

INTERNATIONAL FIRE CONSULTANTS LTD

PRIVATE & CONFIDENTIAL

IFC FIELD OF APPLICATION REPORT

PAR/16831/01

Field of Application of Exitex Intumescent Seals to be installed in FD30 Timber Door Assemblies

Fire Resistance Standard: BS476: Part 22: 1987

Prepared on behalf of:

Costruzioni Chiusure Ermetiche srl Via dell' Artigianato 16 35010 Villa del Conte (PD) Italy

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Prepared for: Costruzioni Chiusure Ermetiche srl

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International Fire Consultants Ltd

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1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC) to define the field of application of Exitex FO104/FS104 and FO154/FS154 intumescent seals when fitted to otherwise tested, assessed or Third Party Certificated timber door assemblies, using one of the door types listed below, when such assemblies are required to provide 30 minutes fire resistance performance, adjudged against BS476: Part 22: 1987.

The construction details of the seals are as follows;

- FO104:Graphite based PVC encased rigid box seal, 10mm wide x 4mm thick overall.FS104:Graphite based PVC encased rigid box seal, 10mm wide x 4mm thick overall,
incorporating a brush pile smoke seal.
- FO154:Graphite based PVC encased rigid box seal, 15mm wide x 4mm thick overall.FS154:Graphite based PVC encased rigid box seal, 15mm wide x 4mm thick overall,
incorporating a brush pile smoke seal.

The scope of this Field of Application Report considers use of Exitex FO104/FS104 and FO154/FS154 intumescent seals when fitted to the following minimum 44mm thick door leaf constructions;

Manufacturer	Product Reference	General Construction
Halspan Ltd.	Optima / Prima	44mm thick particleboard core with lippings on the vertical edges.
Falcon Panel Products Ltd.	Strebord	44mm thick particleboard core with lippings on the vertical edges.
Pacific Rimwood Ltd.	Flamebreak	36mm thick vertically orientated timber lamel core lippings on the vertical edges, and 4mm plywood facings.
Jeld Wen	F30RR0	38mm thick particleboard machined to form panel profiles. 3mm thick hardboard moulded facing.
Vicaima	GDC	44mm thick particleboard core with lippings on the vertical edges.

- Note 1 All doors must include lippings / stiles and rails to perimeter edges as required by the test evidence or assessment of the specific door blank construction. Lippings may be required to other edges, as tested/assessed for the selected door design. Lippings shall be hardwood, minimum density 650kg/m³, or as tested/assessed for the selected door design, whichever is the greater.
- Note 2 This approval only applies to doors that have square edges at the leaf/frame interface; i.e. such that the full leaf thickness fits into the frame rebate/reveal.

The methodologies used in preparing this document are based upon the guidance in BS ISO/TR 12470: 1998; '*Fire resistance tests - Guidance on the application and extension of results'*.

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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, and all other aspects must otherwise be as proven in tests, or as in assessments, summarised herein.

2. TEST EVIDENCE

The test evidence used to support this assessment is summarised in Appendix E of this report.

3. SCOPE OF APPROVAL

3.1 Door Assembly Configuration

The door assembly configurations outlined in Table 1 are approved within the scope of this report *Note 3*.

Configuration		Maximum Approved Leaf Size – Standard Intumescent	Maximum Approved Leaf Size – Reduced Intumescent
	 Latched Single Acting Single Door Without Overpanel 	See Figure PAR/16831/01:A01 in Appendix A	See Figure PAR/16831/01:B01 in Appendix B
	 Unlatched Single Acting Single Door Without Overpanel 	See Figure PAR/16831/01:A02 in Appendix A	See Figure PAR/16831/01:B02 in Appendix B
	 Latched Single Acting Double Doors Without Overpanel 	See Figure PAR/16831/01:A03 in Appendix A	Not Approved
	 Unlatched Single Acting Double Doors Without Overpanel 	See Figure PAR/16831/01:A04 in Appendix A	Not Approved

Table 1. Approved Door Assembly Configurations

Note 3 The selected door design must have been independently tested/assessed in the proposed configuration.

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3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each door configuration covered by this Field of Application Report are given in Appendices A and B, based upon use of the intumescent seal specifications outlined in Section 3.3.

