



CERTIFICATE OF APPROVAL

No CF 5204

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

'Pyroguard T-EI'
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: 24th February 2014
Revised: 19th January 2022
Valid to: 17th July 2024





CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T-EI Insulating Fire Resisting Glass

This certification is provided to the client for its 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 must be read in conjunction with CERTIFIRE Technical Schedule TS25, Fire Resistant Glass, Glazing Systems and Materials.

This Certificate of Approval relates to the fire resistance of Pyroguard UK Ltd. 'Pyroguard T-EI' laminated glass products when used in the following applications, as defined in BS 476: Part 22: 1987 but using test results achieved against the following Standards - BS EN 1363-1 Fire Resistance Tests, BS EN 1364-1 Fire Resistance Tests on Non-Loadbearing Walls, BS EN 1634-1 Fire Resistance Tests on Doors, Shutters and Openable Windows or BS EN 1364-3 Fire Resistance Tests for Non Loadbearing Elements – Curtain Walling.

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



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Pyroguard T-EI Insulating Fire Resisting Glass

Glass Specification	Application	Fire Resistance Performance (mins)		Page No.
		Integrity	Insulation	
Pyroguard T-EI30/18-2	Multiple paned Timber framed screens	30	30	10-14
Pyroguard T-EI60/25-3 (inc. *VI options)	Multiple paned Single and IGU Timber framed screens	60	60	15-20
Pyroguard T-EI30/18-2	Timber doorsets	30	30	21-25
Pyroguard T-EI30/18-2	Multiple paned Steel framed screens	30	30	26-29
Pyroguard T-EI30/18-2	Multiple paned Steel framed screens	60	30	30-32
Pyroguard T-EI30/18-2	Steel framed doorsets	30	30	33-34
Pyroguard T-EI30/18-2	Steel framed doorsets	60	30	35
Pyroguard T-EI90/38-3	Stainless steel or mild framed doorsets	60	60	36
Pyroguard T-EI90/32-2	Multiple paned Steel framed screens	60	60	37
Pyroguard T-EI90/32-2	Multiple paned Steel framed screens	90	90	38-39
Pyroguard T-EI90/35-3	Steel framed doorsets	90	90	40
Pyroguard T-EI90/38-3	Steel framed doorsets	90	90	41
Pyroguard T-EI90/40-3	Steel framed doorsets	90	90	42
Pyroguard T-EI90/40-3	Multiple paned Steel framed screens	90	90	43
Pyroguard T-EI120/47-3	Multiple paned Steel framed screens	120	120	44
Pyroguard T-EI120/52-4	Multiple paned Steel framed screens	120	120	45-46
Pyroguard T-EI60/25-3	Timber doorsets	60	60	47-50
Pyroguard T-EI60/25-3	Single glazed into Steel doorsets	60	60	51-52

Note* The fire resistant pane of the IGU construction can be used as a single glazed pane in any previously fire tested or CERTIFIRE approved system. **Note:** In this case the product code will change.

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Pyroguard T-EI Insulating Fire Resisting Glass (continued)

Glass Specification	Application	Fire Resistance Performance (mins)		Page No.
		Integrity	Insulation	
*Pyroguard T-EI30/18-2 VI	IGUs in multiple paned of Steel framed doorsets	30	30	53
*Pyroguard T-EI30/18-2 VI	IGUs in multiple paned of Steel framed doorsets	60	30	54
*Pyroguard T-EI30/18-2 VI	IGUs in multiple paned Timber framed screens	30	30	55-56
*Pyroguard T-EI30/18-2 VI	IGUs in multiple paned Timber framed screens	60	30	57
*Pyroguard T-EI60/25-3 VI	IGUs in multiple paned Timber framed screens	60	60	58
***Pyroguard T-EW30/13-1 VI	IGUs in multiple paned Steel curtain walling systems	30	30	59
***Pyroguard T-EW30/13-1 VI	IGUs in multiple paned Steel curtain walling systems	60	30	60-61
*Pyroguard T-EI60/25-3 VI	IGUs in multiple paned Steel curtain walling systems	60	60	62-63
***Pyroguard T-EW90/13-1 VI	IGUs in multiple paned Steel curtain walling systems	90	30	64
*Pyroguard T-EI30/18-2 VI	IGUs in multiple paned Steel framed screens	30	30	65
*Pyroguard T-EI30/18-2 VI	IGUs in multiple paned Steel framed screens	60	30	66
*Pyroguard T-EI90/32-2 VI	IGUs in multiple paned Steel framed screens	90	90	67
*Pyroguard T-EI120/47-3 VI	IGUs in multiple paned Steel curtain walling systems	90	90	68
*Pyroguard T-EI120/47-3 VI	IGUs in multiple paned Steel framed screens	120	120	69
*Pyroguard T-EI120/47-3 VI	IGUs in multiple paned Steel curtain walling systems	120	120	70
Pyroguard T-EI30/24-2 SWS	Butt jointed panes in Timber framed screens	30	30	71
Pyroguard T-EI30/24-2 SWS	Butt jointed panes in Timber framed screens	60	30	72
Pyroguard T-EI30/32-2 VF SWS	Butt jointed panes in Timber framed screens	30	30	73-74
Pyroguard T-EI60/40-2 VF SWS and T-EI60/36-2 VF SWS	Butt jointed panes in Timber framed screens	60	60	75-76

Note* The fire resistant pane of the IGU construction can be used as a single glazed pane in any previously fire tested or CERTIFIRE approved system. **Note:** In this case the product code will change.

*****NB:** PyroguardT-EW30/13-1 VI, EW60/13-1 VI and EW90/13-1 VI listed in this certificate are only approved in IGUs with the fire rated glass facing the fire risk and are not approved as a single glass pane.

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Pyroguard T-EI Insulating Fire Resisting Glass (continued)

Glass Specification	Application	Fire Resistance Performance (mins)		Page No.
		Integrity	Insulation	
Pyroguard T-EI30/24-2 SWS	Butt jointed panes in Steel framed screens	30	30	77-78
Pyroguard T-EI30/36-3 SWS	Butt jointed panes in Steel framed screens	30	30	79-80
Pyroguard T-EI30/32-2 SWS	Butt jointed 90° corner panes in Steel framed screens	30	30	81-82
Pyroguard T-EI60/36-3 SWS	Butt jointed panes in Steel framed screens	60	60	83-84
Pyroguard T-EI60/32-2 SWS	Butt jointed 90° corner panes in Steel framed screens	60	60	85-86
Pyroguard T-EI90/36-3 SWS	Butt jointed panes in Steel framed screens	90	90	87-88
Pyroguard T-EI90/47-3 SWS	Butt jointed panes in Steel framed screens	90	90	89-90
Pyroguard T-EI30/18-2 (inc. *VI and VF variants)	Aluprof MB 78 EI Aluminium Screens	30	30	91-92
Pyroguard T-EI30/18-2 (inc. *VI variant)	Aluprof MB 78 EI Aluminium Doorsets	30	30	93
*Pyroguard T-EI30/18-2 VI	IGUs in Aluprof Aluminium MB-SR50N EI curtain walling system	30	30	94
Pyroguard T-EI30/18-2 VI	IGUs in Aluprof Aluminium MB-SR50N EI curtain walling system	60	30	95
***Pyroguard T-EW30/13-1 VI	Aluprof MB 78 EI Aluminium Screens	30	30	96
***Pyroguard T-EW30/13-1 VI	Aluprof MB 78 EI Aluminium Doorsets	30	30	97
Pyroguard T-EI60/25-3 (inc. *VI variant)	Aluprof MB 78 EI Aluminium Screens	30	30	98
Pyroguard T-EI60/25-3 (inc. *VI variant)	Aluprof MB 78 EI Aluminium Screens	60	30	99
*Pyroguard T-EI60/25-3 and 25-3 VI	Aluprof MB 78 EI Aluminium Screens	60	60	100-101
Pyroguard T-EI60/25-3	Aluprof MB 78 EI Aluminium Doorsets	60	60	102

Note* The fire resistant pane of the IGU construction can be used as a single glazed pane in any previously fire tested or CERTIFIRE approved system. **Note:** In this case the product code will change.

*****NB: PyroguardT-EW30/13-1 VI, EW60/13-1 VI and EW90/13-1 VI listed in this certificate are only approved in IGUs with the fire rated glass facing the fire risk and are not approved as a single glass pane.**

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Pyroguard T-EI Insulating Fire Resisting Glass (continued)

Glass Specification	Application	Fire Resistance Performance (mins)		Page No.
		Integrity	Insulation	
*Pyroguard T-EI60/25-3 VI	IGUs in Aluprof MB 78 EI Aluminium Doorsets	60	60	103
*Pyroguard T-EI60/25-3 VI	IGUs in Aluprof MB-SR50N EI Aluminium curtain walling system	60	60	104
***Pyroguard T-EW30/13-1 VI	IGUs in Reynaers CS 77 FP EI30 Aluminium windows	30	30	105
***Pyroguard T-EW30/13-1 VI	IGUs in Reynaers CS 77 FP EI30 Aluminium screens	30	30	106
*Pyroguard T-EI30/18-2 VI	IGUs in Reynaers CS 77 FP EI30 Aluminium doorsets	30	30	107
Pyroguard T-EI30/18-2 TVI	TGUs in Reynaers CS 77 FP EI30 Aluminium screens	30	30	108
Pyroguard T-EI30/18-2	Reynaers CS 77 FP EI30 Aluminium screens	30	30	109
Pyroguard T-EI30/18-2	Reynaers CS 77 FP EI30 Aluminium doorsets	30	30	110
*Pyroguard T-EI60/25-3 VI	IGUs in Reynaers CS 77 FP EI60 Aluminium screens	60	60	111
Pyroguard T-EI60/25-3	Reynaers CS 77 FP EI60 Aluminium screens	60	60	112
Pyroguard T-EI60/25-3	Reynaers CS 77 FP EI60 Aluminium doorsets	60	60	113
Pyroguard T-EI30/18-2 VI*	Reynaers CW 50-FP aluminium curtain walling system	30	30	114
Pyroguard T-EI30/18-2 VI*	Reynaers CW 50-FP aluminium curtain walling system	60	60	115

Note* The fire resistant pane of the IGU construction can be used as a single glazed pane in any previously fire tested or CERTIFIRE approved system. **Note:** In this case the product code will change.

*****NB: PyroguardT-EW30/13-1 VI, EW60/13-1 VI and EW90/13-1 VI listed in this certificate are only approved in IGUs with the fire rated glass facing the fire risk and are not approved as a single glass pane.**

Definition of Pyroguard terms:

VI – Double Glazed Unit “Vitrage Isolant”
TVI – Triple Glazed Unit “Triple Vitrage Isolant”
VF – Laminated “Vitrage Feuilleté”
RV – Double Sided “Recto Verso”
SWS – Structural Wall System

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Pyroguard T-EI Insulating Fire Resisting Glass

General Requirements

The building substructures to which the glazed screen and doorset assemblies are fixed will have been the subject of a previous fire test and found to be capable of providing the required level of fire performance to effectively support the assemblies without detrimental effect for the required periods of fire performance.

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

The edge cover to each pane is normally a minimum of 15mm minimum. See test reports for exact dimensions.

For timber doorset applications, in addition to any relevant requirements for timber framed screens the following conditions shall apply:

- The doorset, including door frame and associated building hardware, should have achieved at least 30 or 60 minutes (whichever is applicable) integrity when tested, or subsequently assessed by one of the laboratories approved by CERTIFIRE as acceptable for this purpose, to BS 476: Part 22: 1987.
- If the proposed doorset is to be used in double-leaf configuration, the test or assessment evidence should be applicable to double-leaf configurations.
- Likewise, if the proposed doorset is to be used in the unlatched configuration, the available evidence should be applicable to unlatched doorsets.
- The proposed doorset should also have included a glazed aperture or apertures of the intended size, shape, area and number.
- 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.
- The door leaves shall consist of timber faces coupled with timber or other cellulosic cores of minimum overall leaf thickness, 44 mm for 30 minutes performance and 54 mm for 60 minutes performance.
- When an alternative CERTIFIRE approved glazing system is used, the system shall have been shown to be capable of including Pyroguard T/E glass. The maximum permitted aperture dimensions shall be as detailed below or included within the relevant CERTIFIRE certificate for the glazing system, whichever is the lesser.
- Other CERTIFIRE approved glazing seals may be acceptable subject to the limitations within the relevant certificate. This Certificate of Approval relates to the sizes of Pyroguard T/EI glass shown when used in conjunction with the systems in the appropriate timber doorset sections below. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Options

Glass can be etched or sandblasted on one glass face.

A silicone capping may be added to all glazing systems. Refer to manufacturer's datasheet for details.



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Pyroguard T-EI Insulating Fire Resisting Glass

Options (cont.)

Self - adhesive films/foils may be applied to either glass surface.

Timber or metallic glazing beads or other trims may be adhered to the glass on either or both faces of the glass. The bars must not be fixed to the perimeter beads.

Insulating Glass Units (IGUs) may incorporate aluminium blinds or Georgian bars within the cavity between the inner and outer glass layers. Where IGUs have been tested with internal blinds fitted they may be omitted.

Exchange of flat timber profile beads to chamfered bead profile of the same height is allowed and minimum edge cover is maintained.

Where approval states "previously tested or Certifire approved" steel system this includes curtain walling.

Notes:

IGUs (VI – Vitrage Isolant) are approved with a counterpane of float, toughened or laminated glass on the exposed or the non-exposed face unless specified otherwise.

The non-fire glass within IGUs may be of any thickness subject maintaining of bead size and frame suitability.

Where a fire resistant IGU is required it can be manufactured from any single size glass listed in this certificate for a given fire performance. The IGU should be glazed into any previously fire tested or CERTIFIRE approved system.

Within this certification IGU spacer widths may be changed provided that for timber systems the minimum bead size is maintained and in the case of metallic systems the IGU can be accommodated within the system glazing rebate. For larger spacer widths please contact the owner of this Certification.

The fire resistant pane of the IGU construction can be used as a single glazed pane in any previously fire tested or CERTIFIRE approved system.

NB: Pyroguard T-EW30/13-1 VI, T-EW60/13-1 VI and T-EW90/13-1 VI listed in this certificate are only approved in IGUs with the fire glass towards fire risk and are not approved as a single glazed pane.

Those glasses listed in this document as single glasses or Double Glazed Units (IGUs) may be converted to Triple Glazed Units (TGUs) provided the it can be accommodated in the systems glazing rebate. The Pyroguard VI notation is then changed to TVI.



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Pyroguard T-EI Insulating Fire Resisting Glass

Notes (cont.)

VF (Vitrage Feuilleté – laminated version of base product) versions of all T-EI products are approved. These glasses are prepared by substitution of one of the two external panes of the fire glass with a laminate pane. This pane can be composed of additional non-fire-resistant glass panes added to the tested glass using one or several non-fire protection interlayers such as cold pour, EVA or PVB. The maximum thickness of the non-fire-resistant interlayer added and that of each non-fire resistance glass are only limited within the proven capability of the glazing system, e.g. the glazing rebate size, the available bead size limit and the capacity of the system to support the weight of the units. Type of approved glass: float glass, toughened glass, laminated glazing, one-way mirror, decorative glazing, self-cleaning glass, reflective glazing, low emissivity glazing, solar control glazing. In addition, the VF can be situated on both the fire and the non-fire risk sides.

Approved glasses may be made thicker by the substitution of panes of the composition for thicker panes while retaining the thickness of the interlayers and within the constraints of the rebate of the approved or previously tested framing system, e.g. T-EI30/18-2 to T-EI30/24-2

For doors described in this Certificate then the glazed element can also be used in any previously fire tested or CERTIFIRE approved glazed insulated steel or timber framed door.

For butt jointed systems: The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.

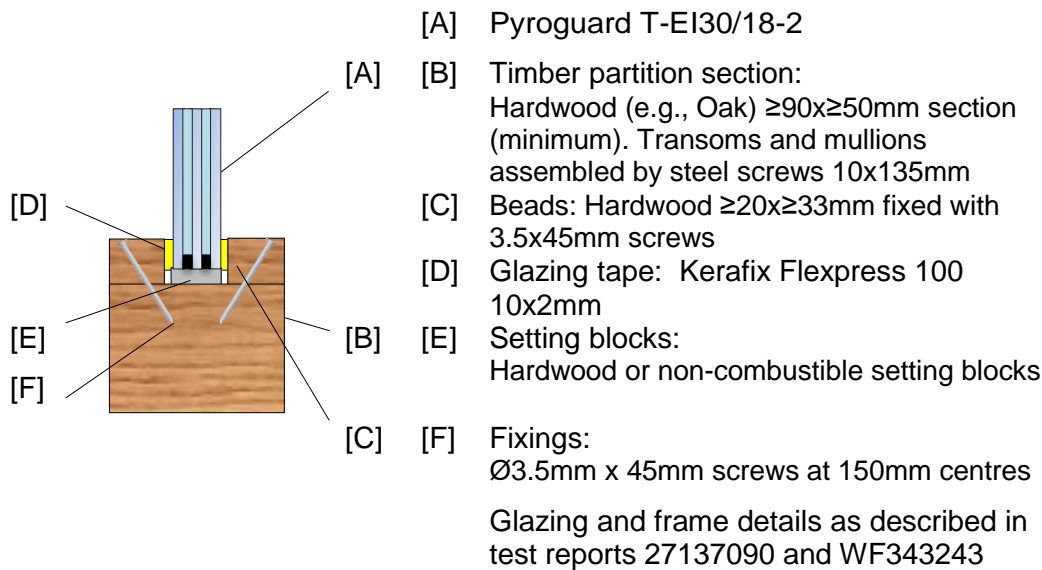
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in Hardwood framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

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

- Framework from Hardwood (e.g. Oak) 90mm by 50mm section (minimum). Transoms and mullions assembled by steel screws 10 x 135mm.
- Hardwood beads 20mm by 33mm wide (minimum) fixed with 3.5 x 45mm screws.



This Certificate of Approval relates to the sizes 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

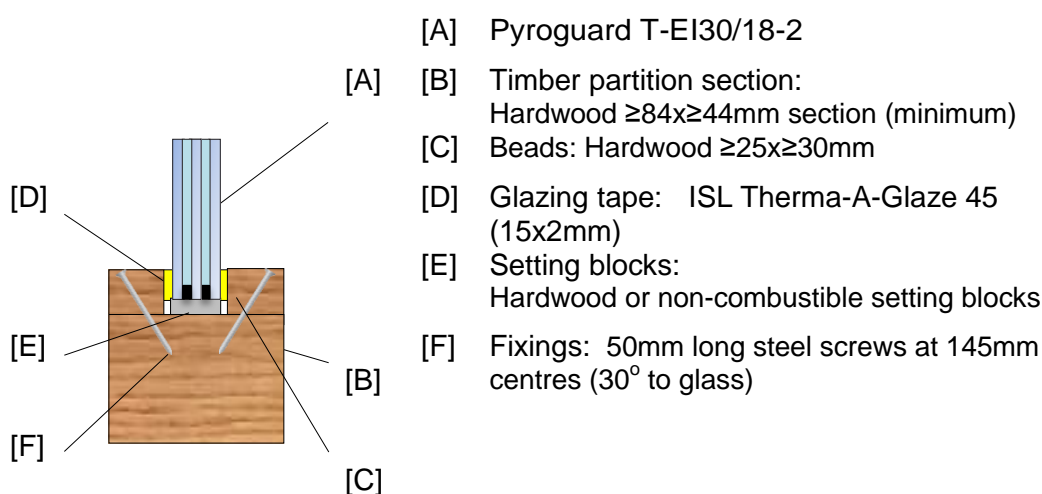
Maximum Width	Maximum Height	Maximum Area
1869mm wide (at 2495mm high)	3119mm high (at 1495mm wide)	4.66m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in timber 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:



Glazing and frame details as described in test reports 27137090 and WF343243

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 glass shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

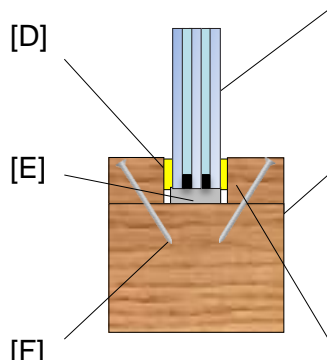
Maximum Width	Maximum Height	Maximum Area
2049mm wide (at 988mm high)	2188mm high (at 858mm wide)	2.16m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in timber 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:

- 
- [A] Pyroguard T-EI30/18-2
 - [A] [B] Timber partition section:
Softwood $\geq 75 \times \geq 40$ mm section
 - [C] [C] Beads: $\geq 20 \times \geq 28$ mm (w x h) square or chamfered (up to 30°) softwood glazing beads, density $\geq 450 \text{kg/m}^3$ or $\geq 17 \times \geq 28$ mm for Lorient System 36/15
 - [D] [D] Glazing tape: 20x3mm calcium magnesium fibre-based glazing tape or Lorient System 36/15
 - [E] [E] Setting blocks:
Hardwood or non-combustible setting blocks
 - [F] [F] Fixings: 60mm long x 4.5mm steel screws at 200mm centres (30° to glass)

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 glass shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

	Maximum Width	Maximum Height	Maximum Area
Calcium magnesium fibre based glazing tape	1837mm wide (at 1395mm high)	1632mm high (at 1570mm wide)	2.56m ²
	1378mm wide (at 2840mm high)	3100mm high (at 1250mm wide)	3.90m ²
Lorient System 36/15	1378mm wide (at 943mm) high	2000mm high (at 650mm wide)	1.30m ²

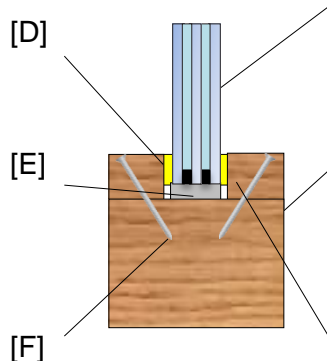


CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in timber 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:

- 
- [A] Pyroguard T-EI30/18-2
 - [A] [B] Timber partition section:
Softwood $\geq 92 \times \geq 45$ mm section
 - [C] Beads: $\geq 20 \times \geq 23$ mm square or chamfered square or chamfered (up to 10°) hardwood glazing beads, minimum density 640kg/m^3 or $\geq 17 \times \geq 23$ mm for Lorient System 36/15
 - [D] Glazing tape: 20mm by 6mm Kerafix 2000 tape, ceramic fibre-based glazing tape or Lorient System 36/15
 - [E] Setting blocks:
Hardwood or non-combustible setting blocks
 - [C] [F] Fixings: 50mm x M4 steel screws at 200mm centres (30° to glass)

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 glass shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

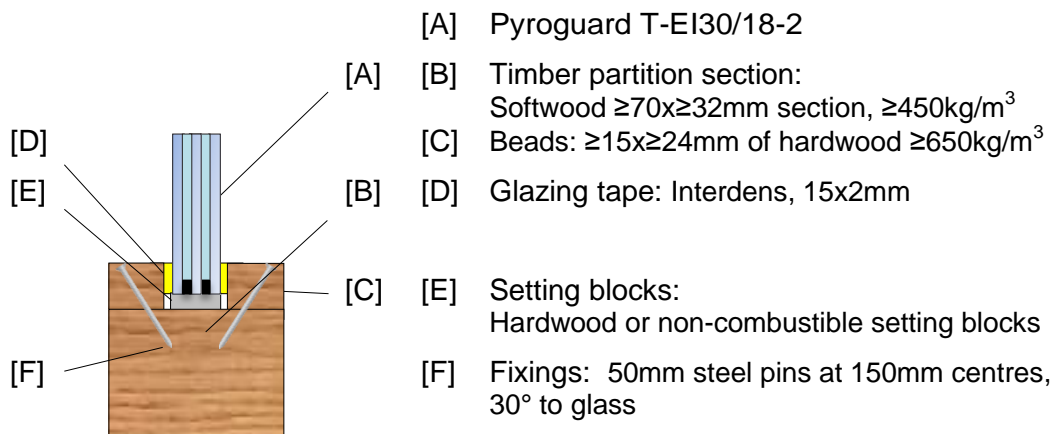
	Maximum Width	Maximum Height	Maximum Area
Kerafix 2000 tape	2400mm wide (at 400mm high)	2600mm high (at 500mm wide)	1.30m ²
Lorient System 36/15	1378mm wide (at 943mm) high	2000mm high (at 650mm wide)	1.30m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 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 within a previously fire tested or CERTIFIRE approved framing system utilising the following basic specification:



- [A] Pyroguard T-EI30/18-2
- [A] [B] Timber partition section:
Softwood $\geq 70 \times \geq 32$ mm section, $\geq 450 \text{kg/m}^3$
- [C] [C] Beads: $\geq 15 \times \geq 24$ mm of hardwood $\geq 650 \text{kg/m}^3$
- [B] [D] Glazing tape: Interdens, 15x2mm
- [C] [E] Setting blocks:
Hardwood or non-combustible setting blocks
- [F] [F] Fixings: 50mm steel pins at 150mm centres,
30° to glass

Glazing and frame details as described in
WF343243

This Certificate of Approval relates to the sizes 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

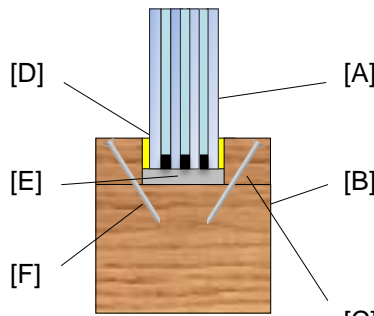
Maximum Width	Maximum Height	Maximum Area
1943mm wide (at 2590mm high)	3237mm high (at 1555mm wide)	5.03m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass in timber framed screens for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:

- 
- [A] Pyroguard T-EI60/25-3
 - [B] Hardwood partition section: $\geq 92 \times \geq 45 \text{mm}$
section hardwood framing sections, minimum
density $\geq 640 \text{kg/m}^3$
 - [C] Hardwood bead: $\geq 20 \times \geq 30 \text{mm}$ (h x w) square or
chamfered (up to 10°) hardwood glazing beads, density
 $\geq 640 \text{kg/m}^3$
 - [D] Glazing tape: 15mm by 3mm
ceramic fibre-based glazing tape
(eg. Kerafix 2000 tape), or Lorient
System 36/23
 - [E] Non-combustible setting blocks
 - [F] Fixings: Fixings at 150mm centres (8x63mm,
angled at approx. 45°). Fixing to be 50mm from
corners in all cases

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

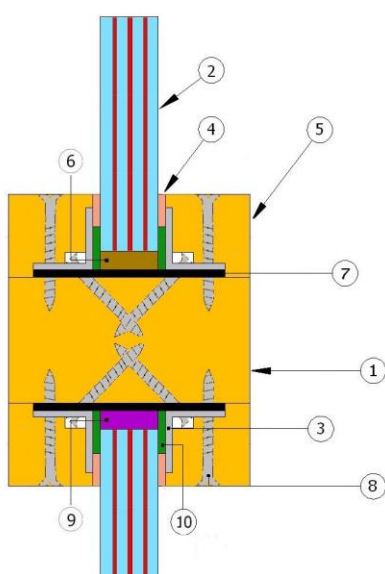
	Maximum Width	Maximum Height	Maximum Area
Ceramic tape	1871mm wide (at 1871mm high)	2500mm high (at 1400mm wide)	3.50m ²
	1378mm wide (at 943mm high)	2000mm high (at 650mm wide)	3.00m ²
Lorient System 36/23	1342mm wide (at 1342mm high)	2000mm high (at 900mm wide)	1.80m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass in timber framed screens for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed utilising the following basic specification:



- 1 100mm by 50mm section (minimum) hardwood framing sections, minimum density 580kg/m³
- 2 Pyroguard T-EI60/25-3
- 3 Mild steel glazing angle 20 x 20 x 2mm
- 4 10mm by 3mm ceramic fibre based glazing tape (eg. 'K' tape)
- 5 26mm high by 26mm wide (minimum) square or chamfered (up to 10°) hardwood glazing beads, minimum density 580kg/m³
- 6 Non-combustible setting blocks
- 7 Sealmaster GL60 Liner 90 x 2mm
- 8 50mm long steel screws at 200mm centres (45° and parallel to glass)
- 9 Sealmaster intumescent glazing compound
- 10 Unifrax CXL715 adhesive

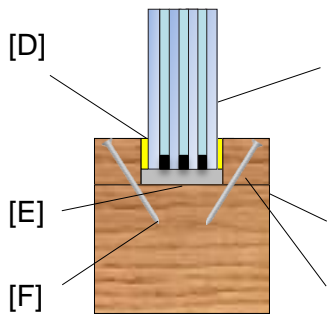
This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Maximum Width	Maximum Height	Maximum Area
1750mm wide (at 2500mm high)	3125mm high (at 1400mm wide)	4.37m ²
2000mm wide (at 1500mm high)	1500mm high (at 2000mm wide)	3.00m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass in hardwood framed screens for periods of 60 minutes integrity and 60 minutes insulation

For this application the following conditions shall apply:

- 
- [A] Pyroguard T-EI60/25-3
 - [B] Hardwood partition section: $\geq 92 \times \geq 45 \text{mm}$, $\geq 640 \text{kg/m}^3$
 - [C] Hardwood bead: Square or chamfered $\geq 20 \times \geq 30 \text{mm}$ (h x w), density $\geq 640 \text{kg/m}^3$
 - [D] Glazing tape: Sealmaster Fireglaze Tape 25x2.5mm
 - [E] With or without non-combustible setting blocks
 - [F] Fixings: Fixings at 150mm centres (8x63mm, angled at approx. 45°). Fixing to be 50mm from corners in all cases

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

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass, shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Maximum Width	Maximum Height	Maximum Area
1000mm wide (at 2000mm high)	2000mm high (at 1000mm wide)	2.00m ²



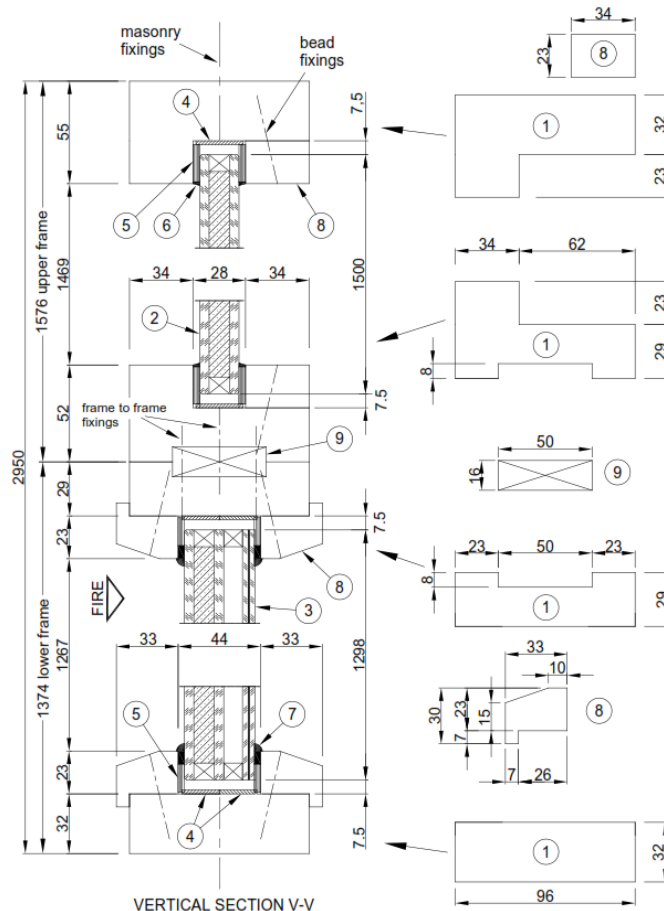
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass (inc. VI variants) in hardwood frame 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 timber framing system utilising the following basic specification:

- Frame: from softwood with minimum density 530kg/m^3 (see below and test report for dimensions)
- Beads: from softwood with minimum density 530kg/m^3 , (see below and test report for dimensions)
- Glass edge intumescent seal: Kerafix ceramic tape: 20x4mm thick capped with Firestop 700 for single glazed option. 15x3mm capped with Flexilodice BS for VI option.
- Aperture liner: Odice Flexilodice. 20x3mm thick for single glazed option. 40x2mm for VI option.
- Glazing and frame details as described in **WF379049**





CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass (inc. VI variants) in hardwood frame for periods of 60 minutes integrity and 60 minutes insulation (Continued)

The timber 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 Pyroguard T-EI60/25-3 or Pyroguard T-EI60/25-3 VI shown in the diagrams below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

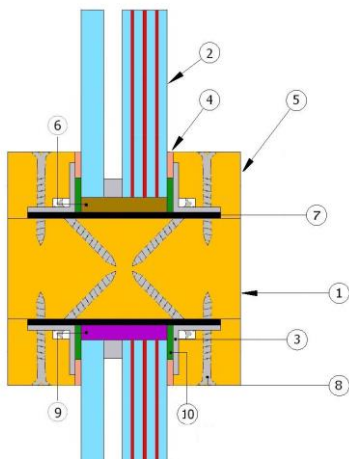
Maximum Permitted Glass Dimensions

Maximum Width	Maximum Height	Maximum Area
3146mm wide (at 1500mm high)	1815mm high (at 2600mm wide)	4.72m ²
3250mm wide (at 1298mm high)	1622mm high (at 2600mm wide)	4.21m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 VI IGUs in timber framed screens for periods of 60 minutes integrity and insulation

For this application the glass shall be glazed utilising the following basic specification:



- ① 100mm by 50mm section (minimum) hardwood framing sections, minimum density 580kg/m³
- ② Pyroguard T-EI60/25-3 VI, comprising Pyroguard T-EI60/25-3, with a 13mm steel spacer and 8.8mm clear laminated/annealed or float glass
- ③ Mild steel glazing angle 20 x 20 x 2mm
- ④ 8mm by 3mm ceramic fibre based glazing tape (eg. 'K' tape) with Unifrax CXL715 adhesive around the perimeter of the glass on both faces
- ⑤ 26mm high by 26mm wide (minimum) square or chamfered (up to 10°), hardwood glazing beads, minimum density 580kg/m³
- ⑥ Non-combustible setting blocks
- ⑦ Sealmaster GL60 Liner 44wide by 1.8mm thick
- ⑧ 50mm long by 4.2mm diameter steel screws at 500mm centres (45° and parallel to glass)
- ⑨ Sealmaster Fireglaze intumescent glazing compound
- ⑩ 8mm by 3mm ceramic fibre based glazing tape (eg. 'K' tape) with Unifrax CXL715 adhesive around the perimeter of the glass on both faces

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 VI IGUs shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

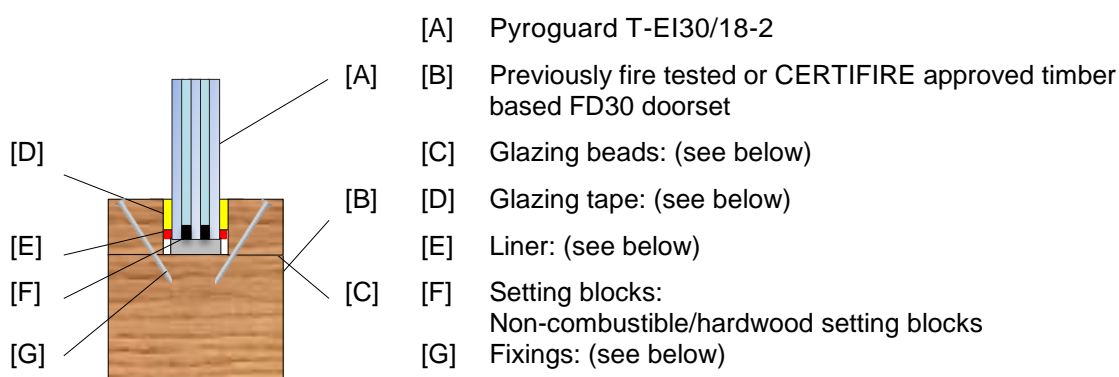
Maximum Width	Maximum Height	Maximum Area
1652mm wide (at 2500mm high)	2950mm high (at 1400mm wide)	4.13m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T EI30/18-2 glass in timber based doorsets for periods of 30 minutes integrity and 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:



- [A] Pyroguard T-EI30/18-2
- [B] Previously fire tested or CERTIFIRE approved timber based FD30 doorset
- [C] Glazing beads: (see below)
- [D] Glazing tape: (see below)
- [E] Liner: (see below)
- [F] Setting blocks:
Non-combustible/hardwood setting blocks
- [G] Fixings: (see below)

Glazing and doorset details as described below

The doorset shall be CERTIFIRE approved or have test evidence for the inclusion of apertures of the proposed dimensions. See "General Requirements" for timber doorsets, above.

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 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 10mm x 2mm ⁽⁹⁾	2125	800	0.64
Sealmaster G30 glazing gasket between beads and glass ⁽⁹⁾	2125	610	0.64
Lorient LP1502, 2mm thick x 15mm interdens sheet ⁽¹⁰⁾	2794	1051	2.35
Sealmaster Intumescent Foam Glazing Tape, 20x5mm uncompressed ⁽¹¹⁾	1800	600	1.08



CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T EI30/18-2 glass in timber based doorsets for periods of 30 minutes integrity and insulation (continued)

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



CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T EI30/18-2 glass in timber based doorsets for periods of 30 minutes integrity and insulation (continued)

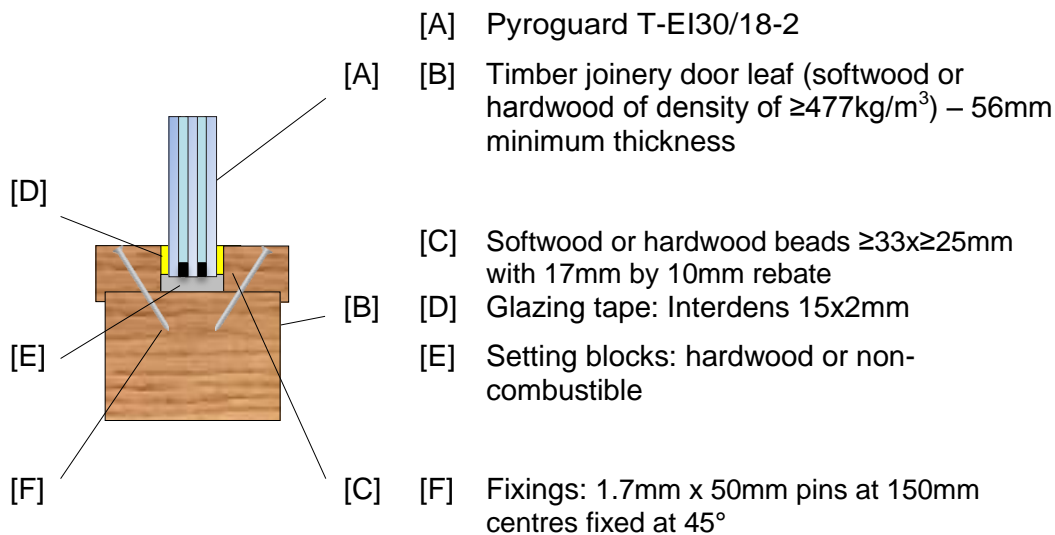
- 8) The glazing beads shall be of minimum density 630kg/m³, sections, 20mm wide minimum by 14.5mm high with a 5mm by 5mm bolection return, chamfered by approximately 20° and fixed using, 45mm long steel screws at a maximum of 150mm centres and angled at 30-45°.
- 9) The glazing beads shall be hardwood of minimum density 500kg/m³, sections, 25mm wide minimum by 23mm high with a 5mm by 5mm bolection return, chamfered by approximately 15° and fixed using, 38mm long steel pins or screws at a maximum of 150mm vertical and 100mm horizontal centres and angled at 15°. A secondary 6mm thick hardwood liner (min. density 500kg/m³) shall be used to line apertures cut within all substrates.
- 10) The glazing beads shall be of minimum density 477kg/m³, sections, 25mm wide minimum by 33mm high with a 5mm by 5mm bolection return, square and fixed using, 50mm long by 1.7mm diameter nails at a maximum of 150mm centres and angled at 45°.
- 11) Sealmaster Foam Glazing Tape at 20x5mm dimension. Hardwood glazing beads, min. density 620kg/m³, 20° chamfer, 20mm high with a 5x5mm minimum bolection fixed using Ø2mm x 50mm long steel pins or No. 8 x 50mm long screws at 150mm maximum centres and 50mm from corners fixed at 45° to glass.

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in timber joinery doorsets for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

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



Glazing and doorset details as described in WF Test Report No. 356228

This Certificate of Approval relates to the sizes 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system. See “General Requirements” for timber doorsets, above.

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

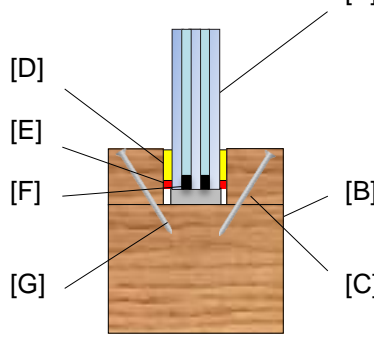
Maximum Width	Maximum Height	Maximum Area
1051mm wide (at 2235mm high)	2793mm high (at 841mm wide)	2.34m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in timber joinery doorsets for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

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

- 
- [A] Pyroguard T-EI30/18-2
 - [B] Timber joinery door leaf (softwood or hardwood of density of $\geq 450\text{kg/m}^3$) – $\geq 58\text{mm}$ thickness
 - [C] Softwood or hardwood beads $\geq 20 \times \geq 18\text{mm}$ with a minimum density of 450kg/m^3
 - [D] Glazing tape: Flexible glazing gasket Odice Flexilodice BS fitted between bead and glass
 - [E] Glazing aperture liner: 20x2mm Odice Flexilodice SA
 - [F] Setting blocks:
Heel-toe set with hardwood or non-combustible setting blocks
 - [G] Fixings:
 $\varnothing 1\text{mm} \times 50\text{mm}$ pins at 100mm centres fixed at 45°

Glazing and doorset details as described in Efectis Test Report EFR-16-V-002718

30mm by 15mm glazing bars may be applied to the either surface of the glass and pinned to the surrounding frame with $\varnothing 0.8\text{mm}$ by 30mm nails.

This Certificate of Approval relates to the sizes 18mm thick Pyroguard T-EI30/18-2 shown in the table below, when used in conjunction with the above system. See "General Requirements" for timber doorsets, above.

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

Maximum Width	Maximum Height	Maximum Area
1213mm wide (at 2088mm high)	2610mm high (at 970mm wide)	2.53m ²

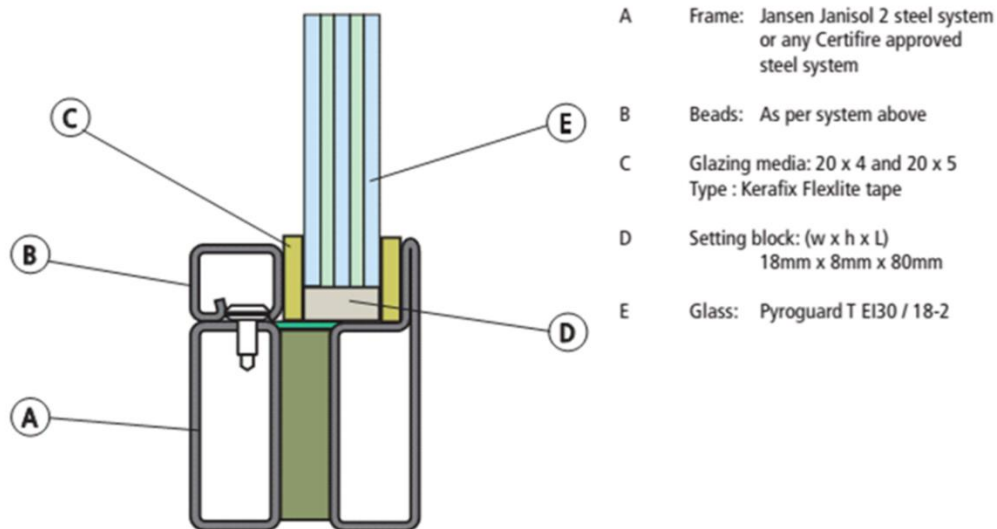
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No 11-000423**



- A Frame: Jansen Janisol 2 steel system or any Certifire approved steel system
- B Beads: As per system above
- C Glazing media: 20 x 4 and 20 x 5
Type : Kerafix Flexlite tape
- D Setting block: (w x h x l)
18mm x 8mm x 80mm
- E Glass: Pyroguard T EI30 / 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
3243mm wide (at 1284mm high)	1605mm high (at 2594mm wide)	4.16m ²
1580mm wide (at 1494mm high)	1868mm high (at 1264mm wide)	2.36m ²

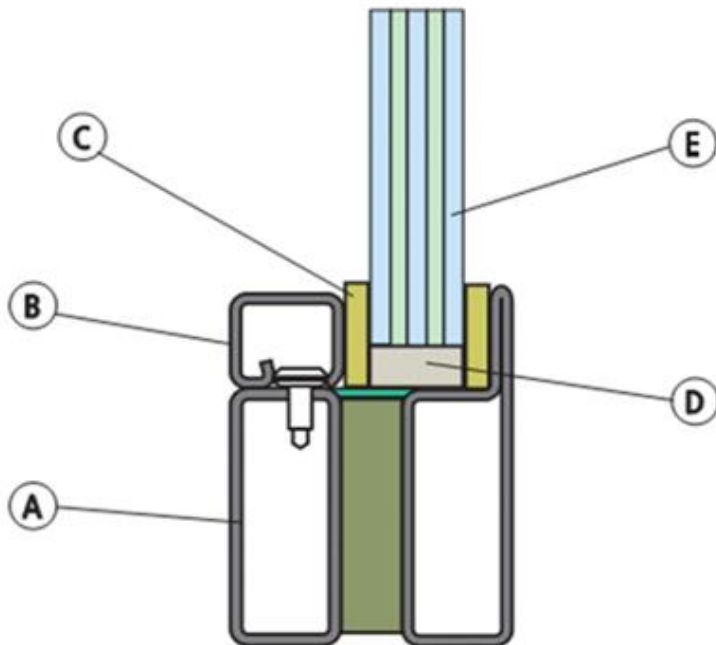
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Warringtonfire test WF426766**



- A. Frame: Jansen Janisol 2 steel system or any Certifire approved steel system
- B. Beads: As per system above
- C. Glazing media: 15mm x 6mm and 20mm x 6mm Kerafix 2000
- D. Setting blocks: (w x h x l) 18mm x 5mm x 52mm
- E. Glass: Pyroguard T-EI30/18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2500mm wide (at 2900mm high)	3625mm high (at 2000mm wide)	7.25m ²

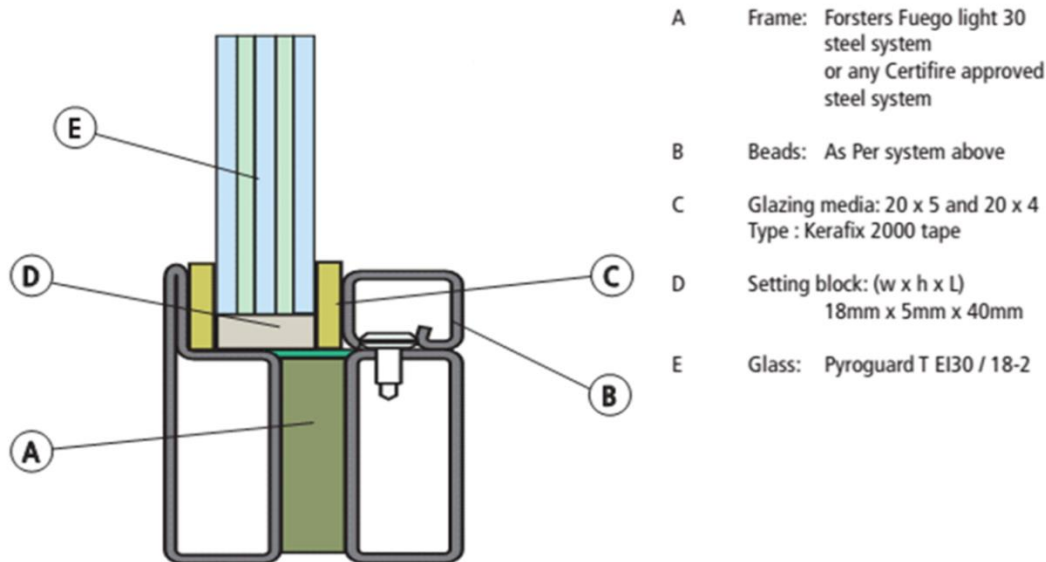
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report No 271-44217 and EFR-13-V-131496**



- A Frame: Forsters Fuego light 30 steel system or any Certifire approved steel system
- B Beads: As Per system above
- C Glazing media: 20 x 5 and 20 x 4 Type : Kerafix 2000 tape
- D Setting block: (w x h x L) 18mm x 5mm x 40mm
- E Glass: Pyroguard T EI30 / 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
3243mm wide (at 1284mm high)	1605mm high (at 2594mm wide)	4.16m ²
1586mm wide (at 1494mm high)	1868mm high (at 1269mm wide)	2.37m ²

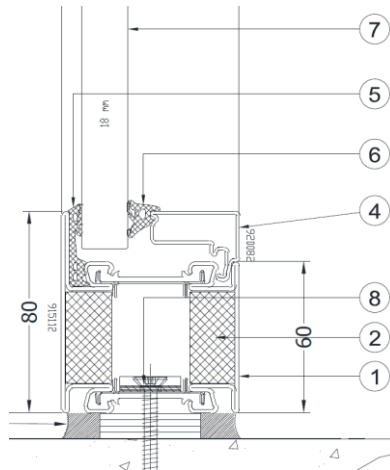
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Warringtonfire test report 405085**



1. RP Technik Hermetic 70FP EI30 RPF 915112
2. RP Technik RA 954023 insulation
4. RP Technik Hermetic 70FP EI30 RPF 920082
5. RP Technik RA 930096 5mm EPDM gasket
6. RP Technik RA 930106 4mm EPDM gasket
7. Pyroguard T-EI30/ 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 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.

