

FIRE RESISTANCE CLASSIFICATION REPORT No. 22922C

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-T EI60-28 in a Forster Fuego Light frame, in accordance with the procedures given in EN 13501-2:2023: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 14 pages and 7 annexes and may only be used or reproduced in its entirety.

1 Details of classified product

1.1 General

The element, type: Pyrobel-T EI60-28 in a Forster Fuego Light frame, is defined as a non-loadbearing glazed wall with fire resistance characteristics.

1.2 Description

The element, Pyrobel-T EI60-28 in a Forster 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 5 of this classification report.

1.2.1 Composition of the test specimen as tested

- height: 3960 mm;
- width: 3940 mm;
- thickness: 65 mm.

1.2.1.1 Glazing system

[1] Glass pane					
Manufacturer	Pyrobel				
Reference	Pyrobel-T EI60-28				
Composition	T6/5/T6/5/T6				
Orientation	Symmetrical				
Thickness	28 mm (NV)				
Dimensions		Width (mm)	Height (mm)	Weight (kg)	Reference
	1a	2000	3844	461.28	0L0001-74-638
	1b	500	3844	115.32	0L0001-74-651
	1c	563	1239	41.88	0L0001-74-664
	1d	563	1239	41.88	0L0001-74-674
	1e	563	1239	41.88	0L0001-74-678
	1f	563	1239	41.88	0L0001-74-687
	1g	1192	1234	88.26	0L0001-74-659
Fixing	Clasped between the rebate of the frame [8] and the glazing beads [7]				

[2] Glazing setting block	
Material	Hardwood
Dimensions	80 mm x 28 mm x 5 mm
Density	655 kg/m ³ (NV)
Quantity	2 underneath each glass pane
Position	Between the glass panes and the frame
[3] Glazing strip	
Reference	Odice Superwool X607
Material	Ceramic paper
Section dimensions	15 mm x 5 mm
Density	230 kg/m ³ (NV)
Fixing	Self-adhesive
Position	Around the glass on internal side of the glazing beads and frame
[4] Sealant	
Manufacturer	Dow Corning
Reference	Firestop 700
Material	Neutral Silicone
Position	Around the glass on exposed and unexposed side
[5] Intumescent strip 1	
Manufacturer	Forster
Reference	Forster fire protection laminate - ref 948002 (2x)
Material	Silicate based intumescent product
Section dimensions	24.5 mm x 2.2 mm x 2 layers
Fixing	Self-adhesive
Position	2 layers at 4 sides under the glass on the frame, see annex 2
[6] Intumescent strip 2	
Manufacturer	Jung, self adhesive - 18x2.0 mm
Reference	Flamiseal G fire protection laminate
Material	Graphite based intumescent product
Section dimensions	18 mm x 2.0 mm
Fixing	Self-adhesive
Position	Around the glass, on the glass itself, see annex 2

[7] Metal glazing bead	
Manufacturer	Forster
Reference	901228
Material	steel
Steel thickness	1.25 mm
Section dimensions	20 mm x 25 mm
Fixing	Clamped on fastening studs (reference: Forster fastening stud ref 906577, material: steel, diameter: 3.5 mm, length 15 mm), c/c distance: 235 mm

1.2.1.2 Metal framing system

[8] Metal frame	
Manufacturer	Forster
Reference	Forster Fuego Light frame
Material	Steel
Steel thickness	1.3 mm
Outer dimensions	3940 mm x 3960 mm x 65 mm
Composition	Single edge profile Double edge profile Cooling strip Infill Connecting rods
Interfixing of the framing parts	Welded together
Fixing to the concrete frame	With fixing anchors (brand and type: Hilti 50 HRD-C, material: steel, diameter: 10 mm, length: 140 mm) c/c distance: 900 mm
[8.1] Single edge profile	
Manufacturer	Forster
Reference	736.851
Section dimensions	70 mm x 65 mm x 50 mm
[8.2] Double edge profile	
Manufacturer	Forster
Reference	736.852
Outer dimensions	65 mm x 90 mm
[8.3] Cooling strip	
Material	Calcium silicate
Section dimensions	25 mm x 45.5 mm (NV)
Density	870 kg/m ³ (NV)

[8.4] Infill	
Material	Calcium silicate
Section dimensions	15 mm x 45 mm (NV)
Density	870 kg/m ³ (NV)
[8.5] Connecting rods	
Material	Steel
Section dimensions	Ø5 mm x 25 mm
[9] Frame setting block	
Manufacturer	Promat
Reference	Promatect®-H
Material	Calcium Silicate
Dimensions	100 mm x 65 mm x 15 mm
Density	870 kg/m ³ (NV)
Quantity	7
Position	Between the bottom edge of the frame and the furnace frame

1.2.1.3 Insulation

[10] Insulation	
Manufacturer	Promat
Reference	Dalfratherm 1200 ULS Blanket
Material	Alkaline earth silicate
Initial thickness	13 mm
Initial density	96 kg/m ³
Position	Around the frame

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	22922A	AGC GLASS EUROPE NV	22/09/2023	EN 1364-1:2015
WFRGENT nv	22922B	AGC GLASS EUROPE NV	-	EN 15254-4:2018

Exposure conditions during the fire resistance test:

Temperature/time curve: standard as in EN 1363-1:2020.

