



CERTIFICATE OF APPROVAL

No CF 592

This is to certify that, in accordance with
TS00 General Requirements for Certification of Fire Protection Products
The undermentioned products of

GLAS TRÖSCH AG FIRESWISS
Stanserstrasse 97, CH-6374 Buochs, Switzerland
Tel: 0041-41-6245656 Fax: 0041-41-6245657

Have been assessed against the requirements of the Technical Schedule(s)
denoted below and are approved for use subject to the conditions
appended hereto:

CERTIFIED PRODUCT

**Fireswiss Foam Laminated
Fire Resisting Glass**

TECHNICAL SCHEDULE

**TS 25 Fire Resistant
Glass, Glazing Systems
and Materials**

Signed and sealed for and on behalf of Warringtonfire Testing and Certification Limited

Paul Duggan
Certification Manager



Issued: 9th October 2007
Revised: 28th June 2019
Next audit test due: 28th June 2022
Frequency: 3 years
Valid to: 27th June 2024

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CERTIFICATE No CF 592

GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam Fire Resisting Glass

This certification is provided to the client for their own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

This Certificate of Approval relates to the fire resistance of Glas Trösch AG FIRESWISS Foam laminated glass products when used in the following applications, as defined in BS 476: Part 22: 1987 subject to the under-mentioned conditions.

Glass Specification	Application	Fire Resistance Performance (minutes)		Page No.
		Integrity	Insulation	
Fireswiss Foam 30-15, 30-16O, 30-19, 30-20O	Hardwood framed screens	30	30	4
	Softwood framed screens	30	30	5
	Steel framed screens	30	30	6
Fireswiss Foam 30-15, 30-16O 30-19, 30-20O	Timber based doorsets	30	30	7-9
	Timber based doorsets	60	30	10
Fireswiss Foam 30-15, 30-16O, 30-19, 30-20O	Steel based doorsets	30	30	11
Fireswiss Foam 30-15, 30-16O, 30-19, 30-20O	Hardwood framed screens	60	30	12
Fireswiss Foam 60-23, 60-24O, 60-27O, 60-28O	Oak framed Rectangular and circular panes in a plasterboard partition	60	60	13
Fireswiss Foam ISO 60-23, 60-23, 60-27	Hardwood framed screens	30	30	14
Fireswiss Foam 60-23, 60-24O, 60-27O, 60-28O	Hardwood framed screens	60	60	15
Fireswiss Foam 60-23, 60-24O, 60-27O, 60-28O	Timber based doorsets	60	60	16
Fireswiss Foam 60-23, 60-24O, 60-27, 60-28O	Steel framed screens	60	60	17
Fireswiss Foam 60-23, 60-24O, 60-27, 60-28O	Steel framed doorsets	60	60	18
Fireswiss Foam ISO 60-23	IGUs in steel framed screens	60	60	19
Fireswiss Foam 30-19	Butt-Jointed steel framed screens	30	30	20
Fireswiss Foam 60-27/1	Butt-Jointed steel framed screens	60	60	21

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U/003

Issued: 9th October 2007
Revised: 28th June 2019
Valid to: 27th June 2024

CERTIFICATE No CF 592

GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam Fire Resisting Glass

This product is approved on the basis of:

- a) Initial type testing
- b) A design appraisal against TS25
- c) Product surveillance under BS EN ISO 9001: 2008
- d) Audit testing
- e) Inspection and surveillance of factory production control

The glass is approved in the following nominal thicknesses:

Glass Specification	Application	Fire Resistance Performance (minutes)	
		Integrity	Insulation
Fireswiss Foam 30-15	15 mm thick (internal)	30*	30
Fireswiss Foam 30-16O	16 mm thick (internal)	30*	30
Fireswiss Foam 30-19	19 mm thick (external)	30*	30
Fireswiss Foam 30-20O	20 mm thick (external)	30*	30
Fireswiss Foam 60-23	23 mm thick (internal)	60	60
Fireswiss Foam 60-24O	24 mm thick (internal)	60	60
Fireswiss Foam 60-27	27 mm thick (external)	60	60
Fireswiss Foam 60-28O	28 mm thick (external)	60	60
Fireswiss Foam 30-19	Butt-Jointed steel framed screens	30	30
Fireswiss Foam 60-27/1	Butt-Jointed steel framed screens	60	60

* may be used to provide 60 minutes integrity and insulation depending upon element of construction, as detailed later in this approval.

This Certificate of Approval must be read in conjunction with CERTIFIRE Technical Schedule TS25, Fire Resistant Glass, Glazing Systems and Materials.

General Requirements

Where the glass is installed in a timber or steel framed screen, the orientation of the screen shall be no more than $\pm 10^\circ$ from the vertical.

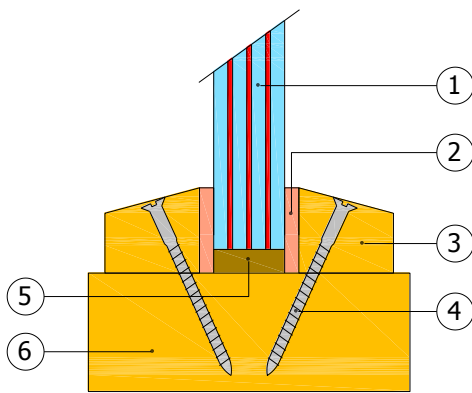
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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass in hardwood framed screens for periods of 30 minutes integrity and 30 minutes insulation

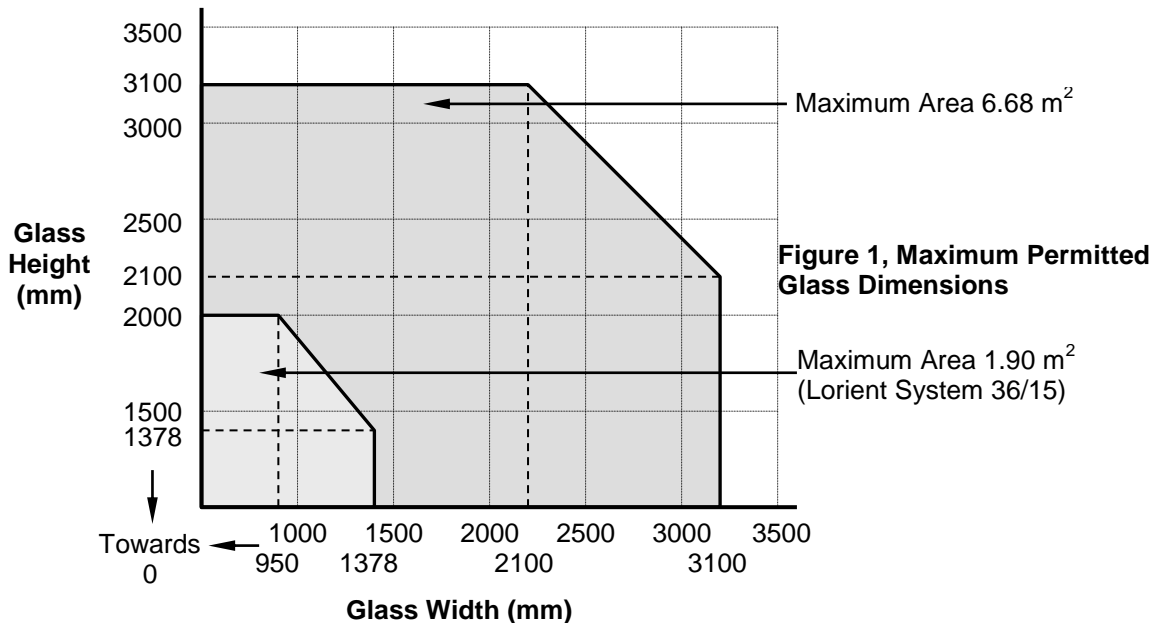
For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



