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IFC FIELD OF APPLICATION REPORT
IFCA/07019 REVISION D

Fire Resistance Standard: BS 476: Part 22: 1987

PREPARED FOR:

Falcon Panel Products Ltd

ASSESSED PRODUCT/SYSTEM:

Mineral Composite Door Leaves Installed in Timber and Composite Frames

ASSESSED PERFORMANCE:

60, 90 and 120 minutes fire resistance

ISSUE DATE:	EXPIRY DATE:
April 2022	April 2027

International Fire Consultants Limited
Park Street Business Centre
20 Park Street
Princes Risborough
Buckinghamshire
HP27 9AH

+44 (0)1844 275500
info@ifcgroup.com

Confidence in fire safety
www.ifcgroup.com
Part of the Kiwa UK Group

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HEAD OFFICE ADDRESS:
International Fire Consultants Limited
Park Street Business Centre
Park Street
Princes Risborough
Buckinghamshire
HP27 9AH

+44 (0)1844 275500
info@ifcgroup.com

REGISTERED ADDRESS:
Kiwa House
Malvern View Business Park
Stella Way, Bishops Cleeve
Cheltenham
GL52 7DQ
Registered No: 2194010

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Report Reference Number:	IFC Report IFCA/07019 Revision D
Prepared on behalf of:	Falcon Panel Products Ltd Clock House Station Approach Shepperton Middlesex TW17 8AN
Issue Date:	April 2022
Valid Until:	April 2027
Ref ID:	#22870

ISSUE RECORD

REV	DATE	AUTHOR	REVIEW	SECTION	AMENDMENTS
-	February 2007	CH	DC	-	-
A	April 2012	PP	DC	-	Inclusion of additional fire resistance test evidence and associated variations, including additional door core option, timber frames and FD60 door assemblies.
B	July 2012	PP	DC	-	Inclusion of two piece stiles, thicker facings and decorative grooves in Design B and clarification of some details
C	September 2016	PB	DC	-	Inclusion of test data from IF12047 Rev A (Norsound Universal 90), RF12178, CFR1504141 & CFR1410311 to provide coverage for hardwood door frames up to 120 minutes, a range of hardware options, rationalised intumescent specification and door construction (removal of the design previously referenced 'A')
D	April 2022	WL	CH	3.6	Revalidation and inclusion of test data CFR1806192 and Chilt/IF13013.

CONTENTS

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 composite mineral based door leaves installed in timber and composite mineral door frames, that are required to provide 60, 90 or 120 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

This assessment has been produced using the principles outlined in the Passive Fire Protection Forum (PFPF): 'Guide to undertaking technical assessments of fire performance of construction products based on fire test evidence, 2021, 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 assemblies, without reducing their potential to achieve a 60, 90 or 120 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, and all other aspects must otherwise be as proven in tests summarised herein.

Based on the demonstrated resistance to distortion of the door assemblies approved herein, tested with the specimen installed with the leaf opening in towards the furnace, this Field of Application Report covers 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.

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.

2. TEST EVIDENCE

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

Some of the test evidence referenced in this Engineering Assessment Report is more than 5 years old. In accordance with industry practice, IFC have reviewed this test evidence, and have concluded that the evidence is still valid, and suitable to form the basis of this approval.

The test standard BS EN 1634-1 has been revised several times since the original testing, and the current version is BS EN 1634-1: 2014 + A1: 2018; but the revisions to the test standard do not affect the opinions in the Assessment Report.

The appropriate performance of fire resisting doorsets is defined in Approved Document B of the Building Regulations (2010 Edition with subsequent Amendments), the Scottish Building Standards Technical Handbook (2013 Edition) or the Building Regulations (Northern Ireland) 2012.

Approved Document B, which applies to England and Wales, identifies doorsets by their performance under test to BS EN 1634-1 or BS476: Part 22: 1987, in terms of integrity for a period of minutes, (e.g. E30/E60, if their performance is measured in terms of EN 1634-1, or FD30/FD60 for BS476: Part 22: 1987). It should be noted that a suffix (S) is added for doors where restricted smoke leakage at ambient temperatures is needed. The Scottish and Northern Ireland documents also refer to the British and European Standards in Section 2D and Section B3 respectively of these documents.

These guidance documents thus give a parity of performance between the two test methods, and although the EN 1634-1 and the BS476: Part 22: 1987 test procedures are both generally based upon the ISO 834 fire resistance test method, there are differences.

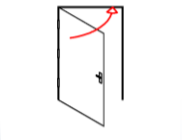
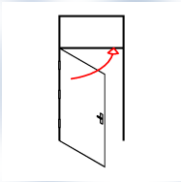
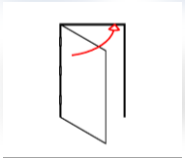
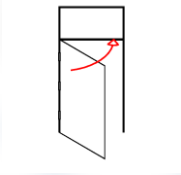
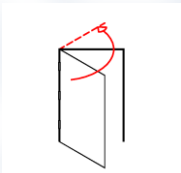
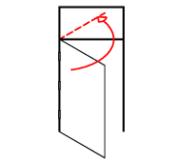
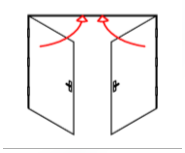
These differences mean that the EN 1634-1 test is generally accepted as being a more onerous test than BS476: Part 22: 1987. This is borne out by IFC's experience of fire resistance testing already performed since the introduction of the European test standard.

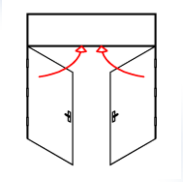
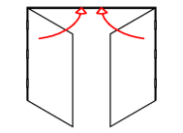
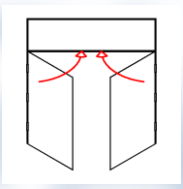
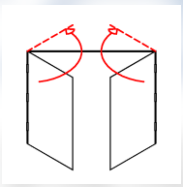
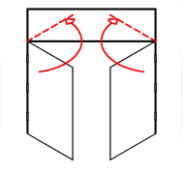
As such, it is our opinion that any test results on doorsets tested to EN 1634-1 can be utilised in situations requiring a performance defined against the BS476: Part 22 test method, or when making assessments and judgements against the BS476 criteria, but not vice versa.

3. SCOPE OF APPROVAL

3.1 Door Assembly Configuration

3.1.1 FD60 Door Assemblies

CONFIGURATION		ENVELOPE OF APPROVED FD60 LEAF SIZES
	• Latched • Single Acting • Single Door • Without Overpanel	Timber Frames: Appendix A Composite Frames: Appendix A
	• Latched • Single Acting • Single Door • With Transommed Overpanel Note 1	Timber Frames: Appendix A Composite Frames: Appendix A
	• Unlatched • Single Acting • Single Door • Without Overpanel	Timber Frames: Appendix A Composite Frames: Appendix A
	• Unlatched • Single Acting • Single Door • With Transommed Overpanel Note 1	Timber Frames: Appendix A Composite Frames: Appendix A
	• Unlatched • Double Acting • Single Door • Without Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Unlatched • Double Acting • Single Door • With Transommed Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Latched • Single Acting • Double Doors Note 2 • Without Overpanel	Timber Frames: Appendix A Composite Frames: Appendix A

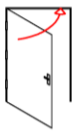
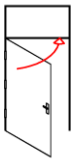
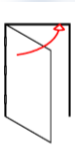
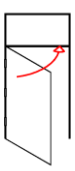
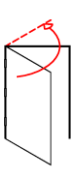
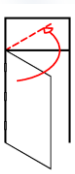
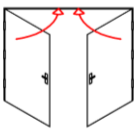
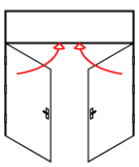
	• Latched • Single Acting • Double Doors Note 2 • With Transommed Overpanel Note 1	Timber Frames: Appendix A Composite Frames: Appendix A
	• Unlatched • Single Acting • Double Doors Note 2 • Without Overpanel	Timber Frames: Appendix A Composite Frames: Appendix A
	• Unlatched • Single Acting • Double Doors Note 2 • With Transommed Overpanel Note 1	Timber Frames: Appendix A Composite Frames: Appendix A
	• Unlatched • Double Acting • Double Doors Note 2 • Without Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Unlatched • Double Acting • Double Doors • With Transommed Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved

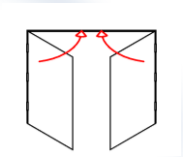
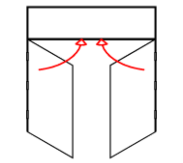
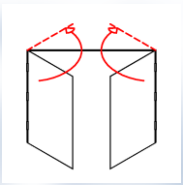
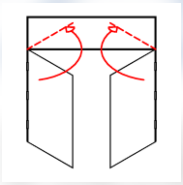
Note 1 Single acting door assemblies which include overpanels may have one of the following configurations;

- leaf/overpanel interface separated by a transom member

Note 2 Single and double acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles.

3.1.2 FD90 Door Assemblies

CONFIGURATION		ENVELOPE OF APPROVED FD90 LEAF SIZES
	• Latched • Single Acting • Single Door • Without Overpanel	Timber Frames: Appendix B Composite Frames: Appendix B
	• Latched • Single Acting • Single Door • With Transommed Overpanel Note 3	Timber Frames: Appendix B Composite Frames: Appendix B
	• Unlatched • Single Acting • Single Door • Without Overpanel	Timber Frames: Appendix B Composite Frames: Appendix B
	• Unlatched • Single Acting • Single Door • With Transommed Overpanel Note 3	Timber Frames: Appendix B Composite Frames: Appendix B
	• Unlatched • Double Acting • Single Door • Without Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Unlatched • Double Acting • Single Door • With Transommed Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Latched • Single Acting • Double Doors Note 4 • Without Overpanel	Timber Frames: Appendix B Composite Frames: Appendix B
	• Latched • Single Acting • Double Doors Note 4 • With Transommed Overpanel Note 3	Timber Frames: Appendix B Composite Frames: Appendix B

	• Unlatched • Single Acting • Double Doors Note 4 • Without Overpanel	Timber Frames: Appendix B Composite Frames: Appendix B
	• Unlatched • Single Acting • Double Doors Note 4 • With Transommed Overpanel Note 3	Timber Frames: Appendix B Composite Frames: Appendix B
	• Unlatched • Double Acting • Double Doors • Without Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Unlatched • Double Acting • Double Doors • With Transommed Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved

Note 3 Single acting door assemblies which include overpanels must have the following configuration;

- leaf/overpanel interface separated by a transom member

Note 4 Single acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles.

3.1.3 FD120 Door Assemblies (120 minutes Integrity/90 minutes insulation)

CONFIGURATION		ENVELOPE OF APPROVED FD120 LEAF SIZES
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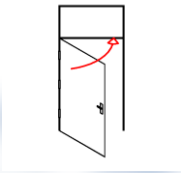
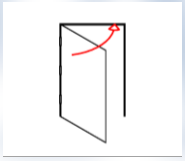
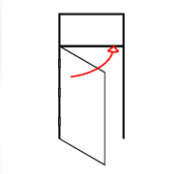
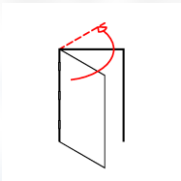
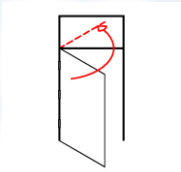
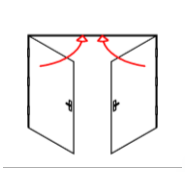
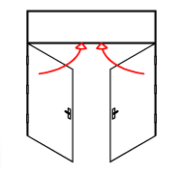
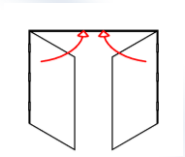
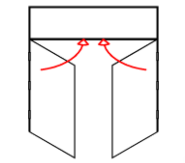
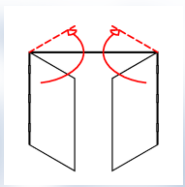
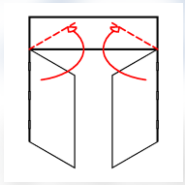
	• Latched • Single Acting • Single Door • With Transommed Overpanel Note 5	Timber Frames: Not Approved Composite Frames: Appendix C
	• Unlatched • Single Acting • Single Door • Without Overpanel	Timber Frames: Appendix C Composite Frames: Appendix C
	• Unlatched • Single Acting • Single Door • With Transommed Overpanel Note 5	Timber Frames: Not Approved Composite Frames: Appendix C
	• Unlatched • Double Acting • Single Door • Without Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Unlatched • Double Acting • Single Door • With Transommed Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Latched • Single Acting • Double Doors Note 6 • Without Overpanel	Timber Frames: Not Approved Composite Frames: Appendix C
	• Latched • Single Acting • Double Doors Note 6 • With Transommed Overpanel Note 5	Timber Frames: Not Approved Composite Frames: Appendix C

	• Unlatched • Single Acting • Double Doors Note 6 • Without Overpanel	Timber Frames: Not Approved Composite Frames: Appendix C
	• Unlatched • Single Acting • Double Doors Note 6 • With Transommed Overpanel Note 5	Timber Frames: Not Approved Composite Frames: Appendix C
	• Unlatched • Double Acting • Double Doors • Without Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved
	• Unlatched • Double Acting • Double Doors • With Transommed Overpanel	Timber Frames: Not Approved Composite Frames: Not Approved

Note 5 Single acting door assemblies which include overpanels must have the following configuration;

- leaf/overpanel interface separated by a transom member

Note 6 Single acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles.

3.2 Maximum Assessable Door Leaf Sizes

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

Double door assemblies may each be of the same width, up to the maximum width indicated in Appendices B, C and D. For latched/bolted unequal pairs, there is no limit on the ratio of leaf widths, (although the large leaf must still be within the limitations in Appendices A, B and C). For unlatched unequal pairs, the width of the small leaf shall not be more than 200mm smaller than that of the large leaf (although the large leaf must still be within the limitations in Appendices A, B and C). The total 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.

3.3 Door Leaf Specification

The door leaf comprises a composite mineral construction, with details of the constructional specifications given below.

The leaf construction is based upon the test evidence detailed in Appendix E and defines 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.

For the sake of clarity, this report only approves doors that are rectilinear; i.e. adjacent door edges shall be straight, and at 90 degrees to each other when viewed in elevation. In addition, doors shall be “flat”; i.e. not curved, when viewed in plan.

COMPONENT		MATERIAL	MINIMUM DENSITY	DIMENSIONS
CORE Note 7		WSCP mineral core	288kg/m³	51mm thick
STILES Note 8		Tectonite	1000kg/m³	25-51mm wide x 51mm thick
RAILS (TOP AND BOTTOM) Note 10		Tectonite	1000kg/m³	48-102mm wide x 51mm thick
FACINGS Note 10	OPTION 1	MDF	750kg/m³	3-4mm thick
	OPTION 2	HDF	820kg/m³	3-4mm thick
	OPTION 3	Plywood	640kg/m³	3-4mm thick
	OPTION 4	Chipboard	640kg/m³	3-4mm thick
LIPPINGS Note 11 and 12		Hardwood	640kg/m³	3-4mm thick
ADHESIVE	FACINGS Note 13	Cross-linked PVA	-	-
	LIPPINGS	Cross-linked PVA or hotmelt adhesive		
	STILES AND RAILS	Cross-linked PVA		
	CORE (BONDED TO PERIMETER FRAMEWORK)	Cross-linked PVA		
OPTIONAL ADDITIONAL DECORATIVE FINISHES Note 14		Timber veneer or decorative plastic based laminate (to leaf faces only)	-	Maximum 2mm thick
		Paint or varnish	-	Maximum 0.5mm thick

Note 7 Core can be constructed from up to seven pieces

Note 8 For 60 and 90 minutes fire resistance stiles can be constructed using multiple pieces of butt-jointed Tectonite providing the sections are no shorter than 400mm and are glued together using cross-linked PVA. 120 minute fire resisting designs must use continuous lengths of Tectonite for the stiles; jointed sections are not permitted.

Note 9 For 60 and 90 minutes fire resistance rails can be constructed using multiple pieces of butt-jointed Tectonite providing the sections are no shorter than 400mm and are glued together using cross-linked PVA. 120 minute fire resisting designs must use continuous lengths of Tectonite for the rails; jointed sections are not permitted.

Note 10 Must have the same option on each face of leaf, and both leaves of double doors.

Note 11 Lippings to be installed at vertical edges of each leaf or can be installed to all four edges if required.

Note 12 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 10 ± 2% for UK market (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.

The radius formed on the leading edge of doors, shall not remove more than 2mm thickness of lippings on the door face.

Note 13 The adhesive spread rate recommendation for the facing of 200-300g/m^2 is within the tested tolerances declared by the manufacturer. The adhesive must be applied directly to the facing material and not the mineral core due to the porosity and absorption rate of the mineral core and for controlling the spread rate being used (as listed above)

Note 14 For enhanced acoustic performance, it is permitted to alter the construction of the WSCP mineral core design, subject to the following provisos:

- The outer facing may be increased to 6mm thick (MDF or HDF)
- Single leaf constructions only
- Norseal NOR810S drop seal may be fitted in the bottom rail subject to the intumescent gasket remaining in the bottom of the leaf as specified in Appendices A, B and C (although the intumescent seal will be interrupted by the fitting of the drop seal)
- Norseal NOR710, Lorient batwing or ST1009 may be fitted around the perimeter of the leaf providing the intumescent specification required in Appendices A, B and C is not altered
- All other details are to remain as specified in this field of application for the WSCP mineral core door design

3.4 Overpanel and Side Panel Specification

3.4.1 Transommed Overpanels

Transommed overpanels are permitted with this door design at 60, 90 and 120 minutes performance for single acting, single and double leaf configurations only; subject to the limitations upon frame type, as outlined in Section 3.1 herein.

The overpanel must be constructed using the same material as that approved for the door leaf (including tectonite stiles and rails as appropriate – See Section 3.3 for details) and must be a single piece of panel across the frame width (i.e. no panel joints). 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 overpanel must be in the same plane as the door leaf. The stops either side of the transom are to run for the remaining full depth of the transom.

The transom must be constructed using one of the following materials.

TRANSOM MATERIAL	MINIMUM SECTION SIZE OF TRANSOM	FIRE RESISTANCE (MINUTES)
Hardwood (minimum density 640kg/m^3)	90 x 38mm (excluding the stops)	60 & 90
Tectonite/hardwood composite	112 x 47mm (excluding the stops)	60, 90 & 120
Tectonite (2/4mm veneer)	94 x 47mm (excluding the stops)	60, 90 & 120

The transom must include 12mm thick door stops on both sides of the transom. The stops can be constructed using hardwood (minimum density 640kg/m^3) for up to 120 minutes of fire resistance performance. For transoms constructed using hardwood, where approved herein, the stops can be planted or rebated from a solid timber section. For the Tectonite frames, the stops will need to be planted and mechanically fixed. The head and jambs of the overpanel are to be constructed using the same material as that used for the transom and are to be of the same section size as that approved for the door frames (Section 3.5).

A schematic diagram for the transom detail is shown below.