Direction of exposure: The test specimen is an asymmetrical construction. The side of the non-loadbearing glazed wall with the glazing beads was exposed to the fire.

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 – I	
$\Delta T_m = 140^\circ\text{C}$	66 minutes, no failure ⁽¹⁾
$\Delta T_M = 180^\circ\text{C}$	64 minutes
Integrity – E	
Spontaneous and sustained flaming	66 minutes, no failure ⁽¹⁾
Failure with \varnothing 6 mm gap gauge	66 minutes, no failure ⁽¹⁾
Failure with \varnothing 25 mm gap gauge	66 minutes, no failure ⁽¹⁾
Ignition of cotton pad	66 minutes, no failure ⁽²⁾
Radiation – W	
Radiation intensity = 15 kW/m ²	66 minutes, no failure ⁽¹⁾

⁽¹⁾ The test was stopped discontinued after 66 minutes at the test sponsor's request.

⁽²⁾ No failure until the moment of failure of the thermal insulation (I).

3 Classification and field of application

3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2023.

3.2 Classification

The element, type: Pyrobel-T EI60-28 in a Forster 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: The side of the non-loadbearing glazed wall with the glazing beads exposed to the fire.

EI 60, EI 45, EI 30, EI 20, EI 15

EW 60, EW 45, EW 30, EW 20, EI 15

E 60, E 45, E 30, E 20, E 15

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 up to $\pm 10^\circ$ from the vertical plane is allowed, provided the height of the glazed element does not exceed 3960 mm.

3.3.1.2 Height of the glazed element with overrun

For the classification times:

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

An increase in height up to a maximum of 4752 mm is allowed, provided the allowances for thermal expansion of the construction are increased pro-rata.

For the classification time:

- EI 60.

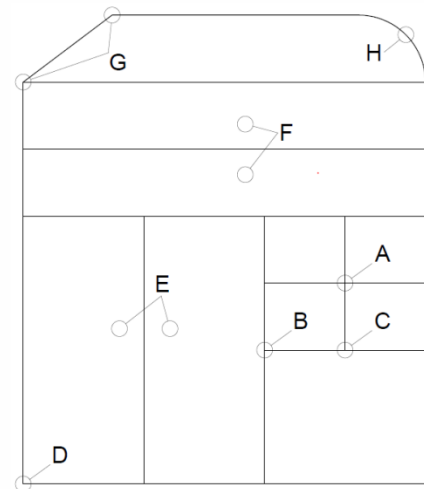
An increase in height up to a maximum of 4356 mm is allowed, provided the allowances for thermal expansion of the construction are increased pro-rata.

3.3.1.3 Width of the glazed element

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

Tested 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;
- Type E: two full vertical panes side by side.



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

For the classification times:

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

The following table shows the calculated extended size/area:

Tested sizes/areas			Extended sizes/areas		
Width (mm)	Height (mm)	Area (m ²)	Width (mm)	Height (mm)	Area (m ²)
2000	3844	7.688	2400	4612.8	9.303

The results are given in the following annex:

Annex 6: the maximum allowed dimensions of rectangular shaped glass panes are represented by the outer lines.

For the classification time:

- EI 60.

The following table shows the calculated extended size/area:

Tested sizes/areas			Extended sizes/areas		
Width (mm)	Height (mm)	Area (m ²)	Width (mm)	Height (mm)	Area (m ²)
2000	3844	7.688	2200	4228.4	8.457

The results are given in the following annex:

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

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 (≤ 235 mm).

The tested bead width may be increased (≥ 25 mm). The bead depth may not be changed. (according to EN 15254-4:2018, figure 5)

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 (≤ 915 mm).

The cross sectional dimensions of the frame profiles may be increased from the dimensions tested ($\geq 90/70$ mm x 65 mm).

3.3.2.5 Supporting constructions

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

- High density rigid standard supporting construction.

Only the supporting construction as described in the classification report may be used.

3.4 Field of extended application

3.4.1 Replacement of glass within the same glass product range

It is allowed to exchange the glass pane Pyrobel-T EI60-28 with the glass pane Pyrobel-T EI60-28 DGU variant from the same product range.

Limitation: The Pyrobel-T EI60-28 DGU variant can only be used with the fire side at the side of the fire resistant segment.

3.4.2 Glass shapes

Circular, triangular or 4 sided non-rectangular shapes may be cut from within the extended rectangular pane size defined by the field of direct application.

All other non-rectangular shapes may only be cut from the tested rectangular pane size and shall not be extended further.

3.4.3 Metal beads: Exchange of bead fixing / bead shape and dimensions

Allowed changes:

- The bead depth may be increased (≥ 20 mm) provided the mechanical edge cover remains within the limits determined by the reference test.
- The bead width (≥ 25 mm) may be increased without restriction.