- 1 Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass
- 2 20 mm by 3 mm, calcium magnesium silicate fibre based glazing tape or Lorient System 36/15
- 3 20 mm high by 28 mm wide square or chamfered (up to 10°) hardwood glazing beads, minimum density 530 kg/m³. (17 mm high for System 36/15)
- 4 60 mm long x 4.5 mm steel screws at 400 mm centres (30° to glass)
- 5 Non-combustible setting blocks
- 6 75 mm by 40 mm (minimum) hardwood framing sections, minimum density 530 kg/m³

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass shown in Figure 1 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



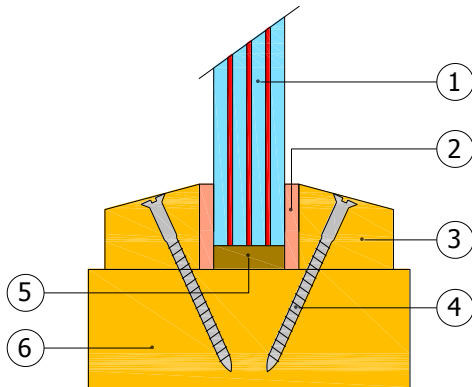
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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass in softwood framed screens for periods of 30 minutes integrity and 30 minutes insulation

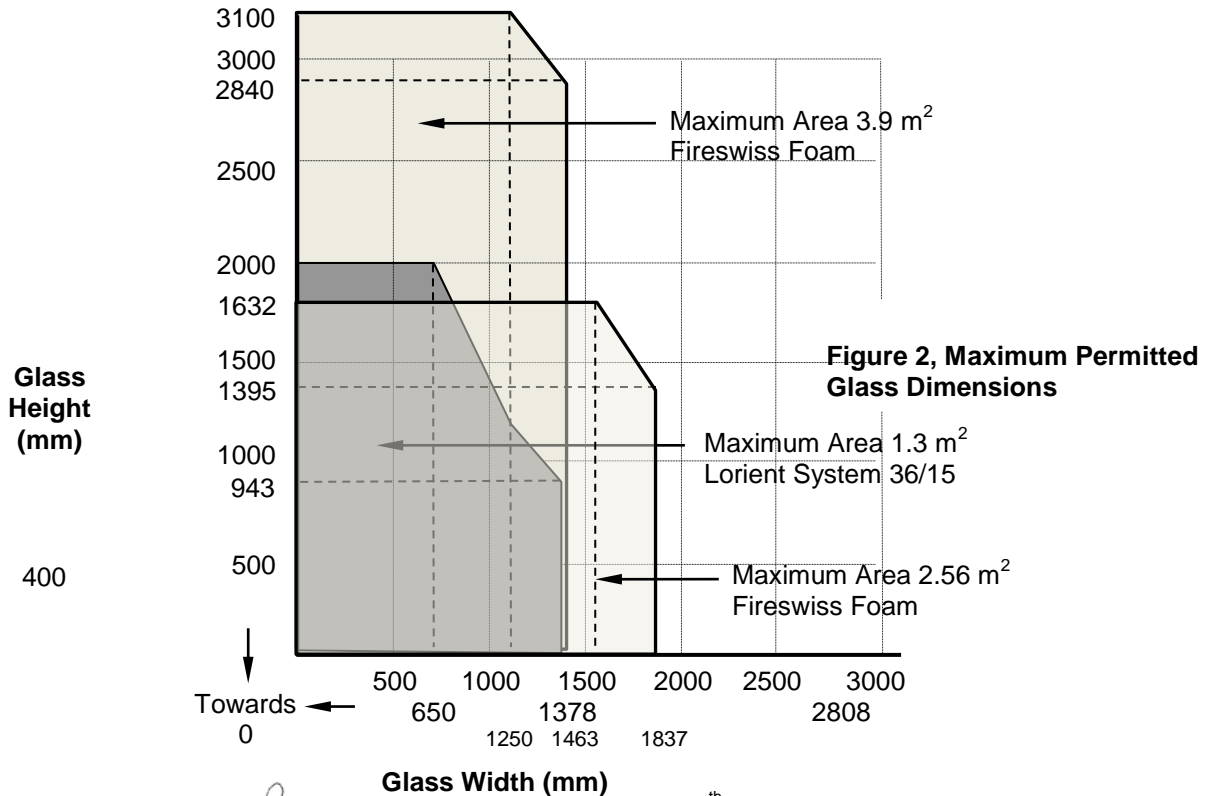
For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



- 1 Fireswiss Foam 30-15,30-160, 30-19 and 30-200 glass
- 2 20 mm by 3 mm calcium magnesium silicate fibre based glazing tape or Lorient System 36/15
- 3 20 mm high by 28mm wide square or chamfered (up to 30°) softwood glazing beads, minimum density 450 kg/m³. (17 mm high for Lorient System 36/15)
- 4 60 mm long x 4.5 mm steel screws at 200 mm centres (30° to glass)
- 5 Hardwood or Non-combustible setting blocks
- 6 75 mm by 40mm (minimum) softwood framing sections, minimum density 450 kg/m³

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass shown in Figure 2 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass in steel framed screens for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system utilising the following basic specification:

- Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass
- 20 mm by 3 mm calcium magnesium silicate fibre based glazing tape
- The edge cover to each pane shall be no less than 15 mm minimum

The insulated steel framing system shall have test evidence or be CERTIFIRE approved for the inclusion of apertures of the proposed dimensions.

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass shown in Figure 3 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