Leaves in double door assemblies may each be of the same width, up to the maximum width indicated in Appendix A. For unlatched unequal pairs, the width of the small leaf shall not be less than 400mm that of the large leaf (although the large leaf must still be within the limitations in Appendix A). The width of the small leaf shall not be less than 300mm, since this will affect its vertical stability relative to that of the larger leaf.

Note 4 The maximum leaf sizes in Appendix A are the ultimate parameters that can be applied to doors when using 15 x 4mm Exitex FO154/FS154 intumescent seals. If the maximum leaf sizes for the selected door design, as tested/assessed in the proposed configuration, are smaller than those given in Appendix A, then the smaller leaf sizes shall apply.

The maximum leaf sizes in Appendix B are the ultimate parameters that can be applied to doors when using 10 x 4mm Exitex FO104/FS104 intumescent seals. If the maximum leaf sizes for the selected door design, as tested/assessed in the proposed configuration, are smaller than those given in Appendix B, then the smaller leaf sizes shall apply.

Note 5 Reference to the maximum leaf sizes for the selected door design, as tested/assessed in the proposed configuration, is in the context of those leaf sizes which are generated when using 15 x 4mm, pressure-forming intumescent seals, in the same positions as those defined in Section 3.3. If the selected door design has only been tested/assessed with non-pressure forming seals, or with pressure-forming intumescent seals having larger cross-sectional area than 15 x 4mm, at any location, then such doors are excluded from the scope of this report.

3.3 Intumescent Seal Specification

A detailed intumescent seal specification is given below. This is based upon the test evidence detailed in Appendix E, (and is, therefore limited to the information available from those test reports), but also defines variations and tolerances, where it is considered that these will not adversely affect overall fire resistance.

Location	Size and Position
Stiles/jambs	1no 15 x 4mm Exitex FO154/FS154 intumescent seal fitted centrally in the frame reveal or leaf edge $Note 6$
Head	1no 15 x 4mm Exitex FO154/FS154 intumescent seal fitted centrally in the frame reveal or leaf edge $Note 6$
Meeting stiles – Strebord, Flamebreak and Vicaima cores	1no 15 x 4mm Exitex FO154/FS154 intumescent seal fitted centrally in the active leaf only ^{<i>Note 6</i>} or 2no 10 x 4mm Exitex FO104/FS104 intumescent seals, fitted centrally in the leaf edge, 10mm apart.

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Location	Size and Position
Meeting stiles — Halspan cores	2no 10 x 4mm Exitex FO104/FS104 intumescent seals, fitted centrally in the leaf edge, 10mm apart.

Table 2. Approved Standard Intumescent Seal Specifications

Note 6 The intumescent seal specification outlined in Table 2 is the minimum required and is applicable when the proposed door assembly was tested/assessed using 15 x 4mm, pressure-forming intumescent seals, or a lesser specification, in the same positions as those defined in Table 3.

Location	Size and Position
Stiles/jambs	1no 10 x 4mm Exitex FO104/FS104 intumescent seal fitted 16mm from the exposed face in the frame reveal or leaf edge $Note 7$
Head	1no 10 x 4mm Exitex FO104/FS104 intumescent seal fitted 16mm from the exposed face in the frame reveal or leaf edge $Note 7$

Table 3. Approved Reduced Intumescent Seal Specification

Note 7 The intumescent seal specification outlined in Table 3 is applicable to only single leaf doors using Strebord or Jeld Wen door cores.

3.4 Door Frames

Timber frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendix A and B, utilising the intumescent seal specification outlined in Section 3.3.

Material	Minimum Density	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
Hardwood or softwood	510kg/m ³ Note 8 & 11	30mm, excluding stop ^{Note 9 & 11}	100mm ^{Note 11}	12mm ^{Note 10}
MDF	720kg/m ³ Note 11	30mm, excluding stop ^{Note 9 & 11}	100mm ^{Note 11}	12mm ^{Note 10}

Table 4. Approved Specifications for Frame Head/Jambs

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- Note 8 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: 1996. The moisture content shall be $10 \pm 2\%$ for UK market, (or to suit internal joinery moisture content specification of export countries).
- Note ⁹ 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 10 The doorstop is to comprise the same material as the door frame and may be either planted and pinned using 40mm steel pins, or integral with the main door frame, providing the minimum frame thickness (excluding stops) remains as stated.
- Note 11 The minimum frame sections and timber density defined in Table 4 are the absolute parameters that can be applied when using Exitex intumescent seals. If the frame section and/or timber density for use with the selected door design, as tested/assessed in the proposed configuration, are greater than those given in Table 4, then the greater specifications shall apply.

