



CERTIFICATE OF APPROVAL

No CF 581A

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

PYROGUARD UK LTD

International House, Millfield Lane, Haydock, WA11 9GA
Tel: 01942 710720 Fax: 01942 710730

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

'Pyrostem 2' Safety Wired
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 Manag

Issued: 16th October 2013
Reissued: 7th March 2019
Valid to: 6th March 2024





CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 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 Pyroguard UK Ltd. 'Pyrostem 2' Safety Wired glass products when used in the following applications, as defined in BS 476: Part 22: 1987 subject to the undermentioned conditions.

Application	Fire Resistance Performance (mins)		Page No.
	Integrity	Insulation	
Timber framed screens	30	0	3 - 4
Timber framed screens	60	0	5
Steel framed screens	30/60/90	0	6-8
Timber based doorsets	30	0	9-13
Timber based doorsets	60	0	14-17

This product is approved on the basis of:

- Initial type testing
- A design appraisal against TS25
- Audit testing
- Inspection and surveillance of factory production control
- Certification of quality systems to ISO 9001:2008

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.

The edge cover to each pane shall be no less than 15 mm minimum.

Glazing in timber doorset may include an arched head detail, subject to the top of the arch being no more than 50 mm higher than the top corners.

Page 2 of 17 Signed
E/056

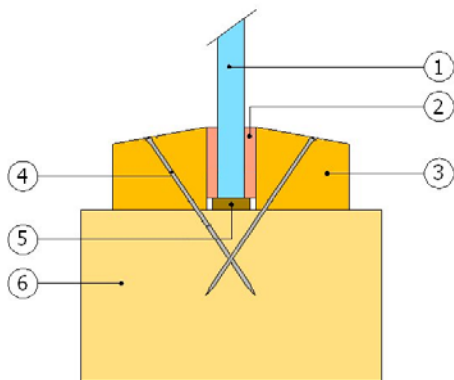
Issued: 16th October 2013
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CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in single-pane timber framed screens for periods of 30 minutes integrity

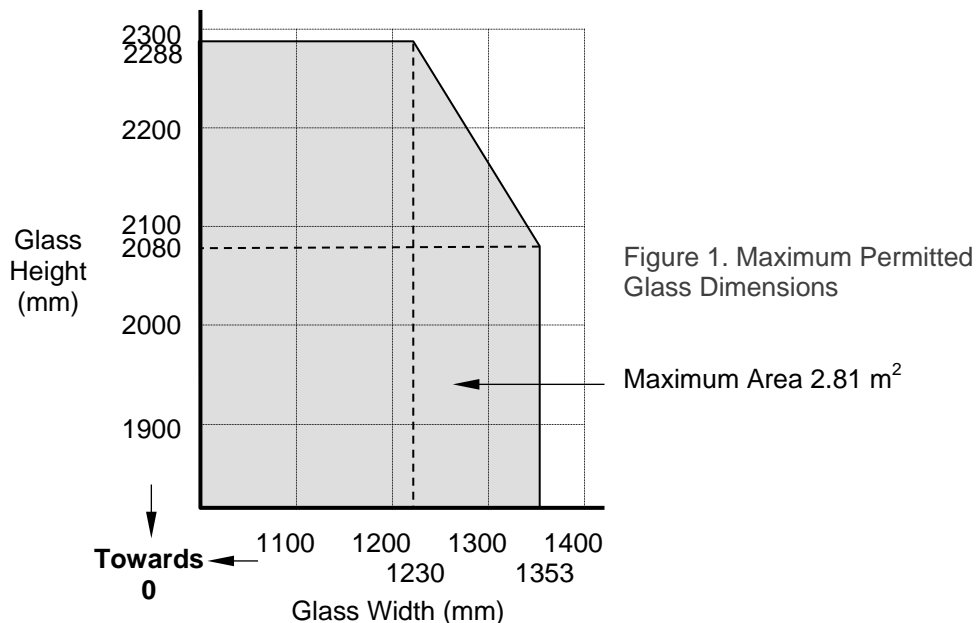
For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



- ① Pyrostem 2 glass
- ② 15 mm by 3 mm 'K tape', ceramic fibre based glazing tape
- ③ 20 mm high by 34 mm wide chamfered (approx. 20°) hardwood glazing beads, minimum density 650 kg/m³.
- ④ 38 mm long No. 8 steel screws or steel pins at 200 mm centres (30° to glass).
- ⑤ Hardwood or Non-combustible setting blocks
- ⑥ 80 mm by 40 mm (minimum) hardwood framing sections, minimum density 650 kg/m³

This Certificate of Approval relates to the sizes of Pyrostem 2 glass shown in Figure 1 below, when used in conjunction with the above system. Multi-pane screens are not permitted.



The aspect ratio of the glass may be unlimited within these aperture dimensions.

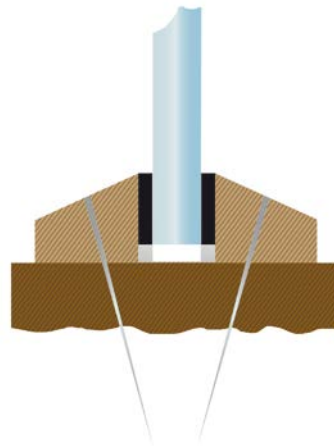
Paul Duggan

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem glass in single-pane timber framed screens for periods of 30 minutes integrity

