



PRIVATE & CONFIDENTIAL

## IFC FIELD OF APPLICATION REPORT

### Field of Application for FD30 Strebord® 44, Strebord® Superpan and Strebord® 54 Door Leaves Installed in Timber and Steel Frames

Fire Resistance Standard: BS476: Part 22: 1987

IFC Report IFCA/08037 Revision D

Prepared on behalf of: Falcon Panel Products Ltd  
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*NOTE: This report should not be manipulated, abridged or otherwise presented without the written consent of International Fire Consultants Ltd*

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## ISSUE AND AMENDMENT RECORD

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-	April 2008	#8969	CH	DC	-	-
A	October 2011	#11227	DC	DJI	Various	Revalidation, updating of format, inclusion of additional test evidence and associated revisions
B	March 2012	#11573	DC	DJI	Various	Revalidation, inclusion of additional test evidence for bond up construction and associated revisions
C	June 2014	#14030	PP	DC	Various	Inclusion of additional test evidence and associated revisions
D	March 2020	#17583	WL	DC	Various	Inclusion of additional test evidence and associated revisions

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# 1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Falcon Panel Products, to define the field of application for timber based door assemblies, comprising Strebord® 44, Strebord® Superpan and Strebord® 54 door leaves installed in timber and steel frames, that are required to provide 30 minute fire resistance performance, when adjudged against BS476: Part 22: 1987.

The use of the Strebord® 54 door leaf design is permitted for specific design options for 30 minute fire resisting applications. All other details are to remain as specified in this Field of Application Report. The Strebord® 54 specification is given in Section 3.3.3.

This assessment has been produced using the principles outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, 2019, Industry Standard Procedure'*.

When establishing the variations in the construction that can achieve the required fire resistance performance, IFC complies with the principles found in the following documents:

- BS ISO/TR 12470-2: 2017 *'Fire resistance tests - Guidance on the application and extension of results from tests conducted on fire containment assemblies and products. Part 2: Non-load bearing elements'*
- EN 15725: 2010: *'Extended application reports on the fire performance of construction products and building elements'*

It is proposed that variations to the tested specifications, as described in the following sections, may be accommodated into door assemblies, without reducing their potential to achieve a 30 minute integrity rating, if tested in accordance with the method and criteria of BS476: Part 22: 1987. The omission of information on any components or manufacturing methods does not imply a lack of approval of those details, but these would need to be the subject of a separate analysis. Only variations specifically mentioned are supported by this assessment document, all other aspects must otherwise be as proven in tests summarised herein.

It is more onerous to test timber door assemblies, hinged or pivoted, with the specimen installed with the leaf opening in towards the furnace. Testing in this orientation is therefore incorporated into Field of Application Reports to cover doors opening in the opposite direction. The principle is only applicable when the door construction, and any features within the door leaf, such as glazing, are symmetrical. Test evidence exists demonstrating the Strebord 44 and Strebord 54 door leaves tested in both orientations, and this is referenced in the summary of test evidence in Appendix G.

Unless stated otherwise, herein, this Field of Application considers the scope of approval for door assemblies that may be installed in either orientation, that being with either face exposed to fire conditions.

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## 2. TEST EVIDENCE

The test evidence used to support this Field of Application Report is summarised in Appendix G of this report.

## 3. SCOPE OF APPROVAL

### 3.1 Door Assembly Configuration

The approved leaf sizes and configurations of door assemblies comprising Strebord® 44, Strebord® Superpan and Strebord® 54 door leaves are outlined below:

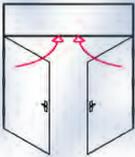
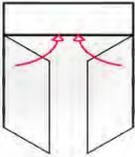
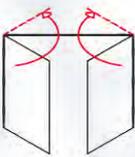
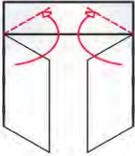
Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Steel Frames
 <ul style="list-style-type: none"> <li>● <b>Latched</b></li> <li>● <b>Single Acting</b></li> <li>● <b>Single Door</b></li> <li>● <b>Without Overpanel</b></li> </ul>	Figure 08037D/C01 in Appendix C	Figure 08037D/E01 in Appendix E
 <ul style="list-style-type: none"> <li>● <b>Latched</b></li> <li>● <b>Single Acting</b></li> <li>● <b>Single Door</b></li> <li>● <b>With Overpanel</b> <i>Note 1</i></li> </ul>	Figure 08037D/C03 in Appendix C	Not Permitted
 <ul style="list-style-type: none"> <li>● <b>Unlatched</b></li> <li>● <b>Single Acting</b></li> <li>● <b>Single Door</b></li> <li>● <b>Without Overpanel</b></li> </ul>	Figure 08037D/C02 in Appendix C	Figure 08037D/E02 in Appendix E
 <ul style="list-style-type: none"> <li>● <b>Unlatched</b></li> <li>● <b>Single Acting</b></li> <li>● <b>Single Door</b></li> <li>● <b>With Overpanel</b> <i>Note 1</i></li> </ul>	Figure 08037D/C04 in Appendix C	Not Permitted
 <ul style="list-style-type: none"> <li>● <b>Unlatched</b></li> <li>● <b>Double Acting</b></li> <li>● <b>Single Door</b></li> <li>● <b>Without Overpanel</b></li> </ul>	Figure 08037D/C02 in Appendix C	Not Permitted

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Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Steel Frames
 <ul style="list-style-type: none"> <li>• Unlatched</li> <li>• Double Acting</li> <li>• Single Door</li> <li>• With Overpanel <i>Note 2</i></li> </ul>	Figure 08037D/C04 in Appendix C	Not Permitted
 <ul style="list-style-type: none"> <li>• Latched</li> <li>• Single Acting</li> <li>• Double Doors <i>Note 3</i></li> <li>• Without Overpanel</li> </ul>	Figure 08037D/C05 in Appendix C	Figure 08037D/E03 in Appendix E
 <ul style="list-style-type: none"> <li>• Latched</li> <li>• Single Acting</li> <li>• Double Doors <i>Note 3</i></li> <li>• With Overpanel <i>Note 1</i></li> </ul>	Figure 08037D/C07 in Appendix C	Not Permitted
 <ul style="list-style-type: none"> <li>• Unlatched</li> <li>• Single Acting</li> <li>• Double Doors <i>Note 3</i></li> <li>• Without Overpanel</li> </ul>	Figure 08037D/C06 in Appendix C	Figure 08037D/E04 in Appendix E
 <ul style="list-style-type: none"> <li>• Unlatched</li> <li>• Single Acting</li> <li>• Double Doors <i>Note 3</i></li> <li>• With Overpanel <i>Note 1</i></li> </ul>	Figure 08037D/C08 in Appendix C	Not Permitted
 <ul style="list-style-type: none"> <li>• Unlatched</li> <li>• Double Acting</li> <li>• Double Doors <i>Note 3</i></li> <li>• Without Overpanel</li> </ul>	Figure 08037D/C06 in Appendix C	Not Permitted
 <ul style="list-style-type: none"> <li>• Unlatched</li> <li>• Double Acting</li> <li>• Double Doors <i>Note 3</i></li> <li>• With Overpanel <i>Note 2</i></li> </ul>	Figure 08037D/C08 in Appendix C	Not Permitted

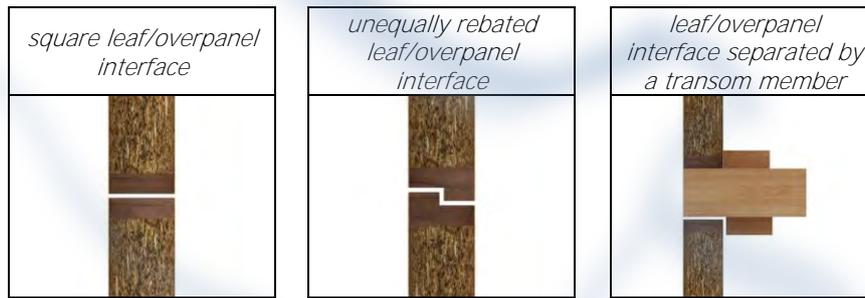
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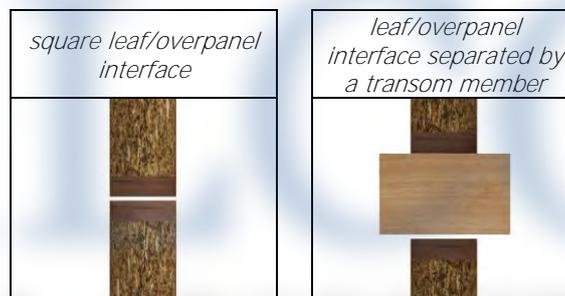
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Note 1 Single acting door assemblies in timber frames which include overpanels may have one of the following configurations:



Single leaf doors with over-rebated edges are not permitted with flush overpanels.

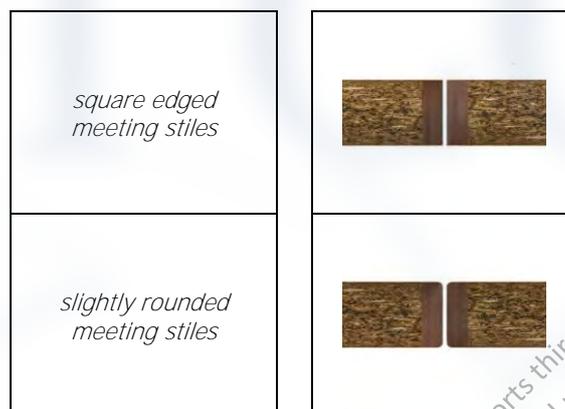
Note 2 Double acting door assemblies in timber frames which include overpanels may have one of the following configurations:



Note 3 Double acting, double leaf door assemblies must have square edged or slightly rounded meeting stiles.

Single acting, double leaf door assemblies may have square edged (or slightly rounded) or rebated meeting stiles. Rebated meeting stiles are not permitted for use in conjunction with flush overpanels (i.e. without a transom); the meeting stiles must be square (or slightly rounded).

Test report WF388638 demonstrates the fire resisting performance of a double door assembly with radiused edges. On this basis a maximum radius of 4mm may be utilised on double acting double leaf door assemblies otherwise as approved herein.



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## 3.2 Maximum Assessable Door Leaf Sizes

### 3.2.1 General

The calculated envelopes of assessed leaf dimensions for each door assembly configuration covered by this field of application report are given in Appendix C (timber door frames) and Appendix E (steel door frames) based upon use of the intumescent seal specifications shown in Appendix B (timber door frames) and Appendix D (steel door frames).

Double door assemblies may each be of the same width, up to the maximum width indicated in Appendix C or E. For unequal pairs there is no limit on the ratio of leaf widths, (although the large leaf must still be within the limitations in Appendix C or E). The width of the small leaf shall not be less than 250mm, since this will affect its vertical stability relative to that of the larger leaf. The small leaf must be fitted with a closer or engaged bolts at the top and bottom of the leaf.

### 3.2.2 Leaf Size Adjustment

The Strebord® 44, Strebord® Superpan and Strebord® 54 designs do not contain any internal framework and may be adjusted in height and width without limitation to suit required door leaf sizes (subject to the limitations in Section 3.2.1 above).

For on-site fitting purposes, lippings may be adjusted by a maximum of 3mm post-manufacture, providing a minimum thickness of 6mm is maintained.

## 3.3 Door Leaf Specification

The Strebord® 44, Strebord® Superpan and Strebord® 54 door leaf designs comprise a timber based construction, with details given below.

The leaf constructions, below, are based upon the test evidence detailed in Appendix G, and define variations and tolerances, where it is considered that these will not adversely affect overall fire resistance. The construction details are limited to the information available from the test reports.

It is the opinion of IFC that the scope given in this Field of Application Report can be applied to both of the door designs listed below, unless otherwise specifically stated herein.

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3.3.1 Strebord® 44

Component		Material	Density	Dimensions
Core		Solid sheet of Strebord® 44 particleboard	Minimum 520kg/m <sup>3</sup> to maximum 630kg/m <sup>3</sup>	44mm thick
Lippings <i>Note 5</i>	Square edges	Hardwood	Minimum 530kg/m <sup>3</sup> <i>Note 6</i>	8–28mm thick
	Rounded edges			10–28mm thick <i>Note 7</i>
	Rebated edges			20–30mm thick <i>Note 8</i>
	Square edges	STRELIP® 30	Minimum 661-698kg/m <sup>3</sup>	6-10mm thick
	Square edges	Streframe	Minimum 450kg/m <sup>3</sup>	6-10mm thick
	Rounded edges	uPVC – to be used only with uPVC facings as listed below	-	Maximum 2mm thick
Adhesive		Polyurethane, PVA, Urea formaldehyde, melamine-urea formaldehyde, phenol formaldehyde or resorcinol	-	-
Minimum leaf thickness	Without applied facings	-	-	43mm <i>Note 9</i>
	With applied facings	-	-	43.5mm <i>Note 10</i>
Optional additional decorative finishes		Timber veneer or decorative plastic based laminate (to leaf faces only)	-	Maximum 2mm thick
		Paint or varnish	-	Maximum 0.5mm thick
		uPVC – Fully encasing leaf	-	Maximum 2mm thick
		MDF <i>Note 12</i>	750 kg/m <sup>3</sup>	Maximum 10mm thick

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### 3.3.2 Strebord® Superpan

Component		Material	Density	Dimensions
Core		38mm thick solid sheet of Strebord® particleboard with nominal 3mm thick integral outer MDF facings, fully bonded with a PVA adhesive, incorporated during the manufacturing process (factory applied)	560kg/m <sup>3</sup> <i>Note 4</i>	44mm thick
Lippings <i>Note 5</i>	Square edges	Hardwood	Minimum 530kg/m <sup>3</sup> <i>Note 6</i>	8–28mm thick
	Rounded edges			10–28mm thick <i>Note 7</i>
	Rebated edges			20–30mm thick <i>Note 8</i>
	Square edges	STRELIP® 30	Minimum 661-698kg/m <sup>3</sup> <i>Note 6</i>	6-10mm thick
	Square edges	Streframe	Minimum 450kg/m <sup>3</sup>	6-10mm thick
Adhesive		Polyurethane, PVA, Urea formaldehyde, melamine-urea formaldehyde, phenol formaldehyde or resorcinol	–	–
Minimum leaf thickness	Without applied facings	–	–	43mm <i>Note 9</i>
	With applied facings			43.5mm <i>Note 10</i>
Optional additional decorative finishes		Timber veneer or decorative plastic based laminate (to leaf faces only)	–	Maximum 2mm thick
		Paint or varnish	–	Maximum 0.5mm thick
		MDF <i>Note 12</i>	750kg/m <sup>3</sup>	Maximum 10mm thick

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### 3.3.3 Strebord® 54

Component		Material	Density	Dimensions
Core		Solid sheet of Strebord® 54 particleboard	Minimum 520kg/m <sup>3</sup> to maximum 630kg/m <sup>3</sup>	54mm thick
Lippings <i>Note 5</i>	Square edges	Hardwood	Minimum 530kg/m <sup>3</sup> <i>Note 6</i>	8–28mm thick
	Rounded edges			10–28mm thick <i>Note 7</i>
	Rebated edges			20–30mm thick <i>Note 11</i>
	Square edges	STRELIP® 60	Minimum 661kg/m <sup>3</sup> <i>Note 6</i>	6-10mm thick
Adhesive		Polyurethane, PVA, Urea formaldehyde, melamine-urea formaldehyde, phenol formaldehyde or resorcinol	–	–
Minimum leaf thickness	Without applied facings	–	–	53mm <i>Note 9</i>
	With applied facings	–	–	53.5mm <i>Note 10</i>
Optional additional decorative finishes		Timber veneer or decorative plastic based laminate (to leaf faces only)	–	Maximum 2mm thick
		Paint or varnish	–	Maximum 0.5mm thick
		MDF <i>Note 12</i>	700kg/m <sup>3</sup>	Maximum 5mm thick

*Note 4* Average density with a  $\pm 10\%$  variation permissible.

*Note 5* Lippings to be installed at vertical edges of each leaf or can be installed to all four edges, if required.

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*Note 6 Lippings to be straight grained hardwood, with minimum measured density at 12% moisture content and of appropriate quality in accordance with BS EN 942: 2007. Moisture content to be  $11 \pm 2\%$  for UK market in heated buildings between 12-21°C (or to suit internal joinery moisture content specification of export countries).*

*The machining of the core/lipping, and bonding process, must be such to ensure that no gaps occur between core and lipping.*

*Note 7 The radius formed on the leading edge of double acting doors, or single acting double doors, shall not remove more than 4mm thickness of lippings on the door face, see Figure 08037D/A01 in Appendix A. The radius of pivot stiles shall suit the pivot/floor spring employed.*

*Note 8 Dimensions to suit equal 22mm width rebates, with a 12mm depth.*

*Note 9 Maximum 0.5mm calibration to both sides of the leaf permitted prior to the application of decorative faces.*

*Note 10 Minimum finished leaf thickness is 43.5mm (with applied finish).*

*Note 11 Dimensions to suit equal 27mm width rebates, with a 12mm depth.*

*Note 12 MDF facings are required to be installed equally to both faces of the leaf as to not unbalance the leaves in cold state applications.*

*MDF facings shall be adhered to the leaf using a PVA or PU type adhesive.*

### 3.3.4 Decorative Grooves

#### Option 1

The Strebord® 44 design has been successfully tested with material removed from both faces of the door leaf and shown to maintain 30 minutes integrity performance. It is therefore permitted to groove/recess both faces of the Strebord® 44 design with the following specification:

Element	Details
Maximum surface area of grooves/recess on any one face	30%
Maximum depth of groove/recess without additional material applied to bottom of groove/recess	7mm
Maximum depth of groove/recess prior to applying 3mm (t) timber or MDF to bottom of groove/recess	10mm

Element	Details	
Approved infill materials for grooves/recess	1. Hardwood (minimum density 640kg/m <sup>3</sup> ) 2. MDF (minimum density 700kg/m <sup>3</sup> )  <i>Note: It is permitted to groove/recess the infill material applied in the bottom of a groove or recess providing at least 3mm of infill material remains in the bottom of the groove/recess</i>	
Adhesive for infill materials	PVA, Urea Formaldehyde, Polyurethane	
Proximity to door edges	Horizontal grooves	75mm from top and bottom of door leaf
	Vertical grooves	75mm from the sides of door leaf
Specific requirements	1. The groove/recess must not coincide with any apertures (e.g. glazing, air transfer grilles, letter plates, etc.) i.e. the groove or recess must stop 5mm short of the aperture cut out 2. Grooves and recesses must not coincide with any items of recessed hardware where the body of the hardware is thicker than 20mm (e.g. concealed over and jamb mounted closers)	
Configuration	Latched & unlatched, single and double acting, single and double leaf door assemblies	
Leaf size range	All	
Intumescent seal dimensions	All	

## Option 2

The Falcon Panel Products Strebord® Superpan may be grooved to the following specification:

Element	Details	
Maximum groove size	10mm wide x 4mm deep	
Proximity to door edges	Horizontal grooves	100mm from top and bottom
	Vertical grooves	100mm from sides
Groove spacing	100mm	
Orientation	Vertical or horizontal	
Specific requirements	1. The groove/recess must not coincide with any apertures (e.g. glazing, air transfer grilles, letter plates, etc.) i.e. the groove or recess must stop 5mm short of the aperture cut out 2. Grooves and recesses must not coincide with any items of recessed hardware where the body of the hardware is thicker than 20mm (e.g. concealed over and jamb mounted closers)	

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Configuration	Latched & unlatched, single and double acting, single and double leaf door assemblies
Leaf size range	2200 x 935mm
Intumescent seal dimensions	15 x 4mm

### Option 3

The Strebord® 54 design can be grooved/recessed on both faces with the following specification:

Element	Details	
Maximum surface area of grooves/recess on any one face	35%	
Maximum depth of groove/recess without additional material applied to bottom of groove/recess	10mm	
Maximum depth of groove/recess prior to applying 3mm (t) timber or MDF to bottom of groove/recess	13mm	
Approved infill materials for grooves/recess	1. Hardwood (minimum density 640kg/m <sup>3</sup> ) 2. MDF (minimum density 700kg/m <sup>3</sup> )  <i>Note: It is permitted to groove/recess the infill material applied in the bottom of a groove or recess providing at least 3mm of infill material remains in the bottom of the groove/recess</i>	
Adhesive for infill materials	PVA, Urea Formaldehyde, Polyurethane	
Proximity to door edges	Horizontal grooves	75mm from top and bottom of door leaf
	Vertical grooves	75mm from the sides of door leaf
Specific requirements	1. The groove/recess must not coincide with any apertures (e.g. glazing, air transfer grilles, letter plates, etc.) i.e. the groove or recess must stop 5mm short of the aperture cut out 2. Grooves and recesses must not coincide with any items of recessed hardware where the body of the hardware is thicker than 20mm (e.g. concealed over and jamb mounted closers)	
Configuration	Latched & unlatched, single and double acting, single and double leaf door assemblies	
Leaf size range	All	
Intumescent seal dimensions	All	

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## Option 4

The Strebord® 44, Strebord® Superpan, and Strebord® 54 designs can be bonded up to a maximum 64mm thick using up to 10mm thick MDF facings on both sides of the door leaf. The facing is to be bonded using a PVA or PU type adhesive. The additional facing can be grooved/recessed on both faces with the following specification, providing the applied design does not unbalance the door leaf in cold state applications (to be determined by others):

Element	Details	
Maximum surface area of grooves/recess on any one face	100% (providing no material is removed from the central Strebord® 44 or Strebord® Superpan core)	
Maximum depth of groove/recess without additional material applied to bottom of groove/recess	10mm	
Maximum depth of groove/recess prior to applying 3mm (t) timber or MDF to bottom of groove/recess	13mm	
Approved infill materials for grooves/recess	1. Hardwood (minimum density 640kg/m <sup>3</sup> ) 2. MDF (minimum density 700kg/m <sup>3</sup> )  <i>Note: It is permitted to groove/recess the infill material applied in the bottom of a groove or recess providing at least 3mm of infill material remains in the bottom of the groove/recess</i>	
Adhesive for infill materials	PVA, Urea Formaldehyde, Polyurethane	
Proximity to door edges	Horizontal grooves	75mm from top and bottom of door leaf
	Vertical grooves	75mm from the sides of door leaf
Specific requirements	1. The groove/recess must not coincide with any apertures (e.g. glazing, air transfer grilles, letter plates, etc.) i.e. the groove or recess must stop 5mm short of the aperture cut out 2. Grooves and recesses must not coincide with any items of recessed hardware where the body of the hardware is thicker than 20mm (e.g. concealed over and jamb mounted closers)	
Configuration	Latched & unlatched, single and double acting, single and double leaf door assemblies	
Leaf size range	All	
Intumescent seal dimensions	All	

### 3.3.5 *Decorative Plant on Mouldings*

It is permitted to fit applied decorative mouldings to the face of the door leaves providing they do not unbalance the door leaf in cold state application. The applied material must be timber based (e.g. softwood, hardwood, MDF or engineered softwood or hardwood) and can be glued to the face of the door leaf or mechanically fixed. Mechanical fixings shall be suitably sized to fix through the decorative facing and must not be installed closer than 50mm from the lipping of the door leaf.

The applied mouldings must not affect the closing action of the door leaf and must not cover any apertures fitted with glass or air transfer grilles etc.