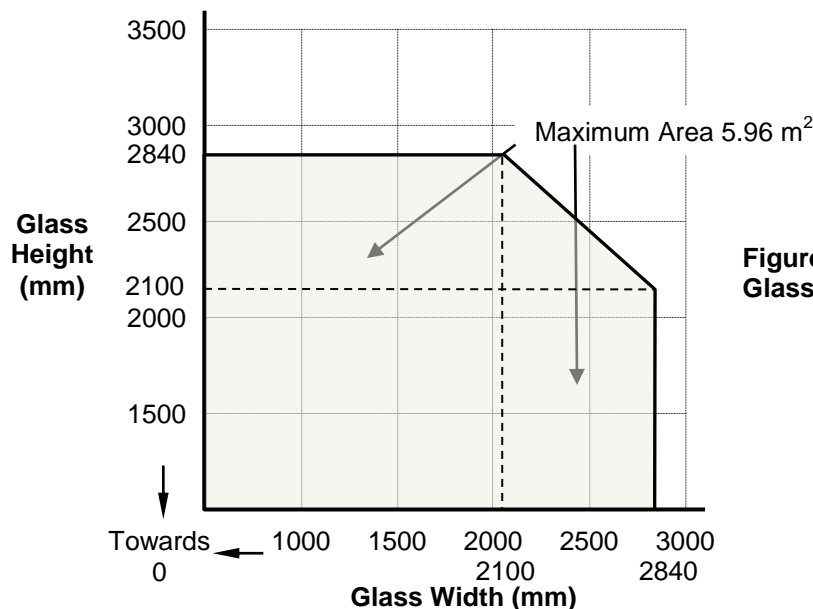


Figure 3, Maximum Permitted Glass Dimensions

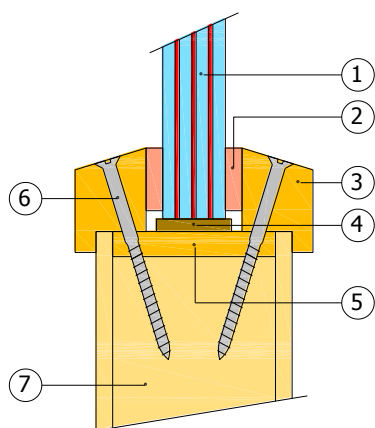
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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass in timber based doorsets for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- 1 Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass
- 2 Glazing seal (see below)
- 3 Hardwood glazing beads (or as specified on Pages 8 & 9, see below)
- 4 Non-combustible/hardwood setting blocks
- 5 Liner (see below)
- 6 Fixings (see below)
- 7 Nominally 44 mm thick FD30 door leaf (or thicker if required to accommodate glazing beads)

The doorset shall be CERTIFIRE approved or have test evidence for the inclusion of apertures of the proposed dimensions.

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass shown in the table below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Glazing System	Maximum Pane dimension – height (mm)	Maximum Pane dimension – width (mm)	Maximum Pane Area (m ²)
Hodgsons Sealants Firestrip 30 ⁽¹⁾	875	758	0.57
Lorient Flexible Figure 1 glazing system ⁽²⁾	1236	750	0.72
Lorient Flexible Figure 1 glazing system ⁽³⁾	1353	800	0.95
Lorient System 36/15 ⁽⁴⁾	1800	600	1.08
Pyroplex 8193 glazing system ⁽⁵⁾	600	600	0.36
Pyroplex 30049 glazing system ⁽⁶⁾	750	750	0.56
Pyroplex 30054 glazing system ⁽⁷⁾	750	750	0.56
Pyroplex 8492 glazing system ⁽⁸⁾	403	626	0.25
Sealmaster Therm-A-Strip 10 mm x 2 mm ⁽⁹⁾	2125	800	0.64
Sealmaster G30 glazing gasket between beads and glass ⁽⁹⁾	2125	610	0.64



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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass in timber based doorsets for periods of 30 minutes integrity and 30 minutes insulation (continued)

- 1) The glazing beads shall be of Sapele or equivalent or higher density (610 kg/m³), sections, 22mm wide by 21mm high, chamfered by approximately 13° and fixed using 1.5 mm diameter, 50mm long steel pins at a maximum of 100mm centres and angled to pass under the face of the glass.
- 2) The glazing beads shall be of minimum density 550 kg/m³, sections, 22mm wide by 15 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 15° and fixed using 1.5 mm diameter, 40mm long steel pins or screws at a maximum of 150mm centres and angled to pass under the face of the glass. A secondary hardwood liner (integral or separate) or a LX4402 intumescent liner shall be used to line apertures cut within flaxboard substrates.
- 3) The glazing beads shall be of minimum density 650 kg/m³ hardwood or 750 kg/m³ MDF, sections, 25mm wide by 20 mm high with a 10 mm by 6 mm bolection return, chamfered by approximately 30° and fixed using 40mm long steel screws at a maximum of 150mm centres and angled at 45°. A secondary 38 mm x 6 mm thick hardwood liner (min. density 650 kg/m³) shall be used to line apertures cut within all substrates.
- 4) The glazing beads shall be of minimum density 550 kg/m³, sections, 18.5 mm wide by 15 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 15° and fixed using 1.5 mm diameter, 45mm long steel screws at a maximum of 200mm centres and angled to pass under the face of the glass. A secondary hardwood liner (integral or separate) or a LX4402 intumescent liner shall be used to line apertures cut within flaxboard substrates.
- 5) The glazing beads shall be of minimum density 630 kg/m³, sections, 20mm wide by 14.5 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 20° and fixed using, 50 mm long steel screws at a maximum of 150mm centres and angled at 30-45°. A secondary 6 mm thick hardwood liner (min. density 630 kg/m³) shall be used to line apertures cut within all substrates.
- 6) The glazing beads shall be of minimum density 630 kg/m³, sections, 20mm wide by 14.5 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 20° and fixed using, 36 mm long steel screws at a maximum of 150mm centres and angled at 30-45°. A secondary 6 mm thick hardwood liner (min. density 630 kg/m³) shall be used to line apertures cut within all substrates.
- 7) The glazing beads shall be of minimum density 630 kg/m³, sections, 20mm wide by 14.5 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 20° and fixed using, 50 mm long steel screws at a maximum of 150mm centres and angled at 30-45°. A secondary 6 mm thick hardwood liner (min. density 630 kg/m³) shall be used to line apertures cut within all substrates.



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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass in timber based doorsets for periods of 30 minutes integrity and insulation (continued)

- 8) The glazing beads shall be of minimum density 630 kg/m³, sections, 20 mm wide by 14.5 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 20° and fixed using, 45 mm long steel screws at a maximum of 150mm centres and angled at 30-45°.
- 9) The glazing beads shall be hardwood of minimum density 500 kg/m³, sections, 25 mm wide by 23 mm high with a 5 mm by 5 mm bolection return, chamfered by approximately 15° and fixed using, 38 mm long steel pins or screws at a maximum of 150mm vertical and 100 mm horizontal centres and angled at 15°. A secondary 6 mm thick hardwood liner (min. density 500 kg/m³) shall be used to line apertures cut within all substrates.

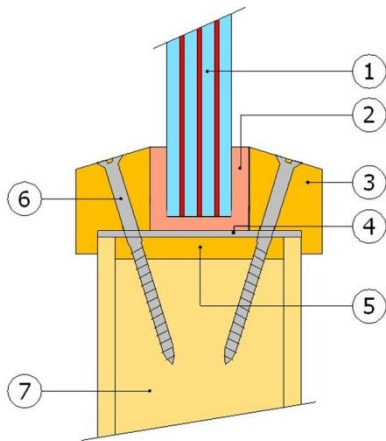
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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-16O, 30-19 and 30-200 glass in timber based doorsets for periods of 60 minutes integrity and 30 minutes insulation

