

FIRE RESISTANCE CLASSIFICATION REPORT No. 15927C

Owner of the classification report:

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

Introduction:

This classification report defines the classification assigned to a non-loadbearing glazed wall (type: Pyrobel 16 EG DGU_Hardwood frame_silicone), 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 12 pages and 6 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The product is defined as a non-loadbearing glazed wall – type: Pyrobel 16 EG DGU_Hardwood frame_silicone. 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 partition is fully described in the test report provided in support of this classification listed in clause 2.1. The drawings of this test report are enclosed in the annexes 1 till 4 of this classification report.

1.2.1 Composition of the tested wall construction:

1.2.1.1 glazing system:

[1]-[9] Glass panes – type: Pyrobel 16 EG DGU – composition: pyrobel 16 EG - air 10 - 6 tempered – nominal thickness: 39.0 ± 2 mm measured thickness: 37.7 till 39.2.

- position: shown in annex 1.
- fixing: clasped between the glazing beads.
- orientation: Pyrobel 16 EG glass component at the exposed side.

| | Dimensions of the glass panes: (width x height) | Dimensions of the exposed area: (width x height) | Reference: |
|-----|----------------------------------------------------|-----------------------------------------------------|----------------|
| [1] | 597 mm x 1006 mm | 543 mm x 952 mm | CM24834-01-501 |
| [2] | 597 mm x 1006 mm | 543 mm x 952 mm | CM24834-01-502 |
| [3] | 577 mm x 1006 mm | 543 mm x 952 mm | CM24831-01-501 |
| [4] | 597 mm x 1006 mm | 543 mm x 952 mm | CM24834-01-503 |
| [5] | 597 mm x 1006 mm | 543 mm x 952 mm | CM24834-01-504 |
| [6] | 577 mm x 1006 mm | 523 mm x 952 mm | CM24742-01-501 |
| [7] | 1250 mm x 750 mm | 1196 mm x 696 mm | CM24833-01-501 |
| [8] | 577 mm x 750 mm | 523 mm x 696 mm | CM24835-01-501 |
| [9] | 900 mm x 2874 mm | 846 mm x 2820 mm | CM24832-01-501 |

[10] Setting block – material: hardwood – dimensions: 70 mm x 39 mm x 5 mm – density: 687 kg/m³ (MV).

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

[11] Chamfered glazing bead – material: hardwood – type: Meranti – section dimensions: 20 mm x 30 mm x 27 mm – density: 491 kg/m³ (MV).

- position: at the exposed and unexposed side.
- fixing:
 - with chipboard screws T20 [12] (both sides) – material: steel – diameter: 4.5 mm – length: 60 mm;
 - centre/centre distance: 200 to 250 mm.

[13] Glazing strip – material: self-adhesive ceramic paper – type: Superwool X607 – thickness: 5 mm – density: 210 kg/m³ (NV).

- position: between the chamfered glazing beads and the glass panes.

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

- position: sealing between the glass panes and the chamfered glazing beads.

1.2.1.2 Framing system:

The timber frame is composed of two units screwed to one another.

[15] Transoms and mullions – material: Meranti – section dimensions: 33 mm x 109 mm – density: 491 kg/m³ (MV).

- number: 4 transoms and 4 mullions.
- fixing to the concrete frame:
 - with anchors [16] – material: steel – brand and type: Hilti 100 HT – diameter: 10 mm – length: 112 mm;
 - centre/centre distance: 500 mm.
- fixing of the units:
 - with chipboard screws T25 [17] – material: steel – diameter: 5 mm – length: 60 mm;
 - centre/centre distance: 300 mm.

[18] Intermediate transoms and intermediate mullions – material: Meranti – section dimensions: 46 mm x 109 mm – density: 491 kg/m³ (MV).

- number: 2 intermediate transoms and 5 intermediate mullions.
- fixing:
 - glued to the connecting (intermediate) transom or (intermediate) mullion.

