

FIRE RESISTANCE CLASSIFICATION REPORT No. 16114C

Owner of the classification report:

AGC Glass Europe
166, Chaussée de la Hulpe
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Belgium

Introduction:

This classification report defines the classification assigned to a non-loadbearing glazed wall (type: Pyrobel 17N_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 8 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The element, Pyrobel 17N_Hardwood frame_silicone, is defined as a non-loadbearing glazed wall.

1.2 Description

The element, Pyrobel 17N_Hardwood frame_silicone, is fully described below in support of this classification. The drawings of the element are enclosed in the annexes 1 till 6 of this classification report.

1.2.1 Composition of the tested wall construction:

Dimensions of the wall:

- height: 3000 mm;
- width: 3000 mm;
- thickness: 88 mm.

1.2.1.1 Glazing system

[1]-[6] Glass panes – type: Pyrobel 17N – nominal thickness: $17.8 \pm 1,6$ mm – measured thickness: 16.5 till 18.1.

- position: shown in annex 1.
- fixing: clasped between the glazing beads.
- orientation: the glass panes are symmetrical.

	Dimensions of the glass panes: (width x height)	Dimensions of the exposed area: (width x height)	Reference:
[1]	1000 mm x 1808 mm	956 mm x 1764 mm	CM25630-02-501
[2]	800 mm x 876 mm	756 mm x 832 mm	CM25630-03-501
[3]	952 mm x 876 mm	908 mm x 832 mm	CM25630-04-502
[4]	800 mm x 876 mm	756 mm x 832 mm	CM25630-03-502
[5]	952 mm x 876 mm	908 mm x 832 mm	CM25630-04-501
[6]	2864 mm x 1000 mm	2820 mm x 956 mm	CM25630-01-501

- [7] Setting block – brand and type: Promat Promatect H – dimensions: 70 mm x 18 mm x 5 mm – density: 870 kg/m³ (NV).
- number: two per glass pane;
 - position: under the glass pane.
- [8] Chamfered glazing bead – material: hardwood – type: Meranti – outer dimensions: 30 mm x 27 mm – density: 527,3 kg/m³ (MV).
- position: at the exposed and unexposed side;
 - fixing:
 - with screws [9] – material: steel – diameter: 4.5 mm – length: 50 mm;
 - centre-to-centre distance: 190 to 210 mm.
- [10] Glazing strip – material: self-adhesive ceramic paper – type: Superwool X607 – section dimension: 5 mm x 20 mm – density: 210 kg/m³ (NV).
- position: between the chamfered glazing beads and the glass panes.
- [11] Sealant – material: neutral silicone – brand and type: Dow Corning Firestop 700.
- position: on top of the glazing strip between the chamfered glazing beads and the glass panes.

1.2.2 Framing system

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

- [12] Transoms and mullions – material: Meranti – section dimensions: 33 mm x 88 mm – density: 527,3 kg/m³ (MV).
- number: 4 transoms and 4 mullions;
 - fixing to the concrete frame:
 - with anchors [13] – material: steel – brand and type: Hilti 100 HT – diameter: 10 mm – length: 112 mm;
 - centre-to-centre distance: 400 to 450 mm;
 - interfixing of the units:
 - with screws [14] – material: steel – diameter: 5 mm – length: 60 mm;
 - centre-to-centre distance: 300 mm.

- [15] Intermediate transoms and intermediate mullions – material: Meranti – section dimensions: 46 mm x 88 mm – density: 527,3 kg/m³ (MV).
- number: 2 intermediate transoms and 2 intermediate mullions;
 - fixing: glued to the connecting (intermediate) transom or (intermediate) mullion.
- [16] Cover lath – material: Meranti – outer dimensions: 40 mm x 12 mm – density: 527,3 kg/m³ (MV).
- number: 2, one at each side;
 - position: over the joint between the two units;
 - fixing:
 - with screws [17] – material: steel – diameter: 3.5 mm – length: 35 mm;
 - centre-to-centre distance: 300 mm (alternating from edge).
- [18] Setting block – material: calcium silicate – type Promatect-H – dimensions: 100 mm x 88 mm x 20 mm – density: 870 kg/m³ (NV).
- position: under the timber frame.
 - centre-to-centre distance: 850 to 950 mm.
- [19] Mineral wool – type: Thermal insulation Insulfrax – initial density: 96 kg/m³ – initial thickness: 20 mm.
- position: between the concrete frame and the timber frame at the fixed edges.

