



CERTIFICATE OF APPROVAL
No CF 628

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

ESSEX SAFETY GLASS

Units 1-3, Moss Road, Witham, Essex. CM8 3UQ
Tel: 01376 520061 Fax: 01376 521176

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

**ESG PYROTECH™ 630,
660 & ESG Laminated
Fire Resistant Glass**

TECHNICAL SCHEDULE

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

Signed and sealed for and on behalf of CERTIFIRE

A handwritten signature in black ink, appearing to read "Sir Ken Knight".

Sir Ken Knight
Chairman - Management Council

Issued: 11th July 2008
Revised: 30th September 2011
Valid to: 10th July 2013

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Only valid when authentic
CERTIFIRE Seal is in place



CERTIFICATE No CF 628 ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

This Certificate of Approval relates to the fire resistance of ESG PYROTECH™ 630 & ESG PYROTECH™ 660 safety glass when used in the following applications, as defined in BS 476: Part 22: 1987 (ESG PYROTECH™ 630) or BS EN 1364-1: 1999 (ESG PYROTECH™ 660) subject to the undermentioned conditions. Further evidence for ESG PYROTECH™ 630 and 660 in accordance EN 1364-1: 1999 is available from Essex Safety Glass.

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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS (cont)

This product is approved on the basis of:

- i) Initial type testing.
- ii) A design appraisal against TS25.
- iii) Certification of quality management system to ISO 9001: 2008.
- iv) Inspection and surveillance of factory production control.
- v) Audit testing.

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

A handwritten signature in black ink, appearing to be "J. Smith".



CERTIFICATE No CF 628 ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

General Requirements

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

There is no restriction to the direction of exposure for the glass i.e. the glass is symmetrical. Orientation may, however, be restricted by the requirements of a non-symmetrical framing system.

The expansion allowance shall be a minimum of 1 mm per 150 mm glass length (both vertical and horizontal) or if in doubt, minimum 5 mm to all edges (10 mm to head if expansion is not possible at the bottom edge).

The edge cover to each pane shall be 10 mm.

Where hardwood is specified, Ash is specifically excluded.

A handwritten signature in black ink, appearing to be "J. H. Smith".

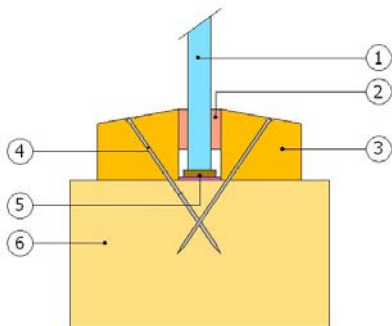
CERTIFICATE No CF 628 ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

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 ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 1 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② Hodgson Sealants Firestrip/Lorient System 36 range/Lorient Flexible Figure 1/ISL Therm-A-Strip/ Pyroplex 8193 U Channel/Sealmaster FireGlaze/Mann McGowan Pyroglaze 30/Mann McGowan Pyrostrip 30/Mann McGowan Pyroglaze Channel/Pyroplex 30049/Pyroplex 30054.
- ③ 15mm high, X 22mm long (chamfered by 15°) softwood, MDF or hardwood glazing beads, minimum density 510 kg/m³. The beads shown in the drawing can be extended in width to form a bolection bead.
- ④ 40 mm long Ø1.5 mm steel pins at 150 mm centres and 50 mm from corners (35° to glass).
- ⑤ Optional non-combustible setting blocks (not required).
- ⑥ 90 mm by 40 mm (minimum) hardwood framing sections, minimum density 640 kg/m³.

This Certificate of Approval relates to the sizes of ESG PYROTECH™ glass shown in Figure 1 below, when used in conjunction with the above system. The maximum permitted overall screen height is 4000 mm.

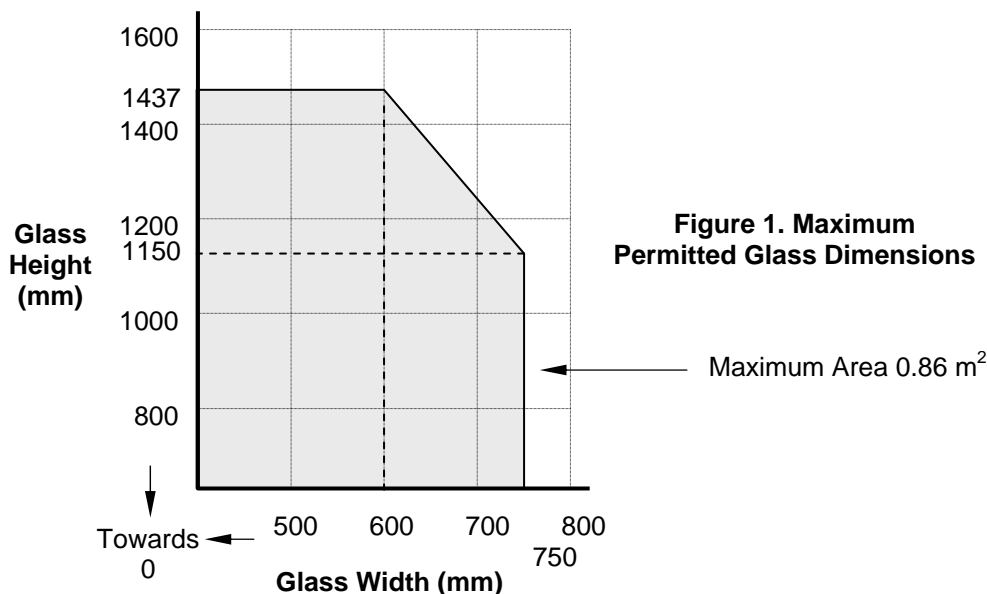


Figure 1. Maximum Permitted Glass Dimensions

Maximum Area 0.86 m²

The aspect ratio of the glass may be unlimited within these aperture dimensions. This system may also be included in previously tested doorset fan and side-lights.

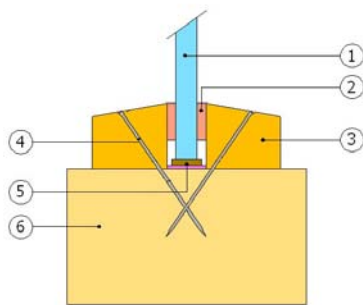
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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Timber framed screens for periods of 30 minutes integrity (continued)

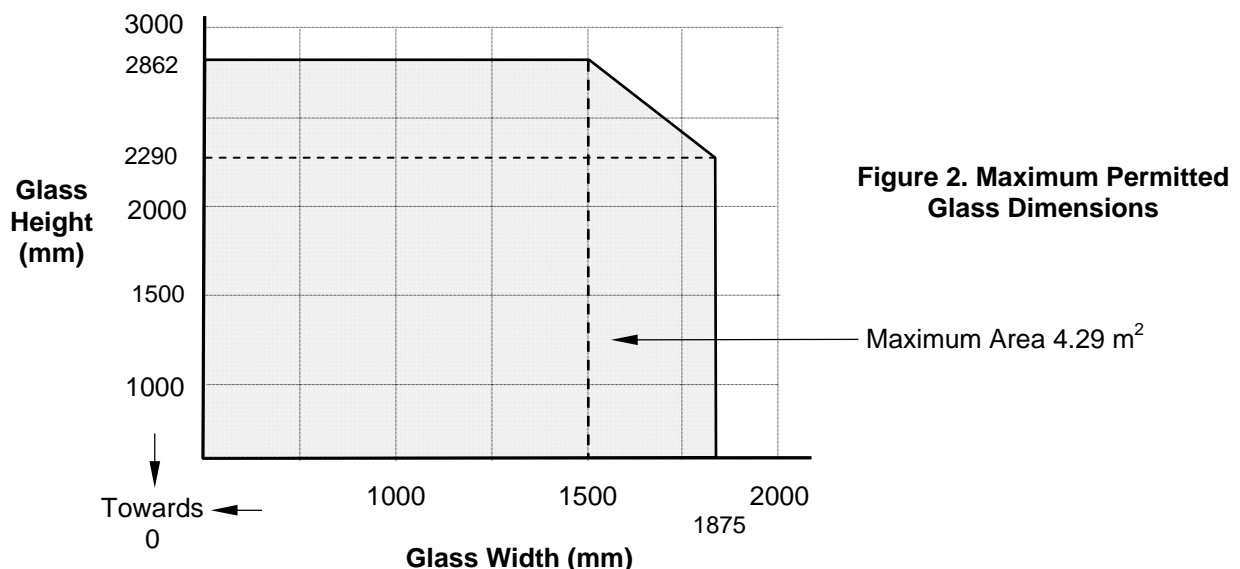
For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



- ① ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 1 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② 15 mm by 3 mm ceramic fibre based glazing tape.
- ③ 21 mm high by 22 mm wide (chamfered by 18°) hardwood glazing beads, minimum density 640 kg/m³. The beads shown in the drawing can be extended in width to form a bolection bead.
- ④ 50 mm long Ø2 mm steel pins at 150 mm centres and 50 mm from corners (35° to glass).
- ⑤ Non-combustible setting blocks and 10 x 1 mm Interdens liner (liner to all edges).
- ⑥ 90 mm by 40 mm (minimum) hardwood framing sections, minimum density 640 kg/m³.

This Certificate of Approval relates to the sizes of PYROTECH™ 630 glass shown in Figure 2 below, when used in conjunction with the above system. The maximum permitted overall screen height is 4000 mm.



The aspect ratio of the glass may be unlimited within these aperture dimensions. This system may also be included in previously tested doorset fan and side-lights.

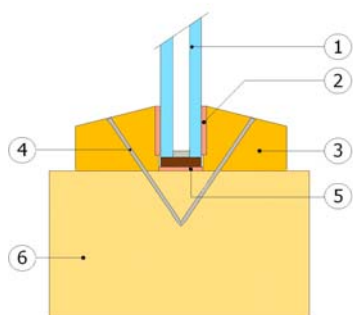
* Radiation performance of 21 minutes to 15 kW/m² up to a maximum screen area of 9 m²

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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Glass IGUs in timber framed screens for periods of 30 minutes integrity*

The glass shall be glazed utilising the following basic specification:



- ① IGU comprising ESG PYROTECH™ 630 glass, 12 mm to 16 mm steel spacer with 4 mm or greater float, toughened or laminated glass (edge of glass wrapped with Aluminium foil)*. See Table 1 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② 15 mm by 3 mm ceramic fibre based glazing tape.
- ③ 19 mm high by 19 mm wide (chamfered by 16°) hardwood glazing beads, minimum density 640 kg/m³. The beads shown in the drawing can be extended in width to form a bolection bead.
- ④ 50 mm long Ø2 mm steel pins at 150 mm centres and 50 mm from corners (35° to glass).
- ⑤ Non-combustible setting blocks and 10 x 1 mm Interdens liner (liner to all edges).
- ⑥ 90 mm by 40 mm (minimum) hardwood framing sections, minimum density 640 kg/m³.

This Certificate of Approval relates to the sizes of PYROTECH™ 630 IGU shown in Figure 3 below, when used in conjunction with the above system. The maximum permitted overall screen height is 4000 mm.