[19] Cover lath – material: Meranti – outer dimensions: 45 mm x 12 mm x 40 mm – density: 491 kg/m³ (MV).

- number: 2, one at each side.
- position: over the joint between the two units.
- fixing:
 - with SPP-screws T15 [20] – material: steel – diameter: 3.5 mm – length: 35 mm;
 - centre/centre distance: 300 mm (alternating from edge).

[21] Setting block – material: calcium silicate – type Promatect-H – dimensions: 200 mm x 65 mm x 20 mm – density: 870 kg/m³ (NV).

- position: under the timber frame.
- centre/centre distance: 850 to 950 mm.

[22] Mineral wool – type: Thermal insulation Superwool X607 – initial density: 96 kg/m³ – initial thickness: 25 mm.

- position: between the concrete frame and the timber frame at the fixed edges.

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 | 15927A | AGC Glass Europe. | 15/03/2013 | EN 1363-1:2012 EN 1364-1:1999 |
| WFRGENT nv | 15927B | AGC Glass Europe. | 15/03/2013 | EN 15254-4:2008+A1:2011 |

Exposure conditions during the fire resistance test:

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

Direction of exposure: The glazing system is asymmetrical: the Pyrobel 16 EG glass segment at the exposed side.

The framing system is symmetrical.

No load is applied.

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 | 66 minutes |
| 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 | 59 minutes |
| Time after which the maximum temperature rise at the unexposed side exceeds 180 °C | 58 minutes |
| Radiation | |
| Time after which the radiation intensity exceeds 15 kW/m ² | No failure at test Termination |
| Mechanical action | |
| No impact test | Not applicable |

The test duration was 67 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 classification is only valid for the direction of exposure as described in § 2.1.

EI 45, 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 13501-2:2007+A1:2009 and 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. Other changes are not permitted:

- a) unlimited decrease and increase in the wall width.
- b) unlimited decrease in the wall height.
- c) decrease in linear dimensions of the panes.
- d) change in the aspect ratio of the 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 distances between fixing centres.
- g) increase in the dimensions of framing members.
- h) allowances for expansion if none were incorporated in the test specimen.
- i) 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.

3.4.1 Exchange of the fire resistant glass

The “pyrobel 16 EG DGU” glass panes can be replaced by thicker “pyrobel EG DGU” glass panes, considering the rules listed in extended application report 15927B.

3.4.2 (A)symmetrical fire resistant glass

The fire resistant glass is asymmetrical and can only be used in the orientation in which it was tested.

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

The maximum dimensions of the circular, triangular and four sided shaped glass panes are represented by the thickest lines in annex 5, 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 5, for the indicated E and EI classifications.

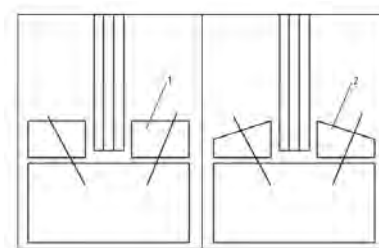
3.4.4 Individual panes in a wall: radiation

The maximum dimensions of the circular, triangular and four sided shaped glass panes are represented by the thickest lines in annex 5, for the indicated EW classifications.

The maximum dimensions of the other non-rectangular glass panes are represented by the thinnest lines in annex 5, for the indicated EW classifications.

3.4.5 Exchange of timber glazing beads

- 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 that used in the reference test.



Schematic drawing 1

- 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 (see schematic drawing 1).
- The bead depth may be increased without restraint: the bead depth must be at least 27 mm.

3.4.6 Exchange of glazing materials

Except for glazing beads, exchange of one glazing material (Gaskets/glazing, strips/setting blocks, ...) is allowed. But only if it can be demonstrated in the reference test and/or previously existing data 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 in reference test data and/or previously existing test data 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.