The applied mouldings must not exceed 25mm thick (i.e. protrusion from the door leaf face) and can be freely applied providing the total weight of the leaf does not increase by more than 30%.

No other material is approved for use as an applied decorative moulding (e.g. PVC or metal).

### 3.3.6 *Post Formed Door Leaves*

Strebord® 44 and Strebord® Superpan may be post formed in uPVC (i.e. fully encapsulated) subject to the following specification:

- The door leaf must be lipped on all edges with hardwood meeting the specification given in Section 3.3.1 and 3.3.2 above
- The lipping must be flat (i.e. not rebated) and may be profiled on the arrises with maximum 6mm radii to the door leaf (resulting in door leaf maximum 8mm radii when the uPVC is included)
- The uPVC must not conceal the perimeter intumescent strips where fitted in the leaf edge
- The uPVC must be no thicker than 2mm
- Post formed door leaves must be used with post formed door frames described in Section 3.4.3 or timber door frames as described in Section 3.4.1

### 3.3.7 *Hardwood Blocking for Pivots*

The following hardwood blocking is permitted for lipping the top and bottom of door leaves that require pivot fixings in severe duty locations

- Square lipping – 6 - 17mm thick
- Hardwood insert to receive pivot – 15mm thick centrally fitted within the door leaf with a minimum of 8mm door core on both sides of the insert
- Hardwood insert with lipping – It is permitted to fit the hardwood insert into the head of the door leaf and the square lipping on top

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The timber must be straight grained joinery quality hardwood with minimum density 640kg/m<sup>3</sup>.

Adhesives must be as required for lippings as detailed in the tables in Sections 3.3.1, 3.3.2 and 3.3.3.

### 3.3.8 Astragals

It is permitted to fit astragals of the same material that is approved for door edge lippings. The astragal can be mechanically fixed and/or glued to the door leaf but must not remove any material from the door leaf or interrupt any perimeter intumescent seals.

The door leaves must be fitted with a door closer or door selecting device that allows the doors to close sequentially.

The astragal must be at least 45mm (w) x 15mm (t) with 12mm overlap on the face of the opposing door leaf.

## 3.4 Frames

### 3.4.1 Timber Frames

Timber frames for doors without transomed overpanels, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendix C, utilising the intumescent seal specification outlined in Appendix B.

Material	Density	Minimum Face Width		Minimum Frame Depth	Minimum Stop Depth
		Single Acting	Double Acting		
Softwood or hardwood	450kg/m <sup>3</sup> <i>Note 13</i>	25mm, excluding stop <i>Note 15</i>	30mm <i>Note 16</i>	70mm	12mm <i>Note 17</i>
MDF	700kg/m <sup>3</sup> <i>Note 14</i>	25mm, excluding stop <i>Note 15</i>	30mm <i>Note 16</i>	70mm	12mm <i>Note 17</i>
Streframe E	510kg/m <sup>3</sup> <i>Note 18</i>	32mm, excluding stop <i>Note 15</i>	32mm <i>Note 16</i>	70mm	12mm <i>Note 17</i>

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*Note 13 Timber must have a minimum measured density at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be  $11 \pm 2\%$  for UK market, (or to suit internal joinery moisture content specification of export countries).*

*Note 14 MDF to have a minimum measured density at 12% moisture content.*

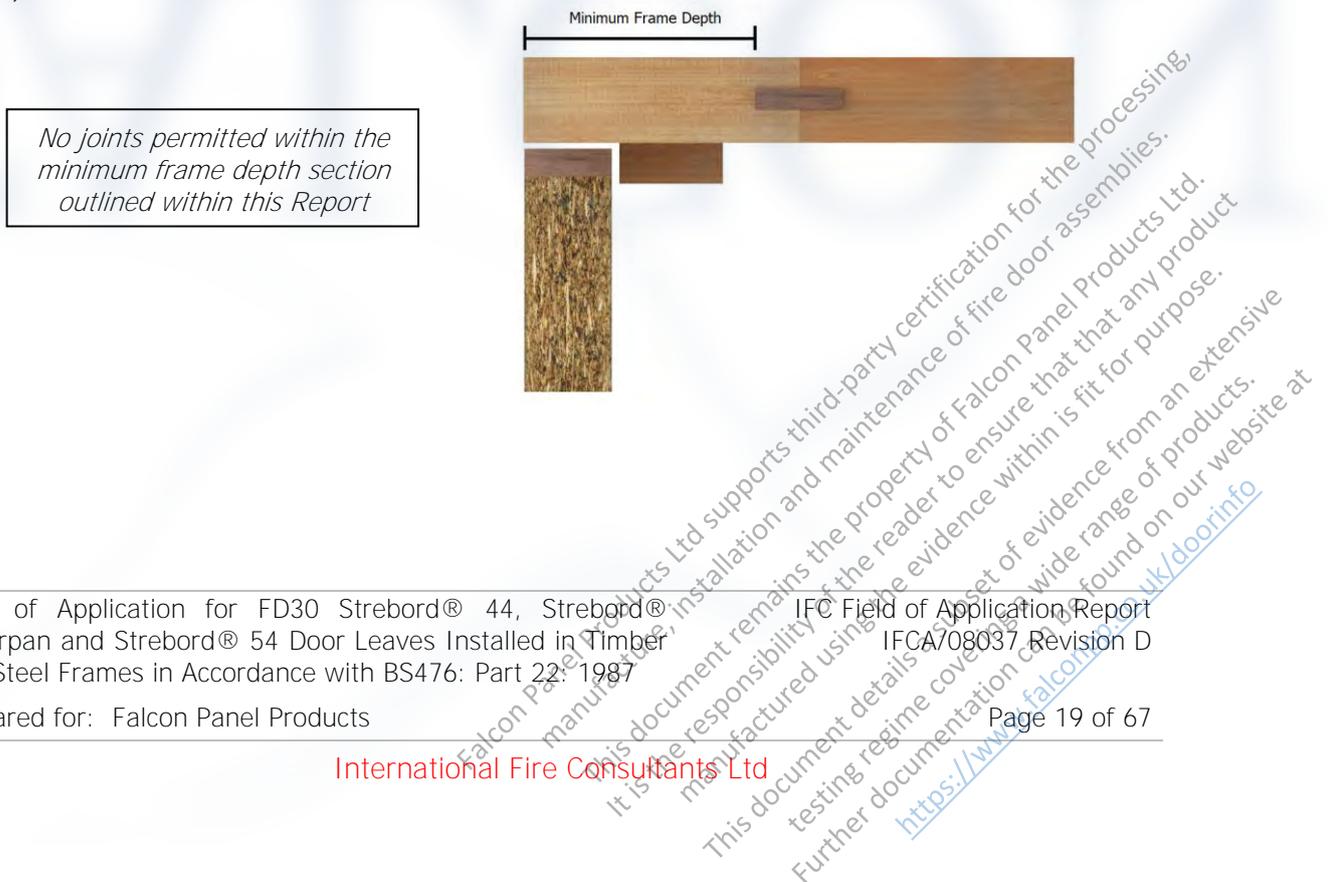
*Note 15 These dimensions assume that the rear of the frame is protected by the adjacent wall, (and firestopping), and that the frame does not project out from the wall. See Section 3.8 regarding projecting frames and shadow gaps.*

*Note 16 Frames for double acting doors do not require a stop but must have the stated minimum frame thickness at the scalloped edge which is to suit the radius of the pivot stile of the door and to facilitate the fitment of the top pivot.*

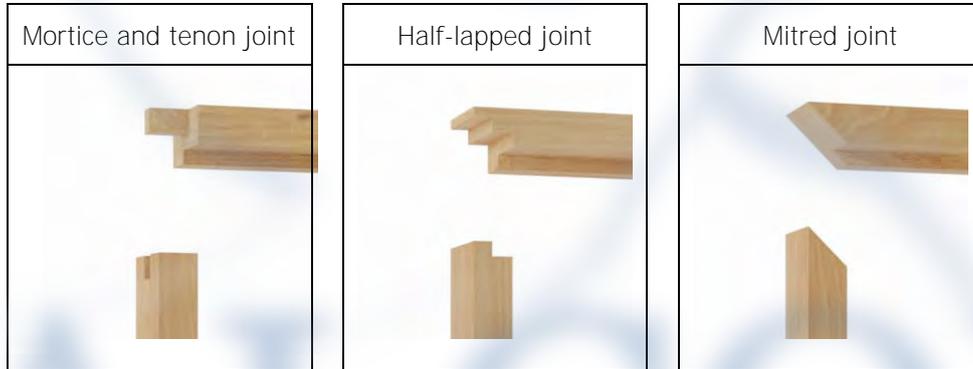
*Note 17 The doorstop can comprise the same material as the door frame or for planted stops can be one of the other approved materials in the table above (i.e. softwood, hardwood, MDF or finger jointed redwood meeting the minimum specification in the table above). The stop may be either planted and pinned using 40mm steel pins, 40mm steel screws (fixings at 200mm centres) or glued in position using one of the adhesives specified for lippings in the leaf construction tables in Section 3, or integral with the main door frame, providing the minimum frame thickness remains as stated.*

*Note 18 The finger jointed engineered redwood must have a minimum measured density at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be  $11 \pm 2\%$  for UK market, (or to suit internal joinery moisture content specification of export countries). The finger joints must be glued using PVAc adhesive of the appropriate grade for the application (details help on confidential file by IFC).*

The overall frame depth may be increased by the use of extension linings, but the joint between the main frame and the extension lining must not intrude in the plane of the door thickness. The extension linings do not have to be the same material as the main door frame but must be one of the approved materials as listed in the table above (Section 3.4.1).



Head/jamb joint : Mortice and tenon, or half-lapped joint, head twice screwed to each jamb or mitred joint which is glued with a non-thermally softening adhesive and the head twice screwed to each jamb.



Architraves : Loose Architraves

Where the face of the frame, and the door leaf, are flush with the face of the wall, loose architraves are optional, and have no fire performance requirements, and so can be freely specified, subject to adequate fire stopping. (See Section 3.9 regarding firestopping of wall/frame gaps).

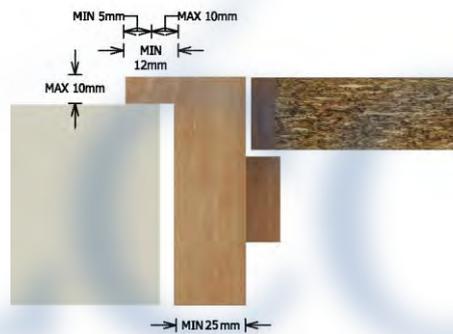
Integral Architraves

*Option 1 (all approved frame thicknesses)* - Where an integral architrave is used, the face of the door may project beyond the face of the wall, providing the thickness of the architrave is no greater than 10mm and it projects at least 15mm beyond the rear face of the door frame. (This 15mm projection shall NOT be formed by machining into the minimum width of frame section, as defined in the table above, i.e. the frame width shall be increased accordingly). This assumes that the face of the door leaf is flush with the face of the architrave. Wall/frame gaps must be controlled to a maximum 10mm with the integral architrave overlapping the supporting wall by a minimum of 5mm. (See Section 3.9 regarding wall/frame gaps and firestopping).



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*Option 2 (minimum 32mm thick frame section) –* Where an integral architrave is used, the face of the door may project beyond the face of the wall, providing the thickness of the architrave is no greater than 10mm and it projects at least 12mm beyond the rear face of the door frame. (This 12mm projection shall NOT be formed by machining into the minimum width of frame section, as defined in the table above, i.e. the frame width shall be increased accordingly). This assumes that the face of the door leaf is flush with the face of the architrave. Wall/frame gaps must be controlled to a maximum 10mm with the integral architrave overlapping the supporting wall by a minimum of 5mm. (See Section 3.9 regarding wall/frame gaps and firestopping).



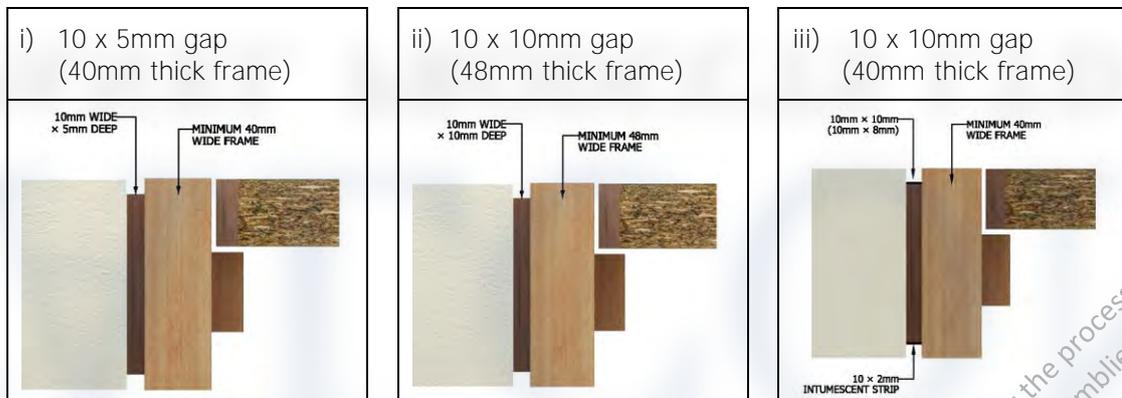
Shadow gap details may be included at junction between the supporting construction and the door frame, using one of the following methods;

- a) The shadow gap may be created by forming a **maximum 10mm wide “rebate”** in the plasterboard/plaster at the edge of the supporting construction, around the door opening, providing the detail does not detract from the established fire resistance performance of the supporting construction. The exact details will depend upon the construction of the wall/partition;

- b) The shadow gap may be formed by including a maximum 10mm wide timber packer between the wall and the frame, whereby the depth of the packer is less than the depth of the wall/frame; the maximum 'step' formed may be no more than 10mm deep at either face of the door frame. The timber packer can be any of the approved frame materials given in the table above (Section 3.4.1), unless there is a specific reason for specifying hardwood door frames as required by this Field of Application Report (e.g. full height multi point locks). If hardwood is required for the main door frame the packer must of the same or greater density and quality as the main frame section.
- c) The shadow gap may be created by increasing the face width of the frame section by a maximum of 10mm, relative to the minimum width defined in the Table above (in Section 4.3.1) and forming a rebate in the rear edge of the frame.

The above options are approved, subject to the following restrictions:

- i) Maximum 10mm wide x 5mm deep shadow gaps can be included, without additional protection, subject to the "main frame section" being at least 40mm wide.
- ii) Maximum 10mm wide x 10mm deep shadow gaps can be included, without additional protection, subject to the "main frame section" being at least 48mm wide.
- iii) Maximum 10mm wide x 10mm deep shadow gaps can be included where the "main frame section" is less than 48mm, (but at least 40mm), providing a 10 x 2mm intumescent strip is securely fitted into the bottom of the shadow gap.



- iv) The term "main frame section", in points i), ii) and iii) above, refers to the basic rectangular frame section, excluding the shadow gap, and excluding any door stops and/or integral architraves.
- v) If a frame includes an integral architrave AND a shadow gap is required, the integral architrave must meet the specification given above, and the shadow gap must be created using the method described in point a) above with intumescent protection as detailed in point iii) above.

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*Note 19* Gaps between the door frame and structural opening including those around timber packers (depending on shadow detail) must be appropriately fire stopped, see Section 3.8 regarding wall/frame gaps).

### 3.4.2 Steel Frames

Steel frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendix E, utilising the intumescent seal specification outlined in Appendix D. (See also Figure 08037D/A01 in Appendix A).

Product	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
	Single Acting		
Nordform A01-A02 1.5mm thick two part steel frame	28mm, excluding stop	100mm	12mm

Head/jamb joint : Mitred with welded joints and screw fixed.

Transom members : No transom members are permitted with steel frames.

### 3.4.3 Post Formed Door Frames

Timber and MDF door frames may be fully encapsulated/post formed in uPVC meeting the following specification. All other details must remain as specified in Section 3.4.1 above.

- Intumescent seal detail as stated in Appendix B of this Report
- uPVC must not cover the intumescent seals in the frame reveal where fitted
- See Appendix C for approved leaf sizes
- Maximum thickness of uPVC is 2mm
- uPVC to be bonded to timber/MDF using a contact adhesive
- Minimum approved door frame thickness for post forming with uPVC is 30mm
- The door stop may also be post formed in uPVC
- The arrises of the door frame may be profiled with 6mm radii prior to post forming the door frame (resulting in door frame maximum 8mm radii when the uPVC is included)
- Frames post formed with uPVC are to be used in conjunction with door leaves that are also post formed in uPVC

## 3.5 Glazed Apertures

### 3.5.1 Glass Types

The following glass types are approved for use in the doors considered herein, which are compatible with the identified approved glazing systems given in Section 3.5.2, although some restrictions on size may be given in subsequent sections. See also Section 3.5.6 regarding ladder glazing.

*The codes used, below, for the glass types, glazing materials, and bead types, (e.g. G1, S30/1 and B30/1), are not those used by the respective manufacturers, and are attributed solely by IFC for the purpose of identification and cross-referencing within this report.*

G1	5mm thick Firelite (Southern Ceramics)
G2	6mm thick ESG Pyrotech 630 (Essex Safety Glass) <i>Note 20</i>
G3	6mm thick Pyrocet XPT (Promat) <i>Note 20</i>
G4	6mm thick Pyroswiss (Vetrotech) <i>Note 20</i>
G5	6mm thick Pyroclear (Pilkington) <i>Note 20</i>
G6	6mm thick Pyrostem (Pyrogard)
G7	6mm thick Pyroshield 2 Texture (Pilkington)
G8	7mm thick Pyroshield 2 Safety Clear (Pilkington)
G9	6mm thick Pyran S (Schott Glass)
G10	7mm thick Pyroshield Fire and Safety (Pilkington)
G11	7mm thick Pyrobelite (AGC Flat Glass)
G12	7mm thick Pyrodur Plus II (Pilkington)
G13	7mm thick Pyroguard Clear (Pyroguard)
G14	7mm thick Pyroguard Wired (Pyroguard)
G15	7.5mm thick Pyrodur Plus (Pilkington)
G16	10mm thick Pyrodur (Pilkington)
G17	11mm thick Pyroguard Clear (Pyroguard)
G18	11mm thick Pyranova 15-S2.0 (Schott)
G19	12mm thick Pyrobelite (AGC Flat Glass)
G20	13mm thick Pyrodur (Pilkington)
G121	12mm thick Pyrobel (AGC Flat Glass) <i>Note 21</i>
G122	15mm thick Pyranova (Schott Glass) <i>Note 21</i>
G123	15mm thick Pyroguard E130 (Pyroguard) <i>Note 21</i>
G124	15mm thick Pyrostop (Pilkington) <i>Note 21</i>
G125	17.3mm thick Pyrobel 16 (AGC Flat Glass) <i>Note 21</i>

*Note 20* Glass types G2, G3, G4 and G5 exhibit sensitivity to the amount of edge cover at the bead interface. It must be ensured that their edge cover is exactly as specified by the glass manufacturer. These glass types also require specific glazing systems, which are referenced in Section 3.5.2

*Note 21* Glass types G121 – G125 are capable of providing 30 minutes insulation performance.

Expansion allowances for all glass types shall be as recommended by the glass manufacturer.

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### 3.5.2 Glazing Materials and Systems

The following glazing materials are approved for use in the doors considered, herein, which are compatible with the identified approved glass types listed above, although some restrictions on size may be given in subsequent sections. See limitations outlined below and also given Figures IFCA/08037D:A02 to A04 in Appendix A.

- S30/1 10 x 3mm Pyrostrip 100 by Mann McGowan (use with G9 and G10)
- S30/2 10 x 2mm Pyrostrip 300 by Mann McGowan (use with G1 and G6 – G20)
- S30/3 10 x 3mm Pyroglaze 30 by Mann McGowan (use with G1 and G6 – G125)
- S30/4 10 x 2mm Interdens by various suppliers (use with G1 and G6 - G20)
- S30/5 10 x 2mm Therm-A-Flex by Intumescent Seals (use with G1 and G6 – G20)
- S30/6 10 x 2mm G30 by Sealmaster (use with G1 and G6 – G20)
- S30/7 10 x 2mm Therm-A-Strip (use with G1 and G6 – G20) *Note 22*
- S30/8 10 x 4mm Therm-A-Bead by Intumescent Seals (use with G1 and G6 – G20)
- S30/9 15 x 3mm LP1003 by Lorient Polyproducts (use with G9 and G10)
- S30/10 15 x 2mm Fireglaze mastic by Sealmaster (use with G1 and G6 – G20) *Note 22*
- S30/11 10 x 5mm closed cell foam by various suppliers (use with G121 – G125)
- S30/12 10 x 4mm ceramic fibre tape by various suppliers (use with G3 and G121 – G125)
- S30/13 System 36 Plus channel by Lorient Polyproducts, to suit glass thickness (use with G1 and G6 – G125)
- S30/14 R8193 channel by Pyroplex (use with G1 and G6 – G14) *Note 23*
- S30/15 Flexible Figure 1 glazing system by Lorient Polyproducts (with G1 and G6 – G125)
- S30/16 30049 by Pyroplex (use with G1 and G6 – G125) *Note 24*
- S30/17 30054 by Pyroplex (use with G1 and G6 – G125) *Note 25*
- S30/18 10 x 5mm Sealed Tight Solutions ST105GT glazing system (use with G1 and G6 – G125) *Note 26*
- S30/19 Norsound Vision 30B (use with G1 and G6 – G125)
- S30/20 Norsound Vision 30T (use with G1 and G6 – G125)
- S30/21 9 x 3mm Sealed Tight Solutions ST105GT(3) glazing system (use with G1 and G6 – G125) *Notes 22 & 27*
- S30/22 Firestrip 30 by Hodgsons Sealants (use with G1, G4 and G6 – G125)
- S30/23 10 x 2mm Therm-A-Strip with 11mm foil edge cover to the glass, to finish flush with the top of the glazing beads on both sides of the glass (use with G2 only)
- S30/24 15 x 5mm Fibrefrax Ceramic tape between bead and glass, with tape to finish flush with the top of the bead and 10 x 2mm Interdens lining the glazing aperture underneath the glass (use with G5 only)

*Note 22* These options may be recessed into the back edge of the bead, except with glass types G2 – G5.

*Note 23* Glazing system S30/14, R8193 channel, has limited fire test evidence. The pane size is therefore limited to 0.6m<sup>2</sup>, irrespective of the glass used.

*Note 24* Glazing system S30/16 30049, has limited fire test evidence. The pane size is therefore limited to 0.4m<sup>2</sup>, irrespective of glass used.

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*Note 25* Glazing system S30/17, 30054, has limited fire test evidence. The pane size is therefore limited to 0.4m<sup>2</sup>, irrespective of glass used.

*Note 26* Glazing system S30/18, ST105GT, has limited fire test evidence. The pane size is therefore limited to 0.82m<sup>2</sup>, irrespective of glass used.

*Note 27* Glazing system S30/21, ST105GT(3), has limited fire test evidence. The pane size is therefore limited to 0.82m<sup>2</sup>, irrespective of glass used.

### 3.5.3 Bead Profiles and Installation

The approved bead sizes and profiles, and relevant fixing details, are shown on Figures IFCA/08037D:A02 to A04 in Appendix A, which also define any limitations upon options of interchangeability with glass types, glazing systems and bead profiles, and see Table 3.3 below.