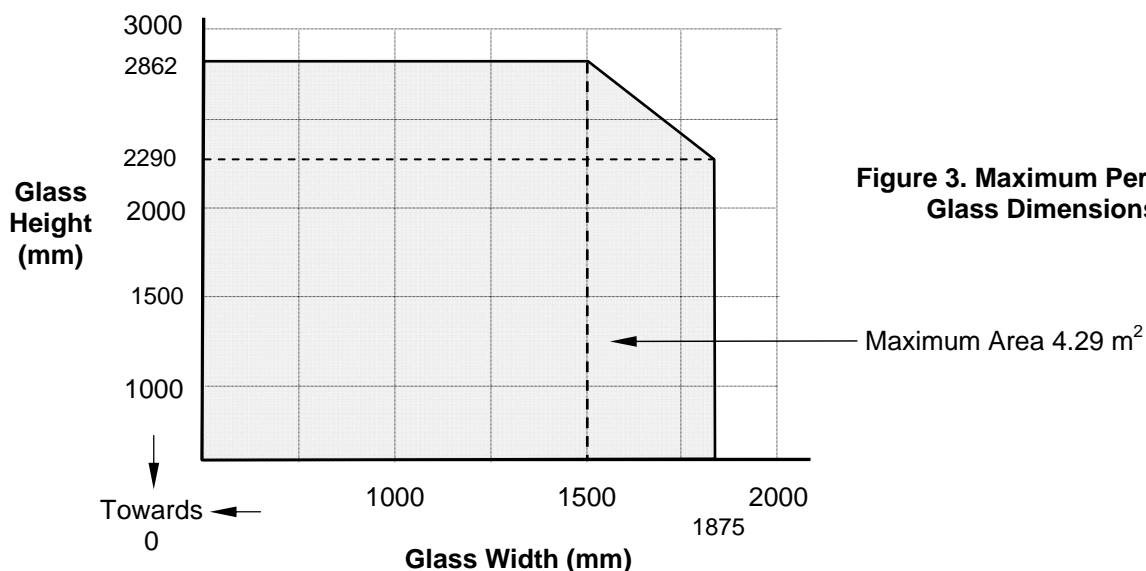


Figure 3. Maximum Permitted Glass Dimensions

* The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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

* Radiation performance was not measured on this size. On a previous test for an IGU of size 632 mm wide by 789 mm high, maximum area 0.5 m², a performance of 15 kW/m² was measured after 21 minutes.

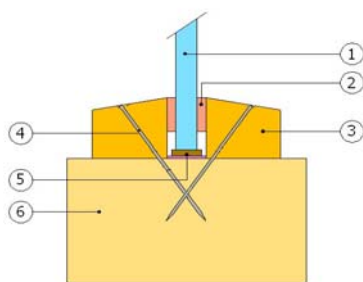
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ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Single Paned Timber framed plasterboard screen 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 ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 1 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② 15 mm by 3 mm ceramic fibre based glazing tape.
- ③ 20 mm high by 35 mm wide (chamfered by 15°) softwood glazing beads minimum density 530 kg/m³. The beads shown in the drawing can be extended in width to form a bolection bead.
- ④ 50 mm long pins at maximum 150 mm centres.
- ⑤ Two non-combustible setting blocks, 6 mm x 10 mm by 80 mm.
- ⑥ 80 mm by 40 mm softwood framing sections minimum, density 530 kg/m³.

This Certificate of Approval relates to the sizes of PYROTECH™ 630 glass shown in Figure 4 below, when used in conjunction with the above system. The maximum permitted overall screen height is 4000 mm.

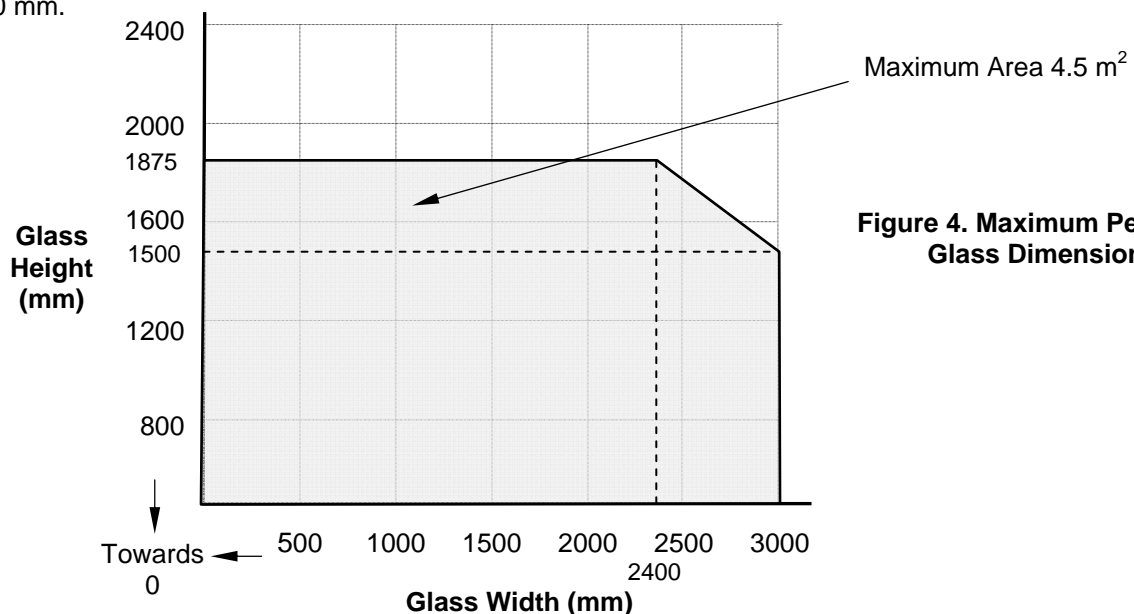


Figure 4. Maximum Permitted Glass Dimensions

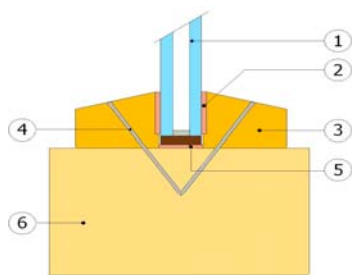
The aspect ratio of the glass may be unlimited within these aperture dimensions. This system may also be included in previously tested doorset fan and side-lights.

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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

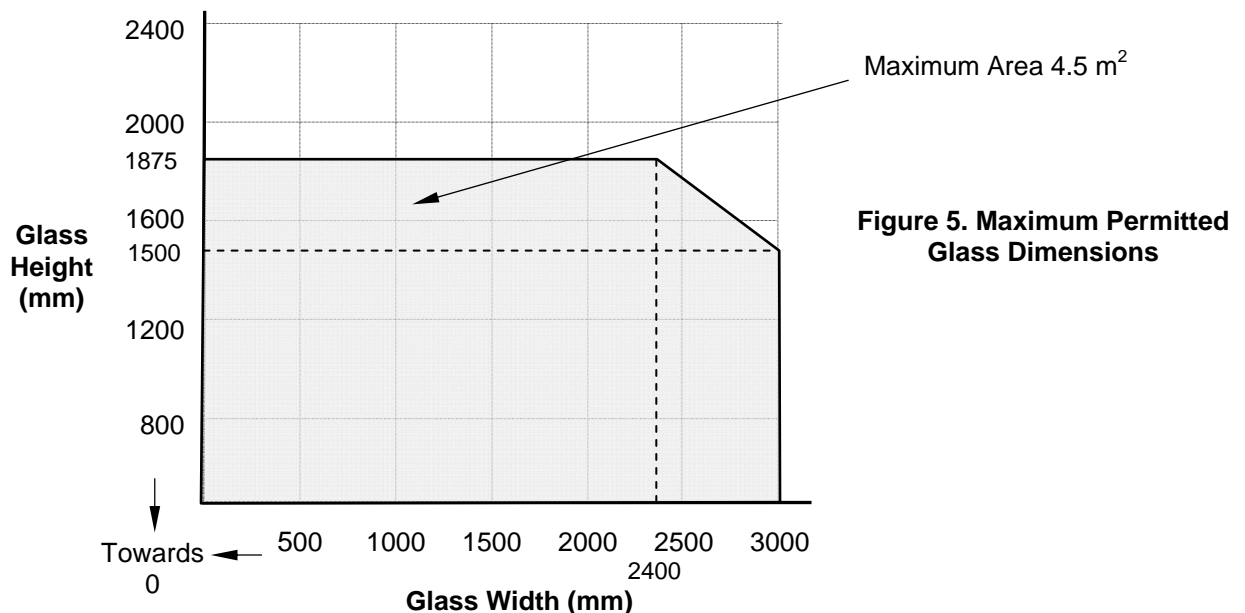
Single IGU in Timber framed plasterboard screen for periods of 30 minutes integrity*

The glass shall be glazed utilising the following basic specification:



- ① ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 1 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② 15 mm by 3 mm ceramic fibre based glazing tape.
- ③ 20 mm high by 35 mm wide (chamfered by 15°) softwood glazing beads minimum density 530 kg/m³. The beads shown in the drawing can be extended in width to form a collection bead.
- ④ 50 mm long pins at maximum 150 mm centres.
- ⑤ Two non-combustible setting blocks, 6 mm x 10 mm by 80 mm.
- ⑥ 80 mm by 40 mm softwood framing sections minimum, density 530 kg/m³.

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figure 5 below, when used in conjunction with the above system. The maximum permitted overall screen height is 4000 mm.



* The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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

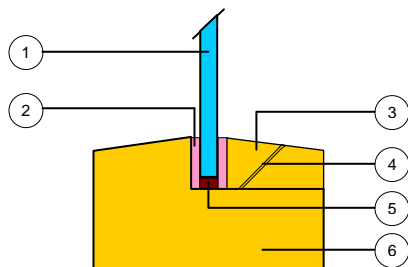
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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Single bead 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 ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 1 for LPS 1270, EN 356 and ballistic security glazing panel references.
- 2 20 mm by 3 mm ceramic fibre based glazing tape.
- 3 20 mm high by 34.5 wide including a 5x5 mm bolection return (chamfered by 15°) hardwood glazing beads, minimum density 680 kg/m³. The beads shown in the drawing can be extended in width to form a bolection bead.
- 4 50 mm pins at maximum 150 mm centres.
- 5 Two non-combustible setting blocks, 6 mm x 10 mm by 80 mm.
- 6 60 mm by 80 mm hardwood framing sections minimum density 680 kg/m³.

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figure 6 below, when used in conjunction with the above system with beads fitted on the non fire side. The maximum permitted overall screen height is 4000 mm.

