

Pyroguard Rapide Plus

El60 Timber Joinery Guide

System description of fire-resistant glazing PG
530-40-75 according to EN13501-2

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1 Purpose of the document

This document serves as the manufacturing and installation instructions for the PG 530-40-75 glazing system. The designs described are based on the accompanying documents (test reports, EXAP report, classification report). Deviations from these are generally not permitted and are the responsibility of the user. Any national regulations not described in this document and depending on the place of use must be taken into account by the user. Any recourse and liability claims by third parties against the user, of whatever kind, arising from the use of these manufacturing and installation instructions and from the component produced on this basis are fully rejected.

System PG 530-40-75 is defined as $\geq 530 \text{ kg/m}^3$ timber density (softwood) of section 40 (h) x 75 (d). All tests herein were carried out with glazed partitions of this type.

2 Normative references

The following documents are cited in the text and form part of the requirements of this document, in whole or in part. For dated references, only the cited edition applies. For undated references, the latest edition, including all amendments, applies.

- EN 1279-1, Glass in building - Insulating glass units - Part 1: Generalities, system description, rules for substitution, tolerances and visual quality
- EN 1363-1, Fire resistance tests - Part 1: General requirements
- EN 1363-2, Fire resistance tests - Part 2: Alternative and additional procedures
- EN 1364-1, Fire resistance tests for non-loadbearing elements - Part 1: Walls
- EN 1995-1-2, Eurocode 5: Design of timber structures - Part 1-2: General rules - Structural fire design
- EN 13501-1, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
- EN 13501-2, Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services
- EN 15725, Extended application reports on the fire performance of construction products and building elements
- EN ISO 12543-1, Glass in building - Laminated glass and laminated safety glass - Part 1: Definitions and description of component parts (ISO 12543-1)
- EN ISO 13943, Fire safety - Vocabulary (ISO 13943)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13501-2, EN ISO 13943, EN ISO 12543-1, EN 1279-1 and EN 1364-1 apply.

4 Supporting documents

Table 1: Supporting documents

No.	Document	Document No.	Type of glazing	Glass configuration	Thickness [mm]
1*	Classification report	21-002717-PR02			
2†	EXAP report	21-002717-PR01			
3†	Test report	15-V-000648	Glazed partition	Pyroguard EI60 INT	23
4†	Test report	13-V-563	Glazed partition	Pyroguard EI60 INT	23
5†	Test report	18-004419-PR01	Glazed partition	Pyroguard EI60 INT	23
6†	Test report	17-002965-PR01	Butt-joint glazing	Pyroguard EI60 EXT+	31
7†	Test report	17-002540-PR01	Butt-joint glazing	Pyroguard EI60 EXT++	34
8†	Test report	18-003353-PR01	Butt-joint glazing	Pyroguard EI60 EXT+	31
*available from Pyroguard TechLibrary †confidential available under NDA					

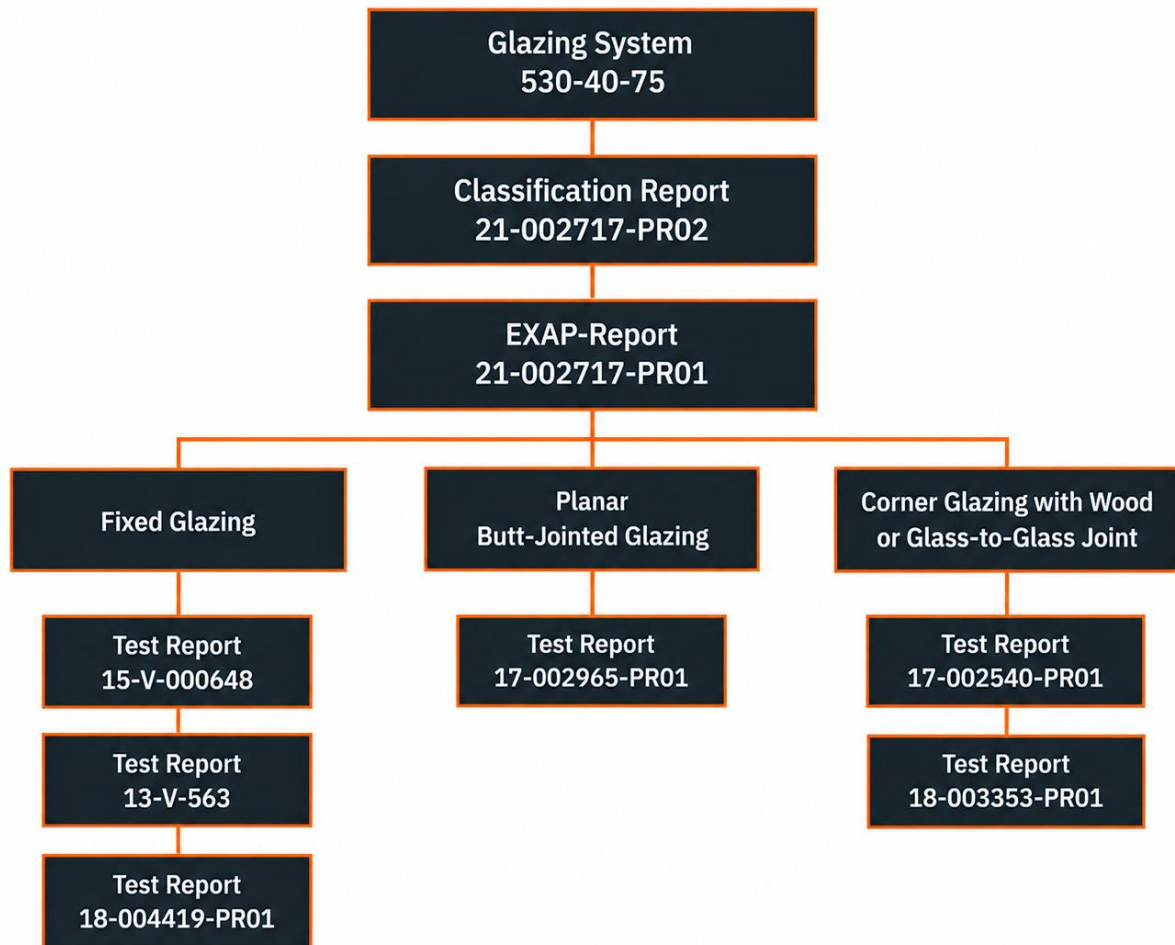


Figure 1: Structure of supporting documents (test reports, EXAP and classification reports)

5 Glazing variants

5.1 Fixed glazing

The maximum permissible construction height is 4950 mm; the width is not limited. The edge distances of the fixing points must not exceed 150 mm; uniform fixing distances of a maximum of 600 mm must be maintained in the field.