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	16114A	AGC Glass Europe	15/07/2013	EN 1364-1:1999
WFRGENT nv	16114B	AGC Glass Europe	-	EN 15254-4:2008+A1:2011

Exposure conditions during the fire resistance test:

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

Direction of exposure: The glazing system is symmetrical.
The framing system is symmetrical.

No load was applied.

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

2.2 Test results

Parameters	Results
Thermal insulation – I	
$\Delta T_m = 140^\circ\text{C}$	52 minutes
$\Delta T_M = 180^\circ\text{C}$	51 minutes
Integrity – E	
Spontaneous and sustained flaming	66 minutes
Failure with gap gauge \varnothing 6 mm	74 minutes, no failure ⁽¹⁾
Failure with gap gauge \varnothing 25 mm	74 minutes, no failure ⁽¹⁾
Ignition of cotton pad	66 minutes, no failure ⁽²⁾
Radiation – W	
Radiation intensity = 15 kW/m ²	74 minutes, no failure ⁽¹⁾

⁽¹⁾ The test was stopped after 74 minutes at the request of the sponsor.

⁽²⁾ No failure until spontaneous and sustained flaming.

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 17N_Hardwood frame_silicone, is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classifications are valid for both directions of exposure.

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 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 “pyrobel 17N” glass panes can be replaced by thicker “pyrobel” glass panes, considering the rules listed in extended application report 16114B.

3.4.2 (A)symmetrical fire resistant glass

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

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 7, 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 7, for the indicated E and EI classifications.

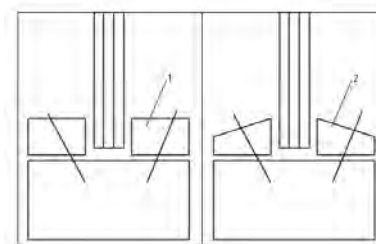
3.4.4 Individual rectangular glass panes: radiation

The maximum dimensions of the circular, triangular and four sided shaped glass panes are represented by the thickest lines in annex 7, for the indicated EW classifications.

The maximum dimensions of the other non-rectangular glass panes are represented by the thinnest lines in annex 7, 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

- The bead height may be increased provided that the increased edge cover on the glass can be demonstrated not to have a detrimental effect on its fire performance. The edge cover shall remain within the limits determined by the reference test or as determined by previously existing test data. A reduction of the bead height is not allowed: the bead height must be at least 27 mm.
- 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 30 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 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.

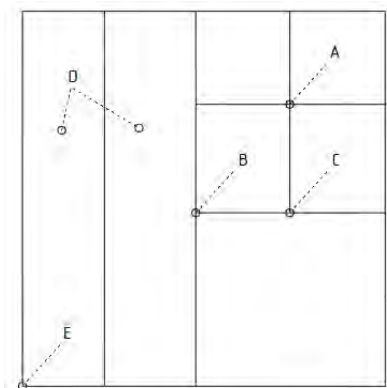
3.4.8 (A)symmetrical framing systems

The framing system is 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 527.3 kg/m³;
- Increased thickness of the frame: the thickness of the frame must be at least 88 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.

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 8, 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 8, 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.