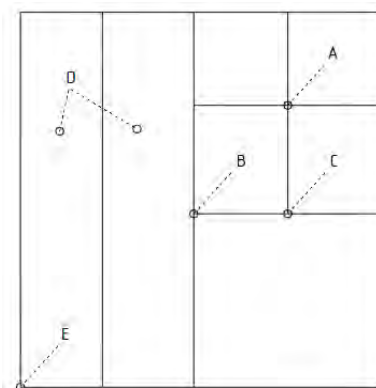
3.4.8 (A)symmetrical framing systems

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

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 is <u>not</u> allowed: | two full panes side by side; |
| type E is allowed: | corner junction; |



Schematic drawing 2

3.4.10 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, with the same or lower char rate and identical profile: the density must have at least a value of 491 kg/m³;
- Increased thickness of the frame: the thickness of the frame must be at least 109 mm.

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 proven by the reference test and/or previously existing test data.

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 6, 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 6, 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 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

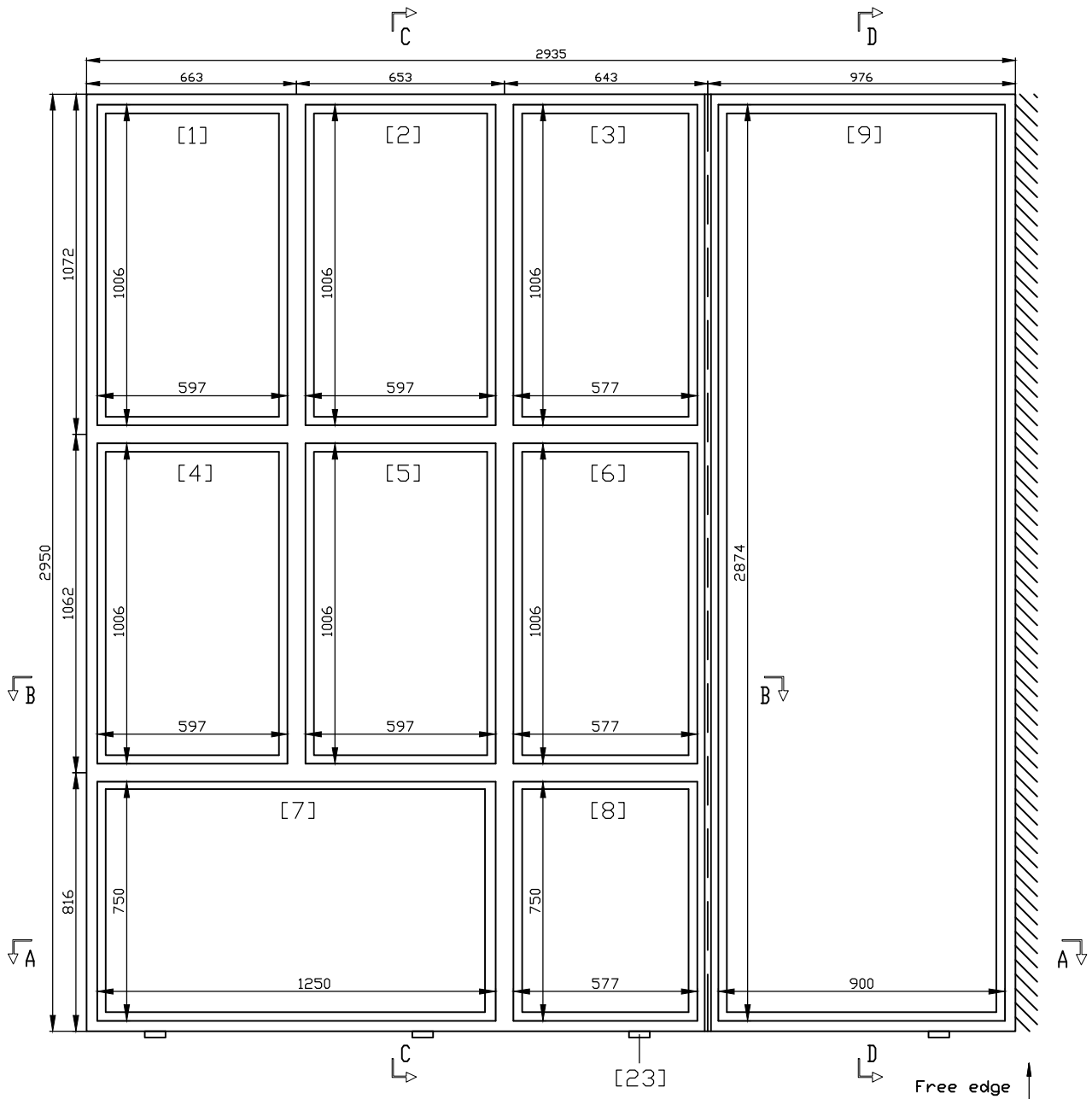
APPROVED

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

This report may be used only literally and completely for publications. - For publications of certain texts, in which this report is mentioned, our permission must be obtained in advance.

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

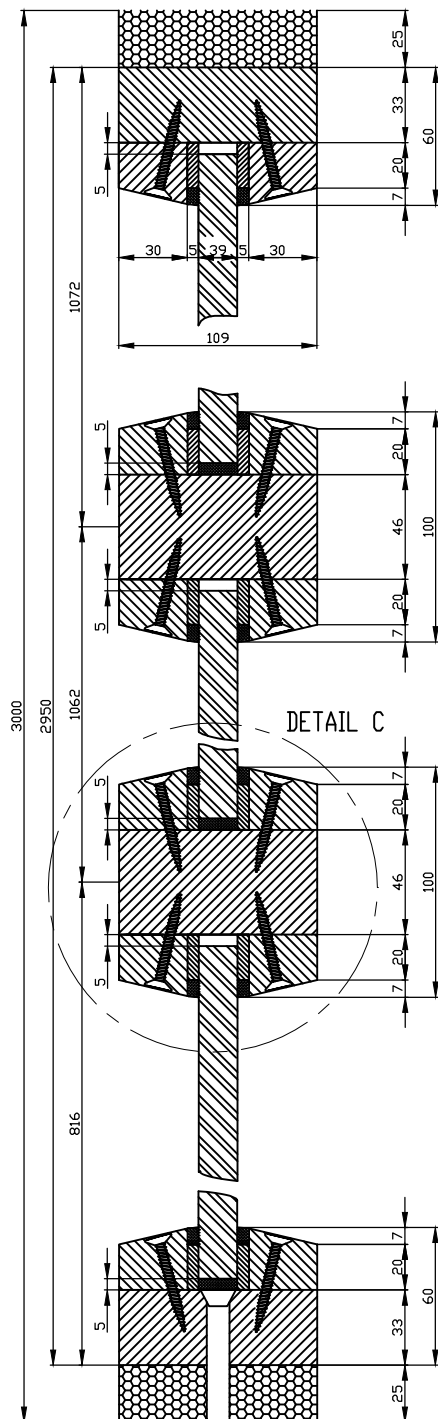
Front view (unexposed side) - dimensions.