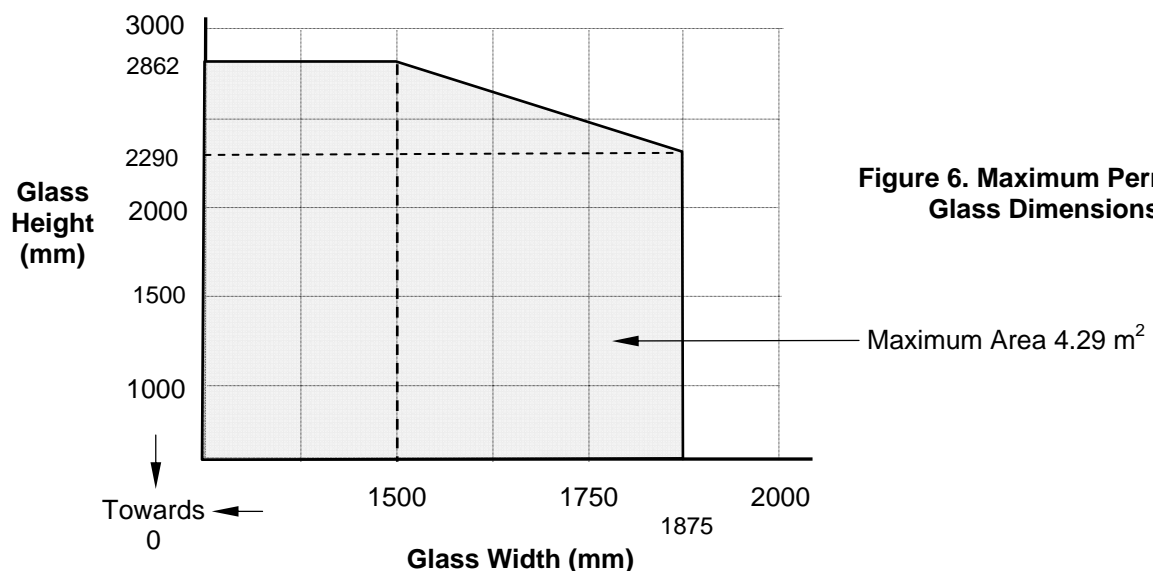


Figure 6. Maximum Permitted Glass Dimensions

The aspect ratio of the glass may be unlimited within these aperture dimensions. This system may also be included in previously tested doorset fan and side-lights.

* Radiation performance of 15 minutes at 15 kW/m²



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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ LPS 1270 and EN 356 security glazing in timber framed screens for periods of 30 minutes integrity

Table 1

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|------------------------------------------|-----------|----------------|-----------------------------|
| ESG PYROTECH™ SECURE EN 356 P6B/15/E30 | EN356 P6B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P7B/15/E30 | EN356 P7B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P8B/17/E30 | EN356 P8B | 17 | 35 |
| ESG PYROTECH™ SECURE LPS 1270 001/17/E30 | 0-0-1 | 17 | 37 |
| ESG PYROTECH™ SECURE LPS 1270 112/21/E30 | 1-1-2 | 21 | 39 |
| ESG PYROTECH™ SECURE LPS 1270 123/23/E30 | 1-2-3 | 23 | 42 |
| ESG PYROTECH™ SECURE LPS 1270 123/27/E30 | 1-2-3 | 27 | 46 |
| ESG PYROTECH™ SECURE LPS 1270 223/35/E30 | 2-2-3 | 35 | 60 |
| ESG PYROTECH™ SECURE LPS 1270 224/44/E30 | 2-2-4 | 44 | 72 |
| ESG PYROTECH™ SECURE LPS 1270 234/48/E30 | 2-3-4 | 48 | 69 |
| ESG PYROTECH™ SECURE LPS 1270 235/61/E30 | 2-3-5 | 61 | 100 |

ESG PYROTECH™ ballistic glazing in timber framed screens for periods of 30 minutes integrity

Table 1a No Spall

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/NS/32/E30 | BR1 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR2/NS/32/E30 | BR2 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR3/NS/32/E30 | BR3 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR4/NS/36/E30 | BR4 | 36 | 78 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/46/E30 | BR5 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/51/E30 | BR5 | 51 | 104 |
| ESG PYROTECH™ BALLISTIC/BR6/NS/54/E30 | BR6 | 54 | 123 |
| ESG PYROTECH™ BALLISTIC/BR7/NS/80/E30 | BR7 | 80 | 188 |
| ESG PYROTECH™ BALLISTIC/SG1/NS/38/E30 | SG1 | 38 | 83 |
| ESG PYROTECH™ BALLISTIC/SG2/NS/47/E30 | SG2 | 47 | 103 |



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ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ ballistic glazing in timber framed screens for periods of 30 minutes integrity (continued)

Table 1b Spall Allowed

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/SA/34/E30 | BR1 | 34 | 75 |
| ESG PYROTECH™ BALLISTIC/BR2/SA/40/E30 | BR2 | 40 | 82 |
| ESG PYROTECH™ BALLISTIC/BR3/SA/35/E30 | BR3 | 35 | 80 |
| ESG PYROTECH™ BALLISTIC/BR4/SA/46/E30 | BR4 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/SA/60/E30 | BR5 | 60 | 113 |
| ESG PYROTECH™ BALLISTIC/BR6/SA/65/E30 | BR6 | 65 | 153 |
| ESG PYROTECH™ BALLISTIC/BR7/SA/91/E30 | BR7 | 91 | 217 |
| ESG PYROTECH™ BALLISTIC/SG1/SA/47/E30 | SG1 | 47 | 109 |
| ESG PYROTECH™ BALLISTIC/SG2/SA/51/E30 | SG2 | 51 | 115 |

ESG PYROTECH™ privacy glazing in timber framed screens for periods of 30 minutes integrity

Table 1c

| Product Code | Thickness (mm) | Weight (kg/m ²) |
|-----------------------------|----------------|-----------------------------|
| ESG PYROTECH™ 1230L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1260L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1430L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1460L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1530L Privacy | 15 | 32 |
| ESG PYROTECH™ 1560L Privacy | 15 | 42 |

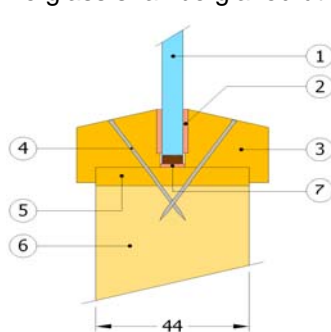
CERTIFICATE No CF 628 ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Timber doors for periods of 30 minutes integrity

For this application the following conditions shall apply:

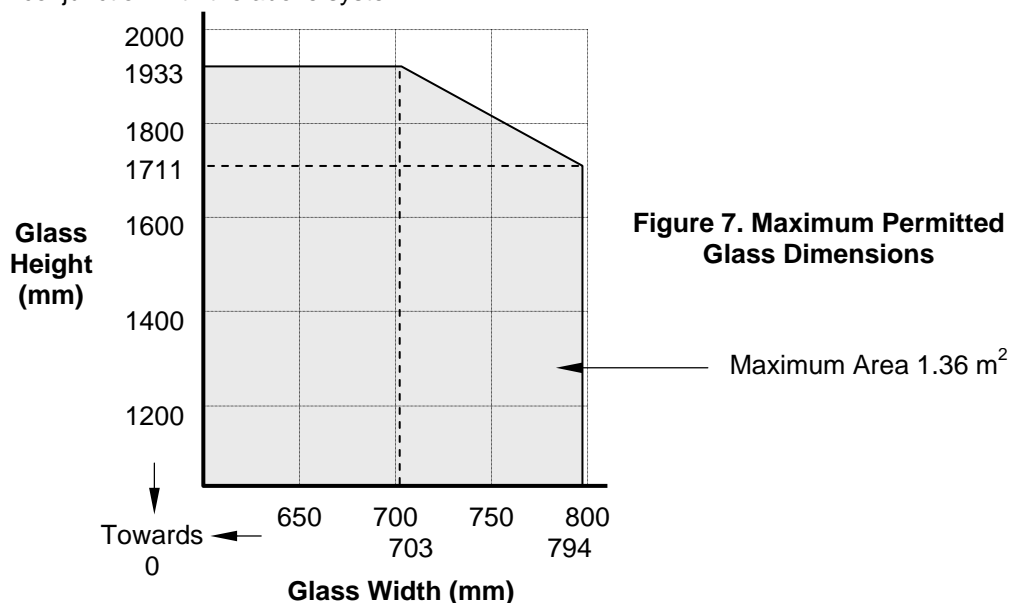
The glass shall be glazed utilising the following basic specification:



- ① ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 2 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② 15 mm by 3 mm ceramic fibre based glazing tape.
- ③ 26 mm high by 22 mm wide including a 5x5 mm bolection return (chamfered by 18°) hardwood glazing beads, minimum density 640 kg/m³.
- ④ 50 mm long Ø2 mm steel pins at 150 mm centres and 50 mm from corners (35° to glass).
- ⑤ Hardwood liner minimum 6 mm thick and 640 kg/m³ density.
- ⑥ Nominally 44 mm thick FD30 timber based door leaf (thicker leaf may be required to accommodate laminated glass with required bead dimensions).
- ⑦ Non-combustible setting blocks and 10 x 1 mm Interdens liner (liner to all edges).

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 ESG PYROTECH™ glass 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.

* Radiation performance of 21 minutes to 15 kW/m² up to a maximum glazed area of 1.2m²

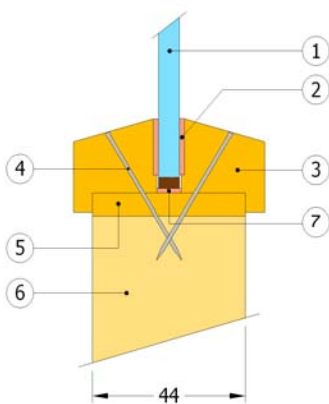
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ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Timber doors for periods of 30 minutes integrity (continued)

For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



- ① ESG PYROTECH™ 630 glass (edge of glass wrapped with Aluminium foil) or laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). See Table 2 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② Hodgson Sealants Firestrip/Lorient System 36 range/Lorient Flexible Figure 1/SL Therm-A-Strip/ Pyroplex 8193 U Channel/Sealmaster FireGlaze/Mann McGowan Pyroglaze 30/Mann McGowan Pyrostrip 30/Mann McGowan Pyroglaze Channel/Pyroplex 30049/Pyroplex 30054.
- ③ 20 mm high by 22 mm wide including a 5x5 mm bolection return (chamfered by 15°) softwood, MDF or hardwood glazing beads, minimum density 510 kg/m³.
- ④ 40 mm long Ø1.5 mm steel pins at 150 mm centres and 50 mm from corners (35° to glass).
- ⑤ No liner required (except where specifically required in the door certificate).
- ⑥ Nominally 44 mm thick FD30 timber based door leaf (thicker leaf may be required to accommodate laminated glass with required bead dimensions).
- ⑦ Optional non-combustible setting blocks (not required).