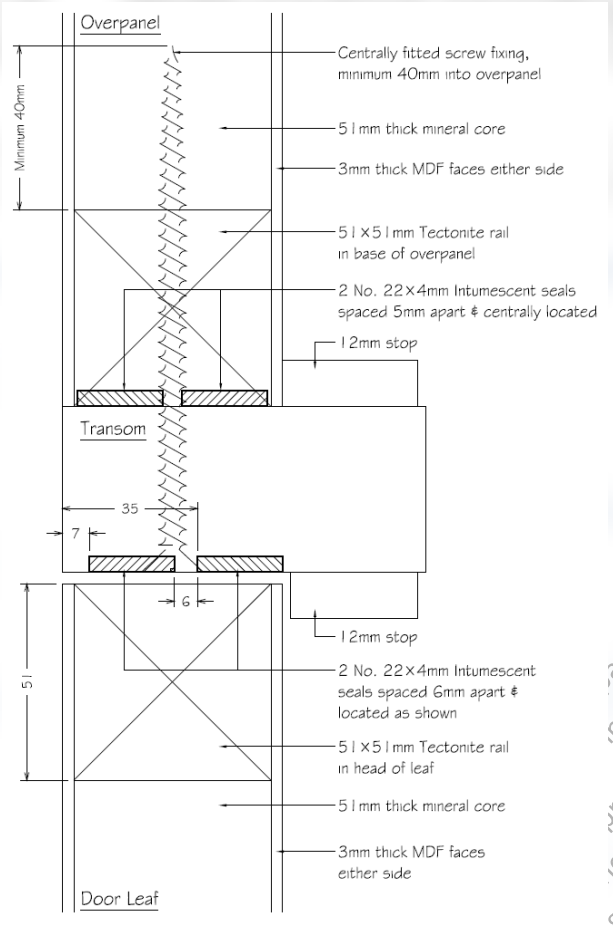


Figure 1 - Transomed overpanel

See table below for installation details for overpanels

ELEMENT	HARDWOOD TRANSOMS	TECTONITE TRANSOMS
Fire Resistance Performance	60 & 90 minutes	60, 90 & 120 minutes
Overpanel Joint	Mortice and tenon with the head twice screwed to each jamb and additionally bonded with cross-linked PVA or urea/ resorcinol formaldehyde.	Butt jointed, with the transom mechanically fixed to each jamb using a minimum of 3no. screw fixings, penetrating by a minimum of 40mm and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde.
Fixings	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.	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.
Intumescent Seals	Appendices A, B & C	Appendices A, B & C
Maximum height single doors	2000mm	2000mm
Maximum height – double doors	1500mm	1500mm

3.4.2 Side Panel

A side panel of the same construction as the door leaves may be used with this door assembly providing the following specification is followed. The side panel must include the Tectonite stiles and rails as appropriate.

- A side panel may only be used with a single leaf, single acting door assemblies
- The leaf must be hung from the door frame that is directly fixed back to the structural opening (i.e. it is not permitted to hang the leaf from the frame that separates the side panel from the leaf).
- The maximum permitted dimensions of the side panel are the same as for the height of the leaf and no more than 500mm in width
- The side panel must be located in the same plane as the door leaf.
- The side panel may be used in conjunction with an overpanel, providing the overpanel is located above the side panel, including a separating transom, and the overall assembly is no wider than 1500mm in total. Overpanels must not exceed 1500mm in height.
- The frame member (mullion) separating the side panel and door leaf must be constructed using one of the following materials, as appropriate for the required level of fire resistance.

MULLION MATERIAL	MINIMUM SECTION SIZE OF TRANSOM	FIRE RESISTANCE (MINUTES)
Hardwood (minimum density 640kg/m^3)	90 x 38mm (excluding the stops)	60 & 90
Tectonite/hardwood composite	112 x 47mm (excluding the stops)	60, 90 & 120
Tectonite (2/4mm veneer)	94 x 47mm (excluding the stops)	60, 90 & 120

A frame member (cill) must also be fitted underneath the side panel, employing the same principle and specification described for the mullion.

See the table below for installation details for side panels

ELEMENT	HARDWOOD MULLIONS	TECTONITE MULLIONS
Fire Resistance Performance	60 & 90 minutes	60, 90 & 120 minutes
Side Panel Joint	Mortice and tenon with the head/cill twice screwed to the mullion, penetrating by a minimum of 40mm and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde.	Butt jointed, with the head/cill mechanically fixed to the mullion using a minimum of 3no. screw fixings, penetrating by a minimum of 40mm and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde.
Fixings	Fixed by screwing through the rear of the frame (on all four edges) with coarsely threaded wood-type screws passing at least 40mm into the centreline of the side panel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.	Fixed by screwing through the rear of the frame (on all four edges) with coarsely threaded wood-type screws passing at least 40mm into the centreline of the side panel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.
Intumescent Seals	Appendix A & B	Appendix A, B & C

3.5 Frames

3.5.1 Timber Frames

Timber frames, to the specifications given below, may be used with the WSCP mineral core door designs:

60 MINUTE FIRE RESISTANCE – SINGLE AND DOUBLE LEAVES					
MATERIAL	DENSITY	MINIMUM FACE WIDTH		MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
		SINGLE ACTING	DOUBLE ACTING		
Hardwood	640kg/m^3 Note 15	38mm, excluding stop Note 16	N/A	90mm	11mm Note 17

90 MINUTE FIRE RESISTANCE – SINGLE AND DOUBLE LEAVES					
MATERIAL	DENSITY	MINIMUM FACE WIDTH		MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
		SINGLE ACTING	DOUBLE ACTING		
Hardwood	640kg/m^3 Note 15	38mm, excluding stop Note 16	N/A	90mm	11mm Note 17

120 MINUTE FIRE RESISTANCE					
MATERIAL	DENSITY	MINIMUM FACE WIDTH		MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
		SINGLE ACTING	DOUBLE ACTING		
Hardwood	640kg/m^3 Note 15	39mm, excluding stop Note 16	N/A	102mm	13mm Note 17

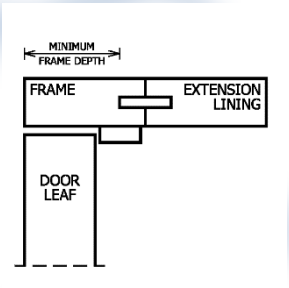
Note 15 Timber must have a minimum measured density at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be 10 ± 2% for the UK market, (or to suit internal joinery moisture content specifications of export countries).

Note 16 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.

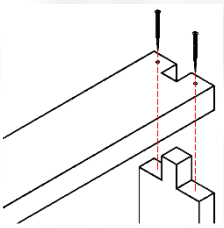
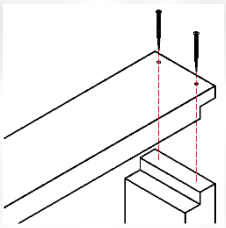
Note 17 The doorstop is to compromise the same material as the door frame and may be either planted and pinned using 40mm long coarsely threaded wood type steel screws or pins, (this may include a 3mm tongue into the face of the frame) or integral with the main door frame, providing the minimum frame thickness remains as states. (Screws or pins may also be fixed from the rear of the frame).

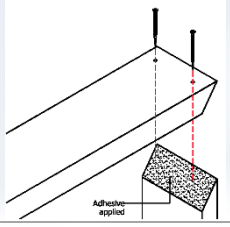
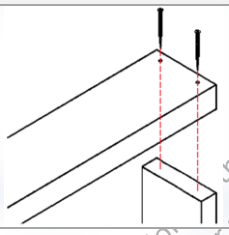
The overall frame depth may be increased by the use of extension linings, but the joint between the main frame and the extension lining must not intrude in the minimum frame depth section.

No joints permitted within the minimum frame depth section outlined within this report.



HEAD/JAMB JOINT: Mortice and tenon, half-lapped joint (created using 10mm deep rebate), mitred joint, or butt joint. All joints are to be glued with PVA adhesive with the head fixed to the jambs using a minimum of 2no. 12 x 100mm long steel wood screws

MORTICE AND TENON JOINT	HALF-LAPPED JOINT
	

MITRED JOINT	BUTT JOINT
	

ARCHITRAVES: Architraves may be required for fire performance requirements, see Section 3.8 regarding wall/frame gaps

TRANSOM MEMBERS: For 60 and 90 minute applications only – see Sections 3.1 and 3.4

3.5.2 Composite Frames

Composite frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendices A, B and C for the WSCP mineral core door design:

MATERIAL	MINIMUM FACE WIDTH		MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
	Single Acting	Double Acting		
Tectonite (2mm or 4mm veneer Note 18)	47mm Tectonite including 2mm/4mm facings, excluding stop	N/A	94mm	12mm
Tectonite (Hardwood composite Note 19)	47mm Tectonite including 4mm thick hardwood facing at frame reveal and a minimum of 40mm x 47mm hardwood glued to Tectonite frame core	N/A	112mm, with additional hardwood	12mm

Note 18 The veneer may be hardwood (meeting the specification in Note 20 below) or MDF and may be applied to all faces of the door frame.

Note 19 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 10 ± 2% for the UK market, (or to suit internal joinery moisture content specifications of export countries).

The following figures detail the composite door frames.

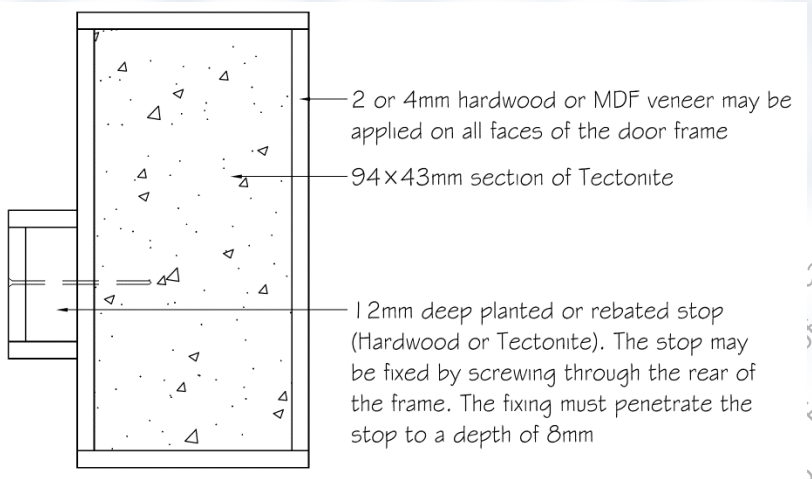


Figure 2 - Tectonite (2-4mm hardwood or MDF veneer) door frame

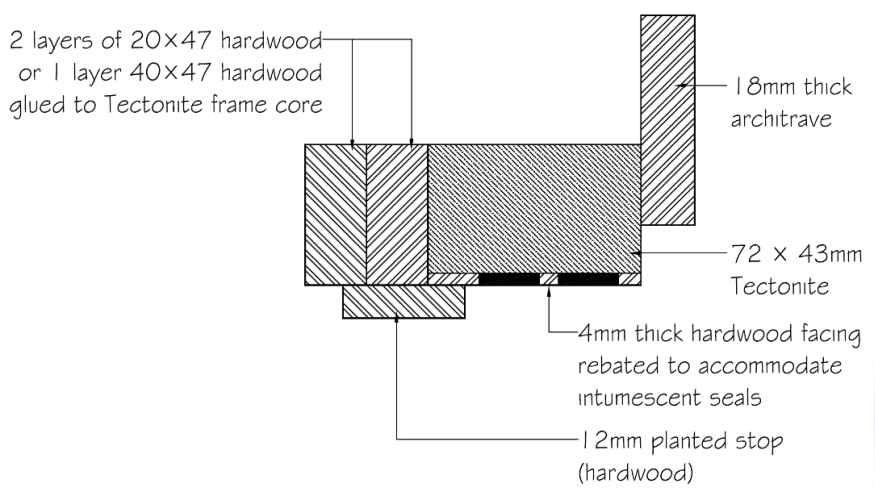
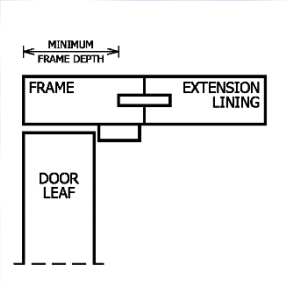


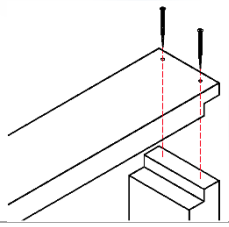
Figure 3 - Tectonite (hardwood composite) door frame

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 minimum frame depth section.

No joints permitted within the minimum frame depth section outlined within this report.



HEAD/JAMB JOINT: Half lapped comprising a 10mm deep horizontal rebate, which is glued using PVA adhesive and fixed with a minimum of three No. 12 x 100mm long vertical countersunk, coarsely threaded wood-type steel screws. An appropriately sized pilot hole is required prior to inserting screws into composite frames.

HALF-LAPPED JOINT


ARCHITRAVES: Architraves may be required for fire performance requirements, see Section 3.8 regarding wall/frame gaps

TRANSOM MEMBERS: See Section 3.1 and 3.4 for transom specification.

3.6 Glazed Apertures

The following glazing systems are approved for use with this WSCP mineral composite door design. Due to the nature of the door design and level of fire resistance, each glazing system has specific installation requirements and has been tested and approved for use with the particular glass types. The components and glass types must not, therefore, be considered interchangeable.

3.6.1 Option 1 - Lorient Glazing System

Glazing System

The following glazing system is approved for up to 120 minutes of fire resistance.

The method of glazing should be as in test WARRES 63295, i.e. Lorient LX5402 intumescent liner fitted around all four sides, Lorient System 90 Plus glazing channel retained with 1.6 mm thick Z profile mild steel beads through fixed with sleeve bolts. The bead fixings should be located at a distance no greater than 50mm from each corner and minimum 150mm centres thereafter. The only glass type that is justified for use with this door construction is 5mm thick Firelite by Southern Ceramics.

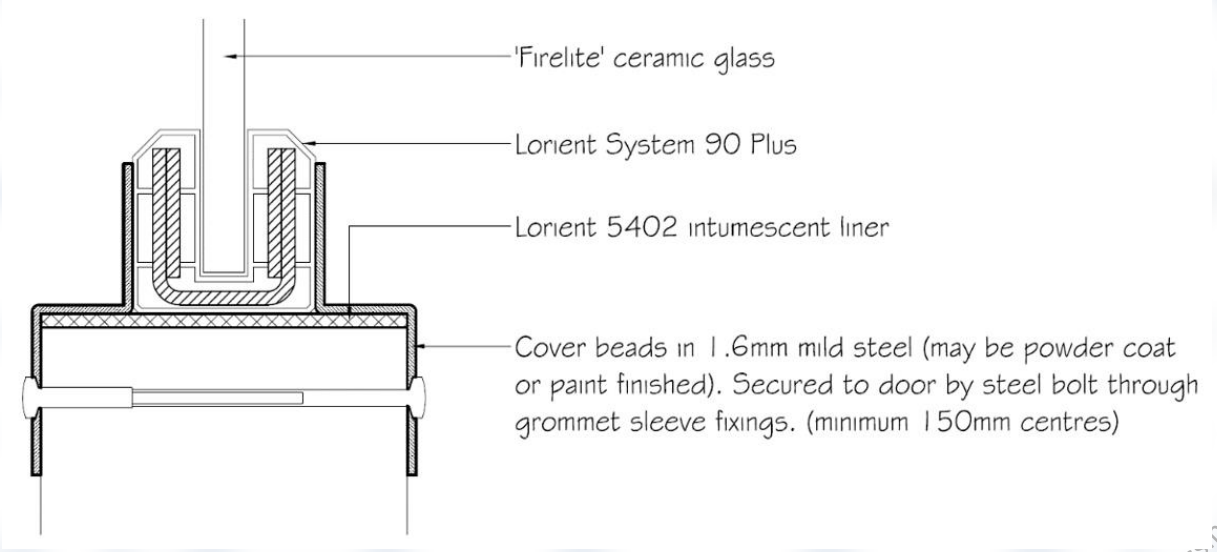


Figure 4 - Glazing system Option 1

Expansion allowance shall be as recommended by the glass manufacturer.

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab, with beads joined together through the use of sleeve bolts passing directly through the core material.

Based upon the limited test evidence available, it is the opinion of IFC that the following limitations apply to 'Option 1' glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.1m²
Maximum vertical length of aperture	-	400mm
Maximum horizontal length of aperture	-	400mm

If the door assemblies are being specified for use in projects where Approved Document N of the Building Regulations is applicable, then further limitations apply to the pane size of 5mm thick Firelite, as it does not satisfy the requirements of BS6206. Panes are restricted to a smaller dimension not exceeding 250mm, measured between glazing beads, in accordance with the requirements of Approved Document N.

Minimum distance from leaf edge (top)	-	200mm
Minimum distance from leaf edge (sides)	-	200mm
Minimum distance from bottom of leaf	-	200mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.2 Option 2 - Norsound Universal 90

Glazing System

The following glazing system is approved for up to 90 minutes of fire resistance.

The method of glazing should be as in test Chilt/IF12047 Revision A, summarised in the table below.