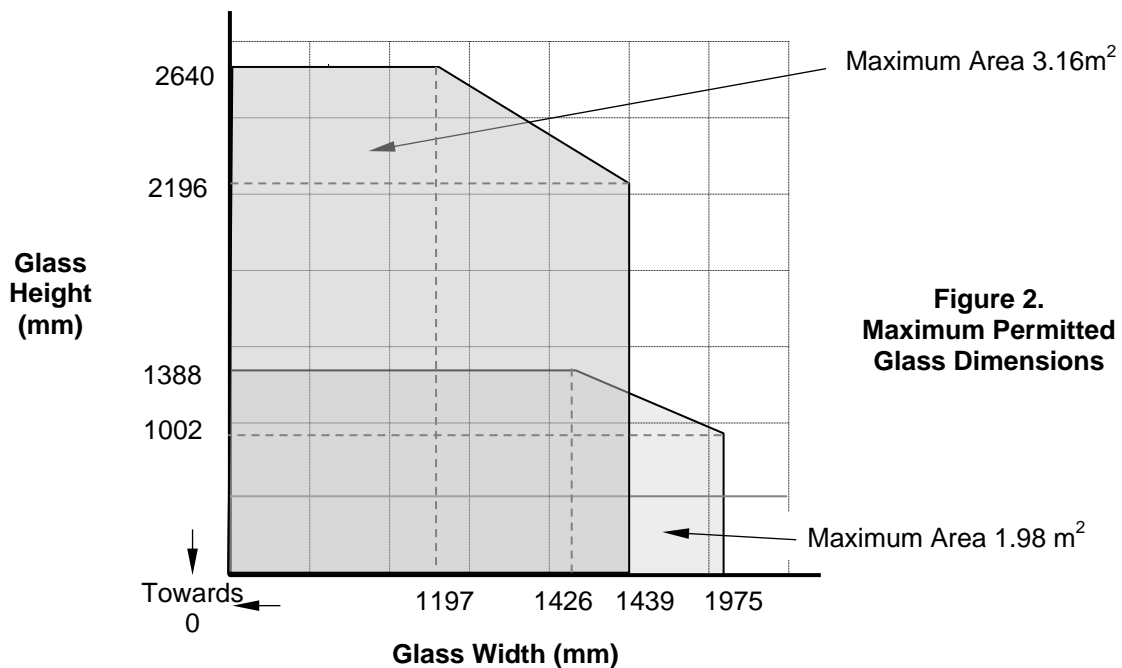
The glass shall be glazed utilising the following basic specification:

- Pyrostem glass
- Sealmaster Intumescent Foam Glazing Tape- 15x5mm uncompressed
- 50mm long pins or screws. Fixings at 150 mm centres, 50 mm from corners
- Softwood/Hardwood framing members, min. density 510kg/m³, 80mm x 40mm
- Glazing Bead, 15mm high x 20mm wide with a 20° chamfer from:
Softwood: min. density 510kg/m³
Hardwood: min. density 510kg/m³



System may be used with and without non-combustible setting blocks

This Certificate of Approval relates to the sizes of Pyrostem glass shown in Figure 2 below, when used in conjunction with the above system. Multi-pane screens are not permitted.

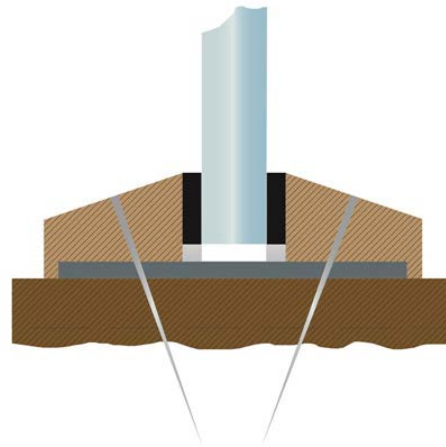


CERTIFICATE OF APPROVAL No CF 581A

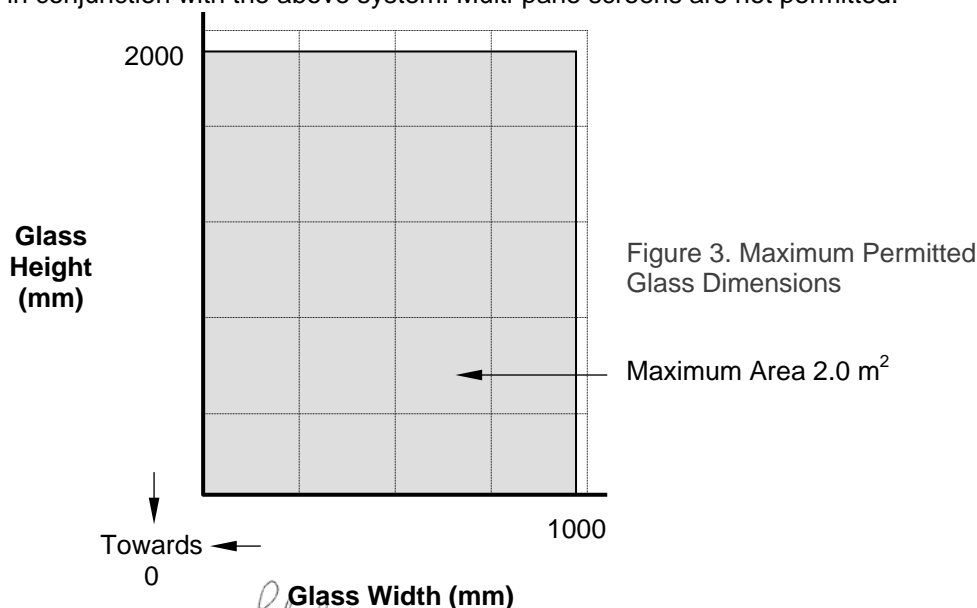
Pyrostem glass in single-pane timber framed screens for periods of 60 minutes integrity

The glass shall be glazed utilising the following basic specification:

- Pyrostem glass
- Sealmaster FIREGLAZE Tape as glazing tape – 25 x 2.5mm
- Sealmaster FIREGLAZE Tape as aperture liner – 63 mm x 2.5 mm
- Fixings at 150 mm centres, (No. 8 x 63 mm, angled at 45° unless otherwise stated)
- Fixing to be 50mm from corners in all cases
- Hardwood framing members – 80 x 40mm (640kg/m³ min.)
- Hardwood Glazing Bead, 27.5mm high by 29mm wide with a 20° chamfer. Density 640kg/m³ min. Base of beads rebated by 2.5mm deep to allow Sealmaster Fireglaze Tape, 63 x 2.5mm, to be included as an aperture liner
- System may be used with and without non-combustible setting blocks



This Certificate of Approval relates to the sizes of Pyrostem glass shown in Figure 3 below, when used in conjunction with the above system. Multi-pane screens are not permitted.

