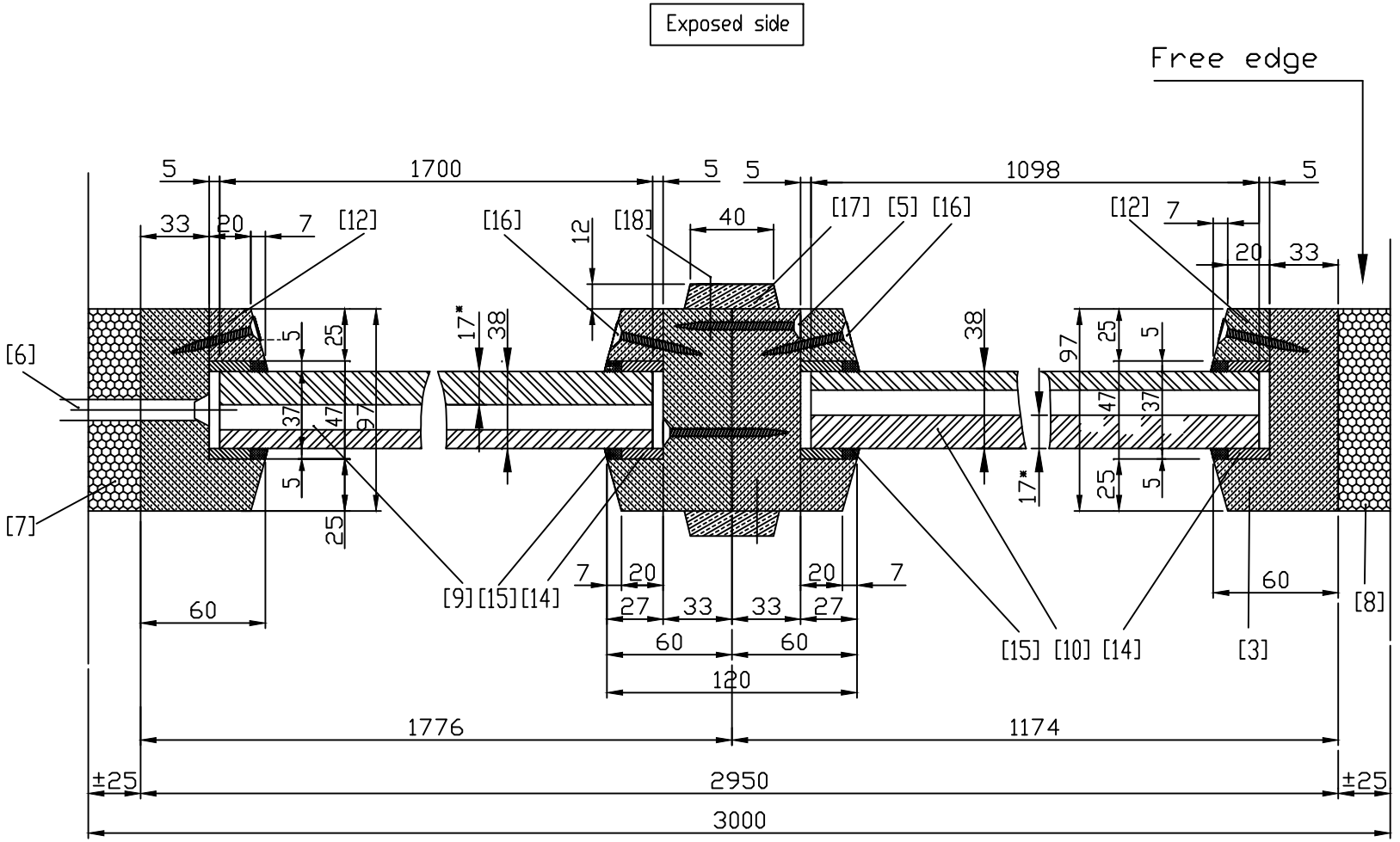
This document is the original version of this classification report and is written in English.