ELEMENT	PRODUCT	DIMENSIONS	LOCATION
Aperture liner	Tectonite	43mm wide x 51mm thick	Glued to all four edges of the aperture using PVAc adhesive
Glass type	Schott Pyran S	6mm thick	-
Expansion allowance	-	3mm all round	-
Beading	Profiled aluminium cover trim	24mm high x 26mm deep overall	Fitted around the glazed aperture on both faces
	Tectonite bead	12mm thick x 22mm deep	Fitted under the cover trim on both faces
Tectonite bead fixings	PVA adhesive & steel screws	15mm long	Fixed through the bead into the glazing fixing pads 50mm from the corners and central in height/width
Cover trim fixings	12no. fixing pads/clips on each face – profiled aluminium	50mm wide x 20mm deep x 3mm thick with a 1mm wide x 8mm deep slot in the outer edge	3no. fitted on each edge 50mm from the corners & 1no. central in height/width, fixed with 2no. 15mm long steel screws per clip
Cover trim fixings	12no. fixing tabs on each face – profiled aluminium	30mm wide x 10mm deep x 1.9mm thick overall	Fitted through the cover trim into the slot in the outer face of the cover trims

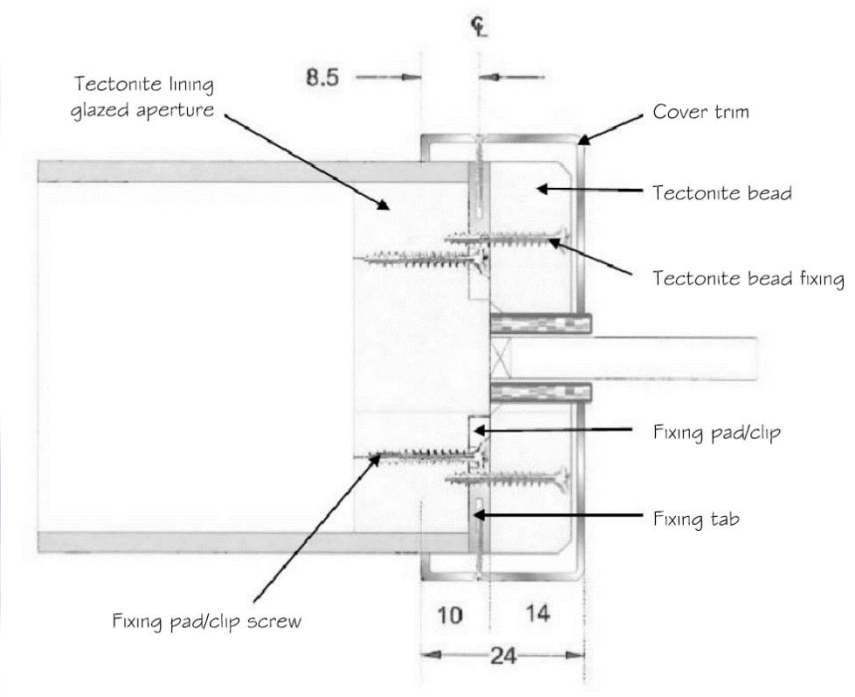


Figure 5 - Glazing system option 2 assembly

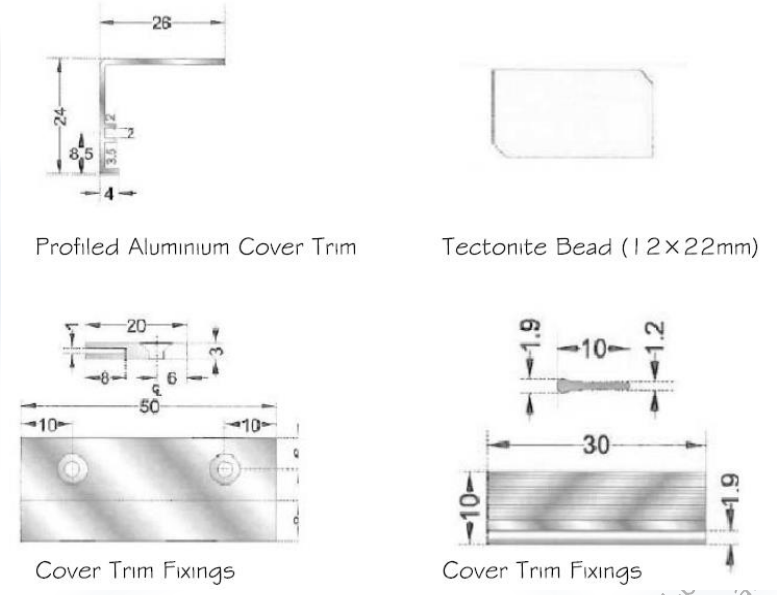


Figure 6 - Glazing system option 2 components

Expansion allowance shall be as recommended by the glass manufacturer.

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab, with a Tectonite aperture liner fitted to all four sides as described in the table above.

Based upon the test evidence available, it is the opinion of IFC that the following limitations apply to 'Option 2' glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.18m²
Maximum vertical length of aperture	-	400mm
Maximum horizontal length of aperture	-	400mm
Minimum distance from leaf edge (top)	-	200mm
Minimum distance from leaf edge (sides)	-	200mm
Minimum distance from bottom of leaf	-	400mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.3 Option 3 - ISL Therm-A-Glaze Steel Channel

Glazing System

The following glazing system is approved for up to 90 minutes of fire resistance.

The method of glazing should be as in test CFR1504141, summarised in the table below.

ELEMENT	PRODUCT	DIMENSIONS	LOCATION
Glass type	Pyrostop 30-20	18mm thick	-
Expansion allowance	-	5mm all round	-
Beading	Stainless steel mitred cassette with welded joints	(See figure below)	Fitted on both faces around the perimeter of the glazed aperture & mitred at the corners
Bead fixings	Steel screws	4mm diameter x 30mm long	Screws located at maximum 140mm centres and 20° to the plane of the glass at one face of the glass
Glazing system	2no. layers ISL Therm-A-Glaze	Each layer = 15mm wide x 2mm thick	Fitted between the glass & bead on both faces
Aperture liner	ISL Therm-A-Glaze(Liner)	52mm wide x 2mm thick	Fitted lining the full width/height of the glazed aperture

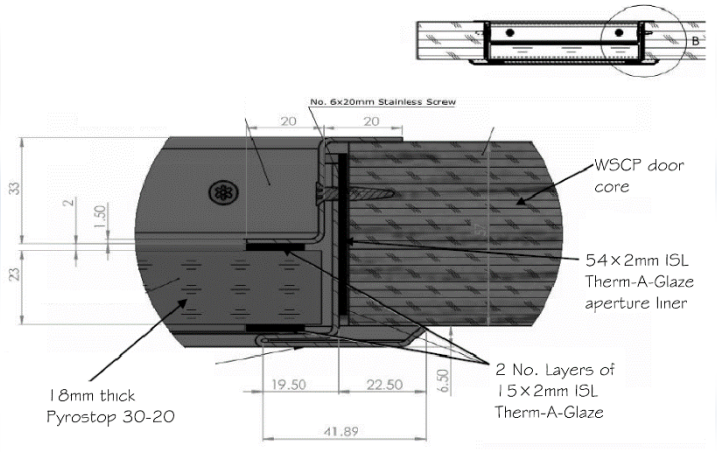


Figure 7 - Glazing system option 3

Expansion allowance shall be as recommended by the glass manufacturer.

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab.

Based upon the test evidence available, it is the opinion of IFC that the following limitations apply to 'Option 3' glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.44m²
Maximum vertical length of aperture	-	2000mm
Maximum horizontal length of aperture	-	316mm
Minimum distance from leaf edge (top)	-	235mm
Minimum distance from leaf edge (sides)	-	106mm
Minimum distance from bottom of leaf	-	235mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf, subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.4 Option 4 – Sealmaster Glazing System

Glazing System

The following glazing system is approved for up to 120 minutes of fire resistance.

The method of glazing should be as in test CFR1806192_1, summarised in the table below.

ELEMENT	PRODUCT	DIMENSIONS	LOCATION
Glass type	Pyrodur EW60-10	10mm thick	-
Expansion allowance	-	5mm all round	-
Beading	Hardwood (minimum density 770kg/m^3)	(See Figure 10 below)	Fitted on both faces around the perimeter of the glazed aperture and mitred at the corners
Bead fixings	Steel screws	4.5mm diameter x 75mm long	Screws located at a maximum of 50mm from each corner and at 145mm centres thereafter. The fixing angle shall be 32° to the plane of the glass
Glazing system	Dixon International Group Ltd Sealmaster Fireglaze 2000	25mm wide x 5mm thick (uncompressed)	Fitted between the glass & bead on both faces. Peripheral gaps are filled with Sealmaster Fireglaze compound
Aperture liner	Dixon International Group Ltd Sealmaster GL60 liner	54mm wide x 2mm thick	Fitted lining the glazed aperture, central to the leaf thickness with further strips of the same used as setting blocks

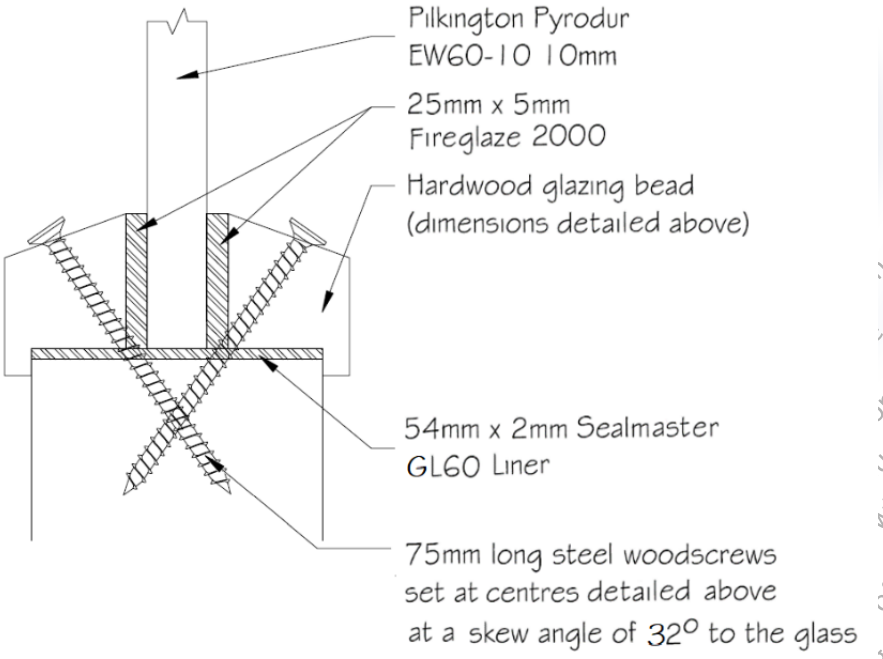


Figure 8 - Glazing system Option 4 bead detail

Expansion allowance shall be as recommended by the glass manufacturer.

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab and shall include a 51mm x 49mm Tectonite perimeter frame.

Based upon the test evidence available, it is the opinion of IFC that the following limitations apply to 'Option 4' glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.22m²
Maximum vertical length of aperture	-	1450mm
Maximum horizontal length of aperture	-	150mm
Minimum distance from leaf edge (top)	-	210mm
Minimum distance from leaf edge (sides)	-	150mm
Minimum distance from bottom of leaf	-	250mm
Minimum distance between apertures	-	102mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.5 Option 5 - Norsound Universal 120

Glazing System

The following glazing system is approved for up to 120 minutes of fire resistance.

The method of glazing should be as in test Chilt/IF13013, summarised in the table below.

ELEMENT	PRODUCT	DIMENSIONS	LOCATION
Aperture liner	Tectonite	43mm wide x 51mm thick	Glued to all four edges of the aperture using PVAc adhesive
Glass type	TGP Firelite ceramic glass	5mm thick	-
Expansion allowance	-	3mm all round	-
Beading	Tectonite inner bead	13mm thick x 22mm deep	Fitted around the glazing aperture on both faces
	Profiled aluminium cover trim	24mm high x 27mm deep overall	Covering the Tectonite bead on both sides
Inner bead fixings	Steel screws	25mm long x No.8 gauge	50mm from the corners and at 150mm centres, parallel to the face of the glass
Aluminium cover trim fixings	Steel screws	15mm long	50mm from the corners and at 150mm centres, perpendicular to the face of the glass

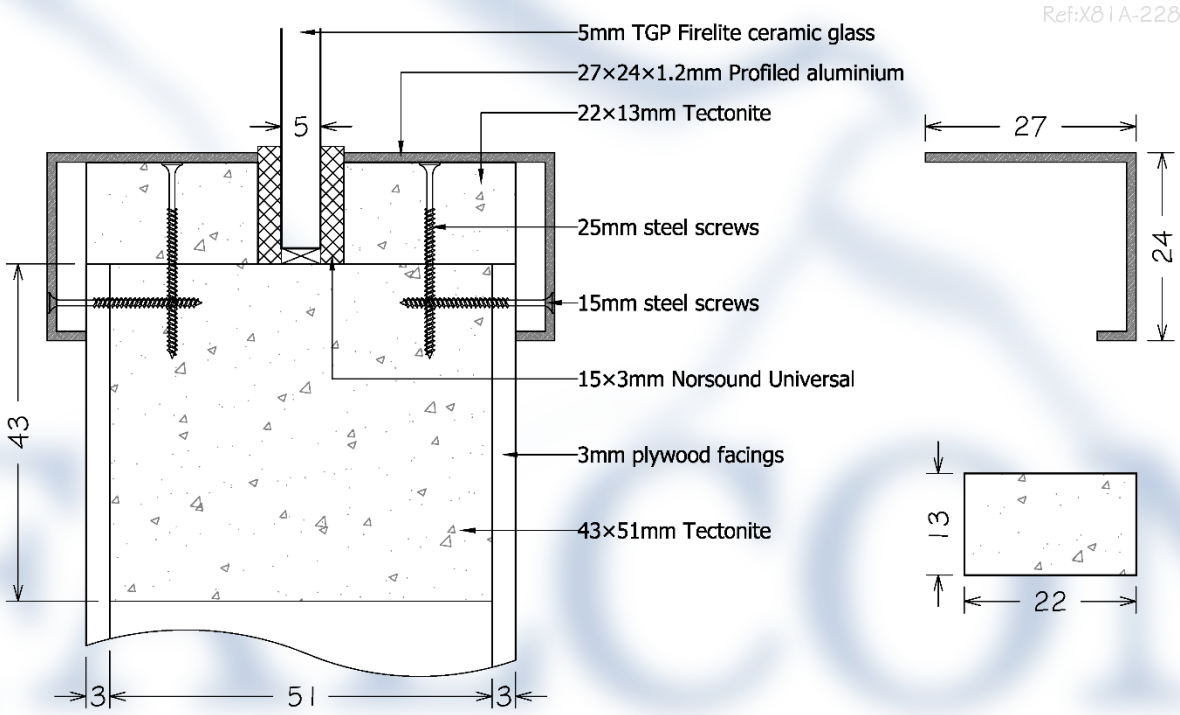


Figure 9 - Glazing system option 5 assembly and components

Expansion allowance shall be as recommended by the glass manufacturer.

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab, with a Tectonite aperture liner fitted to all four sides as described in the table above.

Based upon the test evidence available, it is the opinion of IFC that the following limitations apply to 'Option 5' glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.18m²
Maximum vertical length of aperture	-	400mm
Maximum horizontal length of aperture	-	400mm
Minimum distance from leaf edge (top)	-	200mm
Minimum distance from leaf edge (sides)	-	200mm
Minimum distance from bottom of leaf	-	400mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.7 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 the 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.

The 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 door assemblies where the leaf construction and thickness, and all details at the frame interface, are similar to those proposed herein.

3.8 Installation, Supporting Construction and Door Edge Gaps

3.8.1 Installation

Timber and composite frames must be fixed back to the supporting construction using a minimum of 5no. steel fixings in each jamb, (1no. fixing 200mm below the head, 1no. fixing 200mm above the threshold and 3no. fixings equally spaced in between). 2no. fixings are required in the frame head, set 200mm from the jambs for single leaf doors and 500mm from the jambs for double doors.

The fixings must be of the appropriate type for the supporting construction. 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.

No part of the rear of the frame section shall be exposed once installed, and leaves must not project beyond the exposed face of the door frame.

There shall be no feature rebates or shadow gaps at the junction of the frame and wall (such features could, however, be assessed on an individual basis).

For FD60 assemblies the gap sealing between the supporting construction and timber frames should follow the recommendations given in Section 9.4 of BS8214: 2016, 'Timber-based fire door assemblies – Code of practice', using a product proven in such timber or mineral composite 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 sealing between the supporting construction and door frames for FD90 and FD120 applications should use one of the following methods:

- Gaps up to 10mm must be sealed on both sides with 20mm depth of acrylic intumescent mastic and the installation gap must be subsequently covered with 18mm thick architraves, overlapping the wall and frame by at least 15mm and installed on each side of the wall.
- Gaps between 10 and 20mm must be tightly packed with mineral rock fibre and filled on both faces with a minimum 20mm depth of acrylic intumescent mastic. The installation gap must be subsequently covered with 18mm thick architraves overlapping the wall and frame by at least 15mm and installed on each side of the wall.

- Proprietary gap filling products that have been proven for the required level of fire resistance at the required depth and width. The installation gap must be subsequently covered with 18mm thick architraves overlapping the wall and frame by at least 15mm, and installed on each side of the wall.

For all of the gap sealing applications above, the intumescent mastic, and proprietary gap filling products such as expanding PU foams, should be tested and approved between the required substrates to BS EN 1366-4 or BS 476: Part 20 or have been included within a fire test on a door assembly to BS 476: Part 22 or BS EN 1634-1. The manufacturer's instructions should be carefully followed.

It is permitted to install the door assembly without architraves providing:

- The gap sealing medium has been tested and approved to the relevant test standard criteria outlined above
- The gap sealing medium was tested without architraves or any other capping material

3.8.2 Supporting Construction

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

Note 20 *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 the use of the proposed doorsets in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and doorsets therein.*

3.8.3 Door Gaps and Alignment

The gap between the door and the frame or between meeting stiles of double doors (and between frame 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 in accordance with BS8214 (see also Section 3.10 regarding the suitability of smoke seals).

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

3.9 Intumescent Seals

Warm Springs Composite Products WSCP PVC-Seals shall be employed across the complete range of door sizes and configurations approved herein. The intumescent seal specifications, widths, and positions are shown in Appendices A, B and C, based upon tested details.

Intumescent protection is required for specific items of building hardware, and this is detailed in Appendix D based upon details tested.

3.10 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 $3m^3/m/hr$ 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 Appendices A, B and C, in which case, the latter shall take precedence; and smoke sealing may not be affected.

Test evidence to BS476: Part 22: 1987 (or EN1634-1) shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber door assemblies, of similar design and thickness, when fitted in the proposed arrangements.

4. CONCLUSION

Based upon the available test evidence, and subsequent analysis performed by International Fire Consultants Ltd, if the proposed door assemblies utilising WSCP Composite Mineral door leaves installed in timber and composite frames were manufactured and installed in accordance with the limitations of this Field of Application Report and tested for fire resistance, they would satisfy the integrity criteria of BS476: Part 22: 1987 for 60, 90 or 120 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 up to 90 minutes of fire resistance.

The doors can also be assessed to Section 6 of BS476: Part 22: 1987 for a 90 minute performance rating for both integrity and insulation (providing the steel frame, if included, has been considered), without apertures in the leaves (unless fully insulating glass is included in the assessment).

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

IFC Engineering Assessment Report	IFCA/07019 Revision D
Client	Falcon Panel Products Ltd
Project Address	Clock House Station Approach Shepperton Middlesex TW17 8AN

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

Passive Fire Protection Forum (PFPF) - Industry Standard Procedure 2021

'Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence'

- We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance 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 the assessing authority to withdraw the assessment.

Signature	
Name	Neil Harrison
Position	Technical Director
Company name	Falcon Panel Products Ltd
Date	26th April 2022

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.

It is the responsibility of others to establish whether the proposed product meets any other relevant requirements, including any other requirements for fire performance and life safety, as defined in documents such as the Building Regulations, and the Fire Strategy/Risk Assessment for the project.

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 fire performance of construction products based on fire test evidence, 2021, 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 fire performance of construction products based on fire test evidence, 2021, 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. 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 is not intended to be a complete specification for the proposed assemblies and it is the responsibility of others to ensure that the assemblies are suitable for the intended purpose, whilst incorporating the requirements of this report. Further, the assemblies must be manufactured/installed by experienced/trained personnel using appropriate and established working practices/techniques.

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 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.

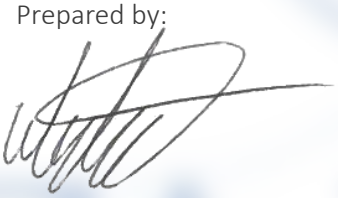
It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal 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 April 2027 should confirm its ongoing validity.

This Field of Application Report is not valid unless it incorporates the declaration by the applicant given in Section 5 duly signed by the applicant.