The doorset shall be CERTIFIRE approved or have test evidence for the inclusion of apertures of the proposed dimensions. Specifically, the following door types may incorporate this glazing system (aperture dimensions subject to CERTIFIRE approval or test evidence):

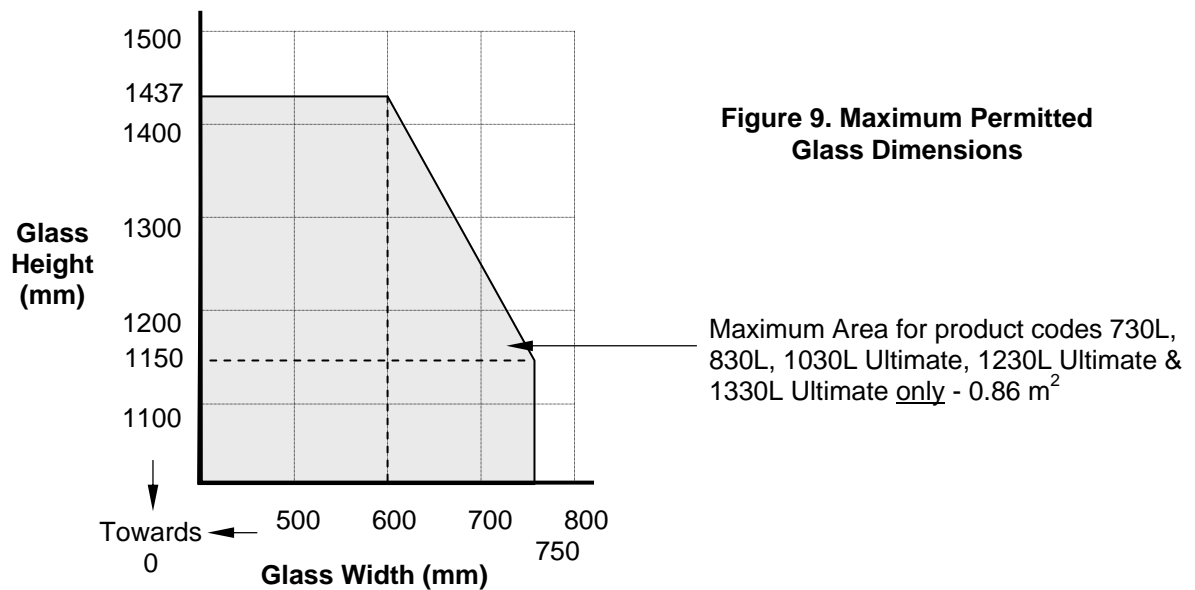
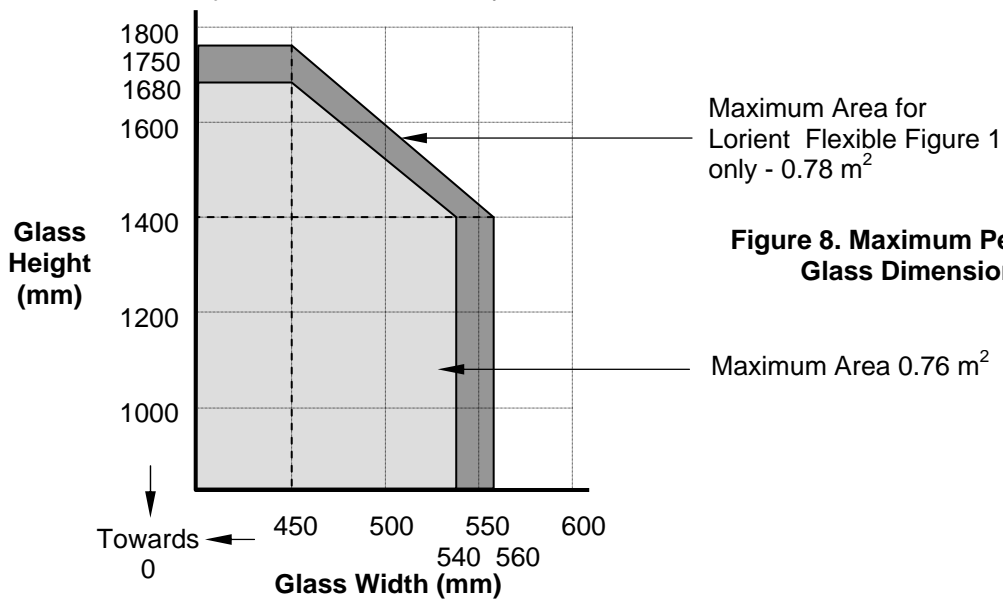
| | |
|------------------------------|---------------|
| Halspan | Prima 30 |
| Pacific Rim | Flamebreak 30 |
| Falcon Panel Products | Strebord 44 |
| Baillargeon | Blankfort 30 |
| All CERTIFIRE approved doors | |

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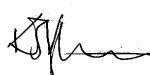
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Timber doors for periods of 30 minutes integrity (continued)

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figures 8 & 9 below, when used in conjunction with the above system.



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

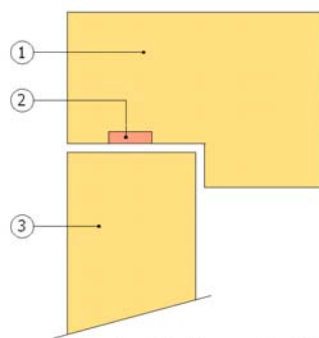


**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

Timber doors for periods of 30 minutes integrity

The doorsets may be single-acting, single-leaf only, latched or unlatched and to be as detailed within the figure below:



Door Leaf to Frame Detail

- ① 90 mm by 40 mm hardwood door frame with 12 mm integral, pinned or screwed stop, minimum density 640 kg/m³.
- ② Intumescent Seal Ltd Therm-A-Seal 15 x 4mm intumescent seals, positioned centrally within the reveal of the frame, at the head and vertical edges. The leaf to frame gap must not exceed 4 mm.
- ③ Minimum 100 mm by 44 mm hardwood stiles and rails (bottom rail 205 mm minimum) minimum density 640 kg/m³. Stiles and rails must be mortice & tenon jointed.

The door leaves may be provided with a mid-rail (or a number of intermediate rails) of minimum dimensions 100 mm by 44 mm and of minimum density 640 kg/m³.

All doorset hardware must be CERTIFIRE approved for use with ITT doors and the leaf must be hung upon 1½ pair of hinges and incorporate an automatic closing device.

Glazing specification must be as shown earlier on Page 13 (with the exception of the hardwood liner).

The maximum permitted door dimensions are as follows:

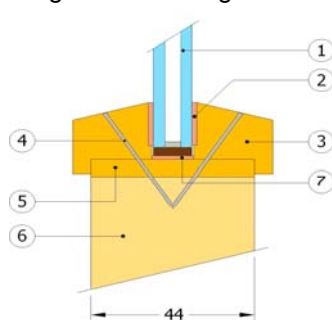
| Maximum Door Leaf Height | Maximum Door Leaf Width | Maximum Door Leaf Area |
|-----------------------------|-----------------------------|------------------------|
| 2233 mm (at 926 mm wide) | 994 mm (at 2040 mm high) | 2.07 m ² |

CERTIFICATE No CF 628 ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

IGUs in timber doors for periods of 30 minutes integrity*

The glass shall be glazed utilising the following basic specification:

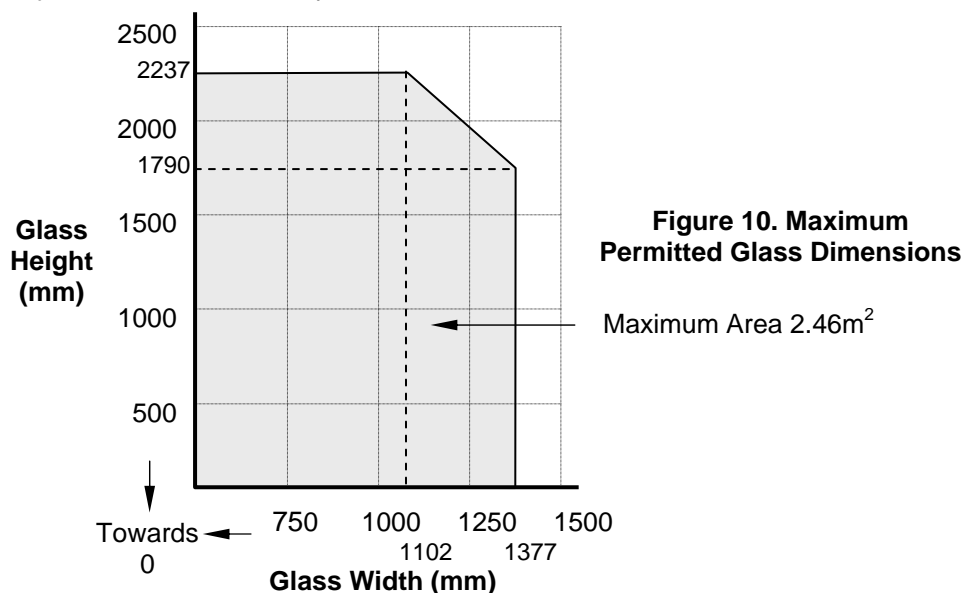


- ① IGU comprising ESG PYROTECH™ 630 glass, 12 mm to 16 mm steel spacer with 4 mm or greater float, toughened or laminated glass (edge of glass wrapped with Aluminium foil)*. See Table 2 for LPS 1270, EN 356 and ballistic security glazing panel references.
- ② 15 mm by 3 mm ceramic fibre based glazing tape.
- ③ 19 mm high by 14 mm wide with a 5x5 mm bolection return (chamfered by 16°) hardwood glazing beads, minimum density 640 kg/m³.
- ④ 50 mm long Ø2 mm steel pins at 150 mm centres and 50 mm from corners (35° to glass).
- ⑤ Hardwood liner min. 6mm thick & 640 kg/m³ density.
- ⑥ Nominally 44 mm thick FD30 timber door leaf.
- ⑦ Non-combustible setting blocks and 10 x 1 mm Interdens liner (liner to all edges).

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

*** The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.**

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 IGUs 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.

* Radiation performance was not measured on this size. On a previous test for an IGU of size 632 mm wide by 789 mm high, maximum area 0.5 m², a performance of 15 kW/m² was measured after 21 minutes.



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ LPS 1270 and EN 356 security glazing panels in timber doors for periods of 30 minutes integrity

Table 2

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|------------------------------------------|-----------|----------------|-----------------------------|
| ESG PYROTECH™ SECURE EN 356 P6B/15/E30 | EN356 P6B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P7B/15/E30 | EN356 P7B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P8B/17/E30 | EN356 P8B | 17 | 35 |
| ESG PYROTECH™ SECURE LPS 1270 001/17/E30 | 0-0-1 | 17 | 37 |
| ESG PYROTECH™ SECURE LPS 1270 112/21/E30 | 1-1-2 | 21 | 39 |
| ESG PYROTECH™ SECURE LPS 1270 123/23/E30 | 1-2-3 | 23 | 42 |
| ESG PYROTECH™ SECURE LPS 1270 123/27/E30 | 1-2-3 | 27 | 46 |
| ESG PYROTECH™ SECURE LPS 1270 223/35/E30 | 2-2-3 | 35 | 60 |
| ESG PYROTECH™ SECURE LPS 1270 224/44/E30 | 2-2-4 | 44 | 72 |
| ESG PYROTECH™ SECURE LPS 1270 234/48/E30 | 2-3-4 | 48 | 69 |
| ESG PYROTECH™ SECURE LPS 1270 235/61/E30 | 2-3-5 | 61 | 100 |

ESG PYROTECH™ ballistic glazing in timber doors for periods of 30 minutes integrity

Table 2a No Spall

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/NS/32/E30 | BR1 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR2/NS/32/E30 | BR2 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR3/NS/32/E30 | BR3 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR4/NS/36/E30 | BR4 | 36 | 78 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/46/E30 | BR5 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/51/E30 | BR5 | 51 | 104 |
| ESG PYROTECH™ BALLISTIC/BR6/NS/54/E30 | BR6 | 54 | 123 |
| ESG PYROTECH™ BALLISTIC/BR7/NS/80/E30 | BR7 | 80 | 188 |
| ESG PYROTECH™ BALLISTIC/SG1/NS/38/E30 | SG1 | 38 | 83 |
| ESG PYROTECH™ BALLISTIC/SG2/NS/47/E30 | SG2 | 47 | 103 |



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ ballistic glazing in timber doors for periods of 30 minutes integrity (continued)