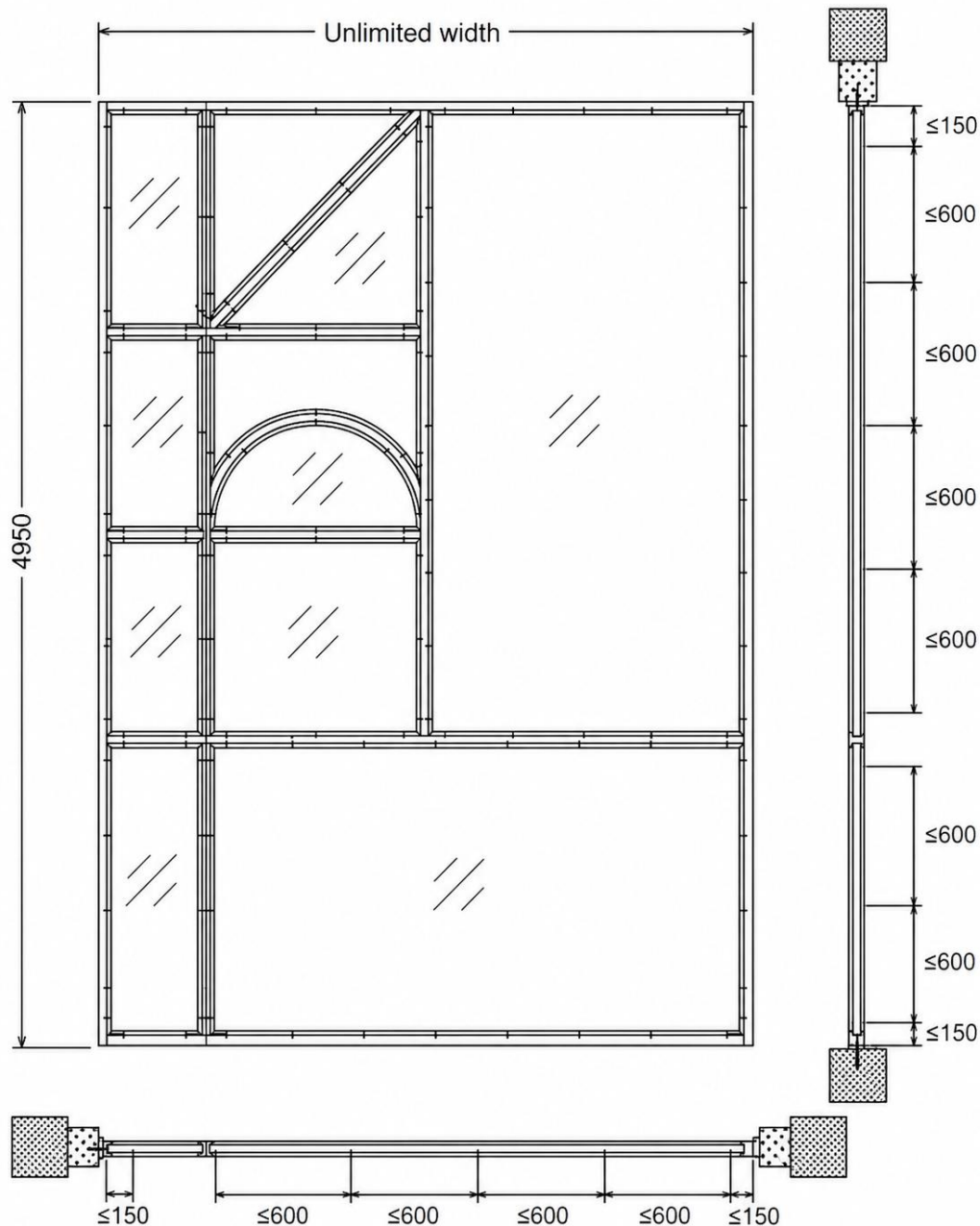


Figure 2: View of fixed glazing

5.1.1 Glass types and dimensions

Table 2: Glass types and dimensions

Pyroguard Rapide Plus	Thickness [mm]	Width [mm]	Height [mm]	Area [m²]
Pyroguard EI60 INT	23	1600	2700	4.32
Pyroguard EI60 EXT	27	1500	3000	4.50
		1210	3100	3.75
Pyroguard EI60 EXT+ SWS	31	1500	3000	4.50
Pyroguard EI60 EXT++ SWS	34	1500	3000	4.50
*= not standard stock O = Obscured, satin VI= Insulated Glazed Unit (IGU, DGU) TVI= Triple Glazed Unit (TGU) INT= Internal grade EXT= External grade				

5.1.2 Glass shapes

Circular, triangular and four-sided non-rectangular geometries may be used, provided their dimensions are within the extended rectangular pane size specified in the table above.

5.2 Butt-joint glazing

A distinction is made between three different types of butt-joint glazing:

- Butt-joint glazing in a straight design (Figure 3)
- Butt-joint glazing with angles and without vertical mullions (Figure 4)
- Butt-joint glazing with angles and a vertical mullion (Figure 5)
- Angled joints with mullions and without glass-glass joints (Figure 6)

The maximum permissible construction height is 3090 mm for all variants; the width is not limited. The edge distances of the fixing points must not exceed 150 mm; uniform fixing distances of a maximum of 600 mm must be maintained in the field. The specifications for the fixing points apply to all variants.