Front View - unexposed side

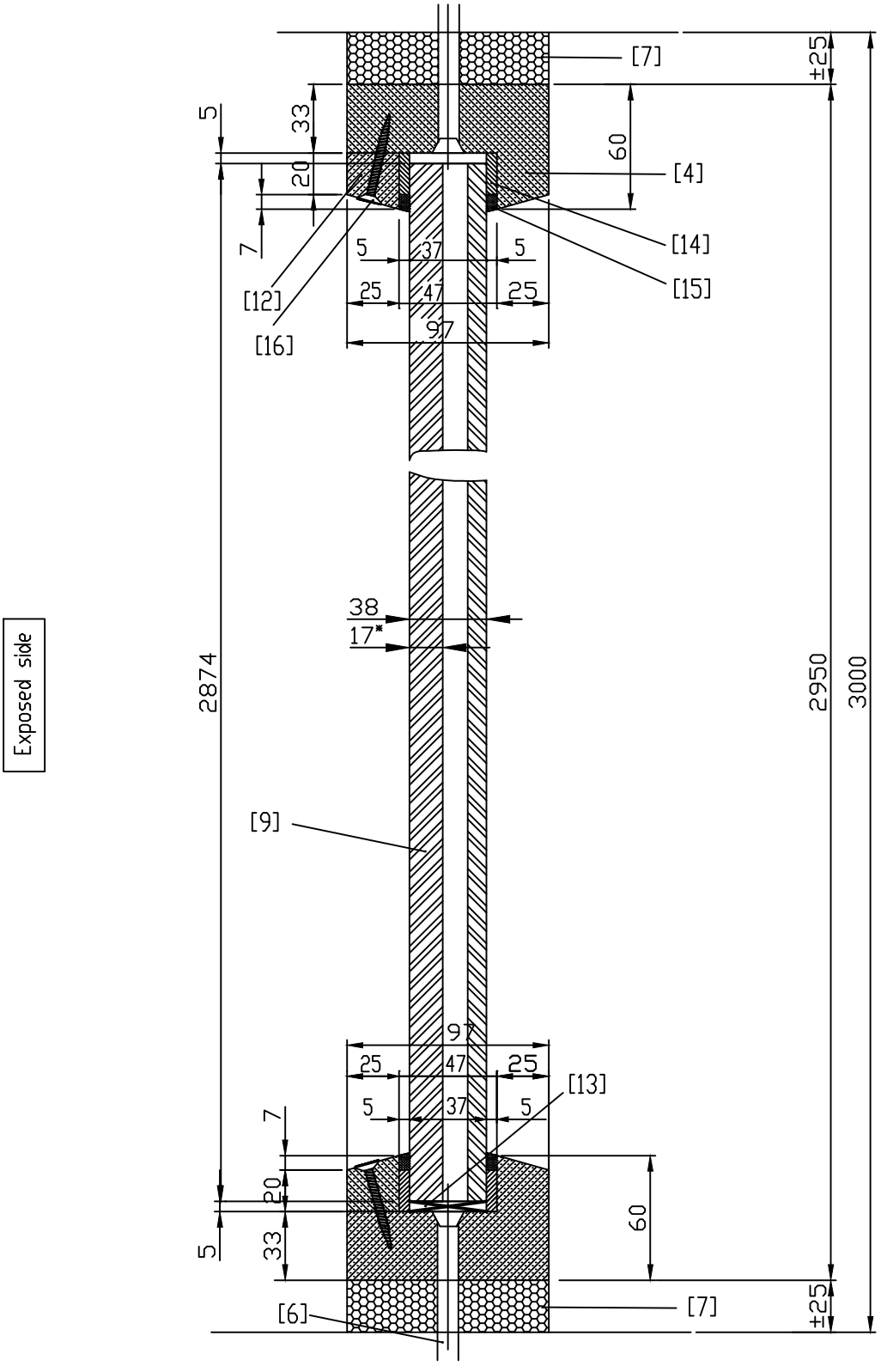


SECTION A-A

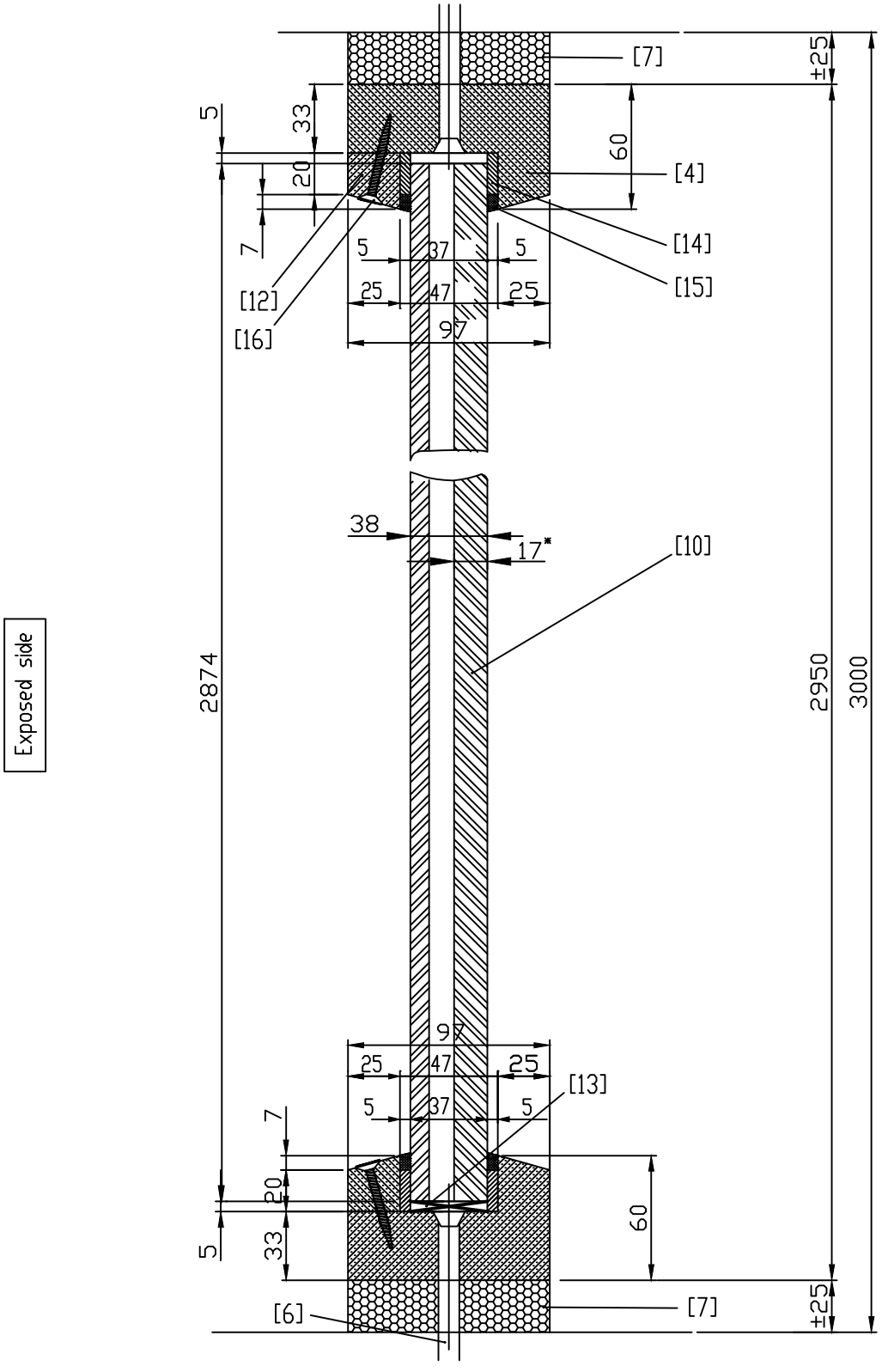


* PYREBEL 16

SECTION B-B



SECTION C-C



LEGEND

[3] Vertical post – Meranti – outside dimensions of the section: 60 mm x 97 mm – density: 526 kg/m³ (MV).

[4] Horizontal slat – Meranti – outside dimensions of the section: 60 mm x 97 mm – density: 526 kg/m³ (MV).

[5] Steel screw – diameter: 5 mm – length: 60 mm.

[6] Concrete plugs – steel – type : Hilti 100 HT – diameter : 10 mm – length : 112 mm.

[7] Mineral wool – type: thermal insulation Insulfrax – initial thickness: 50 mm – compressed to a thickness of approximately 25 mm – density: 96 kg/m³.

[8] Rock wool – brand and type: ROCKWOOL 504 – initial thickness: 50 mm – compressed to a thickness of approximately 25 mm – density: 140 kg/m³.