- B30/1 14mm deep, 15° chamfered top, with bolection moulding not less than 4mm deep. (With glazing systems S30/19 and S30/20 a 2mm splay is required at the base of the bead at the leaf/glass interface).
- B30/2 14mm deep, 15° chamfered top, flush with leaf face, with or without, maximum, 4 x 4mm quirk. (With glazing systems S30/19 and S30/20 a 2mm splay is required at the base of the bead at the leaf/glass interface).
- B30/3 14mm deep, flat top, flush with leaf face, with or without, maximum, 4 x 4mm quirk. (With glazing systems S30/19 and S30/20 a 2mm splay is required at the base of the bead at the leaf/glass interface).
- B30/4 14mm deep, flat top, with bolection moulding not less than 4mm deep. (With glazing systems S30/19 and S30/20 a 2mm splay is required at the base of the bead at the leaf/glass interface).
- B30/5 Bead as per Lorient recommendations. Size to suit channel and glass thickness. Used in conjunction with glazing system S30/13.
- B30/6 22mm deep, 18°-22° chamfered top, including a 5mm x 5mm bolection return. Bead height to accommodate expansion allowance and edge cover as required for modified toughened glass type (expansion allowance and required edge cover must be confirmed by glass manufacturer)

Glazing beads must be formed from timber with a minimum measured density of 640kg/m<sup>3</sup> at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be 11 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).

Glazing beads B30/1 and B30/2 may be clad with 2mm thick PVC, subject to the utilisation of glazing systems S30/2–S30/8 and S30/11, and associated glasses.

### 3.5.4 Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab, with beads fitted directly to the Strebord® 44, Strebord® Superpan or Strebord® 54 door core. Alternatively, where a quirk bead (bead type B30/2 or B30/3) is employed, a 10mm thick hardwood lipping may be applied to the aperture perimeter, using the specification for timber lippings defined in Section 3.3.1.

Based upon the size of apertures tested, it is the opinion of IFC that the following limitations apply to glazed apertures in the door leaves considered herein. Multiple apertures (max 10no.) are permitted providing they comply with the limitations given below;

Maximum total area of apertures	-	1.5m <sup>2</sup> <i>Notes 28 &amp; 29</i>
Maximum vertical length of aperture	-	2085mm <i>Note 29</i>
Maximum horizontal length of aperture	-	825mm <i>Note 29</i>
Minimum distance from leaf edge (top)	-	90mm
Minimum distance from leaf edge (sides)	-	90mm
Minimum distance between apertures	-	150mm <i>Note 29</i>
Minimum distance from bottom of leaf	-	150mm

*Note 28* Refer to Section 3.6.1 for restrictions in size of apertures with specific glass panes and Section 3.6.2 for restrictions in size of apertures with specific glazing systems.

*Note 29* Any aperture(s) for intumescent air transfer grilles, (see Section F.9.4), must also be included in the total area permitted for apertures given above. Margins between apertures apply whether for glazing or grilles.

### 3.5.5 Circular Glazing

The leaves are approved for the incorporation of circular glazing up to aperture dimensions of 500mm diameter, subject to the parameters for margins and total area of glazing per leaf, described in Section 3.5.4. The method of forming the curved beads must remain as tested.

Bead profiles with a bolection moulding are approved (bead types B30/1 and B30/4) with an approved glazing system which can be suitably modified, and associated glasses.

Apertures with some straight and some curved edges (such as full semi-circles or rectangular openings with semi-circular top and bottom ends) are also approved, subject to incorporation of the glazing system, bead type and fixing details as outlined above for circular glazing. Parameters for aperture margins, total area per leaf, and maximum dimensions are described in Section 3.5.4.

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### 3.5.6 Ladder Glazing

To create the effect of narrow glazing bars separating multiple apertures within a door leaf, it is permitted to include a single glazed aperture, with mock glazing bars applied to either face of a single pane of glass. In all cases, the sizes and margins of the aperture(s) must be in accordance with Section 3.5.4.

This detail has been proven in test, using 10 x 2mm Therm-A-Strip seals to prevent ignition of the glazing beads on the unexposed face when fitted to a non-insulating glass. Figure IFCA/08037D:B06 in Appendix B shows the approved detail for perimeter bead and mock glazing bars. The mock bars are secured to the perimeter beads with steel pins fixed through the back of the perimeter bead, as tested.

### 3.5.7 Improved Security Bead

A combined bead and aperture lining can be used to deny access to fixings from one side of the door leaf to improve security.

All glazing details are to meet the specification given in Sections 3.5.1 to 3.5.5 unless otherwise stated below.

The aperture in the door must be lined using minimum 26mm thickness combined bead and lining in hardwood of minimum 640kg/m<sup>3</sup> density.

The combined bead and lining must be bonded to the aperture using the adhesive types approved for lipping (see Section 3.3.1 to 3.3.3) and reinforced using No6-8 50mm long screw fixings located centrally within the thickness of the door leaf at 200mm centres.

The beads must be retained in position with 50mm long steel pins or 50mm long No 6-8 screws, inserted at 35-40° to the vertical plane of the door leaf. Fixings must be at 150mm maximum centres and no more than 50mm from each corner. The bead profile must be appropriate for the glazing system selected.

Glazing Summary				Table 3.1 – Permitted Glazing Systems (S30/_)											
IFC Glass Ref	Glass Thickness	Glass Type	Insulation (Minutes)	1	2	3	4	5	6	7	8	9	10	11	12
G1	5-6mm	Firelite	0	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G2	6mm	Pyrotech 630	0	N	N	N	N	N	N	N	N	N	N	N	N
G3	6mm	Pyrocet XPT	0	N	N	N	N	N	N	N	N	N	N	N	Y
G4	6mm	Pyroswiss	0	N	N	N	N	N	N	N	N	N	N	N	N
G5	6mm	Pyroclear	0	N	N	N	N	N	N	N	N	N	N	N	N
G6	6mm	Pyrostem	0	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G7	6mm	Pyroshield 2 Texture	0	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G8	7mm	Pyroshield 2 Safety Clear	0	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G9	6mm	Pyran S	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G10	7mm	Pyroshield Fire and Safety	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G11	7mm	Pyrobelite	NPD <i>Note 30</i>	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G12	7mm	Pyrodur Plus II	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G13	7mm	Pyroguard Clear	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G14	7mm	Pyroguard Wired	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G15	7.5mm	Pyrodur Plus	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G16	10mm	Pyrodur	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G17	11mm	Pyroguard Clear	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G18	11mm	Pyranova 15-S2.0	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G19	12mm	Pyrobelite	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G20	13mm	Pyrodur	NPD	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
G21	12mm	Pyrobel	30	N	N	Y	Y	N	N	N	N	N	N	Y	Y
G22	15mm	Pyranova	30	N	N	Y	Y	N	N	N	N	N	N	Y	Y
G23	15mm	Pyroguard	30	N	N	Y	Y	N	N	N	N	N	N	Y	Y
G24	15mm	Pyrostop	30	N	N	Y	Y	N	N	N	N	N	N	Y	Y
G25	17.3mm	Pyrobel 16	30	N	N	Y	Y	N	N	N	N	N	N	Y	Y

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Glazing Summary				Table 3.2 – Permitted Glazing Systems (S30/_)											
IFC Glass Ref	Glass Thickness	Glass Type	Insulation (Minutes)	13	14	15	16	17	18	19	20	21	22	23	24
G1	5-6mm	Firelite	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G2	6mm	Pyrotech 630	0	N	N	N	N	N	N	N	N	N	N	Y	N
G3	6mm	Pyrocet XPT	0	N	N	N	N	N	N	N	N	N	N	N	N
G4	6mm	Pyroswiss	0	N	N	N	N	N	N	N	N	N	Y	N	N
G5	6mm	Pyroclear	0	N	N	N	N	N	N	N	N	N	N	N	Y
G6	6mm	Pyrostem	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
G7	6mm	Pyroshield 2 Texture	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G8	7mm	Pyroshield 2 Safety Clear	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G9	6mm	Pyran S	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G10	7mm	Pyroshield Fire and Safety	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G11	7mm	Pyrobelite	NPD <i>Note 30</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G12	7mm	Pyrodur Plus II	NPD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G13	7mm	Pyroguard Clear	NPD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G14	7mm	Pyroguard Wired	NPD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G15	7.5mm	Pyrodur Plus	NPD	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G16	10mm	Pyrodur	NPD	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G17	11mm	Pyroguard Clear	NPD	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G18	11mm	Pyranova 15-S2.0	NPD	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G19	12mm	Pyrobelite	NPD	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G20	13mm	Pyrodur	NPD	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G121	12mm	Pyrobel	30	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G122	15mm	Pyranova	30	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G123	15mm	Pyroguard	30	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G124	15mm	Pyrostop	30	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N
G125	17.3mm	Pyrobel 16	30	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N

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Glazing Type				Table 3.3 – Permitted Bead Type (see Appendix B)					
IFC Glass Ref	Glass Thickness	Glass Type	Insulation (Minutes)	B30/1	B30/2	B30/3	B30/4	B30/5	B30/6
G1	5-6mm	Firelite	0	Y	Y	N	N	Y	N
G2	6mm	Pyrotech 630	0	N	N	N	N	N	Y
G3	6mm	Pyrocet XPT	0	N	N	N	N	N	Y
G4	6mm	Pyroswiss	0	N	N	N	N	N	Y
G5	6mm	Pyroclear	0	N	N	N	N	N	Y
G6	6mm	Pyrostem	0	Y	Y	N	N	Y	N
G7	6mm	Pyroshield 2 Texture	0	Y	Y	N	N	Y	N
G8	7mm	Pyroshield 2 Safety Clear	0	Y	Y	N	N	Y	N
G9	6mm	Pyran S	0	Y	Y	N	N	Y	N
G10	7mm	Pyroshield Fire and Safety	0	Y	Y	N	N	Y	N
G11	7mm	Pyrobelite	NPD <i>Note 30</i>	Y	Y	Y	Y	Y	N
G12	7mm	Pyrodur Plus II	NPD	Y	Y	Y	Y	Y	N
G13	7mm	Pyroguard Clear	NPD	Y	Y	Y	Y	Y	N
G14	7mm	Pyroguard Wired	NPD	Y	Y	Y	Y	Y	N
G15	7.5mm	Pyrodur Plus	NPD	Y	Y	Y	Y	Y	N
G16	10mm	Pyrodur	NPD	Y	Y	Y	Y	Y	N
G17	11mm	Pyroguard Clear	NPD	Y	Y	Y	Y	Y	N
G18	11mm	Pyranova 15-S2.0	NPD	Y	Y	Y	Y	Y	N
G19	12mm	Pyrobelite	NPD	Y	Y	Y	Y	Y	N
G20	13mm	Pyrodur	NPD	Y	Y	Y	Y	Y	N
G121	12mm	Pyrobel	30	Y	Y	Y	Y	Y	N
G122	15mm	Pyranova	30	Y	Y	Y	Y	Y	N
G123	15mm	Pyroguard	30	Y	Y	Y	Y	Y	N
G124	15mm	Pyrostop	30	Y	Y	Y	Y	Y	N
G125	17.3mm	Pyrobel 16	30	Y	Y	Y	Y	Y	N

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*Note 30* Glass types marked NPD (no performance declared) do not achieve 30 minutes insulation performance. However, these glass types do provide some insulation performance, speak to the relevant glass manufacturer for more information if necessary, and also see Section 4 of this Report for a discussion of insulation performance of complete door assemblies.

### 3.6 Overpanels

Overpanels of the same construction as the door leaf designs detailed in Section 3.3 of this Report are permitted with timber frames, and may have square or equally rebated meeting edges, or be separated by a transom member.

In all cases, the overpanel must be a single piece panel across the frame width; i.e. a **"double door" overpanel shall not be used above double door** leaves. Approval of an overpanel size by IFC does not indicate that such a size can be fabricated, this should be checked with the manufacturer, and will be subject to the ability of the supporting construction providing adequate restraint/support.

The following details must be followed when constructing door assemblies with over panels.

- The overpanel must always be on the same plane as the door(s) below and must be fully contained within the door frame/transom i.e. the overpanel must not sit proud of the frame/transom at any point.
- Intumescent seals must be fitted on all edges of the overpanel. The seal specifications and locations are given in Appendix B.
- Concealed overhead closers (single and double acting) are not permitted with overpanels (flush and transomed).
- Overpanels shall be secured into the frame using steel screws fixed through the rear of the frame members, passing at least 40mm into the centre line of the overpanel thickness. (Screws must not be fixed through the overpanel into the stops, or vice versa). Screws must be no more than 100mm from each corner of the overpanel, and at maximum 400mm centres, with a minimum of 2no screws per overpanel edge. This specification applies to overpanels used with or without a transom. The gap between overpanel and frame should not exceed 3mm.
- Transom members shall be in accordance with the following specification:
  - Single acting door assemblies: Minimum 70mm (w) x 32mm (t) with minimum 12mm thick door stops above and below the transom to create a minimum 70mm (w) x 56mm (t) overall section.
  - Double acting door assemblies: Minimum 70mm (w) x 44mm (t).
  - The transom must be fixed to the jambs with a mortice and tenon or half lapped joint. Joints must be tight, with no gaps and require mechanical fixing using appropriate size of screw.

The size of overpanels is limited to the full width of the leaf/leaves contained within the door assembly and the following maximum height:

Single leaves:	2000mm high
Double leaves:	1500mm high

### 3.7 Fanlights and Side Lights

Timber frame door assemblies may include fanlights and side lights. The following details must be followed when constructing door assemblies with fanlights and side lights.

- The glass and glazing system must have suitable supporting test evidence when tested as a glazed screen (with or without a door assembly included) at the pane dimensions to be installed. The test evidence must be full scale and the following test standards are acceptable: BS 476: Part 22: 1987, BS EN 1634-1 or BS EN 1364-1.
- The timber for the framing may be hardwood with a minimum density of 640kg/m<sup>3</sup>.
  - The dimensions of the hardwood framing for the screen must be a minimum of 70mm x 44mm.
- The timber for the framing may be softwood with a minimum density of 510kg/m<sup>3</sup>.
  - The dimensions of the softwood framing for the screen must be a minimum of 100mm x 44mm
- The plane of the glass must always be on the same plane as the door(s).
- Concealed overhead closers (single and double acting) are not permitted with glazed screens.
- The fanlights and sidelights must be glazed in accordance with the supporting test evidence for the glass type (glazing system, bead dimensions and profile, bead fixings including centres, location and type).
- Screen members joints must be a mortice and tenon or half lapped joint. Joints must be tight, with no gaps and require mechanical fixing using appropriate size of screw.
- Multiple apertures are permitted within the fanlights and side lights providing all other details meet the specification given in this section.

The maximum assessed fanlight and side light dimensions that can be used with single or double leaf door assemblies is as follows:

Screen Element	Height	Width
Fanlight	Less than or equal to 600mm	Overall door width
Side light	Overall door height	Less than or equal to 600mm

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### 3.8 Hardware

Some of the various items of hardware to be used with the proposed door assemblies will **have a positive contribution to the overall performance ('essential hardware') and others are classed as 'non-essential'.** However, in all cases it must be ensured that choice of items, or their installation within the assemblies, does not have a detrimental effect upon their achievement of the required period of fire resistance.

General guidance for all items of hardware is outlined in Appendix F, based upon the range of items tested. All hardware beyond the scope of the general guidance must have been subjected to fire resistance testing, and/or assessed by a notified body to support its use in doors of a similar construction to that proposed.

### 3.9 Installation, Supporting Construction and Door Edge Gaps

The frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm on the vertical edges (minimum 200mm from the top and bottom), and a minimum of one fitted centrally across the width of the frame head of double doors. Screws shall be of sufficient length to penetrate the wall by at least 40mm, and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws). Packers shall be used at all fixing positions, although if combustible packers are employed, these must be protected by a layer of gap sealing (see below) aligned near to each face of the door frame.

The supporting construction may be timber or steel stud plasterboard partition, blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 30 minutes fire resistance, at the required size, when incorporating door openings. If fitted into timber or steel stud partitions, the method of forming the door assembly aperture must be as tested by the partition and/or door assembly manufacturer.

*Note 31 Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers – this report does not approve use of the proposed door assemblies in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and door assemblies therein.*

No part of the rear of the frame section shall be exposed once installed, (except for integral architraves, see Section 3.4) and leaves must not project beyond the exposed face of the door frame.

Shadow gap details may be included at the interface of the frame and wall – see Section 3.4 herein.

The gap sealing between the supporting construction and timber frames should follow the recommendations of Tables 2 and 3 in BS8214: 2016, '*Timber-based fire door assemblies – Code of practice*', using a product proven in such timber applications, or tested, assessed or Third Party Certificated solutions may also be utilised using a product proven in such timber applications, and with reference to the correct depth of seal to suit the width of gap between wall and frame. The gap sealing shall be positioned on the plane of the door leaf (unless combustible packers are employed).

The gap between the door and the frame or between meeting stiles (and between double doors and overpanel, where applicable) should be 1.5–4mm. Gaps under the door(s) shall not exceed 6mm for fire performance, although, if smoke control is also required, these gaps shall only be 3mm, or smoke seals shall be included (see also Section 3.11 regarding suitability of smoke seals).

The door assembly design shall be such that when closed single acting leaves are fully flush within the frame and double acting doors should be centred on the frame depth. The face of leaves in double door assemblies shall be flush with each other at meeting stiles when closed.

### 3.10 Intumescent Seals

The following PVC encapsulated perimeter intumescent seals are permitted across the complete range of door sizes and configurations approved herein.

- Palusol 100 – Mann McGowan Fabrications Ltd or Lorient Polyproducts Ltd
- Therm-A-Seal – Intumescent Seals Ltd
- Pyroplex – Pyroplex Ltd
- Type 617 – Lorient Polyproducts Ltd
- STS Fire – Sealed Tight Solutions Ltd
- Norfast – Norsound Ltd (fitted in the frame reveal and not approved as a seal for overpanel edges)

It is recommended that the intumescent seals are manufactured or supplied by members of the Intumescent Seals Association (IFSA) or that the product is included in a Third Party Certification scheme, such as that provided by IFC Certification, to ensure product quality and consistency.

If a Palusol specification is chosen, the seal(s) at the head of double door assemblies must be fitted into the frame reveal, or overpanel, as appropriate. Where the specification is a multiple seal arrangement, it is acceptable to use Palusol, subject to maintaining at least one strip in the frame/overpanel to be continuous across the meeting stile joint.

The intumescent seal specifications, widths, and positions are shown in Appendices B and D, based upon tested details.

Intumescent protection is required for specific items of building hardware and this has already been detailed in Appendix F based upon details tested.

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### 3.11 Ambient Temperature Smoke Seals

Smoke seals or combined intumescent/smoke seals (using the specification approved in Section 3.9), that have been tested in accordance with BS EN 1634-3: 2004 (ambient temperature) or BS476: Part 31: Section 31.1: 1983 and shown not to leak by more than 3m<sup>3</sup>/m/hr at 25Pa may be used in conjunction with the proposed door assemblies to provide smoke control.

The orientation of the seals, door edge gaps, degree of hardware interruption, and leaf configuration, will need to be as tested in accordance with BS EN 1634-3: 2004 (ambient temperature) or BS476: Part 31: Section 31.1: 1983 to achieve the desired level of smoke control, unless these conflict with the intumescent seal widths and positions as described in Appendix F, in which case, the latter shall take precedence.

Test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber door assemblies, when fitted in the proposed arrangements.

## 4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that if the proposed door assemblies utilising Strebord® 44, Strebord Superpan and Strebord® 54 door leaves installed in timber and steel frames were manufactured and installed within the limitations of this Field of Application Report and tested for fire resistance, as appropriate, they would satisfy the integrity criteria of BS476: Part 22: 1987 for 30 minutes.

Partially insulating door assemblies are determined using the criteria given in Section 7 of BS476: Part 22: 1987. These assemblies are evaluated as partially insulating door assemblies on the **basis that the 'solid' part of the leaf satisfies the temperature criteria** given in Section 10.4 of BS 476: Part 20: 1987 and any non-insulating features, such as glazing, are less than 20% of the surface area of the leaf. The assemblies outlined, herein, are permitted to have glazed areas and air transfer grilles, and so could, therefore, be evaluated to this standard if the maximum total aperture area is less than 20% of the leaf size. The leaves may include small apertures, up to a maximum of 20% of the leaf size and can be evaluated to Section 7 in BS 476: Part 22: 1987 as partially insulating door assemblies for 30 minutes fire resistance.

Doors in timber frames can also be assessed to Section 6 of BS476: Part 22: 1987 for a 30 minute performance rating for both integrity and insulation, without apertures in the leaves or with apertures incorporating fully insulating glass.

This Field of Application Report considers that the door assemblies within the scope approval, herein, may be installed in either orientation and so be exposed to fire conditions from either face.

## 5. DECLARATION BY THE APPLICANT

Reference: IFC Field of Application Report IFCA/08037 Revision D

We, the undersigned, confirm that we have read and complied with the obligations placed on us by the

Passive Fire Protection Forum (PFPF)  
Guide to undertaking technical assessments of the fire performance  
of construction products based on fire test evidence  
2019  
Industry Standard Procedure

We confirm that the component or element of structure, which is the subject of this assessment has not to our knowledge been subjected to a fire test to the standard against which this assessment is being made.

We confirm that the change which is the subject of this assessment has not to our knowledge been tested to the standard against which this assessment has been made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the standard against which this assessment is being made.

We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.

We are not aware of any information that could affect the conclusions of this assessment.

If we subsequently become aware of any such information, we agree to ask International Fire Consultants Ltd (IFC) to withdraw the assessment.

Signature:



Name:

Neil Harrison

Position:

Door Technical Manager

Company:

Falcon Panel Products

Date:

6th March 2020

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## 6. LIMITATIONS

This report addresses itself solely to the ability of the proposed assemblies described to satisfy the criteria of the fire resistance test and does not imply any suitability for use with respect to other unspecified criteria.

This document only considers the door assemblies described, herein, and assumes that the surrounding construction will provide no less restraint than the tested assembly and that it will remain in place and be substantially intact for the full fire resistance period.

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to International Fire Consultants Ltd (IFC) the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly, the assessment evaluation is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

As per the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, 2019, Industry Standard Procedure'*, appropriate action has been taken to mitigate the risk of a conflict of interest arising during the preparation of this report. All individuals involved in the production, or subsequent review, of this assessment have declared any perceived conflicts of interest, with regards to the sponsor or subject(s) of this report, prior to working on this project.

The assessor and reviewer have been deemed suitable for involvement in the production of this assessment in accordance with the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, 2019, Industry Standard Procedure'*.

Where the constructional information in this report is taken from details provided to International Fire Consultants Ltd (IFC) and/or from fire resistance test reports referenced herein, it is, therefore, limited to the information given in those documents. It is necessarily dependent upon the accuracy and completeness of that information. Where constructional or manufacturing details are not specified, or discussed, herein, it should not, therefore, be taken to infer approval of variation in such details from those tested or otherwise approved.