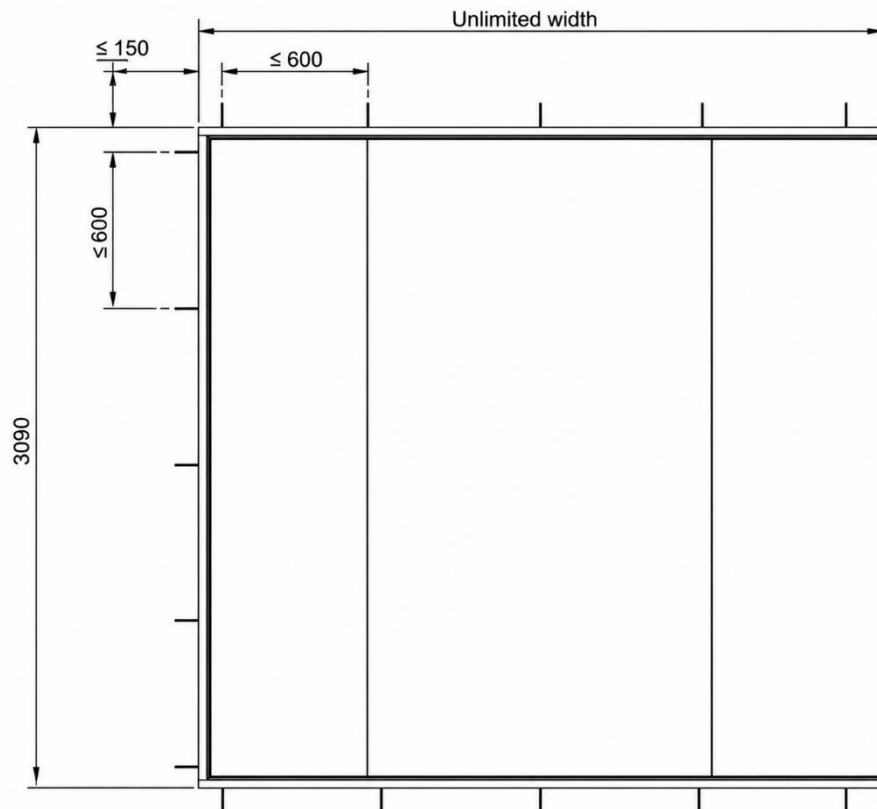


Figure 3: Butt-joint glazing, flat design

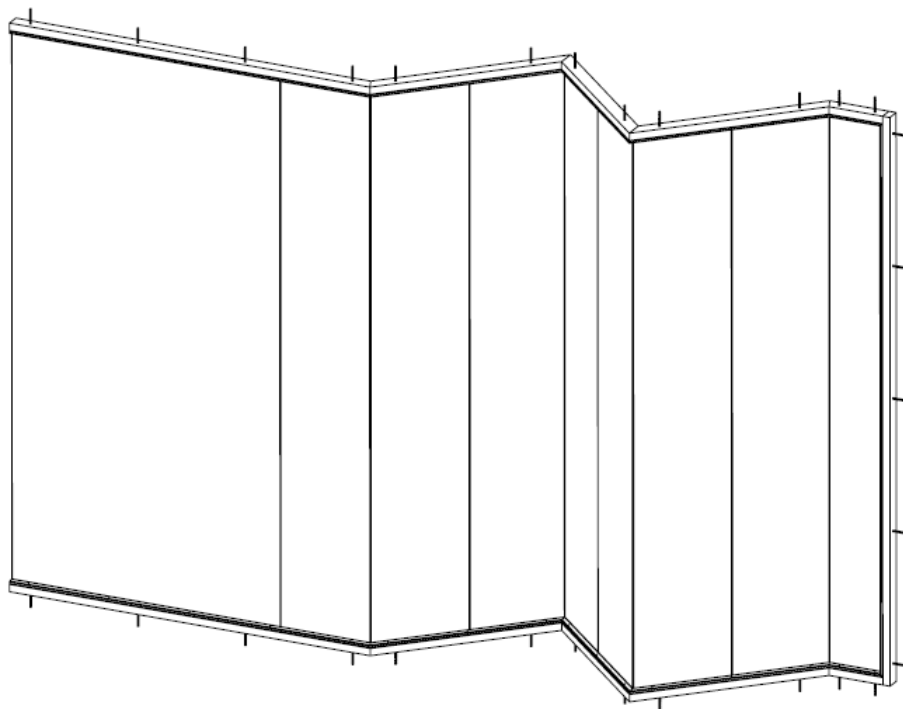


Figure 4: Butt-joint glazing with angles, designed with glass joints

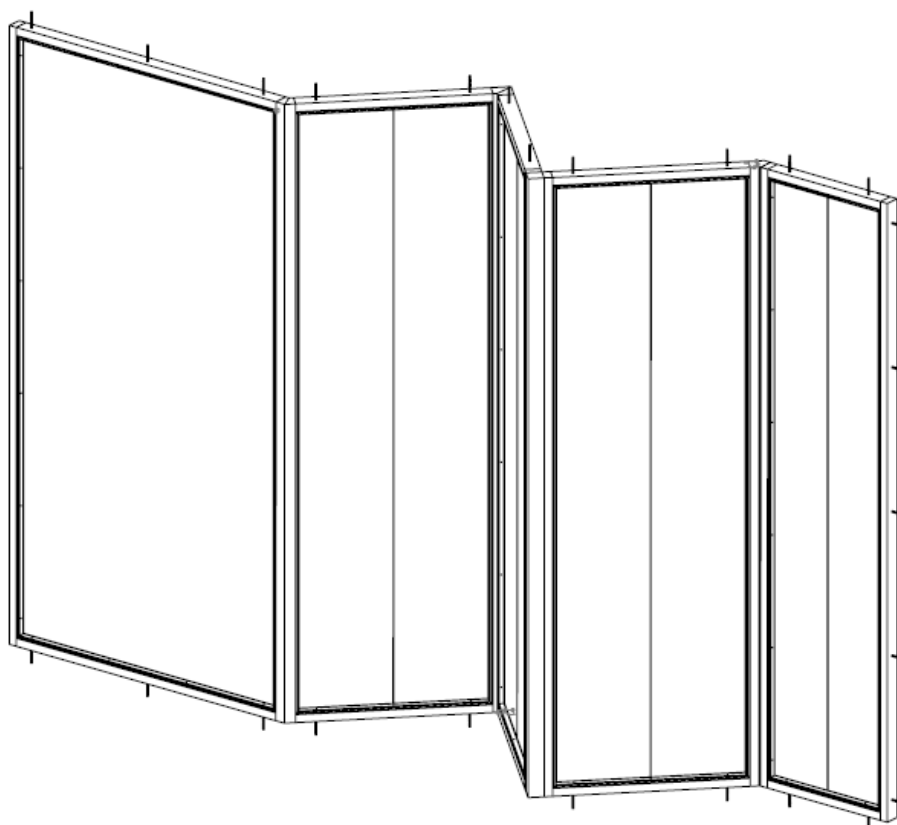


Figure 5: Butt-joint glazing with angles, designed with vertical mullions

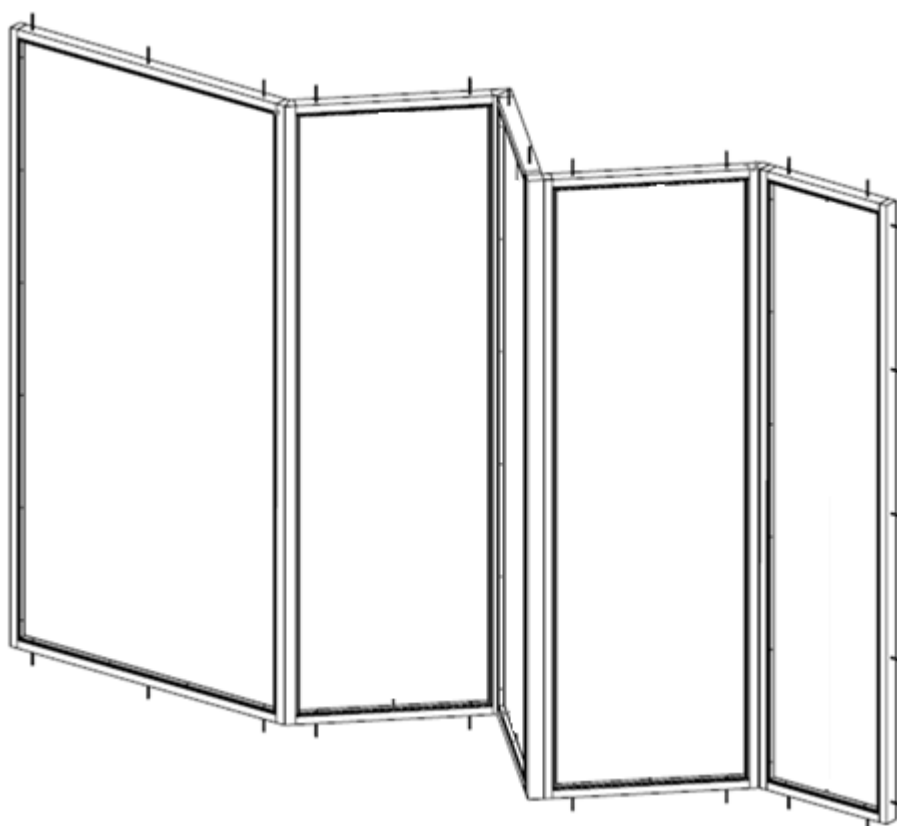


Figure 6: Angled joints with mullions and without glass-glass joints

5.2.1 Glass types and dimensions for butt-joint glazing

Where butt-joint glazing with glass corner joints (glass joints with angles $< 180^\circ$) is used, glass of type Pyroguard EI60 EXT++ SWS must be installed. For planar butt-joints, glass of type Pyroguard EI60 EXT+ SWS may be used. If glazing of type with angles and vertical mullion glazing may be selected from any glass in Table 3. Those glazings that are asymmetrical and are approved in both fire directions. See summary table below.

Table 3

Pyroguard Rapide Plus	Width [mm]	Height [mm]	Area [m ²]	Application
Pyroguard EI60 INT	≤1500	≤3000	≤4.5	Figure 6
Pyroguard EI60 EXT	≤1500	≤3000	≤4.5	Figure 6
Pyroguard EI60 EXT+ SWS*	≤1500	≤3000	≤4.5	Figure 6; Figure 3;
Pyroguard EI60 EXT++ SWS*	≤1500	≤3000	≤4.5	Figure 3; Figure 4; Figure 5; Figure 6;
* = not standard stock				

5.2.2 Insulated Glass

Insulated glass units with fire-resistant properties may be used under the following conditions (see Section 11 for a summary):

- Double-pane and triple-pane insulated glass units with a maximum total spacer thickness of 28 mm.
- Steel, stainless steel, aluminium, and silicone matrix systems may be used as spacers.
- Float, ESG, and VSG (up to 8 films of 0.38 mm each) glass types with a single-pane thickness of up to 6 mm may be used as outer panes.