Prepared by:



Will Lightfoot
BEng (Hons) MSc AIFireE
Senior Fire Safety Engineer
International Fire Consultants Ltd. (IFC)

Reviewed by:

Chris Houchen
BSc AIFireE
Associate Director
International Fire Consultants Ltd. (IFC)

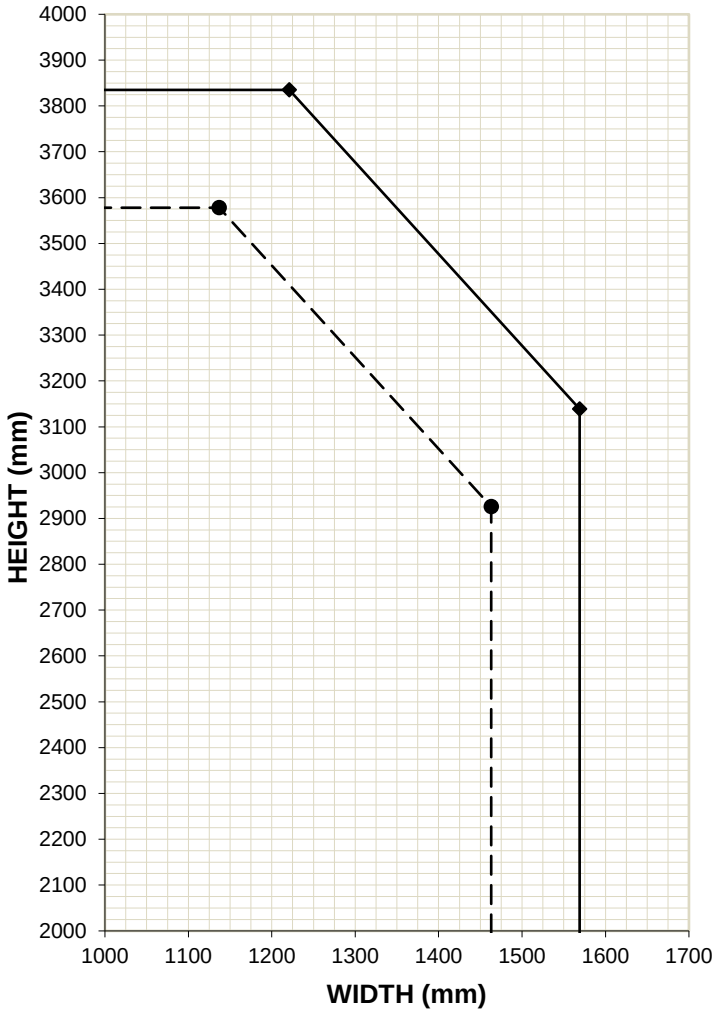
IFC GROUP | INTERNATIONAL FIRE CONSULTANTS

APPENDIX A

Figures IFCA/07019D:A01 to A12

Assessed Leaf Size Envelopes for FD60 WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

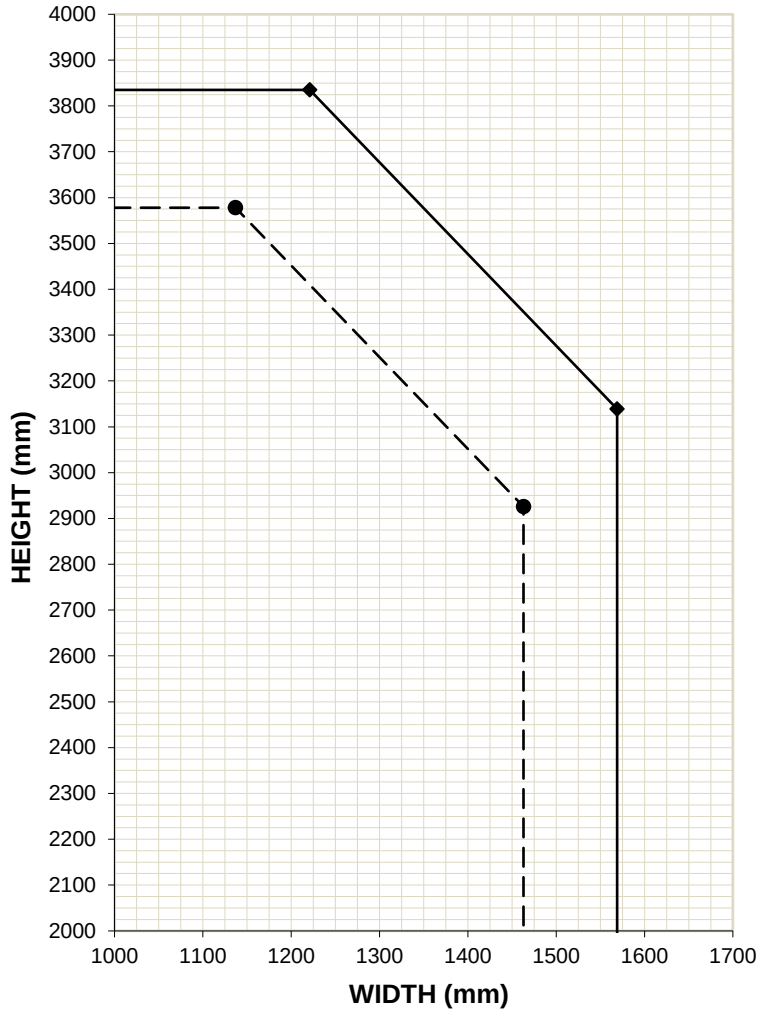
Figure A01	FD60	WSCP Mineral Composite Door	Configuration: LSASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2926mm	1463mm
		3578mm	1137mm
Composite	————	3139mm	1569mm
		3835mm	1221mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite) Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

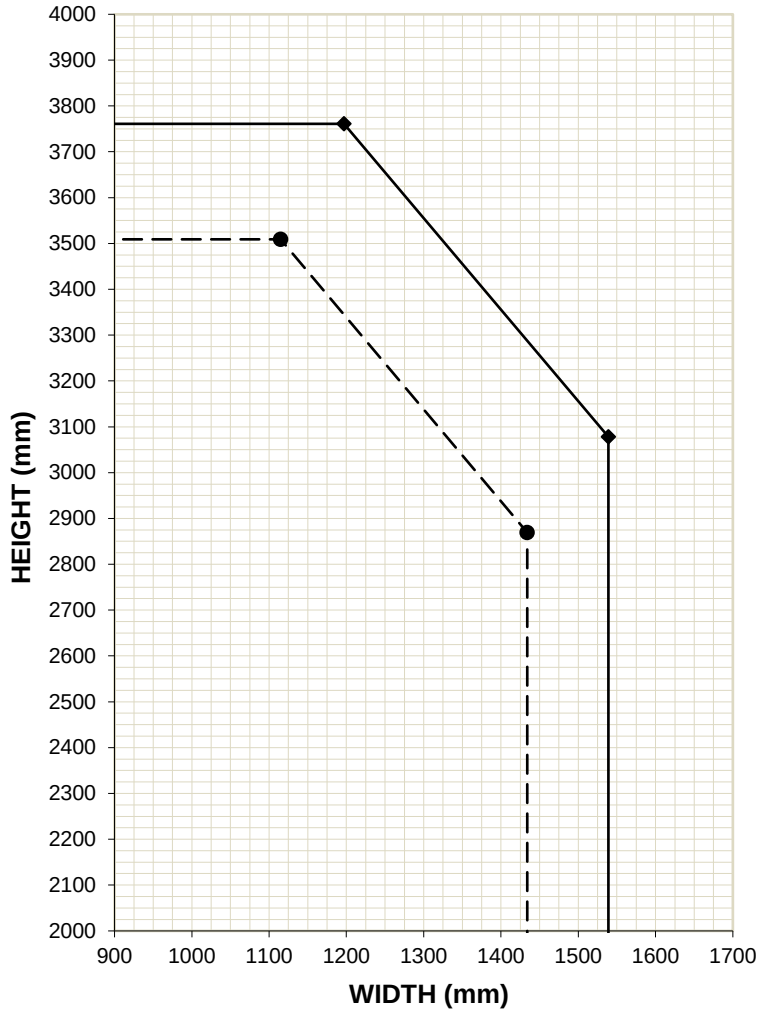
Figure A02	FD60	WSCP Mineral Composite Door	Configuration: LSASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2926mm	1463mm
		3578mm	1137mm
Composite	————	3139mm	1569mm
		3835mm	1221mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

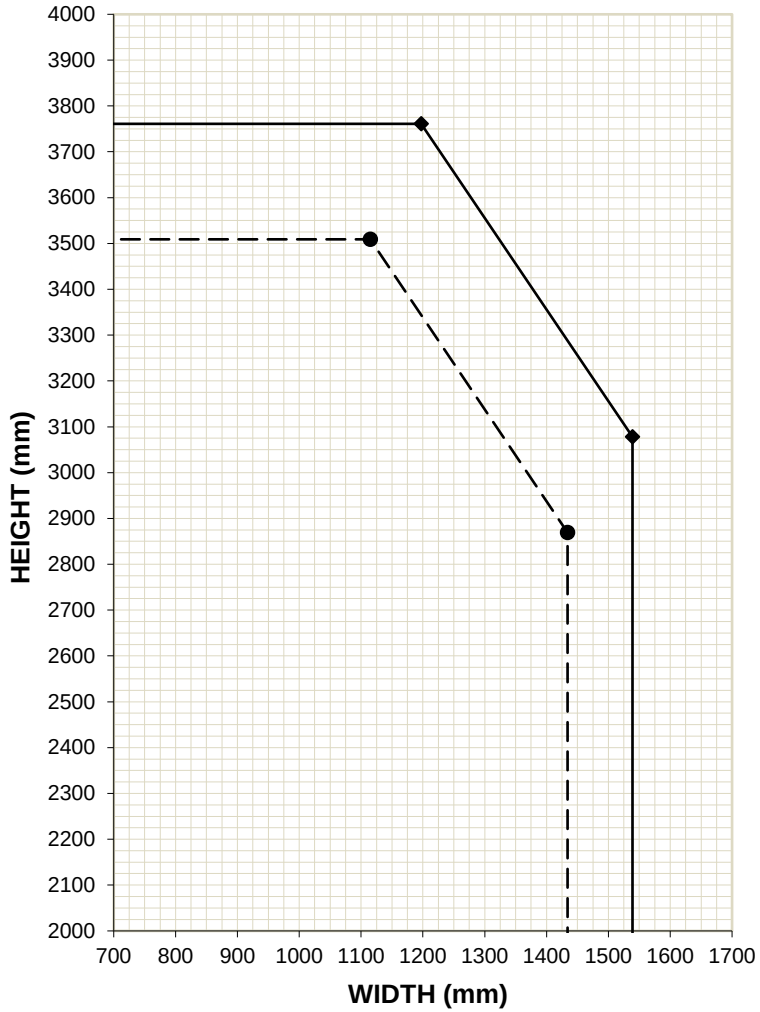
Figure A03	FD60	WSCP Mineral Composite Door	Configuration: ULSASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2869mm	1434mm
		3509mm	1115mm
Composite	————	3078mm	1539mm
		3761mm	1197mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

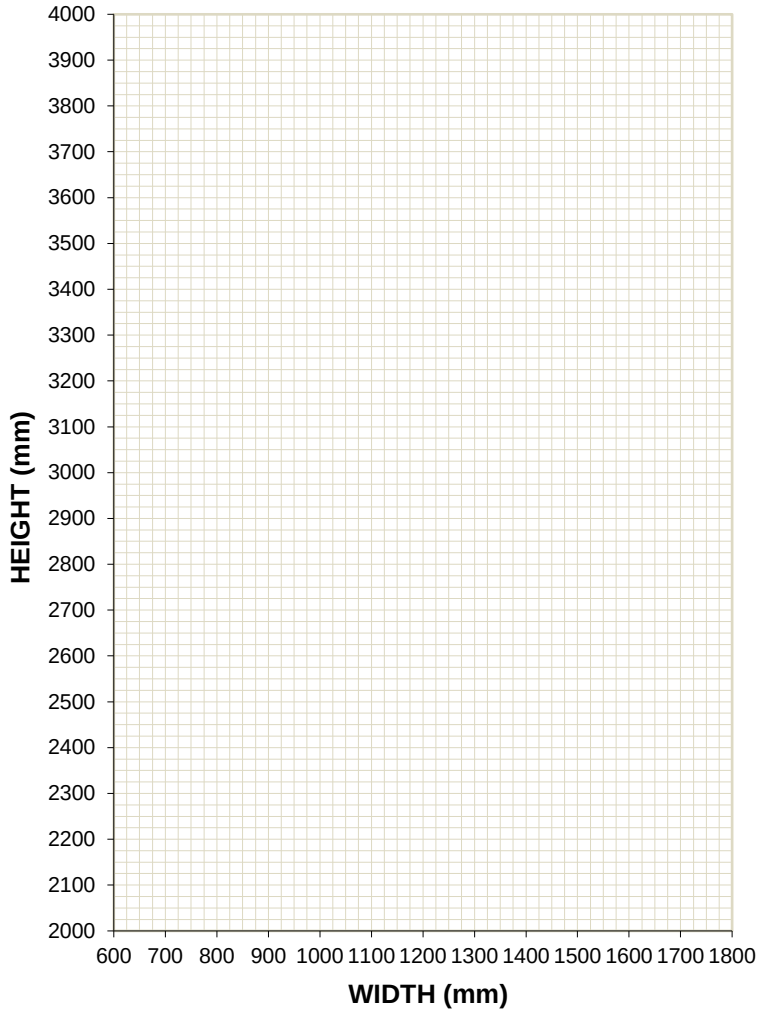
Figure A04	FD60	WSCP Mineral Composite Door	Configuration: ULSASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2869mm	1434mm
		3509mm	1115mm
Composite	————	3078mm	1539mm
		3761mm	1197mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

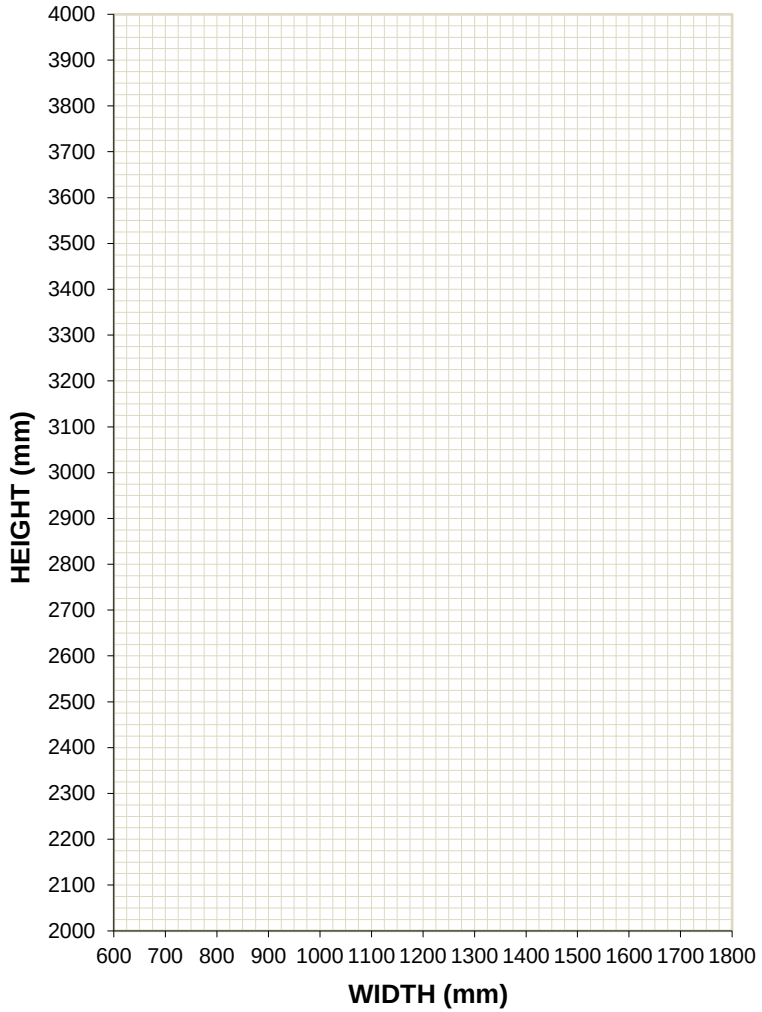
Figure A05	FD60	WSCP Mineral Composite Door	Configuration: DASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

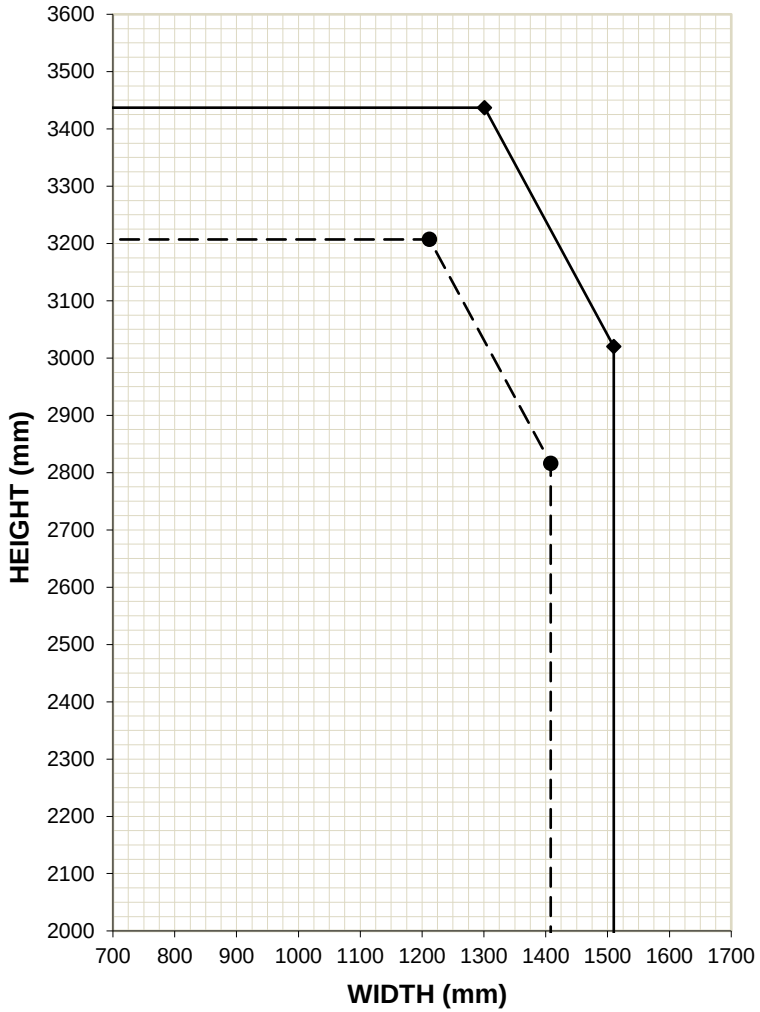
Figure A06	FD60	WSCP Mineral Composite Door	Configuration: DASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