SIGNED

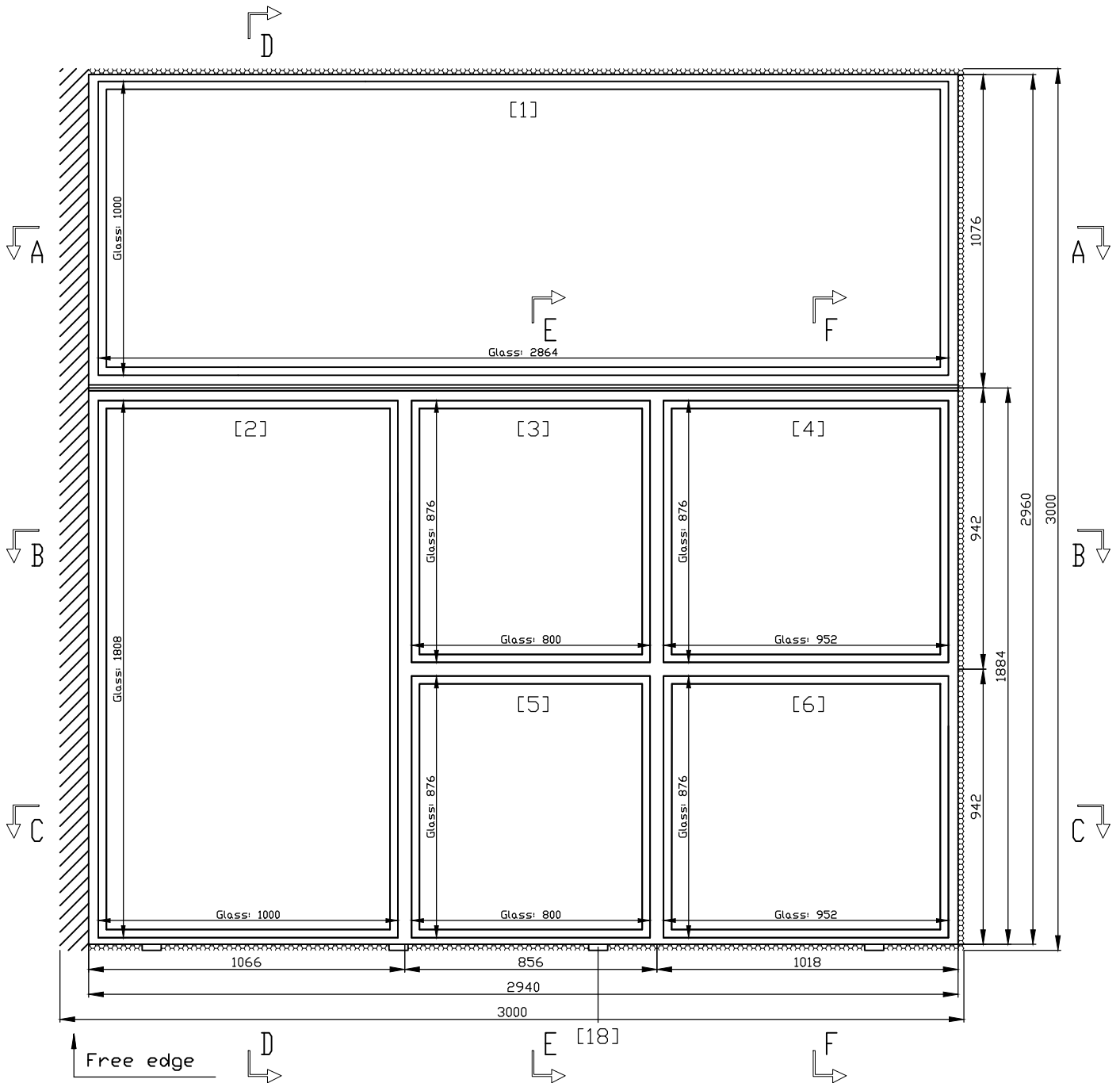
APPROVED

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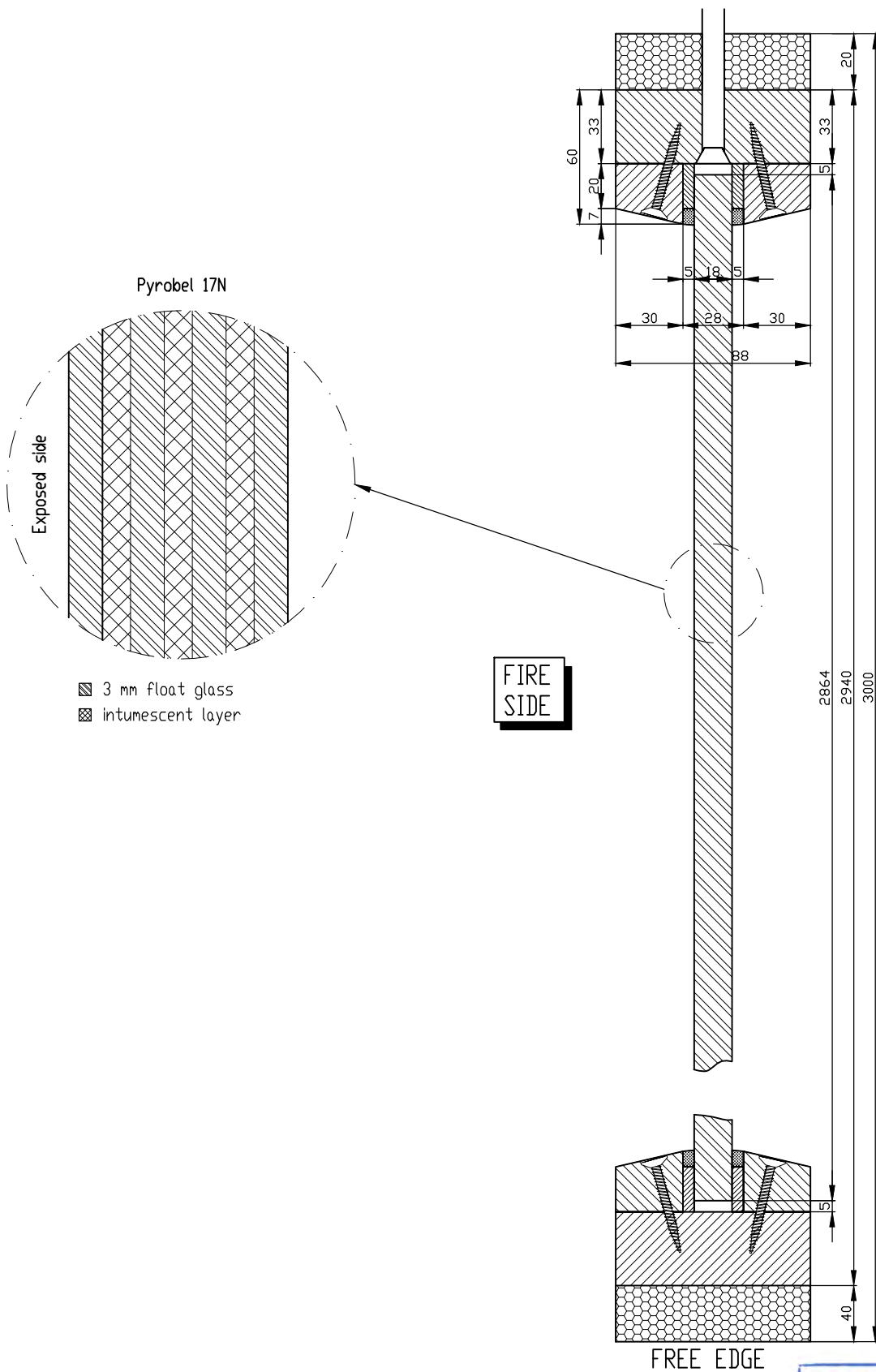
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Front view (unexposed side) - dimensions