[9] Glass – type: Pyrobel 16 IGU – dimensions: 1700 mm x 2874 mm – total thickness: 38 mm – reference: BX08245-01-501 – the protective glass layer is placed on the exposed side – type: Pyrobel 16 – thickness: 17 mm – reference: BX08083-11-501.

[10] Glass – type: Pyrobel 16 IGU – dimensions: 1098 mm x 2874 mm – total thickness: 38 mm – reference: BX08245-02-501 – the protective glass layer is placed on the unexposed side – type: Pyrobel 16 – thickness: 17 mm – reference: BX08083-12-501.

[11] Hardwood frame – Meranti – 526 kg/m³ (MV).

[12] Glazing bead – Meranti – outside dimensions of the section: 27 mm x 25 mm.

[13] Adjusting blocks – type: Promatect H – dimensions: 70 mm x 37 mm x 5 mm.

[14] Ceramic paper – type: Superwool X607 – section: 20 mm x 5 mm.

[15] Neutral silicone – Brand: Dow Corning – type: Firestop 700.

[16] Steel screw – diameter: 4 mm – length: 60 mm.

[17] Wooden lath – Meranti – outside dimensions of the section: 40 mm x 12 mm – density: 526 kg/m³.

[18] Steel screw – diameter: 3,5 mm – length: 35 mm.