The analysis and conclusions within this report are based upon the likely fire resisting performance of a complete door assembly that is manufactured and installed in accordance **with this document, and offered for fire resistance testing in 'perfect' condition**. In practice, management procedures must be in place in any building where the door assemblies are installed, to ensure that no parts of the assembly are damaged or faulty. Further, the doors must open and close without the use of undue force. The edge gaps/alignment of door leaves must be in accordance with the tolerances defined, herein, when the doors are closed.

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Any such shortfalls in respect to the condition of the assemblies will invalidate the approval by IFC, and may seriously affect the ability of the assemblies to provide the required level of fire resistance performance. Determination of what constitutes wear or damage, and any corrective actions in order to return assemblies to the required condition, should only be carried out following consultation with the manufacturer and IFC.

This report applies to fire door assemblies that are evaluated to BS476: Part 22: 1987; which is an applicable test method currently referenced within guidance to Building Regulations in the United Kingdom, and in building codes in some other countries. However, IFC have a duty of care to advise that introduction of CE Marking may become compulsory for fire resisting doorsets marketed in the EU, during the validity period of this report; in which case, users should contact IFC for further details/advice.

Where the assessed constructions have not been subject to an on-site audit by International Fire Consultants Ltd, it is the responsibility of anyone using this report to confirm that all aspects of the assemblies fully comply with the descriptions and limitations, herein.

Any materials specified in this report have been selected and judged primarily on their fire performance. IFC do not claim expertise in areas other than fire safety. Whilst observing all **possible care in the specification of solutions, we would draw the reader's attention** to the fact that during the construction and procurement process, the materials used should be subjected to more general examination regarding the wider Health and Safety, and CoSHH Regulations. Designers, manufacturers and installers are reminded of their responsibilities under the CDM Regulations; but particularly with regard to installation and maintenance of heavy or inaccessible items.

This assessment considers the fire resistance performance of the door assemblies when tested with the leaves in the closed position, within the frame reveal; either retained by the latch, or self-closing device, or locked shut, as applicable. The door assemblies will only provide the assessed fire performance when in a similar configuration; and it is the responsibility of the building occupants/owner to ensure that this is the case.

This Report is provided to the sponsor on the basis that it is a professional independent engineering evaluation as to what the fire performance of the construction/system would be **should it to be tested to the named standard. It is IFC's experience that such an evaluation** is normally acceptable in support of an application for building approvals, certainly throughout the UK and in many parts of Europe and the rest of the world.

However, unless IFC have been commissioned to liaise with the Authorities that have jurisdiction for the building in question for the purpose of obtaining the necessary approvals, IFC cannot assure that the document will satisfy the requirements of the particular building regulations for any building being constructed.

Falcon Panel Products Ltd supports third-party certification for the products manufactured, installation and maintenance of fire door assemblies. It is the responsibility of the reader to ensure that any product manufactured using the evidence within is fit for purpose. This document remains the property of Falcon Panel Products Ltd. Further details of a set of evidence from an extensive testing regime covering a wide range of products. Further documentation can be found on our website at <https://www.falconpanel.co.uk/doorinfo>

It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal of the Report to the Authorities will minimise any risks in this respect.

## 7. VALIDITY

This Field of Application Report has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence. For this reason, anyone using this document after June 2024 should confirm its ongoing validity.

This Field of Application Report is not valid unless it incorporates the declaration by the applicant given in Section 6 duly signed by the applicant.

Prepared by:



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International Fire Consultants Ltd (IFC)

Checked by:



David Cooper  
BEng (Hons) AIMMM AIFireE  
Associate Director  
International Fire Consultants Ltd (IFC)

Field of Application for FD30 Strebord® 44, Strebord® Superpan and Strebord® 54 Door Leaves Installed in Timber and Steel Frames in Accordance with BS476: Part 22: 1987

Prepared for: Falcon Panel Products

IFC Field of Application Report  
IFCA/08037 Revision D

Page 40 of 67

## APPENDIX A

Figures 08037D/A01 to A05

Construction Details

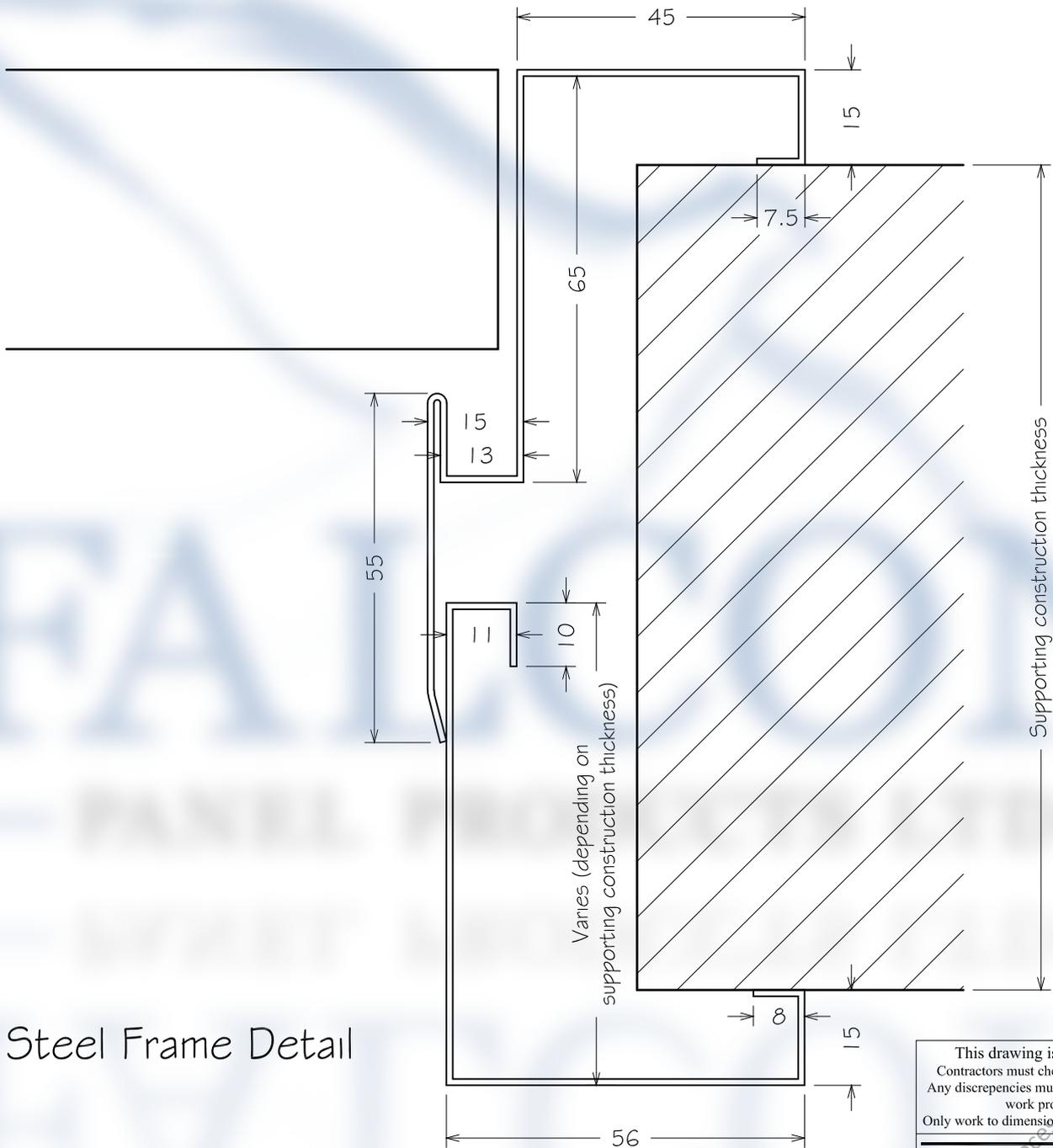
*The figures in this Appendix are not included  
in the sequential page numbering of this report*

Field of Application for FD30 Strebord® 44, Strebord®  
Superpan and Strebord® 54 Door Leaves Installed in Timber  
and Steel Frames in Accordance with BS476: Part 22: 1987

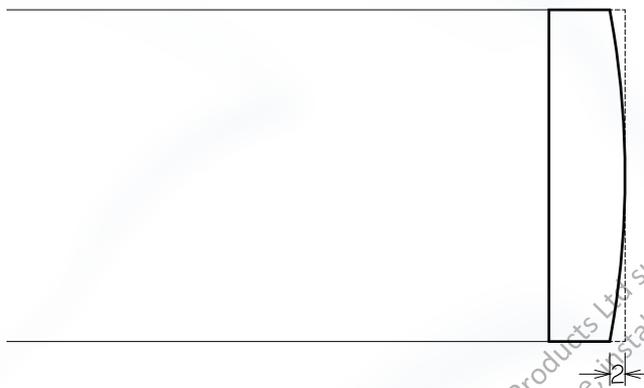
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Steel Frame Detail



Rounded Lipping Detail

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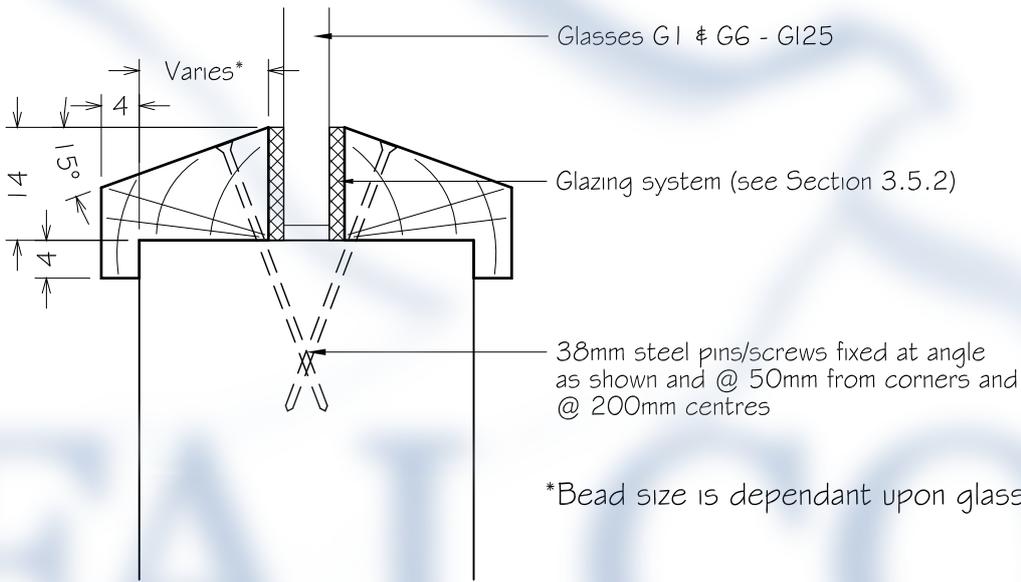
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and Strebord® 54 Door Leaves  
Installed in Timber and Steel Frames

Details of Steel Frame  
# Rounded Lipping

Job number: 17583  
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Not To Scale    Drawn: Mar 2019

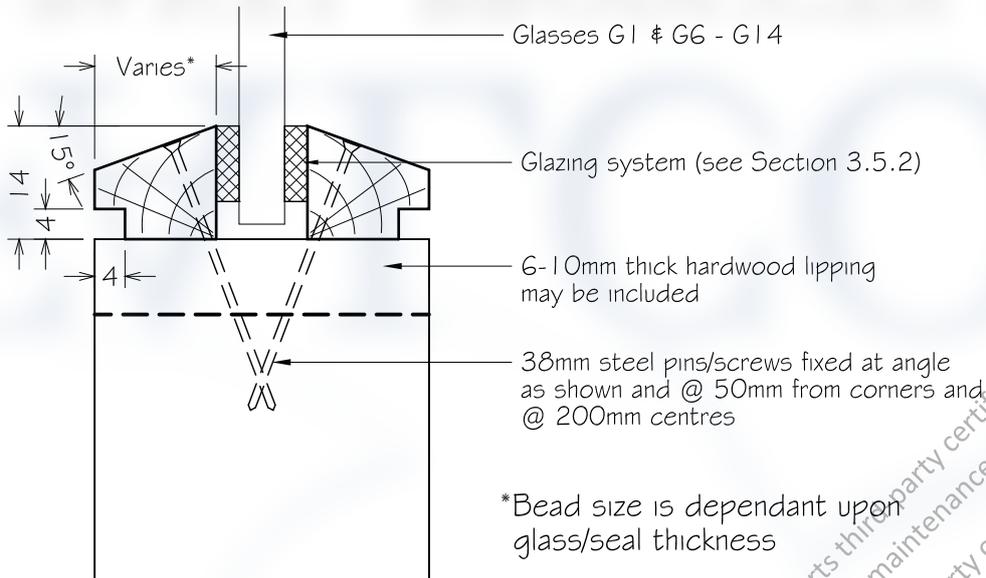
**08037D/A01**

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\*Bead size is dependant upon glass/seal thickness

**BEAD DETAIL B30/1**



\*Bead size is dependant upon glass/seal thickness

**BEAD DETAIL B30/2**

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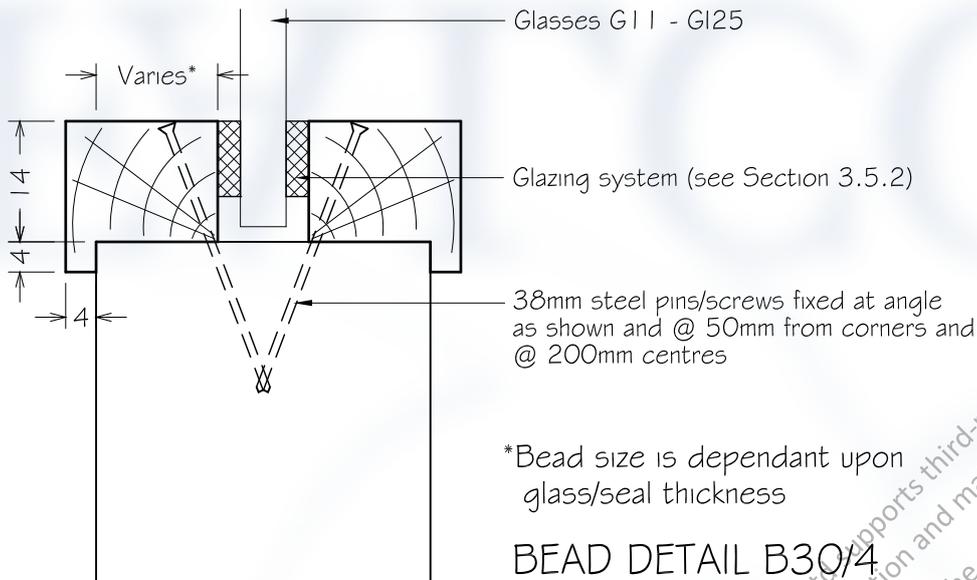
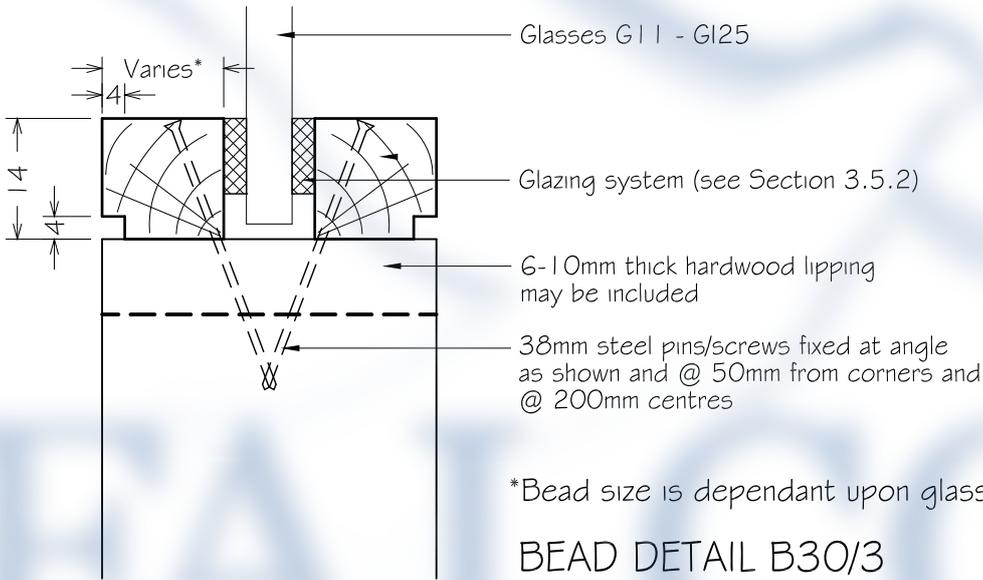
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and Strebord® 54 Door Leaves  
Installed in Timber and Steel Frames

Glazing Bead Details  
Sheet 1 of 3

Job number: 17583  
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**08037D/A02**

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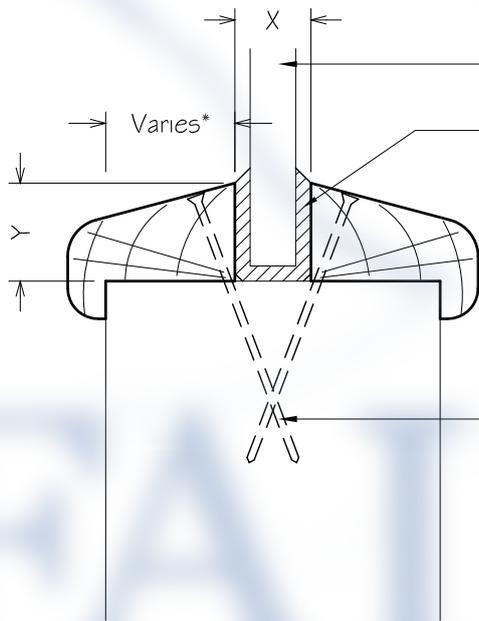
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Installed in Timber and Steel Frames

Glazing Bead Details  
Sheet 2 of 3

Job number: 17583  
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Not To Scale    Drawn: Mar 2019

**08037D/A03**

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Glasses G1 & G6 - G125

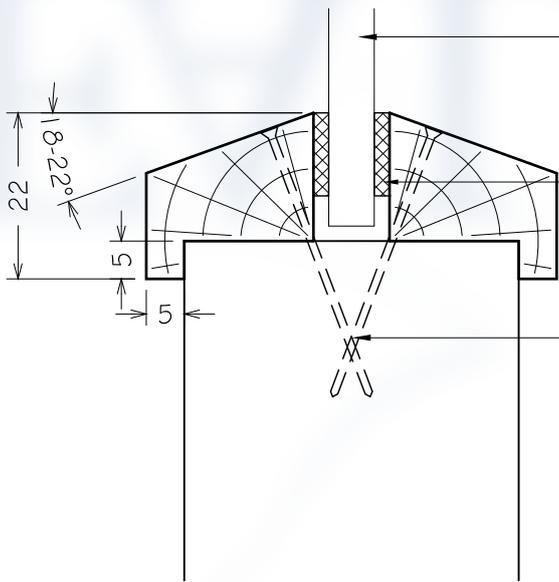
Glazing systems S30/13 & S30/14  
(see Section 3.5.2)

X = Channel thickness (varies to suit glass thickness)

Y = Bead height (must NOT exceed height of channel shoulder)

38mm steel pins/screws fixed at angle as shown and @ 50mm from corners and @ 200mm centres

\*Bead size is dependant upon glass/seal thickness  
**BEAD DETAIL B30/5**



Glasses G2 - G5

Glazing systems (see Section 3.5.2)

38mm steel pins/screws fixed at angle as shown and @ 50mm from corners and @ 200mm centres

\*Bead size is dependant upon glass/seal thickness

**BEAD DETAIL B30/6**

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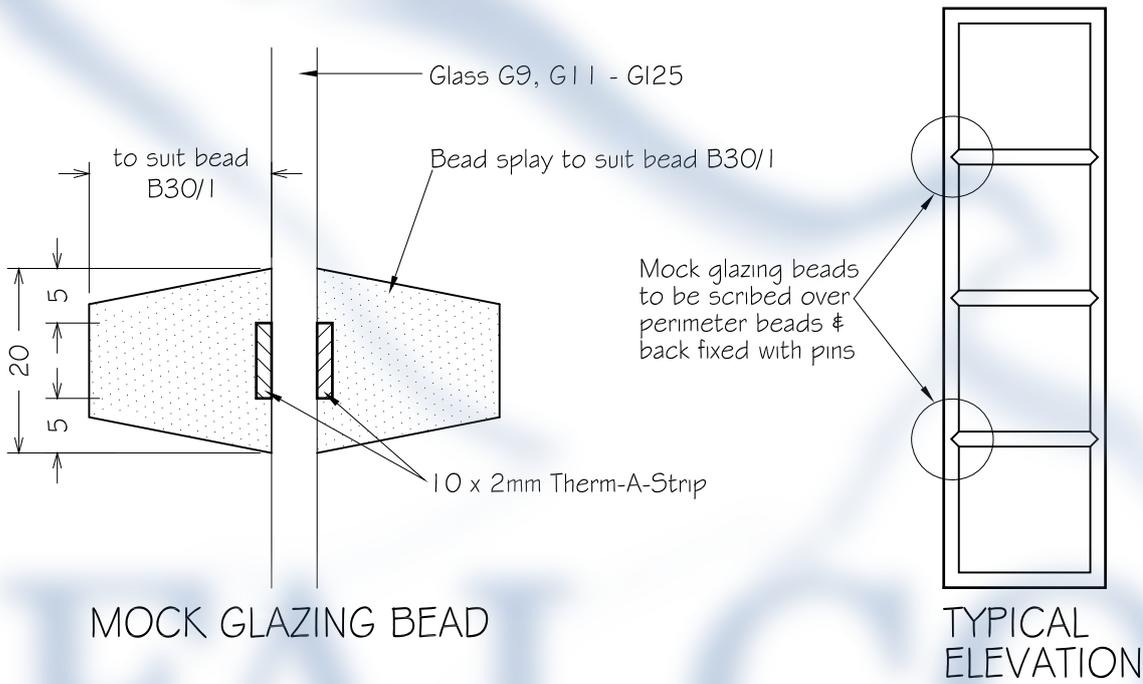
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Falcon Panel Products Ltd  
Strebor® 44, Strebor® Superpan  
and Strebor® 54 Door Leaves  
Installed in Timber and Steel Frames