	Maximum Width	Maximum Height	Maximum Area
Portrait	1605mm wide (at 2284mm high)	2855mm high (at 1284mm wide)	3.66m ²
Landscape	1855mm wide (at 1122mm high)	1402mm high (at 1484mm wide)	2.08m ²

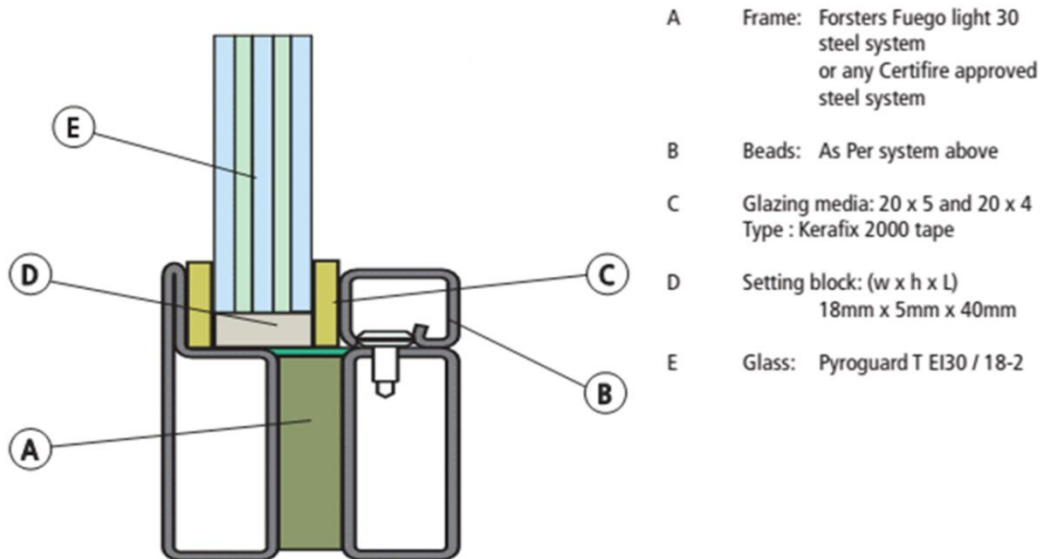
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report No 271-44217**



- A Frame: Forsters Fuego light 30 steel system or any Certifire approved steel system
- B Beads: As Per system above
- C Glazing media: 20 x 5 and 20 x 4 Type : Kerafix 2000 tape
- D Setting block: (w x h x L) 18mm x 5mm x 40mm
- E Glass: Pyroguard T EI30 / 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2680mm wide (at 1284mm high)	1326mm high (at 2594mm wide)	3.44m ²
1311mm wide (at 1494mm high)	1543mm high (at 1269mm wide)	1.96m ²

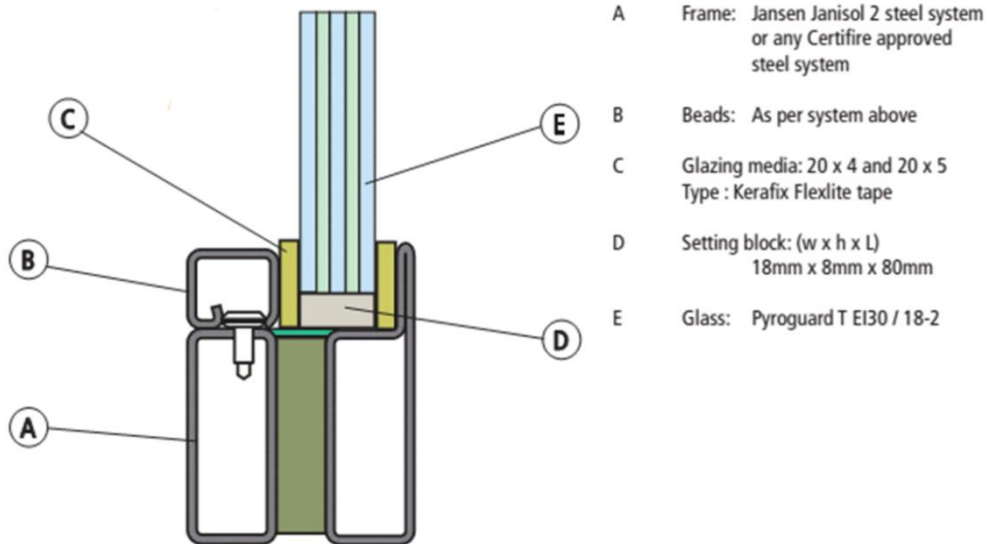
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No 11-000423**



- A Frame: Jansen Janisol 2 steel system or any Certifire approved steel system
- B Beads: As per system above
- C Glazing media: 20 x 4 and 20 x 5 Type : Kerafix Flexlite tape
- D Setting block: (w x h x L) 18mm x 8mm x 80mm
- E Glass: Pyroguard T EI30 / 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2983mm wide (at 1284mm high)	1477mm high (at 2594mm wide)	3.83m ²
1454mm wide (at 1494mm high)	1718mm high (at 1264mm wide)	2.17m ²

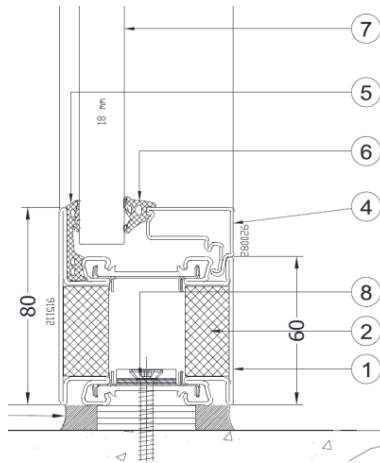
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed screens for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Warringtonfire test report 405085**



3. RP Technik Hermetic 70FP EI30 RPF 915112
4. RP Technik RA 954023 insulation
4. RP Technik Hermetic 70FP EI30 RPF 920082
5. RP Technik RA 930096 5mm EPDM gasket
6. RP Technik RA 930106 4mm EPDM gasket
7. Pyroguard T-EI30/ 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 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.

	Maximum Width	Maximum Height	Maximum Area
Portrait	1305mm wide (at 2284mm high)	2322mm high (at 1284mm wide)	2.98m ²
Landscape	1509mm wide (at 1122mm high)	1140mm high (at 1484mm wide)	1.69m ²

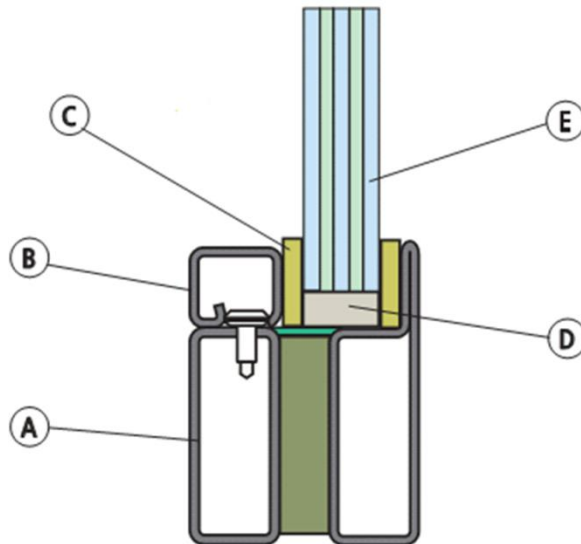
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed doorsets for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-17-V-003939**



- A. Jansen Janisol 2 frame
- B. Jansen 451.008 30mm by 20mm steel bead
- C. 17mm by 5mm Jansen glazing tape
- D. Diagonally set on 18mm by 6mm by 80mm Promatect H setting blocks
- E. Pyroguard T-EI30/ 18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 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.

Maximum Width	Maximum Height	Maximum Area
1149mm wide (at 2485mm high)	2899mm high (at 985mm wide)	2.85m ²

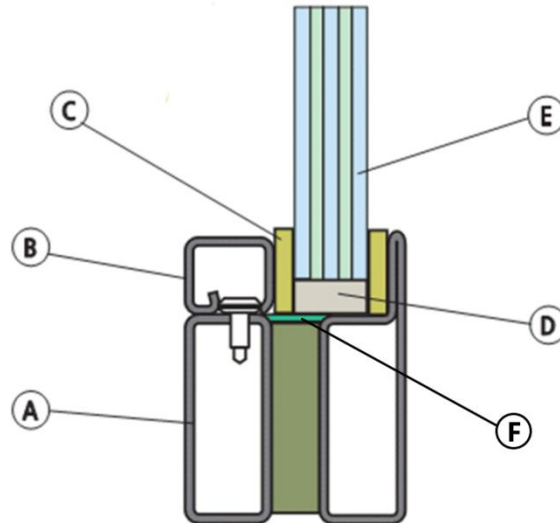
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed doorsets for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-19-V-001826**



- A. Forster Fuego Light 30 frame
- B. Forster 901247 35mm by 20mm steel bead
- C. Forster EPDM gaskets
- D. Diagonally set on 18mm by 5mm by 80mm Promatect H setting blocks
- E. Pyroguard T-EI30/ 18-2
- F. Forster intumescent lining tape 24mm by 1.5mm

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 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.

Maximum Width	Maximum Height	Maximum Area
1642mm wide (at 2854mm high)	3567mm high (at 1314mm wide)	4.68m ²

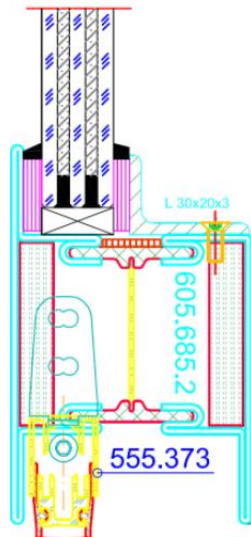
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 glass in steel framed doorsets for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-18-V-000966**



- Jansen Janisol 2 frame
- 30x20mm angle steel bead fixed with M4 by 15mm screws at 185mm centres
- 17x5mm Jansen glazing tape
- Diagonally set on 18x6x80mm Promatect H setting blocks
- Pyroguard T-EI30/18-2

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 18mm thick Pyroguard T-EI30/18-2 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.

Maximum Width	Maximum Height	Maximum Area
1516mm wide (at 2211mm high)	2764mm high (at 1213mm wide)	3.35m ²

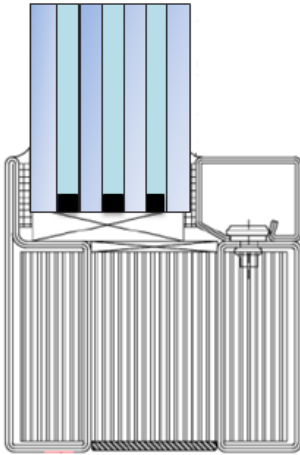
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/38-3 glass in stainless steel framed doorsets for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved stainless steel or mild steel framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **21/25068-941**



- Frame: Forster Fuego Light 90 stainless steel system
- Beads: As per system above
- Glazing media: 15x3mm and 15x5mm Kerafix 2000
- Intumescent liner: Palstop P 29.5mm x 2.2mm
- Glass: Pyroguard T-EI90/38-3

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 38mm thick Pyroguard T-EI90/38-3 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.

Maximum Width	Maximum Height	Maximum Area
906mm wide (at 2460mm high)	3075mm high (at 725mm wide)	2.23m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

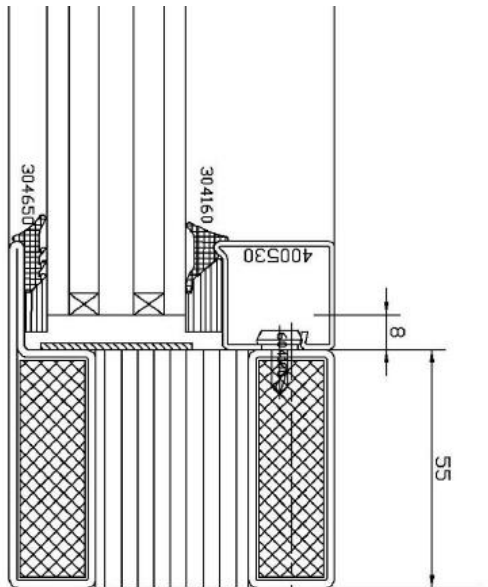
Pyroguard T-EI90/32-2 glass in steel framed screen for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No 271-35263**.

RP Technik 'RP-ISO-hermetic' steel system using 15x5mm Kerafix 2000 ceramic tape and with glass on non-flammable setting blocks



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 32mm thick Pyroguard T-EI90/32-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1875mm wide (at 2834mm high)	3542mm high (at 1500mm wide)	5.31m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

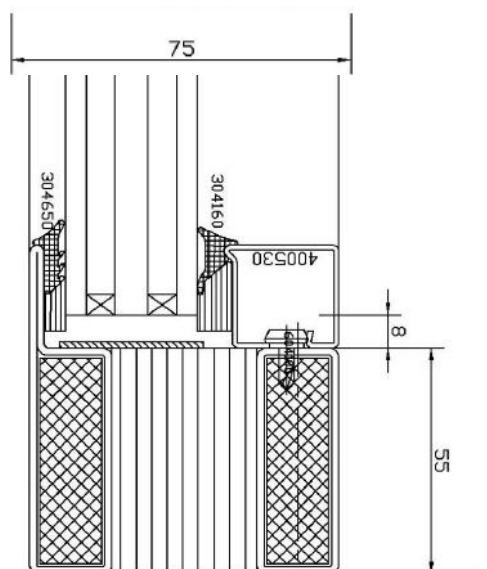
Pyroguard T-EI90/32-2 glass in steel framed screen for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **IFT test report No 271-35924**

RP Technik 'RP-ISO-hermetic' steel system using 10x5mm Kerafix 2000 ceramic tape and EPDM gasket and with glass on non-flammable setting blocks



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 32mm thick Pyroguard T-EI90/32-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2824mm wide (at 1500mm high)	1500mm high (at 2824mm wide)	4.24m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

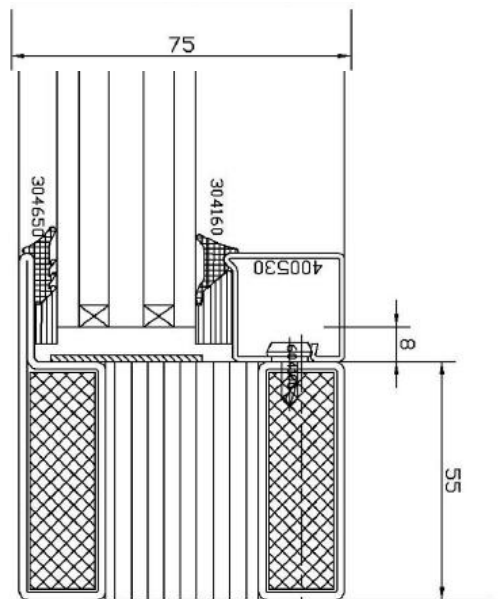
Pyroguard T-EI90/32-2 glass in steel framed screen for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No 271-35263**.

RP Technik 'RP-ISO-hermetic' steel system using 15x5mm Kerafix 2000 ceramic tape and with glass on non-flammable setting blocks



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of 32mm thick Pyroguard T-EI90/32-2 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1800mm wide (at 2834mm high)	3401mm high (at 1500mm wide)	5.10m ²

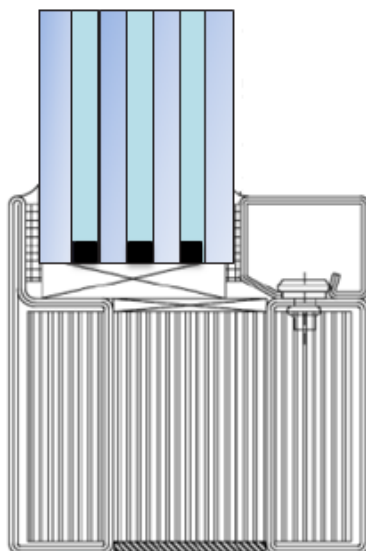
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/35-3 glass in steel framed doorsets for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-19-V-001828**



- Frame: Forster Fuego Light 90 frame
- Beads: Forster 901227 20x20mm steel bead
- Glazing media: Kerafix Flexlit tape 20x5mm
- Intumescent liner: Forster intumescent lining tape 29mm by 1.5mm
- Diagonally set on 35x5x80mm Promatect H setting blocks
- Glass: Pyroguard T-EI90/35-3

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 35mm thick Pyroguard T-EI90/35-3 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.

Maximum Width	Maximum Height	Maximum Area
1360mm wide	2355mm high	3.20m ²

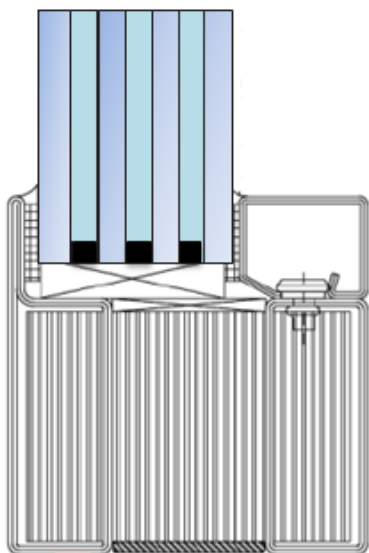
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/38-3 glass in stainless steel framed doorsets for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved stainless steel or mild steel framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **21/25068-941**



- Frame: Forster Fuego Light 90 stainless steel system
- Beads: As per system above
- Glazing media: 15x3mm and 15x5mm Kerafix 2000
- Intumescent liner: Palstop P 29.5mm x 2.2mm
- Glass: Pyroguard T-EI90/38-3

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 38mm thick Pyroguard T-EI90/38-3 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.

Maximum Width	Maximum Height	Maximum Area
725mm wide (at 2460mm high)	2460mm high (at 725mm wide)	1.78m ²

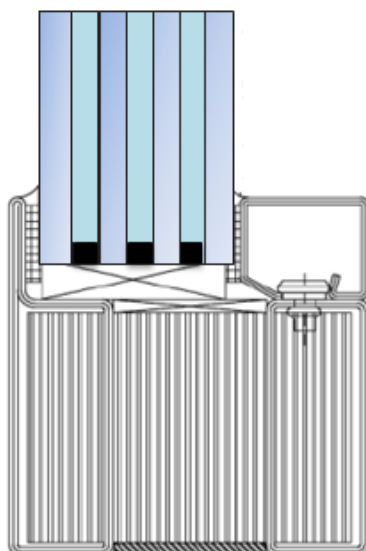
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/40-3 glass in steel framed doorsets for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

T The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **EFR-20-V-01112**



- Frame: Forster Fuego Light 70
- Bead: Forster 901227 20mm by 20mm steel
- Glazing media: Kerafix Flexlit tape 20x5mm and 20x2mm
- Liner: Forster intumescent lining tape 29.5x1.5mm
- Glass: Pyroguard T-EI90/40-3
- Diagonally set on 40x5mm by 80mm Promatect H setting blocks

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 40mm thick Pyroguard T-EI90/40-3 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.

Maximum Width	Maximum Height	Maximum Area
1526mm wide (at 2355mm high)	2642mm high (at 1360mm wide)	3.59m ²

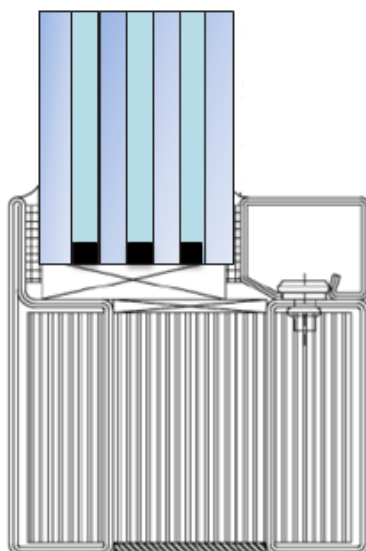
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/40-3 glass in steel multi-pane framed screens for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **EFR-20-V-01112**



- Frame: Forster Fuego Light 70
- Bead: Forster 901227 20mm by 20mm steel
- Glazing Media: Kerafix Flexlit tape 20mm by 5mm and 20mm by 2mm
- Liner: Forster intumescent lining tape 29.5mm by 1.5mm
- Glass: Pyroguard T-EI90/40-3 on 40mm by 5mm by 80mm Promatect H blocks

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 40mm thick Pyroguard T-EI90/40-3 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.