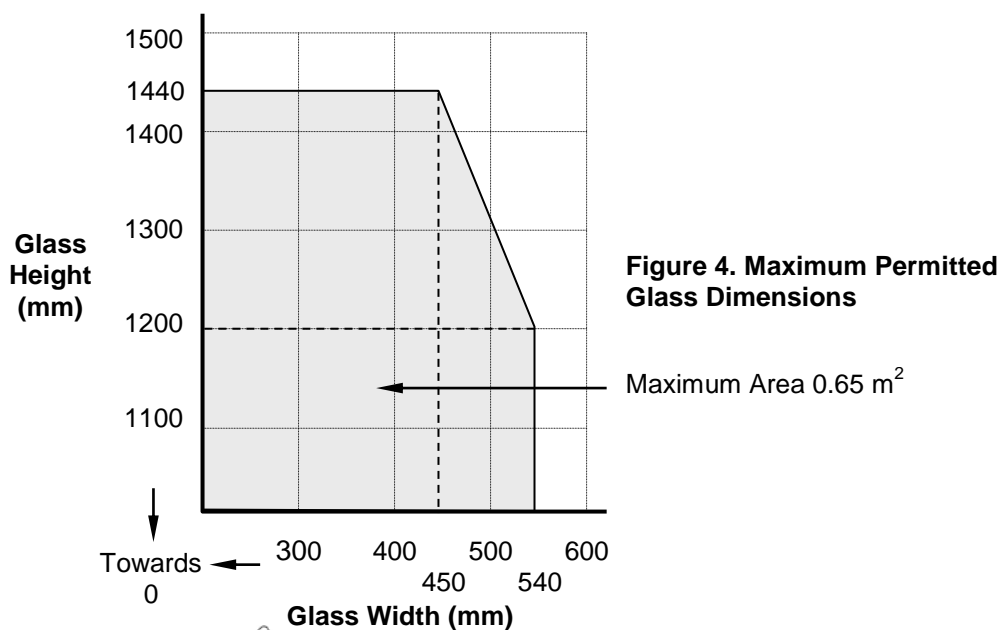
For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested (with test evidence for the inclusion of apertures of the proposed dimensions) or CERTIFIRE approved timber based doorset utilising the following basic specification:



- 1 Fireswiss Foam 30-15, 30-16O, 30-19 and 30-200 glass
- 2 Lorient System 36/15 glazing seal
- 3 Hardwood glazing beads 33 mm high by 21 mm wide including 13 mm high by 5 mm wide bolection return. Minimum density 650 kg/m³.
- 4 Palusol liner (full width)
- 5 Hardwood liner 10 mm thick
- 6 8 x 50 mm screws at 45° and minimum 150 mm centres. Maximum distance from corners 50 mm.
- 7 Nominally 54 mm thick FD60 door leaf

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-16O, 30-19 and 30-200 glass shown in Figure 4 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass in steel based doorsets for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

1. The doorset, including door frame and associated building hardware, should have achieved at least 30 minutes integrity and insulation when tested, or subsequently assessed by one of the laboratories approved by CERTIFIRE as acceptable for this purpose, to BS 476: Part 22: 1987.
2. If the proposed doorset is to be used in double-leaf configuration, the test or assessment evidence should be applicable to double-leaf configurations.
3. Likewise, if the proposed doorset is to be used in the unlatched configuration, the available evidence should be applicable to unlatched doorsets.
4. The proposed doorset should also have included a glazed aperture or apertures of the intended size, shape, area and number. Glass to be glazed using 20 mm by 3 mm calcium magnesium silicate fibre based tape.
5. When used to glaze CERTIFIRE approved doorsets which have smaller apertures than allowed in this certificate, the aperture sizes specified in the doorset certificate shall take precedence.

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-16O, 30-19 and 30-20O glass shown in Figure 5 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

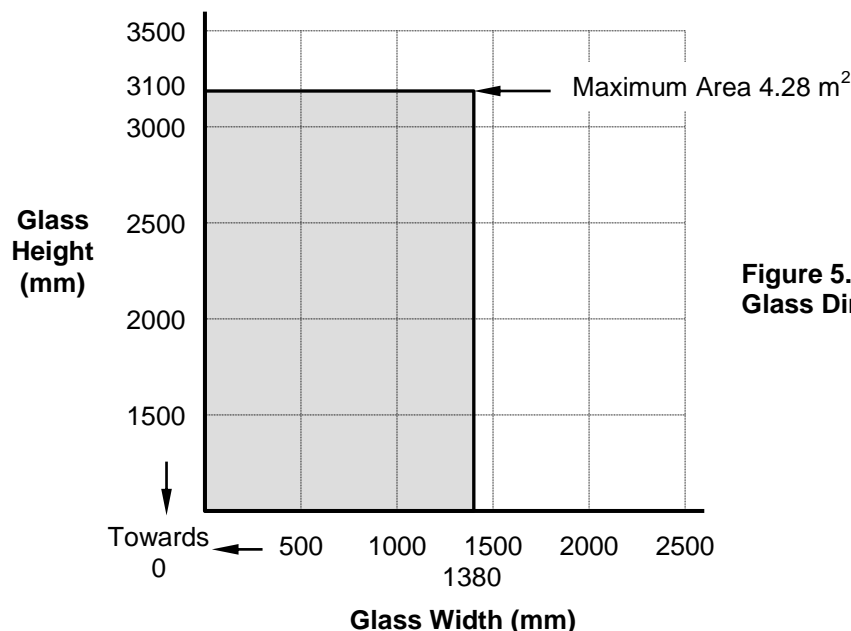


Figure 5. Maximum Permitted Glass Dimensions

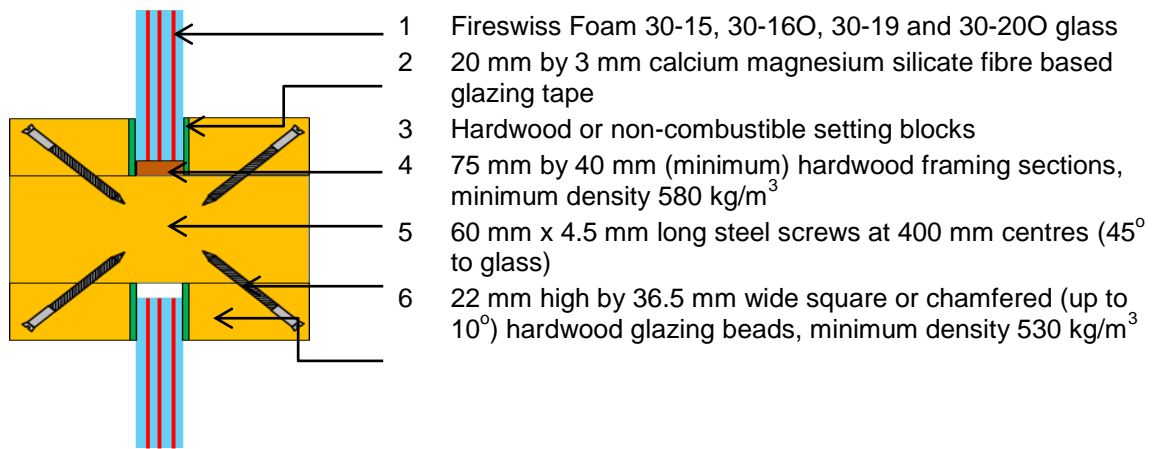
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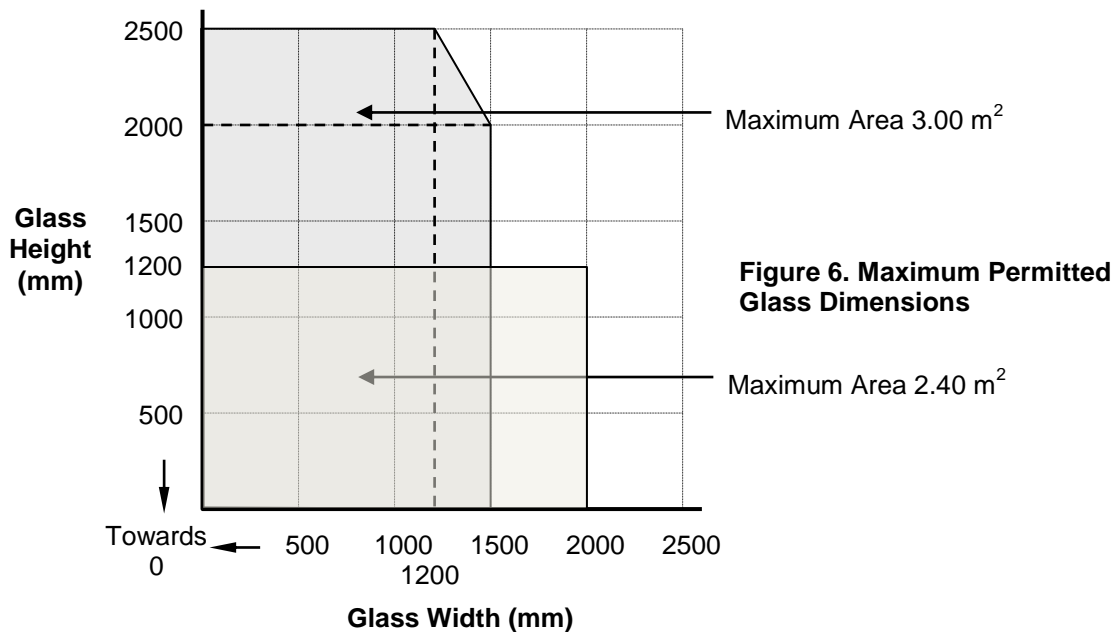
Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass in hardwood framed screens for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