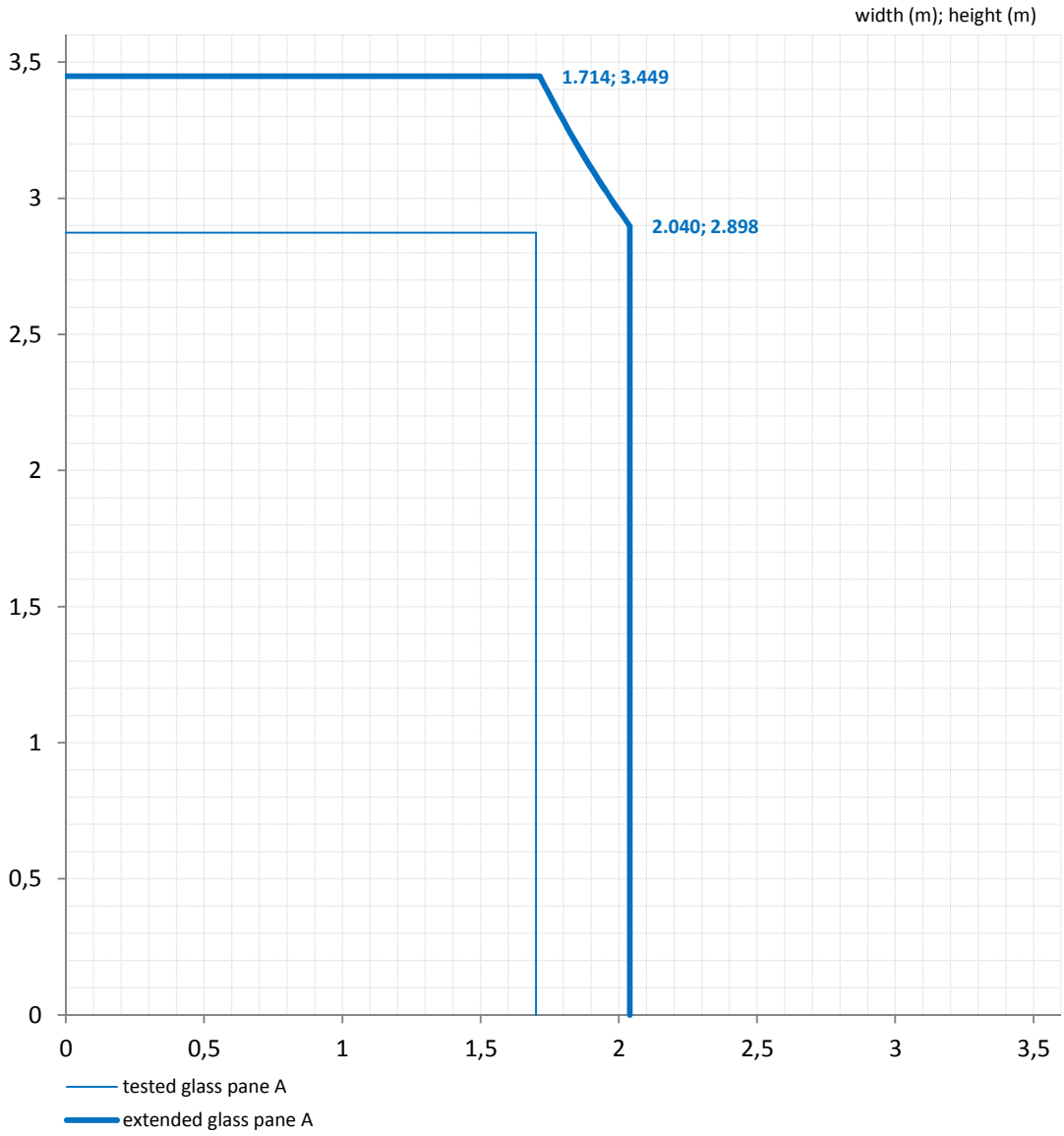
Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:

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

The extended dimensions are only valid for direction of exposure 1:

- "Pyrobel 16" glass component at the exposed side.