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.

- Head/jamb joint: Mortice and Tenon, or half-lapped joint, head twice screwed to each jamb <u>or</u> mitred joint which is glued with a non-thermally softening adhesive and the head twice screwed to each jamb.
- Architraves: Loose architraves are optional, and have no fire performance requirements, and so can be freely specified; subject to the face of the door being flush with the face of the frame, and wall. (See Section 3.8 regarding wall/frame gaps).

3.5 Glazed Apertures

3.5.1 Glass Types

The FD30 doors have been tested with glazing and achieved 30 minutes fire resisting performance.

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.

The codes used, below, for the glass types, glazing materials, and bead types (e.g. G1, S1 and B1), are not those used by the respective manufacturers, and are attributed solely by IFC for the purpose of identification and cross referencing within this assessment.

G30/1	7mm thick Pyrobelite (AGC Flat Glass)
G30/2	7mm thick Pyrodur Plus II (Pilkington)
G30/3	7mm thick Pyroguard Clear (CGI)
G30/4	7mm thick Sureglaze Insul (Halspan)
G30/5	7.5mm thick Pyrodur Plus (Pilkington)
G30/6	10mm thick Pyrodur (Pilkington)
G30/7	11mm thick Pyroguard Clear (CGI)
G30/8	12mm thick Pyrobelite (AGC Flat Glass)
G30/9	13mm thick Pyrodur (Pilkington)

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

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 also **Figure PAR/16831/01:C01**)

S30/1 10 x 5mm Exi-Glaze 30 by Exitex Ltd (Use with G30/1 – G30/9)

3.5.3 Bead profiles and installation

The approved bead size and profile, and relevant fixing details, are shown on Figure PAR/16831/01:C01 in Appendix C.

B30/1 21mm high with a 15° chamfered top and bolection moulding not more than 6.5mm deep. The glazing beads shall be mitre jointed bolection beads of foil wrapped MDF with 720kg/m³minimum density.

The bead profile must extend so that it projects over the edge of the aperture. Beads must be secured within the aperture ensuring pins are set as shown on **Figure PAR/16831/01:C01** in Appendix C. Care must be taken to ensure that bead fixings engage into `solid' core material.

3.5.4 Assessed aperture sizes

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;

Maximum area of aperture	-	0.57m ²
Maximum aperture height	-	1165mm
Maximum aperture width	-	570mm
Minimum margin from leaf edge	-	175mm
Minimum distance between apertures	-	175mm

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More than one aperture may be included in each leaf subject to the individual limitations above. The minimum margins may need to be increased to accommodate hardware; see also Appendix D

3.6 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 insured 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 D, 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.

3.7 Ambient Temperature Smoke Seals

Additional Exitex smoke seals that have been tested to BS476: Part 31: Section 31.1: 1983 and shown not to leak by more than 3m³/m/hr at 25Pa, may be used in conjunction with the proposed doorsets to provide smoke control.

The orientation of the seals, door edge gaps, degree of hardware interruption, and leaf configuration must be as tested to 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 described in Section 3.3; in which case IFC should be consulted.

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.

3.8 Installation, Supporting Construction and Door Edge Gaps

The door frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm; this applies to head and jambs. 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). If the scope of approval for the selected door design includes fixing details with smaller fixing centres and/or longer screws, the latter shall take precedence.

The supporting construction may be timber or steel stud plasterboard clad partition, or 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 openings. If fitted into timber or steel stud partitions, the method of forming the aperture must be as tested by the partition manufacturer.

No part of the rear of the frame section shall be exposed once installed, apart from integral architraves. There shall be no feature rebates or shadow gaps at the junction of the frame and wall. The overall frame depth may be increased by the use of extension linings, but care should be taken to ensure that the 'main frame' (i.e. the portion on the plane of the door leaf) is robustly secured to the supporting construction.