3.4.4 Exchange of gaskets / glazing strips / setting blocks

Exchange of a glazing material, e.g. gaskets, is only allowed if it is demonstrated in a reference test and/or pre-existing test data that the exchange does not have a detrimental effect on the fire performance within a comparable glazing system of the same glass product range.

3.4.5 Changing or adding surface coverings

Decorative surface coverings of the glazing beads may be added.

Limitation: It must be demonstrated that the covering material achieves at least Class A2 when tested according to EN 13501-1. Any coverings on glazed elements classified EI shall be secured using only fixing method(s) proven in the reference test and/or by pre-existing test data.

3.4.6 Metal frames: Frame materials / sections / thickness of chamber walls

The tested stainless steel frame may be replaced by a mild steel frame (identical design).

Frame section may be changed provided that it is demonstrated that:

- The inertia of the profiles is not reduced in the cold state.
- The frame section width is not reduced.
- The wall thickness and number of chambers in the frame are not reduced.

Limitation: Without additional test evidence it is not allowed to exchange the tested material for another material.

3.4.7 Changes or adding frame surface coverings

Decorative surface coverings of the glazing beads may be added.

Limitation: Decorative surface coverings of the framing members may be added where one does not exist, provided it is demonstrated that the covering material achieves at least Class A2 when classified according to EN 13501-1. If the surface covering is not Class A2 then the rules laid down in the EN 15269-2, EN 15269-3 and EN 15269-5 apply.

4 Limitations

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

SIGNED

APPROVED

Signed for and on behalf of Warringtonfire Gent.

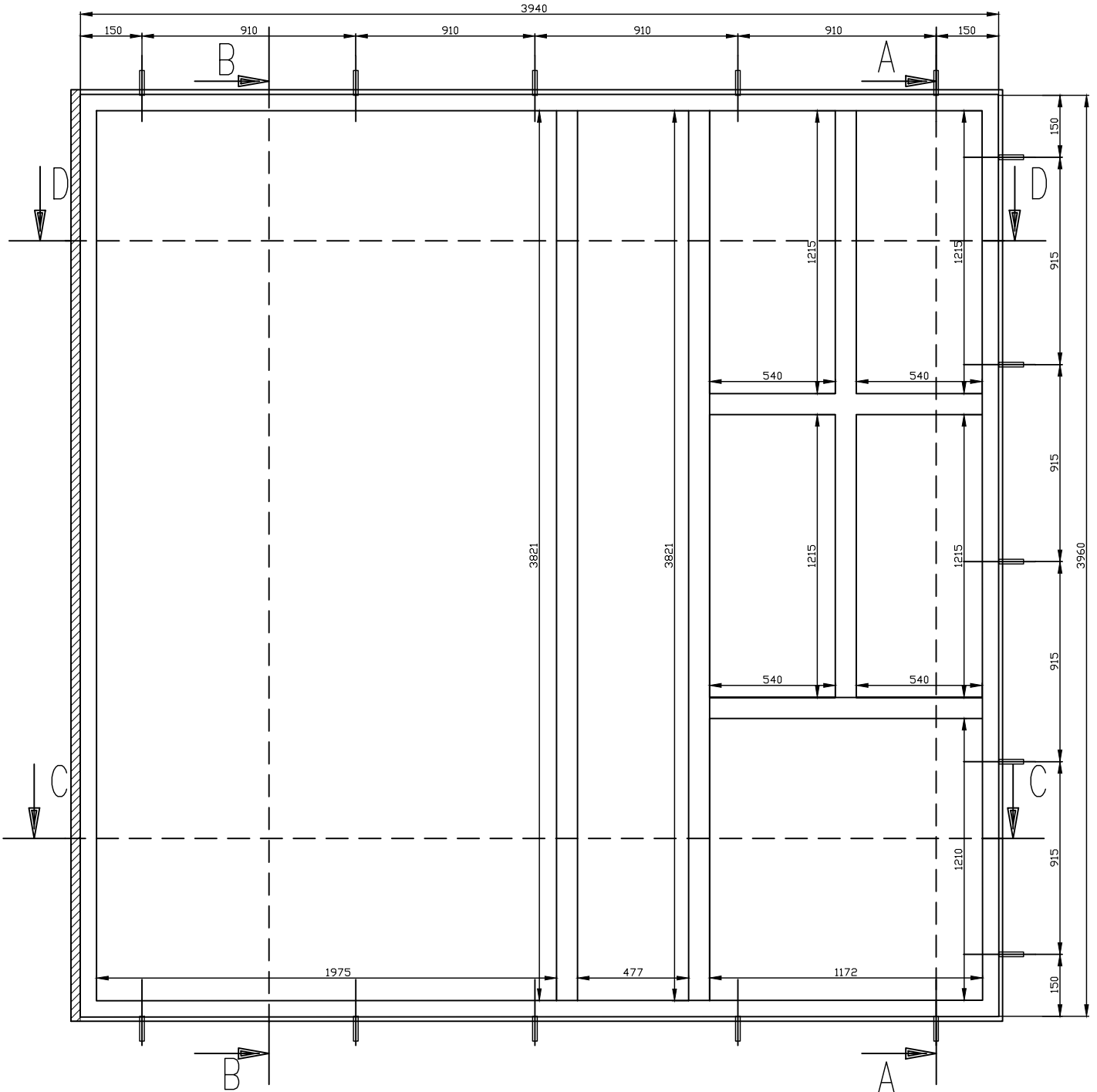
This document is the original version of the classification report and is written in English.