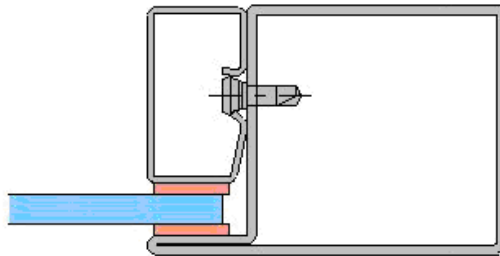


CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in single-pane steel framed screens for periods of 30 minutes integrity

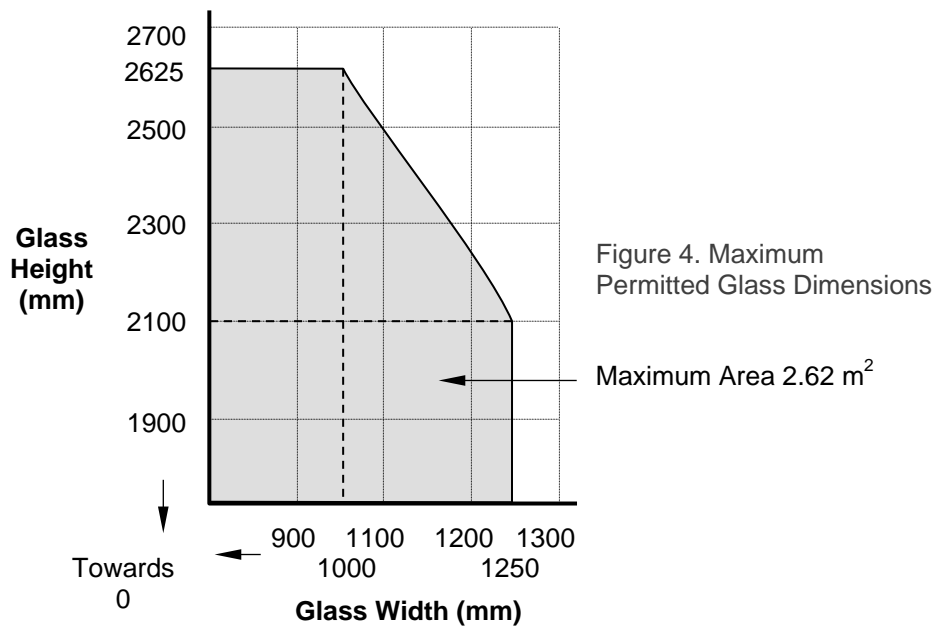
For this application the following conditions shall apply:

The glass shall be installed into a previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads, see example below. The glass shall be glazed into the screen with 'K Tape' ceramic fibre gasket on both faces and set on non-combustible setting blocks to determine the correct edge cover of 3 mm x 15 mm (minimum).



Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of Pyrostem 2 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. Multi-pane screens are not permitted.



Paul Dyer

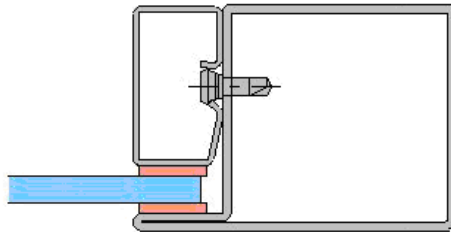
CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in single-pane steel framed screens for periods of 60 minutes integrity

For this application the following conditions shall apply:

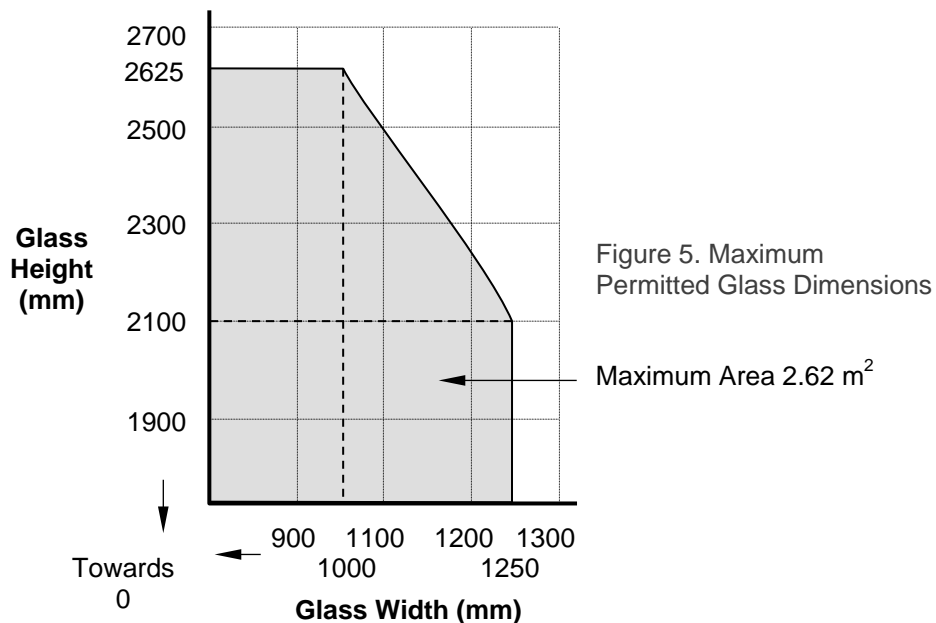
The glass shall be installed into a previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads, see example below. The glass shall be glazed into the screen with 'K Tape' ceramic fibre gasket on both faces and set on non-combustible setting blocks to determine the correct edge cover of 3 mm x 15 mm (minimum).

Additionally the over the upper 2/3 of the pane, the 'K Tape' must be recessed by 5 mm on both faces and the resulting gap filled with CXL 715 high temperature adhesive. The glazing beads must be positioned on the 'non-fire hazard' side of the screen i.e. the screen is not suitable for situations where the fire hazard may be from either side.



Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of Pyrostem 2 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. Multi-pane screens are not permitted.