Glazing Bead Details  
Sheet 3 of 3

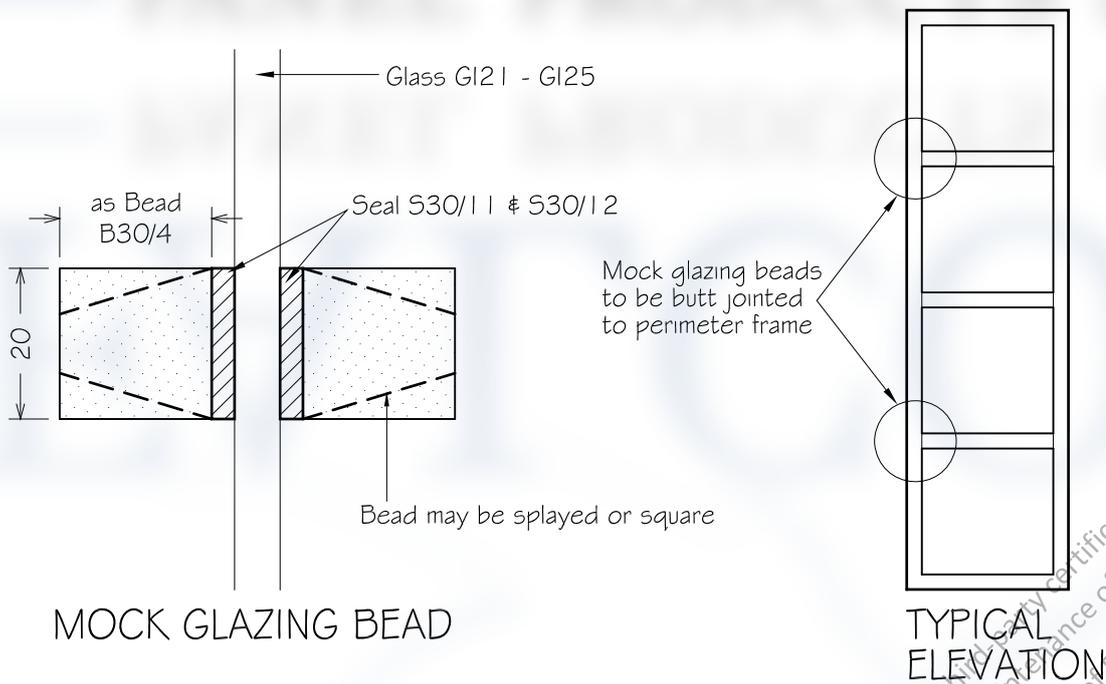
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**08037D/A04**

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LADDER DETAIL for use with bead detail B30/1



LADDER DETAIL for use with bead detail B30/4

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and Strebor® 54 Door Leaves  
Installed in Timber and Steel Frames

Ladder Glazing  
Details

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08037D/A05

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This document details a subset of the evidence generated during the testing regime covering a wide range of products.  
Further documentation can be found at <https://www.falconpanel.co.uk/>

## APPENDIX B

Assessed Intumescent Seal Specifications for  
Strebord® 44 Strebord® Superpan and Strebord® 54  
Door Leaves Installed in Timber Frames

Field of Application for FD30 Strebord® 44, Strebord®  
Superpan and Strebord® 54 Door Leaves Installed in Timber  
and Steel Frames in Accordance with BS476: Part 22: 1987

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Page 42 of 67

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testing regime covering a wide range of products.  
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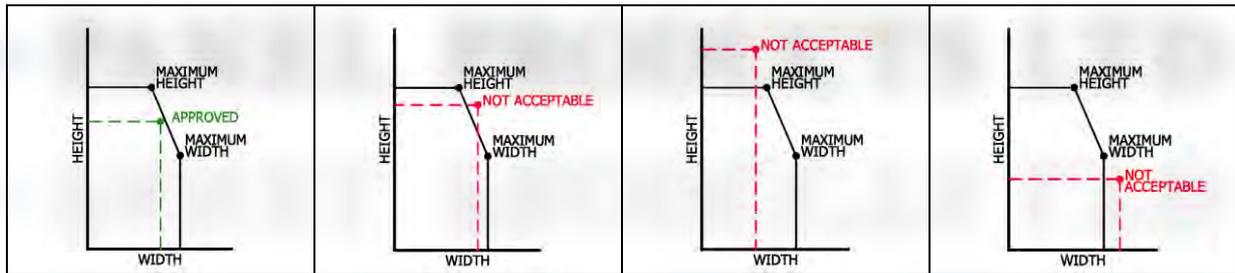
Location	Standard Specification	Norfast Specification	Enhanced Specification
Stiles/ jambs	1no 10 x 4mm seal fitted centrally in leaf edge or frame reveal	1no Norfast seal surface fixed in the frame reveal butted up against the upstand of the door stop	1no 15 x 4mm seal fitted centrally in leaf edge or frame reveal or 2no 10 x 4mm seals fitted 8-10mm apart centrally in the leaf edge or frame reveal
Head	1no 10 x 4mm seal fitted centrally in leaf edge or frame reveal	1no Norfast seal surface fixed in the frame reveal butted up against the upstand of the door stop	1no 15 x 4mm seal fitted centrally in leaf edge or frame reveal or 2no 10 x 4mm seals fitted 8-10mm apart centrally in the leaf edge or frame reveal
Square overpanel junction	<i>Overpanels not approved with standard specification</i>	<i>Overpanels not approved with Norfast specification</i>	2no 15 x 4mm seals fitted 10mm apart centrally in leaf or overpanel edge
Equal rebate overpanel junction	<i>Overpanels not approved with standard specification</i>	<i>Overpanels not approved with Norfast specification</i>	2no 15 x 4mm seals; 1no fitted centrally in the rebate in the leaf edge and 1no fitted centrally in the rebate in the overpanel edge
Square meeting stiles	2no 10 x 4mm seals fitted 10mm apart centrally in one leaf edge only	<i>Double leaf doors not approved with Norfast specification</i>	2no 10 x 4mm seals fitted 10mm apart centrally in one leaf edge only
Equal rebate meeting stiles	<i>Equal rebate meeting stiles not approved with standard specification</i>	<i>Double leaf doors not approved with Norfast specification</i>	2no 10 x 4mm seals; 1no. fitted centrally in the bottom of the rebate in one leaf and 1no. fitted centrally in the bottom of the rebate in the opposing leaf
Interface between overpanel and frame/ transom reveal	1no 10 x 4mm seal fitted centrally in panel edge or frame/ transom reveal	<i>Overpanels not approved with Norfast specification</i>	1no 15 x 4mm seal fitted centrally in panel edge or frame/ transom reveal

Note: The 4mm thick seals are a pvc case. Combined intumescent/smoke seals may be used maintaining the widths specified above (and subject to the conditions outlined in Section 3.10 and 3.11).

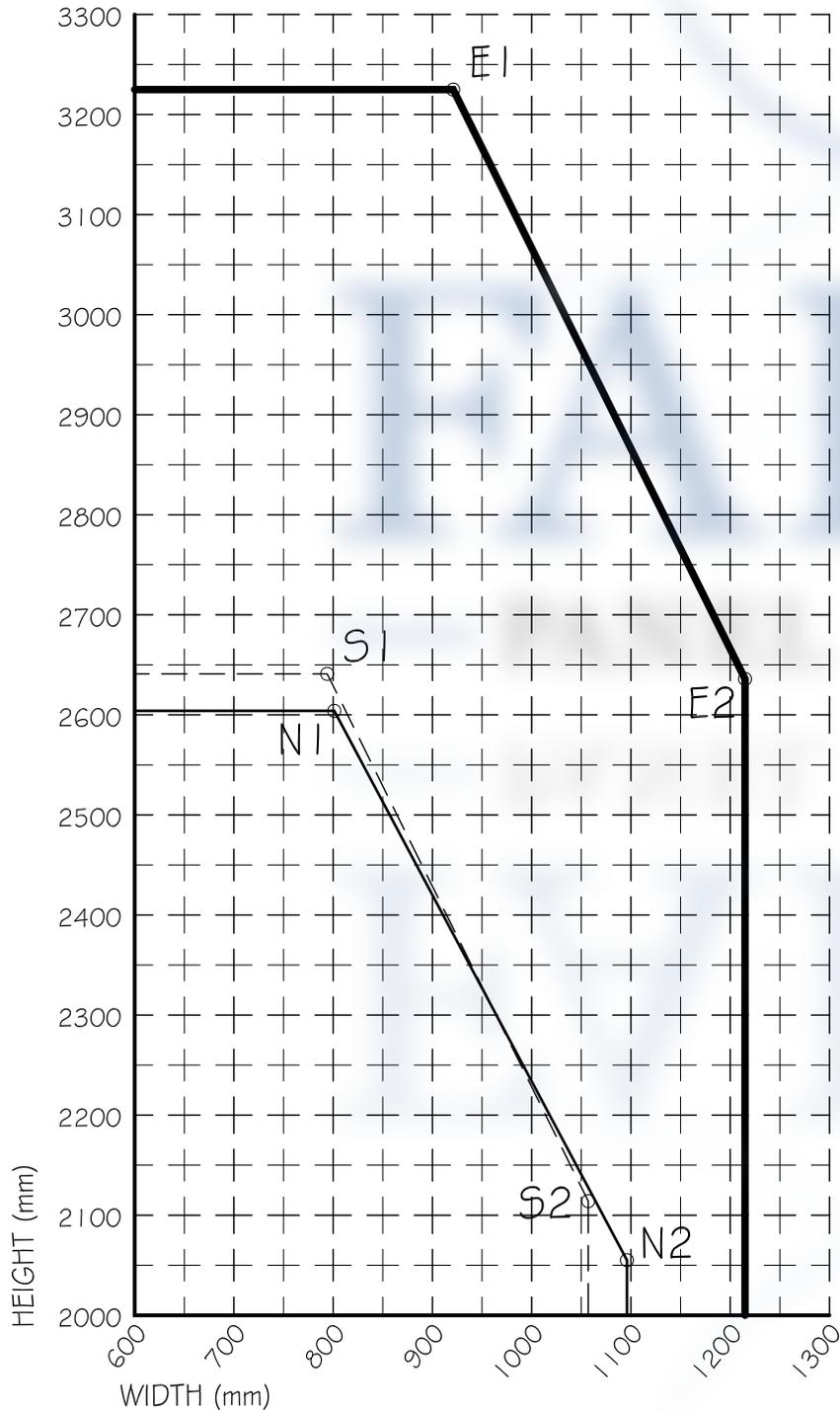
## APPENDIX C

Figures 08037D/C01 to C08

Assessed Leaf Size Envelopes for Strebord® 44,  
Strebord® Superpan and Strebord® 54 Door  
Leaves Installed in Timber Frames



*The figures in this Appendix are not included  
in the sequential page numbering of this report*



	Using Standard Intumescent Specification	
	-----	
	S1	S2
Width	794	1057
Height	2641	2114

	Using Norfast Intumescent Specification	
	—————	
	N1	N2
Width	801	1096
Height	2604	2055

	Using Enhanced Intumescent Specification	
	—————	
	E1	E2
Width	921	1215
Height	3225	2636

Configuration  
 Timber Frames  
 LATCHED  
 SINGLE ACTING  
 SINGLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

## ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf using the standard intumescent seal specification

POINTS N1 & N2 represent the maximum height and width of a door leaf using the Norfast intumescent seal specification

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/O8037 Revision D, which contains full details of the assessed doorset construction.

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 and Strebord® 54 Door Leaves  
 Installed in Timber and Steel Frames

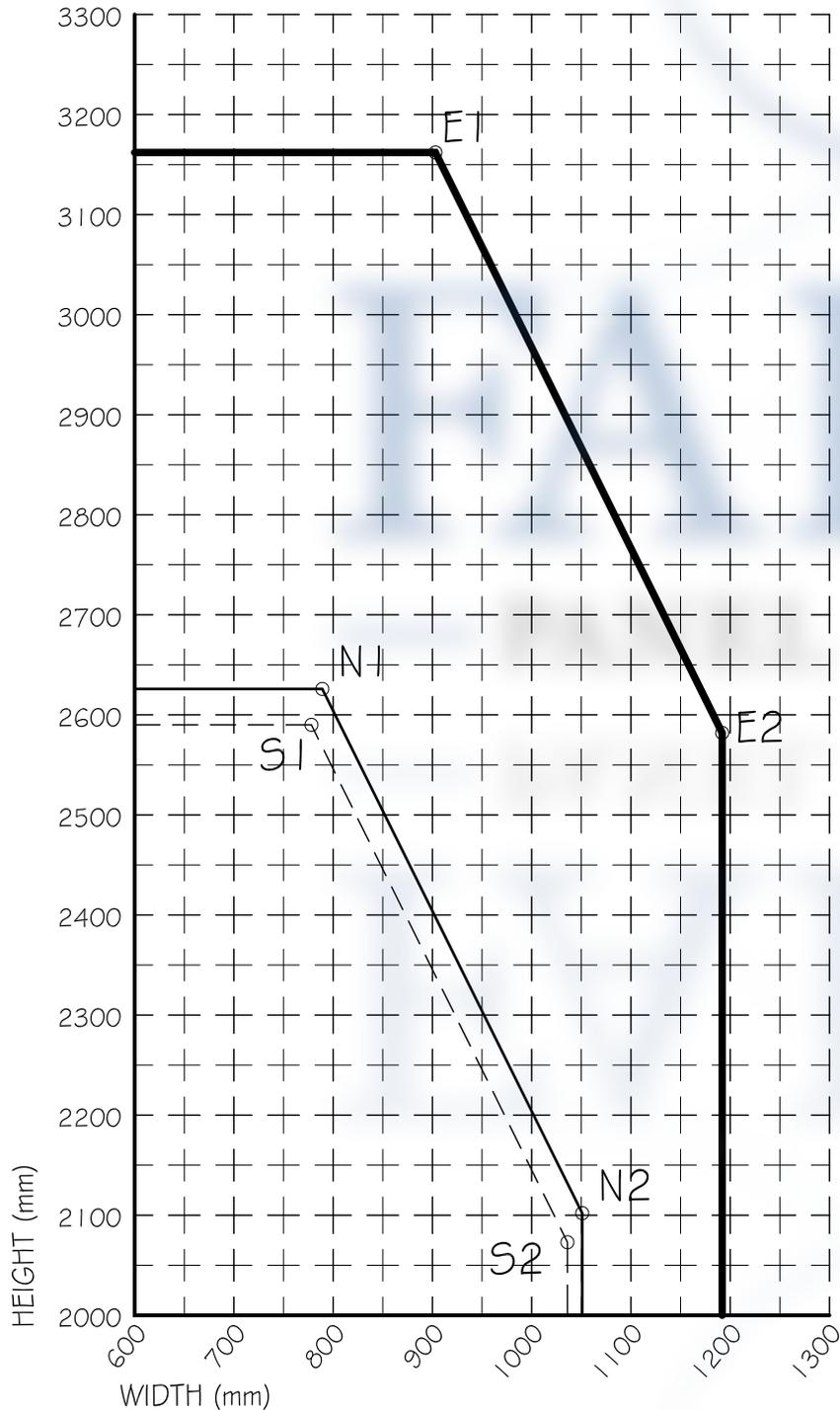
Envelope of Approved  
 Door Leaf Sizes  
 In Timber Frames

Job number: 17583

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Mar 2019

08037D/C01



Using Standard Intumescent Specification	
Width	S1: 778    S2: 1036
Height	2590    2073

Using Norfast Intumescent Specification (Single Acting Only)	
Width	N1: 789    N2: 1051
Height	2626    2102

Using Enhanced Intumescent Specification	
Width	E1: 903    E2: 1192
Height	3162    2582

Configuration  
 Timber Frames  
 UNLATCHED SINGLE or DOUBLE ACTING SINGLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

### ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf using the standard intumescent seal specification

POINTS N1 & N2 represent the maximum height and width of a single acting door leaf only using the Norfast intumescent seal specification.

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

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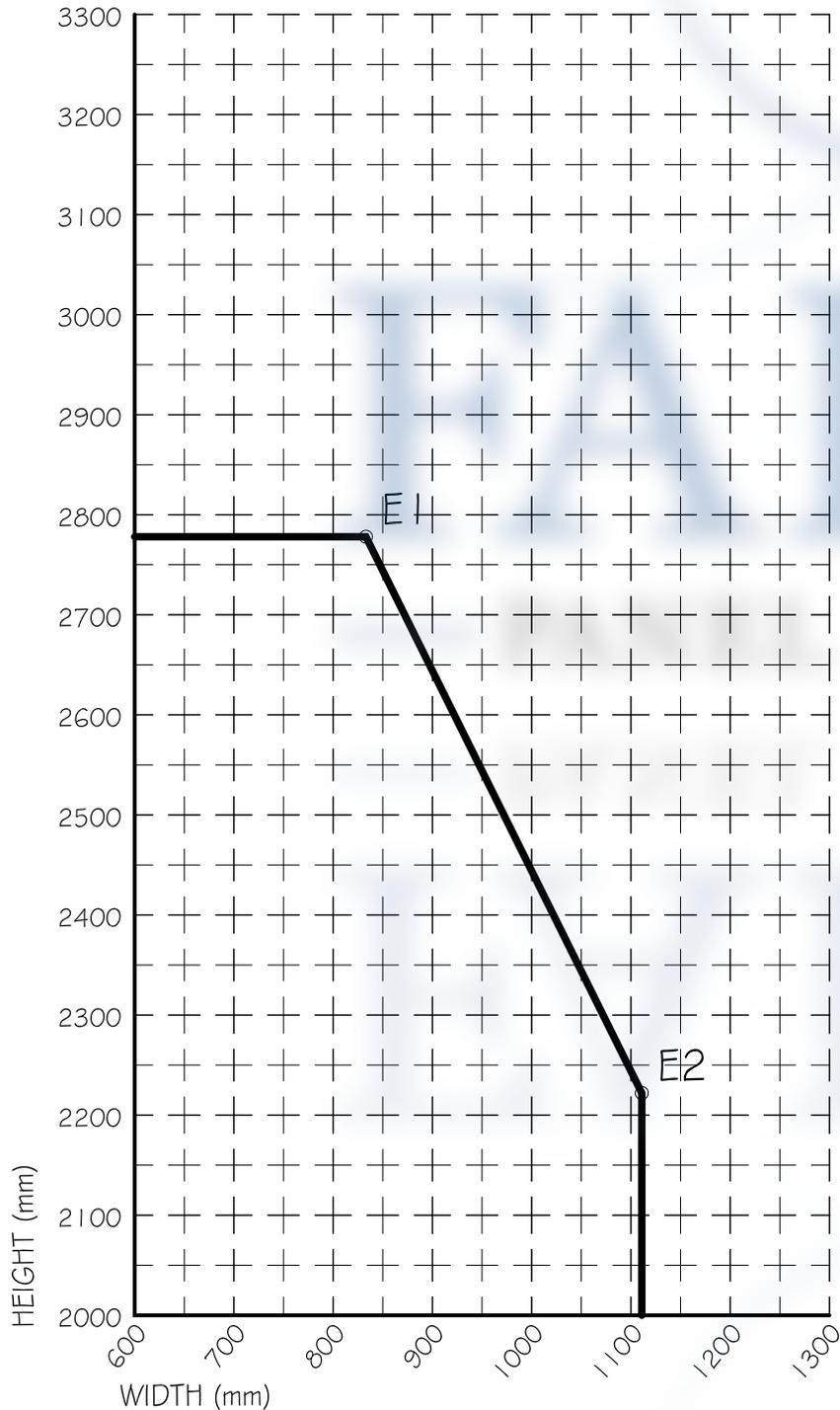
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 and Strebord® 54 Door Leaves  
 Installed in Timber and Steel Frames

Envelope of Approved  
 Door Leaf Sizes  
 In Timber Frames

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**08037D/C02**



## ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

	Using Enhanced Intumescent Specification	
	E1	E2
Width	833	1111
Height	2778	2222

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Configuration  
 Timber Frames  
 LATCHED  
 SINGLE ACTING  
 SINGLE LEAF  
 WITH OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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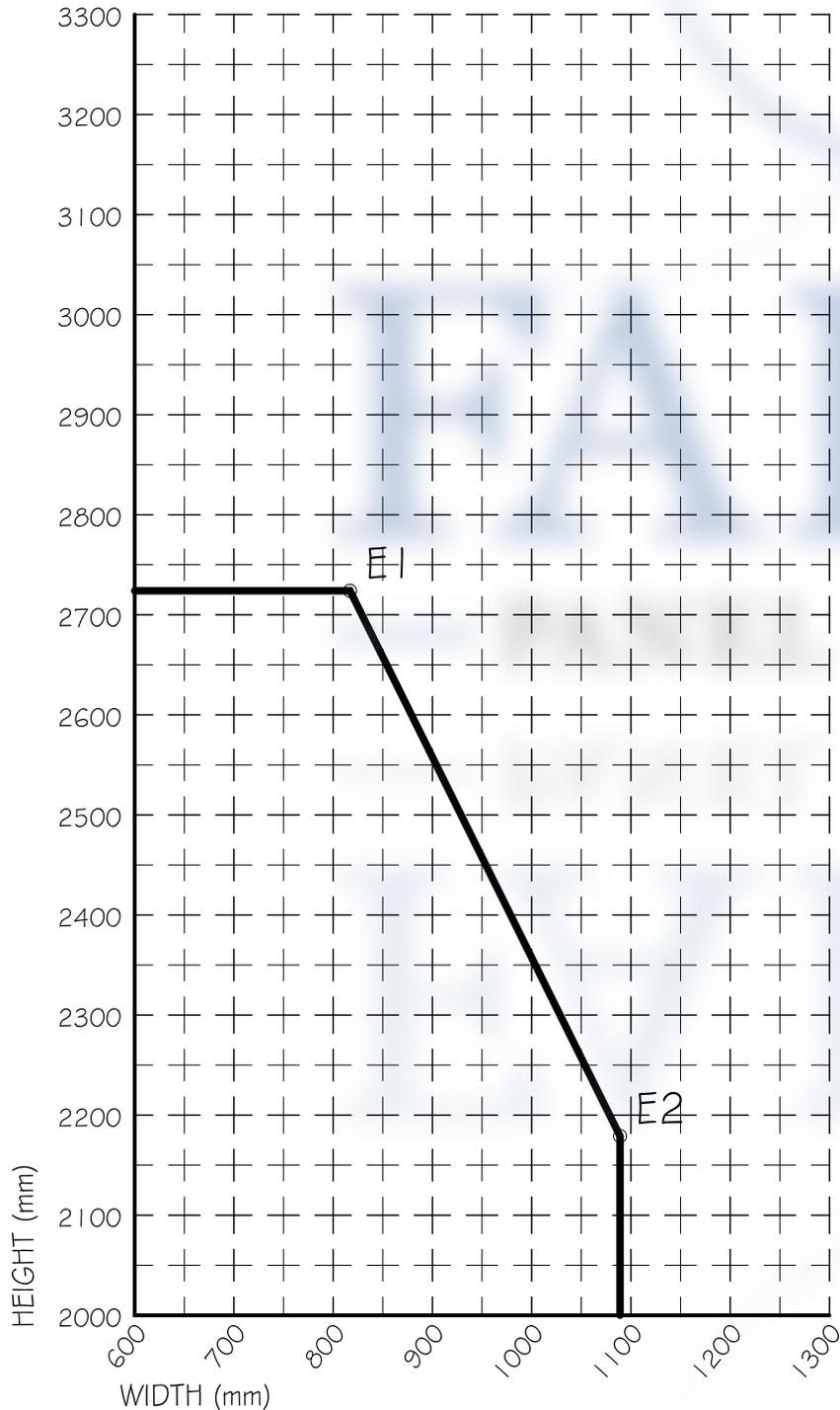
Envelope of Approved  
 Door Leaf Sizes  
 In Timber Frames