In case of doubt, the most recent version prevails, originally issued in English.

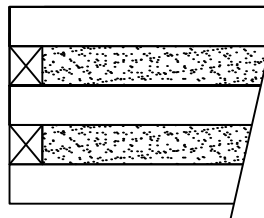
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Front view (unexposed side) - dimensions - glass structure.

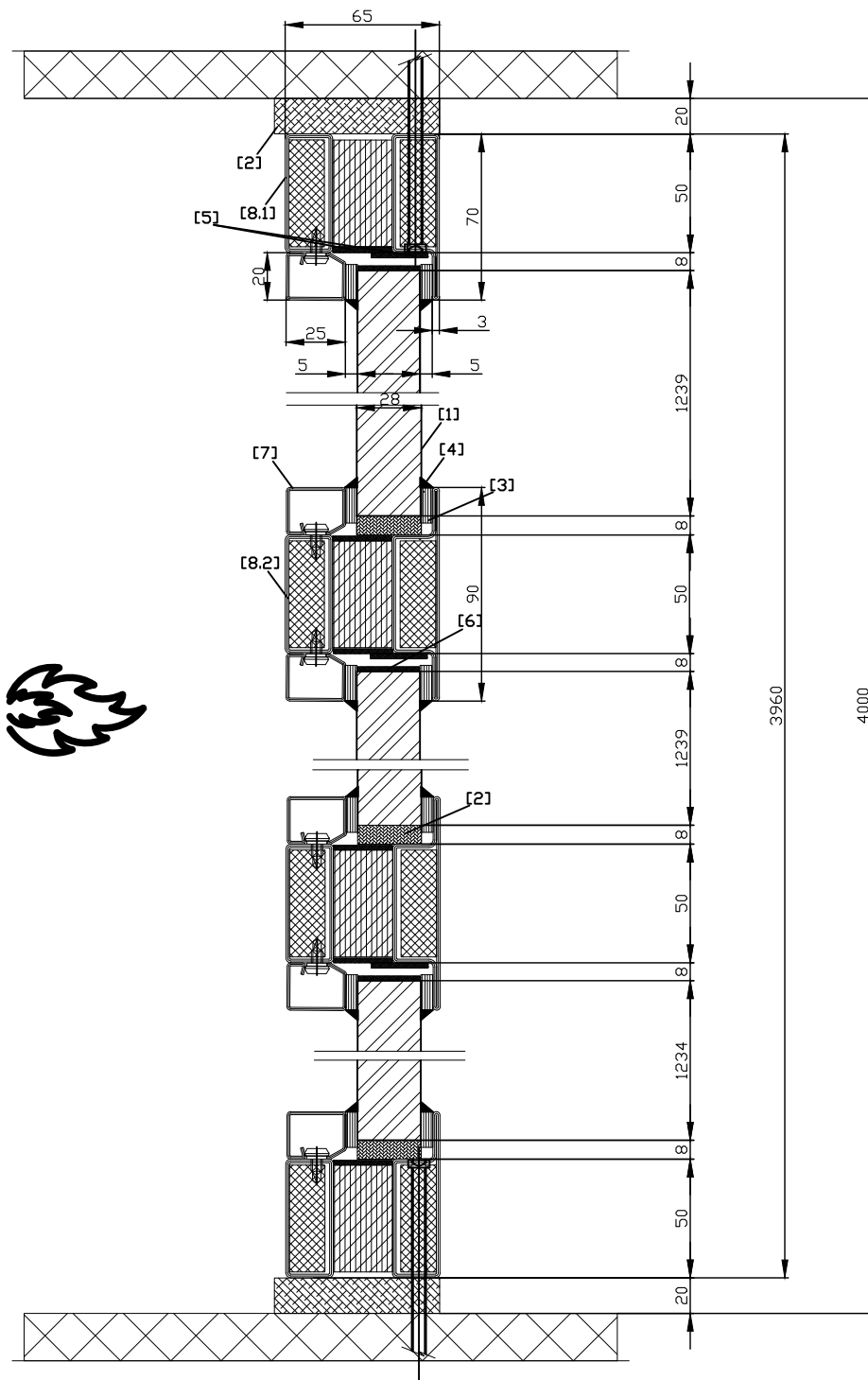


Pyrobel-T EI60-28
 structure

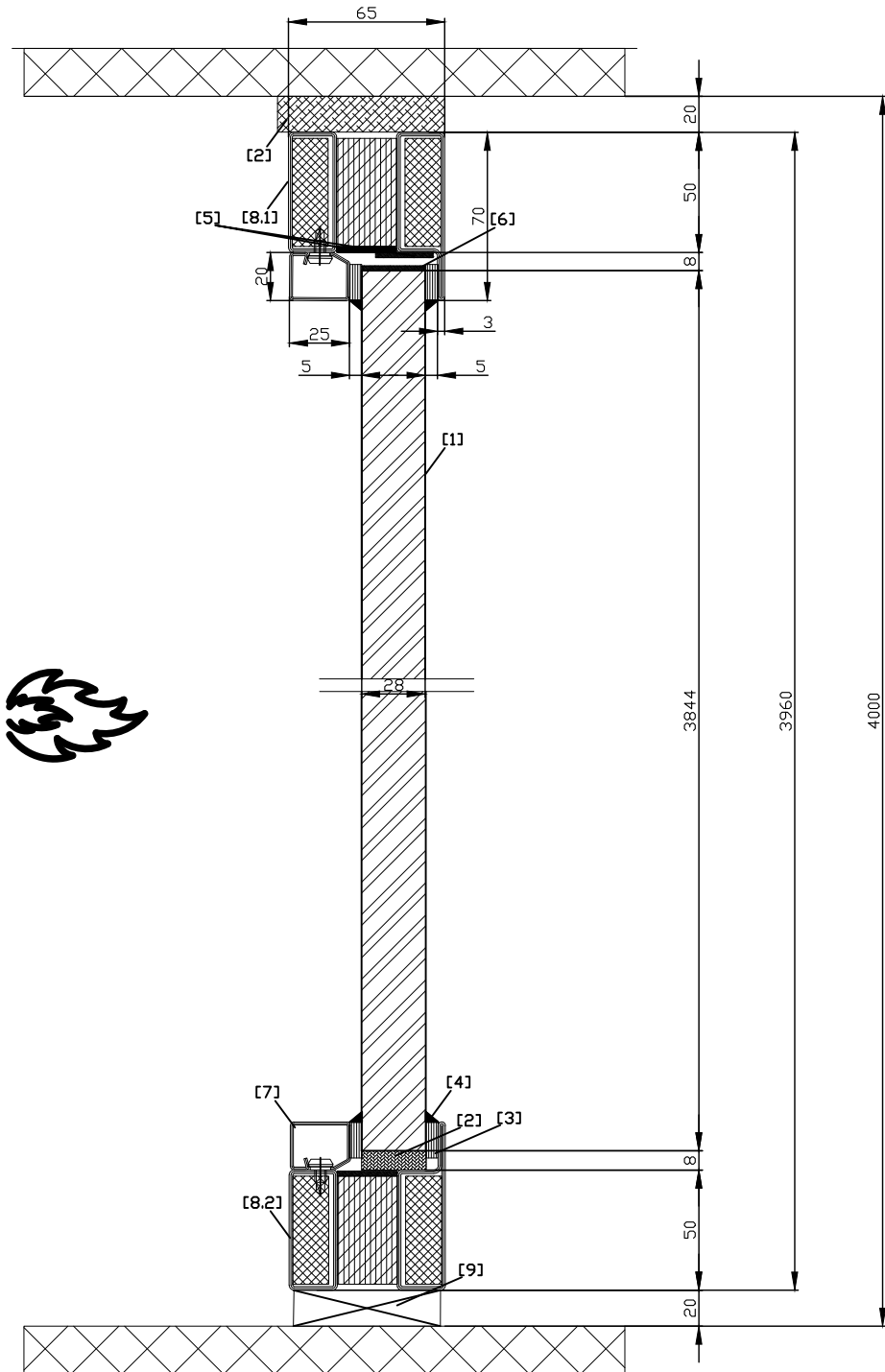


- 6.0 mm toughened glass
- 5.0 mm intumescent gel
- 6.0 mm toughened glass
- 5.0 mm intumescent gel
- 6.0 mm toughened glass