- For glazing with a thickness exceeding 35 mm, the profile depth must be increased in a 1:1 ratio corresponding to the glass thickness.
- For all EI60 glasses detailed here the fire risk to the insulating glass unit must be facing only the fire-resistant glass side (i→o). Other approvals must be sought to approve both sides fire risk direction installations.

6 Glazing system

6.1 Components of the glazing system

System PG 420-40-75 is defined as $\geq 530 \text{ kg/m}^3$ timber density (softwood) of section $\geq 40 \text{ (h)} \times \geq 75 \text{ (d)}$. This section of the document describes the system options.

Table 4

- 1 Fixing of the glazing bead with screws (4.5 mm x 60 mm) or nails (1.6 mm x 50 mm)
- 2 Pyroguard Rapide Plus EI60-xx
- 3 Glazing bead
- 4 Glazing bead with increased width
- 5 Glass edge cover (see EN 12488)
- 6 Height of the glazing bead / glazing rebate (see EN 12488)
- 7 Width of the glazing bead
- 8 Width of the frame profile
- 9 Ceramic fibre strip (e.g.: Kerafix 2000 KuhnOdice)
- 10 Intumescent strip (e.g.: Palusol 100 KuhnOdice)
- 11 Glazing block (e.g.: Flammi 12 / Promatect H KuhnOdice)

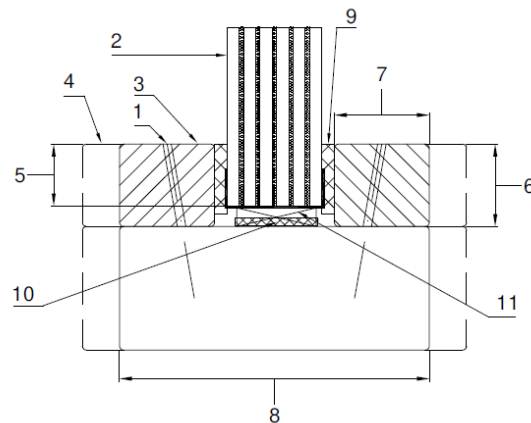


Figure 7: Glazing system

6.2 Profiles

The profiles must be made of timber with a mean density of at least 530 kg/m^3 . Solid timber and laminated timber are permitted. The glazing beads must have a minimum cross-section of $\geq 17 \text{ (h)} \times \geq 20 \text{ (w)} \text{ mm}$. For glazing with a thickness of more than 35 mm, the profile depth must be increased in accordance with the glass thickness at a ratio of 1:1.

The glazing beads may be nailed or screwed. Fixing must be centred and carried out with an inclination of approximately 10° towards the glass. The edge distance of the fixing is 80 mm; uniform distances of a maximum of 450 mm are permitted in the field.