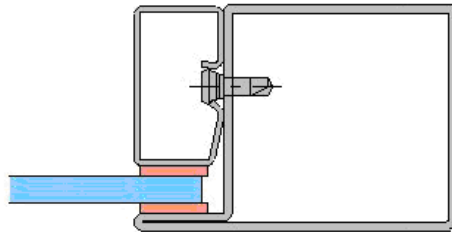
CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in single-pane steel framed screens for periods of 90 minutes integrity

For this application the following conditions shall apply:

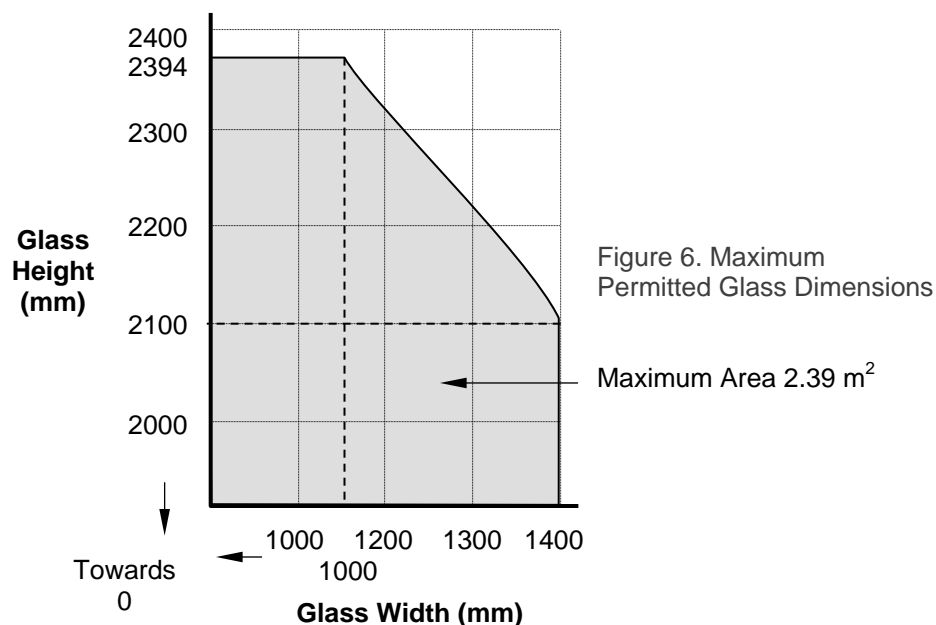
The glass shall be installed into a previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads, see example below. The glass shall be glazed into the screen with 'K Tape' ceramic fibre gasket on both faces and set on non-combustible setting blocks to determine the correct edge cover of 3 mm x 15 mm (minimum).

Additionally over the upper 2/3 of the pane, the 'K Tape' must be recessed by 5 mm on both faces and the resulting gap filled with CXL 715 high temperature adhesive. The glazing beads must be positioned on the 'non-fire hazard' side of the screen i.e. the screen is not suitable for situations where the fire hazard may be from either side.



Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of Pyrostem 2 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. Multi-pane screens are not permitted.

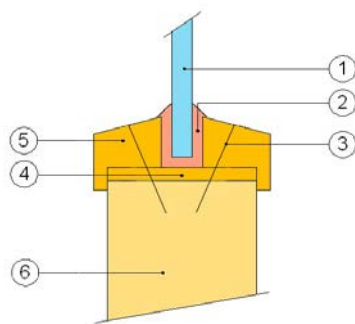


CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in timber based doorsets for periods of 30 minutes integrity

For this application the following conditions shall apply:

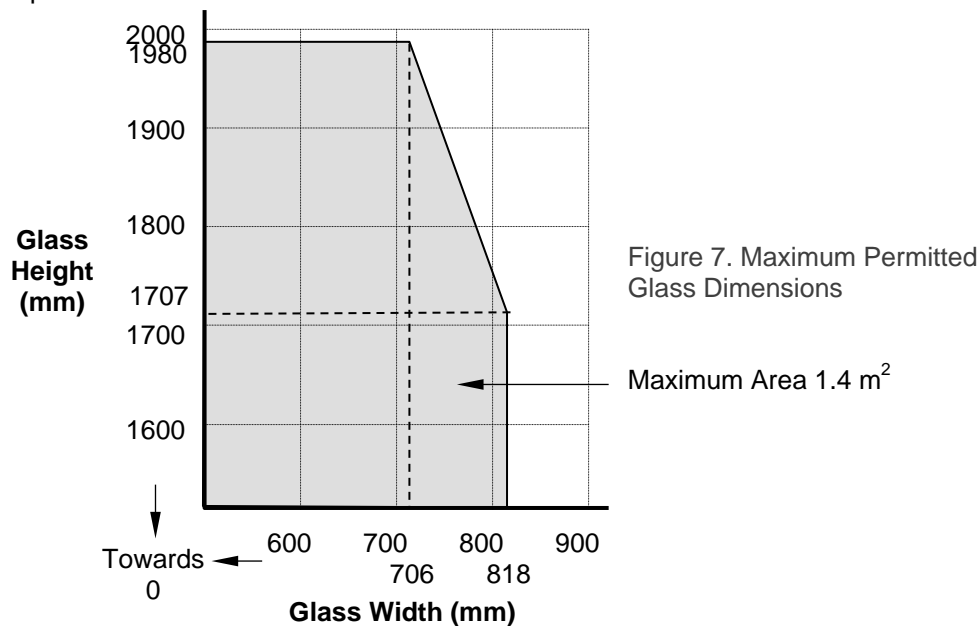
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② Lorient Flexible Figure 1 glazing system
- ③ Steel nail pins 38 mm long (min.), angled at 15° to the vertical, at 200 mm centres
- ④ Hardwood liner 8 mm thick (min.)
- ⑤ Hardwood glazing beads 25 mm high by 23mm wide, including a 10 mm x 7 mm bolection return (min.). Chamfered by approximately 10° and Minimum density 480 kg/m³
- ⑥ Nominally 44 mm thick FD30 door leaf

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 Pyrostem 2 glass shown in the Figure 5 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



These systems may also be included in previously tested doorset fan and side-lights.