Job number: 17583

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Mar 2019

08037D/C03



## ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

	Using Enhanced Intumescent Specification	
	E1	E2
Width	817	1089
Height	2724	2179

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Configuration  
 Timber Frames  
 UNLATCHED SINGLE or DOUBLE ACTING SINGLE LEAF  
 WITH OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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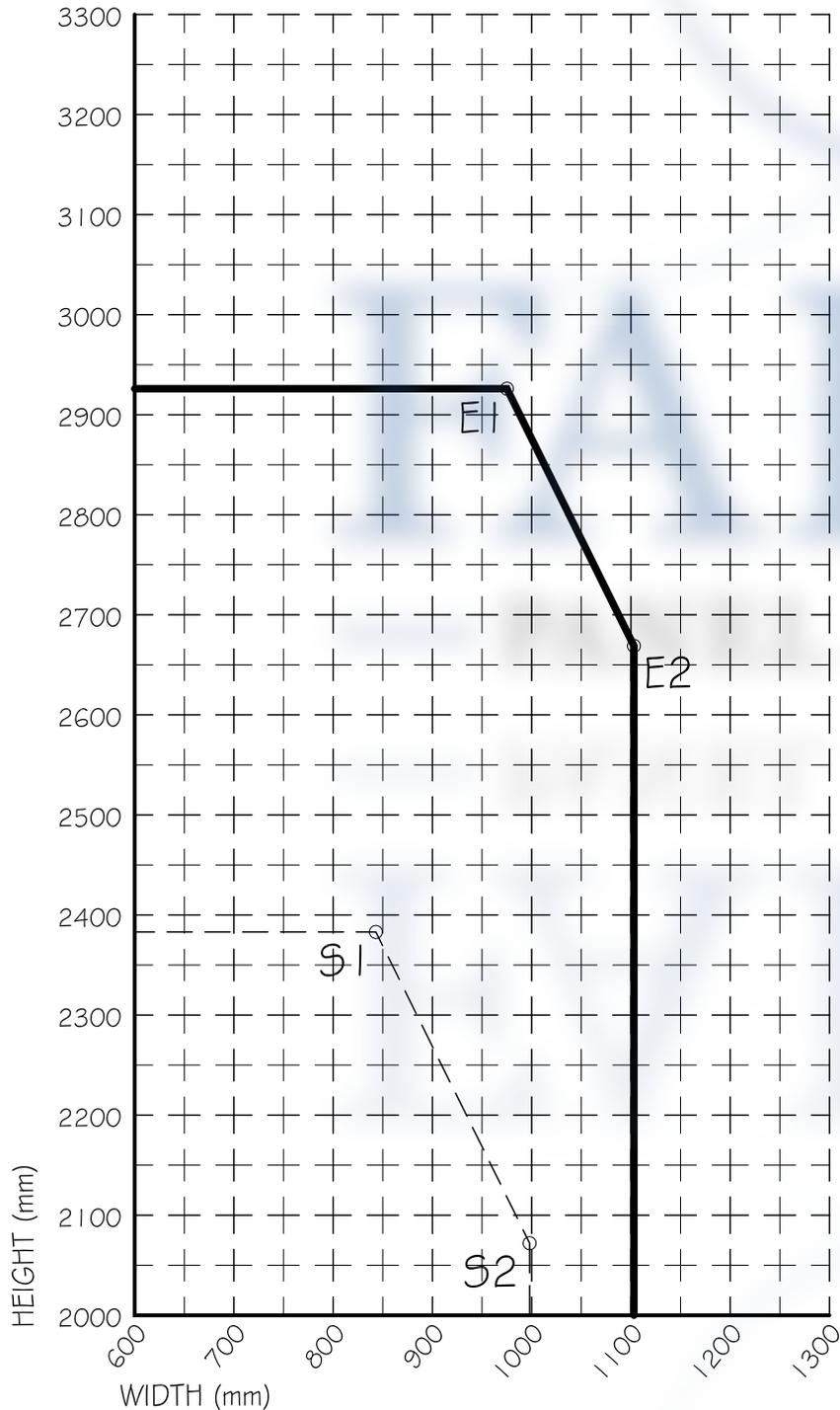
Envelope of Approved  
 Door Leaf Sizes  
 In Timber Frames

Job number: 17583

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Mar 2019

08037D/C04



Using Standard Intumescent Specification		
-----		
	S1	S2
Width	843	998
Height	2383	2072

### ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf using the standard intumescent seal specification

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

Using Enhanced Intumescent Specification		
—————		
	E1	E2
Width	975	1103
Height	2926	2669

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/O8037 Revision D, which contains full details of the assessed doorset construction.

Configuration  
 Timber Frames  
 LATCHED  
 SINGLE ACTING  
 DOUBLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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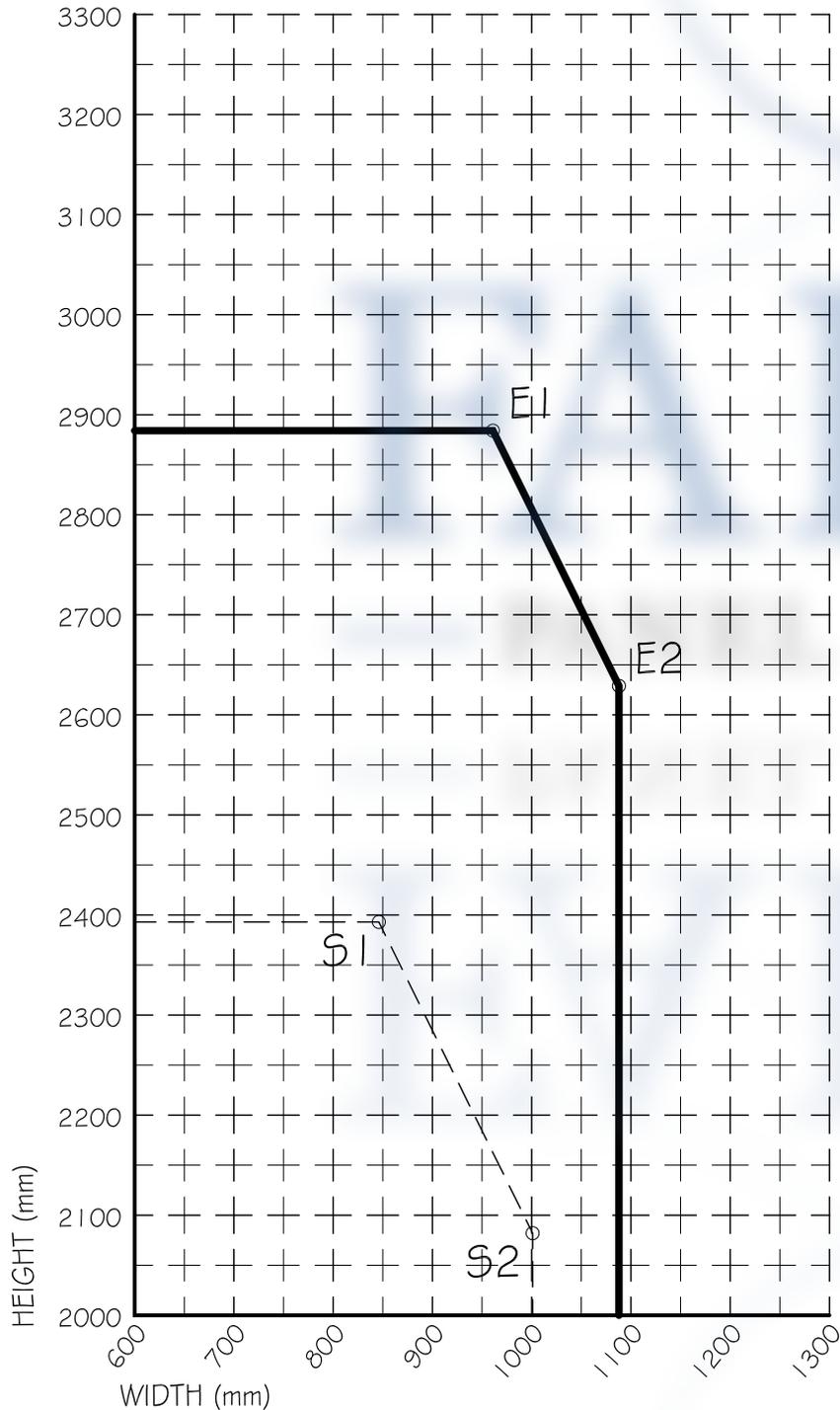
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Job number: 17583  
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 Not To Scale    Drawn: Mar 2019

08037D/C05



Using Standard Intumescent Specification	
	-----
	S1      S2
Width	835      988
Height	2359      2052

### ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf using the standard intumescent seal specification

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

Using Enhanced Intumescent Specification	
	—————
	E1      E2
Width	965      1092
Height	2897      2643

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Configuration  
 Timber Frames  
 UNLATCHED  
 SINGLE or DOUBLE ACTING  
 DOUBLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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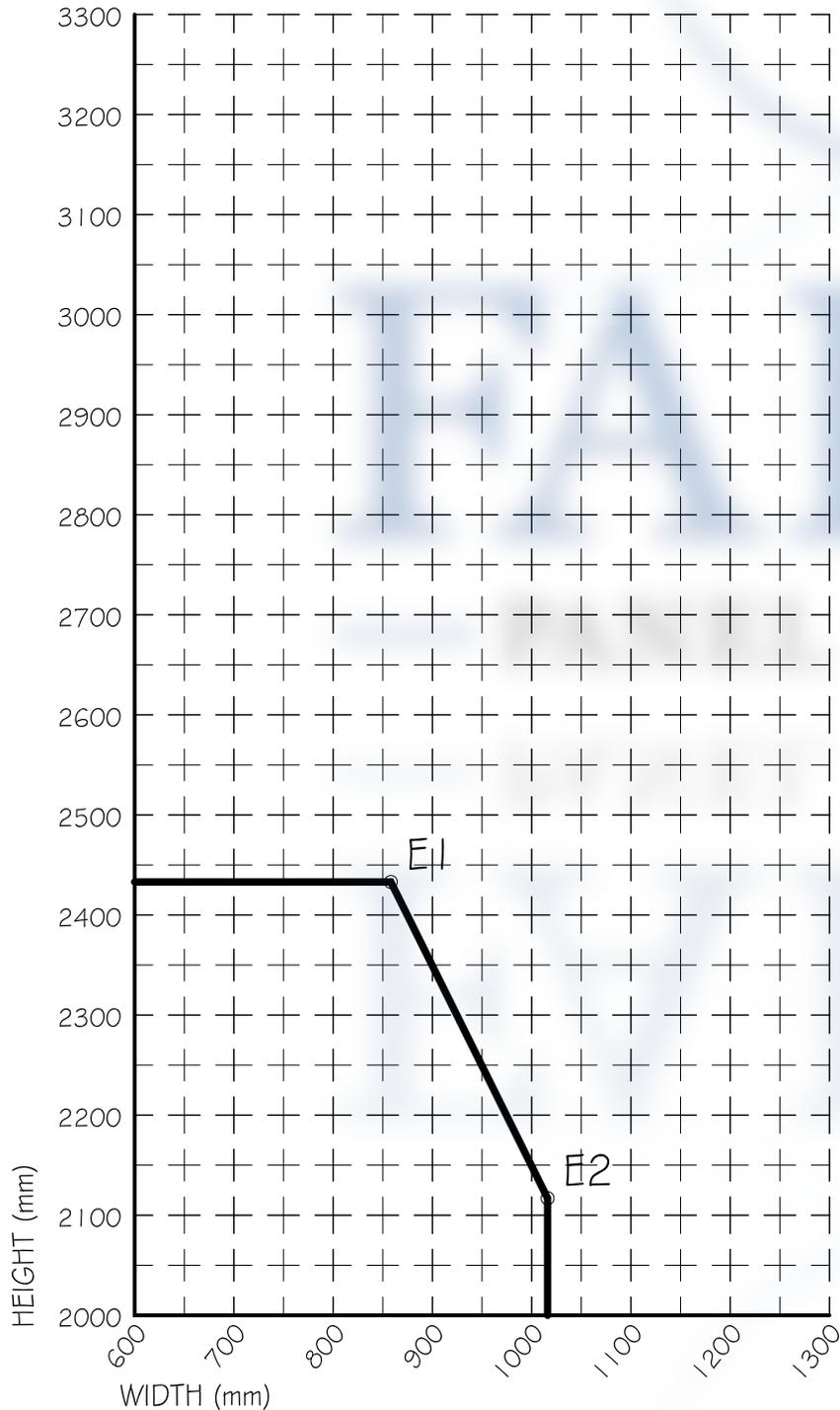
Envelope of Approved  
 Door Leaf Sizes  
 In Timber Frames

Job number: 17583

Drawn by: CSP      Checked by: DJC

Not To Scale      Drawn: Mar 2019

08037D/C06



## ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

	Using Enhanced Intumescent Specification	
	E1	E2
Width	858	1016
Height	2433	2117

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Configuration  
 Timber Frames  
 LATCHED  
 SINGLE ACTING  
 DOUBLE LEAF  
 WITH OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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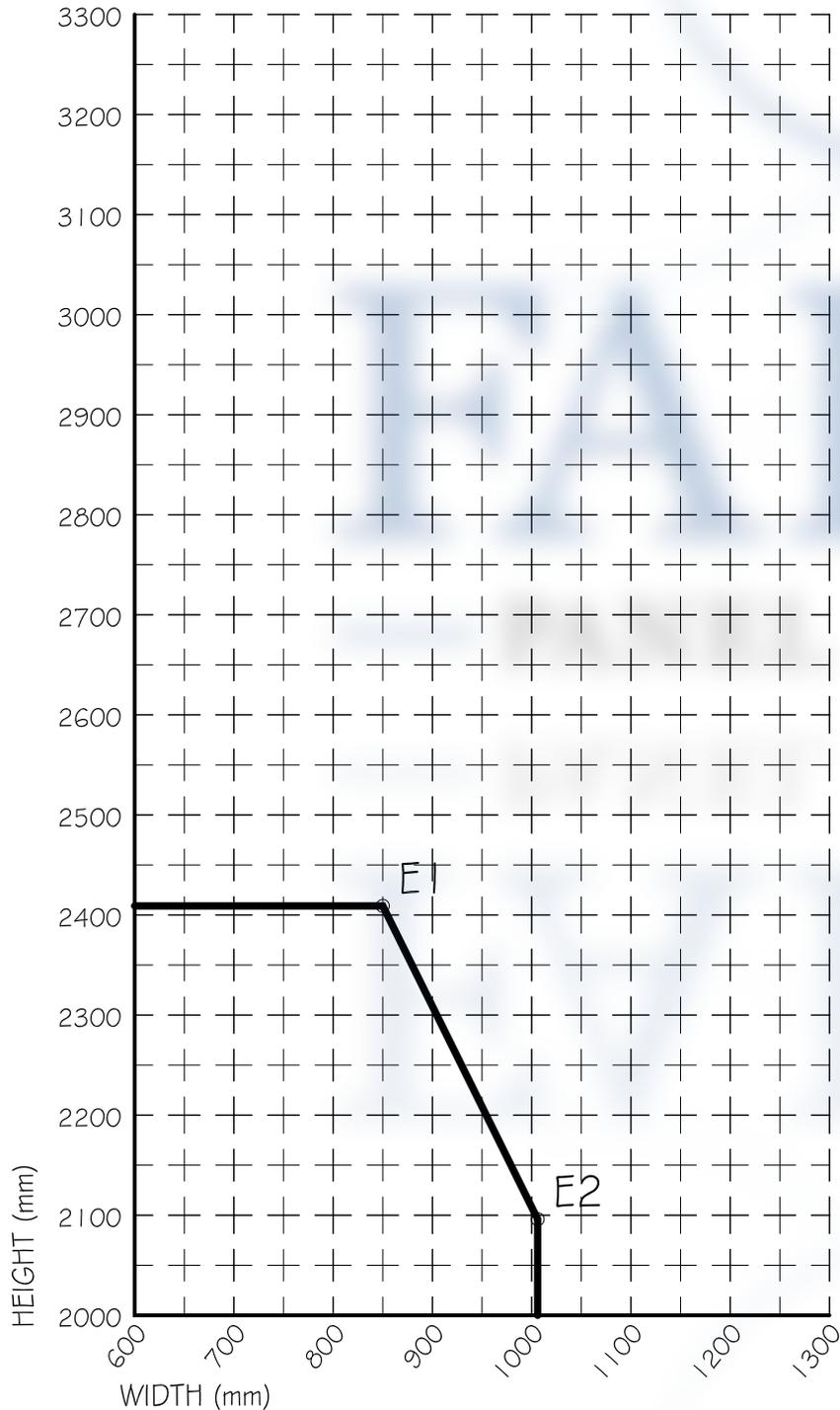
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 Door Leaf Sizes  
 In Timber Frames

Job number: 17583

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Mar 2019

**08037D/C07**



## ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS E1 & E2 represent the maximum height and width of a door leaf using the enhanced intumescent seal specification

Using Enhanced Intumescent Specification		
	E1	E2
Width	850	1006
Height	2409	2096

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Configuration  
 Timber Frames  
 UNLATCHED SINGLE or DOUBLE ACTING DOUBLE LEAF  
 WITH OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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 and Strebord® 54 Door Leaves  
 Installed in Timber and Steel Frames

Envelope of Approved  
 Door Leaf Sizes  
 In Timber Frames

Job number: 17583

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Mar 2019

08037D/C08

## APPENDIX D

Assessed Intumescent Seal Specifications for Strebord® 44,  
Strebord® Superpan and Strebord® 54 Door Leaves  
Installed in Nordform Steel Frames

Field of Application for FD30 Strebord® 44, Strebord®  
Superpan and Strebord® 54 Door Leaves Installed in Timber  
and Steel Frames in Accordance with BS476: Part 22: 1987

Prepared for: Falcon Panel Products

IFC Field of Application Report  
IFCA/08037 Revision D

Page 45 of 67

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Further details of the evidence covered by this document are available from an extensive  
testing regime covering a wide range of products.  
Further documentation can be found on our website at  
<https://www.falconpanel.co.uk/doorinfo>

Intumescent Seal Specifications for Strebord® 44, Strebord® Superpan and Strebord® 54 Door Leaves Installed in Nordform Steel Frames

Location	Specification
Stiles/ jambs	1no 20 x 4mm graphite based seal fitted centrally in the leaf edge
Head	1no 20 x 4mm graphite based seal fitted centrally in the leaf edge
Square meeting stiles	1no 20 x 4mm seal fitted centrally, or, 2no 10 x 4mm seals fitted 10mm apart centrally, in one leaf edge only

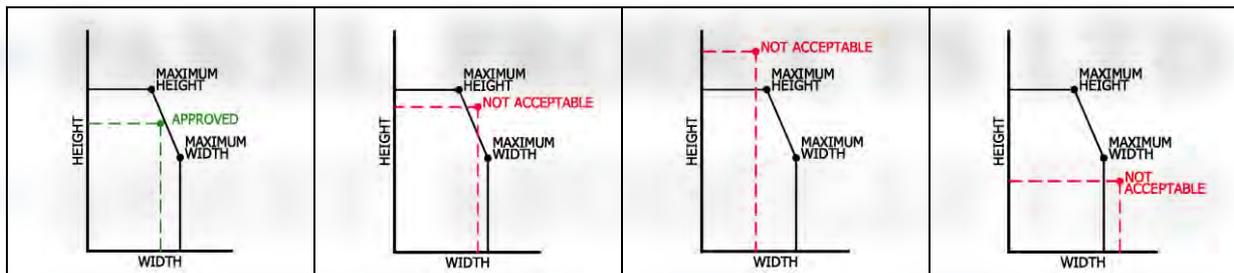
*Note: The 4mm thick seals are graphite based Pyroplex seals in a pvc case. Combined intumescent/smoke seals may be used, maintaining the widths specified above (and subject to the conditions outlined in Section 3.10 and 3.11).*

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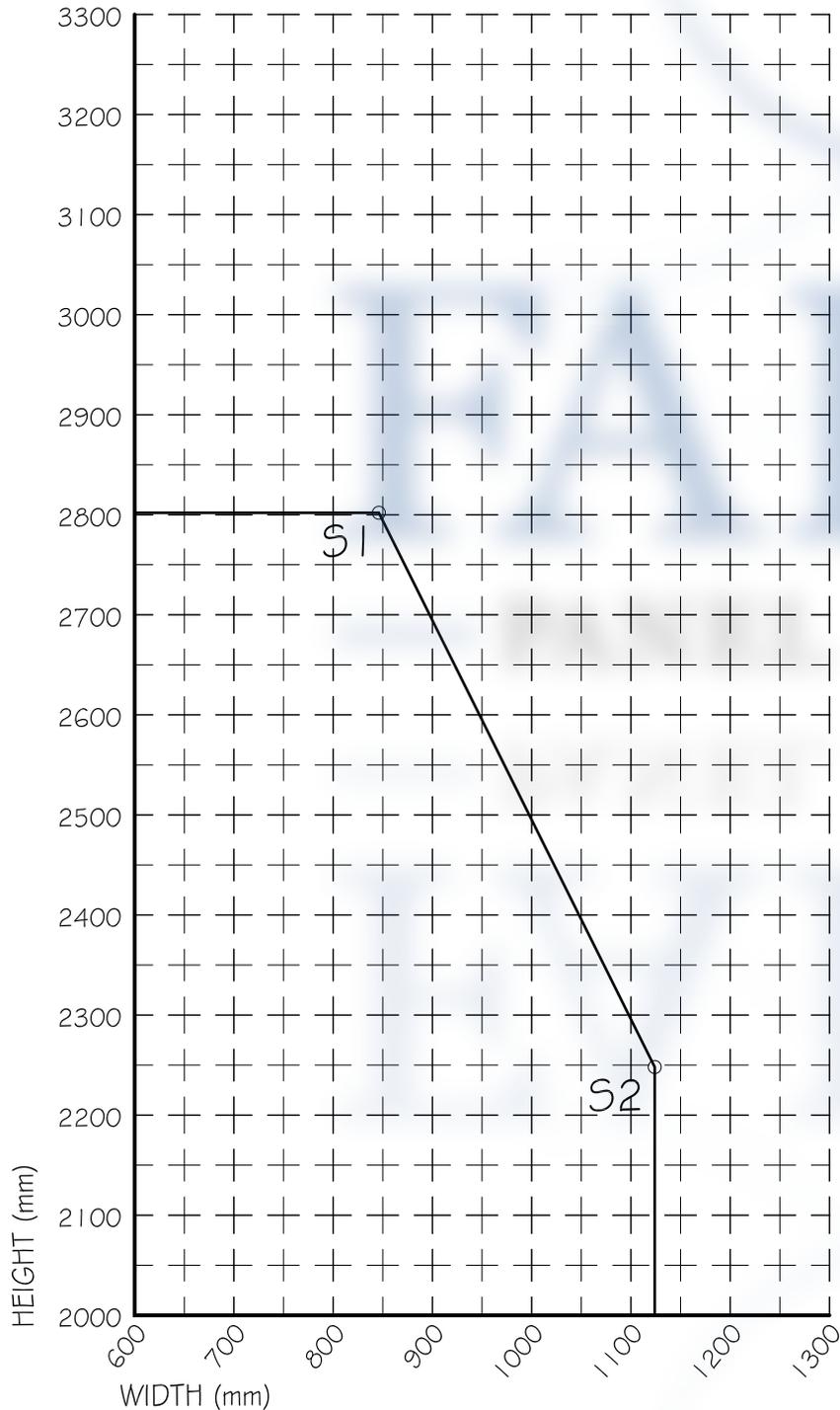
## APPENDIX E

Figures IFCA/08037D/E01 to E04

Assessed Leaf Size Envelopes for Strebord® 44,  
Strebord® Superpan and Strebord® 54 Door  
Leaves Installed in Nordform Steel Frames



*The figures in this Appendix are not included  
in the sequential page numbering of this report*



	S1	S2
Width	846	1124
Height	2802	2248

### ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/O8037 Revision D, which contains full details of the assessed doorset construction.