Maximum Width	Maximum Height	Maximum Area
1470mm wide (at 2445mm high)	2743mm high (at 1310mm wide)	3.59m ²
3198mm wide (at 755mm high)	847mm high (at 2850mm wide)	2.41m ²

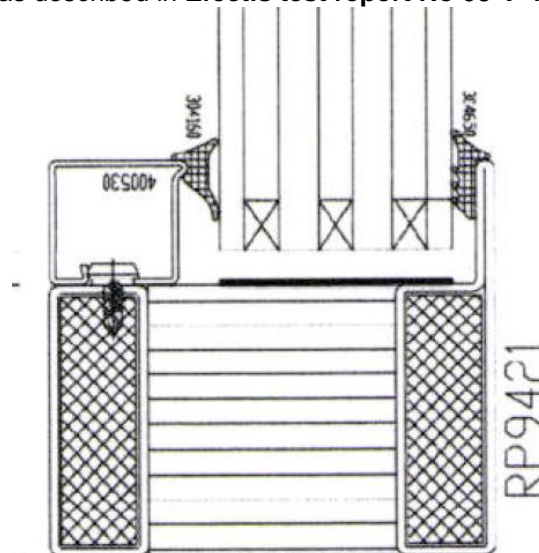
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI120/47-3 glass in steel framed screen for periods of 120 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **Efectis test report No 08-V-437**



- Frame: RP Technik RP ISOFEU 120 [RP9421] steel partition system
- Beads: 28x25mm steel beads clipped onto screws
- Liner: 50x1.5mm Kerafix Flexpress 100
- Glazing tape: EPDM gasket 304160 and 304650
- Setting blocks: 80x47x7 Promat H (PROMAT)
- Glazing: Pyroguard T-EI120/47-3 with 18mm edge cover

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes with 47mm thick Pyroguard T-EI120/47-3 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1300mm wide (at 2825mm high)	2825mm high (at 1300mm wide)	3.67m ²

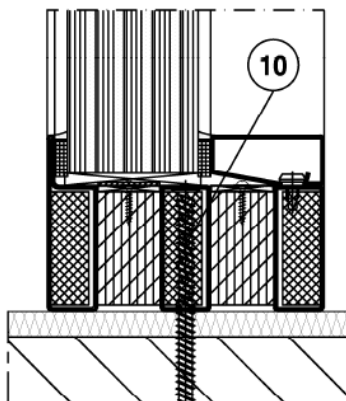
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI120/52-4 glass in steel multi-pane framed screens for periods of 120 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **IFT 21-001341**



- Forster Fuego Light 110 frame
- Forster 901249 45mm by 20mm steel bead
- Kerafix 2000 tape 15x5mm
- 80x54mm by 5mm hardwood setting blocks
- Pyroguard T-EI120/52-4
- Forster intumescent lining tape 24.5x2.2mm

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 52mm thick Pyroguard T-EI120/52-4 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.

Maximum Width	Maximum Height	Maximum Area
1521mm wide (at 2850mm high)	3063mm high (at 1415mm wide)	4.33m ²
2541mm wide (at 1206mm high)	1296mm high (at 2364mm wide)	3.06m ²

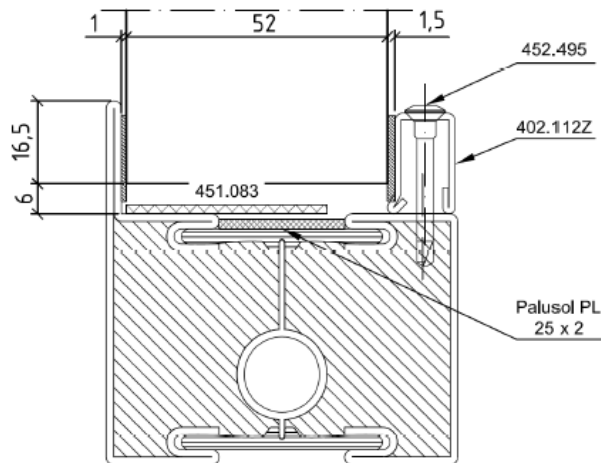
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI120/52-4 glass in steel multi-pane framed screens for periods of 120 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **EFR 20-V-003506 A**



- Jansen Janisol C4 frame
- Jansen 12mm by 20mm steel bead
- Odice Superwool glazing tape 17mm by 1mm and 17mm by 2mm
- 80mm by 52mm by 6mm Promatect H setting blocks
- Pyroguard T-EI120/52-4
- Jansen intumescent lining tape 24.4mm by 2.5mm

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of 52mm thick Pyroguard T-EI120/52-4 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.

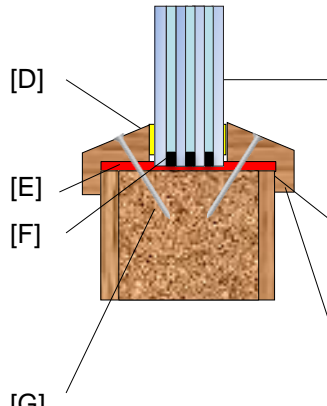
Maximum Width	Maximum Height	Maximum Area
1290mm wide (at 2839mm high)	3052mm high (at 1200mm wide)	3.66m ²
1694mm wide (at 1389mm high)	1493mm high (at 1576mm wide)	2.35m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass in timber based doorsets for periods of 60 minutes integrity and 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:

- 
- [A] Pyroguard T-EI60/25-3
 - [B] A ≥54mm thick FD60 door leaf incorporating a flaxboard core and 10mm thick Anti-Flam Chipboard faces (or thicker if required to accommodate glazing beads)
 - [C] Hardwood glazing bead: ≥25x≥17mm (h x w) including 5mm high by 5mm wide bolection return. Density ≥650kg/m³
 - [D] Lorient System 36/23 glazing seal
 - [E] Aperture liner: 2mm thick mono ammonium phosphate liner (M.A.P.), full width
 - [F] Heel-toe hardwood or non-combustible setting blocks
 - [G] Fixings: 8x45mm screws at 45° and minimum 200mm centres. Maximum distance from corners 50mm.

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass shown in diagram below, when used in conjunction with the above system. See “General Requirements” for timber doorsets, above. The aspect ratio of the glass may be unlimited within these aperture dimensions.

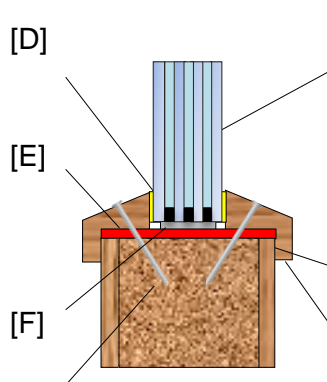
Maximum Width	Maximum Height	Maximum Area
495mm wide (at 1200mm high)	1320mm high (at 450mm wide)	0.59m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 glass in timber based doorsets for periods of 60 minutes integrity and 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:

- 
- [A] Pyroguard T-EI60/25-3
 - [B] Previously fire tested or Certifire approved 54mm FD60 door leaf
 - [C] Hardwood bead: $\geq 30 \times \geq 26$ mm (h x w) wide minimum (dimension includes a $\geq 5 \times \geq 5$ mm bolection)
 - [D] Glazing tape: Sealmaster Fireglaze Tape – 25x2.5mm thick
 - [E] Aperture liner: Sealmaster Fireglaze Tape – 54x2.5mm thick
 - [F] Heel-toe hardwood or non-combustible setting blocks
 - [G] Fixings: 8x63mm long screws at 150mm maximum centres and 50mm from corners (fixed at 45° to glass)

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

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass shown in diagram below, when used in conjunction with the above system. See “General Requirements” for timber doorsets, above. The aspect ratio of the glass may be unlimited within these aperture dimensions.

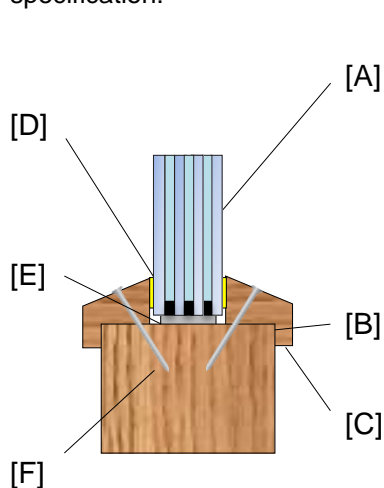
Maximum Width	Maximum Height	Maximum Area
495mm wide (at 1200mm high)	1320mm high (at 450mm wide)	0.59m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T EI60/25-3 glass in solid timber joinery doorsets for periods of 60 minutes integrity and 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:



[A] Pyroguard T-EI60/25-3

[B] Door: Joinery type door leaf comprising hardwood stiles and rails of minimum density $\geq 640\text{kg/m}^3$, stiles and rails minimum $\geq 75\text{mm}$ thick by $\geq 70\text{mm}$ wide. Stiles and top rail including $\geq 20\text{mm}$ wide by $\geq 30\text{mm}$ deep rebate.

Note: If substituted for a GDC doorset, the doorset, including door frame and associated building hardware, should have achieved at least 60 minutes integrity when tested, or subsequently assessed as acceptable for this purpose, to BS 476: Part 22: 1987. The proposed doorset should also have included a glazed aperture or apertures of the intended size, shape, area and number. 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

[C] Hardwood glazing beads: $\geq 25\text{x}\geq 30\text{mm}$ (h x w) including bolection return. Minimum density $\geq 640\text{kg/m}^3$

[D] Glazing tape: Interdens 15mm by 2mm

[E] Hardwood packer: 5mm thick by 23mm wide by 40mm long

[F] Fixings: 8 x 50mm screws at 45° and minimum 150mm centres. Maximum distance from corners 50mm

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass shown in the table below, when used in conjunction with the above system. See "General Requirements" for timber doorsets, above. The aspect ratio of the glass may be unlimited within these aperture dimensions.

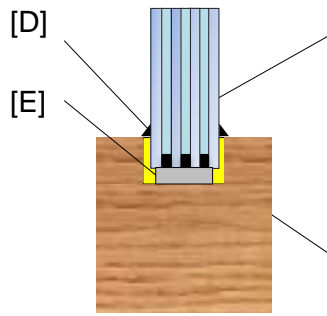
Maximum Width	Maximum Height	Maximum Area
950mm	2250mm	2.14m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T EI60/25-3 glass in solid timber joinery doorsets for periods of 60 minutes integrity and 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:

- 
- [A] Pyroguard T-EI60/25-3
 - [B] Door leaf of $\geq 81\text{mm}$ thick of glued laminated eucalyptus $\geq 650\text{kg/m}^3$
 - [C] Bead: Non-removable beads to give 25mm rebate -glass slides into the rebate
 - [D] Glazing tape: Flexilodice 20x2mm layered with Odice Papier Superwool 15mm x 2mm to surround the glass in the rebate and capped with Feraub Parasilico AM85-AT
 - [E] Promatect H setting blocks 25mm x 5mm x 80mm
 - [F] Fixings: 20mm x 20mm steel angles 50mm long on both sides of the glass at 250mm centres (not shown)

Glazing and frame details as described in Efectis report EFR-18-V-2858 A

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 glass shown in the table below, when used in conjunction with the above system. See "General Requirements" for timber doorsets, above. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Maximum Width	Maximum Height	Maximum Area
937mm	2251mm	2.10m ²

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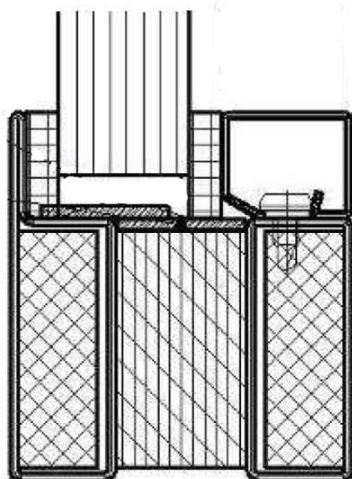
Pyroguard T-EI60/25-3 glass in steel framed doors for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No 271-41119**

Pyroguard T-EI60/25-3 in Forster Fuego Light 60 Steel Framed Door



- Glass: Pyroguard T-EI60/25-3
- Frame: Forster Fuego Light 60
- Beads: As per system
- Setting blocks: Hardwood 80x25x8mm with 80x25x5mm in frame recess
- Glazing Media: 20x6mm Kerafix 2000
- Intumescent Liner: 24.5x2.2mm Palstop "P"

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing doors 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 single glazed 25mm thick Pyroguard T-EI60/25-3 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
913mm wide (at 2329mm high)	2795mm high (at 761mm wide)	2.13m ²

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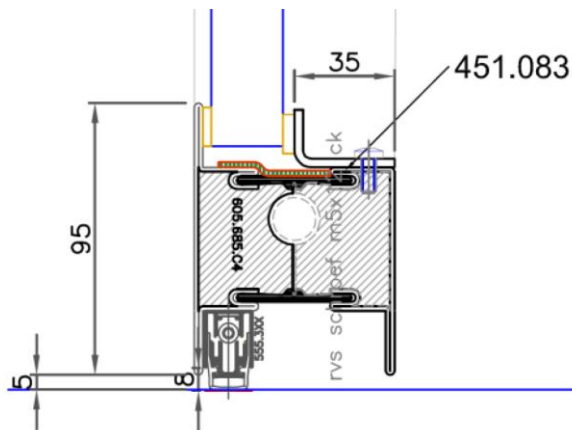
Pyroguard T-EI60/25-3 glass in steel framed doors for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis report EFR-19-V-000114**

Pyroguard T-EI60/25-3 in Jansen Janisol C4 Steel Framed Door



- Glass: Pyroguard T-EI60/25-3
- Jansen Janisol C4
- Beads: 20x35mmx3mm screw fixed steel angle
- Setting blocks: Promatect H 80mmx25x5mm
- Glazing Media: Jansen mineral fibre tape 17x3mm
- Intumescent Liner: Jansen graphite 40x1.8mm

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing doors 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 single glazed 25mm thick Pyroguard T-EI60/25-3 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1319mm wide (at 2405mm high)	2445mm high (at 1298mm wide)	3.17m ²

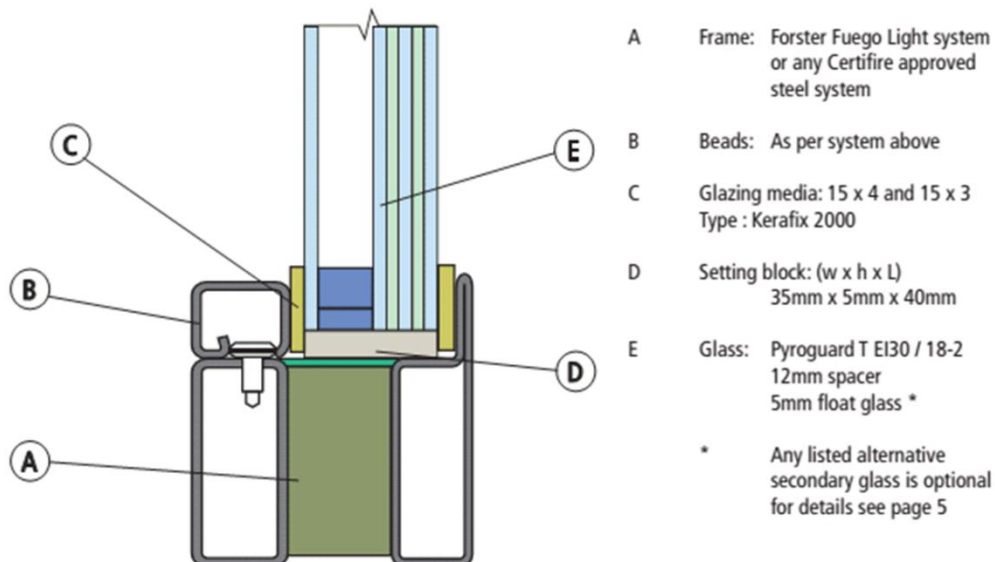
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI glass in steel framed doors for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report No 11-V-693**



- A Frame: Forster Fuego Light system or any Certifire approved steel system
 - B Beads: As per system above
 - C Glazing media: 15 x 4 and 15 x 3 Type : Kerafix 2000
 - D Setting block: (w x h x L) 35mm x 5mm x 40mm
 - E Glass: Pyroguard T EI30 / 18-2 12mm spacer 5mm float glass *
- * Any listed alternative secondary glass is optional for details see page 5

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing doors 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 IGU of 35mm thick Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1286mm wide (at 2684mm high)	3355mm high (at 1029mm wide)	3.45m ²

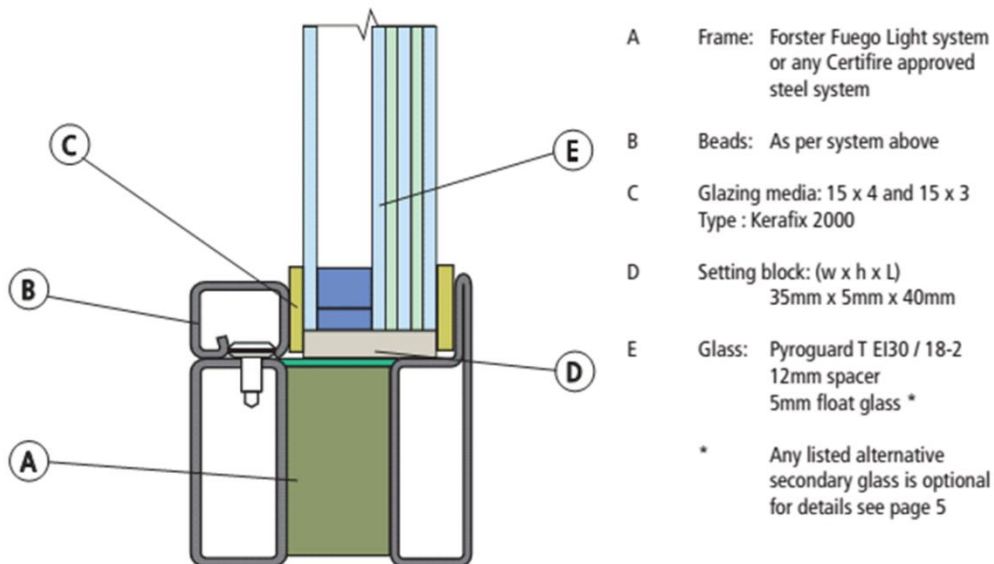
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI glass in steel framed doors for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report No 11-V-693**



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

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 IGU of 35mm thick Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system.

Counterpanes of laminated glass must only be used when on the exposed face of the door.

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

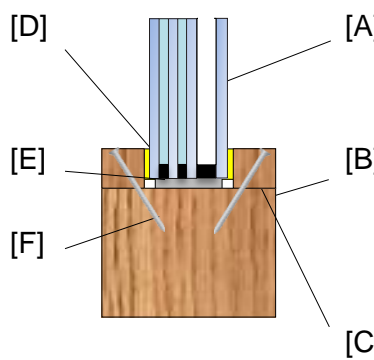
Maximum Width	Maximum Height	Maximum Area
1029mm wide (at 2684mm high)	2684mm high (at 1029mm wide)	2.76m ²

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Pyroguard T-EI30/18-2 VI glass in hardwood frame for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

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

- 
- [A] Pyroguard T-EI30/18-2 VI;
IGU comprising 18mm Pyroguard T-EI30/18-2 VI glass, 6-20mm cavity and a 4-16mm non-fire rated counterpane adjust section accordingly to maintain minimum bead dimensions
 - [B] Section: $\geq 106 \times \geq 40$ mm hardwood section, minimum density $\geq 630 \text{kg/m}^3$
 - [C] Beads: $\geq 20 \times \geq 35$ mm (h x w) square, hardwood density $\geq 630 \text{kg/m}^3$
 - [D] Glazing tape:
Choice of
25x1.5mm Intumex (Odice);
25x1.5mm Flexpress 100 (Kuhn);
20x3mm Fibrefrax FT paper (Kuhn);
20x3mm Superwool (Odice);
20x3mm Flexlit (Kuhn)
 - [E] Non-combustible or hardwood setting blocks 30x7.5x80mm
 - [F] Fixings: 4x40mm steel screws at 150mm
- Glazing and frame details as described in Efectis test report No 09-V-481 and WF343243

The insulated timber 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 IGU of 35mm thick Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system.

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

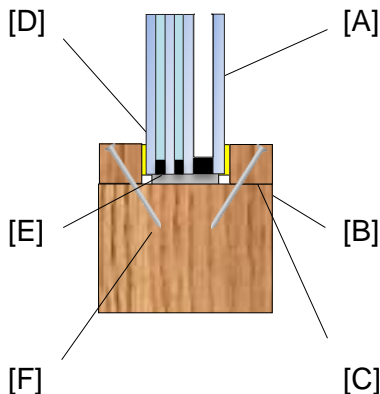
Maximum Width	Maximum Height	Maximum Area
3231mm wide (at 1485mm high)	1856mm high (at 2585mm wide)	4.80m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI Insulated Glazed Units in timber 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:

- 
- [A] Pyroguard T-EI30/18-2 VI;
IGU comprising 18mm Pyroguard T-EI30/18-2 VI glass, 6-20mm cavity and a 4-16mm non-fire rated counterpane adjust section accordingly to maintain minimum bead dimensions
 - [B] Section: $\geq 83 \times \geq 40$ mm hardwood framing sections, minimum density $\geq 640 \text{kg/m}^3$
 - [C] Beads: $\geq 20 \times \geq 23$ mm (h x w) square or chamfered (up to 10°) hardwood glazing beads, density $\geq 640 \text{kg/m}^3$. (17mm high for Lorient System 36/15)
 - [D] Glazing tape: 20mm by 6mm ceramic fibre based glazing tape (e.g., 'K' tape) or Lorient System 36/15
 - [E] Non-combustible setting blocks
 - [F] Fixings: 40mm long steel screws at 400mm centres (30° to glass)

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

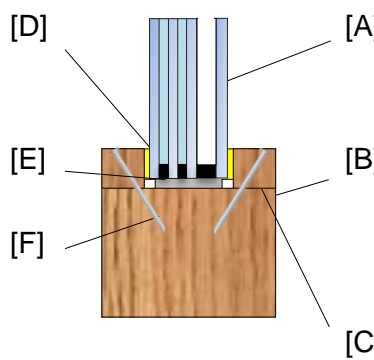
	Maximum Width	Maximum Height	Maximum Area
Ceramic Fibre Tape	3120mm wide (at 1500mm high)	3120mm high (at 1500mm wide)	4.68m ²
Lorient System 36/15	1378mm wide (at 1378mm high)	2000mm high (at 950mm wide)	1.90m ²

CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI glass in hardwood frame 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 or CERTIFIRE approved timber framing system utilising the following basic specification:

- 
- [A] Pyroguard T-EI30/18-2 VI;
IGU comprising 18mm Pyroguard T-EI30/18-2 VI glass, 6-20mm cavity and a 4-16mm non-fire rated counterpane adjust section accordingly to maintain minimum bead dimensions
 - [B] Section: $\geq 106 \times \geq 40$ mm hardwood section, minimum density $\geq 630 \text{kg/m}^3$
 - [C] Beads: $\geq 20 \times \geq 35$ mm (h x w) square, hardwood density $\geq 630 \text{kg/m}^3$
 - [D] Glazing tape:
Choice of
25x1.5mm Intumex (Odice);
25x1.5mm Flexpress 100 (Kuhn);
20x3mm Fibrefrax FT paper (Kuhn);
20x3mm Superwool (Odice);
20x3mm Flexlit (Kuhn)
 - [E] Non-combustible or hardwood setting blocks 30x7.5x80mm
 - [F] Fixings: 4x40mm steel screws at 150mm
- Glazing and frame details as described in Efectis test report No 09-V-481 and WF343243

The insulated timber 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 IGU of 30mm thick Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system.

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

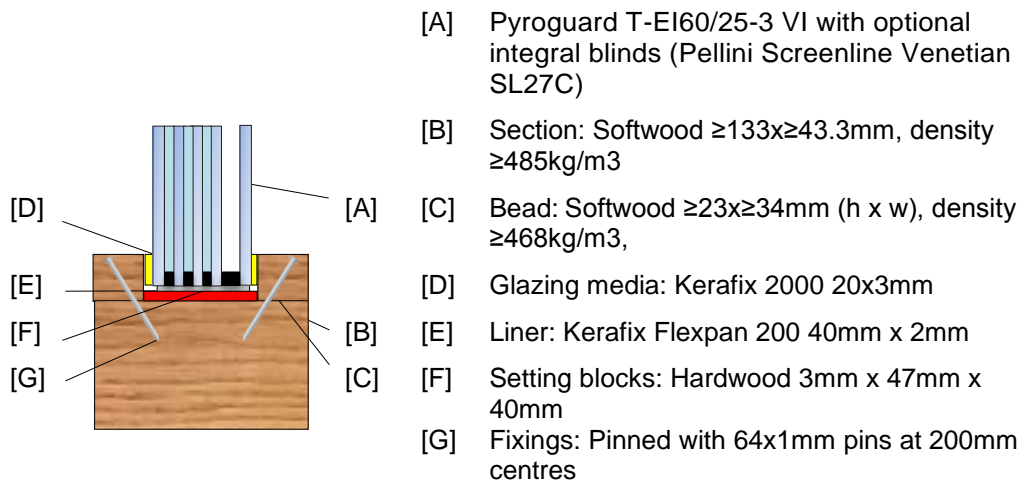
Maximum Width	Maximum Height	Maximum Area
2628mm wide (at 1485mm high)	1510mm high (at 2585mm wide)	3.90m ²

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Pyroguard T-EI60/25-3 VI glass in softwood frame for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

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



Glazing and frame details as described in Warringtonfire report WF426402

The orientation of the IGU can be either way with respect to the fire risk.