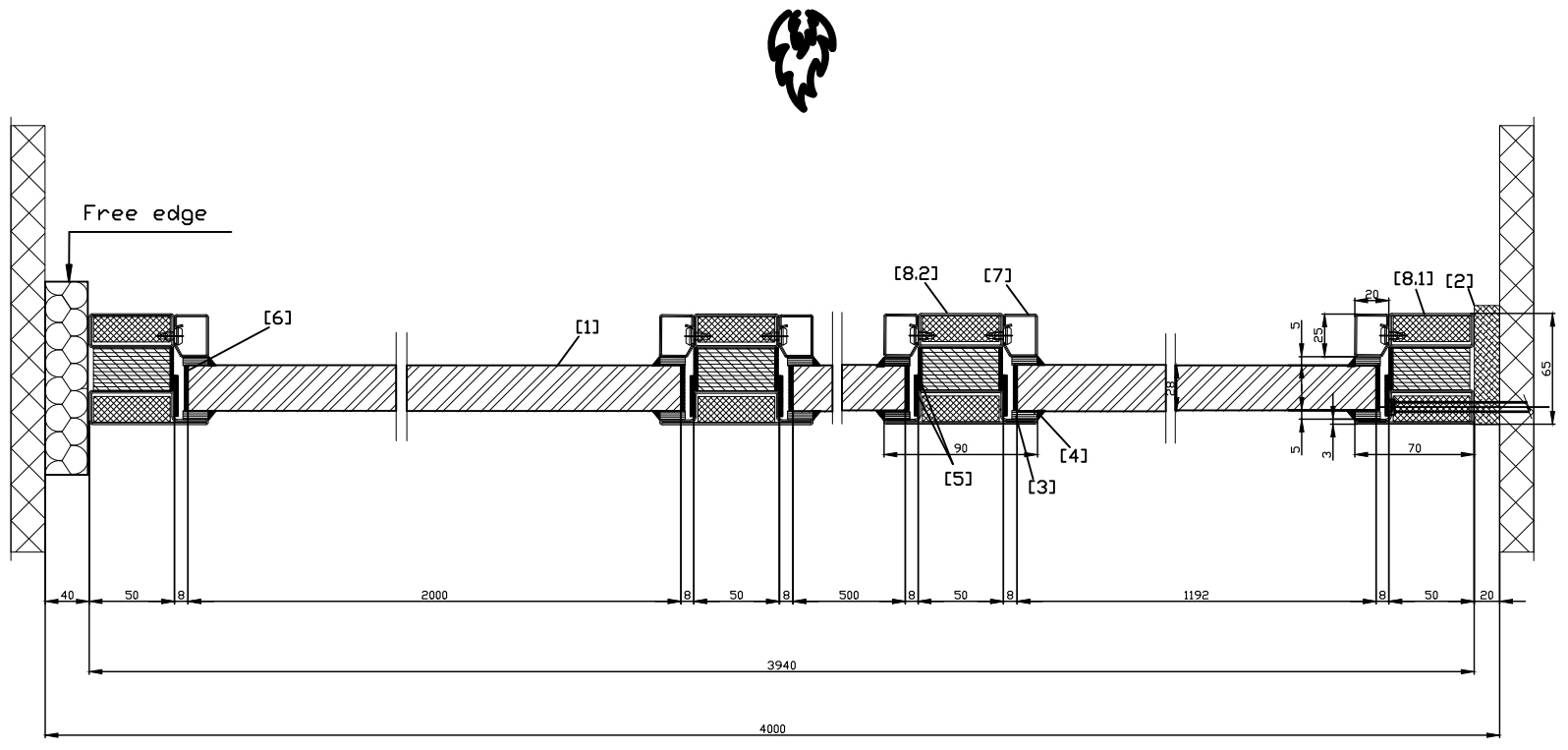
Section A-A - dimensions.



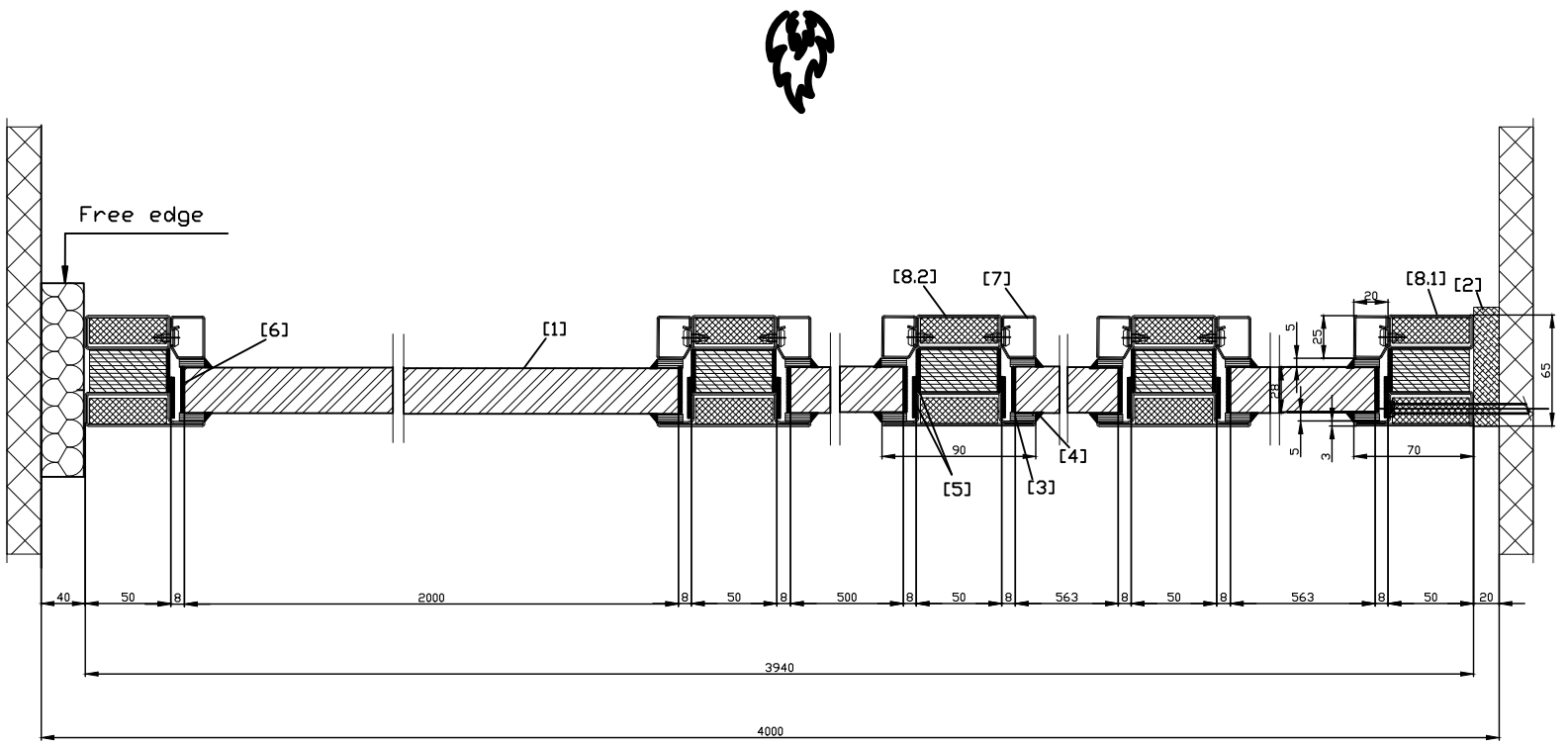
Section B-B - dimensions.