This Certificate of Approval relates to the sizes of Fireswiss Foam 30-15, 30-160, 30-19 and 30-200 glass, shown in Figure 6 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 60-23, 60-240, 60-27 and 60-280 Rectangular and Circular glass panes mounted and fixed in an Oak frame, installed in a plasterboard partition for periods of 60 minutes integrity and 60 minutes insulation

Framework

The frame was made of jointed laminated Oak Timber, density 580 kg/m³.

- The two mullions and two transoms of the frame were assembled together by double tenon and mortise system.
- The circular part was made of 1085 x 1100 mm timber panel, made of jointed laminated Oak Timber with a density of 580 kg/m³.
- The timber panel had a 1000 mm circular-shaped opening.
- The rectangular shaped part and the circular shaped one were assembled together by steel screws 4.5 x 50 mm every 200 mm.
- The whole frame was fixed to the supporting structure by 8 x 109 mm steel screws REF 550.596 (Jansen)
- The gap between the supporting construction and the frame was filled with mineral Rockwool, density of 60 kg/m³.

Glazing

The frame defines two apertures glazed with 23mm thick Fireswiss Foam 60-23, 60-240, 60-27 and 60-280 glass.

Dimensions of rectangular pane: 1.410 x 990 mm (w x h)

Dimensions of Circular panes: Ø990 mm

The glasses were held by:

- 60 x 54 mm steel clamps, consisting of a folded steel sheet with two Ø 2.5 x 30 mm oblong hole.. They were placed:
 - Horizontally at 185 mm from the angles, and then located every 340 mm for the rectangular part.
 - Vertically at 280 mm from the angles and then located every 460 mm for the rectangular part.
 - Every 45° or every 785.25 mm arc length for the circular part.
- A simple bead system constructed from the same timber with the same density of the frame, with a section of 23 x 20 mm. The beads were bevelled with an angle of 30°, and were fixed on the frame by steel screws Ø 4.5 x 35 mm every 200 mm for the rectangular glass, and every 30° for the circular glass, on each side of the glass, The beads were provided with a 20 x 3 ceramic tape reference Kerafix 2000.

The rectangular glass was supported in its lower part by two Flammi 12 setting blocks, dimensions 80 x 23 x 5 mm, placed at 10mm from the bottom corners.

The circular glass was supported in its lower part by two Flammi 12 setting blocks, dimensions 80 x 23 x 5 mm placed at 30° - 40° off the lead.

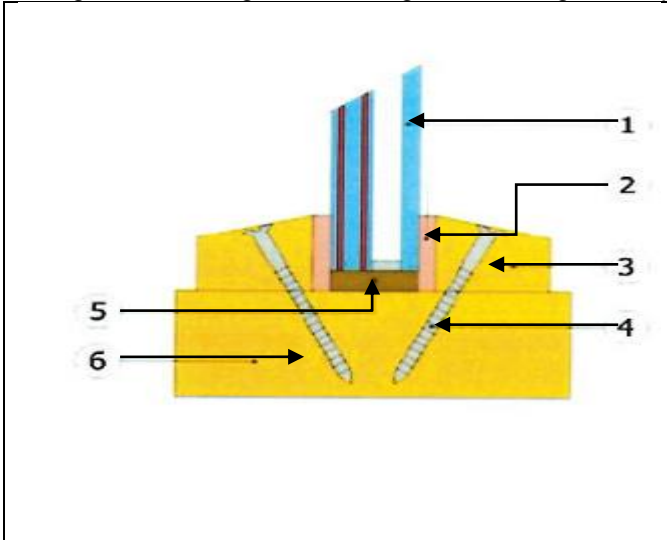
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GLAS TRÖSCH AG FIRESWISS

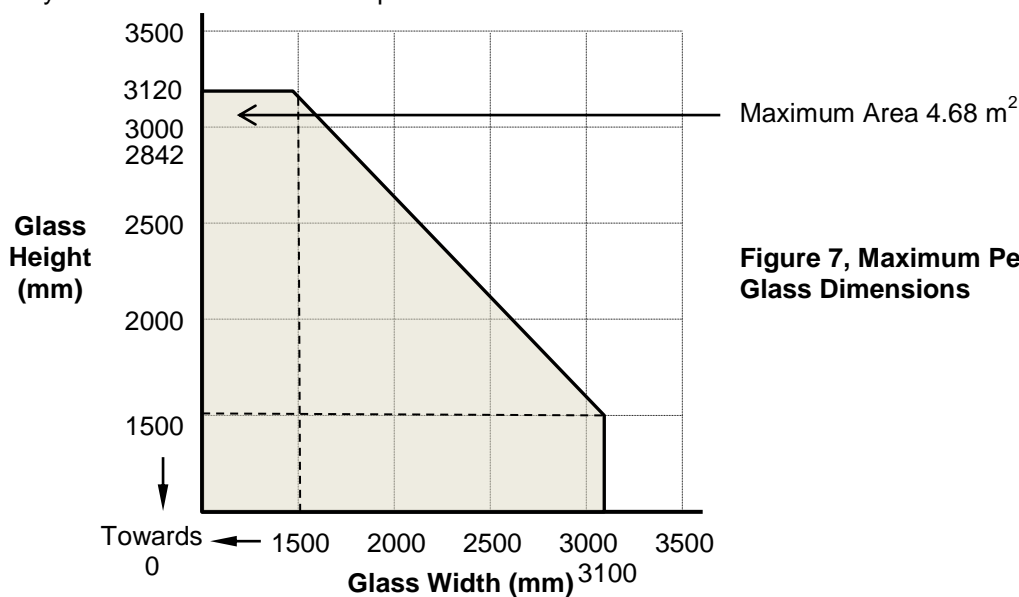
Fireswiss Foam ISO 60-23, Fireswiss Foam 60-23, 60-27 glass in softwood framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:

	1	Fireswiss Foam ISO 60-23, 60-23 60-27 glass
	2	20 mm by 3 mm calcium magnesium silicate fibre based glazing tape or Lorient System 36/15
	3	20 mm high by 28mm wide square or chamfered (up to 30°) softwood glazing beads, minimum density 450 kg/m ³ . (17 mm high for Lorient System 36/15)
	4	60 mm long x 4.5 mm steel screws at 200 mm centres (30° to glass)
	5	Hardwood or non setting blocks
	6	82 mm by 40 mm (minimum) softwood framing sections, minimum density 450 kg/m ³ ,

This Certificate of Approval relates to the sizes of Fireswiss Foam ISO 60-23, 60-23, and 60-27 glass as shown in Figure 7 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



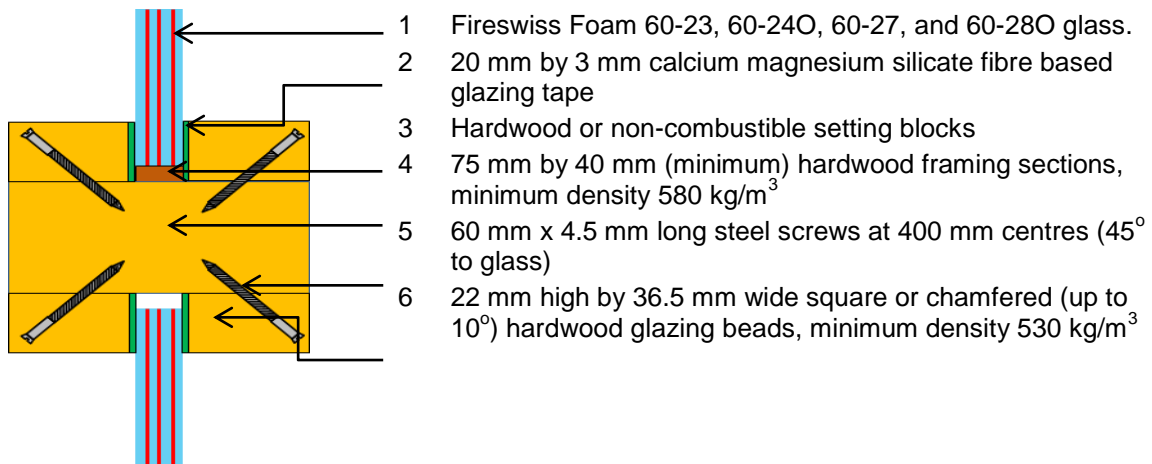
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GLAS TRÖSCH AG FIRESWISS

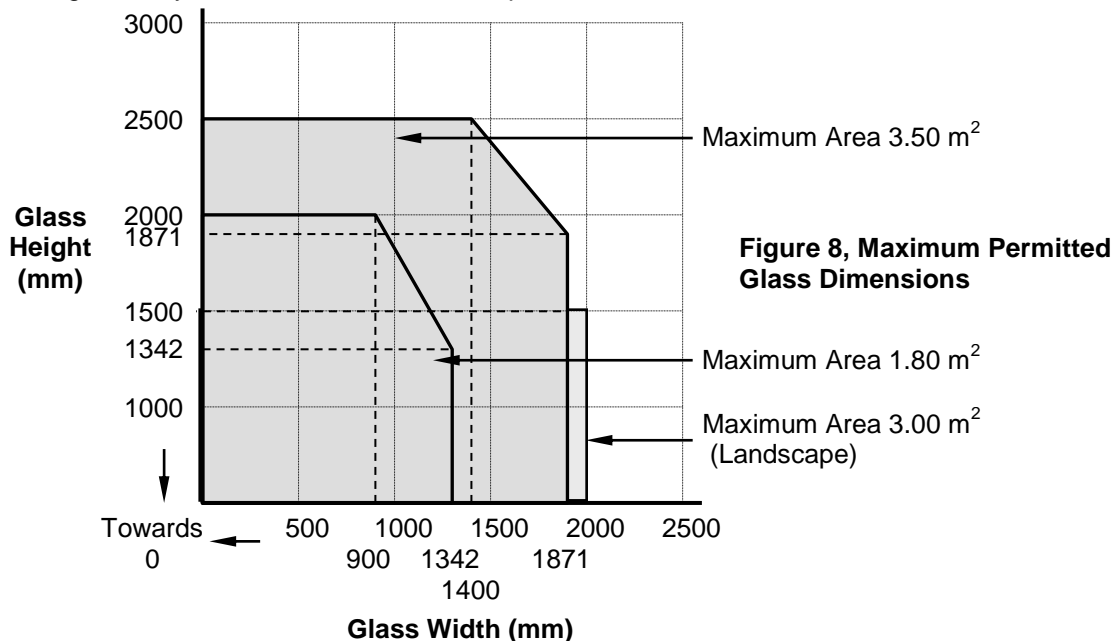
Fireswiss Foam 60-23, 60-240, 60-27, and 60-280 glass in hardwood framed screens for periods of 60 minutes integrity and 60 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



This Certificate of Approval relates to the sizes of Fireswiss Foam 60-23, 60-240, 60-27, and 60-280 glass shown in Figure 8 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



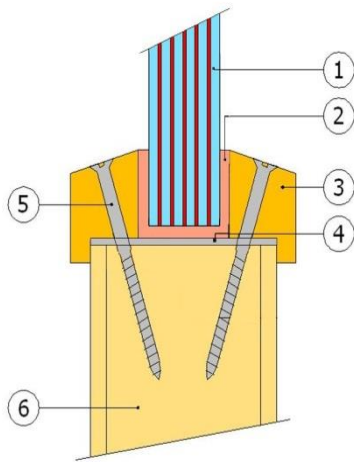
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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 60-23, 60-240, 60-27, and 60-280 glass in timber based doorsets for periods of 60 minutes integrity and 60 minutes insulation

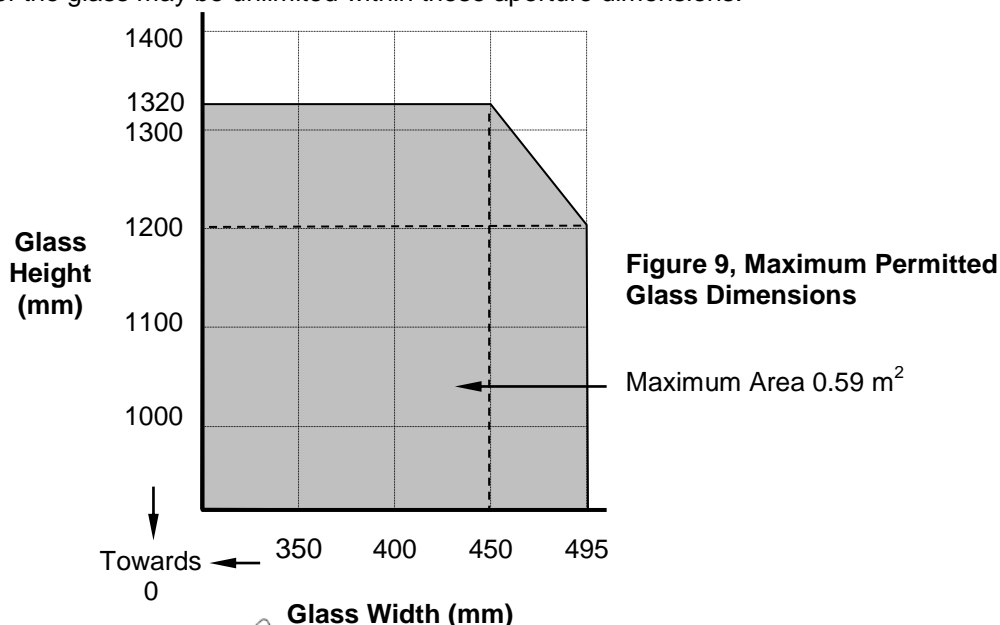
For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested doorsets, as specified below (with test evidence for the inclusion of apertures of the proposed dimensions) utilising the following basic specification:



- 1 Fireswiss Foam 60-23, 60-240, 60-27, and 60-28 glass
- 2 Lorient System 36/23 glazing seal
- 3 Hardwood glazing beads 25 mm high by 17 mm wide including 5 mm high by 5 mm wide bolection return. Min. density 650 kg/m³
- 4 2 mm thick mono ammonium phosphate liner (M.A.P.), full width
- 5 8 x 45 mm screws at 45° and minimum 200 mm centres. Maximum distance from corners 50 mm.
- 6 Minimum 54 mm thick FD60 door leaf incorporating a flaxboard core and 10 mm thick Anti-Flam Chipboard faces.

This Certificate of Approval relates to the sizes of Fireswiss Foam 60-23, 60-240, 60-27, and 60-280 glass shown in Figure 9 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 60-23, 60-24O, 60-27 and 60-28O glass in steel framed screens for periods of 60 minutes integrity and 60 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system utilising the following basic specification:

- 20 mm by 6 mm calcium magnesium silicate fibre based glazing tape
- The edge cover to each pane shall be no less than 15 mm minimum

The insulated steel framing system shall have test evidence or be CERTIFIRE approved for the inclusion of apertures of the proposed dimensions.

This Certificate of Approval relates to the sizes of Fireswiss Foam 60-23, 60-24O, 60-27 and 60-28O glass shown in Figure 10 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

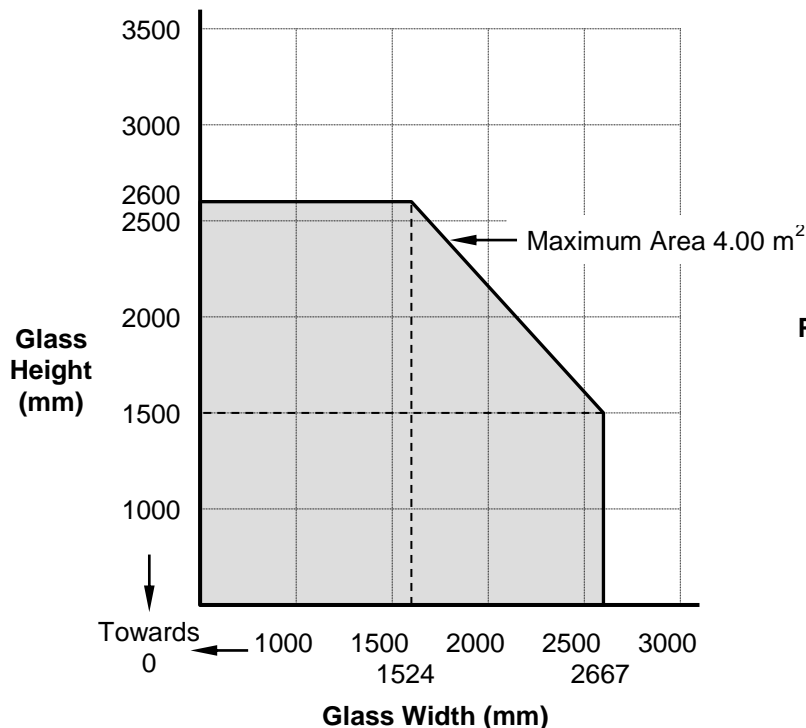


Figure 10, Maximum Permitted Glass Dimensions

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GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 60-23, 60-240, 60-27 and 60-280 glass in insulated steel framed doorsets for periods of 60 minutes integrity and 60 minutes insulation

For this application the following conditions shall apply:

1. The doorset, including door frame and associated building hardware, should have achieved at least 60 minutes integrity and insulation when tested, or subsequently assessed by one of the laboratories approved by CERTIFIRE as acceptable for this purpose, to BS 476: Part 22: 1987.
2. If the proposed doorset is to be used in double-leaf configuration, the test or assessment evidence should be applicable to double-leaf configurations.
3. Likewise, if the proposed doorset is to be used in the unlatched configuration, the available evidence should be applicable to unlatched doorsets.
4. The proposed doorset should also have included a glazed aperture or apertures of the intended size, shape, area and number. Glass to be glazed using 20 mm by 5 mm Kerafix 2000 tape.
5. When used to glaze CERTIFIRE approved doorsets which have smaller apertures than allowed in this certificate, the aperture sizes specified in the doorset certificate shall take precedence.

This Certificate of Approval relates to the sizes of Fireswiss Foam 60-23, 60-240, 60-27 and 60-280 glass shown in Figure 11 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

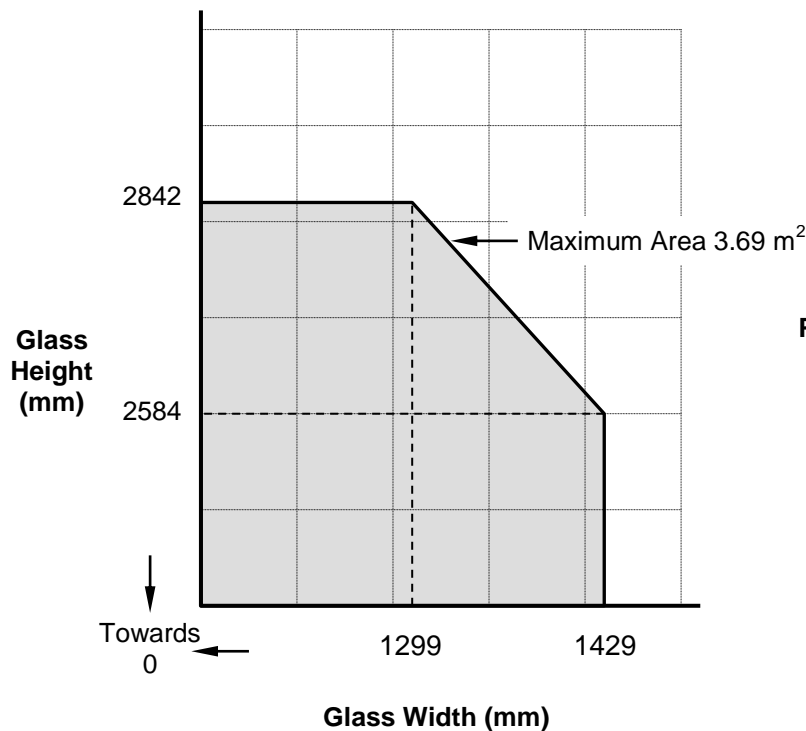


Figure 11, Maximum Permitted Glass Dimensions

CERTIFICATE No CF 592

GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 60-23 ISO glass in steel framed screens for periods of 60 minutes integrity and 60 minutes insulation