Dimensions in mm.

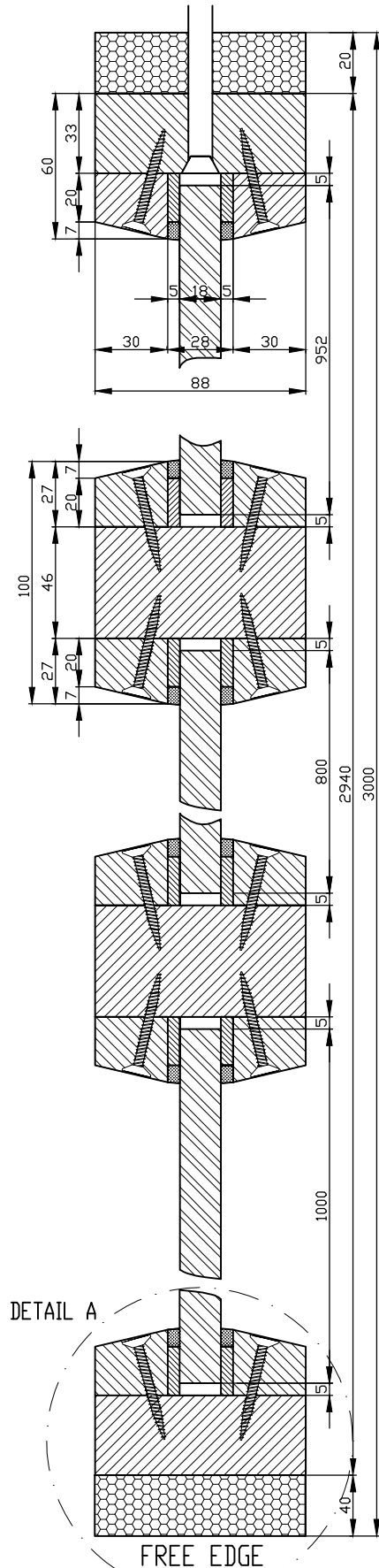
Section A-A - dimensions



Dimensions in mm.