The fire stopping installation detail shall be Blue 60, manufactured by Craylon Ltd. The gap between the door frame and the associated construction are to be filled with Craylon Blue 60 expanding foam in conjunction with Craylon Blue 60 fire rated packers, used as a minimum, at the fixing locations. The installation gap between frame and supporting construction must be a minimum 5mm up to a maximum of 25mm.

The gap between the door and the frame, or between meeting stiles, should be 1.5–4mm. Gaps under the door(s) should not exceed 6mm for fire performance, although, if smoke control is also required, these gaps should only be 3mm, or smoke seals should be included (see also Section 3.7 regarding suitability of smoke seals).

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

4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that, if the Exitex FO104/FS104 and FO154/FS154 intumescent seals were fitted to otherwise tested, assessed or Third Party Certificated timber door assemblies, manufactured and installed in accordance with the preceding clauses, and the assemblies were tested for fire resistance, in accordance with the criteria of BS476: Part 22: 1987, the intumescent seals would not be a cause of integrity failure before the proposed period of 30 minutes. All other aspects of the door assemblies must be as tested, assessed or Third Party Certificated, unless otherwise noted herein.

The scope of this Field of Application Report permits the use of 15 x 4mm Exitex FO154/FS154 and 10 x 4mm Exitex FO104/FS104 intumescent seals with the door constructions referenced in Section 1, minimum 44mm thick, that have otherwise been tested, assessed or Third Party Certificated to achieve 30 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

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5. LIMITATIONS

This Field of Application Report is only valid for the intumescent seals outlined herein and addresses itself solely to their ability to contribute to the performance of the proposed cellulosic door assemblies, in order to satisfy the criteria of the fire resistance test. All other aspects of the door assemblies must be as tested, or assessed, for the required period, against the criteria of the test standard.

This Field of Application Report addresses itself solely to the ability of the proposed intumescent seals to contribute to 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 assembly constructions 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.

Where the constructional information in this report is taken from details provided to International Fire Consultants Ltd and/or 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 with items of hardware 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 assemblies are damaged or faulty. 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 the door assemblies to the required condition, should only be carried out following consultation with the manufacturer and IFC.

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.

This Report is provided to the sponsor on the basis that it is a professional independent engineering opinion 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 opinion 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.

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.

In compiling this assessment, International Fire Consultants Ltd have referred to judgmental data from other organisations, the quality or accuracy of which we have no control over. We have not had access to the original data and, therefore, IFC are not in a position to evaluate its technical validity. Should any failure be alleged of the product as a result of the quality of this information, International Fire Consultants Ltd cannot be held responsible.

6. VALIDITY

This assessment 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 February 2022 should confirm its ongoing validity.

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APPENDIX A

Assessed Leaf Size Envelope for FD30 Timber-Based Door Leaves Installed in Timber Frames, when fitted with Exitex FO154/FS154 Intumescent Seals

Figures PAR/16831/01:A01 to A04

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

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

This graph represents the envelopes of approved leaf sizes for the proposed door leaf constructions and configurations. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved for the specific construction.

POINTS F1 \$ F2 represent the maximum height and width of a door leaf using the Flamebreak construction

F2

1030

2060

H2

1103

2206

J2

1038

2077

52

1200

2400

V2

1045

2090

POINTS H I & H2 represent the maximum height and width of a door leaf using the Halspan construction

POINTS J1 \$ J2 represent the maximum height and width of a door leaf using the Jeld Wen construction

POINTS S1 \$ S2 represent the maximum height and width of a door leaf using the Strebord construction

POINTS VI \$ V2 represent the maximum height and width of a door leaf using the Vicaima construction

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/16831/01, which contains full details of the assessed door constructions.

This drawing is Copyright© Contractors must check all dimensions. Any discrepencies must be reported before work proceeds. Only work to dimensions stated on drawing.

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Field of Application Report PAR/16831/01 Costruzioni Chiusure Ermetiche srl Exitex Intumescent Seals to be installed in FD30 Timber Door Assemblies

> Envelope of Approved Door Leaf Sizes ISASD

In Timber Frames

Job number: 16831				
Drawn by: CSP Checked by: WL				
Not To Scale Drawn: Mar 2017				
PAR/16831/01:A01				



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

This graph represents the envelopes of approved leaf sizes for the proposed door leaf constructions and configurations. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved for the specific construction.