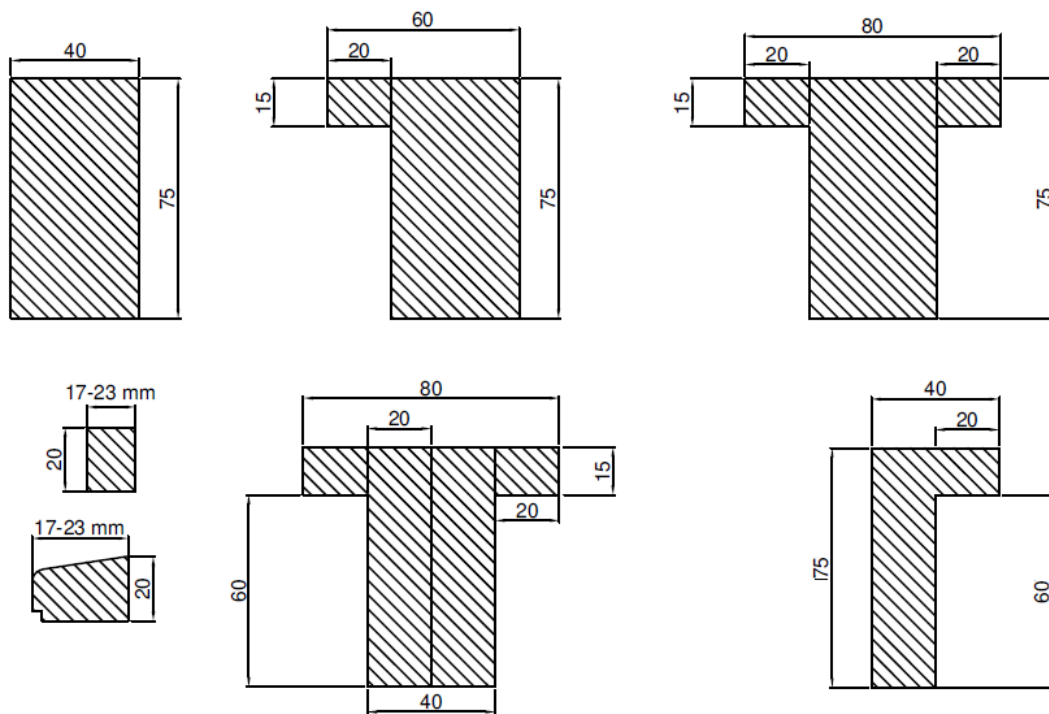


Figure 8: Profile types and dimensions

6.3 Profile joints

Frame connections may be executed in the following variants:

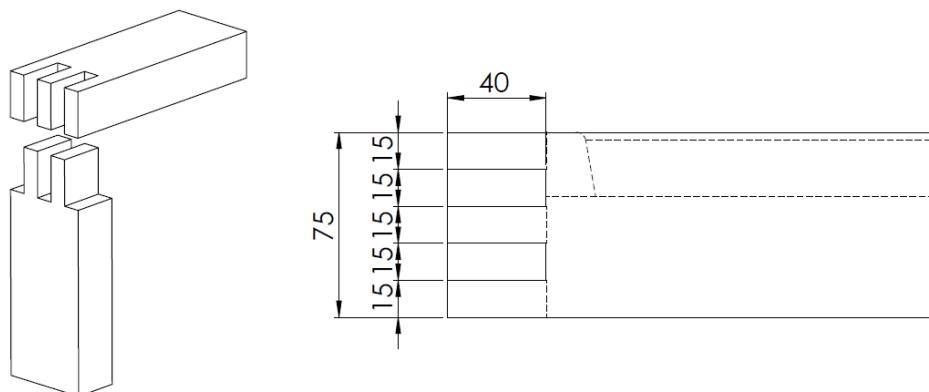


Figure 9: Butt-jointed with mortise and tenon, glued (white wood glue)

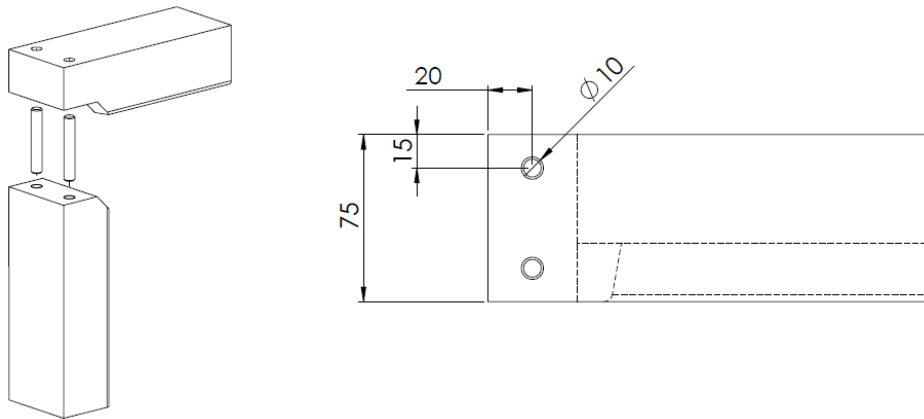


Figure 10: Dowelled with 2 hardwood dowels $\varnothing 10 \times 50$ mm, glued (white wood glue)

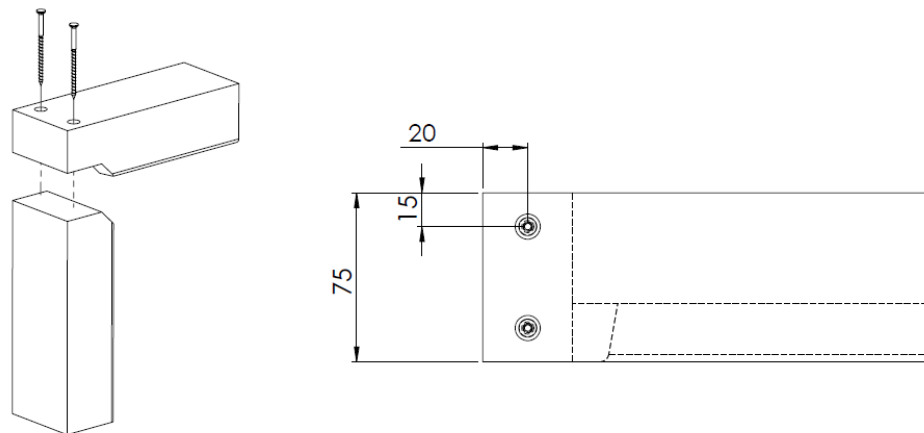


Figure 11: Screwed with 2 countersunk wood screws 4.5×60 mm

7 Frame couplings

7.1 Planar couplings

It is also possible to connect frame elements to one another using countersunk wood screws 4.5×40 mm at spacings between the fixing points of ≤ 350 mm.