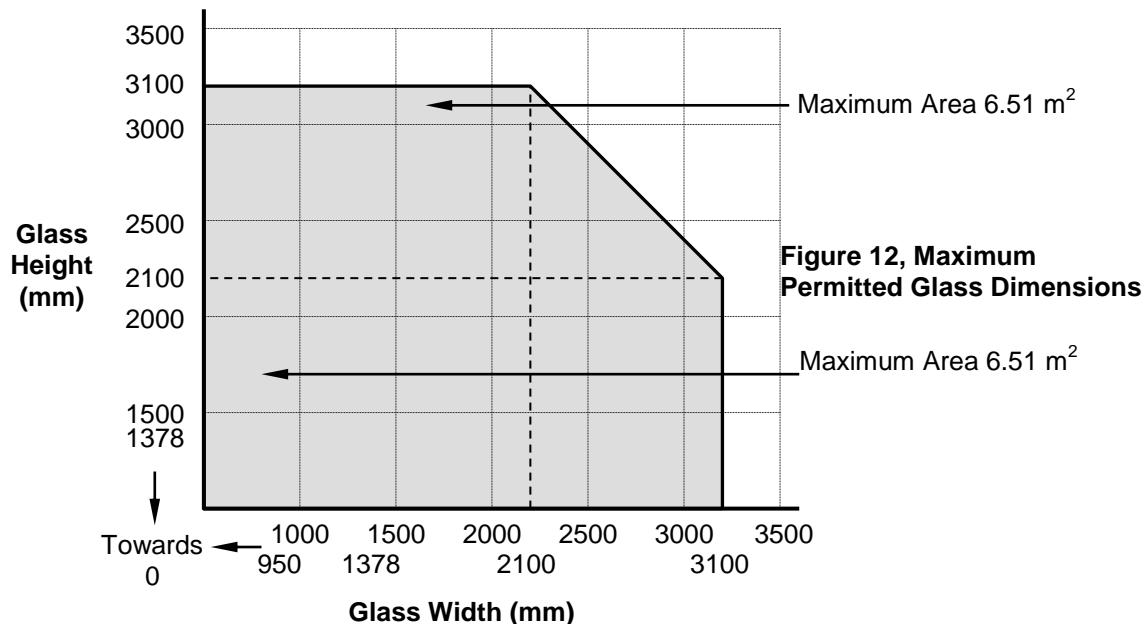
For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system:

- 20 mm by 6 mm calcium magnesium silicate fibre based glazing tape
- The edge cover to each pane shall be no less than 15 mm minimum

The insulated steel framing system shall have test evidence or be CERTIFIRE approved for the inclusion of apertures of the proposed dimensions.

This Certificate of Approval relates to the sizes of Fireswiss Foam 60-23 ISO shown in Figure 12 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



CERTIFICATE No CF 592

GLAS TRÖSCH AG FIRESWISS

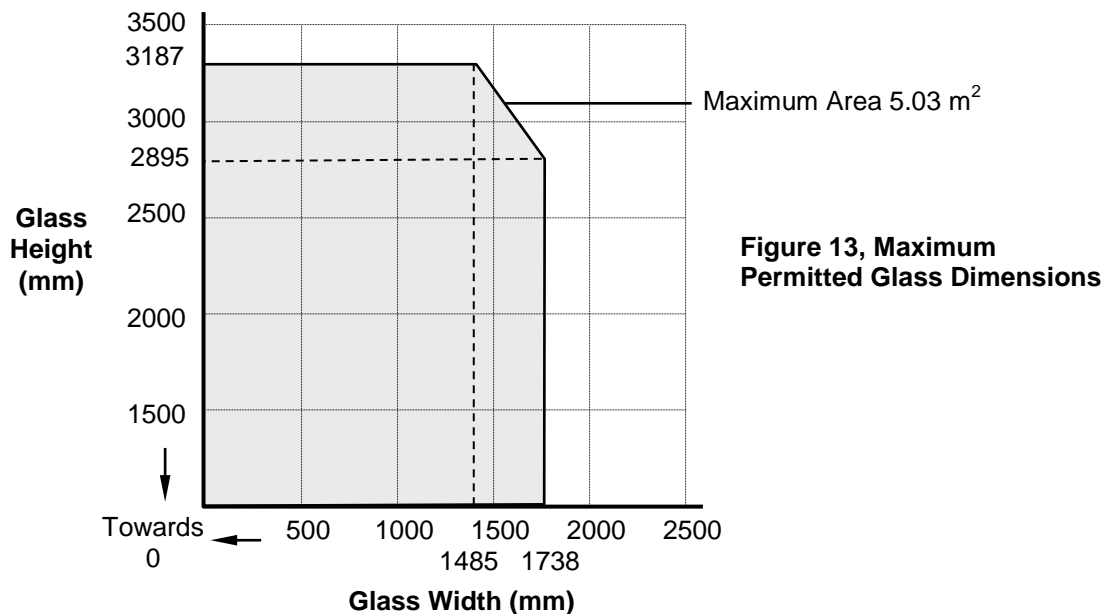
Fireswiss Foam 30-19 laminated glass panes in butt jointed steel framed screens for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system (which is covered appropriately by test or assessment evidence for the inclusion of apertures of the proposed dimensions) using pressure plate glazing, screw-fixed or clip-on retaining bead. The glass shall be glazed into the screen as described in the drawing shown on the next page and set on non-combustible setting blocks to determine the correct edge cover.

- The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system utilising the following basic specification.
 - Fireswiss Foam 30-19
 - (15 by 6mm) calcium magnesium silicate fibre based glazing tape.
 - The edge cover to each pane shall be no less than 15 mm minimum.
 - Joints between adjacent panes should be 5 mm wide and sealed with Palusol Strip E capped off with fire resistant Silicone sealant.

This Certificate of Approval relates to the sizes of Fireswiss Foam 30-19 laminated glazed panes shown in Figure 13 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within the glass dimensions shown below.



CERTIFICATE No CF 592

GLAS TRÖSCH AG FIRESWISS

Fireswiss Foam 60-27/1 laminated glass panes in butt jointed steel framed screens for periods of 60 minutes integrity and 60 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system (which is covered appropriately by test or assessment evidence for the inclusion of apertures of the proposed dimensions) using pressure plate glazing, screw-fixed or clip-on retaining beads. The glass shall be glazed into the screen as described in the drawing shown on the next page and set on non-combustible setting blocks to determine the correct edge cover.

- The glass shall be glazed within a previously fire tested or CERTIFIRE approved insulated steel framing system utilising the following basic specification.
- Fireswiss Foam 60-27/1
- (15 by 6mm) calcium magnesium silicate fibre based glazing tape.
- The edge cover to each pane shall be no less than 15 mm minimum.
- Joints between adjacent panes should be 5 mm wide and sealed with Palusol Strip E capped off with fire resistant Silicone sealant.

This Certificate of Approval relates to the sizes of Fireswiss Foam 60-27/1 laminated glass panes shown in Figure 14 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within the glass dimensions shown.