POINTS F1 \$ F2 represent the maximum height and width of a door leaf using the Flamebreak construction

F2

1010

2020

H2

1081

2163

J2

1018

2036

52

1168

2336

V2

1025

2050

POINTS H I & H2 represent the maximum height and width of a door leaf using the Halspan construction

POINTS J1 & J2 represent the maximum height and width of a door leaf using the Jeld Wen construction

POINTS S1 \$ S2 represent the maximum height and width of a door leaf using the Strebord construction

POINTS VI \$ V2 represent the maximum height and width of a door leaf using the Vicaima construction

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/16831/01, which contains full details of the assessed door constructions.

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Field of Application Report PAR/16831/01 Costruzioni Chiusure Ermetiche srl Exitex Intumescent Seals to be installed in FD30 Timber Door Assemblies

Envelope of Approved Door Leaf Sizes ULSASD In Timber Frames Job number: 16831 Checked by: WL Drawn by: CSP

PAR/16831/01:A02

Drawn: Mar 2017

Not To Scale



Configuration	
Timber Frames	
	_
DOUBLE LEAF	
FLUSH MEETING STILES	
WITHOUT OVERPANEL	_
REQUIRED INTEGRITY : 30 Minutes	

This graph represents the envelopes of approved leaf sizes for the proposed door leaf constructions and configurations. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved for the specific construction.

POINTS F1 \$ F2 represent the maximum height and width of a door leaf using the Flamebreak construction

F2

H2

52

V2

POINTS H I & H2 represent the maximum height and width of a door leaf using the Halspan construction

POINTS S1 \$ S2 represent the maximum height and width of a door leaf using the Strebord construction

POINTS VI \$ V2 represent the maximum height and width of a door leaf using the Vicaima construction

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> Envelope of Approved Door Leaf Sizes ISADD

In Timber Frames

Job number: 16831			
Drawn by: CSP Checked by: WL			
Not To Scale Drawn: Mar 2017			
PAR/1683	1/01:A03		



-Configuration-
Timber Frames
UNIATCHED
SINGLE ACTING
I DOUBLE LEAF I FLUSH MEFTING STILES
WITHOUT OVERPANEL
REQUIRED INTEGRITY : 30 Minutes

This graph represents the envelopes of approved leaf sizes for the proposed door leaf constructions and configurations. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved for the specific construction.

POINTS F1 \$ F2 represent the maximum height and width of a door leaf using the Flamebreak construction

F2

52

V2

POINTS H I & H2 represent the maximum height and width of a door leaf using the Halspan construction

POINTS S1 \$ S2 represent the maximum height and width of a door leaf using the Strebord construction

POINTS VI \$ V2 represent the maximum height and width of a door leaf using the Vicaima construction

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/16831/01, which contains full details of the assessed door constructions.

Any discrepencies must be reported before work proceeds. Only work to dimensions stated on drawing. INTERNATIONAL FIRE CONSULTANTS LIMITED 20 Park Street PRINCES RISBOROUGH Buckinghamshire HP27 9AH United Kingdom

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Contractors must check all dimensions.

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Envelope of Approved Door Leaf Sizes ULSADD In Timber Frames Job number: 16831

Checked by: WL Drawn by: CSP Not To Scale Drawn: Mar 2017 PAR/16831/01:A04

APPENDIX B

Assessed Leaf Size Envelope for FD30 Timber-Based Door Leaves Installed in Timber Frames, when fitted with Exitex FO104/FS104 Intumescent Seals

Figures PAR/16831/01:B01 to B02

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

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

This graph represents the envelopes of approved leaf sizes for the proposed door leaf constructions and configurations. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved for the specific construction.

POINTS J1 \$ J2 represent the maximum height and width of a door leaf using the Jeld Wen construction

Jeld Wen

Strebord

JI

J2

1015

2031

52

1038

2077

POINTS SI \$ S2 represent the maximum height and width of a door leaf using the Strebord construction

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> Envelope of Approved Door Leaf Sizes ISASD

In Timber Frames

	Job number: 16831				
Drawn by: CSP Checked by: W					
Not To Scale Drawn: Mar 201					
	PAR/16831/01:B01				

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/16831/01, which contains full details of the assessed door constructions.