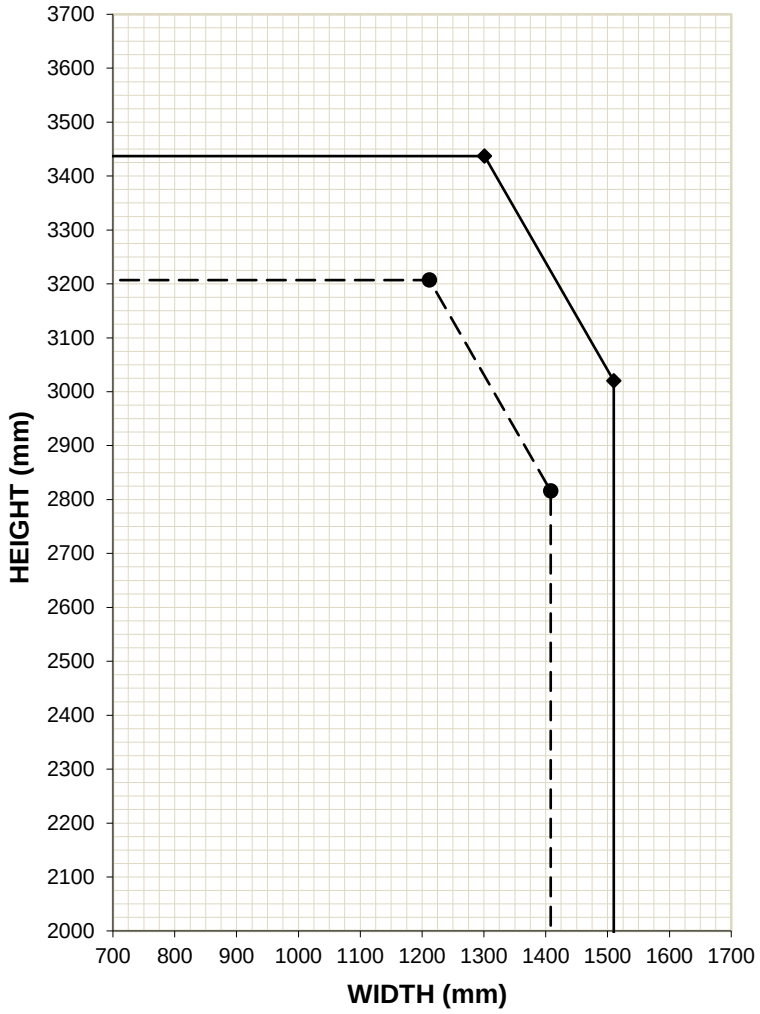
Figure A07	FD60	WSCP Mineral Composite Door	Configuration: LSADD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2816mm	1408mm
		3207mm	1212mm
Composite	————	3020mm	1510mm
		3437mm	1301mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and oversailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

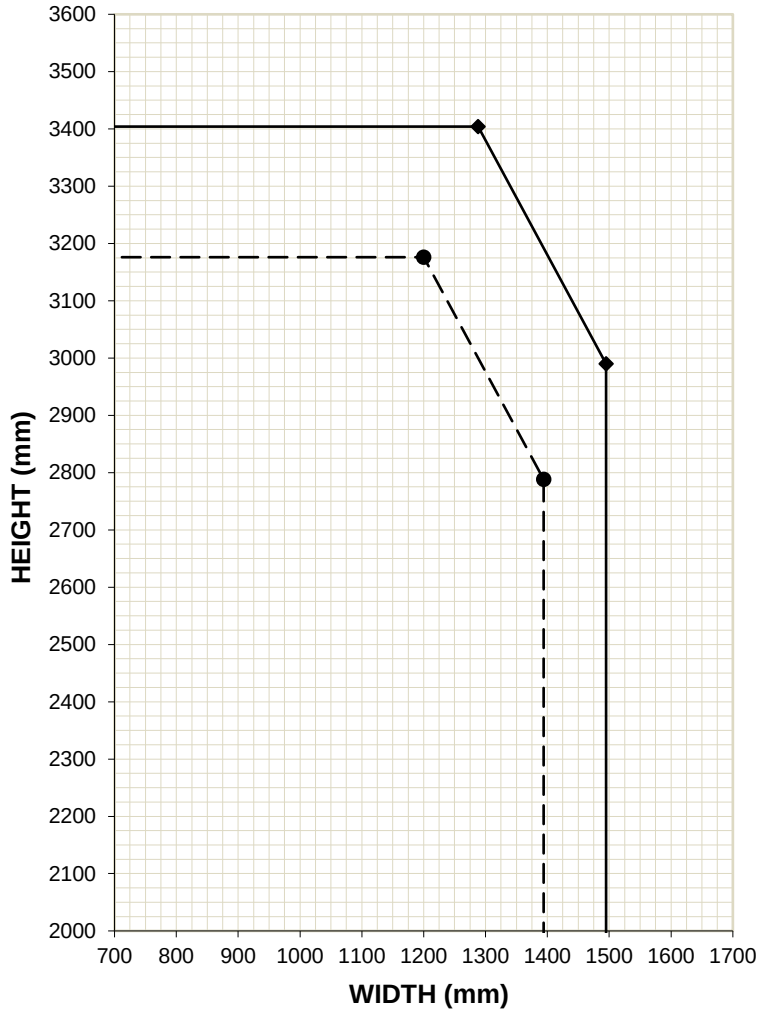
Figure A08	FD60	WSCP Mineral Composite Door	Configuration: LSADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2816mm	1408mm
		3207mm	1212mm
Composite	————	3020mm	1510mm
		3437mm	1301mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

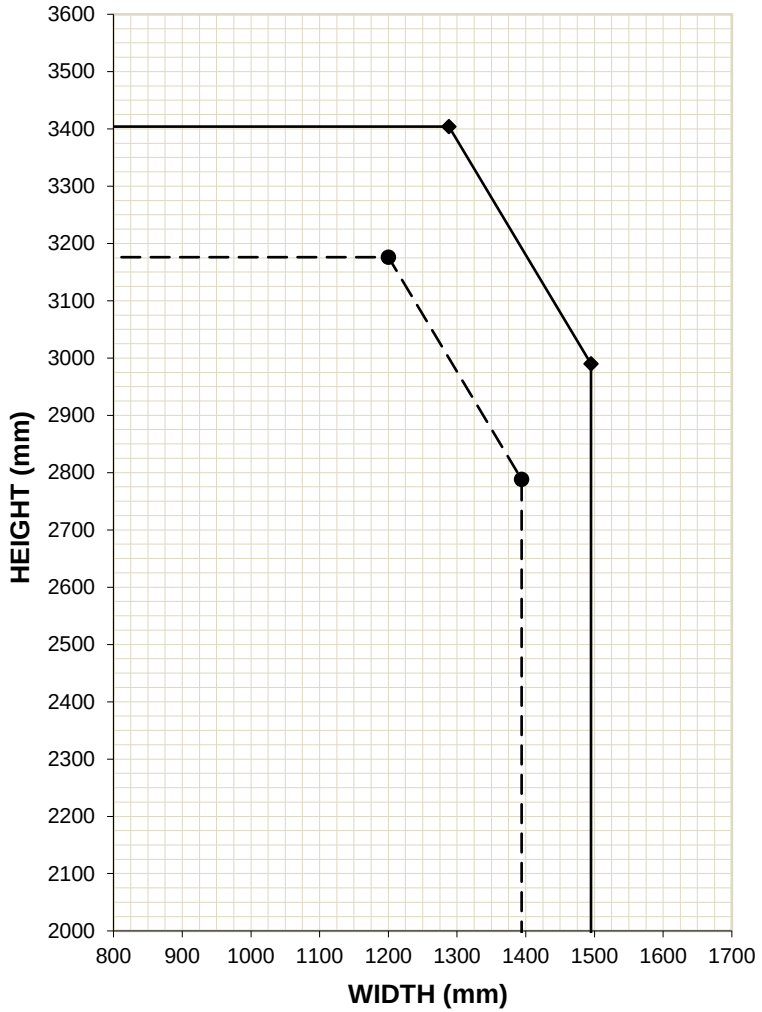
Figure A09	FD60	WSCP Mineral Composite Door	Configuration: ULSADD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2788mm	1394mm
		3176mm	1200mm
Composite	————	2990mm	1495mm
		3404mm	1288mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

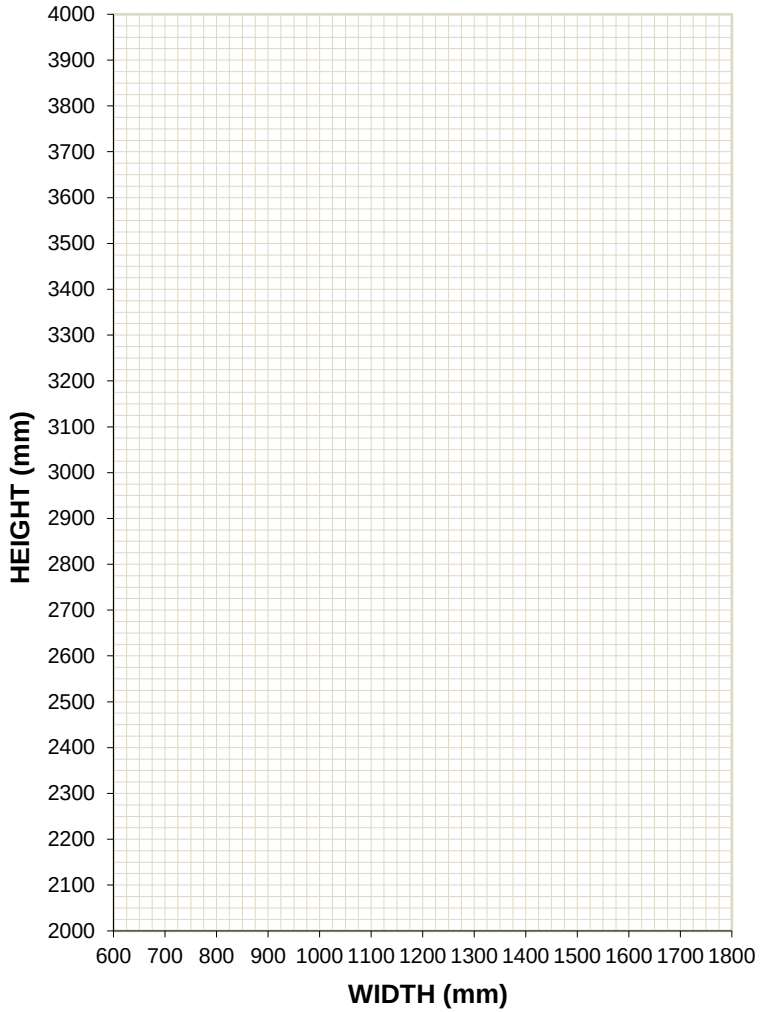
Figure A10	FD60	WSCP Mineral Composite Door	Configuration: ULSADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2788mm	1394mm
		3176mm	1200mm
Composite	————	2990mm	1495mm
		3404mm	1288mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

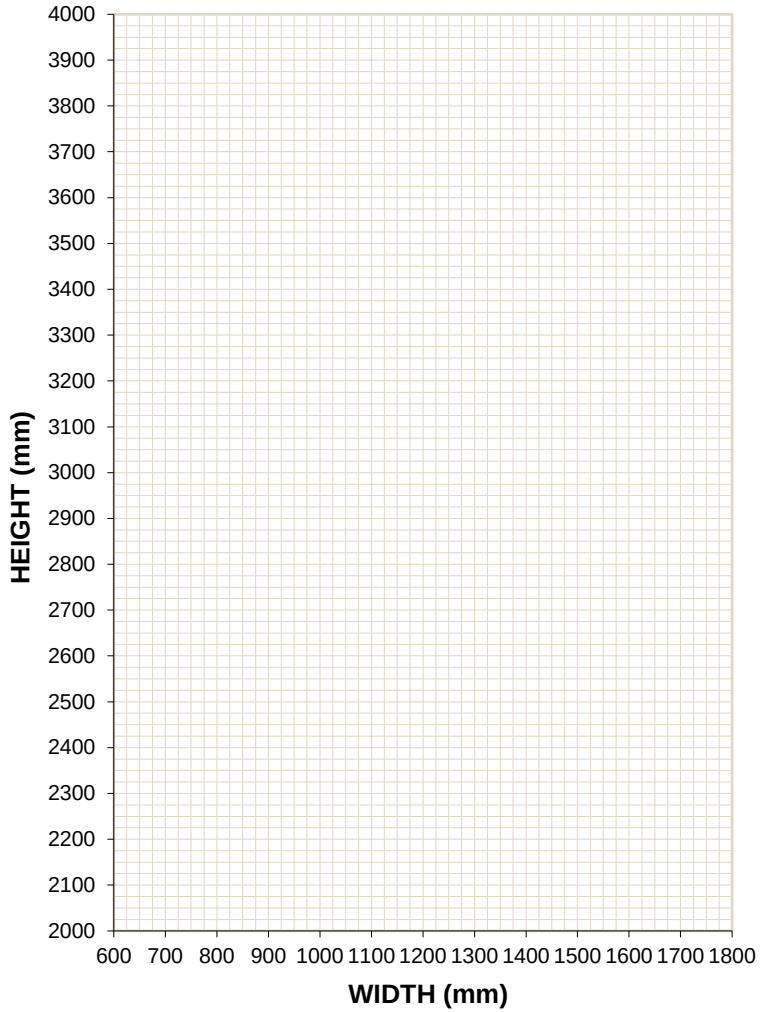
Figure A11	FD60	WSCP Mineral Composite Door	Configuration: DADD



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

Figure A12	FD60	WSCP Mineral Composite Door	Configuration: DADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

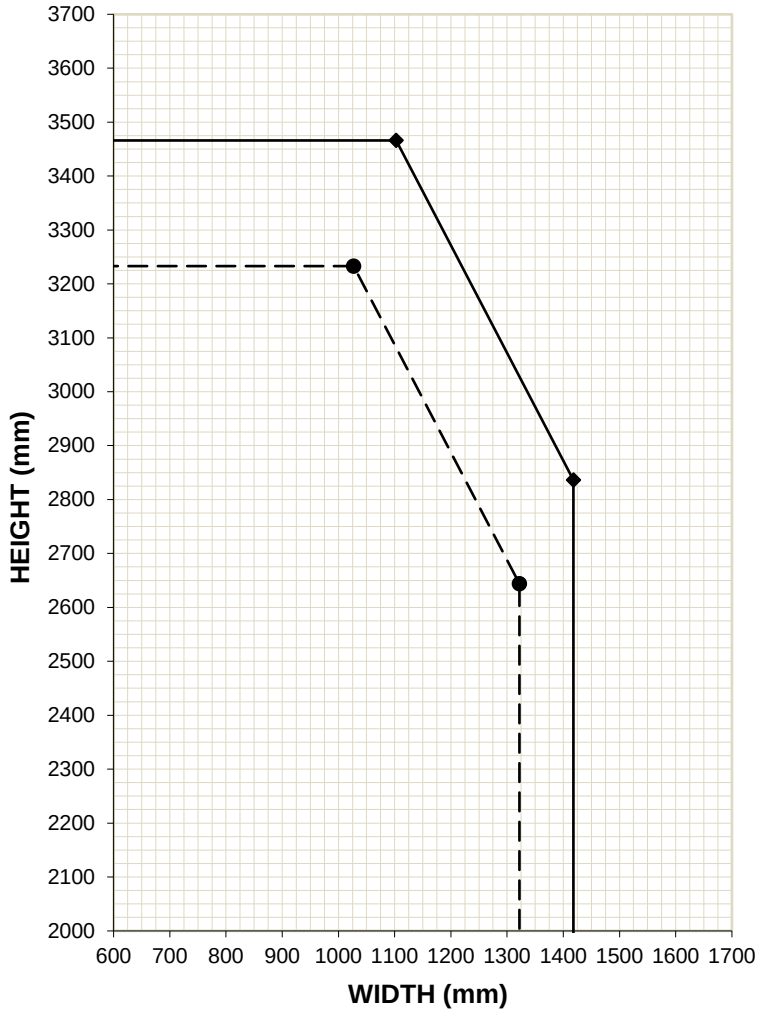
INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

APPENDIX B

Figures IFCA/07019D:B01 to B12

Assessed Leaf Size Envelopes for FD90 WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

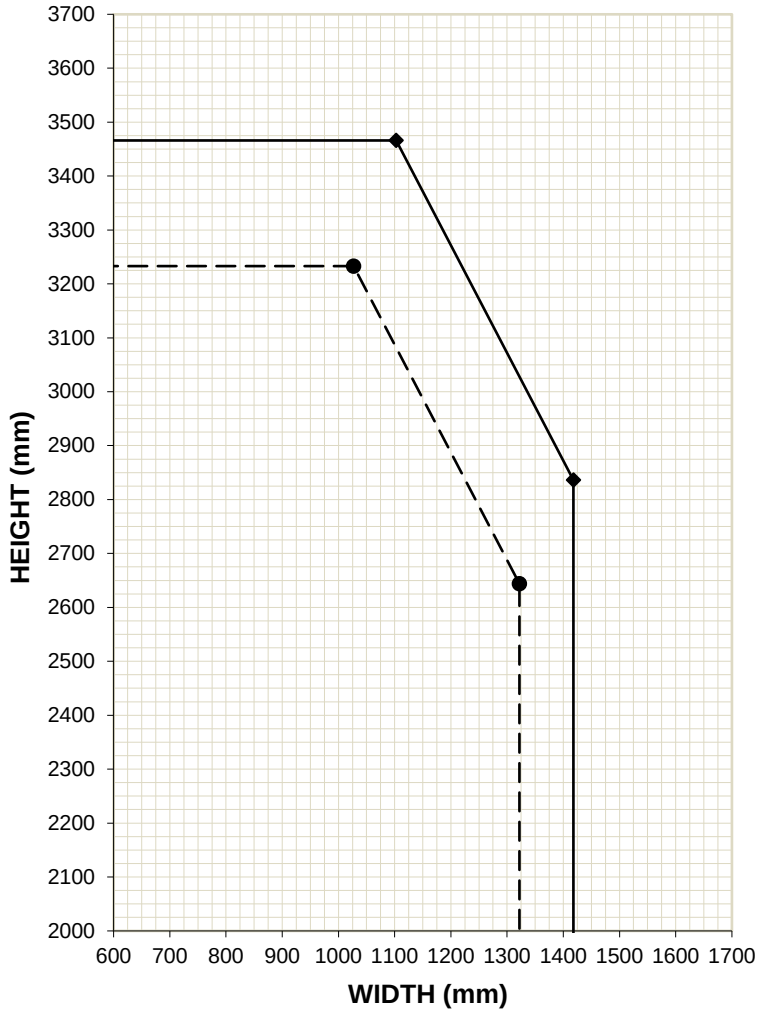
Figure B01	FD90	WSCP Mineral Composite Door	Configuration: LSASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2644mm	1322mm
		3233mm	1027mm
Composite	————	2836mm	1418mm
		3466mm	1103mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