Section C-C - dimensions.



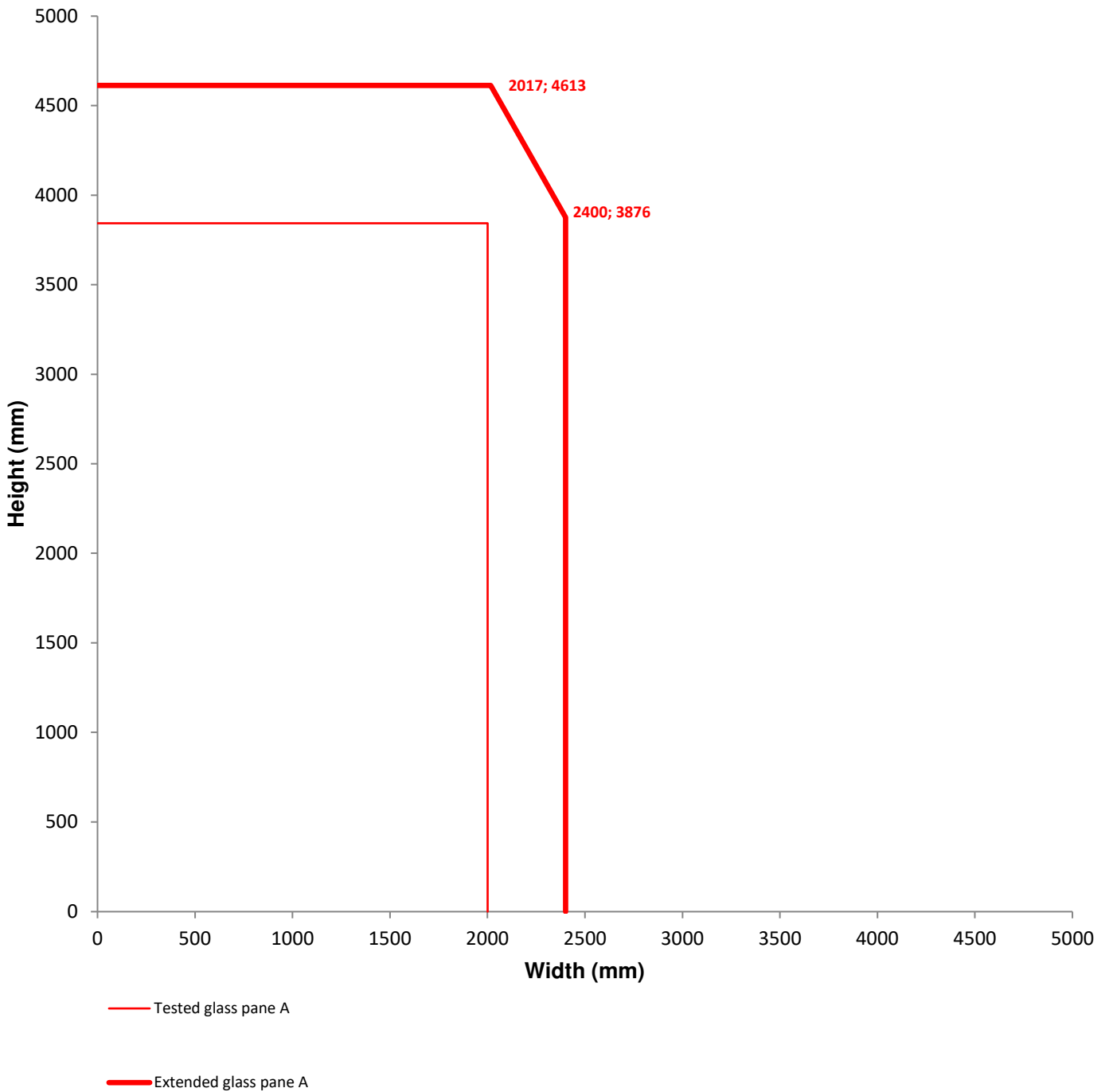
Section D-D - dimensions.