The insulated timber 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 IGU of 47mm thick Pyroguard T-EI60/25-3 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2773mm wide (at 1350mm high)	1440mm high (at 2600mm wide)	3.74m ²

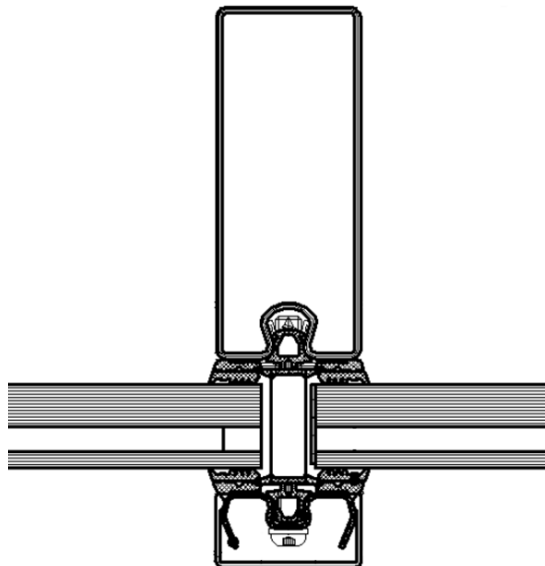
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI glass in steel framed Curtain Walling System with glazed panels for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **Efectis test report No 2007-CVB-RO495**



- Frame: Thermafix Vario steel system or any Certifire approved steel system
- Beads: A per system above
- Glazing media: EPDM
- Type: System gasket
- Setting block: (w x h x L) 26mm x 5mm x 80mm
- Glass: Pyroguard T-EW30/13-1, 8mm steel spacer, 5mm tempered*

*Any listed alternative glass is optional. For details see page 6

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW30/13-1 VI shown in the diagram below, when used in conjunction with the above system.

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

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

Maximum Width	Maximum Height	Maximum Area
1875mm wide (at 2928mm high)	3660mm high (at 1500mm wide)	5.49m ²

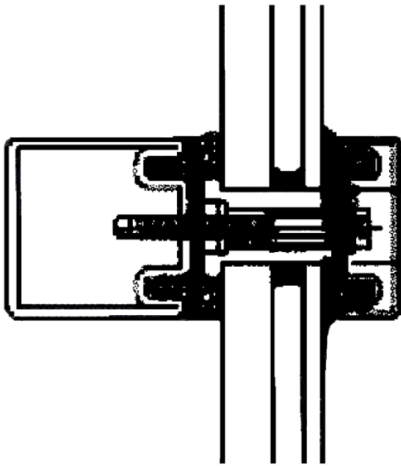
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI glass in steel framed curtain walling system for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **Efectis test report No 12-V-207**



- Frame: ISO Hermetic 45 N RP Technik steel system or any Certifire approved steel system
- Beads: A per system above
- Glazing media: 20mm x 1.5mm
- Type: Ceramic tape + system gaskets
- Setting block: (w x h x L) 26mm x 5mm x 80mm
- Glass: Pyroguard T-EW30/13-1, 8mm steel spacer, 5mm tempered*

*Any listed alternative glass is optional except for laminated.
For details see page 6

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

Counterpanes of laminated glass are not permitted.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU with 26mm thick Pyroguard T-EW30/13-1 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1492mm wide (at 2800mm high)	2988mm high (at 1400mm wide)	4.18m ²
1578mm wide (at 1391mm high)	1484mm high (at 1494mm wide)	2.19m ²

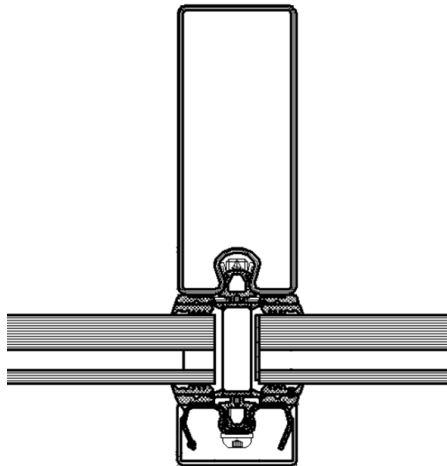
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI or T-EW60/13-1 glass in steel framed Curtain Walling system with glazed panels for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **Efectis test report No 007-CVB-RO495**



- Frame: Forster Thermafix Vario steel system or any Certifire approved steel system
- Beads: A per system above
- Glazing media: EPDM Type: System gasket
- Setting blocks: 26mm x 5mm x 80mm
- Glass: Pyroguard T-EW30/13-1, 8mm steel spacer, 5mm tempered*

*Any listed alternative glass is optional except for laminated. For details see page 6

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

Counterpanes of laminated glass are not permitted.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW30/13-1 VI or T-EW60/13-1 shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1875mm wide (at 2928mm high)	3660mm high (at 1500mm wide)	5.49m ²

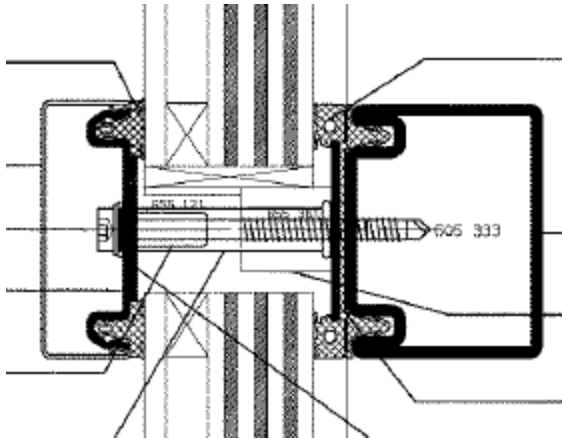
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 VI glass in a stainless-steel curtain walling system for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

Glazing and frame details as described in **Efectis test report No 09-V-234**



- RP Hermetic 60N steel curtain walling system
- Stainless steel profiles reference 430 060 (RP TECHNIK).
- The glazing plates are associated with an intumescent seal reference KERAFIX FLEXPRESS, with a section of 30 x 1,5 mm.
- Sealing reference 305 170 (RP TECHNIK) between the glass and the frame,
- Sealing reference 300 381 (RP TECHNIK), between the glass and the plates.
- The glazings are packed in the lower part with 4 x 100 x 40 mm supporting blocks, which are placed on block supports, reference 525 251 (RP TECHNIK)

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU of 40mm thick Pyroguard T-EI60/25-3 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1769mm wide (at 2820mm high)	3525mm high (at 1415mm wide)	4.99m ²

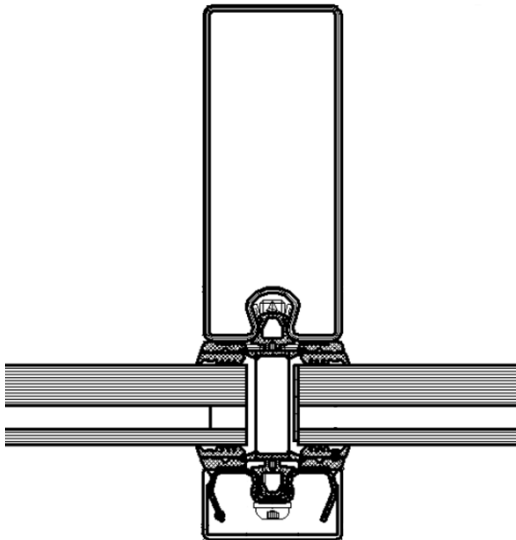
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 VI glass in steel framed curtain walling systems for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-19-V-4362 A**



- Frame: Forster Thermafix Vario steel system or any Certifire approved steel system
- Beads: A per system above
- Glazing media: Forster EPDM
- Setting block: Promatect H (w x h x L) 52mm x 3mm x 80mm
- Glass: Pyroguard T-EI60/25-3 VI
- The periphery of the IGUs wrapped with Kerafix Flexpan 200 24.5mm x 1.5mm

The orientation of the IGU can be either way with respect to the fire risk.

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU of 52mm thick Pyroguard T-EI60/25-3 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1575mm wide (at 3600mm high)	3780mm high (at 1500mm wide)	5.67m ²

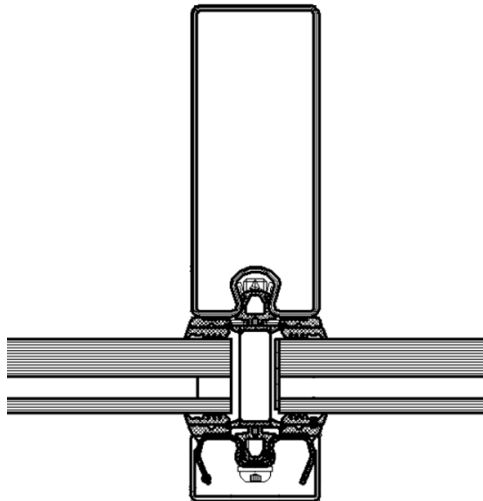
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW90/13-1 VI glass in steel framed Curtain Walling Systems with glazed for periods of 90 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report No 007-CVB-RO495**



Frame: Thermafix Vario steel system or any Certifire approved steel system

Beads: As per system above

Glazing media: EPDM system gaskets

Setting blocks: 26mm (w) x 5mm (h) x 80mm (l)

Glass: Pyroguard T EW30/13-1 8mm, steel spacer, 5mm tempered glass*

* Any listed alternative secondary glass is optional except for laminated

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This configuration is only approved as an IGU and only with the Pyroguard T-EW90/13-1 on the exposed side.

Counterpanes of laminated glass are not permitted.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW90/13-1 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1500mm wide (at 2928mm high)	2928mm high (at 1500mm wide)	4.39m ²

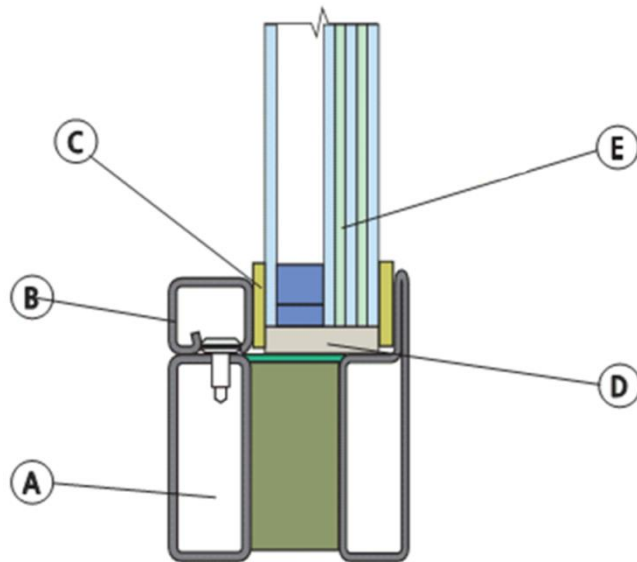
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI glass in steel framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No10-000976**
-



- A Frame: Forster Fuego Light system or any Certifire approved steel system
 - B Beads: As per system above
 - C Glazing media: 20 x 4 and 20 x 3 Type : Kerafix 2000
 - D Setting block: (w x h x L) 35mm x 5mm x 40mm
 - E Glass: Pyroguard T EI30 / 18-2
12mm spacer
5mm float glass *
- * Any listed alternative secondary glass is optional

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU of 35mm thick Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1618mm wide (at 2284mm high)	2855mm high (at 1294mm wide)	3.70m ²
1855mm wide (at 1097mm high)	1372mm high (at 1484mm wide)	2.04m ²

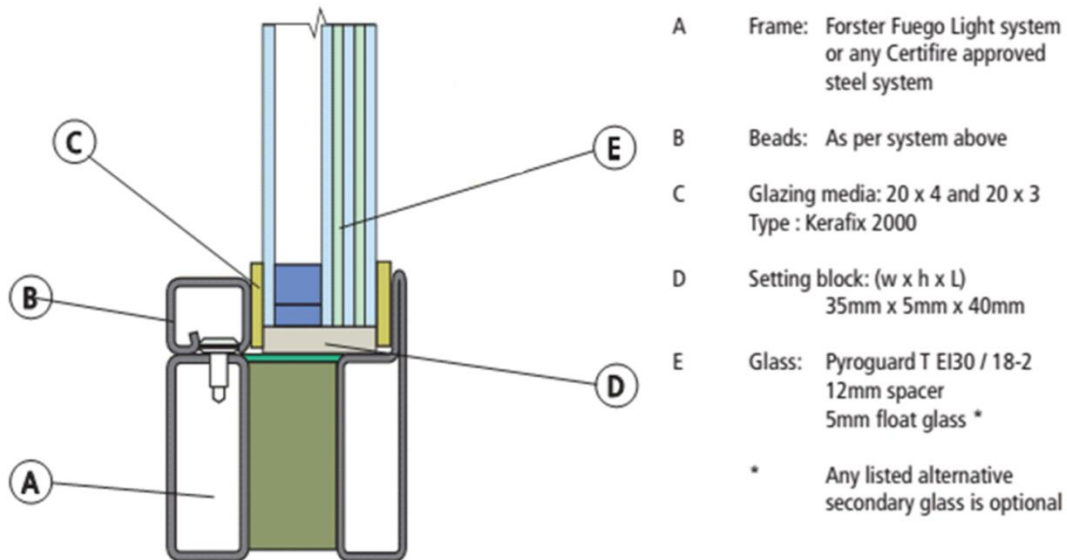
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI glass in steel framed screens for periods of 60 minutes integrity and 30 Minutes insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFT test report No10-000976**



- A Frame: Forster Fuego Light system or any Certifire approved steel system
 - B Beads: As per system above
 - C Glazing media: 20 x 4 and 20 x 3 Type : Kerafix 2000
 - D Setting block: (w x h x L) 35mm x 5mm x 40mm
 - E Glass: Pyroguard T EI30 / 18-2 12mm spacer 5mm float glass *
- * Any listed alternative secondary glass is optional

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU of 35mm thick Pyroguard T-EI30/18-2 VI shown in the diagram below, when used in conjunction with the above system.

Counterpanes of laminated glass must only be used when on the exposed face of the screen.

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

Maximum Width	Maximum Height	Maximum Area
1316mm wide (at 2284mm high)	2323mm high (at 1294mm wide)	3.01m ²
1509mm wide (at 1097mm high)	1116mm high (at 1484mm wide)	1.66m ²

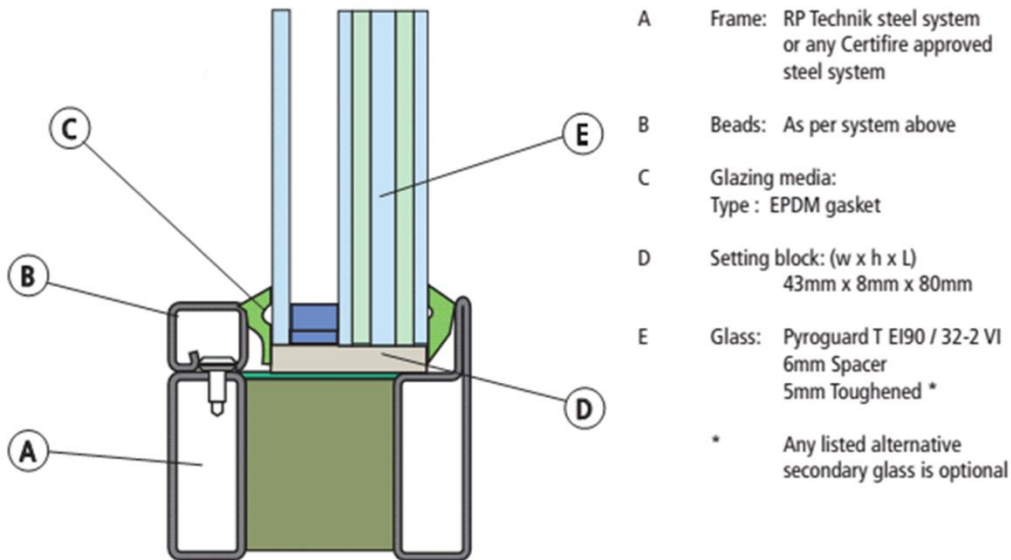
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/32-2 VI glass in steel framed screens for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **IFC test report No576**



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of IGU of 43mm thick Pyroguard T-EI90/32-2 VI shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1804mm wide (at 1079mm high)	1295mm high (at 1503mm wide)	1.95m ²

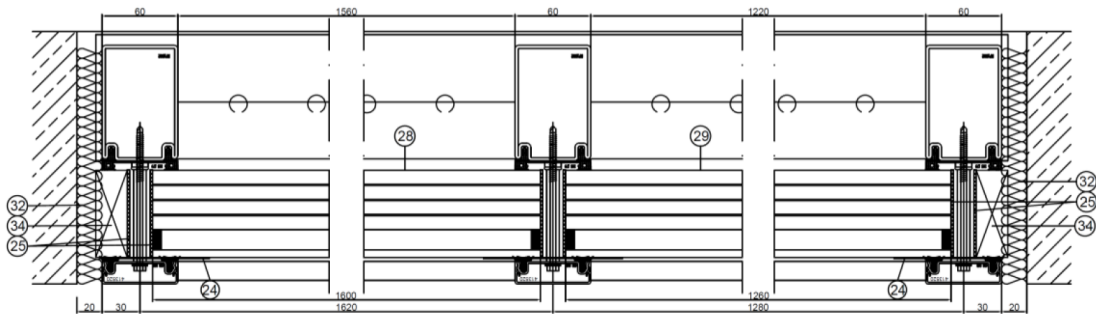
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI120/47-3 VI glass in steel curtain walling systems for periods of 90 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-16-G-004298**



- RP Technik RP-ISO Hermetic 60N
- Pyroguard T-EI120/47-3 VI

This Certificate of Approval relates to the sizes of Pyroguard T-EI120/47-3 VI 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.

Maximum Width	Maximum Height	Maximum Area
2000mm wide (at 2400mm high)	3000mm high (at 1600mm wide)	4.80m ²

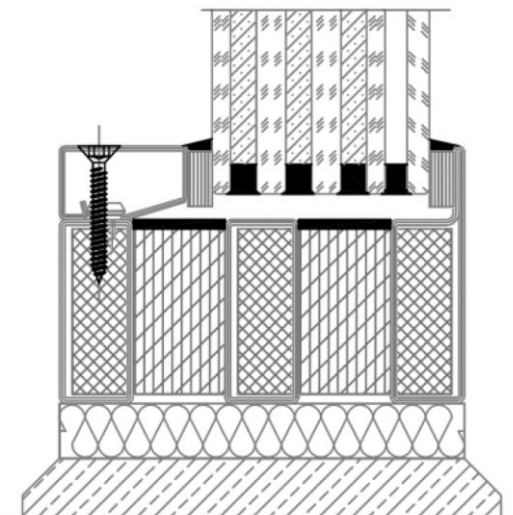
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI120/47-3 VI glass in steel framed screens for periods of 120 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-16-G-004086**



- Forster Fuego Light EI120
- Pyroguard T-EI120/47-3 VI
- Forster 35mm by 20mm steel bead fixed with 3.9mm by 32mm screw
- Gluske Kerafix Flexlit glazing tape capped with silicone

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

This Certificate of Approval relates to the sizes of Pyroguard T-EI120/47-3 VI 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.

	Maximum Width	Maximum Height	Maximum Area
Portrait	1488mm wide (at 2285mm high)	2647mm high (at 1285mm wide)	3.40m ²
Landscape	1720mm wide (at 1110mm high)	1286mm high (at 1485mm wide)	1.91m ²

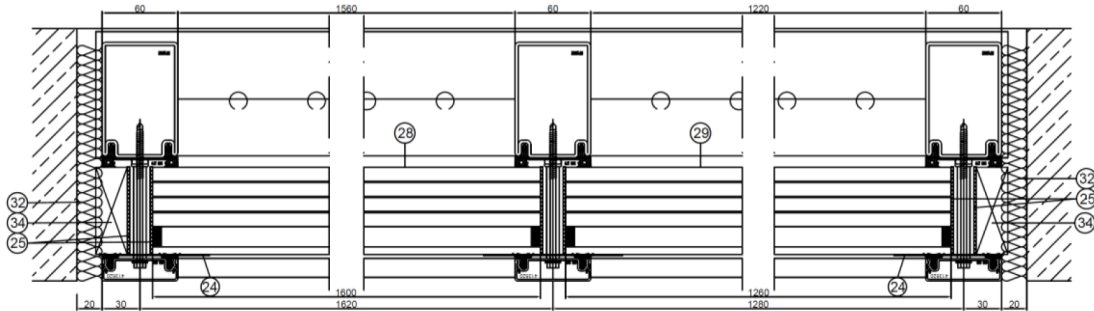
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI120/47-3 VI glass in steel curtain walling systems for periods of 120 minutes integrity and insulation

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing and frame details as described in **Efectis test report EFR-16-G-004298**



- RP Technik RP-ISO Hermetic 60N
- Pyroguard T-EI120/47-3 VI

This Certificate of Approval relates to the sizes of Pyroguard T-EI120/47-3 VI 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.