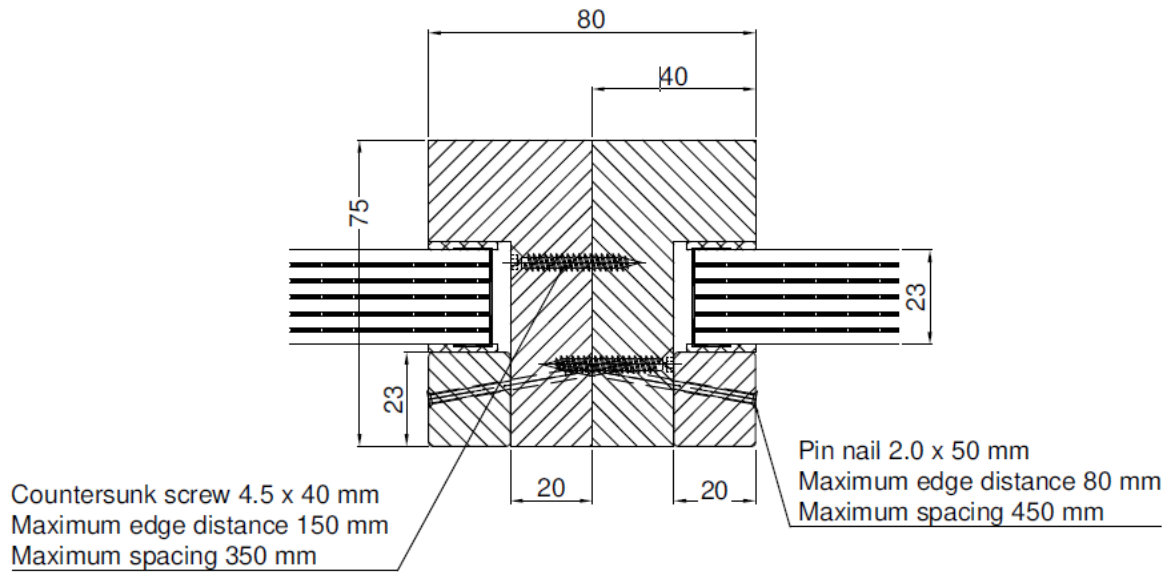


Figure 12: Planar coupling

7.2 Angled couplings

Fire-resistant glazing with corner configurations must be executed in accordance with Figure 13 and Figure 14. The corner frames must be symmetrical. In the corner area, the mullion profiles must run over the full height of the fire-resistant glazing. The frames are screwed together with countersunk steel screws with a minimum size of 4.5 x 70 mm at 90°. The fixing distances must not exceed 410 mm.

Corner configurations of the fire-resistant glazing with angles from 90° to 180° are permitted, provided the visible width of the frames is not less than 40 mm. The maximum permissible height of the corner construction is 3090 mm, while the width is not limited.

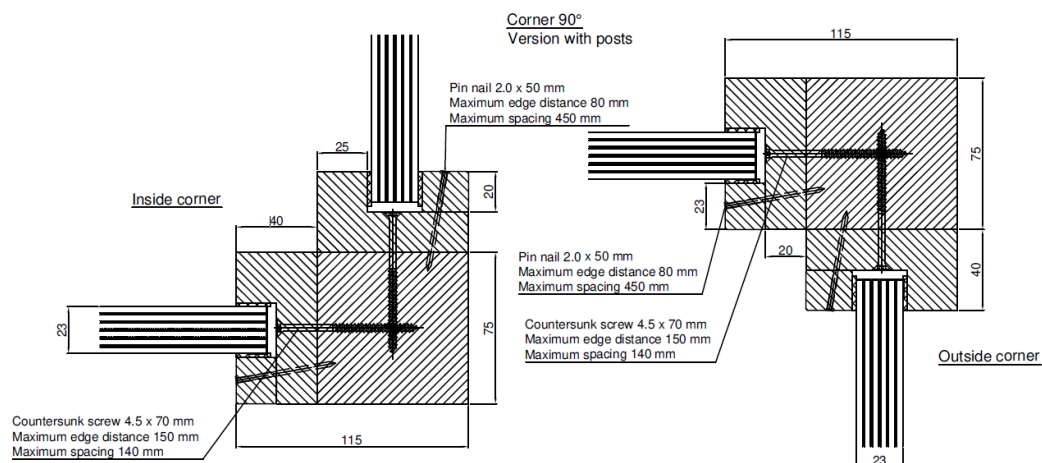


Figure 13: 90° corner with mullion

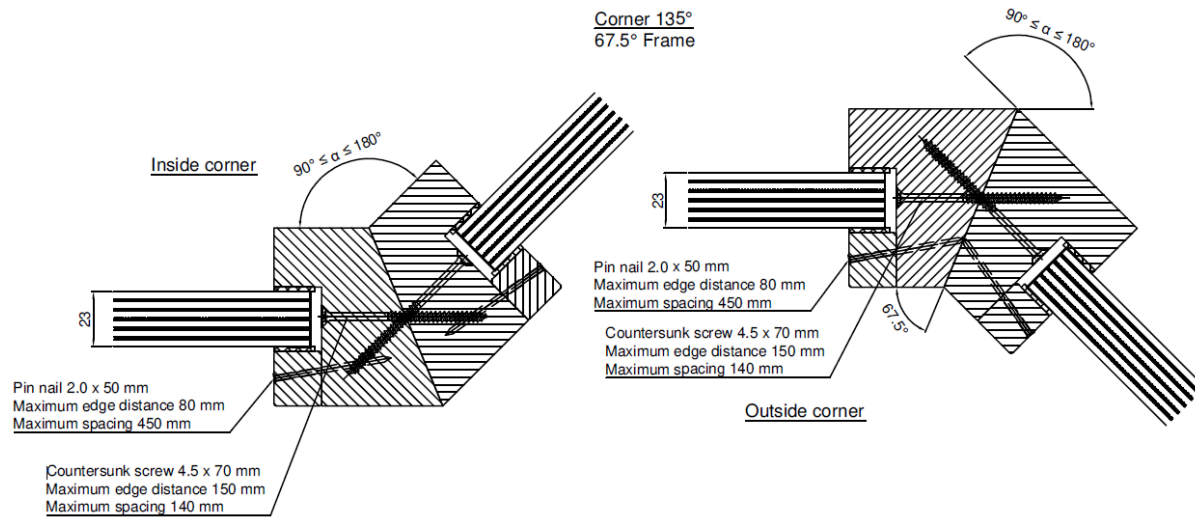


Figure 14: Corners with angles

8 Connections to the supporting structure

8.1 Tested supporting structures

- Solid construction with low density (650 ± 200) kg/m³ and a minimum thickness of 175 mm
- Solid construction with high density (≥ 850 kg/m³) and a minimum thickness of 175 mm
- Lightweight construction (LWC); stud partition wall with a minimum thickness of 75 mm

8.2 Connections within the reveal

Wall connections in reveals, e.g. masonry or lightweight walls, with direct screw fixing.