Dimensions in mm

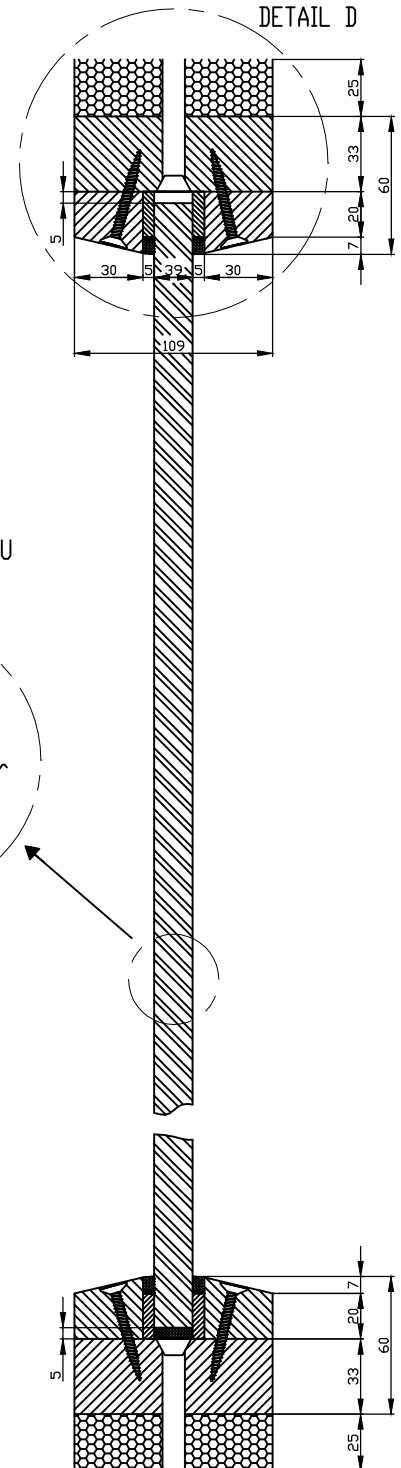
Section C-C and D-D - dimensions.