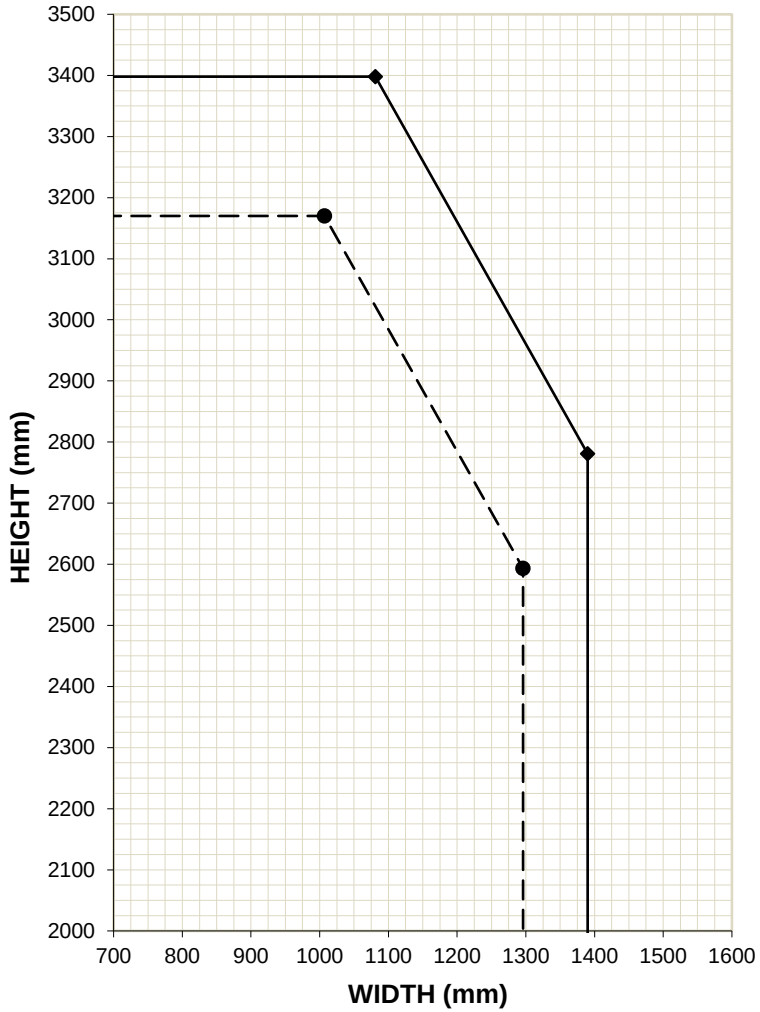
Figure B02	FD90	WSCP Mineral Composite Door	Configuration: LSASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2644mm	1322mm
		3233mm	1027mm
Composite	————	2836mm	1418mm
		3466mm	1103mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite) fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

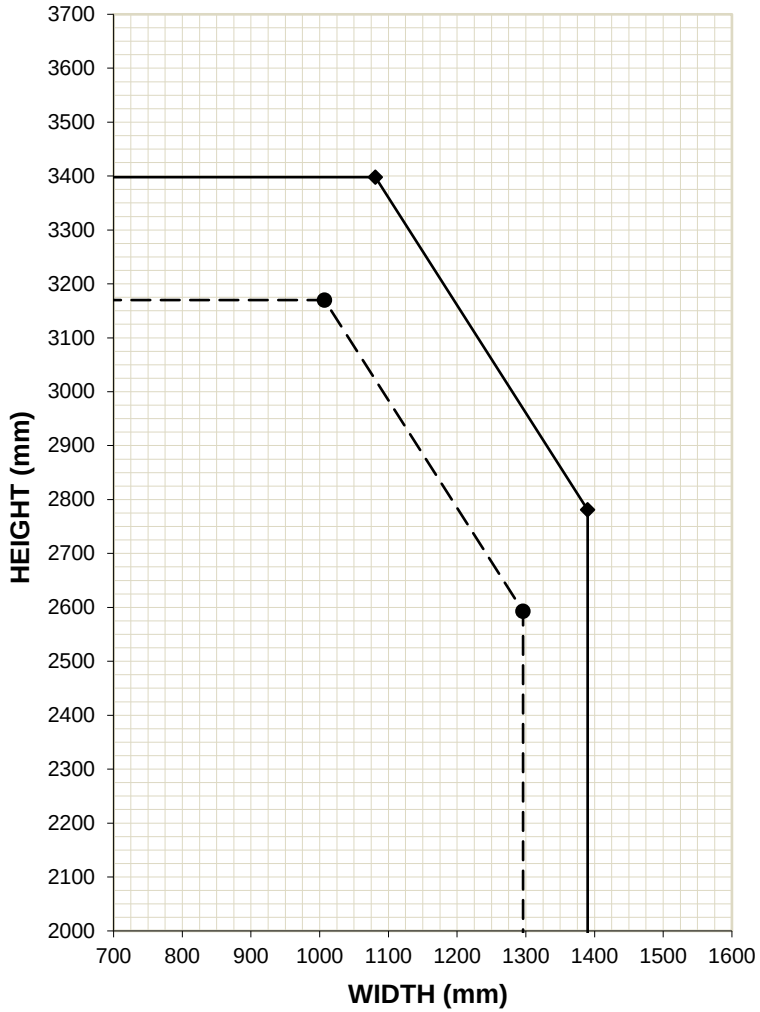
Figure B03	FD90	WSCP Mineral Composite Door	Configuration: ULSASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2593mm	1296mm
		3170mm	1007mm
Composite	————	2781mm	1390mm
		3398mm	1081mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

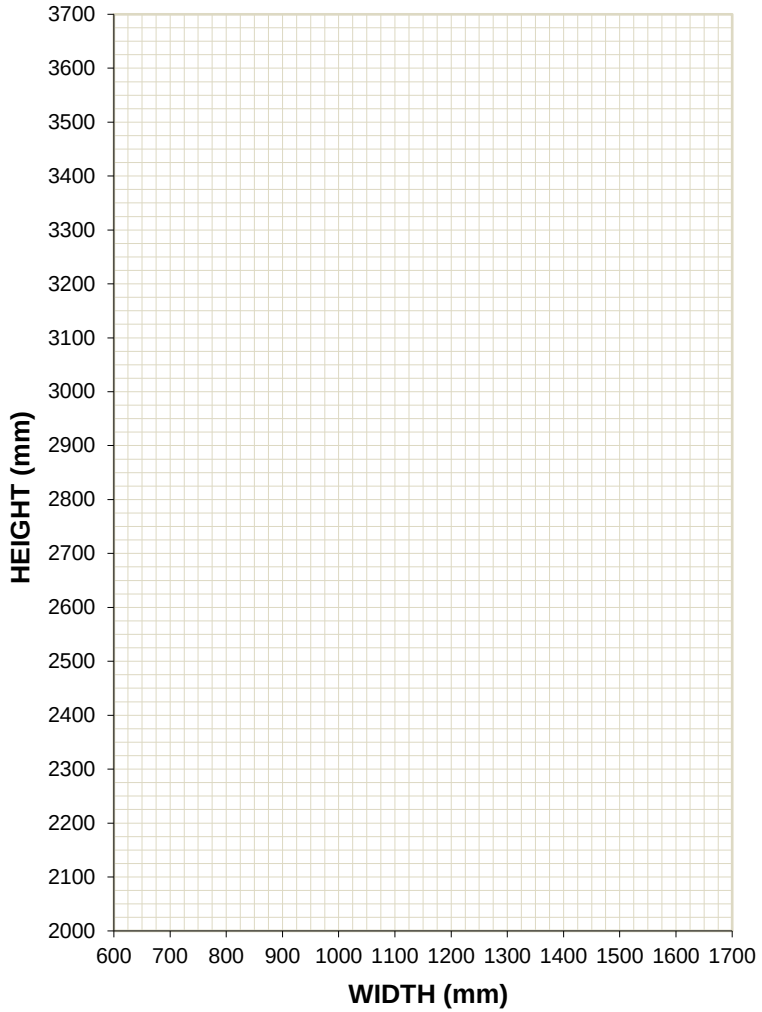
Figure B04	FD90	WSCP Mineral Composite Door	Configuration: ULSASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2593mm	1296mm
		3170mm	1007mm
Composite	————	2781mm	1390mm
		3398mm	1081mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

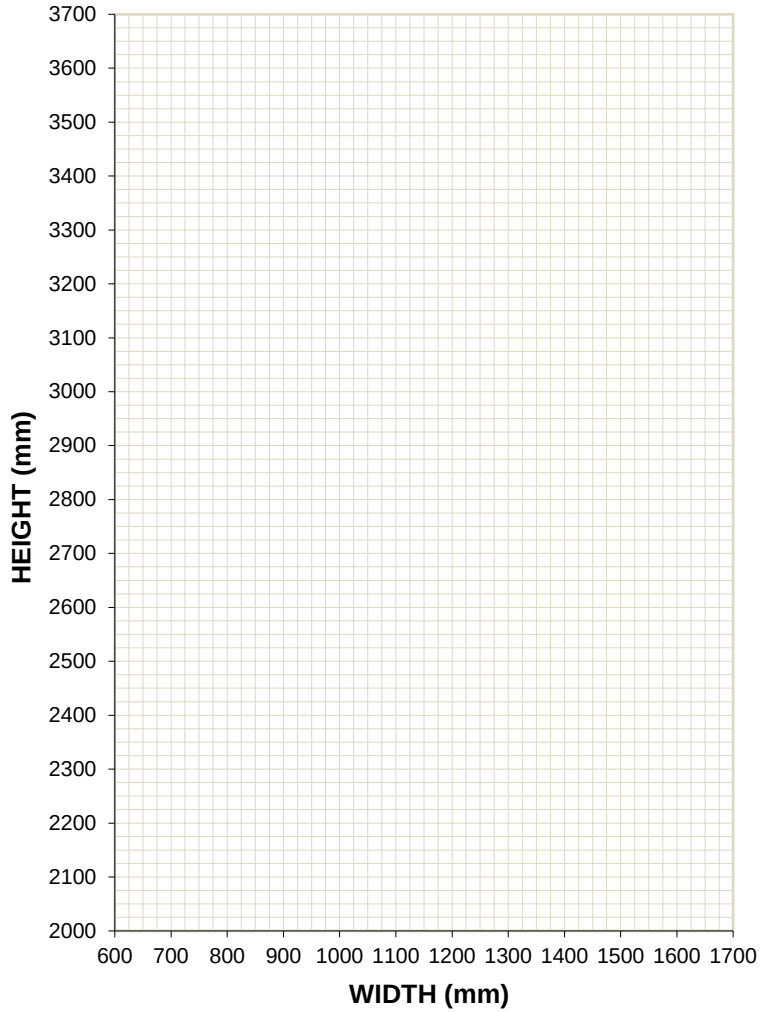
Figure B05	FD90	WSCP Mineral Composite Door	Configuration: DASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

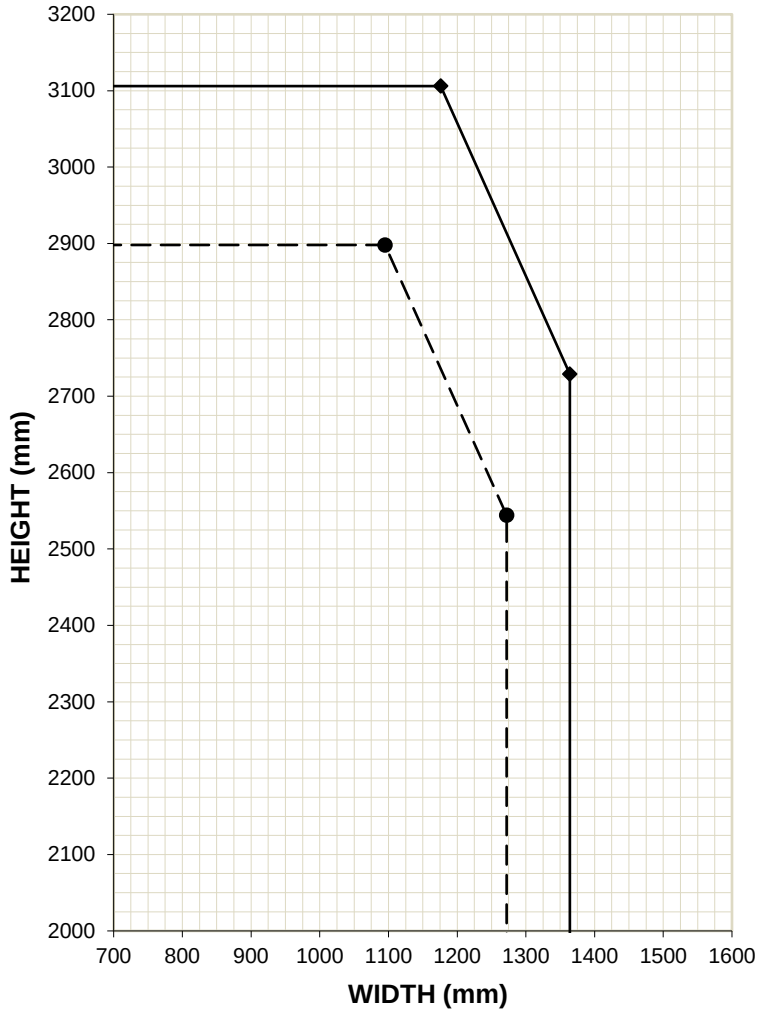
Figure B06	FD90	WSCP Mineral Composite Door	Configuration: DASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

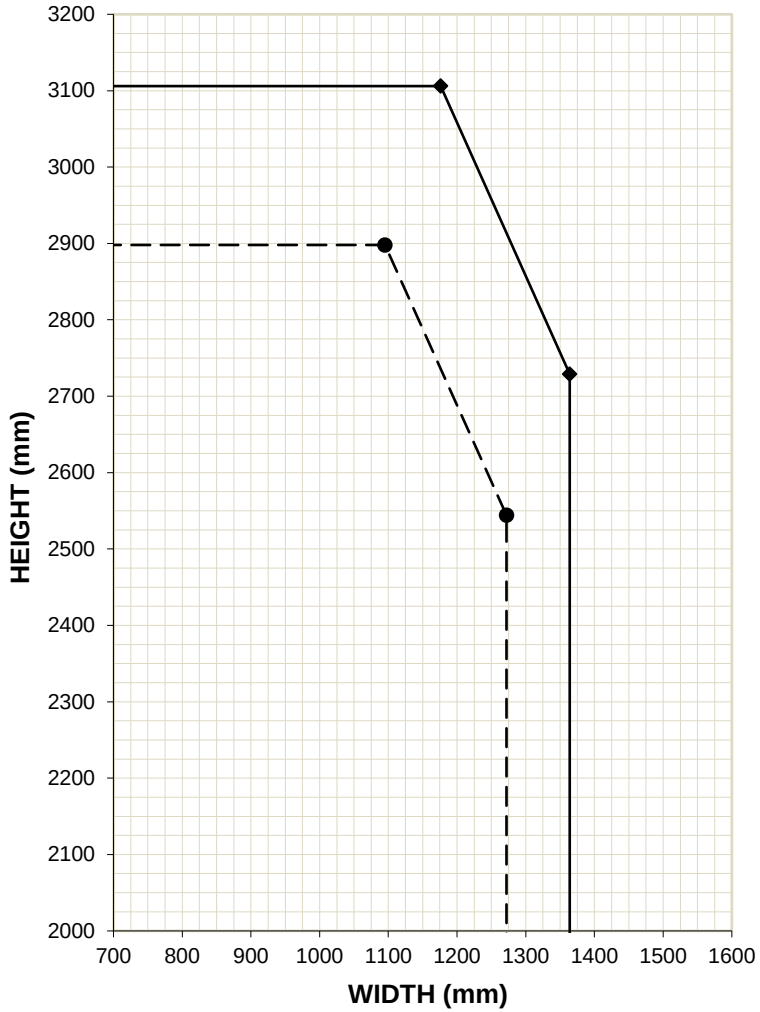
Figure B07	FD90	WSCP Mineral Composite Door	Configuration: LSADD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2544mm	1272mm
		2898mm	1095mm
Composite	————	2729mm	1364mm
		3106mm	1176mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

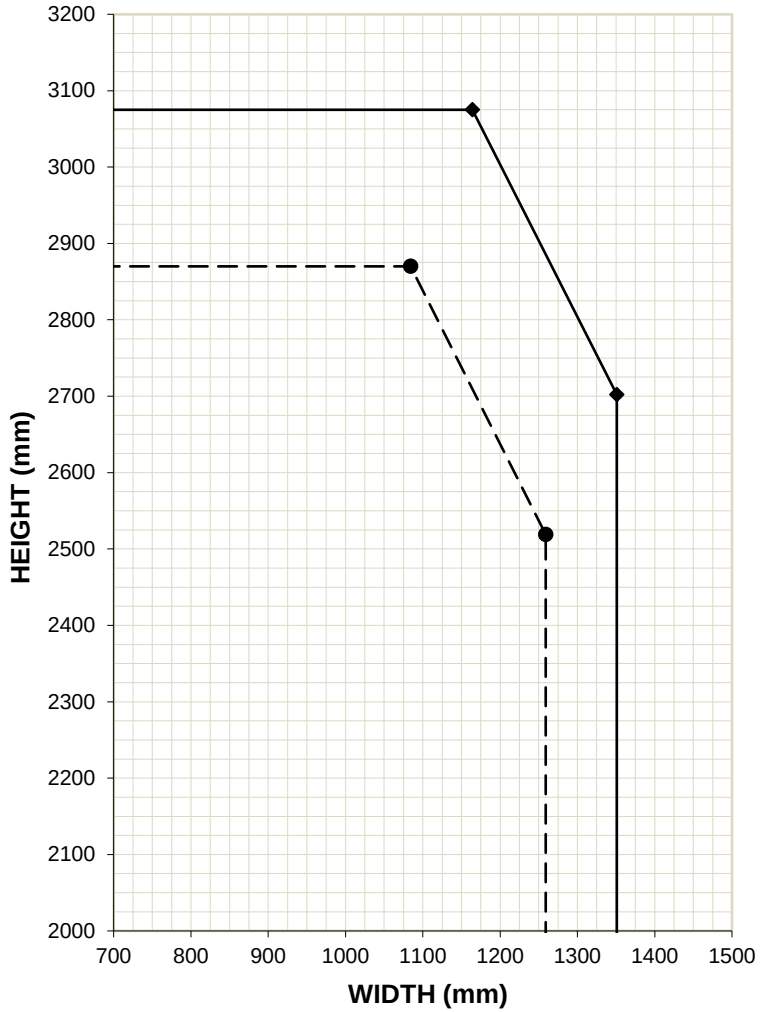
Figure B08	FD90	WSCP Mineral Composite Door	Configuration: LSADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2544mm	1272mm
		2898mm	1095mm
Composite	————	2729mm	1364mm
		3106mm	1176mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