Individual rectangular glass panes: aspect ratio and increase in area

The extended dimensions are only valid for the following classification times:

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

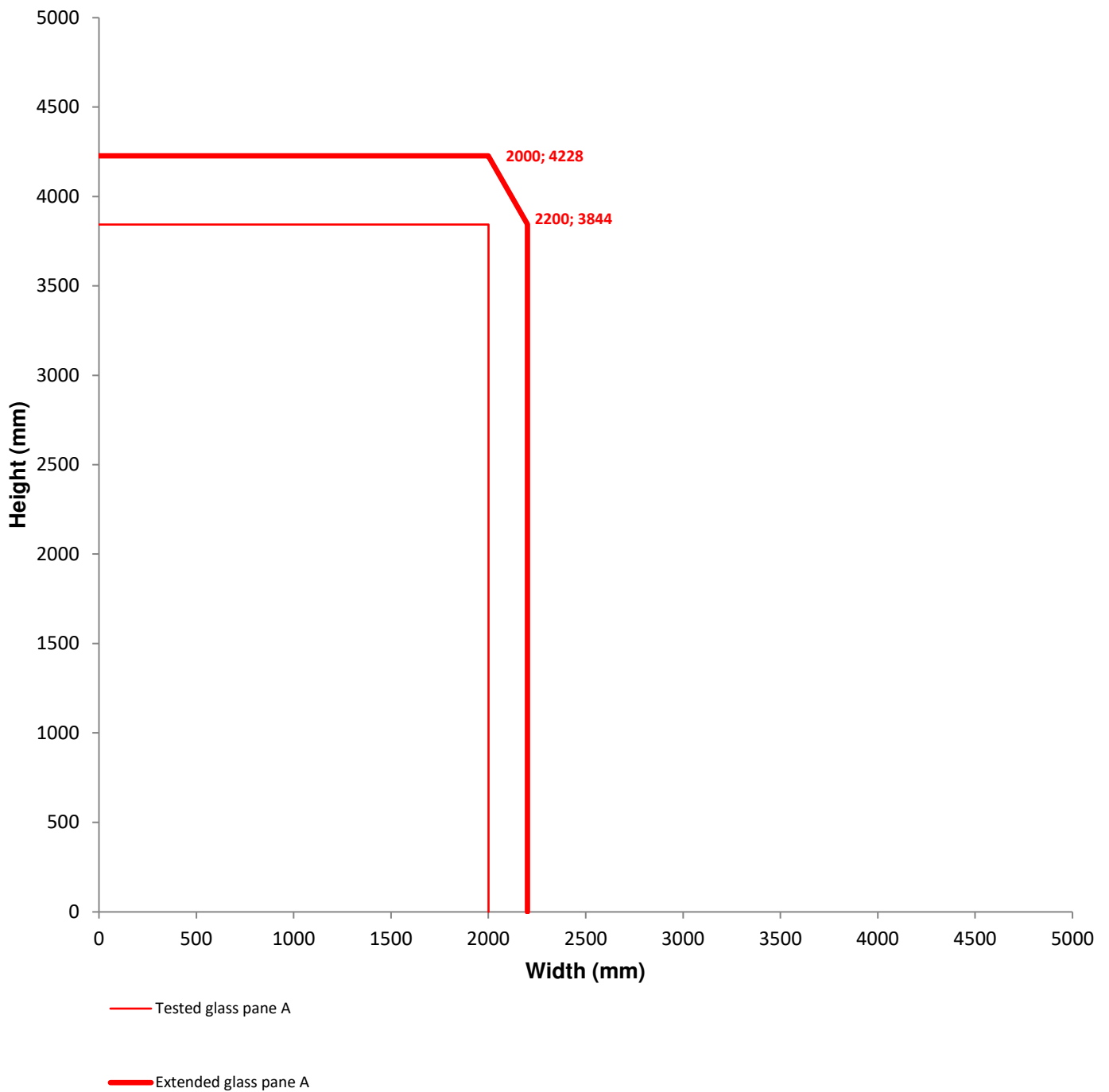


Note:

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 classification times:
- EI 60.



Note:

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