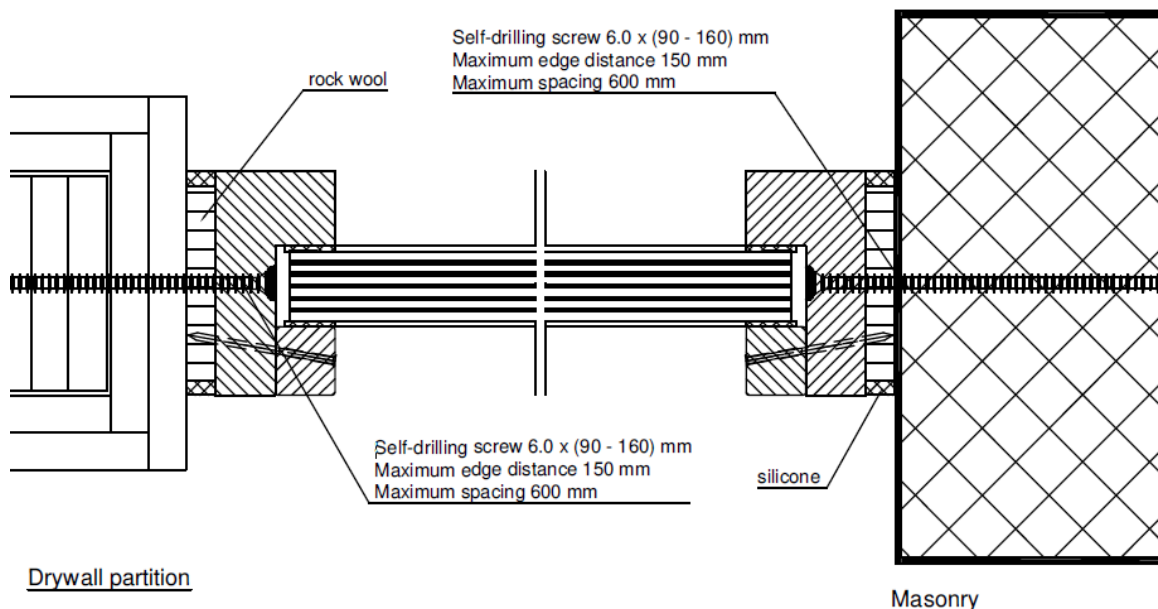


Figure 15: Connection to the supporting structure within the reveal

8.3 Connections mounted in front of the supporting structure

Wall connections surface-mounted with concealed or visible installation screws to e.g. masonry or lightweight walls.

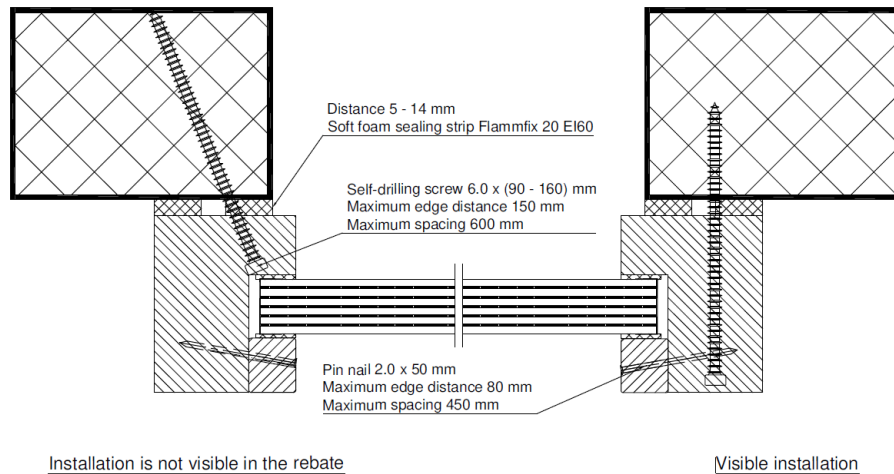


Figure 16: Surface-mounted connection to the supporting structure

9 Glass coupling butt joint

9.1 Butt-joint glazing for flat fronts

Fire-resistant glazing with butt-joints must be executed in accordance with Figure 16. The timber frame at the side, top and bottom connections must be designed in accordance with the section "Connections to the supporting structure". FIRESWISS FOAM 60-27/1 fire-resistant glass must be used as the glazing. The maximum permissible glass size is 1500 x 3000 mm (width x height). The butt-joint must be executed with a visible width of approx. 2.0 - 3.0 mm and fitted with an intumescent strip measuring 9 x 2.0 mm (Palusol KuhnOdice). The butt-joint is sealed on both sides with silicone. See Figure 17.

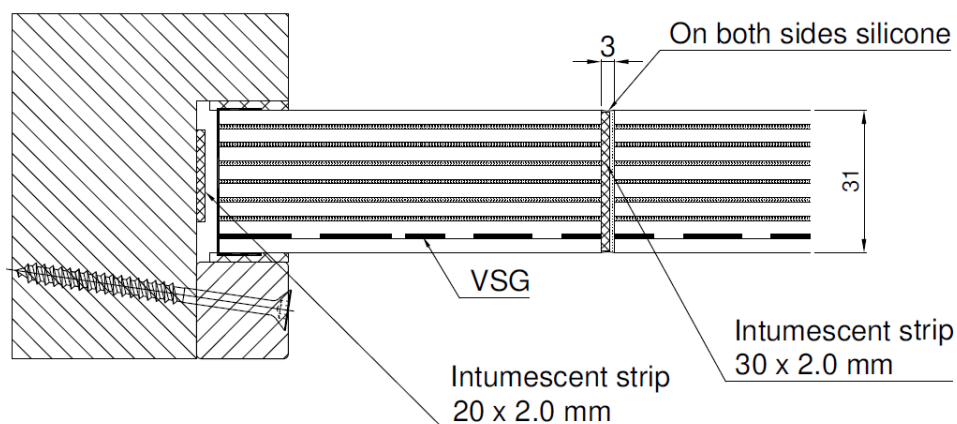


Figure 17: Frame with straight butt-joint glazing

9.2 Butt-joint glazing, corner joints

Fire-resistant glazing with corner butt-joints must be executed in accordance with Figure 18 and Figure 19. The timber frame at the side, top and bottom connections must be designed in accordance with Section 8 "Connections to the supporting structure". Pyroguard EI60 EXT++ SWS fire-resistant glass must be used as the glazing. The maximum permissible glass size is 1500 x 3000 mm (W x H). The butt-joint must be made with a width of approx. 2.0 mm and fitted with an intumescent strip (Palusol from KuhnOdice) 32 x 2.0 mm (in the case of 135° joints) and 40 x 2.0 mm (in the case of 90° joints). The butt-joint is sealed on both sides with silicone. Corners with an angle of up to 90° are possible as butt-joints. See Figure 18 and Figure 19.