Table 2b Spall Allowed

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/SA/34/E30 | BR1 | 34 | 75 |
| ESG PYROTECH™ BALLISTIC/BR2/SA/40/E30 | BR2 | 40 | 82 |
| ESG PYROTECH™ BALLISTIC/BR3/SA/35/E30 | BR3 | 35 | 80 |
| ESG PYROTECH™ BALLISTIC/BR4/SA/46/E30 | BR4 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/SA/60/E30 | BR5 | 60 | 113 |
| ESG PYROTECH™ BALLISTIC/BR6/SA/65/E30 | BR6 | 65 | 153 |
| ESG PYROTECH™ BALLISTIC/BR7/SA/91/E30 | BR7 | 91 | 217 |
| ESG PYROTECH™ BALLISTIC/SG1/SA/47/E30 | SG1 | 47 | 109 |
| ESG PYROTECH™ BALLISTIC/SG2/SA/51/E30 | SG2 | 51 | 115 |

ESG PYROTECH™ privacy glazing in timber doors for periods of 30 minutes integrity

Table 2c

| Product Code | Thickness (mm) | Weight (kg/m ²) |
|-----------------------------|----------------|-----------------------------|
| ESG PYROTECH™ 1230L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1260L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1430L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1460L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1530L Privacy | 15 | 32 |
| ESG PYROTECH™ 1560L Privacy | 15 | 42 |

**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

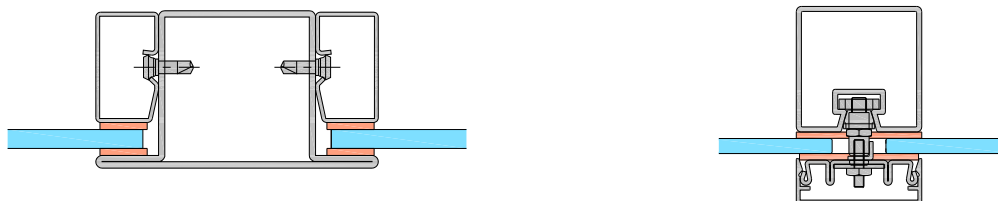
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 630 Glass & ESG Laminated Fire Resistant Glass in steel framed screens for periods of 30 minutes integrity

The screens shall be no greater than 4000 mm high unless suitable tie backs and/or fire protected structural supports are provided.

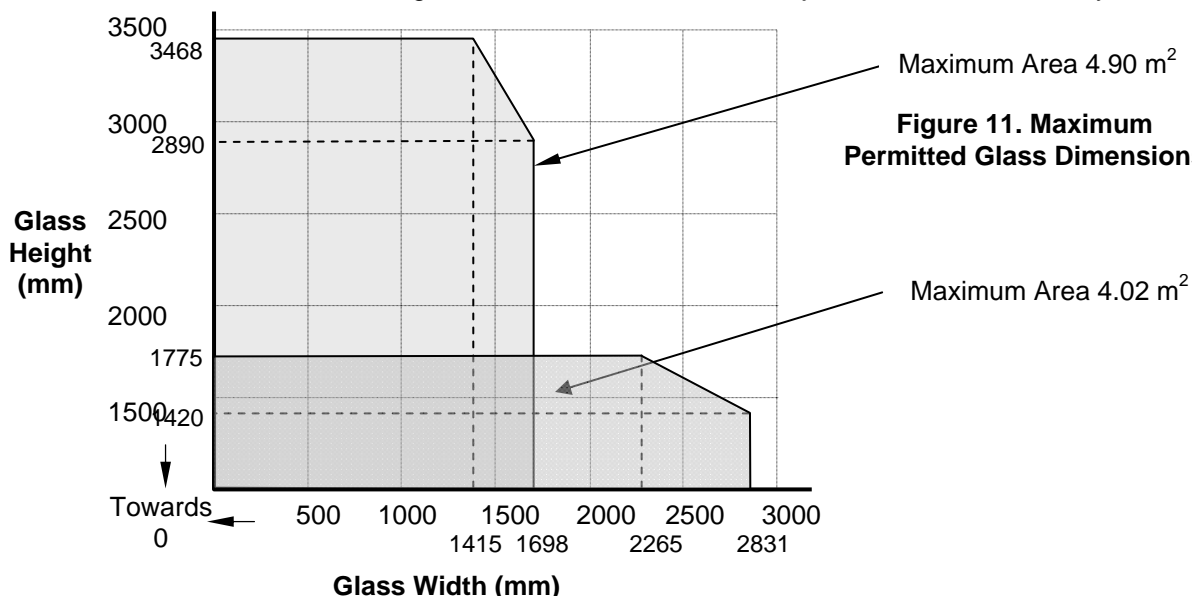
The glass shall be installed into a previously tested framing system (which is covered appropriately by test or assessment evidence) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems, using pressure plate glazing, screw-fixed or clip-on retaining beads, see examples below. The glass shall be glazed into the screen with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover. For 60 minute ratings, the top edges of the panes shall be bonded to the gasket on both faces, with Autostic adhesive

Laminate construction utilising combinations of approved ESG PYROTECH™ glass, bonded together with interlayer(s). See Table 3 for LPS 1270, EN 356 and ballistic security glazing panel references.



Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass & ESG Laminated Fire Resistant Glass shown in Figure 11 below, when used in conjunction with the above systems:



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

**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels in steel screens containing IGUs* for periods of 30 minutes integrity

The screens shall be no greater than 4000 mm high unless suitable tie backs and/or fire protected structural supports are provided.

The glass shall be installed into a previously tested framing system (which is covered appropriately by test or assessment evidence) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems, using pressure plate glazing, screw-fixed or clip-on retaining beads, see examples below. The IGU shall comprise 6 mm ESG PYROTECH™ 630 glass, a 12 mm to 16 mm spacer bar and 4 mm or greater float, toughened or laminated glass*. The glass shall be glazed into the screen with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover. For 60 minute ratings, the top edges of the panes shall be bonded to the gasket on both faces, with Autostic adhesive

See Table 3 for LPS 1270, EN 356 and ballistic security glazing panel references.

Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels shown in Figure 12 below, when used in conjunction with above systems

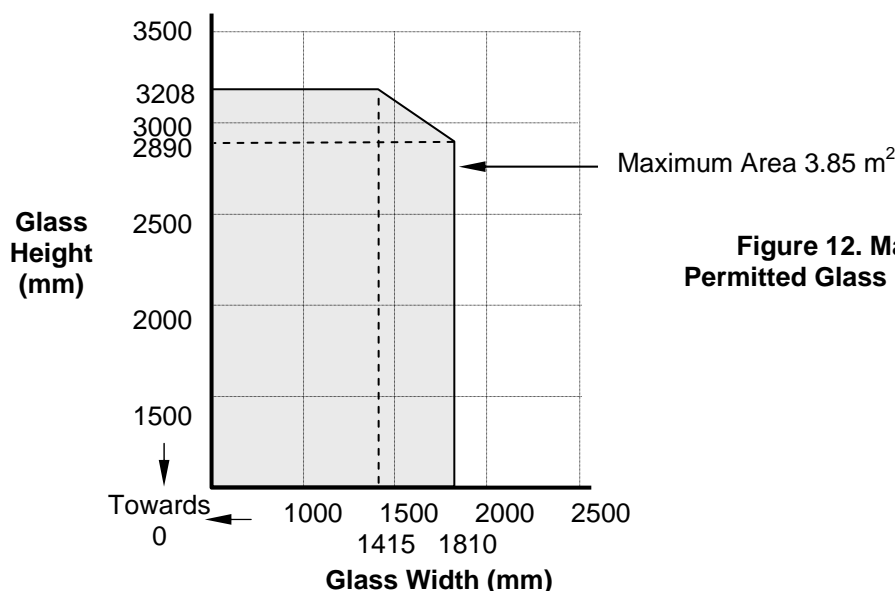


Figure 12. Maximum Permitted Glass Dimensions

- * The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ LPS 1270 and EN 356 security glazing panels in steel framed screens for periods of 30 minutes integrity

Table 3

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|------------------------------------------|-----------|----------------|-----------------------------|
| ESG PYROTECH™ SECURE EN 356 P6B/15/E30 | EN356 P6B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P7B/15/E30 | EN356 P7B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P8B/17/E30 | EN356 P8B | 17 | 35 |
| ESG PYROTECH™ SECURE LPS 1270 001/17/E30 | 0-0-1 | 17 | 37 |
| ESG PYROTECH™ SECURE LPS 1270 112/21/E30 | 1-1-2 | 21 | 39 |
| ESG PYROTECH™ SECURE LPS 1270 123/23/E30 | 1-2-3 | 23 | 42 |
| ESG PYROTECH™ SECURE LPS 1270 123/27/E30 | 1-2-3 | 27 | 46 |
| ESG PYROTECH™ SECURE LPS 1270 223/35/E30 | 2-2-3 | 35 | 60 |
| ESG PYROTECH™ SECURE LPS 1270 224/44/E30 | 2-2-4 | 44 | 72 |
| ESG PYROTECH™ SECURE LPS 1270 234/48/E30 | 2-3-4 | 48 | 69 |
| ESG PYROTECH™ SECURE LPS 1270 235/61/E30 | 2-3-5 | 61 | 100 |

ESG PYROTECH™ ballistic glazing in steel framed screens for periods of 30 minutes integrity

Table 3a No Spall

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/NS/32/E30 | BR1 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR2/NS/32/E30 | BR2 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR3/NS/32/E30 | BR3 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR4/NS/36/E30 | BR4 | 36 | 78 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/46/E30 | BR5 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/51/E30 | BR5 | 51 | 104 |
| ESG PYROTECH™ BALLISTIC/BR6/NS/54/E30 | BR6 | 54 | 123 |
| ESG PYROTECH™ BALLISTIC/BR7/NS/80/E30 | BR7 | 80 | 188 |
| ESG PYROTECH™ BALLISTIC/SG1/NS/38/E30 | SG1 | 38 | 83 |
| ESG PYROTECH™ BALLISTIC/SG2/NS/47/E30 | SG2 | 47 | 103 |



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ ballistic glazing in steel framed screens for periods of 30 minutes integrity (continued)

Table 3b Spall Allowed

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/SA/34/E30 | BR1 | 34 | 75 |
| ESG PYROTECH™ BALLISTIC/BR2/SA/40/E30 | BR2 | 40 | 82 |
| ESG PYROTECH™ BALLISTIC/BR3/SA/35/E30 | BR3 | 35 | 80 |
| ESG PYROTECH™ BALLISTIC/BR4/SA/46/E30 | BR4 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/SA/60/E30 | BR5 | 60 | 113 |
| ESG PYROTECH™ BALLISTIC/BR6/SA/65/E30 | BR6 | 65 | 153 |
| ESG PYROTECH™ BALLISTIC/BR7/SA/91/E30 | BR7 | 91 | 217 |
| ESG PYROTECH™ BALLISTIC/SG1/SA/47/E30 | SG1 | 47 | 109 |
| ESG PYROTECH™ BALLISTIC/SG2/SA/51/E30 | SG2 | 51 | 115 |

ESG PYROTECH™ privacy glazing in steel framed screens for periods of 30 minutes integrity

Table 3c

| Product Code | Thickness (mm) | Weight (kg/m ²) |
|-----------------------------|----------------|-----------------------------|
| ESG PYROTECH™ 1230L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1260L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1430L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1460L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1530L Privacy | 15 | 32 |
| ESG PYROTECH™ 1560L Privacy | 15 | 42 |