SECTION C-C



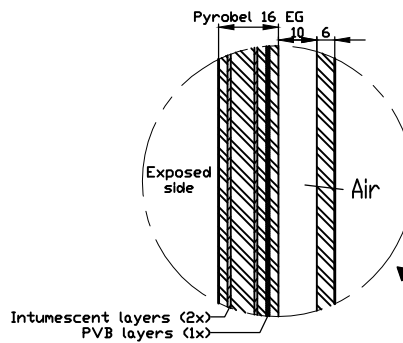
DETAIL C

SECTION D-D



DETAIL D

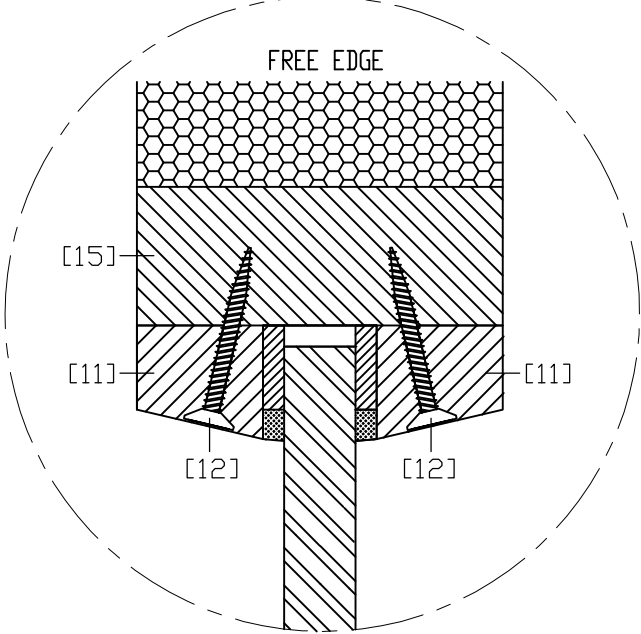
Pyrobel 16 EG DGU



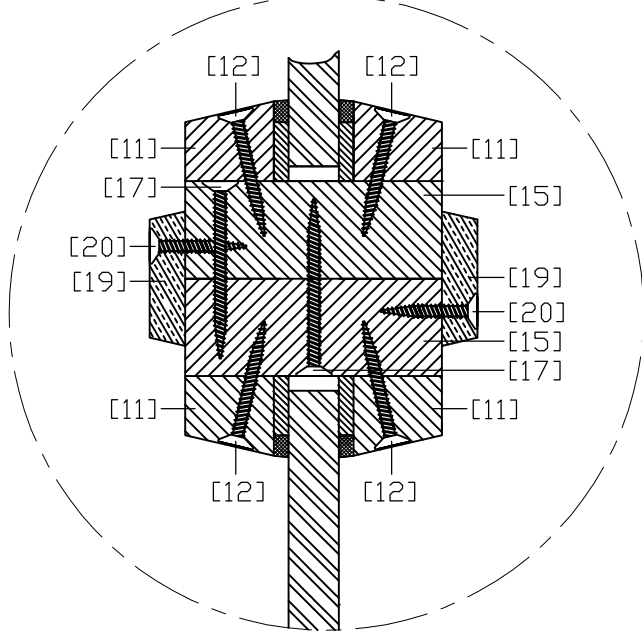
Dimensions in mm

Details.