Maximum Width	Maximum Height	Maximum Area
1613mm wide (at 2400mm high)	2420mm high (at 1600mm wide)	3.87m ²

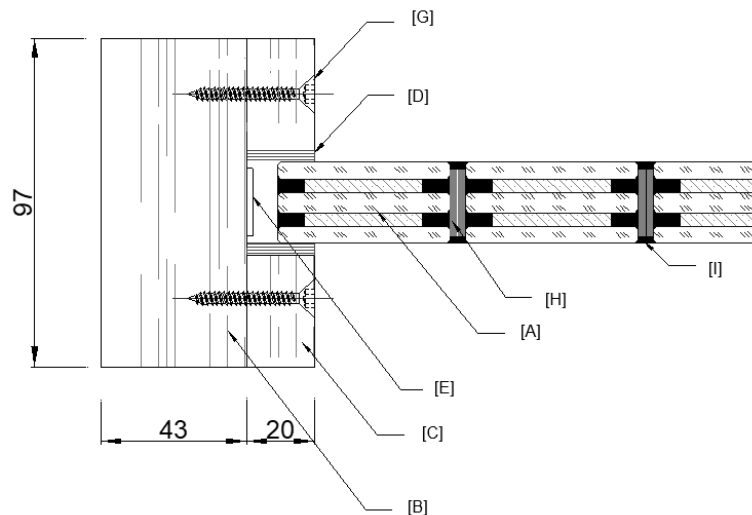
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/24-2 SWS Butt Jointed Glass in softwood frame for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

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

Glazing and frame details as described in **Warringtonfire report WF426403**



- [A] Pyroguard T-EI30/24-2 SWS
- [B] Section: Softwood frame with a density of 573kg/m³ and 97.4x43mm
- [C] Beads: Softwood beads 20mm high by 33mm wide minimum
- [D] Glazing media: Kerafix 2000 mineral fibre 20mm x 3mm
- [E] Liner: Kerafix Flexpan 200 20mm x 2mm
- [F] Setting blocks: Hardwood setting blocks 15mm x 24mm x 6mm
- [G] Fixings: Pins 1mm x 50mm every 200mm or screws
- [H] Glass-glass joint intumescent: Two layers of 20 x 2 Palusol
- [I] Glass-glass joint silicone DOWSIL 895

The insulated timber 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 24mm thick Pyroguard T-EI30/24-2 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1625mm wide (at 2898mm high)	3622mm high (at 1300mm wide)	4.71m ²

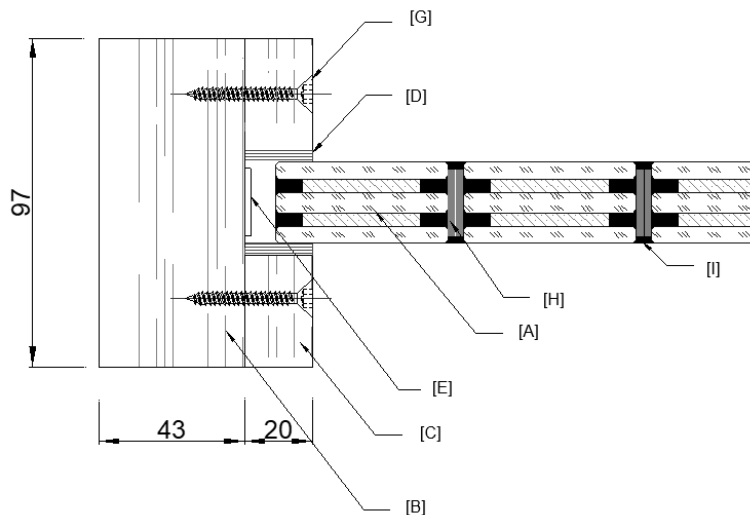
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/24-2 SWS Butt Jointed Glass in softwood frame 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 or CERTIFIRE approved timber framing system utilising the following basic specification:

Glazing and frame details as described in **Warringtonfire report WF426403**



- [A] Pyroguard T-EI30/24-2 SWS
- [B] Section: Softwood frame with a density of 573kg/m³ and 97.4x43mm
- [C] Beads: Softwood beads 20mm high by 33mm wide minimum
- [D] Glazing media: Kerafix 2000 mineral fibre 20mm x 3mm
- [E] Liner: Kerafix Flexpan 200 20mm x 2mm
- [F] Setting blocks: Hardwood setting blocks 15mm x 24mm x 6mm
- [G] Fixings: Pins 1mm x 50mm every 200mm or screws
- [H] Glass-glass joint intumescent: Two layers of 20 x 2 Palusol
- [I] Glass-glass joint silicone DOWSIL 895

The insulated timber 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 24mm thick Pyroguard T-EI30/24-2 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1625mm wide (at 2898mm high)	3622mm high (at 1300mm wide)	4.71m ²

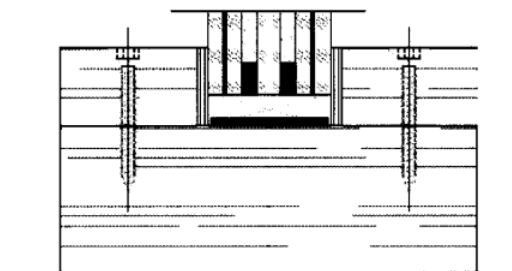
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/32-2 VF SWS Butt Jointed Glass in hardwood frame for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

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

- Hardwood frame with a density of 650kg/m^3 and 107mm by 38mm section minimum. Assembled in the construction with dowels and screws 10 x 160mm every 900mm. Double hardwood beads 20mm high by 35mm wide minimum fixed by screws 4 x 60mm every 170mm at angle of 30° degrees around the framework 30 x 2mm Flexpress intumescent strip.
- Glazing material Kerafix 2000 mineral fibre 20 x 3mm at glazed edges. Fire Resistant Sealant at butt joint between glass junction 30mm wide.
- 80 by 6mm Promatect H or Flammi 12 (GLUSKE) setting blocks and Bottom edge clearance 6mm, edge cover 14mm
- Intumescent seal between non fire glass and bead, 25 by 1.5mm Intumex (Odice) or (Flexpress 100 (Gluske) or 20 by 3mm Fibrefrax FT paper (GLUSKE) or superwool (Odice)
- Glazing and frame details as described in **Efectis test report No 09-V-241**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



- Frame: Hardwood 107mm by 38mm, density 650kg/m^3
- Beads: Hardwood 35mm by 20mm, density 650kg/m^3
- Glazing media: 20mm by 3mm
- Type: Kerafix 2000 mineral fibre
- Fixing: 4mm by 60mm steel screws
- Setting blocks: (w x h x L) 32mm by 6mm by 40mm
- Glazing: Pyroguard T EI30/32-2 VF SWS



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Pyroguard T-EI30/32-2 VF SWS Butt Jointed Glass in hardwood frame for periods of 30 minutes integrity and insulation (Continued)

The insulated timber 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 32mm thick Pyroguard T-EI30/32-2 VF SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2288mm wide (at 2900mm high)	3625mm high (at 1830mm wide)	6.63m ²

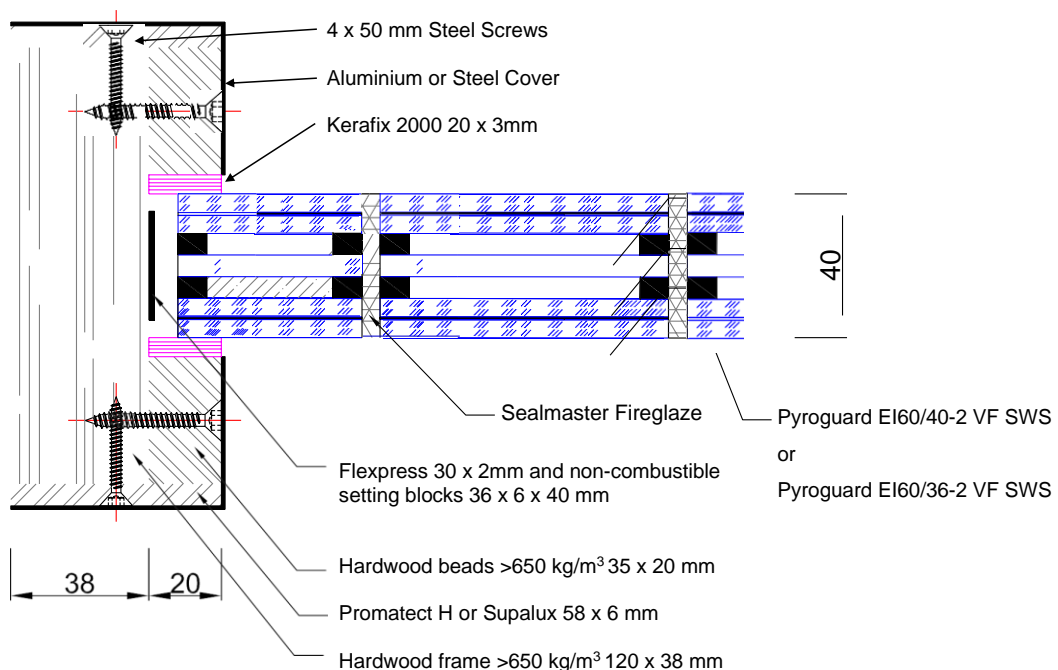
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/40-2 VF SWS and T-EI60/36-2 VF SWS Butt Jointed Glass in hardwood frame for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

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

- 40mm thick fire glass Pyroguard T-EI60/40-2 VF SWS with 2 x 10.8mm safety glass with 55.2 construction/2 x 6mm intumescent interlayer/6mm float glass, symmetrical glass construction with glazing beads on both sides.
- Alternatively constructed with 44.2 safety glass construction to give 36mm thick fire glass Pyroguard T-EI60/36-2 VF SWS.
- Glazing and frame details as described in **Efectis test report No 08-V-295**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.





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Pyroguard T-EI60/40-2 VF SWS and T-EI60/36-2 VF SWS Butt Jointed Glass in hardwood frame for periods of 60 minutes integrity and insulation (Continued)

The insulated timber 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 40mm or 36mm thick Pyroguard T-EI60/40-2 VF SWS or Pyroguard T-EI60/36-2 VF SWS 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.

Maximum Width	Maximum Height	Maximum Area
1952mm wide (at 2900mm high)	3093mm high (at 1830mm wide)	5.66m ²

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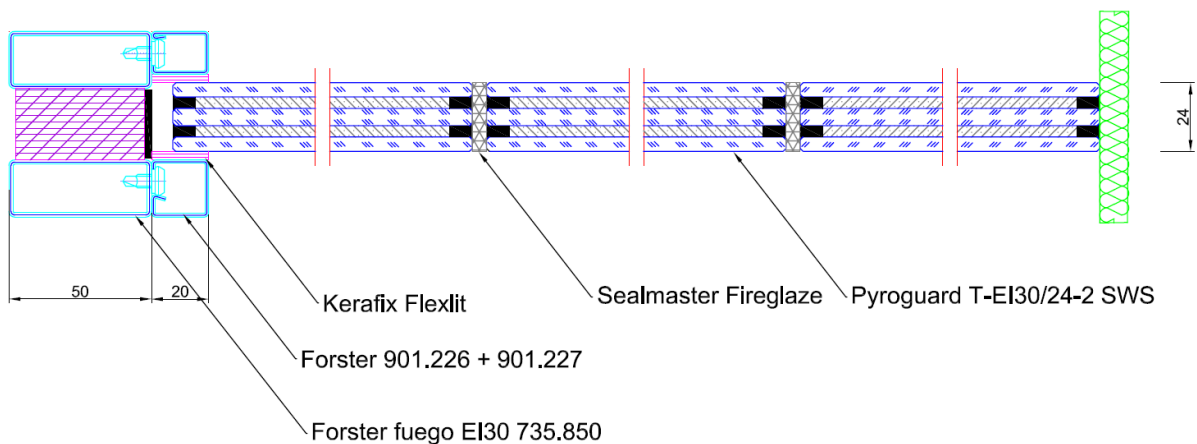
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/24-2 SWS Butt Jointed Glass in steel partition system for periods of 30 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a double bead system 15 x 20mm on the fire side and 20 x 20mm non fire side, screw fixed every 300mm with 20mm by 3mm Flexlit Kerafix ceramic glazing (Gluske) tape. Thinnest beads on fire side.
- The butt joints of the glazing were assembled side by side with 24mm by 5mm fire resistant silicone, Sealmaster Fireglaze, Dowsil 121 or Dowsil 895. Along the top of all glazing, Kerafix Silicone (GLUSKE) was applied on the unexposed side.
- Clearance between glass and frame was 7.5mm. Edge Cover was 12.5mm.
- Glazing and frame details as described in **Efectis test report No 12-V-236**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.



CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T-EI30/24-2 SWS Butt Jointed Glass in steel partition system for periods of 30 minutes integrity and insulation. (Continued)

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/24-2 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1560mm wide (at 3265mm high)	3918mm high (at 1300mm wide)	5.09m ²

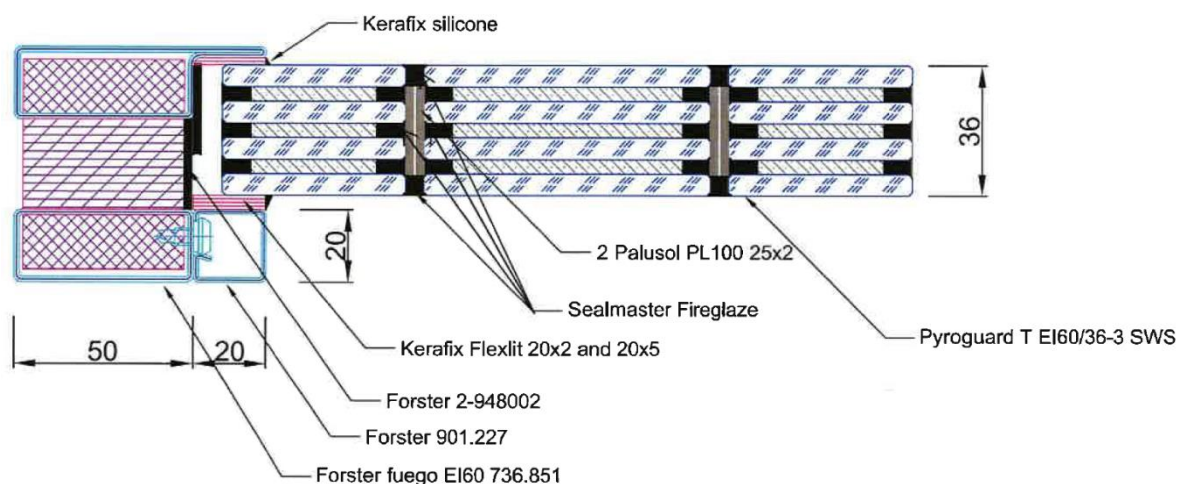
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/36-3 SWS butt jointed glass in steel partition system for periods of 30 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a single clip-on bead system of 20mm x 20mm fixed every 400mm maximum and 75mm from corners maximum. The beads with 20mm by 5mm Kerafix Flexit and 20mm by 2mm on the fin both capped with Kerafix Silicone.
- The butt joints of the glazing assembled side by side with a layer of 25mm by 2mm Odice Palusol PL100 on each pane and capped with Sealmaster Fireglaze or Dow Corning Dowsil 895.
- Each pane was supported on 80mm by 36mm by 5mm Promatect H setting blocks.
- Clearance between glass and frame was 5mm. Edge Cover was 15mm.
- Glazing and frame details as described in **Efectis test report No EFR-18-V-003243**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

Pyroguard T-EI30/36-3 SWS butt jointed glass in steel partition system for periods of 30 minutes integrity and insulation. (Continued)



CERTIFICATE No CF 5204
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This Certificate of Approval relates to the sizes of Pyroguard T-EI30/36-3 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2100mm wide (at 3265mm high)	3809mm high (at 1800 wide)	6.85m ²

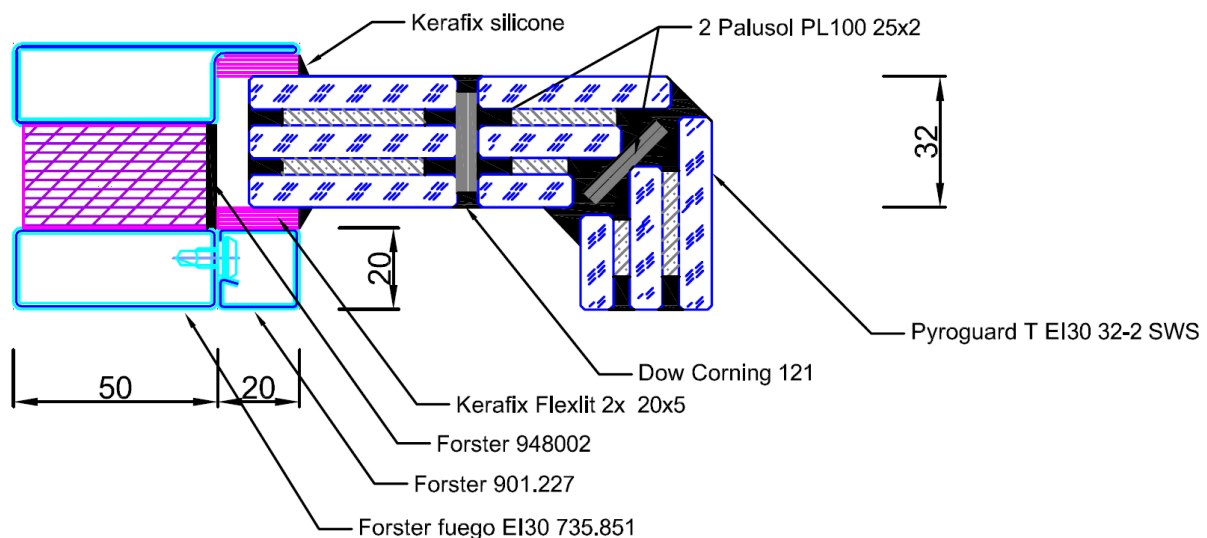
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/32-2 SWS butt jointed glass in steel partition system with 90° corners for periods of 30 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a double clip-on bead system of 20mm x 15mm fixed every 200mm maximum and 75mm from corners maximum. The beads with 15mm by 2mm Kerafix Flexit and capped with Kerafix Silicone.
- The butt joints of the glazing assembled with two layers of 25mm by 2mm Odice Palusol PL100 and filled with Dow Corning DOWSIL 121 or Do DOWSIL wsil 895.
- The each pane was support on 80mm by 32mm by 5mm Promatect H setting blocks.
- Clearance between glass and frame was 5mm. Edge Cover was 15mm.
- Glazing and frame details as described in **Efectis test report No EFR-19-V-000119**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.



CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T-EI30/32-2 SWS butt jointed glass in steel partition system with 90° corners for periods of 30 minutes integrity and insulation. (Continued)

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/32-2 SWS shown in the table below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1875mm wide (at 3270mm high)	4087mm high (at 1500mm wide)	6.13m ²

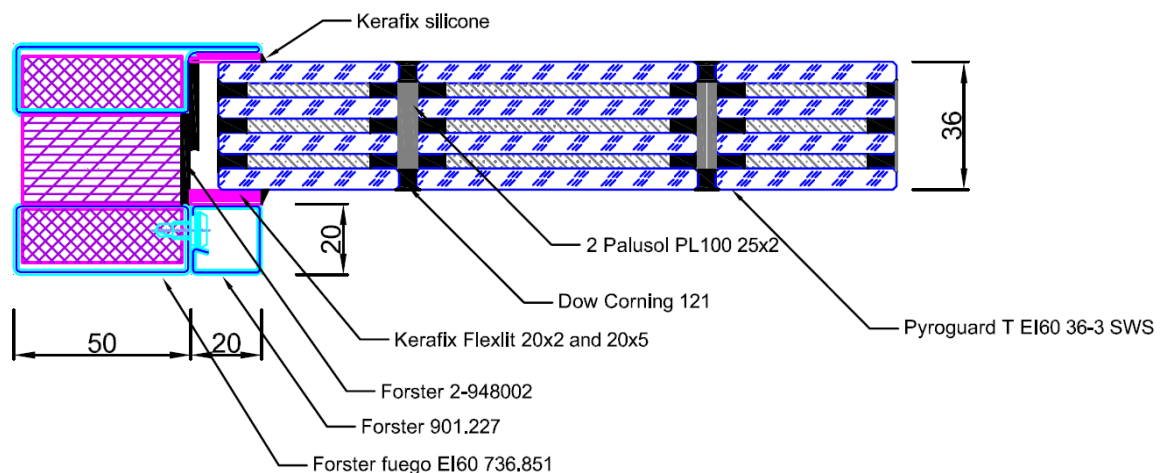
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Pyroguard T-EI60/36-3 SWS butt jointed glass in steel partition system for periods of 60 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a single clip-on bead system of 20mm x 20mm fixed every 400mm maximum and 60mm from corners maximum. The beads with 20mm by 5mm Kerafix Flexit and 20mm by 2mm on the fin both capped with Kerafix Silicone.
- The butt joints of the glazing assembled side by side with a layer of 25mm by 2mm Odice Palusol PL100 on each pane and capped DOWSIL 121 or DOWSIL 895.
- Each pane was supported on 80mm by 36mm by 7.5mm Promatect H setting blocks.
- Clearance between glass and frame was 8mm. Edge Cover was 12mm.
- Glazing and frame details as described in **Efectis test report No EFR-19-V-000117**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.



CERTIFICATE No CF 5204

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Pyroguard T-EI60/36-3 SWS butt jointed glass in steel partition system for periods of 60 minutes integrity and insulation. (Continued)

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/36-3 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2100mm wide (at 3265mm high)	3809mm high (at 1800mm wide)	6.85m ²

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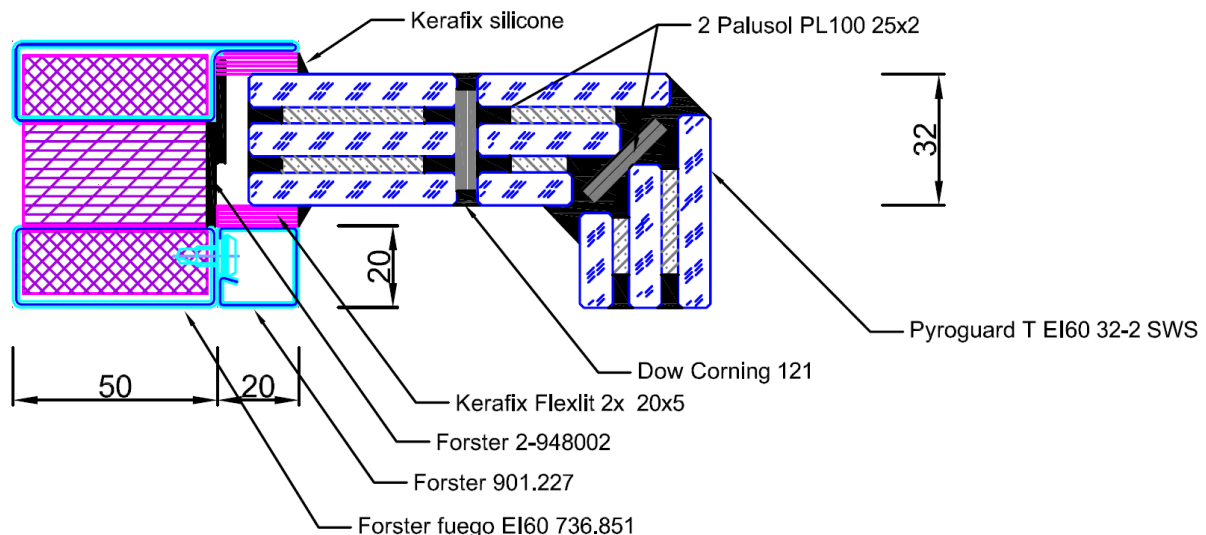
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/32-2 SWS butt jointed glass in steel partition system with 90° corners for periods of 60 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a double clip-on bead system of 20mm x 15mm fixed every 200mm maximum and 75mm from corners maximum. The beads with 15mm by 2mm Kerafix Flexit and capped with Kerafix Silicone.
- The butt joints of the glazing assembled with two layers of 25mm by 2mm Odice Palusol PL100 and filled with DOWSIL 121. Straight joints may alternatively be filled with DOWSIL 895.
- Each pane was supported on 80mm by 32mm by 5mm Promatect H setting blocks.
- Clearance between glass and frame was 5mm. Edge Cover was 15mm.
- Glazing and frame details as described in **Efectis test report No EFR-19-V-000119**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.



CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T-EI60/32-2 SWS butt jointed glass in steel partition system with 90° corners for periods of 60 minutes integrity and insulation. (Continued)

This Certificate of Approval relates to the sizes of Pyroguard T-EI60/32-2 SWS when used in conjunction with the above system. The two panes making the 90° corner are limited to one of maximum size Pane A and one maximum size Pane B, see below.