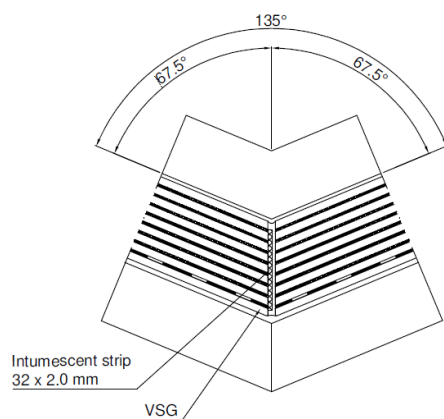


Figure 18: Butt-joint with an angle of 135°

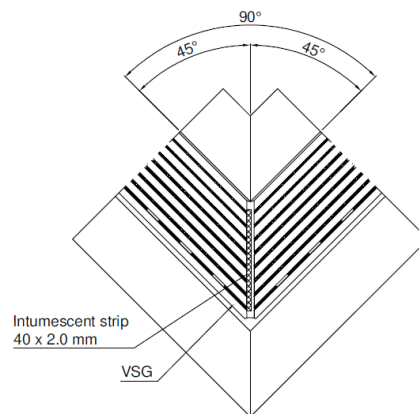


Figure 19: Butt-joint with an angle of 90°

10 Product data sheet

Pyroguard Rapide Plus

- EI60 INT
- EI60 INT VI
- EI60 EXT
- EI60 EXT VI

EN1279-5+A2 INSULATING GLASS UNITS
EN14449 LAMINATED SAFETY GLASS

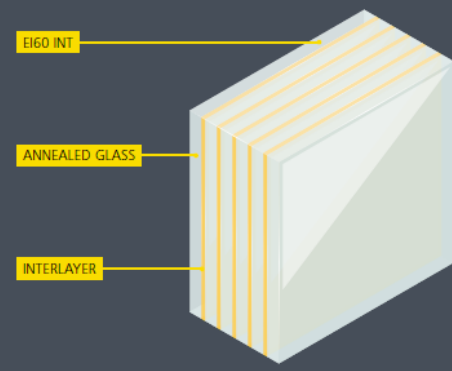


Classification: EI

The highest level of protection from flames, smoke and heat.



Structural wall / butt joint





Fire resistance
EI60



Cuttability
glass



Light weight



Good sound reduction



Impact resistance
1B1



Good light transmission



Temp range
-40°C/+50°C

CHARACTERISTICS	EI60 INT	EI60 INT VI 16mm SPACER 33.1 LOW E COUNTERPANE	EI60 EXT	EI60 EXT VI 16mm SPACER 4mm LOW E COUNTERPANE
FIRE RESISTANCE (EN 13501-2)	EI60	EI60	EI60	EI60
GLASS PRODUCTION SIZE MIN - MAX (mm)	100 x 100 2125 x 3100	100 x 100 2125 x 3100	100 x 100 2125 x 3100	100 x 100 2125 x 3100
THICKNESS AND TOLERANCE (mm)	23 (+3/-3)	45 (+3/-3)	27 (-3/+3)	47 (-3/+3)
WEIGHT (kg/m ²)	50	67	61	71
R _w (C;Ctr) SOUND REDUCTION (EN 140-3)	43 (-1;-3)	45 (-2;-7)	44 (-3;-3)	-
TV LIGHT TRANSMISSION (EN 410) (%)	82	68	81	68
U _g VALUE (EN 673) W/m ² K	5.2	1.0	5.1	1.0
g VALUE (EN 410)	0.65	0.45	0.61	0.47
TEMPERATURE RANGE (°C)	-40/+50	-40/+50	-40/+50	-40/+50
ATTACK RESISTANCE (EN 356)*	-	-	P1A	P1A
IMPACT RESISTANCE (EN 12600)*	1B1	1B1	1B1	1B1
UV STABILITY (EN ISO 12543-4)	-	✓	✓	✓
CE CERTIFICATE OF CONFORMITY	0757-CPR-695B	1812-CPR-1866	0757-CPR-695B	1812-CPR-1866

*impact and attack resistance of counterpane not reported
 **VI example construction. Data calculated using WINSLT (90% Ar; Guardian 1.0 Low E counterpane)

11 Insulating glass units (VI and TVI)

A Pyroguard EI60-xx

Edge tape (e)

Made of aluminium foil, plastic-coated, self-adhesive on one side, with 3 mm overlap in the edge seal area

B Edge seal / Spacer

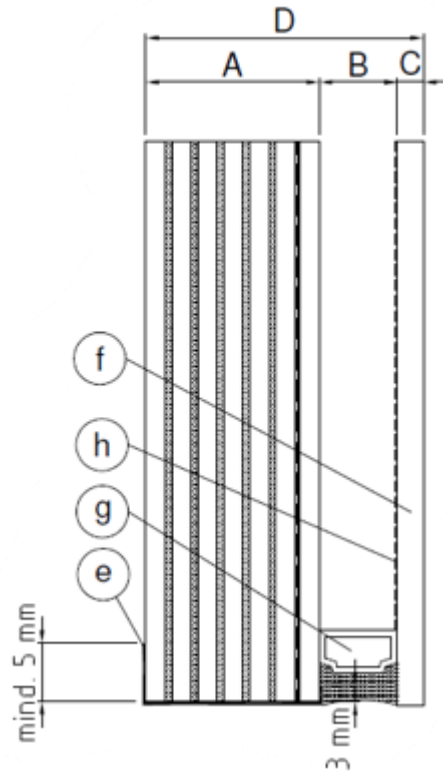
Spacer (g) ≤ 28 mm

C Opposite pane

Made of Float glass, ESG (tempered safety glass), TVG (heat-strengthened glass), or VG/VSG (laminated safety glass) with nominal thickness ≥ 3 mm, optional coating (h) on C

D Total glass thickness

According to table



Variants Pyroguard EI60-xx VI or TVI

A ① ②	B ③ ④	C ⑤	D Double-glazed (VI)	D Triple-glazed (TVI)
EI60-xx ≥ 23 mm	≤ 28 mm	Float glass ≥ 3 mm	≥ 35 mm	≥ 45 mm
		ESG ≥ 3 mm	≥ 35 mm	≥ 45 mm
		TVG ≥ 3 mm	≥ 35 mm	≥ 45 mm
		Laminated Float/Float ≥ 6 mm ⑥	≥ 38 mm	≥ 49 mm
		Laminated ESG/ESG ≥ 6 mm ⑥	≥ 38 mm	≥ 49 mm
		Laminated TVG/TVG ≥ 6 mm ⑥	≥ 38 mm	≥ 49 mm



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 [Pyroguard](https://www.youtube.com/Pyroguard)