Configuration  
**Steel Frames**  
 LATCHED  
 SINGLE ACTING  
 SINGLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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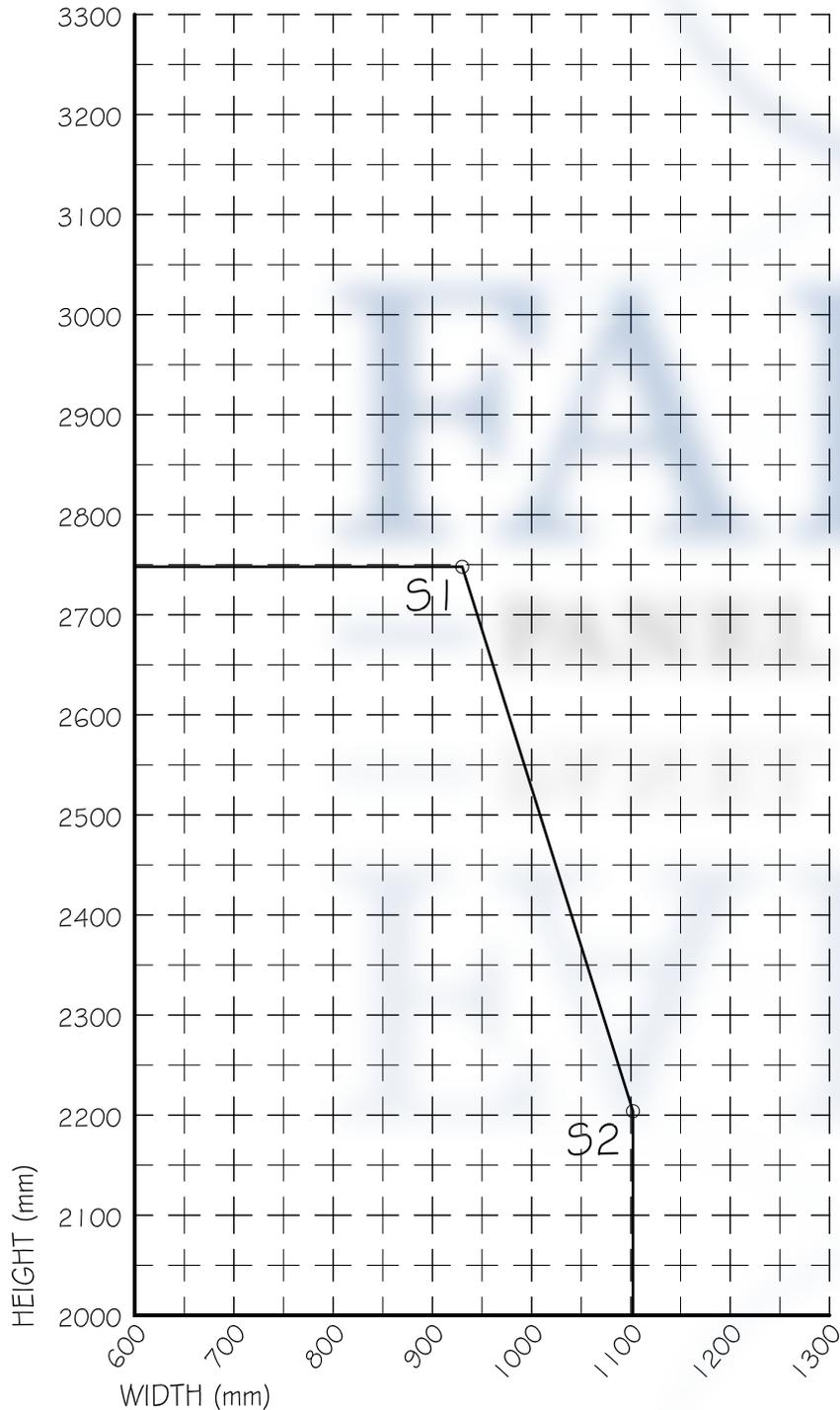
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 Strebord® 44, Strebord® Superpan  
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 Installed in Timber and Steel Frames

Envelope of Approved  
 Door Leaf Sizes  
 In Steel Frames

Job number: 17583  
 Drawn by: CSP    Checked by: DJC  
 Not To Scale    Drawn: Mar 2019

**08037D/E01**



	S1	S2
Width	830	1102
Height	2748	2204

## ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf

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Configuration  
**Steel Frames**  
 UNLATCHED  
 SINGLE ACTING  
 SINGLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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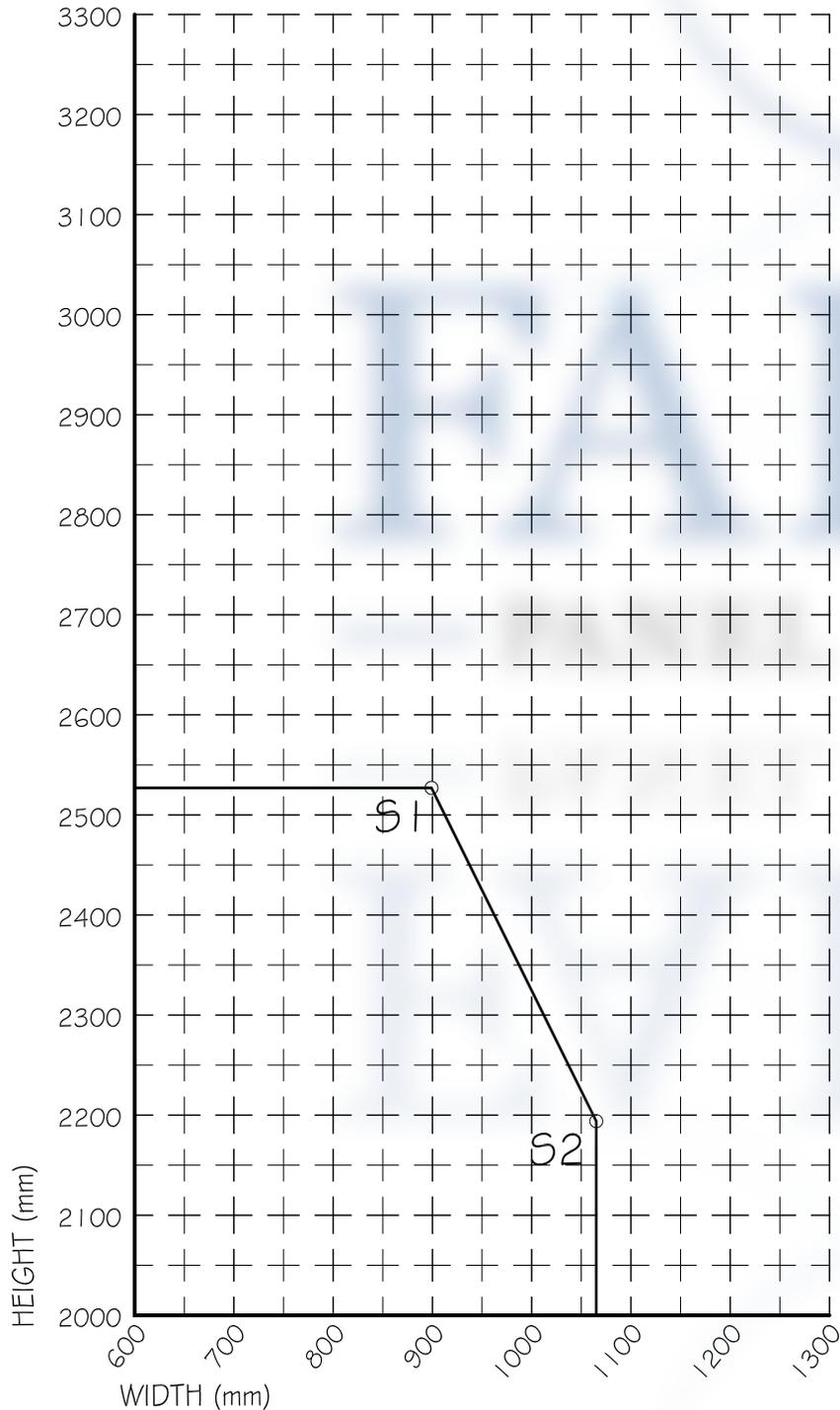
Envelope of Approved  
 Door Leaf Sizes  
 In Steel Frames

Job number: 17583

Drawn by: CSP Checked by: DJC

Not To Scale Drawn: Mar 2019

**08037D/E02**



	S1	S2
Width	899	1065
Height	2527	2194

### ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/O8037 Revision D, which contains full details of the assessed doorset construction.

Configuration  
**Steel Frames**  
 LATCHED  
 SINGLE ACTING  
 DOUBLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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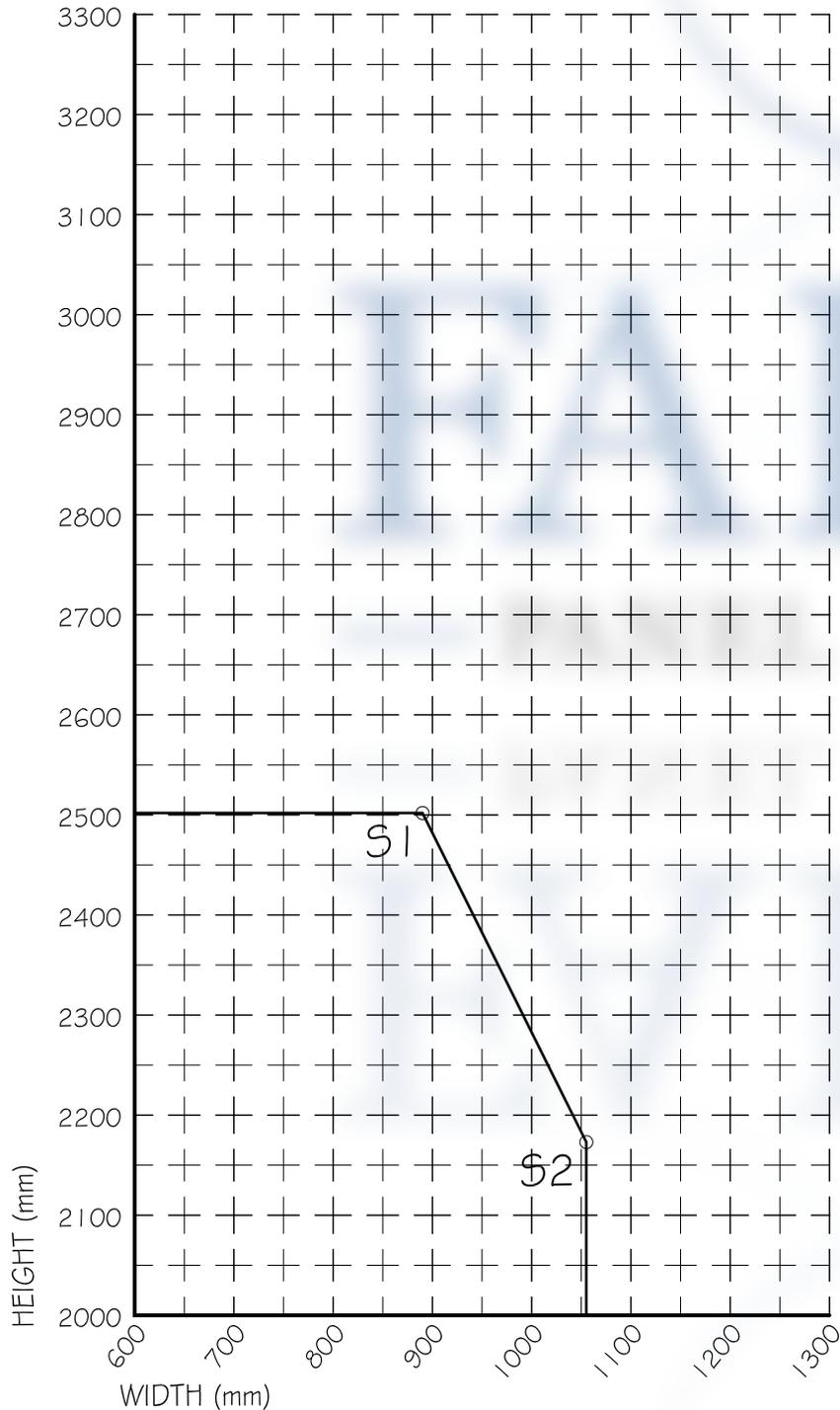
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 Door Leaf Sizes  
 In Steel Frames

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**08037D/E03**



	S1	S2
Width	890	1055
Height	2502	2173

### ENVELOPE OF APPROVED DOOR LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved.

POINTS S1 & S2 represent the maximum height and width of a door leaf

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/O8037 Revision D, which contains full details of the assessed doorset construction.

Configuration  
**Steel Frames**  
 UNLATCHED  
 SINGLE ACTING  
 DOUBLE LEAF  
 WITHOUT OVERPANEL  
 REQUIRED INTEGRITY: 30 Minutes

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 Door Leaf Sizes  
 In Steel Frames

Job number: 17583

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Not To Scale Drawn: Mar 2019

**08037D/E04**

# APPENDIX F

## General Guidance on Installation of Hardware

### F.1 Hinges

A variety of hinges have been successfully tested with the Strebord® 44, Strebord® Superpan and Strebord® 54 door designs. These include:

- Royde & Tucker H101 lift-off type hinges
- Royde & Tucker H102 lift-off type hinges
- Royde & Tucker H105 lift-off type hinges
- Royde & Tucker Hi-Load 207 butt hinge
- CONSORT CBH103 butt hinge
- Arrone 8182 butt hinge
- Dorma 2BB butt hinge
- Dorma 3090F butt hinge
- Eurospec Enduromax butt hinge
- Eurospec Enduro HIN1433/13
- Vier/Zoo VLHL243RS lift off type hinge
- Vier/Zoo VLHR243RS lift off type hinge
- Vier/Zoo VHP243RS butt hinge
- Zoo ZHSS243RS butt hinge

These and other hinges may be used, subject to compliance with the specifications below:

Hinge types: Fixed pin, washered butt, ball bearing butt, lift-off type or journal supported hinges may be used.

Number of hinges: 2no (1 pair) per leaf, for leaves up to 1200mm high  
3no (1½ pairs) per leaf, for leaves greater than 1200mm and up to 2400mm high  
4no (2 pairs) per leaf, for leaves greater than 2400mm high

Positions: The top hinge must be positioned 150mm down from the head of the leaf to the top of the hinge and the bottom hinge positioned 200mm up from the foot of the leaf to the bottom of the hinge. The middle hinge must be either equispaced between the top and bottom hinge, or 200–250mm below the top hinge. (All positions  $\pm 25$ mm). If four hinges are required the middle two hinges must be equally spaced between the top and bottom hinges.

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Fixings:	Steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) x minimum 25mm long (frame) and minimum 32mm long (door leaf). Screws to have thread for the full length. Position of screws (in relation to the door face) in blades of alternative hinge types shall be similar to hinges tested with the proposed door type.
Hinge blade sizes:	2.5–3.5mm thick x 100–110mm high x 30–36mm width. (These dimensions refer to the blade size, i.e. the part of the hinges that are recessed into the edge of the leaves/frame).
Hinge materials:	Brass, Phosphor Bronze, Steel or Stainless Steel. (Aluminium, Nylon or <b>'Mazac' are not permitted</b> ). No combustible or thermally softening materials to be included.
Additional protection:	Hinge blades must be bedded on low pressure forming or STS graphite based intumescent material at least 1mm thick.

Rising butt, cranked butts and spring hinges (single or double action) are not suitable for use on doors approved within the scope of this Field of Application Report, although they may be suitable on the basis of an individual and specific fire engineering evaluation.

## F.2 Concealed Hinges

The following concealed hinges may be used with the Strebord® 44, Strebord® Superpan and Strebord® 54 door designs for 30 minutes fire resistance:

- TECTUS TE 340 3D FR
- TECTUS TE 640 3D A8 FR

The following concealed hinges may be used with the Strebord® 54 door design for 30 minutes fire resistance:

- TECTUS 527FR

The material of the hinges must remain the same as tested.

The door frame material and specification (e.g. quality and construction) must meet the requirements of Section 3.4 in this Report, however, the thickness of the frame hanging jamb must be a minimum 44mm thick excluding stop depth.

Concealed hinges are only permitted with frames that sit fully within the supporting construction (i.e. not proud from the supporting construction at any point or frames that incorporate shadow details between the rear of the frame and supporting construction)

The mortice must be as tight to the hinge body as is compatible with its operation.

- Number of hinges : It must be ensured that the correct number of hinges are fitted, to ensure that the door leaf is supported for the full fire resistance period.
- Positions : The top hinge must be positioned 200mm down from the head of the leaf to the top of the hinge and the bottom hinge positioned 200mm up from the foot of the leaf to the bottom of the hinge. The middle hinge(s) must be either equispaced between the top and bottom hinge, or a hinge may be positioned 300mm below the top hinge. (All positions  $\pm 25\text{mm}$ )
- Fixings : Fixings must be as tested and supplied by the hinge manufacturer i.e. stainless steel counter sunk head wood screws; 4no per hinge blade and 40mm long x 5.2mm diameter
- Additional protection : ROKU strip M130 – Rolf Kuhn GmbH (self-adhesive graphite strips fitted within the hinge blade – see manufacturer for approved detail re: location, dimensions and thickness)

### F.3 Mortice Latches/Locks

Over-morticing is to be avoided; mortices shall be as tight as possible to the latch. If gaps around the case exceed 2mm, then these must be made good with intumescent mastic or sheet material. Holes for spindles or cylinders should be kept as small as is compatible with the operation of the hardware.

Where glazing apertures are also incorporated and are positioned such that locks/latches are included in the margin between the aperture and door edge, care must be taken to **ensure that the effective door 'stile' is not weakened** by the mortice. It is a condition of this assessment that, except where tubular latches are employed, the margin must be at least **75mm wider than the lock/latch mortice. If the mortice latch/lock is fitted in line with a 'rail'** between two apertures, no part of the lock mortice shall be closer than 50mm to the edge of any aperture.

### F.3.1 Single Point Latches/Locks

Where mortice latches/locks are fitted they should comply with the following specifications:

- Position : Centred, 800 – 1500mm, above the bottom of the door leaf
- Latch/lock types : Mortice latches, tubular mortice latches, sashlocks, deadlocks
- Maximum dimensions : Forend plate: 235mm long x 22mm wide, or, 200mm long x 25mm wide  
Latch body: 20mm thick x 185mm high x 100mm wide  
Strikeplate: 235mm long x 20mm wide, 200mm long x 25mm wide or 125mm long x 35mm wide
- Materials : Latches must have no essential part of their structure made from polymeric or other low melting point (<800°C) materials and should not contain any flammable materials.
- Additional protection : At meeting stiles of double leaf door assemblies, the strikeplate and forend must be bedded on 1mm thick low pressure forming or STS graphite based intumescent material.

Strebord® 54 door leaves may be fitted with mortice latches/locks that comply with the following specifications:

- Position : Centred 1000mm (± 200mm), above the bottom of the door leaf
- Latch/lock types : Mortice latches, tubular mortice latches, sashlocks, deadlocks
- Maximum dimensions : Forend plate: 310mm long x 20mm wide  
Latch body: 20mm thick x 185mm high x 70mm wide  
Strikeplate: 275mm long x 45mm wide
- Materials : Latches must have no essential part of their structure made from polymeric or other low melting point (<800°C) materials and should not contain any flammable materials.
- Additional protection : 2mm thick STS 302 liner fitted to the back of the latch body  
1mm thick STS raw graphite intumescent material fitted to fully cover the cheeks of the latch body  
2mm thick STS302 intumescent liner fitted under the latch forend  
1mm thick STS raw graphite intumescent material fitted encasing the latch keep

### F.3.2 Additional Single Point Latches/Locks

Additional mortice latches/locks may be included, and they should comply with the following specifications:

- Position : Centred minimum 250mm above or below the first lock, which should be centred 500–1000mm from the bottom of the door leaf
- Latch/lock types : Mortice latches, tubular mortice latches, sashlocks, deadlocks
- Maximum dimensions : Forend plate: 235mm long x 22mm wide, or, 200mm long x 25mm wide  
Latch body: 20mm thick x 185mm high x 100mm wide  
Strikeplate: 235mm long x 20mm wide, or, 200mm long x 25mm wide
- Materials : Latches must have no essential part of their structure made from polymeric or other low melting point (<800°C) materials and should not contain any flammable materials.
- Additional protection : The body of the latch/lock should be encased in, and the strikeplate and forend must be bedded on, 1mm thick low pressure forming or STS graphite based intumescent material.

### F.3.3 Full Height Locking Systems (Multipoint Locks)

The following multi point locks have been successfully tested with Strebord® design and are therefore approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores for 30 minutes fire resistance:

- Winkhaus AV2
- Winkhaus AV3
- ERA Surefire MPL
- Glutz 1893 MINT

Multi point locks must be subject to the following limitations and specifications:

- Only to be installed in single acting, single leaf assemblies
- Door frames to be softwood or hardwood, as outlined in Section 3.4.1
- Perimeter intumescent specification to be Enhanced Specification, 2no graphite-based seals fitted in the frame reveal as detailed in Appendix B, with minimum of 5mm of each seal continuous past top and bottom latch keeps and minimum of 5mm of one seal continuous past central keep. In instances where latch keeps are less than 185mm the intumescent seals may be fully interrupted.
- Central and upper latch bodies must be encased in minimum 1mm thick graphite based intumescent material or MAP/Interdens.
- Latch keeps must be bedded on minimum 1mm thick graphite based intumescent material

Field of Application for FD30 Strebord® 44, Strebord® Superpan and Strebord® 54 Door Leaves Installed in Timber and Steel Frames in Accordance with BS476: Part 22: 1987

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IFCA/08037 Revision D

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#### F.4 Electromechanical Strikes

The following electromechanical strike has been successfully tested with the Strebord® design and is therefore approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores for 30 minutes fire resistance, subject to the limitations and specification given in the following section:

- GEM GK700 electric strike

The GEM GK700 electric strike is approved for use in latched, single acting, single and double leaf door assemblies in timber door frames.

The GEM GK700 electric strike must be used with the following intumescent specification:

- 2no 10 x 4mm PVC encapsulated intumescent strips (see Appendix B for approved types) spaced 11mm apart and centrally fitted within the leaf edge; at least 5mm width of both strips must remain either side of the forend of the lock in the leaf edge (i.e. the electric strike is to be fitted opposite the leaf edge fitted with intumescent strips)
- The lock fitted in the leaf must also be protected with 1mm STS graphite (or a low-pressure, high volume intumescent gasket such as Interdens) around the latch body and underneath the latch forend.
- The electric strike (whether fitted in the frame of a single leaf door or meeting edge of a double leaf door) requires 1mm (t) STS graphite (or a low-pressure, high volume intumescent gasket such as Interdens) encasing the body of the electric strike and 2mm (t) STS raw graphite (or a low-pressure, high volume intumescent gasket such as Interdens) lining the strike plate.
- The strike may be fitted in door frames constructed using softwood or hardwood meeting the specification given in Section 3.4.1, however, the frame jamb that the strike is fitted into must be a minimum of 44mm (t).
- For single leaf doors, the hole in the rear of the frame for the wireway needs to be kept as small as possible to the diameter of the wire. For electric strikes fitted in the meeting edge of double leaf doors, see Section F.5 for approved wire way solutions.