Section B-B and C-C - dimensions

FIRE
SIDE



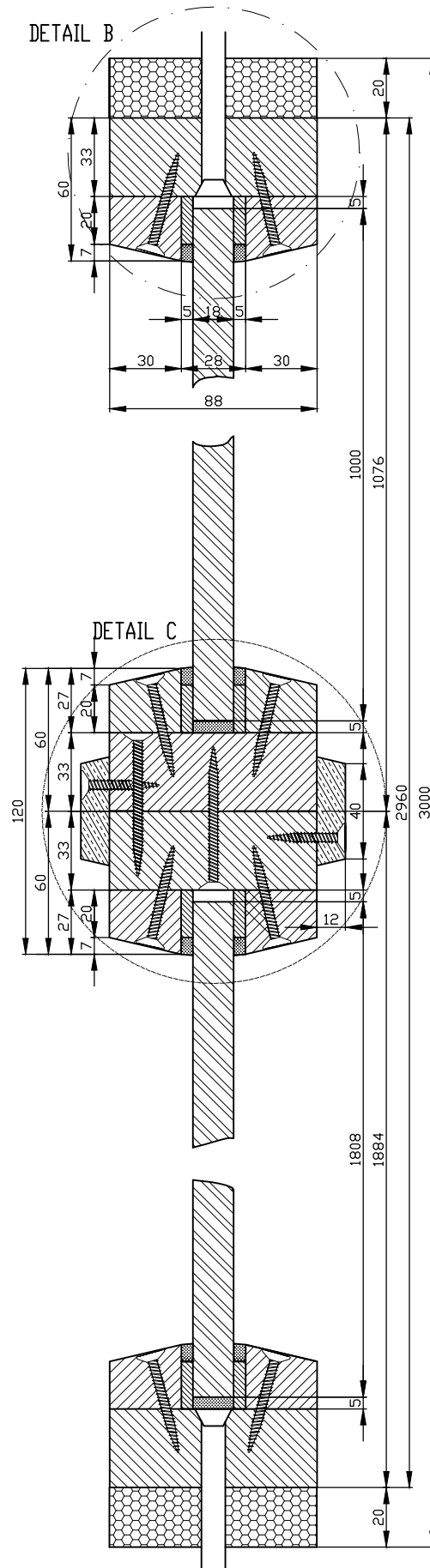
DETAIL A

FREE EDGE

Dimensions in mm.

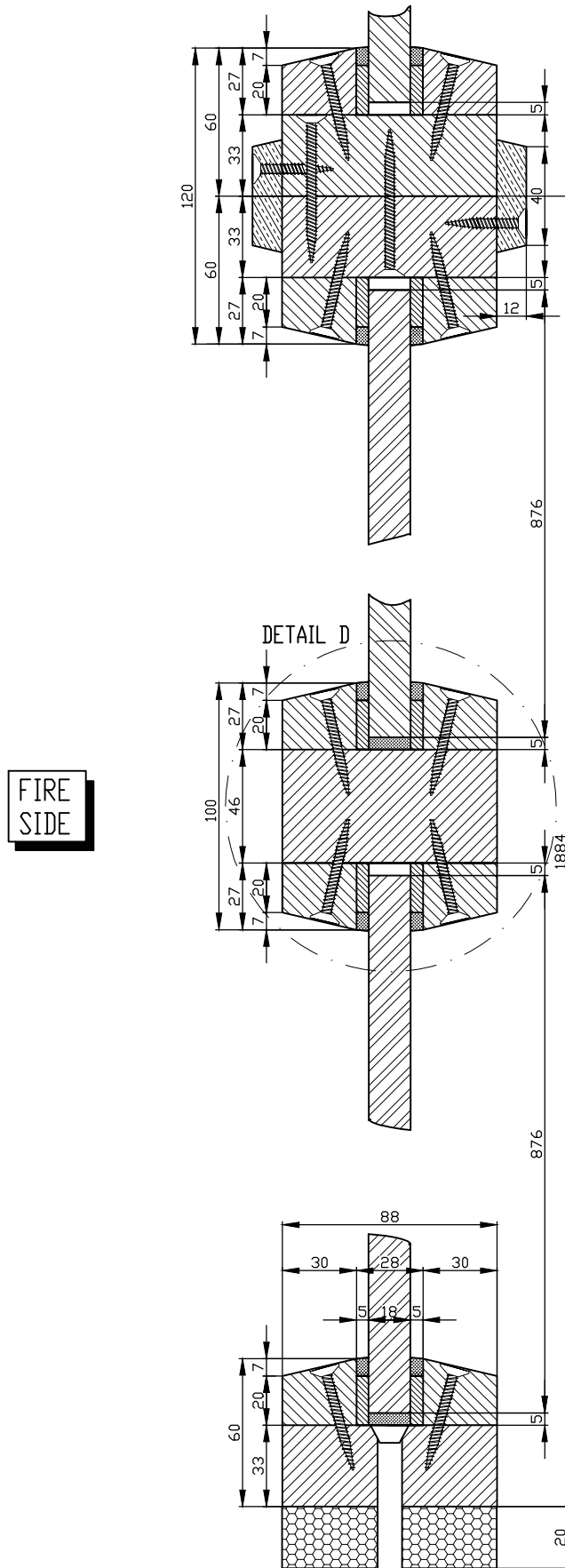
Section D-D - dimensions

FIRE
SIDE



Dimensions in mm.