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

	Maximum Width	Maximum Height	Maximum Area
Pane A	456mm wide (at 3270mm high)	3542mm high (at 421mm wide)	1.49m ²
Pane B	1625mm wide (at 3270mm high)	3542mm high (at 1500mm wide)	5.13m ²

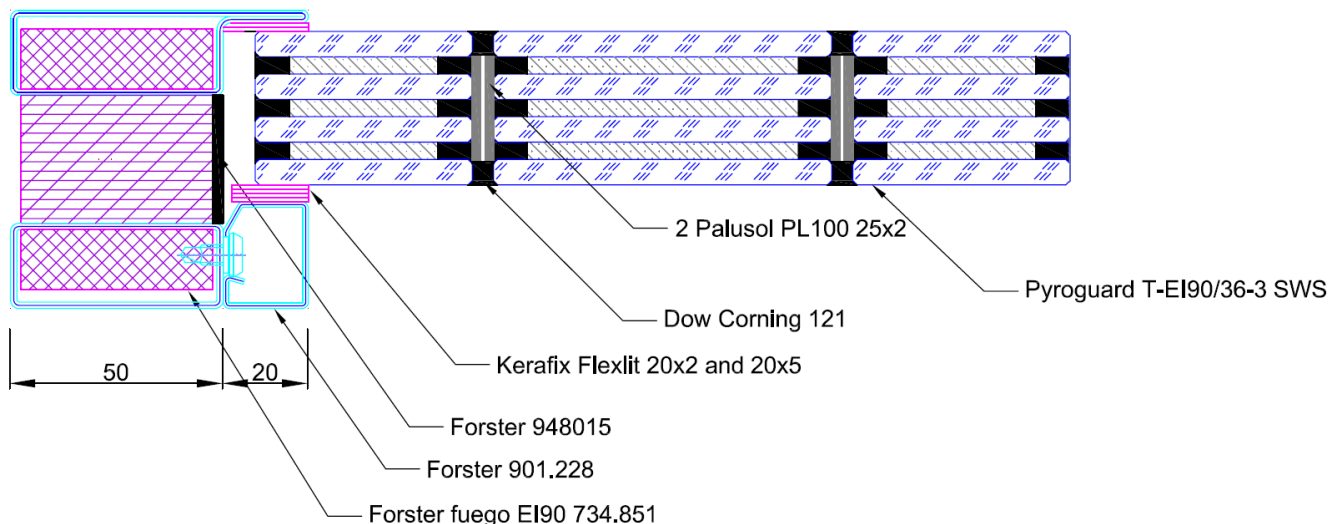
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Pyroguard T-EI90/36-3 SWS butt jointed glass in steel partition system for periods of 90 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a single clip-on bead system of 20x20mm fixed every 400mm maximum and 60mm from corners maximum. The beads with 20x5mm Kerafix Flexit and 20x2mm on the fin both capped with Kerafix Silicone.
- The butt joints of the glazing assembled side by side with a layer of 25x2mm Odice Palusol PL100 on each pane and capped DOWSIL 121.
- Each pane was supported on 80x36x7.5mm Promatect H setting blocks.
- Clearance between glass and frame was 8mm. Edge Cover was 12mm.
- Glazing and frame details as described in **Efectis test report No EFR-19-V-000117**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.



Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.



CERTIFICATE No CF 5204

PYROGUARD UK LTD

Pyroguard T-EI90/36-3 SWS butt jointed glass in steel partition system for periods of 90 minutes integrity and insulation. (Continued)

This Certificate of Approval relates to the sizes of Pyroguard T-EI90/36-3 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1880mm wide (at 3265mm high)	3410mm high (at 1800mm wide)	6.14m ²

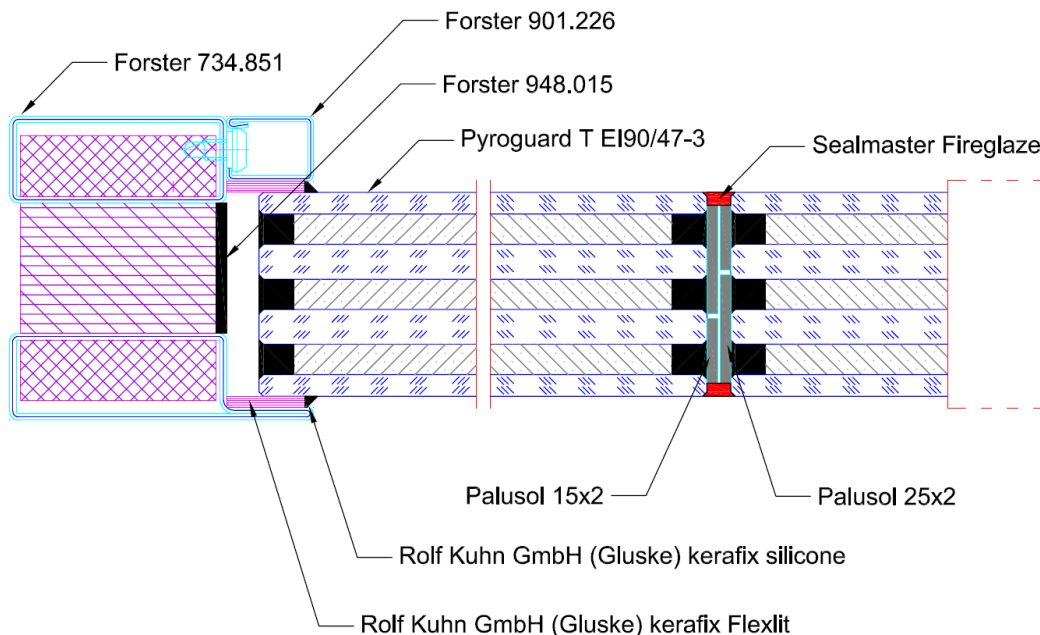
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI90/47-3 SWS butt jointed glass in steel partition system for periods of 90 minutes integrity and insulation.

For this application the following conditions shall apply:

The glass may be installed into any previously tested or CERTIFIRE approved framing system (which is covered appropriately by test or Warringtonfire assessment evidence) using pressure plate glazing, screw-fixed or clip-on retaining beads utilising the following basic specification:

- Glazing with a single clip-on bead system of 15mm x 20mm fixed every 200mm maximum and 60mm from corners maximum. The beads and the fin with 20mm by 5mm capped with Kerafix Silicone.
- The butt joints of the glazing assembled side by side with a layer of 25mm by 2mm and 15mm by 2mm Odice Palusol PL100 on each pane and capped with Sealmaster Fireglaze silicone.
- Each pane was supported on 80mm by 36mm by 8mm Promatect H setting blocks.
- Clearance between glass and frame was 8mm. Edge cover was 12mm.
- Glazing and frame details as described in **Efectis test report No EFR-18-V-003116**
- The top and bottom transoms supporting the butt jointed glazing must be fastened directly to the supporting structure.





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Pyroguard T-EI90/47-3 SWS butt jointed glass in steel partition system for periods of 90 minutes integrity and insulation. (Continued)

Where an alternative previously fire tested or CERTIFIRE approved insulated steel system is used the glazing system approved for that framing system may also be used.

The insulated steel framing system shall have test evidence or be CERTIFIRE approved.

This Certificate of Approval relates to the sizes of Pyroguard T-EI90/47-3 SWS shown in the diagram below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1900mm wide (at 3265mm high)	3446mm high (at 1800mm wide)	6.20m ²

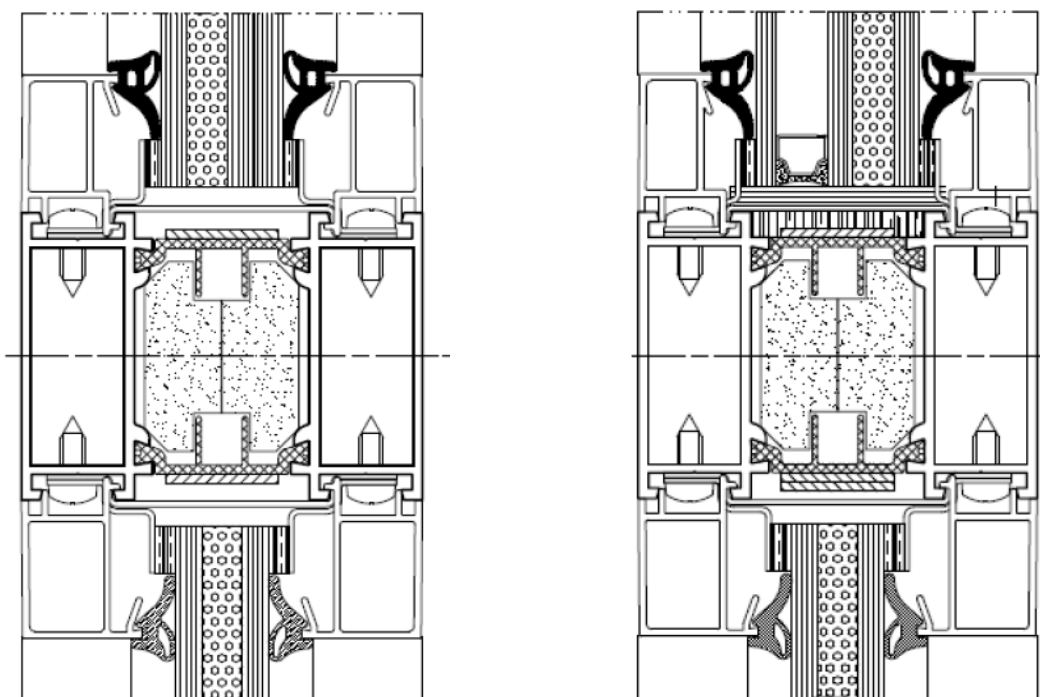
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 (including VI and VF Variants) within Aluprof MB-78 EI aluminium framing screen system for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No's. EFR-14-V-003556A, EFR-14-V-003554 and EFR-14-V-003555**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 (including VI and VF Variants) shown in the diagrams below, when used in conjunction with the above system.



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Pyroguard T-EI3018-2 (including VI and VF Variants) within Aluprof MB-78 EI aluminium framing screen system for periods of 30 minutes integrity and insulation

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

Maximum Width	Maximum Height	Maximum Area
1837mm wide (at 2800mm high)	3500mm high (at 1470mm wide)	5.14m ²
2981mm wide (at 1500mm high)	1875mm high (at 2385mm wide)	4.47m ²

Maximum Width	Maximum Height	Maximum Area
3582mm wide (at 377mm high)	471mm high (at 2866mm wide)	1.35m ²

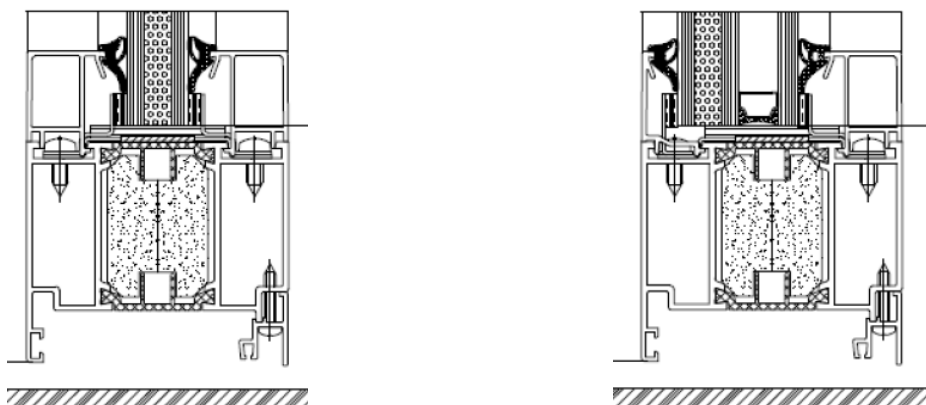
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 (including VI variant) within Aluprof MB-78 EI aluminium framed door systems for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed doorset system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of doorset system.

Glazing and frame details are as described in **Efectis test report No's. EFR-14-V-003552, EFR-14-V-003553 and EFR-15-V-003849**



Pyroguard T-EI30/18-2 (including VI variant) within Aluprof MB-78 EI aluminium framed door systems for periods of 30 minutes integrity and insulation

This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 (including VI variant) shown in the diagrams below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Maximum Width	Maximum Height	Maximum Area
1297mm wide (at 2235mm high)	2594mm high (at 1118mm wide)	2.90m ²
1425mm wide (at 2385mm high)	3046mm high (at 1118mm wide)	3.40m ²

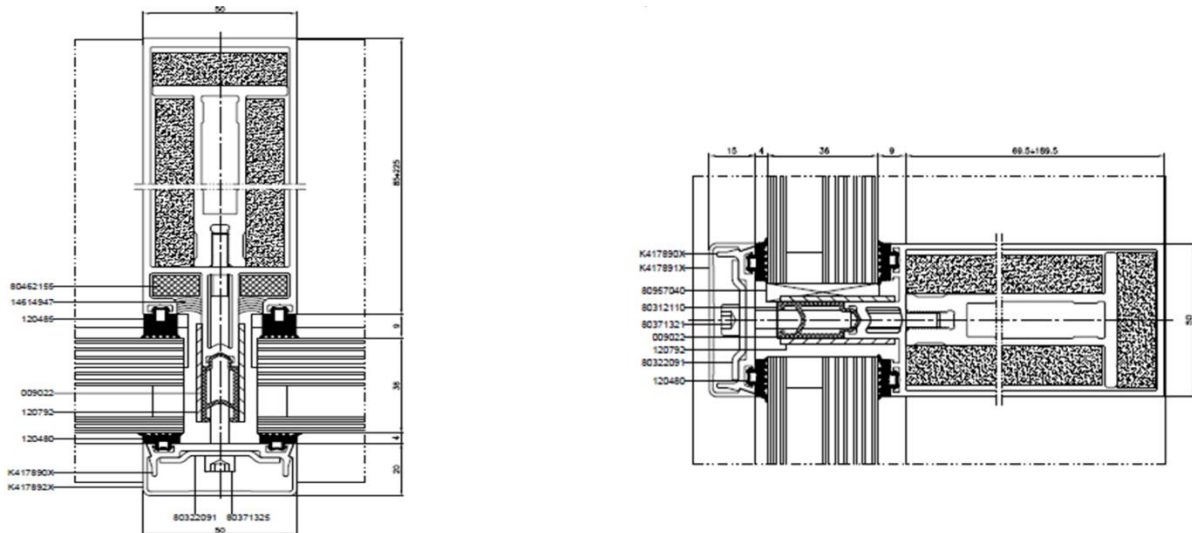
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 (including VI variant) within Aluprof MB-SR50N EI aluminium curtain walling systems for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-SR50N EI aluminium curtain walling system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems.

Glazing and frame details are as described in **Warringtonfire test report WF426341**.



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 (including VI variant) shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1875mm wide (at 2726mm high)	3407mm high (at 1500mm wide)	5.11m ²

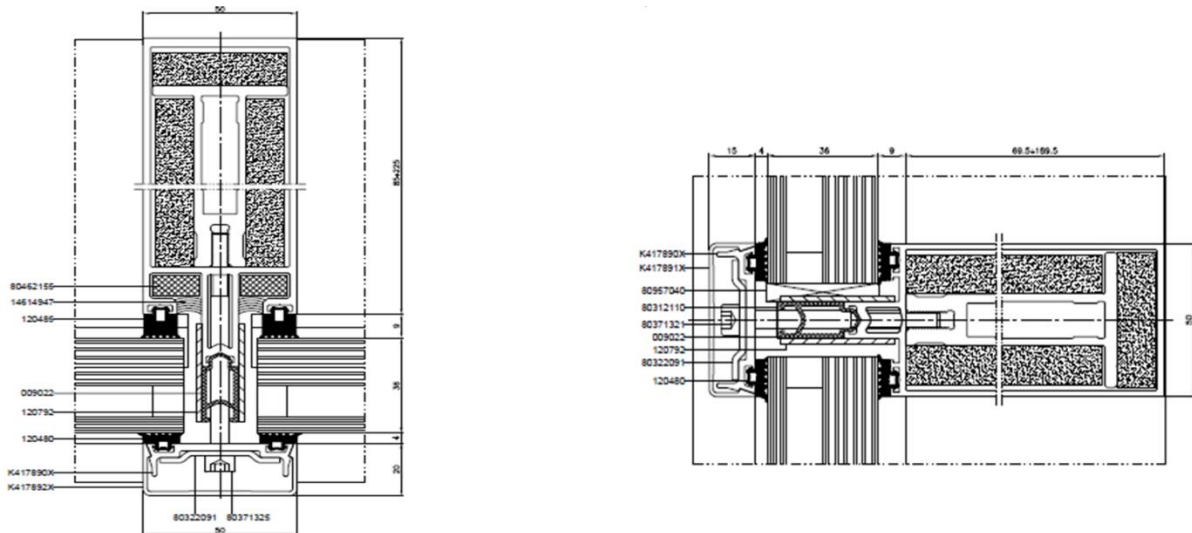
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 (including VI variant) within Aluprof MB-SR50N EI aluminium curtain walling systems for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-SR50N EI aluminium curtain walling system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems.

Glazing and frame details are as described in **Warringtonfire test report WF426341**.



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 (including VI variant) shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1550mm wide (at 2726mm high)	2817mm high (at 1500mm wide)	4.22m ²

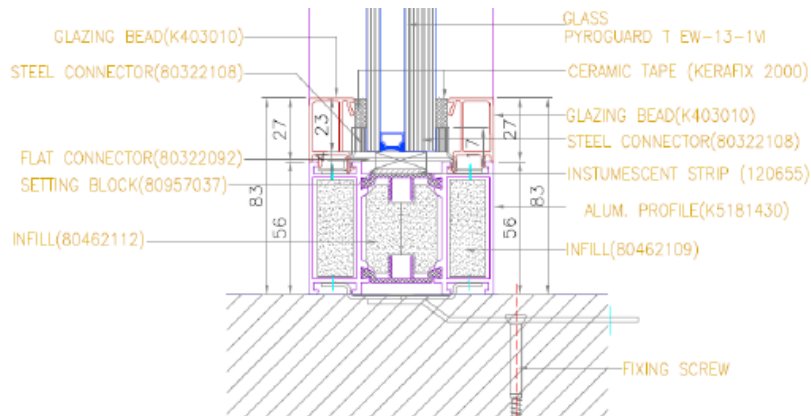
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI glass in Aluprof MB-78 EI aluminium framed screen system with glazed panels for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium screen system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems

- Glazing and frame details as described in **Thomas Bell-Wright test report UE 087-1C**
-



This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW30/13-1 VI shown in the diagram below, when used in conjunction with the above system.

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

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

Maximum Width	Maximum Height	Maximum Area
1391mm wide (at 2880mm high)	3264mm high (at 1228mm wide)	4.00m ²

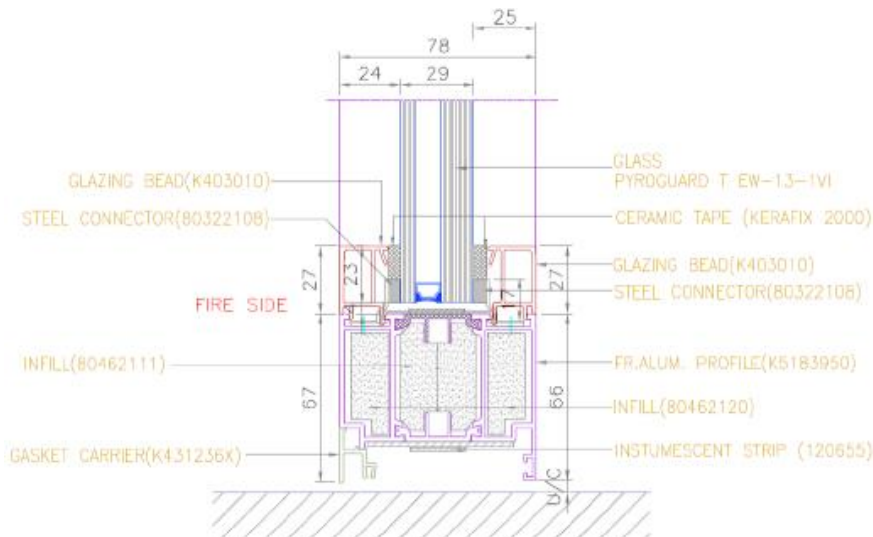
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI glass in Aluprof MB-78 EI aluminium framed door system with glazed panels for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium door system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems

- Glazing and frame details as described in **Thomas Bell-Wright test report UE 087-1C**



This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW30/13-1 VI shown in the diagram below, when used in conjunction with the above system.

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

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

Maximum Width	Maximum Height	Maximum Area
1232mm wide (at 2216mm high)	2511mm high (at 1087mm wide)	2.73m ²

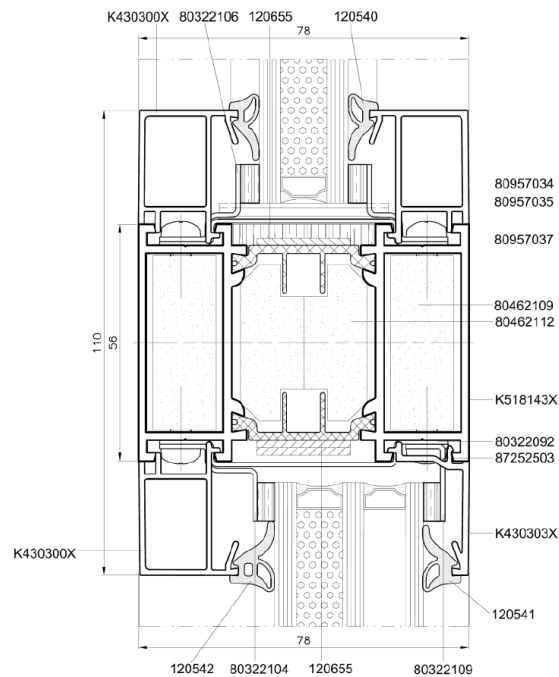
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 and 25-3 VI within Aluprof MB-78 EI aluminium framing screen system for periods of 30 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No's. EFR-16-V-002561 A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 and 25-3 VI 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.

Maximum Width	Maximum Height	Maximum Area
3125mm wide (at 1500mm high)	1875mm high (at 2500mm wide)	4.69m ²

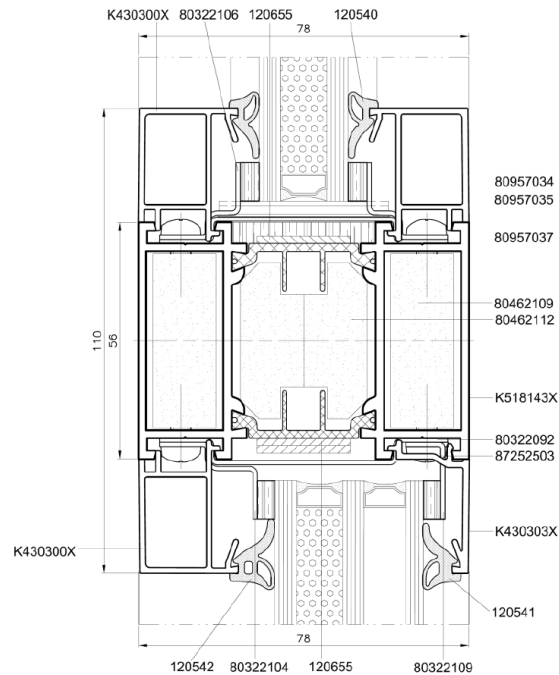
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 and 25-3 VI within Aluprof MB-78 EI aluminium framing screen system for periods of 60 minutes integrity and 30 minutes insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No's. EFR-16-V-002561 A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 and 25-3 VI 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.