-Configuration	-
Timber Frames	
UNLATCHED SINGLE ACTING SINGLE LEAF	
WITHOUT OVERPANEL	

This graph represents the envelopes of approved leaf sizes for the proposed door leaf constructions and configurations. Any combination of leaf width and height that falls within the graph axes and the connecting line on the graph are approved for the specific construction.

POINTS J1 & J2 represent the maximum height and width of a door leaf using the Jeld Wen construction

Jeld Wen

Strebord

 $\left| \right|$

J2

995

1991

52

1018

2036

POINTS SI \$ S2 represent the maximum height and width of a door leaf using the Strebord construction

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Field of Application Report PAR/16831/01 Costruzioni Chiusure Ermetiche srl Exitex Intumescent Seals to be installed in FD30 Timber Door Assemblies

Envelope of Approved Door Leaf Sizes ULSASD In Timber Frames Job number: 16831 Drawn by: CSP Checked by: WL Not To Scale Drawn: Mar 2017

PAR/16831/01:B02

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/16831/01, which contains full details of the assessed door constructions.

APPENDIX C

Glazing details

Figure PAR/16831/01:C01

The figure in this Appendix is not included in the sequential page numbering of this report

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APPENDIX D

General Guidance on Installation of Hardware

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General Guidance on Installation of Hardware

D.1 Hinges

D.1.1 Knuckle hinges

Variety of hinges have been successfully tested with the FDF30 door cores referenced in this assessment, but other hinges may be used, subject to compliance with the specifications below.

Examples of approved hinges are;

- Eclipse Architectural Hardware, 102mm x 30mm stainless steel butt hinge ref: Hoppe AR8582-SSS Grade 13
- M Marcus, 101mm x 32mm stainless steel butt hinge, ref: CF881 Grade 13
- Zoo Architectural, 102mm x 30mm stainless steel butt hinge ref: CF849 size 13

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

- Minimum $3no (1\frac{1}{2} pairs)$ per leaf up to 2400mm high
- number: 4no (2 pairs) per leaf where leaves are greater than 2400mm high.
- Positions: The top hinge must be positioned 120-200mm down from the head of the leaf to the top of the hinges and the bottom hinges positioned 150-225mm 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.
- Fixings: Steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) x 32mm long, and having 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 2.5-3.5mm thick x 89-115mm 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
'Mazac' are not permitted). No combustible or thermally softening materials to
be included.

Additional Exitex Exi-Hinge Pads - 1mm thick, fitted underneath both hinge blades. protection:

Rising butt, non-cranked butts and spring hinges (single or double action) are not suitable for use on doors approved within the scope of this assessment.

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D.2 Mortice Latches/Locks

D.2.1 Mechanical single-point latches/locks

A variety of locks/latches have been successfully tested with the FD30 door cores referenced in this assessment but other mortice latches/locks may be used, subject to compliance with the specifications below.

An example of such a latch/lock is;

- Zoo Hardware, steel cylinder mortice latch, ref: CE1121
- Hoppe, steel cylinder tubular latch, ref: AR8019-76 SC/EB
- Arrone, steel cylinder mortice latch, CE1121 CF530
- Arrone, steel cylinder mortice latch with stainless steel eurocylinder lock, ref: AR91-5-60-SSS

When mortice latches or locks are fitted, they should be centred at 1000mm (\pm 200mm), above the bottom of the door leaf, and should comply with the following specifications:

Latch/lock types:	Mortice latches, tubular mortice latches, sashlocks, deadlocks
Maximum dimensions:	Forend plate: 160mm long x 20mm wide, or, 160mm long x 25mm wide Latch body: 20mm thick x 130mm high x 100mm wide Strikeplate: 160mm long x 20mm wide, or, 160mm 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:	At meeting stiles of double leaf door assemblies, the strikeplate and forend must be bedded on 1mm thick Exitex Exi-Fire intumescent material.

Rebate conversion kites may be included subject to there being suitable test, assessment or Third Party Certification for their inclusion in 30 minute fire resisting timber based door assemblies, and incorporation of any intumescent gasket required.

Over-morticing is to be avoided; mortices should be as tight as possible to the latch. If gaps around the case exceed 2mm, then these must be made good with intumescent mastic of 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.

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D.3 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 as such 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 doorsets (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.

A variety of closers have been successfully tested with the FD30 door cores referenced in this assessment but other closers may be used, subject to compliance with the specifications below.