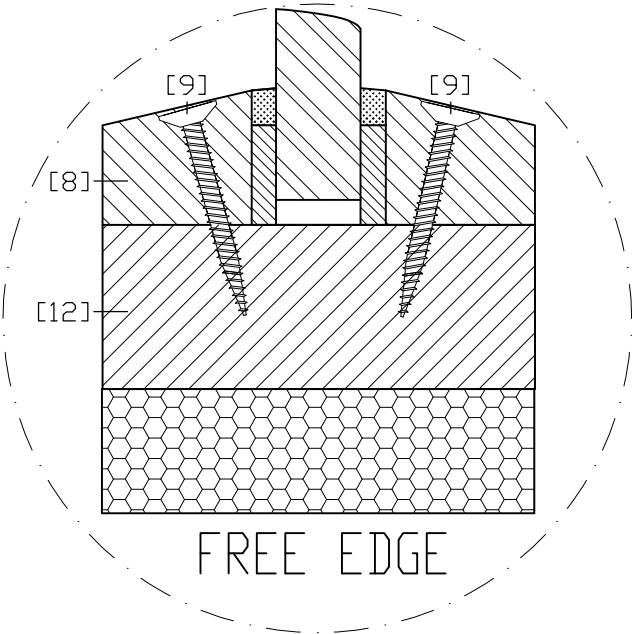
Section E-E and F-F - dimensions



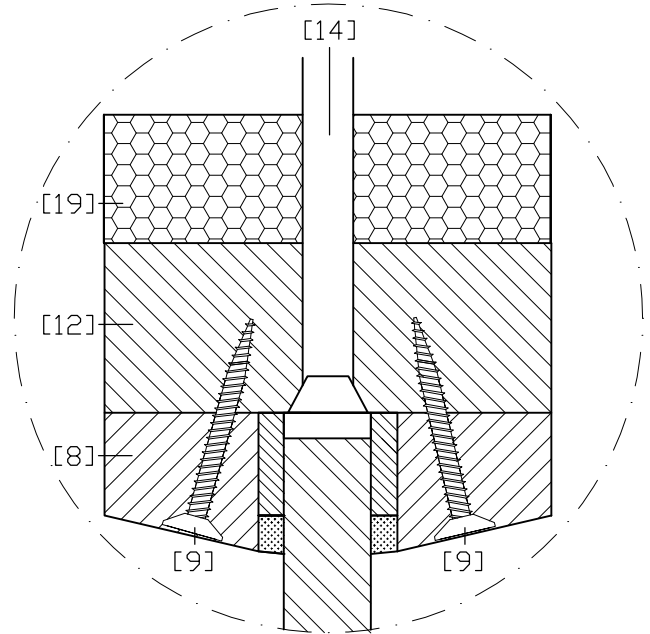
Dimensions in mm.