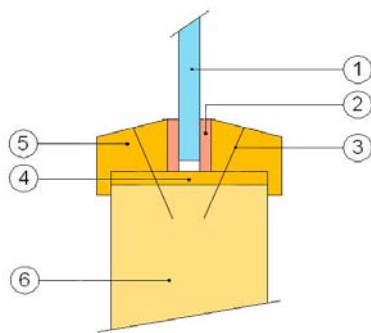
Paul Egger

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in timber based doorsets for periods of 30 minutes integrity continued

For this application the following conditions shall apply:

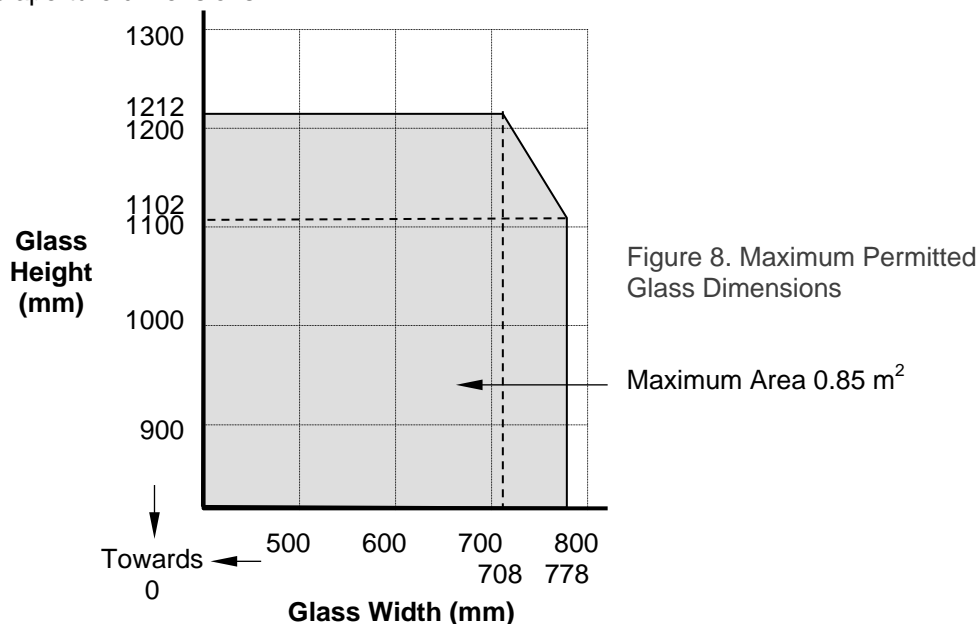
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② 'K Tape' 20 x 3 mm
- ③ Steel nail pins 40 mm long (min.), angled at 30° to the vertical, at 230 mm vertical and 150 mm horizontal centres
- ④ Hardwood liner 6 mm thick (min.)
- ⑤ Hardwood glazing beads 30 mm high by 21.5mm wide, including a 10 mm x 5 mm bolection return (min.). Chamfered by approximately 30° and Minimum density 640 kg/m³
- ⑥ Nominally 44 mm thick FD30 door leaf

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 Pyrostem 2 glass shown in the Figure 6 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



These systems may also be included in previously tested doorset fan and side-lights

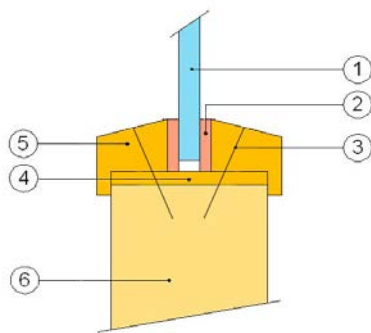
Paul Dyer

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in timber based doorsets for periods of 30 minutes integrity

For this application the following conditions shall apply:

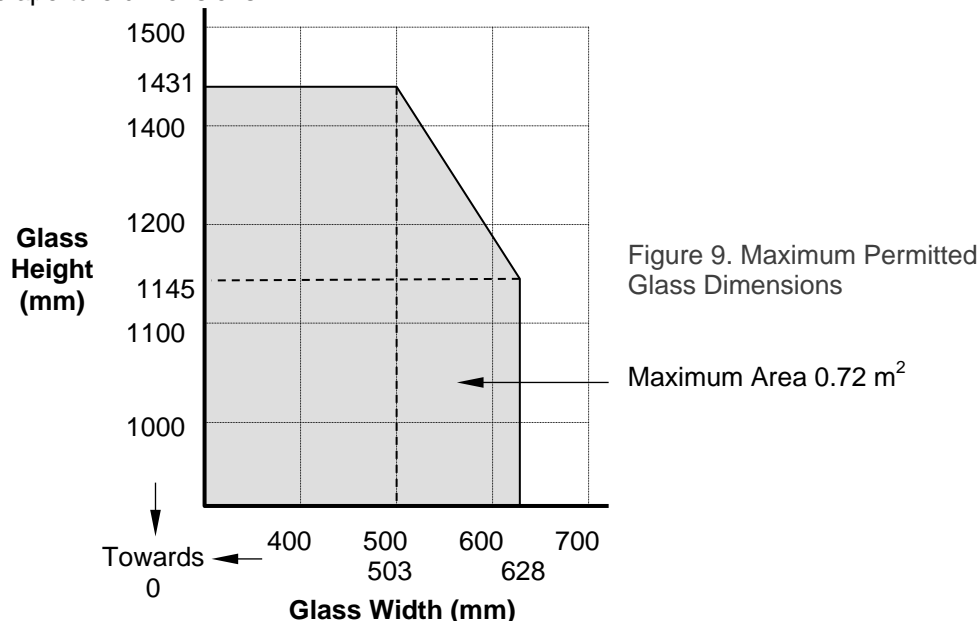
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② Hodgsons Firestrip 30 - 10 x 3 mm
- ③ Steel nail pins 40 mm long (min.), angled at 30° to the vertical, at 230 mm vertical and 150 mm horizontal centres
- ④ Hardwood liner 6 mm thick (min.)
- ⑤ MDF glazing beads 26 mm high by 22mm wide, including a 10 mm x 6 mm bolection return (min.). Chamfered by approximately 20° and minimum density 700 kg/m³
- ⑥ Nominally 44 mm thick FD30 door leaf

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 Pyrostem 2 glass shown in the Figure 7 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



These systems may also be included in previously tested doorset fan and side-lights

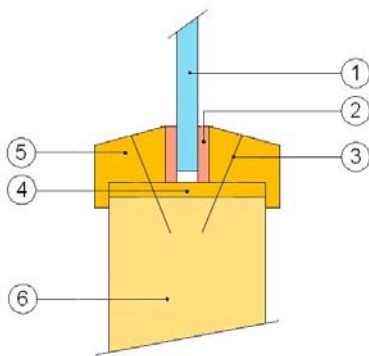
Paul Duggan

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in timber based doorsets for periods of 30 minutes integrity