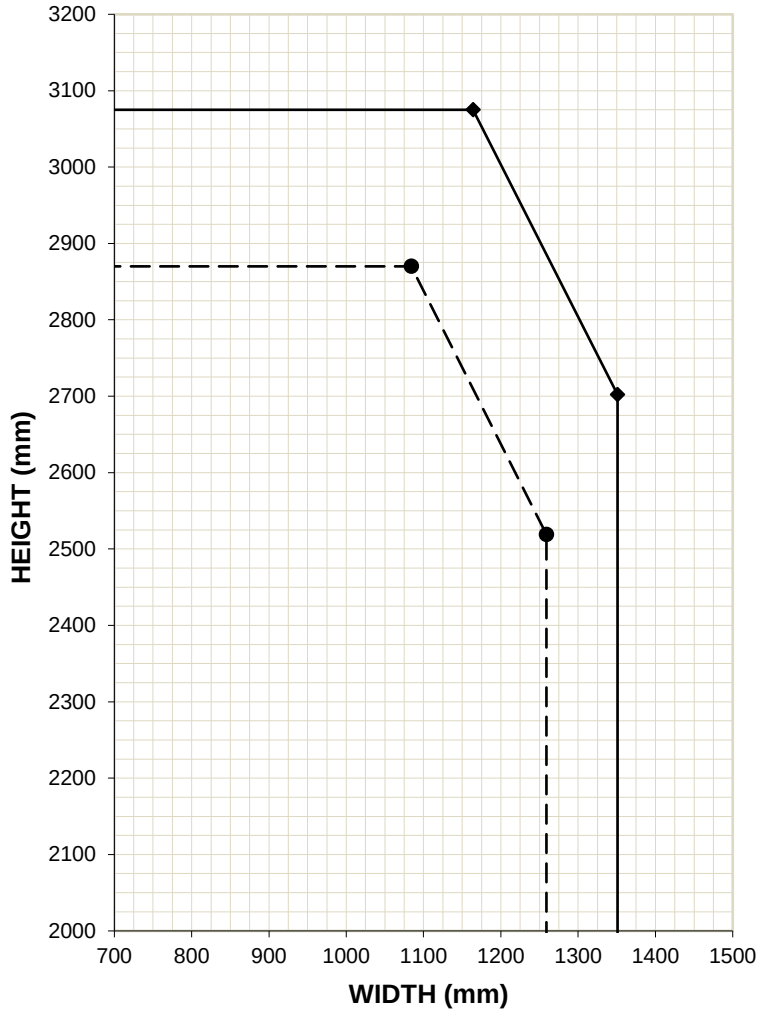
Figure B09	FD90	WSCP Mineral Composite Door	Configuration: ULSADD



Frame Type		Leaf Height	Leaf Width
Timber	----------	2519mm	1259mm
		2870mm	1084mm
Composite	————	2702mm	1351mm
		3075mm	1164mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

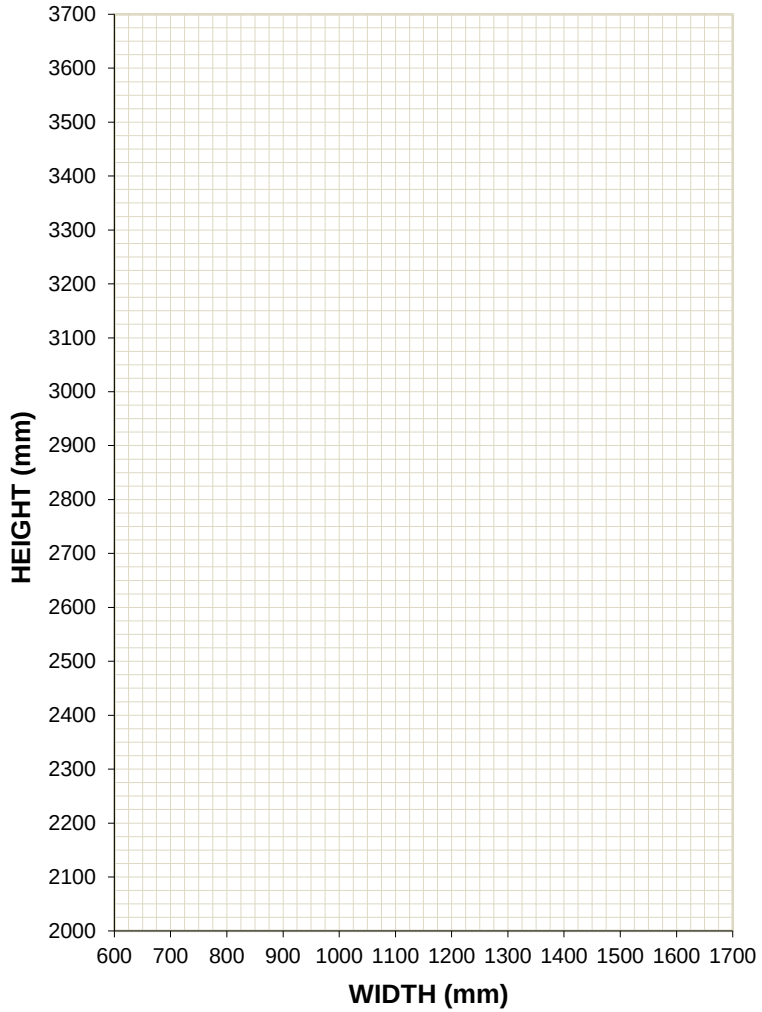
Figure B10	FD90	WSCP Mineral Composite Door	Configuration: ULSADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	2519mm	1259mm
		2870mm	1084mm
Composite	————	2702mm	1351mm
		3075mm	1164mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

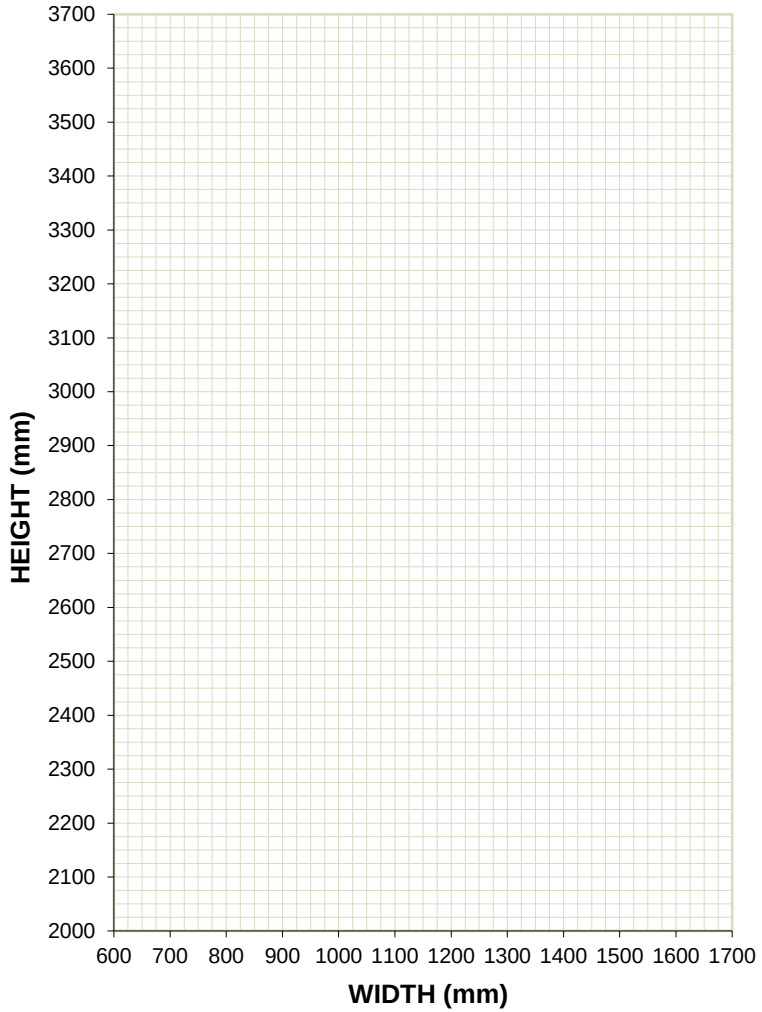
Figure B11	FD90	WSCP Mineral Composite Door	Configuration: DADD



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

Figure B12	FD90	WSCP Mineral Composite Door	Configuration: DADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

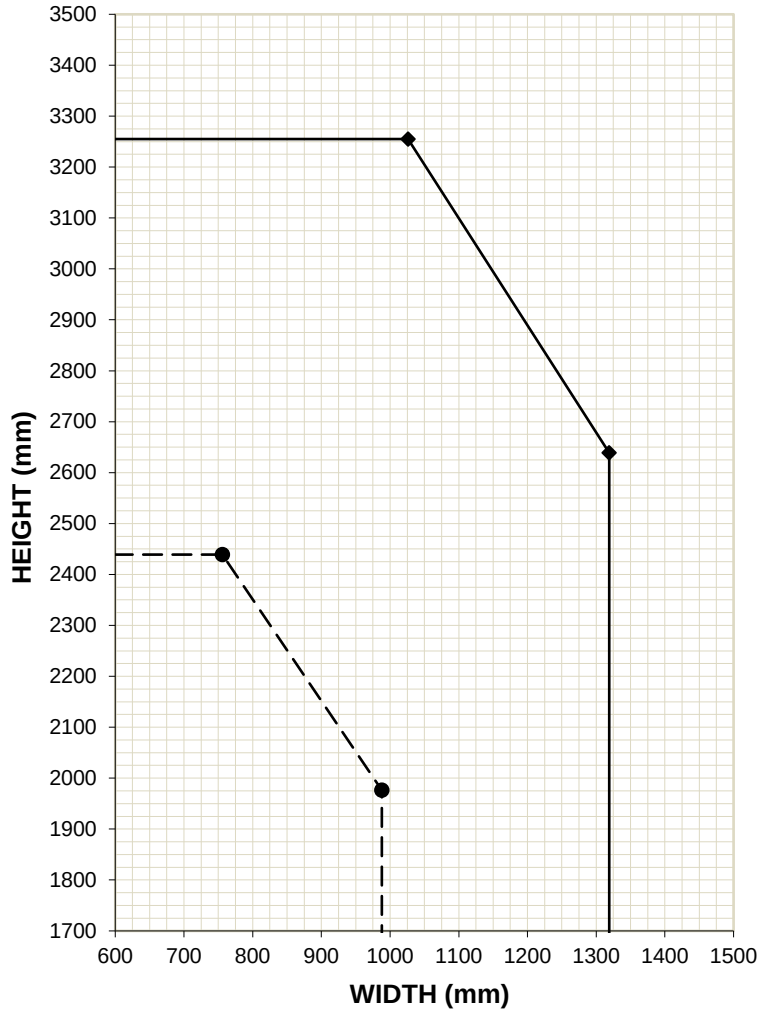
INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

APPENDIX C

Figures IFCA/07019D:C01 to C12

Assessed Leaf Size Envelopes for FD120 WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

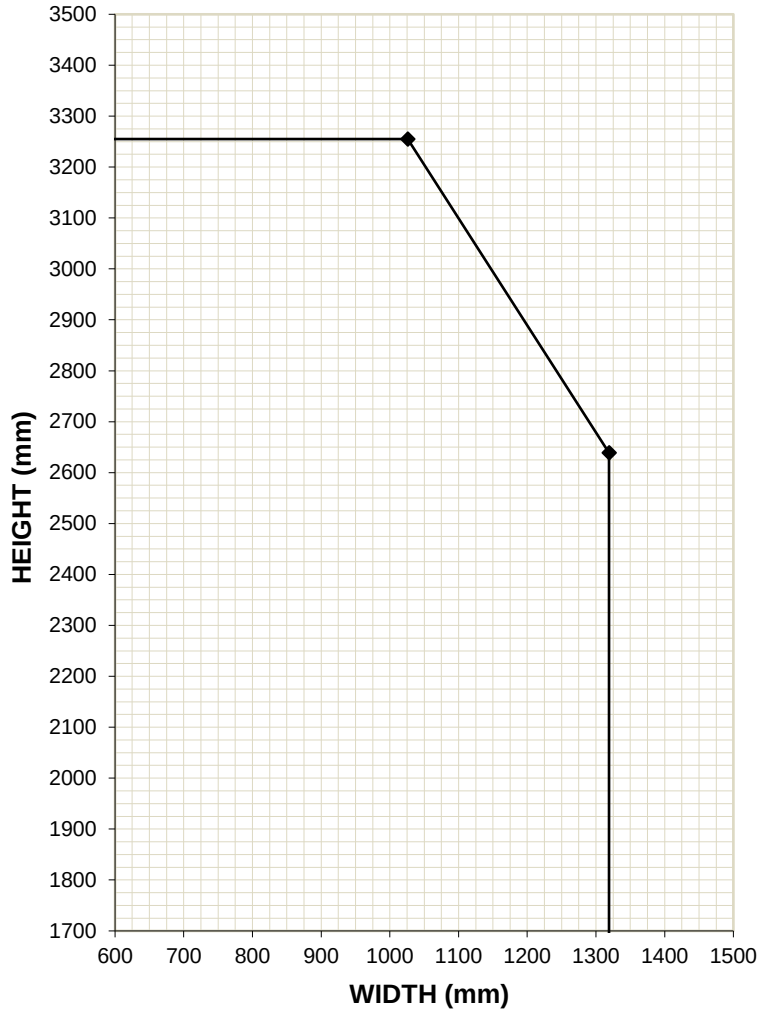
Figure C01	FD120	WSCP Mineral Composite Door	Configuration: LSASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	1976mm	988mm
		2439mm	756mm
Composite	————	2639mm	1319mm
		3255mm	1026mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

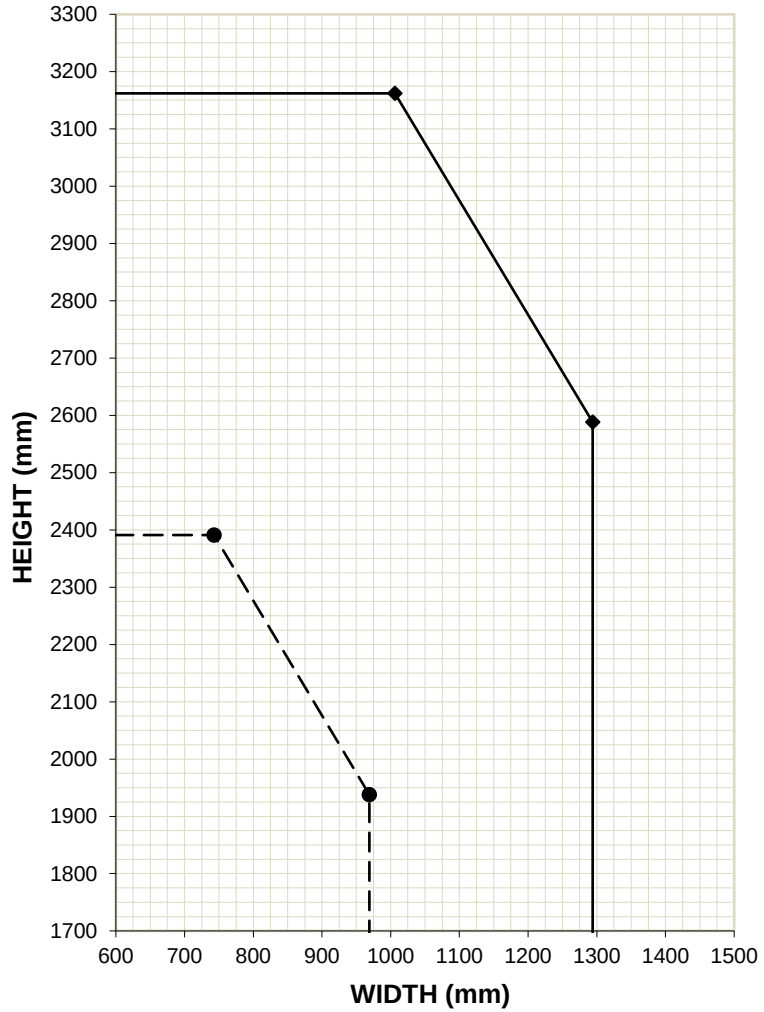
Figure C02	FD120	WSCP Mineral Composite Door	Configuration: LSASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	———	2639mm	1319mm
		3255mm	1026mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

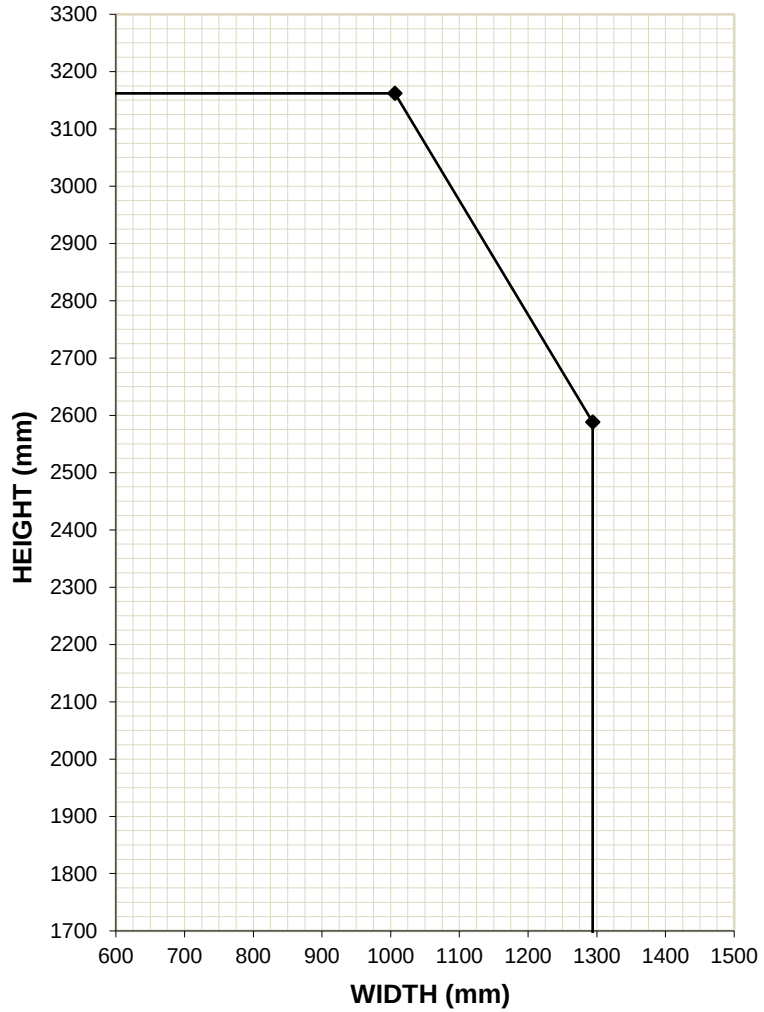
Figure C03	FD120	WSCP Mineral Composite Door	Configuration: ULSASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	1938mm	969mm
		2391mm	743mm
Composite	————	2588mm	1294mm
		3162mm	1006mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