Details

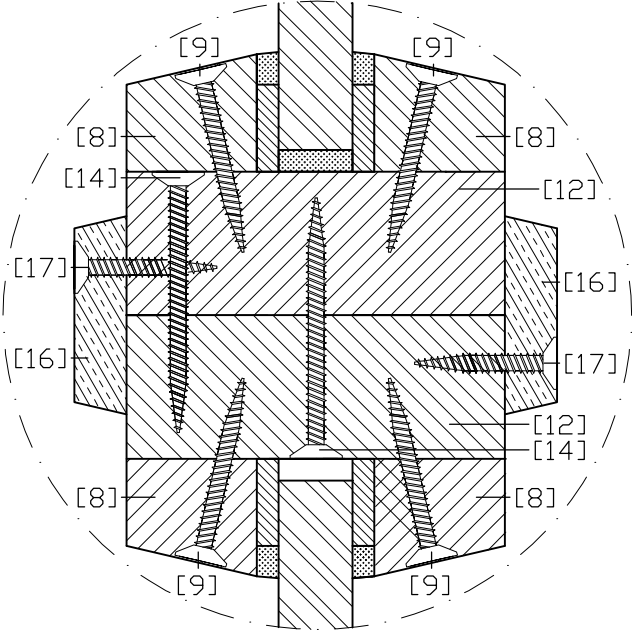
DETAIL A



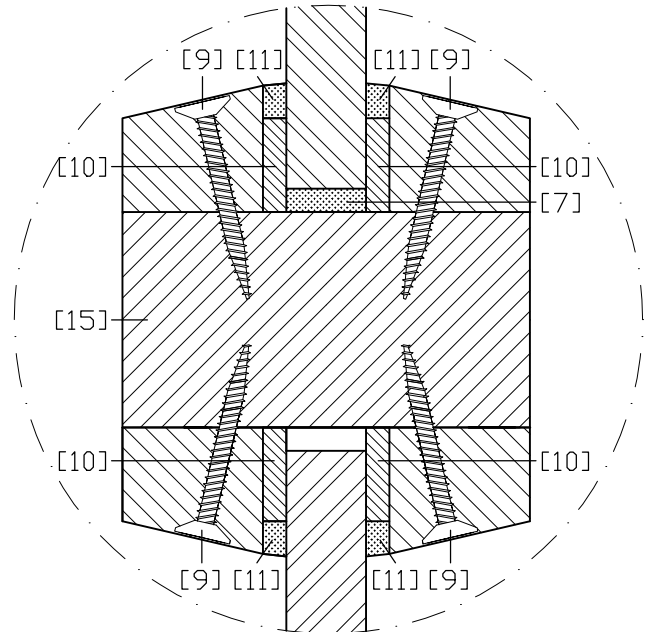
DETAIL B



DETAIL C



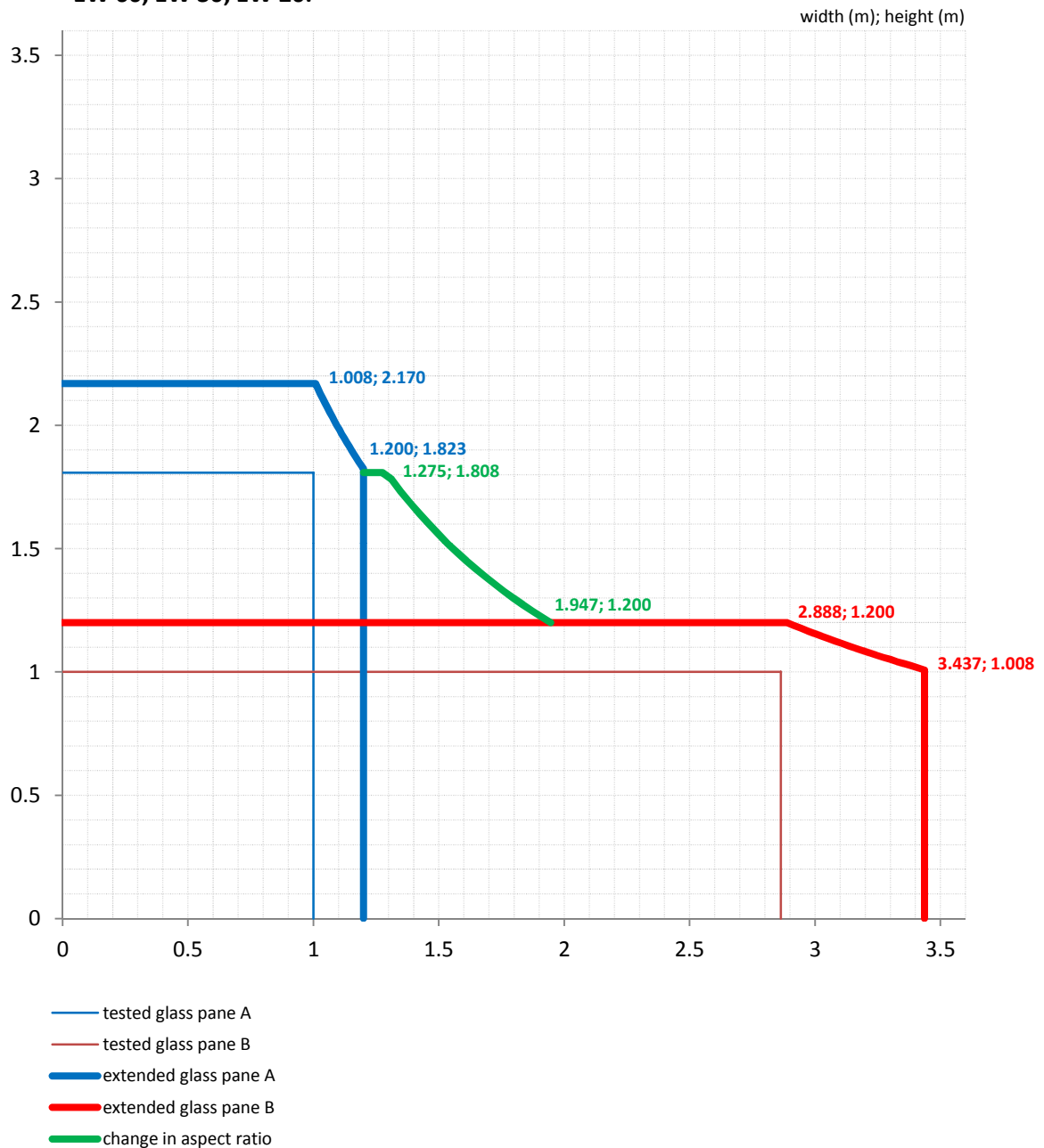
DETAIL D



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.