For this application the following conditions shall apply:

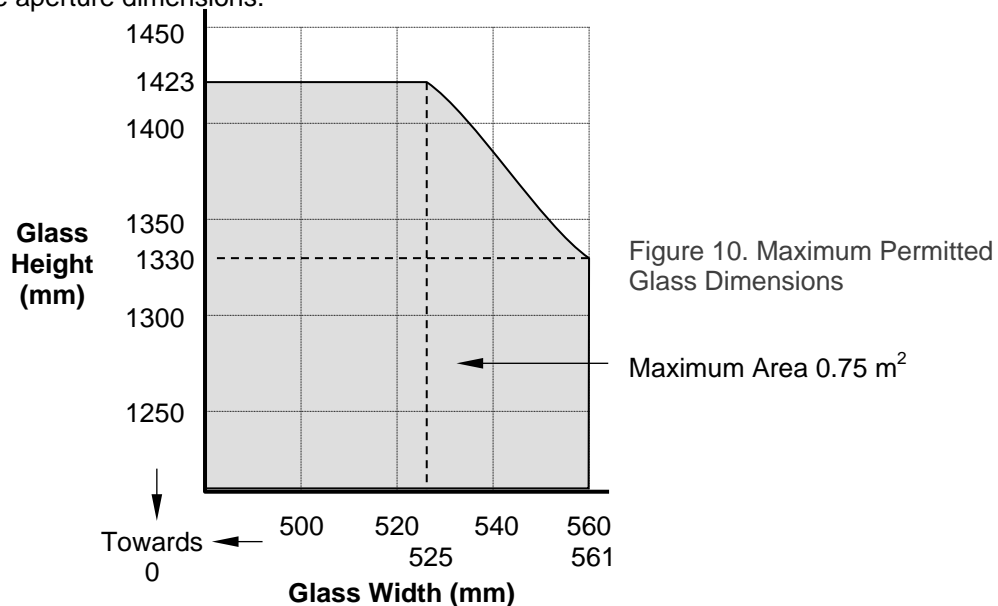
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② Closed Cell Foam Tape - 15 x 2 mm. An intumescent acrylic sealant was applied around the perimeter of the glass.
- ③ Steel nail pins 40 mm long (min.), angled at 30° to the vertical, at 230 mm vertical and 150 mm horizontal centres
- ④ MDF liner 6 mm thick (min.) with minimum density 700 kg/m³
- ⑤ MDF glazing beads 25 mm high by 21mm wide, including a 10 mm x 6 mm bolection return (min.). Chamfered by approximately 15° and minimum density 700 kg/m³
- ⑥ Nominally 44 mm thick FD30 door leaf

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 Pyrostem 2 glass shown in the Figure 8 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



These systems may also be included in previously tested doorset fan and side-lights

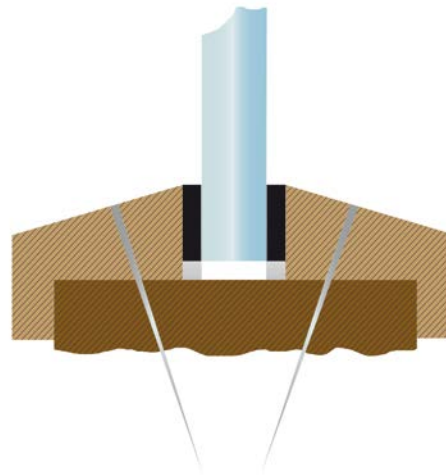
Paul Duggan

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem glass in timber based doorsets for periods of 30 minutes integrity

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

- Pyrostem glass
- Sealmaster Intumescent Foam Glazing Tape
- Ø1.6 x 40mm / Ø2mm x 50 mm long steel pins or No. 8 x 40/50 mm long screws at 150 mm maximum centres and 50mm from corners (fixed at 45° to glass).
- 15 mm beads use 40 mm pins/screws,
- 20 mm beads use 50 mm pins/screws
- Bolection – 5mm x 5mm minimum.
- Nominally 44 mm thick timber based FD30 door leaf. The doorset shall be CERTIFIRE approved or have test evidence for the inclusion of apertures of the proposed dimensions. Only solid cored timber based or cellulosic cores are suitable for being glazed with this system. Core incorporating voids or hollow tubes should not be glazed using this system unless a 6 mm hardwood aperture liner is fitted within the perimeter of the aperture.
- Glazing Bead from:
Softwood: min. density 510kg/m³, 20° chamfer
Hardwood: min. density 620kg/m³, 20° chamfer
MDF: min. density 700kg/m³, 15° chamfer



System may be used with and without non-combustible setting blocks

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 Pyrostem 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.

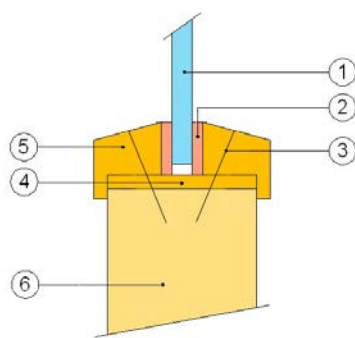
Glass	Bead Height / Tape Dimension (mm)	Maximum Glass Height (mm)	Maximum Glass Width (mm)	Maximum Glass Area (m ²)
Pyroguard UK Ltd Pyrostem	20 / 20x5 15 / 10x5	2135 1829	828 709	1.52 1.30

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in timber based doorsets for periods of 60 minutes integrity

For this application the following conditions shall apply:

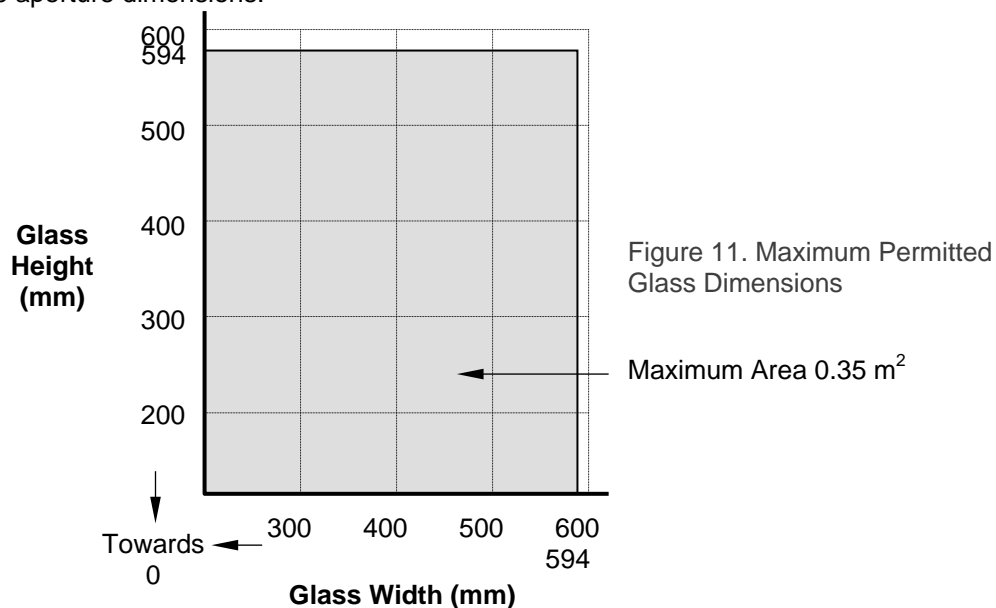
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② Therm-A-Glaze 60 25x4 mm seal
- ③ Steel nail pins 50 mm long (min.), angled at 30° to the vertical, at 150 mm horizontal centres/50 mm from corners
- ④ Therm-A-Glaze 60 54x2 mm seal
- ⑤ Hardwood glazing beads 30 mm high by 25mm wide, including a 5 mm x 5 mm bolection return (min.). Chamfered by approximately 15° and Minimum density 640 kg/m³
- ⑥ Nominally 54 mm thick FD60 door leaf

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 Pyrostem 2 glass shown in the Figure 9 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



These systems may also be included in previously tested doorset fan and side-lights

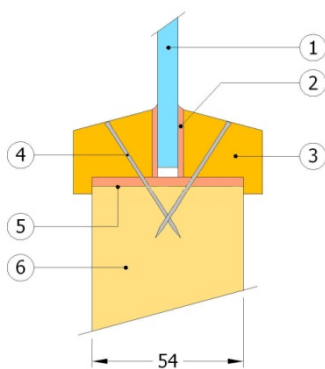
Paul Dyer

CERTIFICATE OF APPROVAL No CF 581A

Pyrostem 2 glass in timber based doorsets for periods of 60 minutes integrity

For this application the following conditions shall apply:

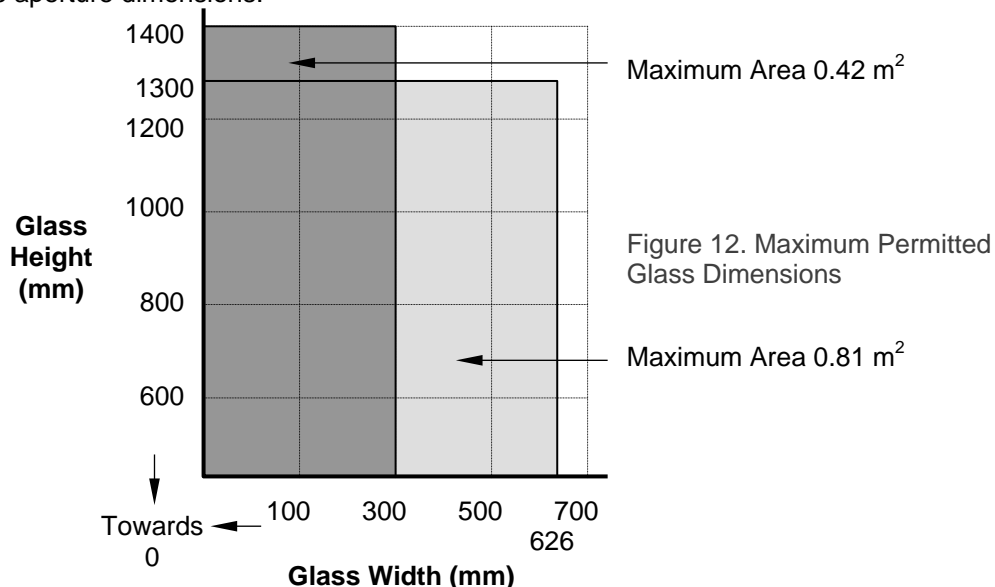
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② Lorient Polyproducts Ltd 'System 90' seal
- ③ MDF glazing beads 29 mm high by 18 mm wide (min.). Chamfered by approximately 20° and Minimum density 650 kg/m³
- ④ Steel nail pins 50 mm long (min.), angled at 30° to the vertical, at 150 mm horizontal centres and 230 mm vertical centres/50 mm from corners
- ⑤ Palusol 54x2 mm seal
- ⑥ Nominally 54 mm thick FD60 door leaf

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 Pyrostem 2 glass shown in the Figure 10 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



These systems may also be included in previously tested doorset fan and side-lights

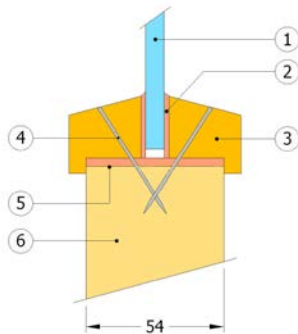
Pyrostem 2 glass in timber based doorsets for periods of 60 minutes integrity

Paul Duggan

CERTIFICATE OF APPROVAL No CF 581A

For this application the following conditions shall apply:

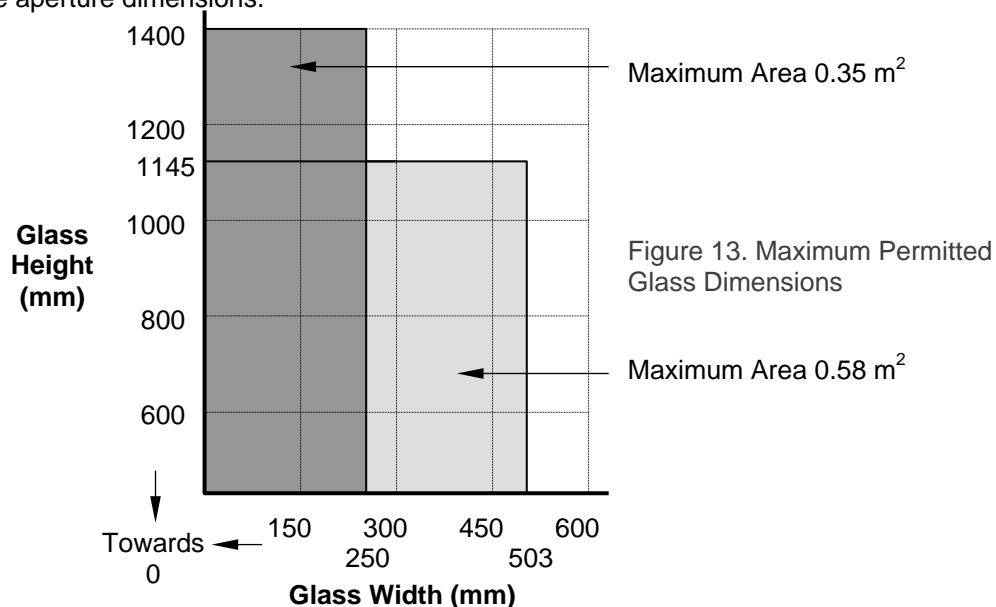
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:



- ① Pyrostem 2 Glass
- ② Sealmaster FG2000 Tape 25 x 4 mm
- ③ Hardwood glazing beads 26 mm high by 27mm wide, including a 6 mm x 10 mm bolection return (min.). Chamfered by approximately 20° and Minimum density 650 kg/m³
- ④ Steel nail pins 58 mm long (min.), angled at 30° to the vertical, at 150 mm centres/50 mm from corners
- ⑤ Sealmaster GL60 Liner 54 x 2 mm
- ⑥ Nominally 54 mm thick FD60 door leaf

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 Pyrostem 2 glass shown in the Figure 11 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



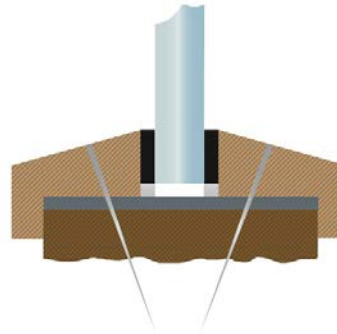
These systems may also be included in previously tested doorset fan and side-lights
Pyrostem glass in timber based doorsets for periods of 60 minutes integrity

Paul Dyer

CERTIFICATE OF APPROVAL No CF 581A

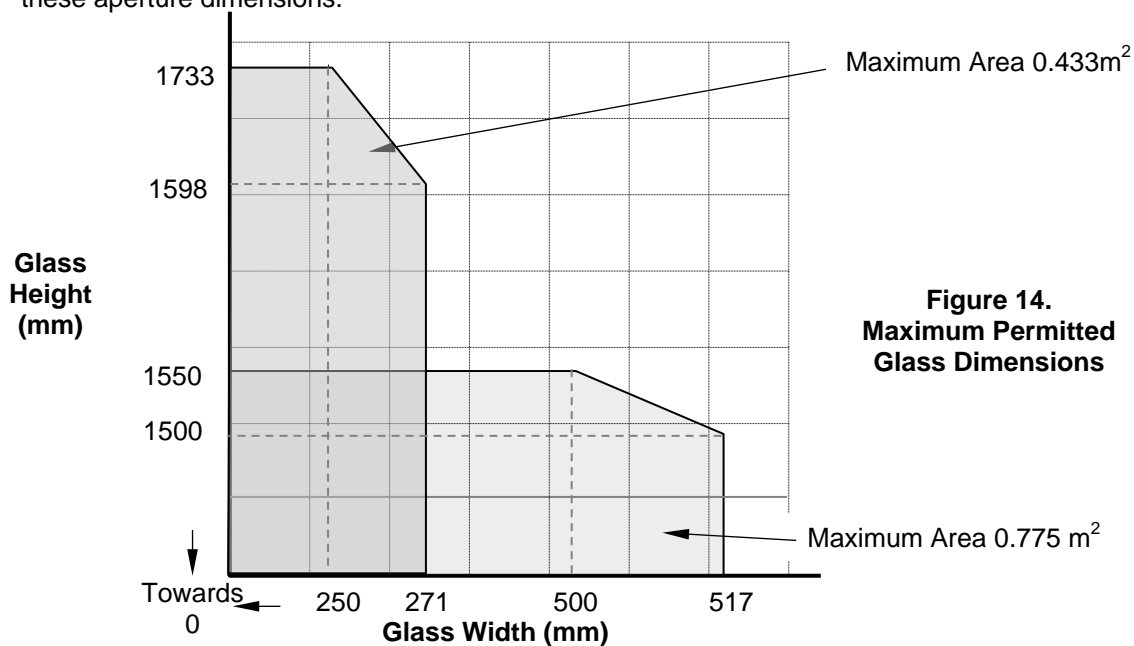
The glass shall be glazed within a previously fire tested or CERTIFIRE approved timber based doorset utilising the following basic specification:

- Pyrostem glass
- Sealmaster FIREGLAZE Tape as glazing tape – 25 mm x 2.5 mm thick
- Sealmaster FIREGLAZE Tape as aperture liner – 54 mm x 2.5 mm thick
- No. 8 x 63 mm long screws at 150 mm maximum centres and 50mm from corners (fixed at 45° to glass).
- Bead dimensions – 30 mm high by 26 mm wide (dimension includes a 5 mm x 5 mm bolection)
- Glazing Bead from hardwood with a minimum density 640kg/m³, 20° chamfer
- System may be used with and without non-combustible setting blocks.
- Nominally 54 mm thick timber based FD60 door leaf. The doorset shall be CERTIFIRE approved or have test evidence for the inclusion of apertures of the proposed dimensions. Only solid cored timber based or cellulosic (i.e. flaxboard/chipboard/timber lamel) cores are suitable for being glazed with this system and if desirable may include a timber/MDF liner. Core incorporating voids or hollow tubes should not be glazed using this system unless a 6 mm hardwood aperture liner (minimum density 640kg/m³) is fitted within the perimeter of the aperture.



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 Pyrostem glass shown in the Figure 14 below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.



Paul Dyer