CERTIFICATE No CF 628
ESSEX SAFETY GLASS

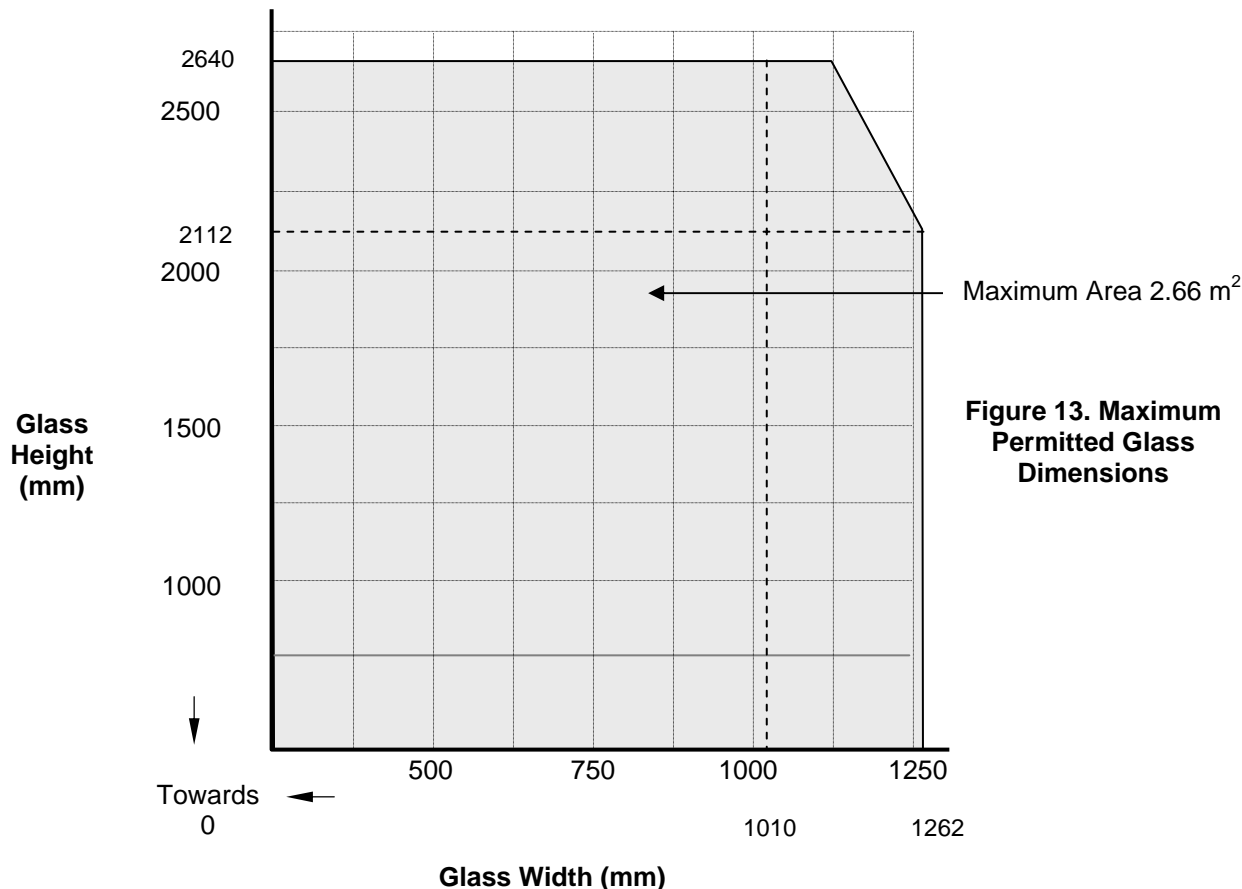
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 630 Glass & ESG Laminated Fire Resistant Glass in single steel framed doors for periods of 30 minutes integrity

The glass shall be installed into a previously tested steel doorset (which is covered appropriately by test, assessment evidence or CERTIFIRE approval) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems. The glass pane shall comprise single 6 mm ESG PYROTECH™ 630 glass and approved ESG Laminated glass, glazed into the door with ceramic fibre gasket on both faces and set on PU setting blocks to determine the correct edge cover and expansion allowance. ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 4.

Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figure 13 below, when used in conjunction with previously tested steel doorsets:



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

CERTIFICATE No CF 628
ESSEX SAFETY GLASS

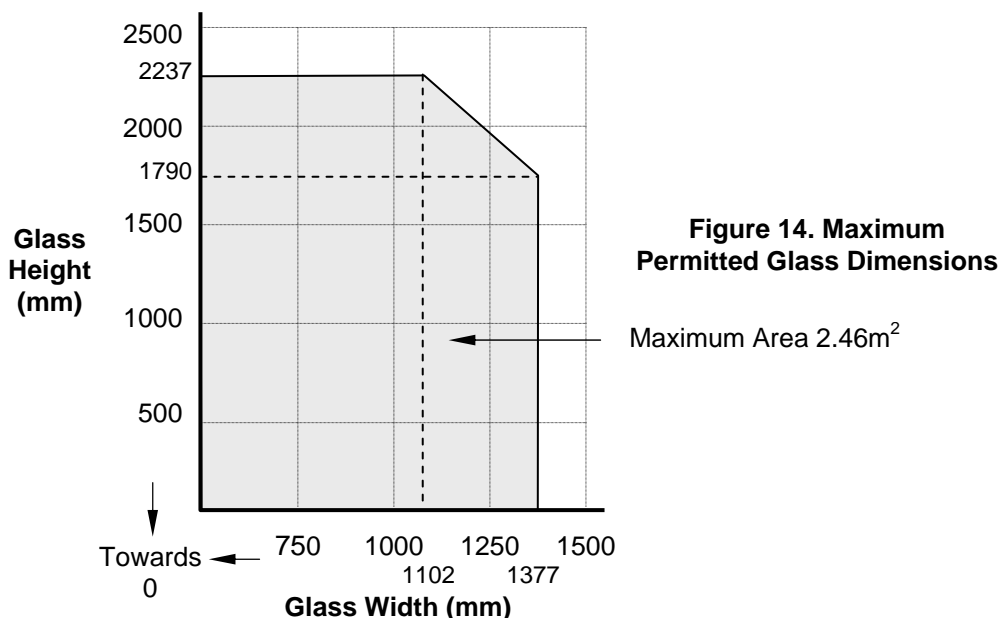
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 630, PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels in single steel framed doors containing IGUs* for periods of 30 minutes integrity

The glass shall be installed into a previously tested steel doorset (which is covered appropriately by test, assessment evidence or CERTIFIRE approval) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems. The IGU shall comprise 6 mm ESG PYROTECH™ 630 glass, a 12 mm to 16 mm spacer bar and 4 mm or greater float, toughened or laminated glass*. The ESG PYROTECH™ 630 and approved ESG Laminated glass IGUs are glazed into the door with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover and expansion allowance. ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 4.

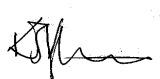
Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figure 14 below, when used in conjunction with previously tested steel doorsets:



- * The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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



CERTIFICATE No CF 628
ESSEX SAFETY GLASS

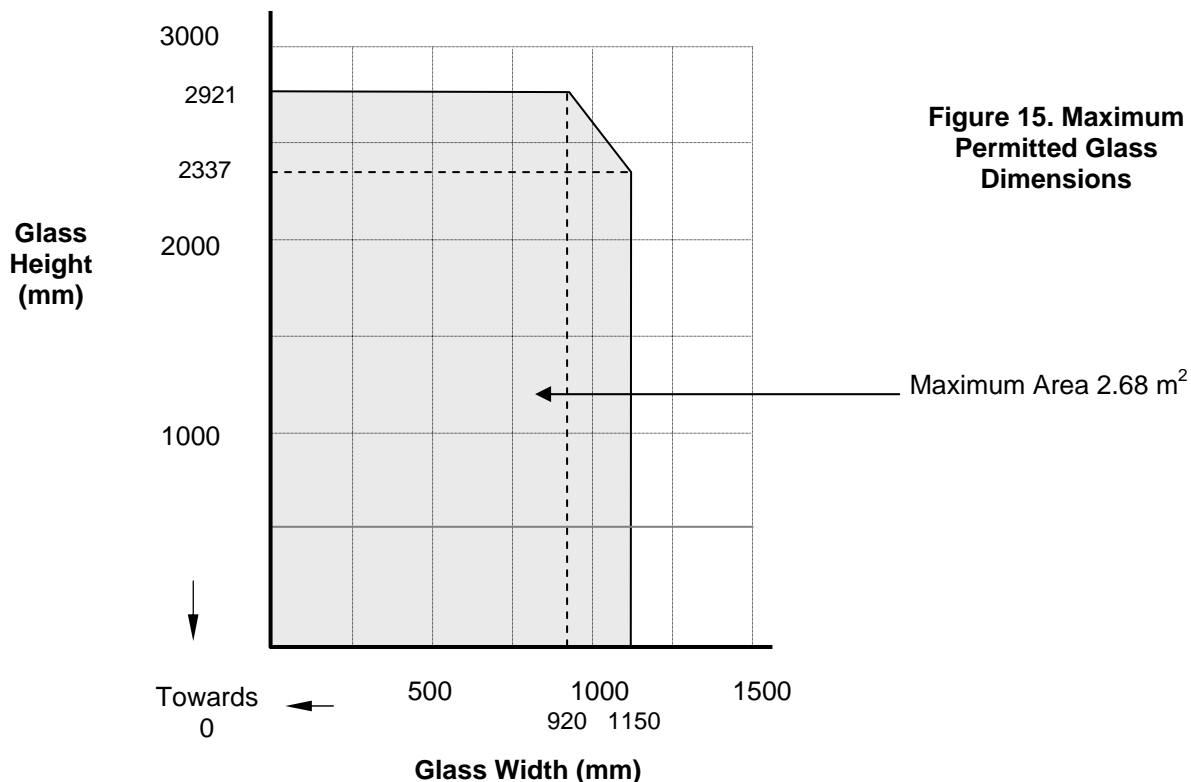
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 630 Glass & ESG Laminated Fire Resistant Glass in double steel framed doors for periods of 30 minutes integrity

The glass shall be installed into a previously tested steel doorset (which is covered appropriately by test, assessment evidence or CERTIFIRE approval) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems. The glass panes shall comprise single 6 mm ESG PYROTECH™ 630 glass, glazed into the door with ceramic fibre gasket on both faces and set on PU setting blocks to determine the correct edge cover and expansion allowance. ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 4.

Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figure 15 below, when used in conjunction with previously tested steel doorsets:



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

CERTIFICATE No CF 628
ESSEX SAFETY GLASS

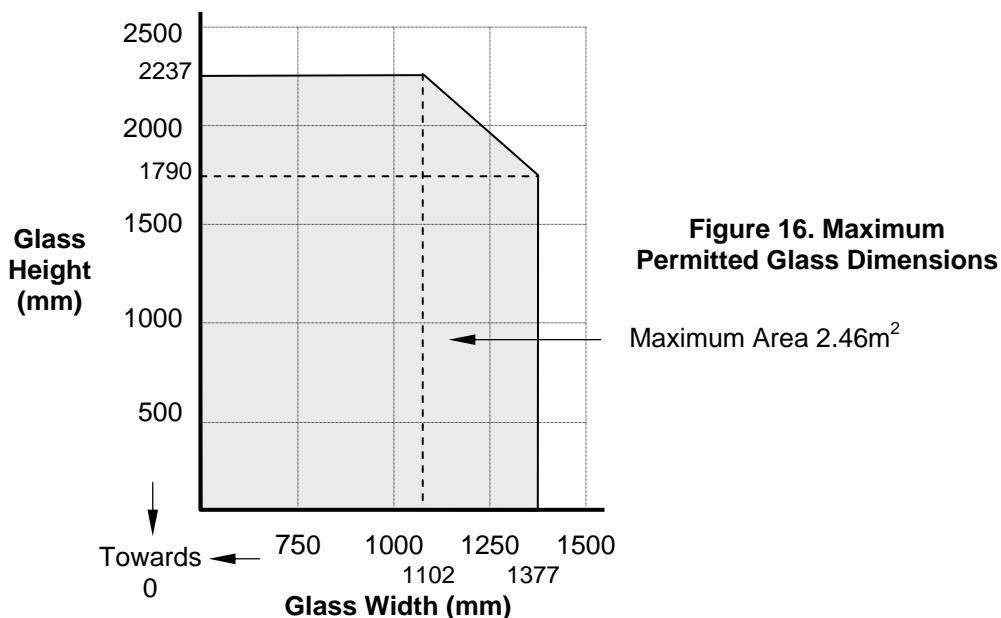
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™630, ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels in double steel framed doors containing IGUs* for periods of 30 minutes integrity

The glass shall be installed into a previously tested steel doorset (which is covered appropriately by test, assessment evidence or CERTIFIRE approval) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems. The IGU shall comprise 6 mm ESG PYROTECH™ 630 glass, a 12 mm to 16 mm spacer bar and 4 mm or greater float, toughened or laminated glass*. The ESG PYROTECH™ 630 and approved ESG Laminated glass IGUs are glazed into the door with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover and expansion allowance. ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 4.

Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 630 glass shown in Figure 16 below, when used in conjunction with previously tested steel doorsets:



- * The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™, LPS 1270 and EN 356 security glazing panels in steel framed doors for periods of 30 minutes integrity

Table 4

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|------------------------------------------|-----------|----------------|-----------------------------|
| ESG PYROTECH™ SECURE EN 356 P6B/15/E30 | EN356 P6B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P7B/15/E30 | EN356 P7B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P8B/17/E30 | EN356 P8B | 17 | 35 |
| ESG PYROTECH™ SECURE LPS 1270 001/17/E30 | 0-0-1 | 17 | 37 |
| ESG PYROTECH™ SECURE LPS 1270 112/21/E30 | 1-1-2 | 21 | 39 |
| ESG PYROTECH™ SECURE LPS 1270 123/23/E30 | 1-2-3 | 23 | 42 |
| ESG PYROTECH™ SECURE LPS 1270 123/27/E30 | 1-2-3 | 27 | 46 |
| ESG PYROTECH™ SECURE LPS 1270 223/35/E30 | 2-2-3 | 35 | 60 |
| ESG PYROTECH™ SECURE LPS 1270 224/44/E30 | 2-2-4 | 44 | 72 |
| ESG PYROTECH™ SECURE LPS 1270 234/48/E30 | 2-3-4 | 48 | 69 |
| ESG PYROTECH™ SECURE LPS 1270 235/61/E30 | 2-3-5 | 61 | 100 |

ESG PYROTECH™ ballistic glazing in steel framed doors for periods of 30 minutes integrity

Table 4a No Spall

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/NS/32/E30 | BR1 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR2/NS/32/E30 | BR2 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR3/NS/32/E30 | BR3 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR4/NS/36/E30 | BR4 | 36 | 78 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/46/E30 | BR5 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/51/E30 | BR5 | 51 | 104 |
| ESG PYROTECH™ BALLISTIC/BR6/NS/54/E30 | BR6 | 54 | 123 |
| ESG PYROTECH™ BALLISTIC/BR7/NS/80/E30 | BR7 | 80 | 188 |
| ESG PYROTECH™ BALLISTIC/SG1/NS/38/E30 | SG1 | 38 | 83 |
| ESG PYROTECH™ BALLISTIC/SG2/NS/47/E30 | SG2 | 47 | 103 |



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ ballistic glazing in steel framed doors for periods of 30 minutes integrity (continued)

Table 4b Spall Allowed

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/SA/34/E30 | BR1 | 34 | 75 |
| ESG PYROTECH™ BALLISTIC/BR2/SA/40/E30 | BR2 | 40 | 82 |
| ESG PYROTECH™ BALLISTIC/BR3/SA/35/E30 | BR3 | 35 | 80 |
| ESG PYROTECH™ BALLISTIC/BR4/SA/46/E30 | BR4 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/SA/60/E30 | BR5 | 60 | 113 |
| ESG PYROTECH™ BALLISTIC/BR6/SA/65/E30 | BR6 | 65 | 153 |
| ESG PYROTECH™ BALLISTIC/BR7/SA/91/E30 | BR7 | 91 | 217 |
| ESG PYROTECH™ BALLISTIC/SG1/SA/47/E30 | SG1 | 47 | 109 |
| ESG PYROTECH™ BALLISTIC/SG2/SA/51/E30 | SG2 | 51 | 115 |

ESG PYROTECH™ privacy glazing in steel framed doors for periods of 30 minutes integrity

Table 4c

| Product Code | Thickness (mm) | Weight (kg/m ²) |
|-----------------------------|----------------|-----------------------------|
| ESG PYROTECH™ 1230L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1260L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1430L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1460L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1530L Privacy | 15 | 32 |
| ESG PYROTECH™ 1560L Privacy | 15 | 42 |

CERTIFICATE No CF 628
ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™660, PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels in steel framed doors containing IGUs* for periods of 60 minutes integrity

The glass shall be installed into a previously tested steel doorset (which is covered appropriately by test, assessment evidence or CERTIFIRE approval) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems. The IGU shall comprise 6 mm ESG PYROTECH™ 630 glass, a 12 mm to 16 mm spacer bar and 4 mm or greater float, toughened or laminated glass*. The ESG PYROTECH™ 630 and approved ESG Laminated glass IGUs are glazed into the door with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover and expansion allowance. ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 5.

Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of IGUs of ESG PYROTECH™ 660 glass shown in Figure 17 below, when used in conjunction with previously tested steel doorsets:

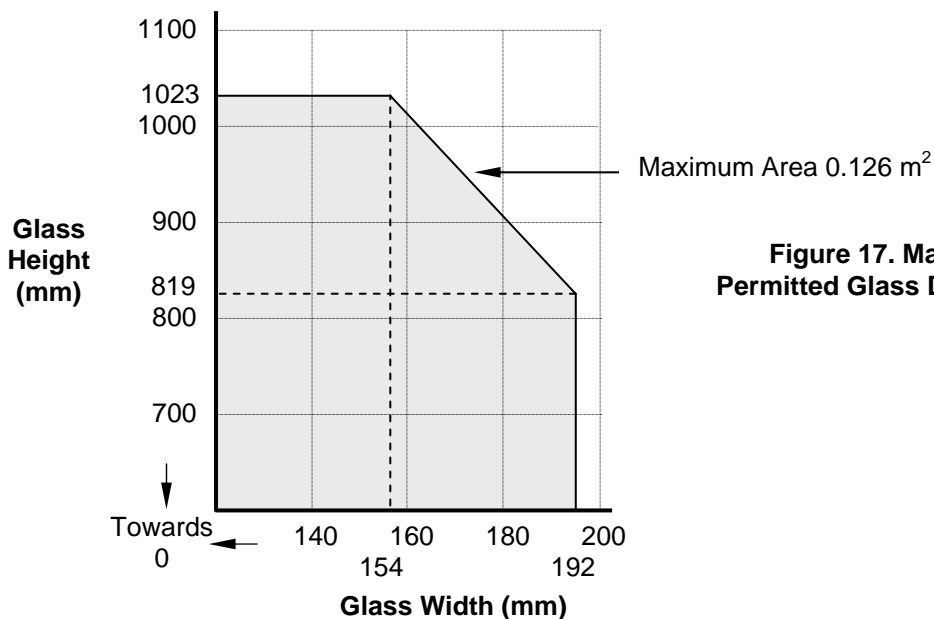


Figure 17. Maximum Permitted Glass Dimensions

- * The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 660 IGUs* and ESG PYROTECH™ LPS 1270 and EN 356 security glazing panels in steel framed doors for periods of 60 minutes integrity

Table 5

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|------------------------------------------|-----------|----------------|-----------------------------|
| ESG PYROTECH™ SECURE EN 356 P6B/15/E60 | EN356 P6B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P7B/15/E60 | EN356 P7B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P8B/17/E60 | EN356 P8B | 17 | 35 |
| ESG PYROTECH™ SECURE LPS 1270 001/17/E60 | 0-0-1 | 17 | 37 |
| ESG PYROTECH™ SECURE LPS 1270 112/21/E60 | 1-1-2 | 21 | 39 |
| ESG PYROTECH™ SECURE LPS 1270 123/23/E60 | 1-2-3 | 23 | 42 |
| ESG PYROTECH™ SECURE LPS 1270 123/27/E60 | 1-2-3 | 27 | 46 |
| ESG PYROTECH™ SECURE LPS 1270 223/35/E60 | 2-2-3 | 35 | 60 |
| ESG PYROTECH™ SECURE LPS 1270 224/44/E60 | 2-2-4 | 44 | 72 |
| ESG PYROTECH™ SECURE LPS 1270 234/48/E60 | 2-3-4 | 48 | 69 |
| ESG PYROTECH™ SECURE LPS 1270 235/61/E60 | 2-3-5 | 61 | 100 |

ESG PYROTECH™ ballistic glazing in steel framed doors for periods of 60 minutes integrity

Table 5a No Spall

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/NS/32/E60 | BR1 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR2/NS/32/E60 | BR2 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR3/NS/32/E60 | BR3 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR4/NS/36/E60 | BR4 | 36 | 78 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/46/E60 | BR5 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/51/E60 | BR5 | 51 | 104 |
| ESG PYROTECH™ BALLISTIC/BR6/NS/54/E60 | BR6 | 54 | 123 |
| ESG PYROTECH™ BALLISTIC/BR7/NS/80/E60 | BR7 | 80 | 188 |
| ESG PYROTECH™ BALLISTIC/SG1/NS/38/E60 | SG1 | 38 | 83 |
| ESG PYROTECH™ BALLISTIC/SG2/NS/47/E60 | SG2 | 47 | 103 |



CERTIFICATE No CF 628
ESSEX SAFETY GLASS

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ ballistic glazing in steel framed doors for periods of 60 minutes integrity (continued)

Table 5b Spall Allowed

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/SA/34/E60 | BR1 | 34 | 75 |
| ESG PYROTECH™ BALLISTIC/BR2/SA/40/E60 | BR2 | 40 | 82 |
| ESG PYROTECH™ BALLISTIC/BR3/SA/35/E60 | BR3 | 35 | 80 |
| ESG PYROTECH™ BALLISTIC/BR4/SA/46/E60 | BR4 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/SA/60/E60 | BR5 | 60 | 113 |
| ESG PYROTECH™ BALLISTIC/BR6/SA/65/E60 | BR6 | 65 | 153 |
| ESG PYROTECH™ BALLISTIC/BR7/SA/91/E60 | BR7 | 91 | 217 |
| ESG PYROTECH™ BALLISTIC/SG1/SA/47/E60 | SG1 | 47 | 109 |
| ESG PYROTECH™ BALLISTIC/SG2/SA/51/E60 | SG2 | 51 | 115 |

ESG PYROTECH™ privacy glazing in steel framed doors for periods of 60 minutes integrity

Table 5c

| Product Code | Thickness (mm) | Weight (kg/m ²) |
|-----------------------------|----------------|-----------------------------|
| ESG PYROTECH™ 1230L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1260L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1430L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1460L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1530L Privacy | 15 | 32 |
| ESG PYROTECH™ 1560L Privacy | 15 | 42 |

CERTIFICATE No CF 628
ESSEX SAFETY GLASS

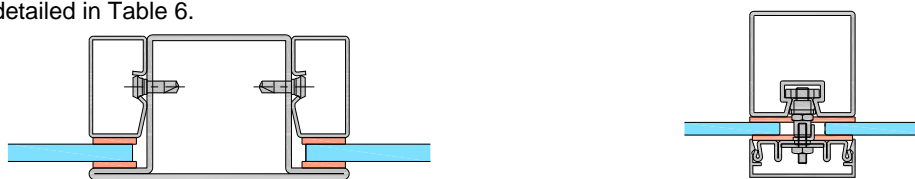
ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 660 Glass, ESG Laminated Fire Resistant Glass & ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels in steel framed screens for periods of 60 minutes integrity

The screens shall be no greater than 4000 mm high unless suitable tie backs and/or fire protected structural supports are provided.