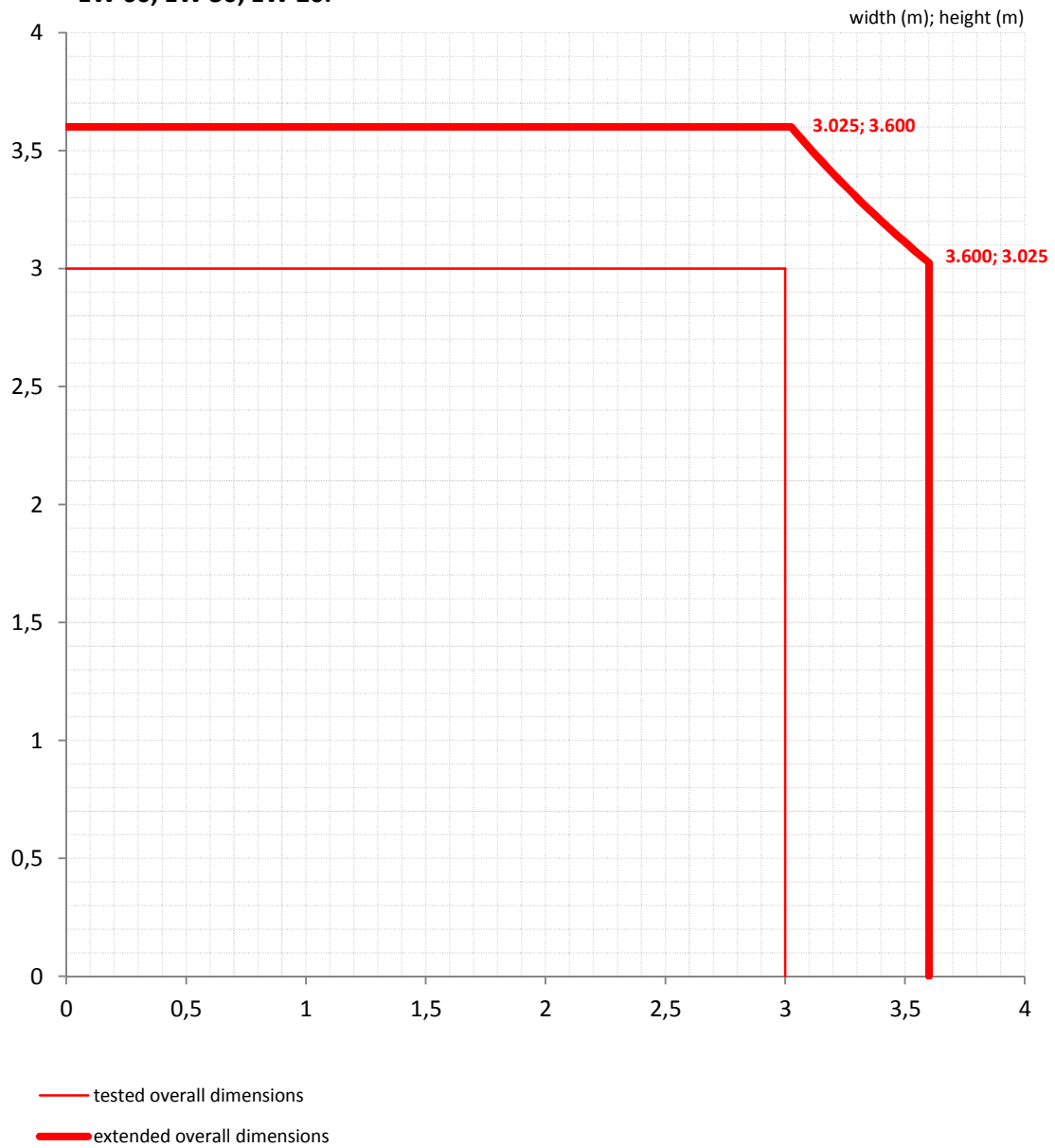
Note:

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

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.