Face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on FD30 door leaves, of the same cores as referenced in this assessment, in timber frames may be used.

Examples of such closers are;

- Hoppe Arrone AR 450 SE
- Synergy Hardware S600 SES.MEC
- Synergy S150

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

D.4 Bolts

Some of the tests referenced in this report include double leaf doors with surface mounted bolts fitted to the passive leaf and engaged. This therefore mimics more closely the meeting edge condition of an unequal pair of doors, which is considered the most onerous test configuration due to the likelihood of differential leaf deflection. The extra restraint provided by the engaged bolts, in associated with disengaged latches as tested, does, therefore, have a beneficial effect on leaf size envelopes; see Appendices A and B.

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

- Surface mounted bolts shall be fixed so that there is a minimum of 50mm between the bolt and the door edge;
- Surface mounted 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.

Leaf edge mounted flush bolts are not permitted.

D.5 Non-Essential Hardware Items

D.5.1 Drop Seals

The following drop seal can be fitted into his design of fire resisting door leaf but it must be positioned centrally within the door thickness. Additional intumescent protection surrounding the drop seal is not required.

- TREND 12 x 20 (from CCE)
- SUPERIOR/SUPERIOR AL 14 x 35 (from CCE)
- CHRONOSEAL 14 x 35 (from CCE)
- SUPERIOR FILLER 14 x 35 (from CCE)
- ASDROMAX 15 x 30 (from CCE)
- CHRONOSEAL 15 x 30 (from CCE)
- ASDROMIN 13 x 30 (from CCE)
- APPLIQUE (from CCE)

Care must be taken to ensure that these items do not interrupt the intumescent strips in door edges.

D.5.2 Letter Plates

If fitted, these must be tested, assessed or otherwise approved for use in 44mm thick FD30 doors. They must be fitted in accordance with the manufacturer's instructions, including all intumescent liners and flaps. Plates must not be less than 100mm away from the leaf edge, or any other aperture.

Note D1 The installation of such items in a door leaf may compromise its performance as a smoke control doorset.

APPENDIX E

Summary of Fire Test Evidence

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Summary of Fire Test Evidence

All of the fire resistance tests listed below are used with the kind permission of their sponsor(s).

Test Report	Configuration Tested	Leaf Sizes	Leaf Construction	Test Standard	Integrity
CFR1603081	ULSADD	2400mm high x 1000/1000mm wide x 44 mm thick	Halspan Optima / Prima	BS EN 1634-1: 2014	20 minutes Note E1
CFR1603241	ULSADD	2100mm high x 926/926mm wide x 44mm thick	Vicaima GDC	BS EN 1634-1: 2014	31 minutes
CFR1604131	ULSADD	2040mm high x 925/927mm wide x 44mm thick	Pacific Rim wood Flamebreak	BS EN 1634-1: 2014	18 minutes Note E2
CFR1604291	ULSASD	2040mm high x 926mm wide x 44mm thick	Falcon Strebord	BS476: Part 22: 1987	42 minutes
	ULSASD	2040mm high x 926mm wide x 44mm thick	Falcon Strebord	BS476: Part 22: 1987	36 minutes
CFR1606031	ULSASD	2040mm high x 926mm wide x 44mm thick	Jeld Wen F30RR0	BS476: Part 22: 1987	36 minutes
	ULSASD	2040mm high x 925mm wide x 44mm thick	Jeld Wen F30RR0	BS476: Part 22: 1987	33 minutes

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Test Report	Configuration Tested	Leaf Sizes	Leaf Construction	Test Standard	Integrity
CFR1603041	ULSADD	2400mm high x 1000/1000mm wide x 44m thick	Falcon Strebord	BS EN 1634-1: 2014	34 minutes

ULSASD	= Unlatched, Single Acting, Single leaf Doorset
ULSADD	= Unlatched, Single Acting, Double leaf Doorset

- Note E1 The failure witnessed at 20 minutes was from the glazed aperture. The tested detail has not been considered as part of this assessment. Further integrity failure was witnessed at the meeting edge of the leaves at 26 minutes. A compensatory alternative intumescent detail has been used within this assessment.
- *Note E2* The failure witnessed at 18 minutes was from the glazed aperture. The tested detail has not been considered as part of this assessment.

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