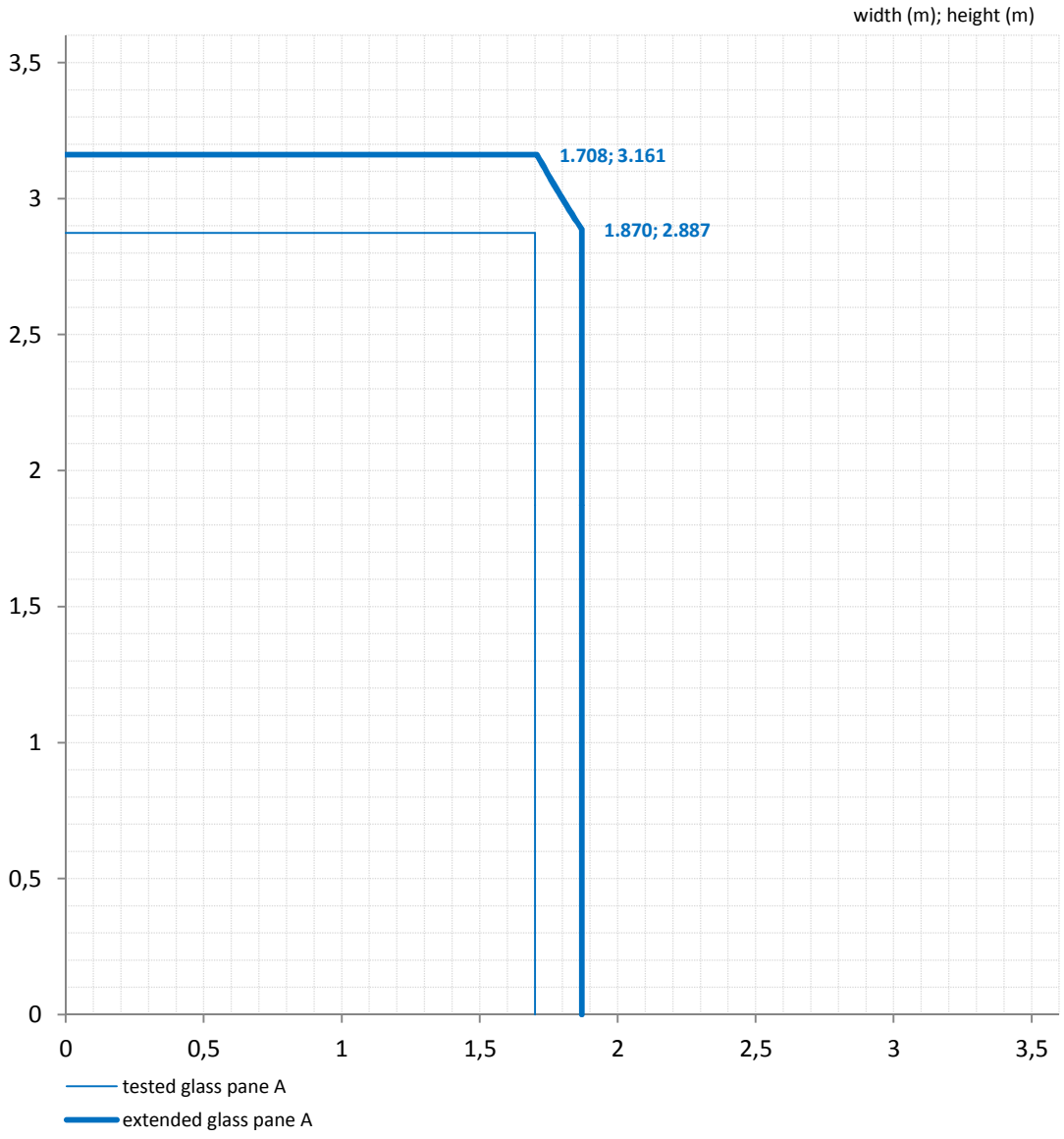
Note:

The maximum dimensions of the 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).

Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:
- **EI 30**.

The extended dimensions are only valid for direction of exposure 1:
- "Pyrobel 16" glass component at the exposed side.



Note:

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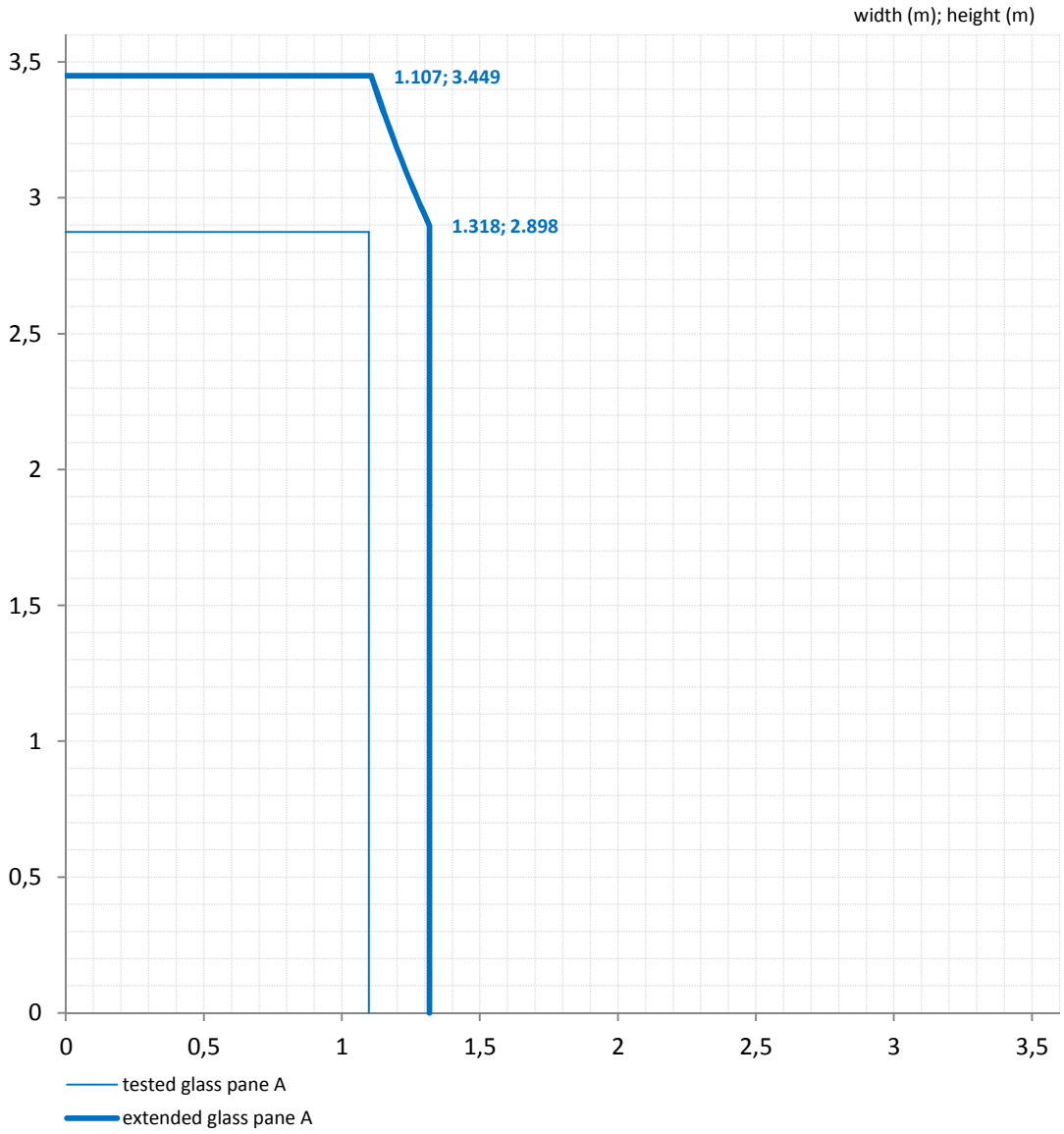
Individual rectangular glass panes: aspect ratio and increase in area

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

The extended dimensions are only valid for direction of exposure 2:
- "Pyrobel 16" glass component at the unexposed side.



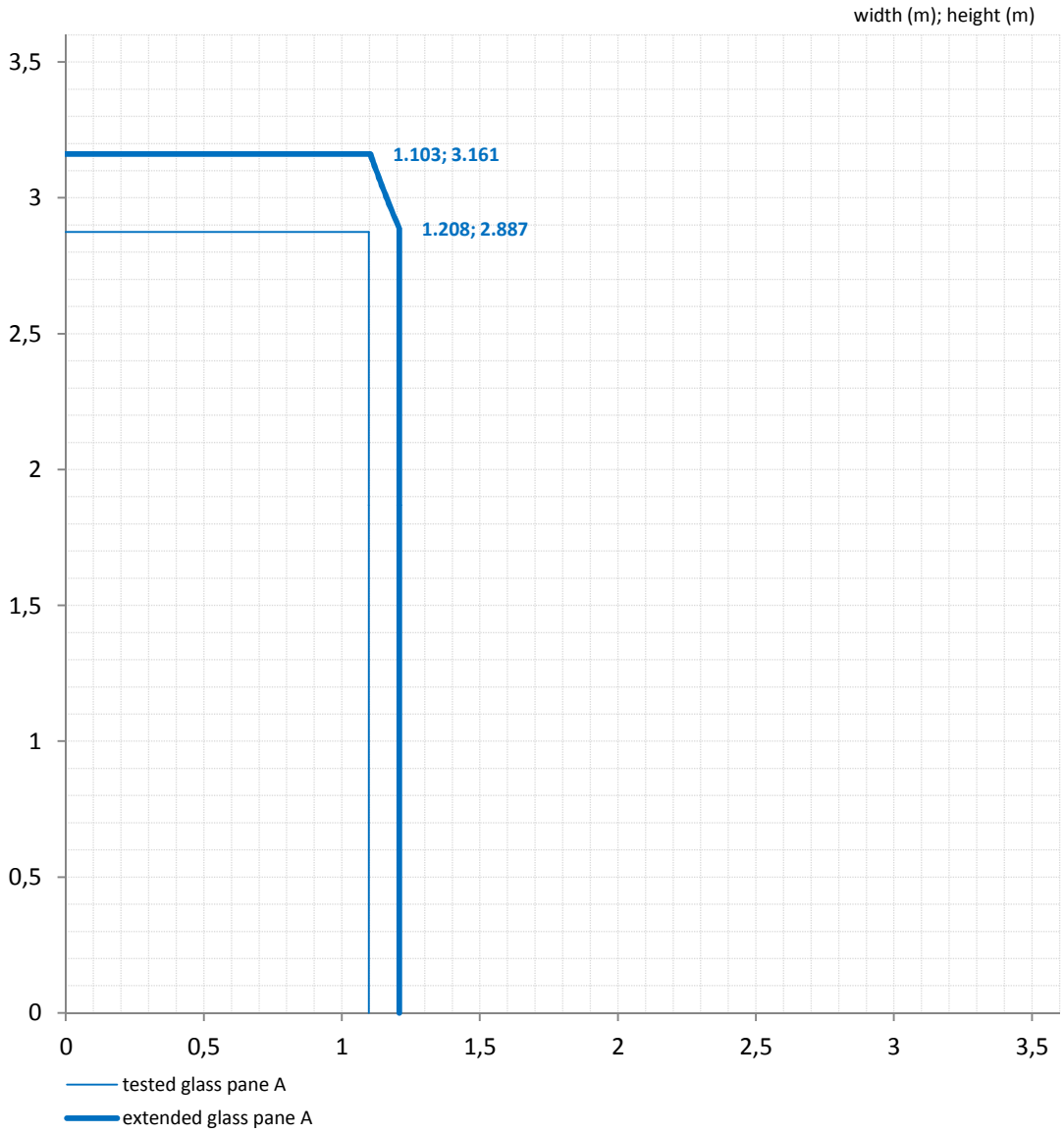
Note:

The maximum dimensions of the 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).

Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:
- **EI 30**.

The extended dimensions are only valid for direction of exposure 2:
- "Pyrobel 16" glass component at the unexposed side.

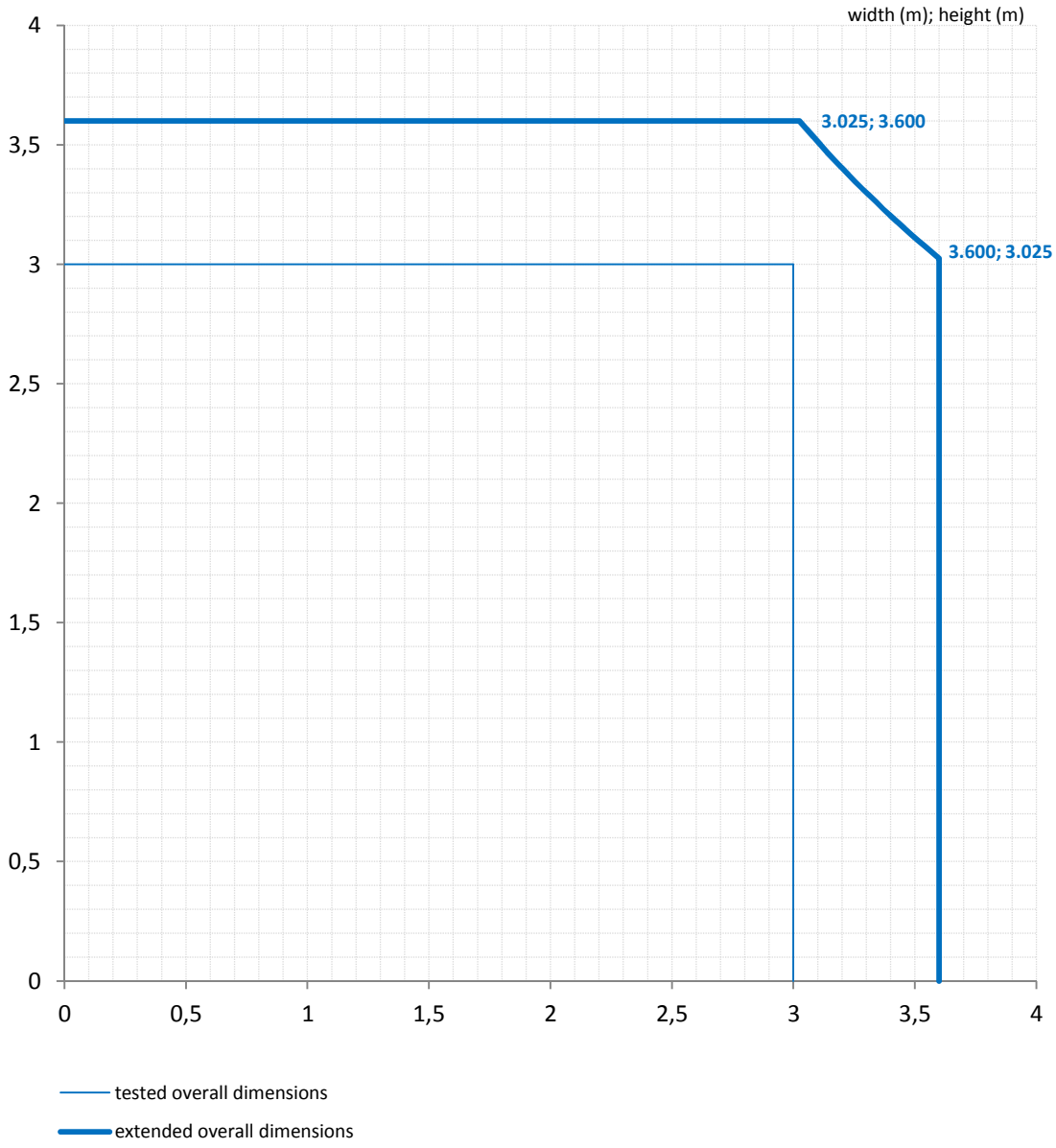


Note:

The maximum dimensions of the 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 as a whole

The extended dimensions are only valid for the following classification:
- **EI 20, EI 15**;
- **E 30 , E 20**;
- **EW 30, EW 20**.

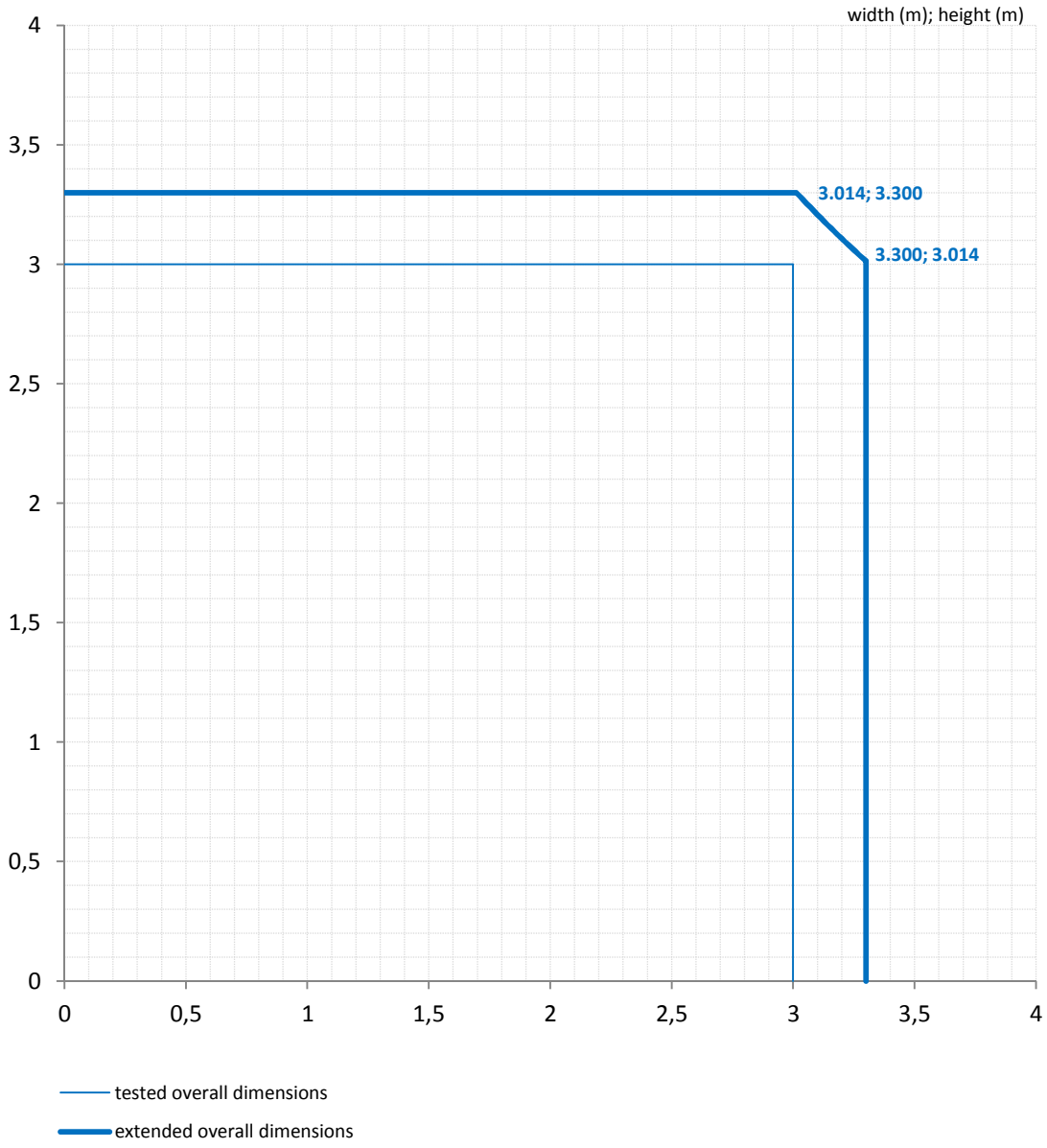


Note:

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 element is allowed.

Increase in overall dimensions and area of the partition as a whole

The extended dimensions are only valid for the following classifications:
- **EI 30**.



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 element is allowed.