Alternative electric strikes are permitted for use providing they have the same or smaller dimensions as the GEM GK700 strike (dimensions of strike: 175mm (h) x 44mm (w) x 27mm (d)) and comprise the same materials and same basic design as the GEM GK700. All other details must comply with this specification given above.

## F.5 Cableways and Cable Loops for Electromechanical Hardware

The following cableway details are approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores:

### F.5.1 Cableway Method 1

- Maximum 10mm diameter hole drilled through the door core central to the door core thickness.
- The hole is to be positioned maximum 1200mm above the threshold
- The hole must be lined with 10mm x 1mm STS Cablepro intumescent.
- The hole must be located a minimum of 100mm from any cut out or aperture within the door leaf.

### F.5.2 Cableway Method 2

- Maximum 10mm (w) x 42mm (d) channel cut centrally in the leaf edge.
- The channel is capped with 10mm (w) x 30mm (d) hardwood (same specification as door edge lipping), glued in position using one of the adhesives approved for door edge lipping with a pre-formed intumescent strip fixed to the bottom of the hardwood capping to line the conduit formed for the wire-way.
- The door edge is then lipped using the appropriate lipping specification to conceal the timber capping and wire way.
- This detail is approved for use in the lower half of the door leaf and can run from the hanging edge to the latch/lock at the closing edge/meeting edge.
- The cableway must be located maximum 1200mm above the threshold.

### F.5.3 Cableway Method 3

- Maximum 10mm (w) x 10mm (d) channel cut centrally in the leaf edge.
- The door edge is then lipped using the appropriate lipping specification to conceal the timber capping and wire way.
- This detail is approved for use in the lower half of the door leaf and can run from the hanging edge to the latch/lock at the closing edge/meeting edge.
- The cableway must be located maximum 1200mm above the threshold.

### F.5.4 Concealed Cable Loops

The following concealed cable loop may be used in conjunction with the above detailed installations;

- Abloy EA280 cable loop

The cable loop must be installed with 2mm thick STS 302 intumescent liner fitted beneath the forend and lining the cut out.

## F.6 Door Closers

Where required by regulatory guidance or specific fire strategy, each hinged door leaf must be fitted with a self-closing device unless it is normally kept locked shut and labelled with an appropriate sign which complies with BS5499: Part 1: 1990.

It is essential that all closers fulfil the requirements of BS EN 1154: 1997 and are of the correct power rating for the width and weight of the doors (minimum power size 3). They **must be fitted according to the manufacturer's instructions and be adjusted so that they are** capable of fully closing the door leaf, against any friction imposed by the latch (and smoke seals, if fitted), from any position of opening.

### F.6.1 Face-Fixed Overhead Closers

Face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on unlatched FD30 cellulosic door leaves in timber frames may be used.

Any accessory that is located within the door reveal must have appropriate test or assessment evidence.

In addition, where areas of uninsulated glazing are adjacent to the closer, the selected closer type must have been tested on the unexposed face of an uninsulated steel door, or a fully glazed door fitted with uninsulating glass, to demonstrate that the closer does not emit flammable fluids onto the glass face that would otherwise cause integrity failure before the required period of fire resistance.

### F.6.2 Concealed Overhead Closers

The following concealed overhead closers has been successfully tested and is approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores:

- Rutland ITS 11204 concealed closer
- Arrone AR7383

The closer must be fitted in accordance with the following specification:

- The intumescent seal(s) at the head of the assembly should be fitted in the frame reveal
- The closer is approved for use in the leaf head (i.e. not approved as a transom mounted closer)
- The closer is approved for single acting single and double leaf assemblies, without overpanels

- For installation of the Rutland ITS 11204 concealed closer;
  - 20mm thick square hardwood lipping at the head of the door leaf (see Section 3.3 for approved lipping details)
  - 2mm thick Rutland IP114 intumescent gasket lining the closer arm channel in the frame head (encasing long edges of the channel)
  - 2mm thick Rutland IP114 intumescent gasket, or 1mm thick STS raw graphite material, on top of body in the leaf head
- For installation of the Arrone AR7383 concealed closer;
  - There shall be a minimum of 3mm wide intumescent seal continuous past the closer arm channel
  - 2mm thick Arrone intumescent kit shall be fitted with the concealed closer

The following concealed overhead closer has been successfully tested and is approved for use with the Strebord® 54 door cores only:

- Geze Boxer 2-4 concealed closer

The closer must be fitted in accordance with the following specification:

- The intumescent seal(s) at the head of the assembly should be fitted in the frame reveal
- 8mm thick square hardwood lipping at the head of the door leaf (see Section 3.3 for approved lipping details)
- A minimum of 8mm of intumescent shall remain continuous past the closer arm.
- 1mm thick Lorient Polyproducts Ltd MAP intumescent material shall be fitted around the closer body and on top of the closer body.
- The closer is approved for use in the leaf head (i.e. not approved as a transom mounted closer)
- The closer is approved for single acting single and double leaf assemblies, without overpanels

### *F.6.3 Concealed Jamb Mounted Closers*

The following concealed jamb mounted closer has been successfully tested and is approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores:

- Astra 4000 series

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The closer must be fitted in accordance with the following specification:

- Only to be installed in single acting, single leaf assemblies
- Door frames to be softwood or hardwood, as outlined in Section 3.4.1
- 2no 10 x 4mm PVC encapsulated intumescent strips (see Appendix B for approved types) spaced 8mm apart and centrally fitted within the leaf edge
- The closer is to be installed in the hanging jamb and must be located maximum 1200mm above the threshold

## F.7 Bolts

### F.7.1 Meeting Style Bolts

Some of the tests referenced in this report include double leaf doors with flush bolts fitted, but disengaged; bolts are not, therefore, necessary for the doors to achieve 30 minutes fire resistance (subject to an appropriate self-closing device being fitted). The extra restraint provided by flush bolts, in association with latches, does, however, have a beneficial effect on leaf size envelopes; see Appendices C and E.

Unless specific fire test evidence is available, all bolts shall be steel. The following limitations and protection apply;

- Maximum size of flush bolt is 609mm long x 20mm wide and 20mm deep;
- The head of the leaf and/or frame should contain a minimum 5mm width of intumescent material local to the bolt/keep plate;
- The body of the bolt should be bedded on minimum 1mm thick STS graphite based intumescent material;
- Edge fixed bolts shall be positioned centrally in the leaf thickness
- The intumescent seals at the meeting styles, as defined in Appendices B and D shall be fitted in the active leaf;
- There should be a minimum of 5mm width of intumescent strip in the door edge, past the body of the bolt;
- Flush bolts are not approved on doors with rebated overpanels, since this will clash with the rebate alignment. Surface mounted bolts may be used; see below;
- Face fixed flush bolts shall be fixed so that there is a minimum of 50mm between the bolt and the door edge;
- Surface mounted barrel bolts shall not exceed 400mm in length, but there is no limitation on their width. Screws for fixing bolts must be at least 25mm long and have thread for the full screw length.

### F.7.2 Security Bolts

Single leaf assemblies may include ERA 4383G door security bolts fitted in the head of the leaf 100mm from the closing edge. The forend and keep are 20mm wide and may fully interrupt the intumescent seal at the head of the leaf, however, the keep must be bedded on minimum 1mm thick STS graphite based intumescent material.

### F.8 Floor Springs and Accessories

Floor springs and accessories (straps and top pivots) are necessary for double acting assemblies.

The following floor springs and accessories have been successfully tested and are approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores:

- Rutland PS190 with ITS11204

The following floor springs and accessories have been successfully tested and are approved for use with the Strebord® 54 door core:

- Rutland PS190 with TS7104

Alternative floor springs and accessories may be used, subject to having appropriate fire test or assessment evidence for use on timber door assemblies of similar construction to that proposed, and the following limitations:

- Incorporation of any intumescent gasketry used in the test;
- Continuation of at least 10mm (total width) of the intumescent edge seals in leaf or frame head (as applicable); either 5mm along both sides of the top strap/pivot for double acting straps, or 10mm on one side for single acting straps;
- Minimum 1mm thick intumescent sheet must line the mortise of the top strap and pivot in both the door leaf and frame head (or as supplied by the floor spring manufacturer);
- No removal of the timber or intumescent strip at the leaf stile (except for a 6-8mm diameter access hole for the top strap adjustment screw).

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## F.9 Non-Essential Hardware Items

### F.9.1 Letter Plates

The following letter plates and accessories have been successfully tested and are approved for use with the Strebord® 44, Strebord® Superpan and Strebord® 54 door cores:

- Royde and Tucker LP008 with integral cowell, installed complete with Royde and Tucker LP008 intumescent kit
- Fab and Fix Letterplate (ref: 3C018) with cowell (ref: 3F005), installed complete with Fire and Acoustic Seals Ltd Spartan Hardware Ref: FASGP1013 intumescent kit

Alternative letter plates may be installed but must be tested, assessed or otherwise approved for use in 44mm thick (or less) cellulosic FD30 doors. They must be fitted in **accordance with the manufacturer's instructions**, paying attention to the approved location within the door leaf (e.g. maximum height from threshold) and including all intumescent liners and flaps. Plates must not be less than 100mm away from the leaf edge, or any other aperture.

*Note F1 The installation of such items in a door leaf may compromise its performance as a smoke control door assembly.*

### F.9.2 Push Plates, Kick Plates, etc

Plastic, pvc or metal plates may be surface-mounted to the doors, but, if more than 800mm in length by nominally 200mm wide, they must be attached in a way that would prevent them distorting the door leaf, e.g. glued with thermally softening adhesive or screwed with short aluminium screws and fitted in such a way so they will not be prevented from falling away by being trapped under door stops, glazing beads or handle escutcheons etc.

### F.9.3 Pull Handles

These may be fixed to the door assemblies, provided that the fixing points are no greater than 800mm apart. Pull handles that are fixed through the leaf should use clearance holes as close fitting as possible to the bolt.

#### *F.9.4 Intumescent Air Transfer Grilles*

These must be tested, assessed or otherwise approved for use with 44mm thick (or less) cellulosic FD30 doors. They must be fitted fully in accordance with the **manufacturer's** instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that for which test or assessment evidence exists. See Section 3.5.4, for restrictions on maximum size and placement of any apertures; these apply to those for grilles, which must also be included in the total area permitted for apertures given in Section 3.5.4.

*Note F2* The installation of such items in a door leaf may compromise its performance as a smoke control door assembly.

#### *F.9.5 Security Viewers*

These may be fixed into the proposed doors, e.g. Sealed Tight Solutions STS4008, subject to the following limitations, unless specific fire test evidence exists to the contrary;

- Viewers must not exceed 15mm outer diameter, and be made from brass or steel;
- Holes bored through the door must be no greater than 2mm larger than the bore of the viewer and must be lined with 1mm thick graphite based or low pressure forming intumescent mastic/sheet;
- The viewer must include an effective shutter/cover plate.

#### *F.9.6 Door Selectors*

These are used on double leaf door assemblies with rebated meeting stiles, to ensure that the leaves close in sequence. Face fixed items are recommended. Door selectors must not be recessed into the leaf or frame to the extent that they interrupt any intumescent strips.

#### *F.9.7 Panic Hardware*

Panic hardware may be fitted, provided that its installation does not require the removal of any timber from the leaf, stop or frame reveal and it in no way interferes with the self closing action of the door leaf

#### *F.9.8 Threshold Seals*

Automatic threshold drop seals may be recessed into the bottom of the Strebord® 44, Strebord® Superpan and Strebord® 54 door leaves. The drop seal must have suitable supporting evidence that demonstrates a minimum of 30 minutes fire resistance performance to BS 476: Part 22: 1987 or BS EN 1634-1. The seal must be fitted in accordance with the seal manufacturers test evidence, including any associated intumescent protection.

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### *F.9.9 Identification Plates*

Identification plates (plastic or metal) may be surface fixed to door leaves with screws or adhesive. The signage must comply with the requirements of BS 5499-5: 2002.

Plastic or metal identification plates that are no larger than 45mm diameter x 2mm thick can be fitted flush with the leaf face providing they are located a minimum of 50mm from the leaf edge.

### *F.9.10 Contact Switch*

Door assemblies may include a CQR FC620 Maximal flush contact switch fitted in the head of the leaf a minimum of 100mm from the edges and any other hardware. The receiver is installed adjacent in the head of the frame. The contact switch and receiver should be installed such that a minimum of 5mm of intumescent seal is continuous past them at the head.

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## APPENDIX G

### Summary of Primary Fire Test Evidence

Test Report, Test Laboratory, Test Date	Configuration Tested	Leaf Size Tested (H x W x T)	Test Standard	Integrity (minutes)
RF97059, Chiltern International Fire, 03/07/1997	ULSADD, opening in	2100mm x 874mm + 874mm x 44mm	BS476: Part 22: 1987	37
RF98048, Chiltern International Fire, 15/06/1998	ULSADD, opening in	2100mm x 902mm + 902mm x 44mm	BS476: Part 22: 1987	42
RF98137, Chiltern International Fire, 25/01/1999	ULSADD, opening in	2100mm x 902mm + 902mm x 44mm	BS476: Part 22: 1987	32
RF99050, Chiltern International Fire, 13/05/1999	ULSADD.OP, opening in	2100mm x 900mm + 900mm x 44mm	BS476: Part 22: 1987	36
RF00136, Chiltern International Fire, 10/10/2000	ULSADD.OP, opening in	2100mm x 900mm + 900mm x 44mm	BS476: Part 22: 1987	37
RF01030, Chiltern International Fire, 02/04/2001	ULSADD, opening in	2100mm x 902mm + 902mm x 44mm	BS476: Part 22: 1987	32
RF02109, Chiltern International Fire, 15/11/2002	A: ULSASD, opening in B: LSASD, opening in	A: 2136mm x 936mm x 44mm B: 2700mm x 1072mm x 44mm	BS476: Part 22: 1987	A: 34 B: 35
RF03083, Chiltern International Fire, 30/10/2003	ULSADD, opening in	2100mm x 902mm + 902mm x 44mm	BS476: Part 22: 1987	30
RF03108, Chiltern International Fire, 25/11/2003	ULSADD, opening in	2100mm x 903mm + 903mm x 44mm	BS476: Part 22: 1987	30
RF05134, Chiltern International Fire, 17/02/2006	A: ULSASD, opening in B: ULSASD, opening in	A: 2040mm x 915mm x 44mm B: 2800mm x 915mm x 44mm	BS476: Part 22: 1987	A: 37 B: 38

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Test Report, Test Laboratory, Test Date	Configuration Tested	Leaf Size Tested (H x W x T)	Test Standard	Integrity (minutes)
RF07109, Chiltern International Fire, 10/08/2007	ULSADD, opening in	2100mm x 902mm + 902mm x 44mm	BS476: Part 22: 1987	36
RF08094 Revision A, Chiltern International Fire, 04/07/2008	ULSADD, opening in	2100mm x 901mm + 901mm x 44mm	BS476: Part 22: 1987	33
RF08125, Chiltern International Fire, 16/10/2008	ULSADD, opening in	2442mm x 915mm + 915mm x 44mm	BS476: Part 22: 1987	49
RF08135, Chiltern International Fire, 29/09/2008	ULSADD, opening in	2100mm x 931mm + 931mm x 44mm	BS476: Part 22: 1987	31
RF08088, Chiltern International Fire, 04/07/2008	ULSADD, opening in	2440mm x 915mm + 915mm x 44mm	BS476: Part 22: 1987	44
RF09031, Chiltern International Fire, 12/03/2009	ULSADD, opening in	2150mm x 931mm + 280mm x 44mm	BS476: Part 22: 1987	39
RF09170, Chiltern International Fire, 08/12/2009	ULSADD, opening in	2100mm x 902mm + 902mm x 44mm	BS476: Part 22: 1987	36
RF10011, Chiltern International Fire, 24/02/2010	ULSADD, opening in	2740mm x 926mm x 44mm	BS476: Part 22: 1987	51
RF10098 (mill test), Chiltern International Fire, 20/08/2010	ULSADD, opening in	2100mm x 902mm x 44mm	BS 476: Part 22: 1987	32
RF11006 (mill test), Chiltern International Fire, 18/01/2011	ULSADD, opening in	2096mm x 934mm x 44mm	BS 476: Part 22: 1987	33
RF11121 (PVA lipping adhesive), Chiltern International Fire, 18/08/2011	ULSADD, opening in	2055mm x 927mm x 44mm	BS EN 1634-1	38
RF11170, Chiltern International Fire, 29/11/2011	ULSADD, opening in	2135mm x 915mm x 44mm	BS EN 1634-1	38

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Test Report, Test Laboratory, Test Date	Configuration Tested	Leaf Size Tested (H x W x T)	Test Standard	Integrity (minutes)
RF11172 (25mm thick MDF door frames), Chiltern International Fire, 28/11/2011	ULSASD, opening in	2135mm x 915mm x 44mm	BS476: Part 22: 1987	39
RF11192 (Superpan primary test evidence), Chiltern International Fire, 17/01/2012	ULSADD, opening in	2100mm x 915mm + 915mm x 44mm	BS476: Part 22: 1987	34
PF16035	ULSADD	2135mm x 932mm x 44mm	BS 476: Part 22: 1987	47
WF378795 (STS Glazing system)	ULSADD	2438mm x 926mm x 45mm	BS 476: Part 22: 1987	37
PF14072 (mill test & polyurethane adhesive for lipping), BM TRADA, 28/03/2014	ULSADD, opening in	2098mm x 932mm x 44mm	BS 476: Part 22: 1987	32
WF380214 (over rebated lippings & mill test)	A: ULSASD	A: 2052mm x 952mm x 44mm	BS EN 1634-1	A: 52
WF386959 (multiple locks, concealed closer and cableways), Exova Warringtonfire, 18/08/2017	A: ULSASD, opening in	A: 2438mm x 950mm x 44mm	BS 476: Part 22: 1987	A: 32
WF384630 Rev A (finger jointed engineered redwood, cableway, GM GK700 electric strike), Exova Warringtonfire, 15/06/2017	LSADD, opening in	2440mm x 1050mm + 400mm x 44mm	BS 476: Part 22: 1987	43
PF14168 Rev A (full height lock and flush pull handle), BM TRADA, 20/11/2014	LSASD, opening in	2040mm x 926mm x 46mm	BS EN 1634-1	48
PF14233 AR1 (full height lock)	LSASD	2055mm x 915mm x 44mm	BS EN 1634-1	45

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PF15050 (MDF frames and Flexifire gaskets for hinges), BM TRADA, 02/04/2015	LSADD, opening in	1502mm x 610mm + 610mm x 44mm	BS 476: Part 22: 1987	49
PF15178 Rev A (MDF door frames and decorative grooves), BM TRADA, 06/10/2015	A: LSASD, opening in B: LSASD, opening in C: LSASD, opening in	A, B & C: 1982mm x 686mm x 44mm	BS 476: Part 22: 1987	A: 38 B: 38 C: 45
WF391032 (full height lock and cableway)	A: LSASD B: LSASD	A & B: 2395mm x 1180mm x 54mm	BS 476: Part 22: 1987	A: 43 B: 37
WF391843 (concealed jamb mounted closer and full height lock), Exova Warringtonfire, 11/11/2017	LSASD, opening in	2235mm x 1050mm x 44mm	BS 476: Part 22: 1987	51
WF401039 (finger jointed engineered redwood, decorative inserts, full height lock, Geze concealed closer), Warringtonfire, 22/06/2018	LSASD, opening in	2408mm x 1048mm x 44mm	BS 476: Part 22: 1987	36
WF402305 (concealed jamb mounted closer and full height lock), Exova Warringtonfire, 02/08/2018	LSASD, opening in	2405mm x 1046mm x 43mm	BS 476: Part 22: 1987	51
WF405305 (decorative inserts), Warringtonfire, 25/10/2018	A: ULSASD, opening in B: ULSASD, opening out	A & B: 2040mm x 930mm x 44mm	BS 476: Part 22: 1987	A: 40 B: 40
CFR1811071, Cambridge Fire Research, 07/11/2018	A: ULSASD, opening in B: ULSASD, opening in	A: 2745mm x 1012mm x 44mm B: 2752mm x 916mm x 44mm	BS 476: Part 22: 1987	A: 39 B: 38
CFR1812111, Cambridge Fire Research, 11/12/2018	ULDADD	2039mm x 926mm + 925mm x 45mm	BS 476: Part 22: 1987	36
CFR1812121, Cambridge Fire Research, 12/12/2018	ULSADD, opening in	2751mm x 931mm + 931mm x 44mm	BS 476: Part 22: 1987	36

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Test Report, Test Laboratory, Test Date	Configuration Tested	Leaf Size Tested (H x W x T)	Test Standard	Integrity (minutes)
WF414781 (Strelip), Warringtonfire, 07/07/2019	ULSADD, opening in	2040mm x 935mm + 935mm x 44mm	BS EN 1634-1:2014	33
WF413865 (Strelip), Warringtonfire, 13/05/2019	ULSADD, opening in	2135mm x 935mm + 935mm x 54mm	BS 476: Part 22: 1987	70
WF414882 (Streframe lipping, letter plate), Warringtonfire, 11/06/2019	ULSADD, opening in	2040mm x 926mm + 926mm x 44mm	BS EN 1634-1:2014	32
WF388638 (radiused PVC edges), Exova Warringtonfire, 07/09/2017	ULSADD, opening in	2205mm x 1005mm + 1005mm x 48mm	BS 476: Part 22: 1987	39
WF411193 (side screens), Warringtonfire, 28/02/2019	ULSADD, opening in and out	2040mm x 926mm x 44mm	BS 476: Part 22: 1987	37
WF414162 (AV3 lock, Arrone concealed closer, letter plate), Warringtonfire, 14/05/2019	LSASD, opening in	2045mm x 925mm x 44mm	BS 476: Part 22: 1987	36
	LSASD, opening out	2045mm x 925mm x 44mm	BS 476: Part 22: 1987	38
CFR1810221 Door B Floor spring and pivot, Cambridge Fire Research, 22/10/2018	ULDASD	2005mm x 926mm x 44mm	BS 476: Part 22: 1987	39
WF41777, Floor spring and pivot, Warringtonfire High Wycombe, 14/08/2019	ULDADD	2040mm x 924mm + 924mm x 54mm	BS 476: Part 22: 1987	60

LSASD = Latched Single Acting Single leaf Doorset  
 ULSASD = Unlatched, Single Acting. Single leaf Doorset  
 ULSADD = Unlatched, Single Acting, Double leaf Doorset  
 ULSADD.OP = Unlatched, Single Acting, Double leaf Doorset with Overpanel

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*Note: Where appropriate, fire test evidence for the Strebord® 54 door core has been used to justify increased scope for certain door designs when using the thicker core. The Strebord® 54 door core has been successfully tested at 60 minutes fire resistance and the fire test evidence is contained within the current version of IFC Field of Application Report IFCA/08038 for the Strebord® 54 design.*

*Fire test evidence from glass, hardware, and intumescent seal manufacturers has also been considered when preparing this Field of Application Report.*

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