The glass shall be installed into a previously tested framing system (which is covered appropriately by test or assessment evidence) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems, using pressure plate glazing, screw-fixed or clip-on retaining beads, see examples below. The glass shall be glazed into the screen with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover. The top edges of the panes shall be bonded to the gasket on both faces, with Autostic adhesive.

Laminate construction utilising combinations of approved ESG PYROTECH™ Fire Resistant Glass, bonded together with interlayer(s). ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 6.



Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ 660 glass & ESG laminated fire resistant glass shown in Figure 18 below, when used in conjunction with above systems:

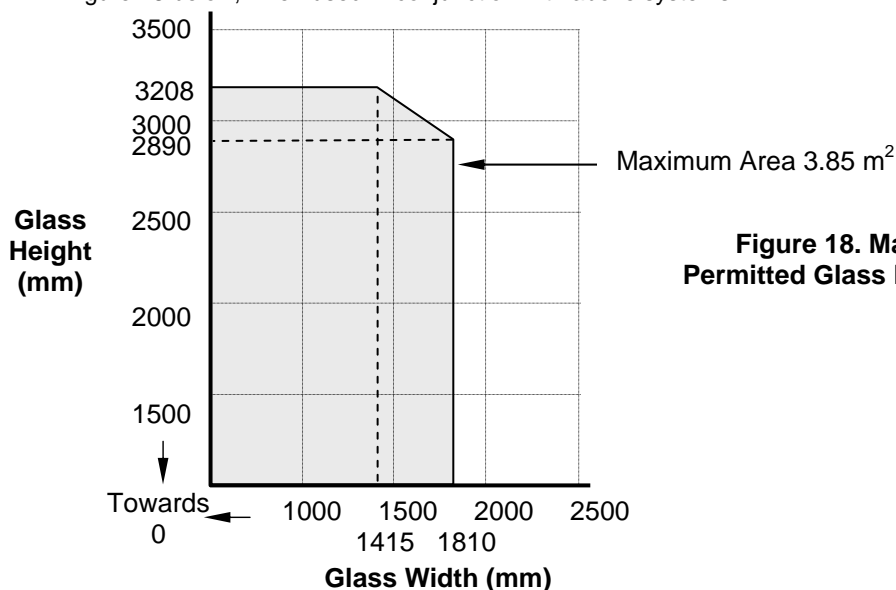


Figure 18. Maximum Permitted Glass Dimensions

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

* Radiation performance of 17 minutes to 15 kW/m² up to a maximum screen area of 9 m²

**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 660 Glass, ESG Laminated Fire Resistant Glass & ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels in steel framed screens containing IGUs* for periods of 60 minutes integrity

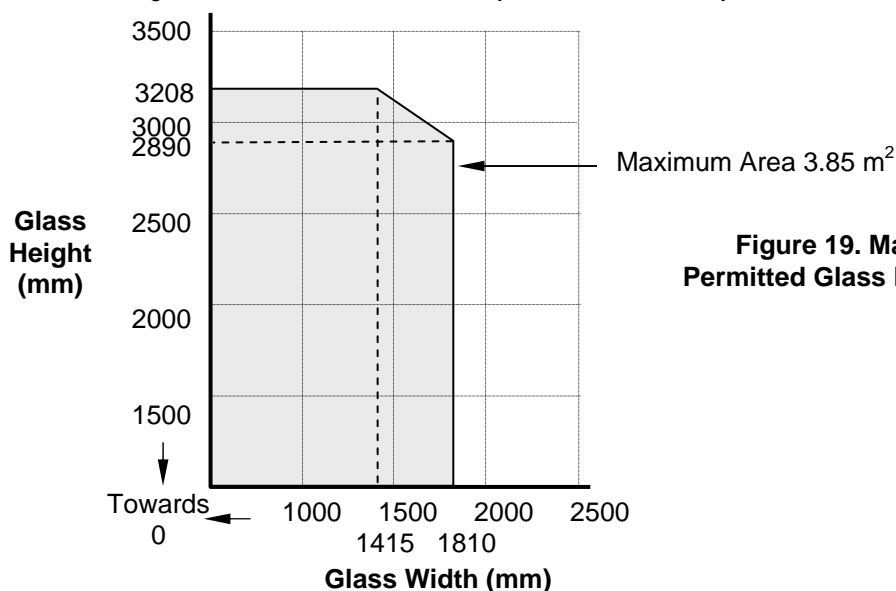
The screens shall be no greater than 4000 mm high unless suitable tie backs and/or fire protected structural supports are provided.

The glass shall be installed into a previously tested framing system (which is covered appropriately by test, assessment evidence or CERTIFIRE approval) e.g. Wrightstyle, Schuco, Forster, Jansen, including Jansen Economy 50 and 60 systems using pressure plate glazing, screw-fixed or clip-on retaining beads. The IGU shall comprise 6 mm ESG PYROTECH™ 660 glass, a 12 mm to 16 mm spacer bar and 4 mm or greater float, toughened or laminated glass*. The ESG PYROTECH™ 660 and approved ESG Laminated glass IGUs are glazed into the screen with ceramic fibre gasket on both faces and set on setting blocks, which comprise calcium silicate material to determine the correct edge cover and expansion allowance. The top edges of the panes shall be bonded to the gasket on both faces, with Autostic adhesive.

Laminated constructions utilising combinations of approved ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels will be as detailed in Table 6.

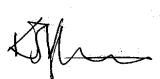
Maximum Permitted Pane Dimensions

This Certificate of Approval relates to the sizes of ESG PYROTECH™ LPS 1270, EN 356 and ballistic security glazing panels shown in Figure 19 below, when used in conjunction with above systems



* The IGU must be oriented such that the float, toughened or laminated glass is on the fire risk side. If the fire risk side cannot be identified or may be from either direction, then this system shall not be used.

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





**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ 660 Glass, ESG Laminated Fire Resistant Glass, ESG PYROTECH™ LPS 1270 and EN 356 security glazing panels in steel framed screens for periods of 60 minutes integrity

Table 6

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|------------------------------------------|-----------|----------------|-----------------------------|
| ESG PYROTECH™ SECURE EN 356 P6B/15/E60 | EN356 P6B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P7B/15/E60 | EN356 P7B | 15 | 33 |
| ESG PYROTECH™ SECURE EN 356 P8B/17/E60 | EN356 P8B | 17 | 35 |
| ESG PYROTECH™ SECURE LPS 1270 001/17/E60 | 0-0-1 | 17 | 37 |
| ESG PYROTECH™ SECURE LPS 1270 112/21/E60 | 1-1-2 | 21 | 39 |
| ESG PYROTECH™ SECURE LPS 1270 123/23/E60 | 1-2-3 | 23 | 42 |
| ESG PYROTECH™ SECURE LPS 1270 123/27/E60 | 1-2-3 | 27 | 46 |
| ESG PYROTECH™ SECURE LPS 1270 223/35/E60 | 2-2-3 | 35 | 60 |
| ESG PYROTECH™ SECURE LPS 1270 224/44/E60 | 2-2-4 | 44 | 72 |
| ESG PYROTECH™ SECURE LPS 1270 234/48/E60 | 2-3-4 | 48 | 69 |
| ESG PYROTECH™ SECURE LPS 1270 235/61/E60 | 2-3-5 | 61 | 100 |

ESG PYROTECH™ ballistic glazing in steel framed screens for periods of 60 minutes integrity

Table 6a No Spall

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/NS/32/E60 | BR1 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR2/NS/32/E60 | BR2 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR3/NS/32/E60 | BR3 | 32 | 69 |
| ESG PYROTECH™ BALLISTIC/BR4/NS/36/E60 | BR4 | 36 | 78 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/46/E60 | BR5 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/NS/51/E60 | BR5 | 51 | 104 |
| ESG PYROTECH™ BALLISTIC/BR6/NS/54/E60 | BR6 | 54 | 123 |
| ESG PYROTECH™ BALLISTIC/BR7/NS/80/E60 | BR7 | 80 | 188 |
| ESG PYROTECH™ BALLISTIC/SG1/NS/38/E60 | SG1 | 38 | 83 |
| ESG PYROTECH™ BALLISTIC/SG2/NS/47/E60 | SG2 | 47 | 103 |



**CERTIFICATE No CF 628
ESSEX SAFETY GLASS**

ESG PYROTECH™ 630, 660 & ESG LAMINATED FIRE RESISTANT GLASS

ESG PYROTECH™ ballistic glazing in steel framed screens for periods of 60 minutes integrity (continued)

Table 6b Spall Allowed

| Product Code | Level | Thickness (mm) | Weight (kg/m ²) |
|---------------------------------------|------------|----------------|-----------------------------|
| ESG PYROTECH™ BALLISTIC/BR1/SA/34/E60 | BR1 | 34 | 75 |
| ESG PYROTECH™ BALLISTIC/BR2/SA/40/E60 | BR2 | 40 | 82 |
| ESG PYROTECH™ BALLISTIC/BR3/SA/35/E60 | BR3 | 35 | 80 |
| ESG PYROTECH™ BALLISTIC/BR4/SA/46/E60 | BR4 | 46 | 103 |
| ESG PYROTECH™ BALLISTIC/BR5/SA/60/E60 | BR5 | 60 | 113 |
| ESG PYROTECH™ BALLISTIC/BR6/SA/65/E60 | BR6 | 65 | 153 |
| ESG PYROTECH™ BALLISTIC/BR7/SA/91/E60 | BR7 | 91 | 217 |
| ESG PYROTECH™ BALLISTIC/SG1/SA/47/E60 | SG1 | 47 | 109 |
| ESG PYROTECH™ BALLISTIC/SG2/SA/51/E60 | SG2 | 51 | 115 |

ESG PYROTECH™ privacy glazing in steel framed screens for periods of 60 minutes integrity

Table 6c

| Product Code | Thickness (mm) | Weight (kg/m ²) |
|-----------------------------|----------------|-----------------------------|
| ESG PYROTECH™ 1230L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1260L Privacy | 12 | 26.2 |
| ESG PYROTECH™ 1430L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1460L Privacy | 14 | 31.2 |
| ESG PYROTECH™ 1530L Privacy | 15 | 32 |
| ESG PYROTECH™ 1560L Privacy | 15 | 42 |