Maximum Width	Maximum Height	Maximum Area
2542mm wide (at 1500mm high)	1525mm high (at 2500mm wide)	3.81m ²

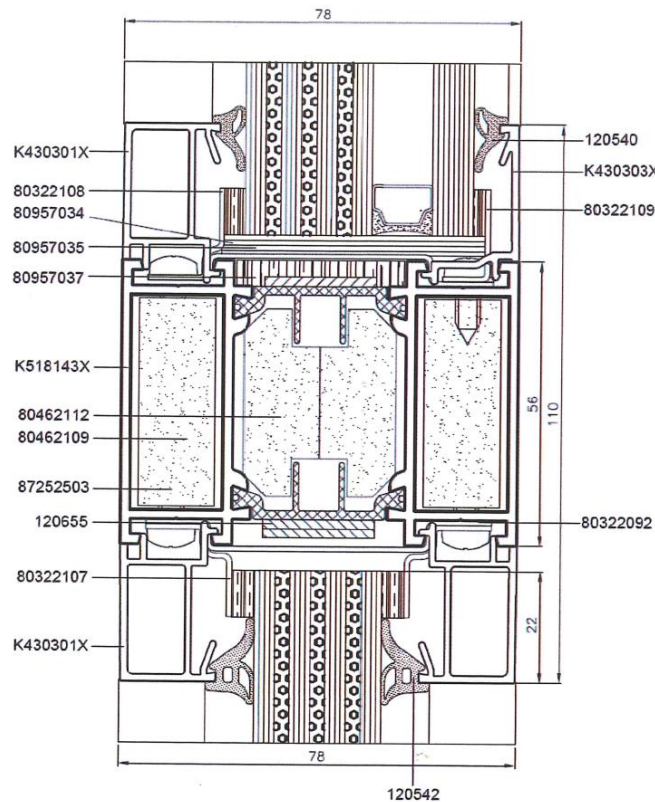
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 and 25-3 VI within Aluprof MB-78 EI aluminium framing screen system for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No's. EFR-14-V-003557A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 and 25-3 VI shown in the diagrams below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Maximum Width	Maximum Height	Maximum Area
1573mm wide (at 2800mm high)	2996mm high (at 1470mm wide)	4.40m ²

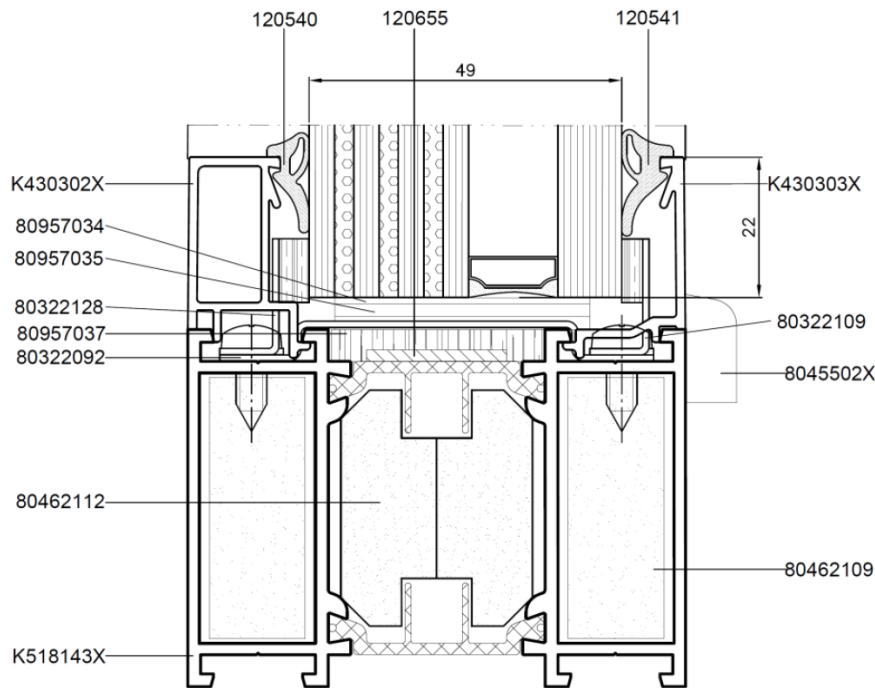
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 and 25-3 VI IGUs within Aluprof MB-78 EI aluminium framing single pane screen system for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed single pane screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No's. EFR-18-V-003590 A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 and 25-3 VI 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.

Maximum Width	Maximum Height	Maximum Area
2751mm wide (at 1476mm high)	1722mm high (at 2358mm wide)	4.06m ²

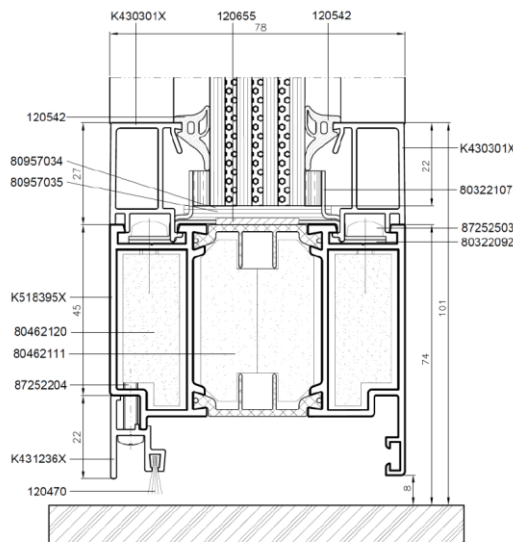
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 within Aluprof MB-78 EI aluminium framed doorsets for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed doorset system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of doorset system.

Glazing and frame details are as described in **Efectis test report EFR-16-V-002562 A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 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.

Maximum Width	Maximum Height	Maximum Area
1256mm wide (at 2358mm high)	2672mm high (at 1108mm wide)	2.96m ²

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Pyroguard T-EI60/25-3 VI IGUs within Aluprof MB-78 EI aluminium framed door systems for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-78 EI aluminium framed doorset system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of doorset system.

Glazing and frame details are as described in **Efectis test report No. EFR-15-V-000202**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 VI shown in the diagram below, when used in conjunction with the above system. The aspect ratio of the glass may be unlimited within these aperture dimensions.

Maximum Width	Maximum Height	Maximum Area
1118mm wide (at 2358mm high)	2358mm high (at 1118mm wide)	2.64m ²

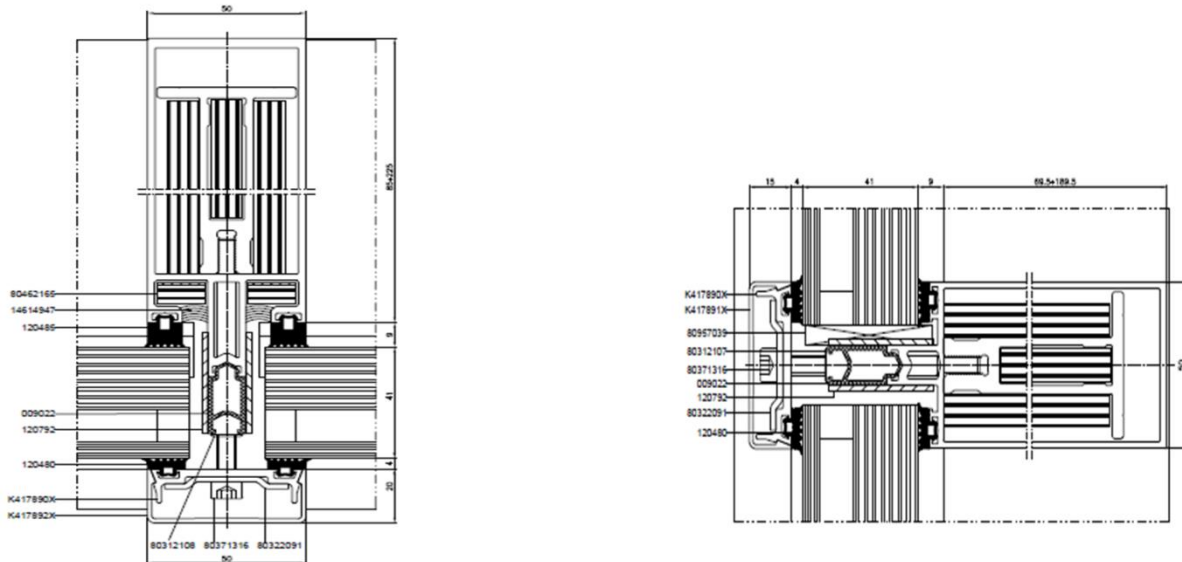
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 VI IGUs within Aluprof MB-SR50N EI aluminium curtain walling systems for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within an Aluprof MB-SR50N EI aluminium curtain walling system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems.

Glazing and frame details are as described in **Warringtonfire test report WF426340**.



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 VI shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1625mm wide (at 2738mm high)	2966mm high (at 1500mm wide)	4.45m ²

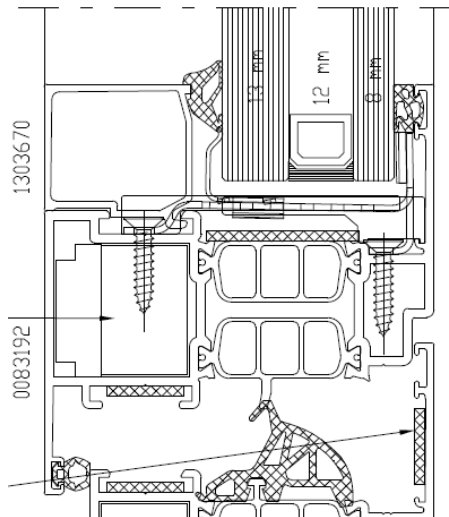
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI IGUs within Reynaers CS 77 FP EI30 aluminium framing opening window system for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI30 aluminium framed window as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **DMT test report DMT-DP-50-826**



This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW30/13-1 VI shown in the diagram below, when used in conjunction with the above system.

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

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

Maximum Width	Maximum Height	Maximum Area
934mm wide (at 1677mm high)	1788mm high (at 876mm wide)	1.56 m ²

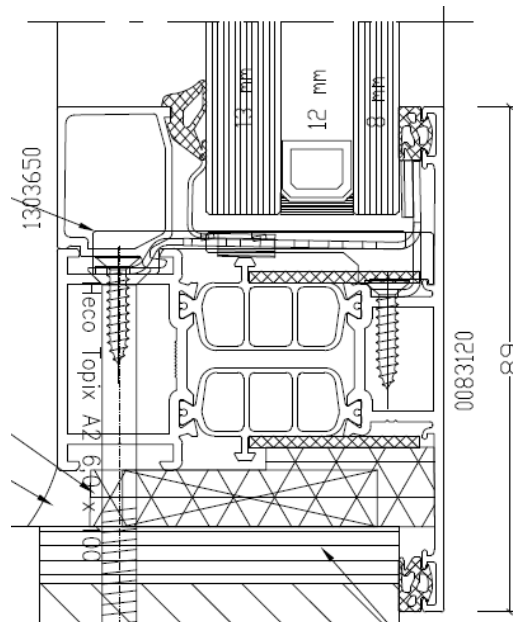
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EW30/13-1 VI IGUs within Reynaers CS 77 FP EI30 aluminium framing screen system for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI30 aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **DMT test report DMT-DP-50-826**



This Certificate of Approval relates to the sizes of IGU with 13mm thick Pyroguard T-EW30/13-1 VI shown in the diagram below, when used in conjunction with the above system.

This configuration is only approved as an IGU and only with the Pyroguard T-EW30/13-1 on the exposed side.

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

Maximum Width	Maximum Height	Maximum Area
1471mm wide (at 2860mm high)	3050mm high (at 1379mm wide)	4.20m ²
1525mm wide (at 405mm high)	432mm high (at 1430mm wide)	0.61m ²

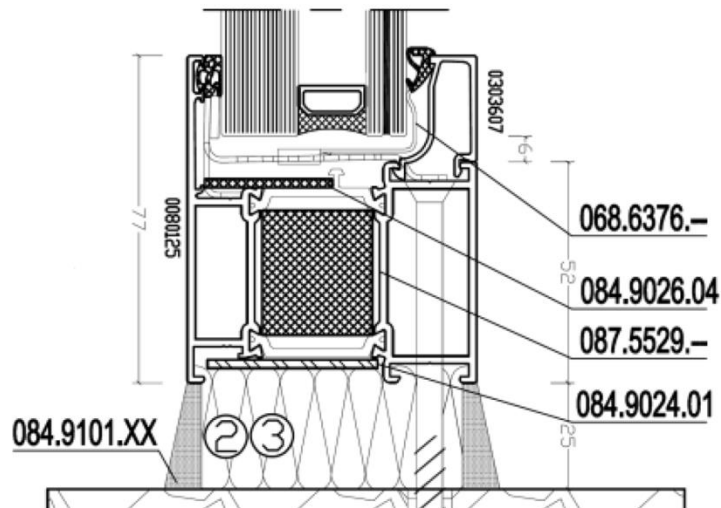
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI IGUs within Reynaers CS 77 FP EI30 aluminium framing screen system for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI30 aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-18-V-004086-A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 (including VI variant) shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1544mm wide (at 3210mm high)	4012mm high (at 1235mm wide)	4.95m ²

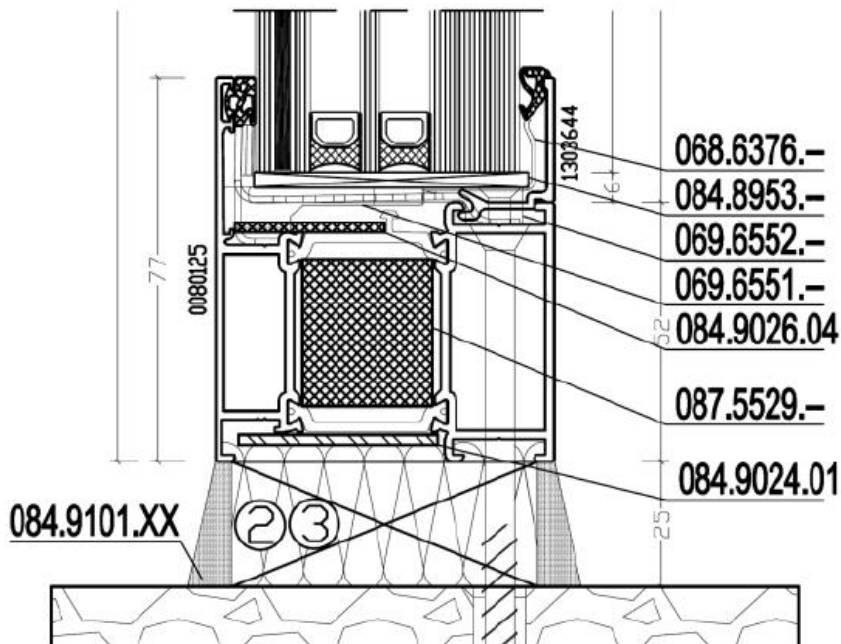
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 TVI (TGUs) within Reynaers CS 77 FP EI30 aluminium framing screen system for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI30 aluminium framed screen as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-18-V-004086-A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 TVI (TGUs) only, shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1900mm wide (at 3210mm high)	4012mm high (at 1520mm wide)	6.10m ²

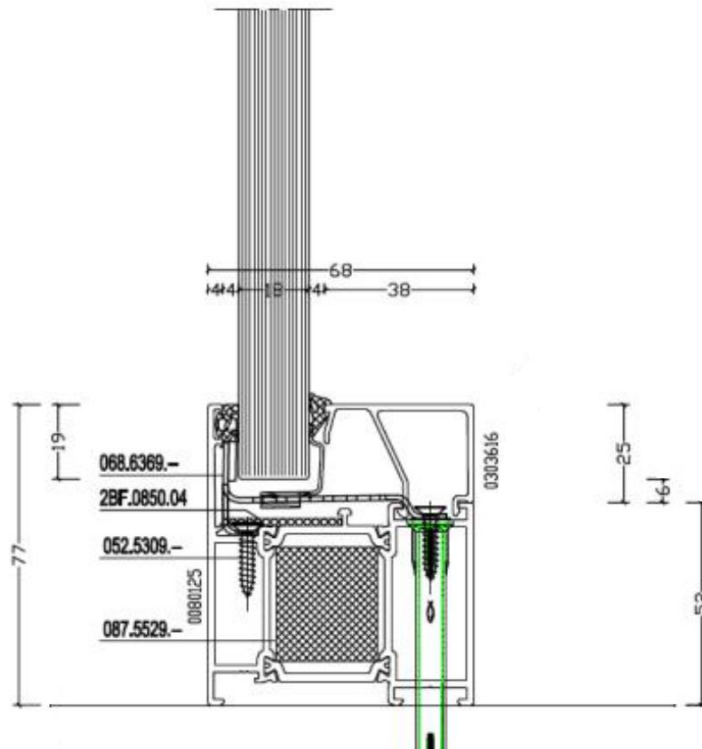
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 within Reynaers CS 77 FP EI30 aluminium framed screens for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI30 aluminium framed screens as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-20-V-000079**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1775mm wide (at 2726mm high)	3407mm high (at 1420mm wide)	4.84m ²

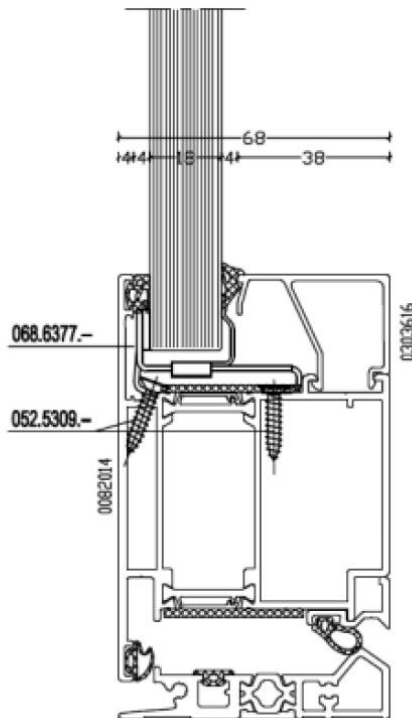
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 within Reynaers CS 77 FP EI30 aluminium framed doorsets for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI30 aluminium framed doorsets as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-20-V-000079**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1642mm wide (at 2584mm high)	3230mm high (at 1314mm wide)	4.24m ²

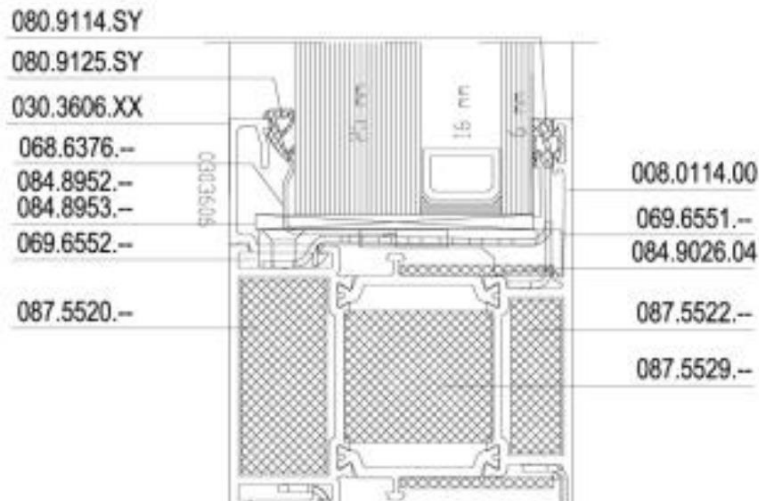
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 VI IGUs within Reynaers CS 77 FP EI60 aluminium framed screens for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI60 aluminium framed screens as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-18-V-004069-A**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 VI IGUs shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1775mm wide (at 2800mm high)	3313mm high (at 1500mm wide)	4.97m ²

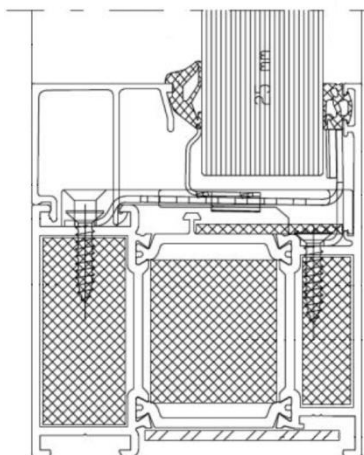
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 within Reynaers CS 77 FP EI60 aluminium framed screens for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI60 aluminium framed screens as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-20-V-000080**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1514mm wide (at 2726mm high)	2907mm high (at 1420mm wide)	4.13m ²

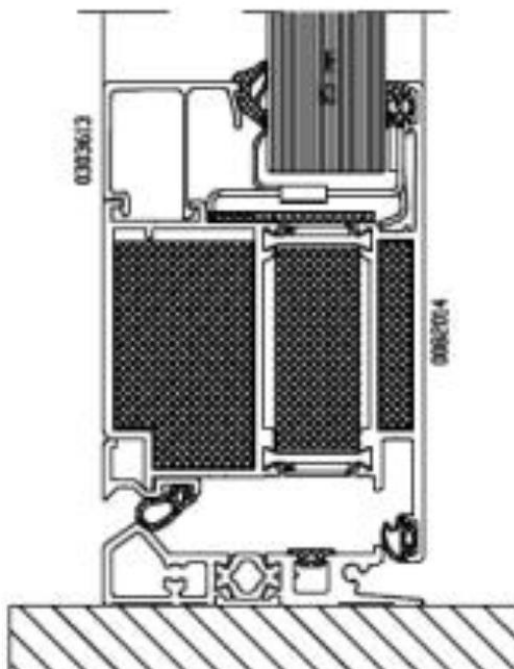
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI60/25-3 within Reynaers CS 77 FP EI60 aluminium framed doorsets for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CS 77 FP EI60 aluminium framed doorsets as detailed diagrammatically below. Please consult the frame manufacturer for full specification of framing system.

Glazing and frame details are as described in **Efectis test report No. EFR-20-V-000080**



This Certificate of Approval relates to the sizes of Pyroguard T-EI60/25-3 shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
1401mm wide (at 2584mm high)	2756mm high (at 1314mm wide)	3.62m ²

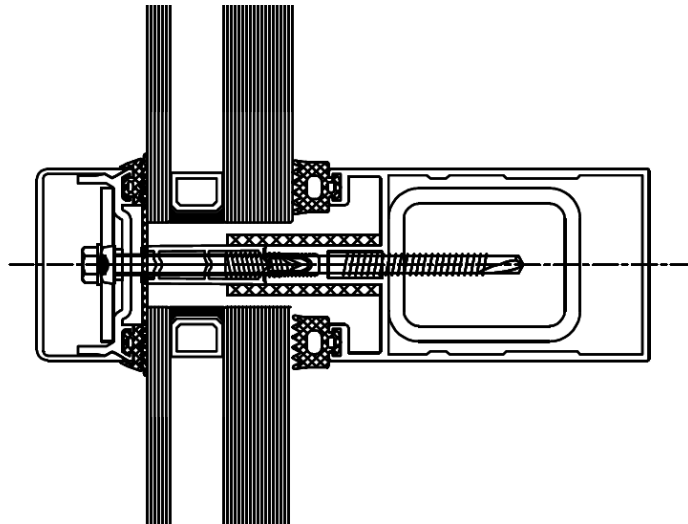
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI within Reynaers CW 50-FP profile aluminium curtain wall system for periods of 30 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CW 50-FP aluminium curtain walling system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems.

Glazing and frame details are as described in **Warringtonfire test report No. 438579/R Issue 3**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 VI shown in the diagrams below, when used in conjunction with the above system.

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

Maximum Width	Maximum Height	Maximum Area
2047mm wide (at 2865mm high)	3581mm high (at 1638mm wide)	5.86m ²

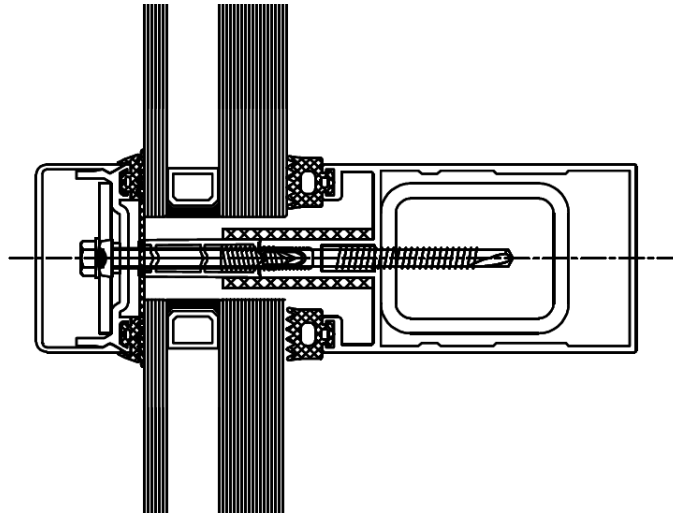
CERTIFICATE No CF 5204 PYROGUARD UK LTD

Pyroguard T-EI30/18-2 VI within Reynaers CW 50-FP profile aluminium curtain wall system for periods of 60 minutes integrity and insulation

For this application the following conditions shall apply:

The glass shall be glazed within a Reynaers CW 50-FP aluminium curtain walling system as detailed diagrammatically below. Please consult the frame manufacturer for full specification and approved scope of curtain walling systems.

Glazing and frame details are as described in **Warringtonfire test report No. 438579/R Issue 3**



This Certificate of Approval relates to the sizes of Pyroguard T-EI30/18-2 VI shown in the diagrams below, when used in conjunction with the above system.

This configuration is only approved as an IGU and only with the Pyroguard T-EI30/18-2 on the exposed side.

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

Maximum Width	Maximum Height	Maximum Area
1720mm wide (at 2865mm high)	3008mm high (at 1638mm wide)	4.92m ²