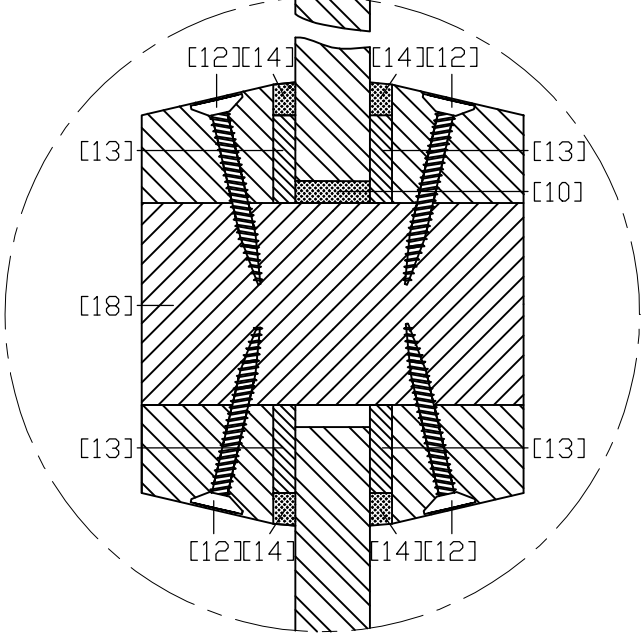
DETAIL A



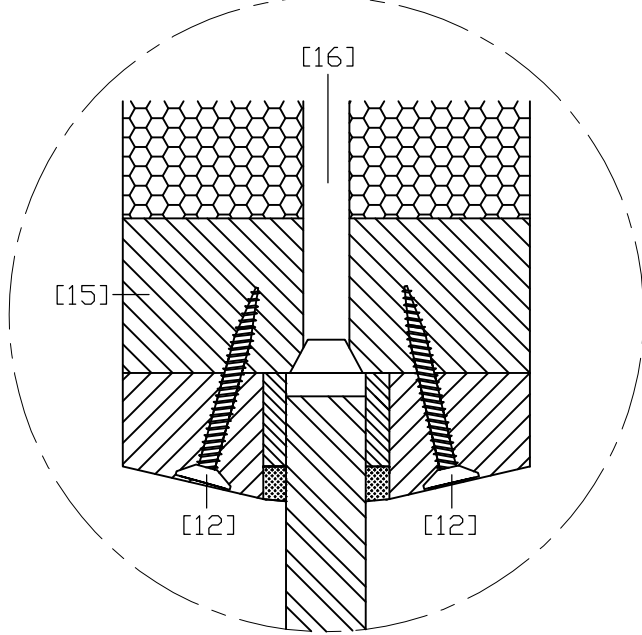
DETAIL B



DETAIL C



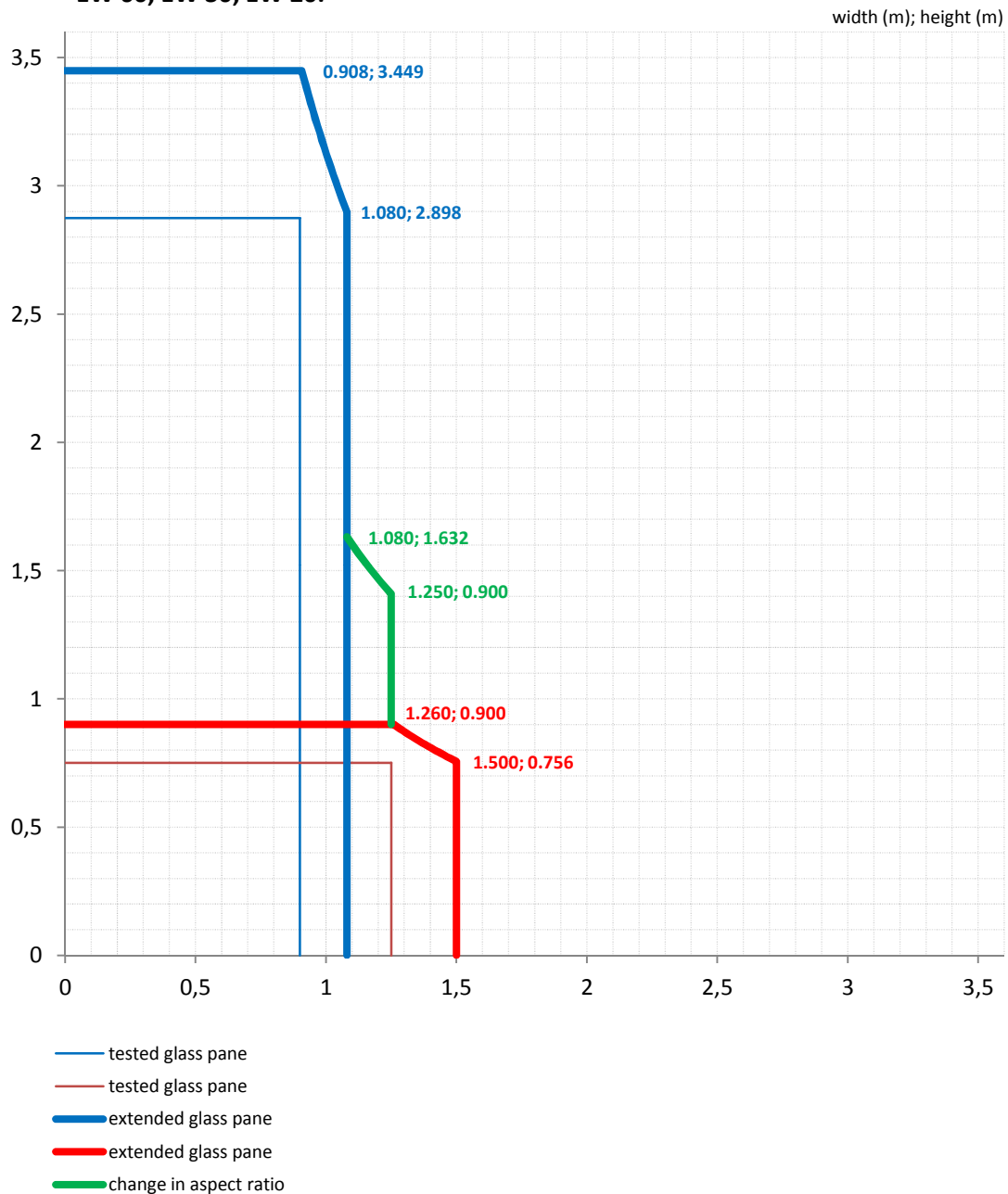
DETAIL D



Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classifications:

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



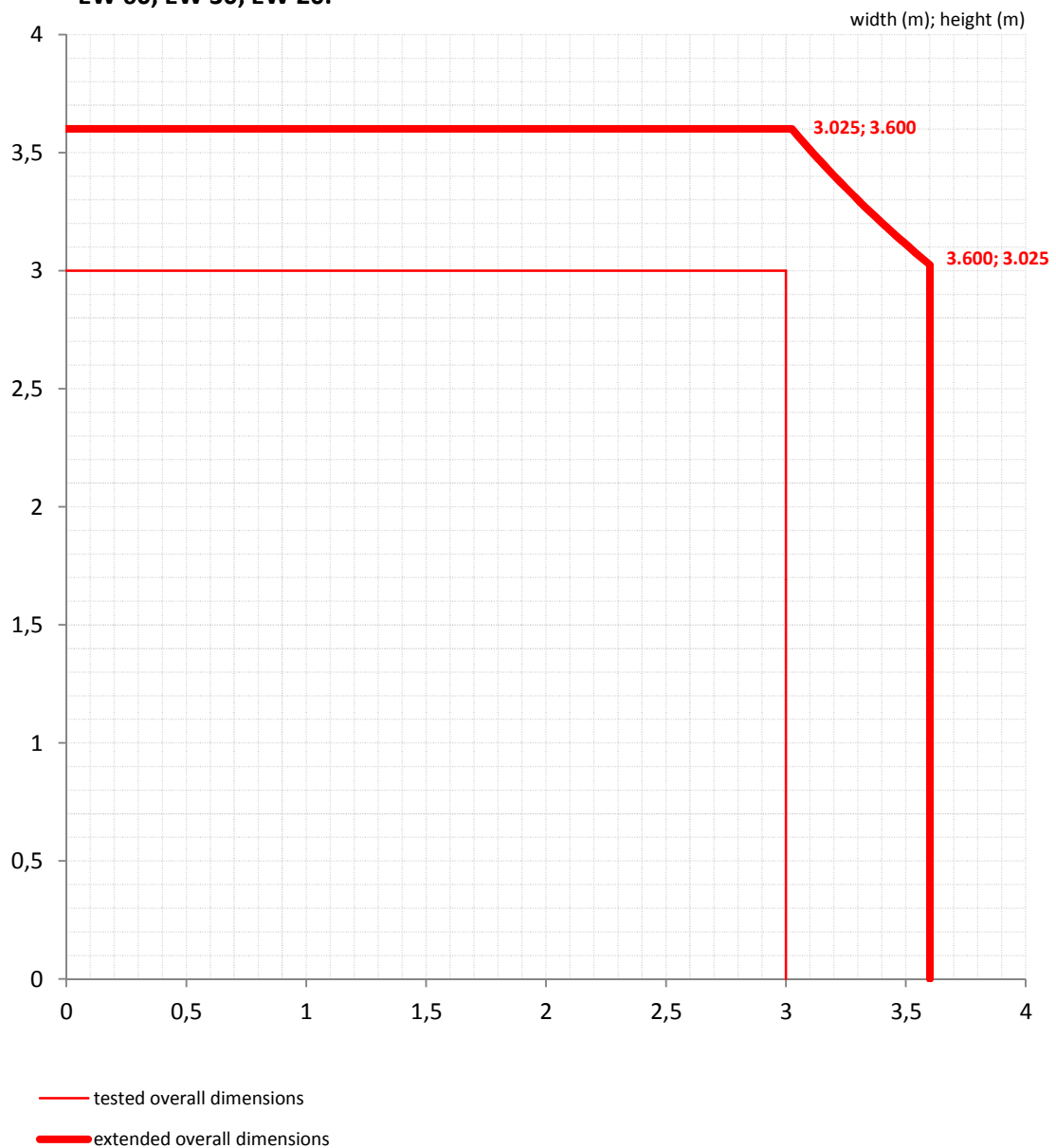
Note:

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 as a whole

The extended dimensions are only valid for the following classifications:

- EI 45, EI 30, 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.