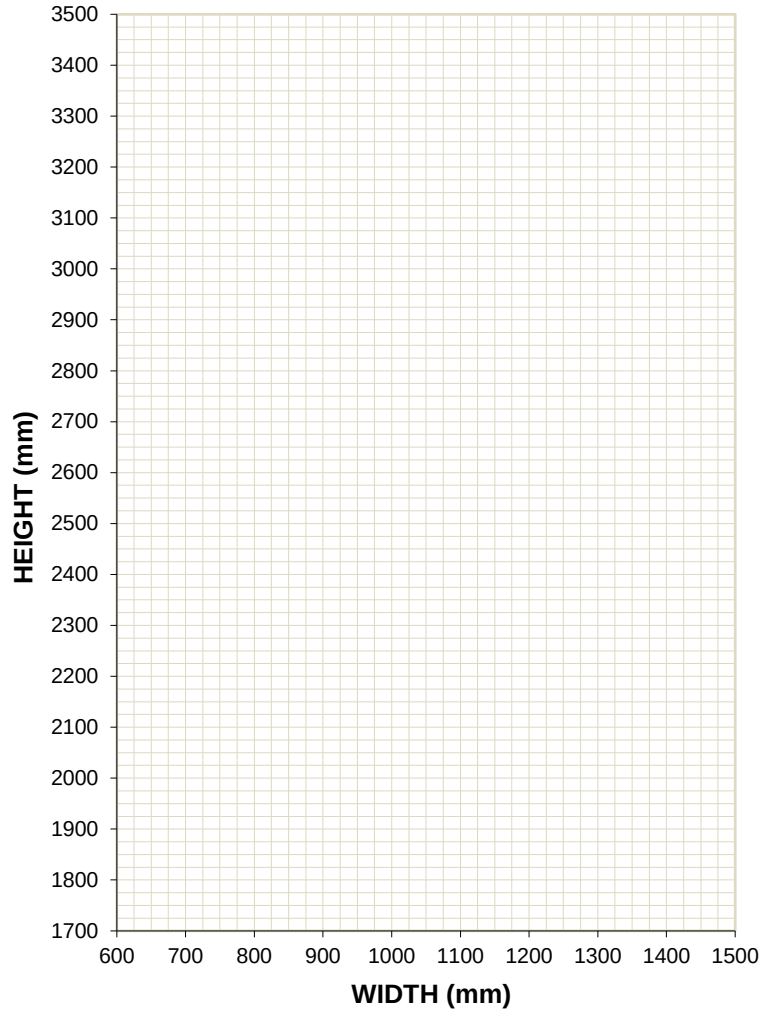
Figure C04	FD120	WSCP Mineral Composite Door	Configuration: ULSASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	———	2588mm	1294mm
		3162mm	1006mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

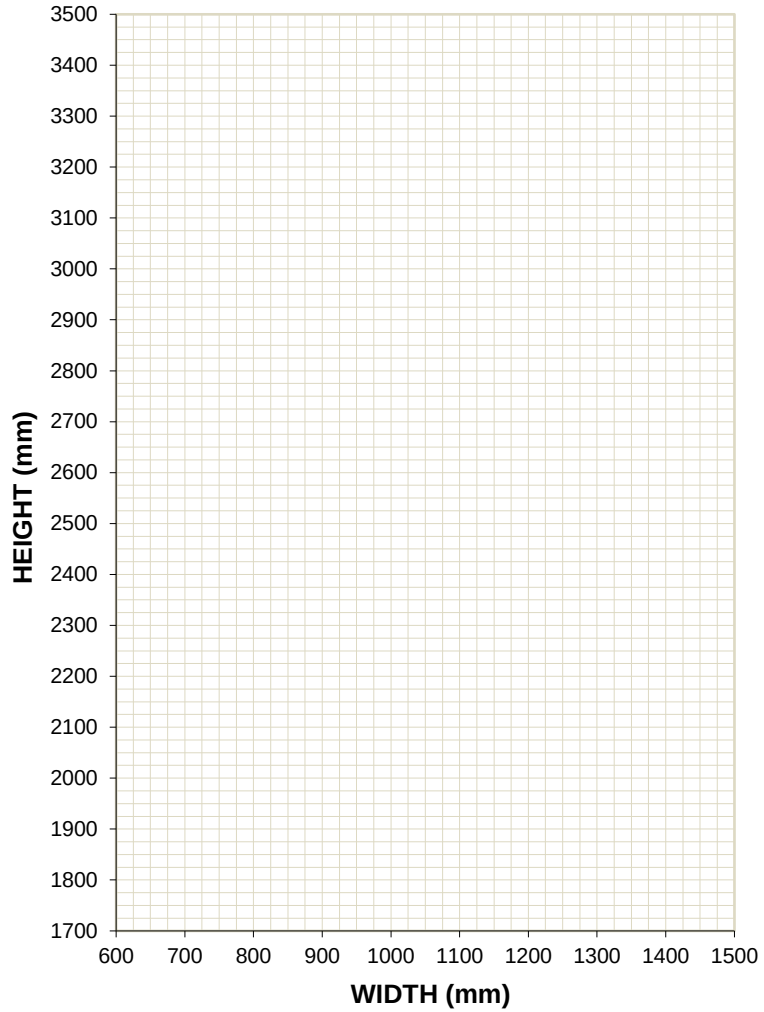
Figure C05	FD120	WSCP Mineral Composite Door	Configuration: DASD



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

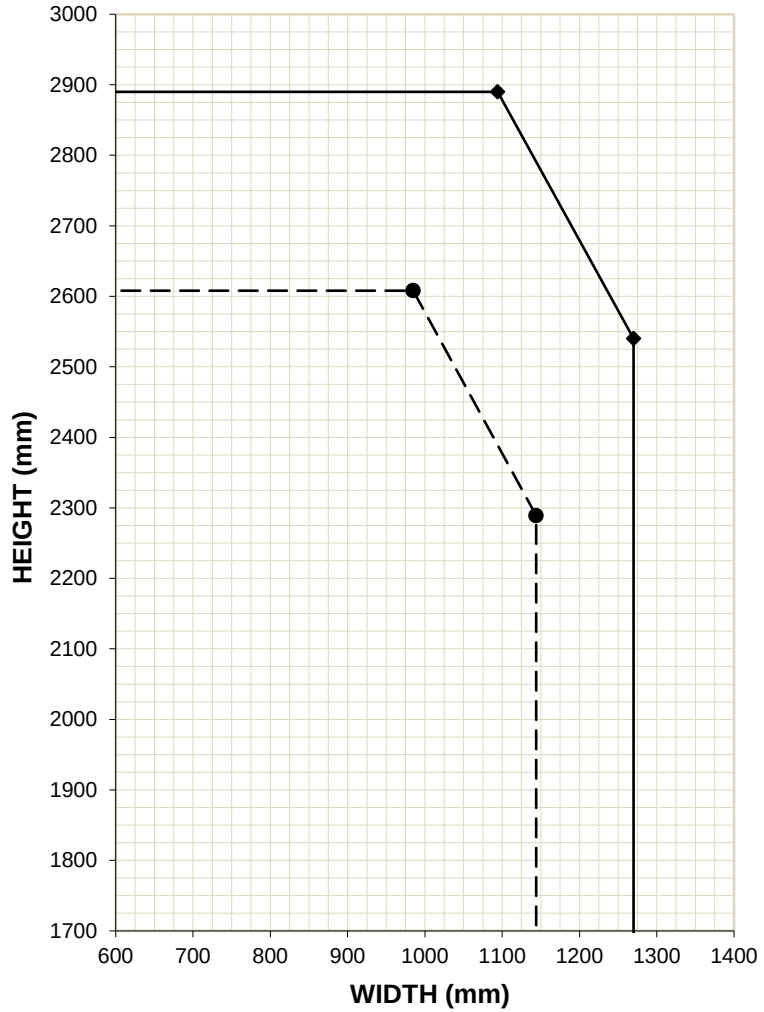
Figure C06	FD120	WSCP Mineral Composite Door	Configuration: DASD + OP



Frame Type		Leaf Height	Leaf Width
Timber	---------	Not Approved	
Composite	———————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

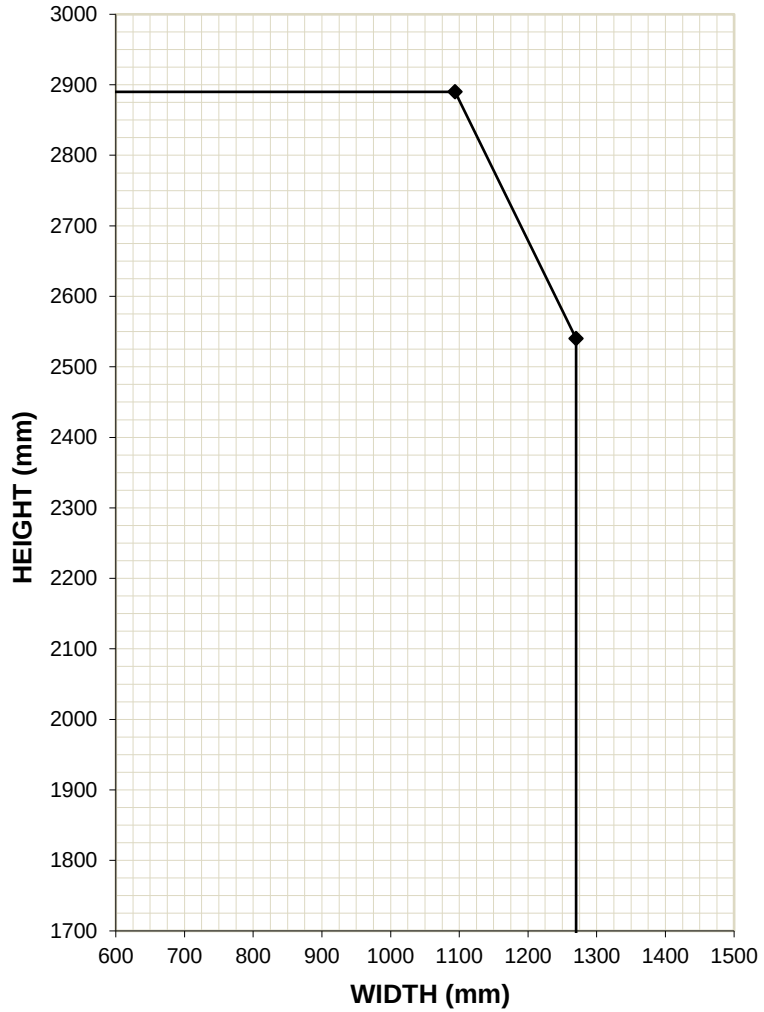
Figure C07	FD120	WSCP Mineral Composite Door	Configuration: LSADD



Frame Type		Leaf Height	Leaf Width
Timber	- - - - - - - -	2289mm	1144mm
		2608mm	985mm
Composite	———	2540mm	1270mm
		2890mm	1094mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

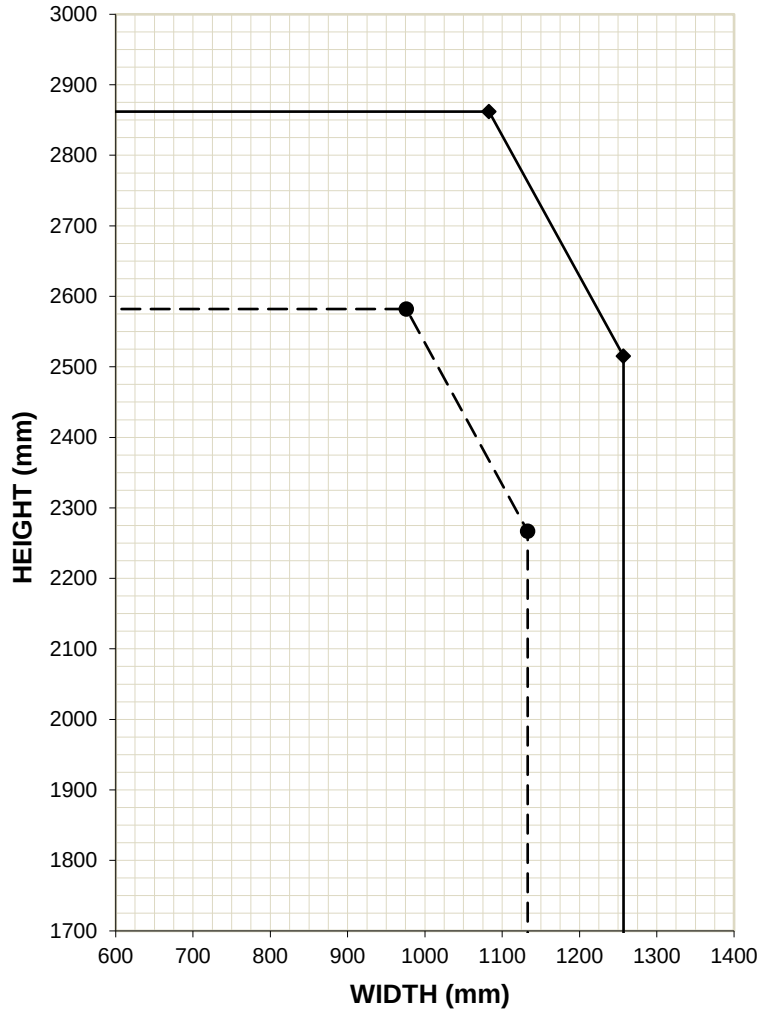
Figure C08	FD120	WSCP Mineral Composite Door	Configuration: LSADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	2540mm	1270mm
		2890mm	1094mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

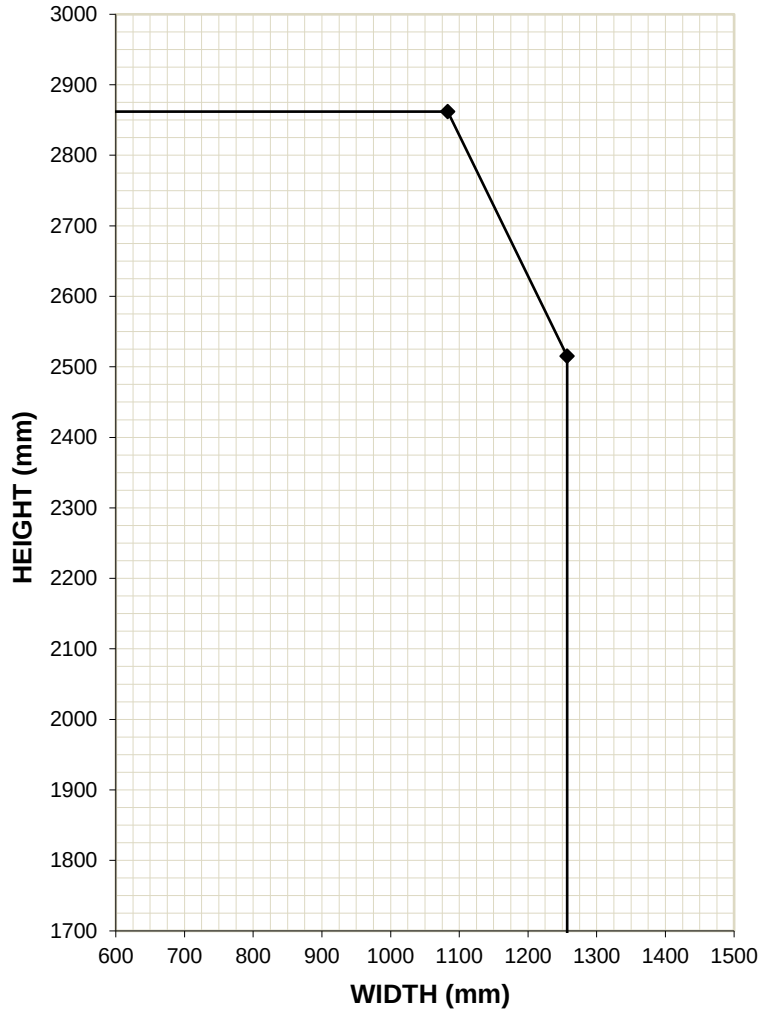
Figure C09	FD120	WSCP Mineral Composite Door	Configuration: ULSADD



Frame Type		Leaf Height	Leaf Width
Timber	- - - - - - - - -	2267mm	1133mm
		2582mm	976mm
Composite	———	2515mm	1257mm
		2862mm	1083mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

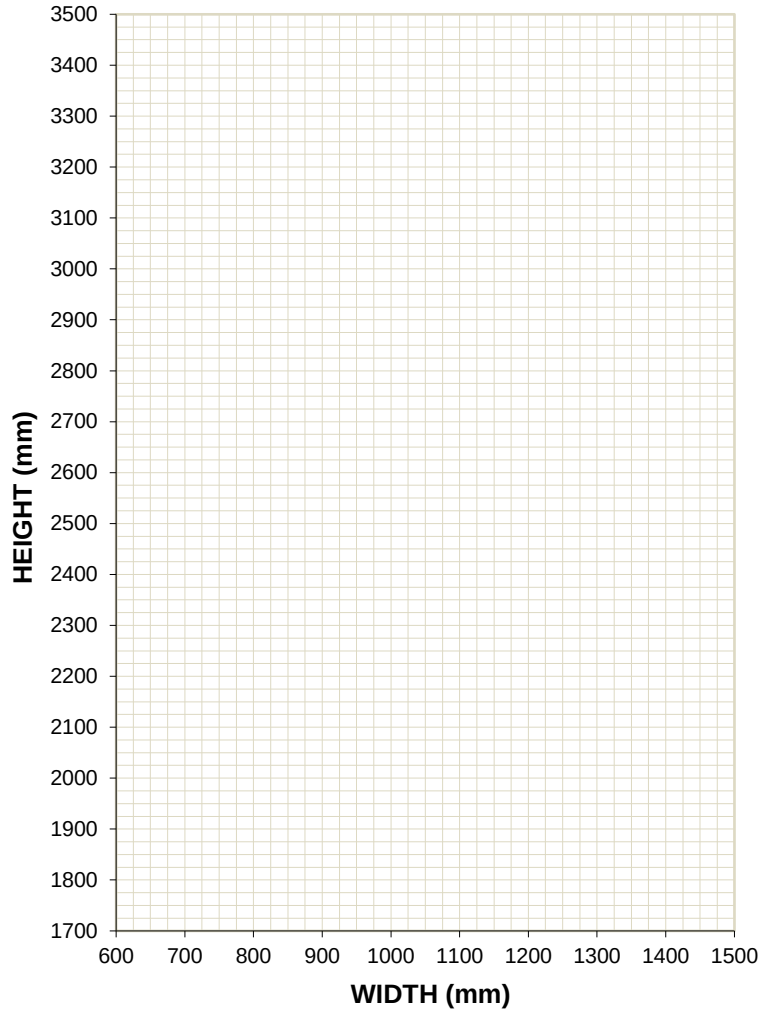
Figure C10	FD120	WSCP Mineral Composite Door	Configuration: ULSADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	----------	Not Approved	
Composite	————	2515mm	1257mm
		2862mm	1083mm

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	JAMBS	1no. 22mm x 4mm WSCP PVC-Seal against the stop set 35mm from the opening face and 1no. seal set 7mm from the opening face (approx. 5mm spacing between seals)
LEAF EDGES	SQUARE MEETINGS STILES	2no. 22mm x 4mm WSCP PVC-Seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1no. seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	BOTTOM OF LEAF	47mm x 1mm WSCP PVC-Seal (uncased graphite)Fitted centrally in a groove in the leaf and over sailing the lippings
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		2no. 22mm x 4mm WSCP PVC-Seals spaced 5mm apart and centrally located within the frame reveal or panel edges

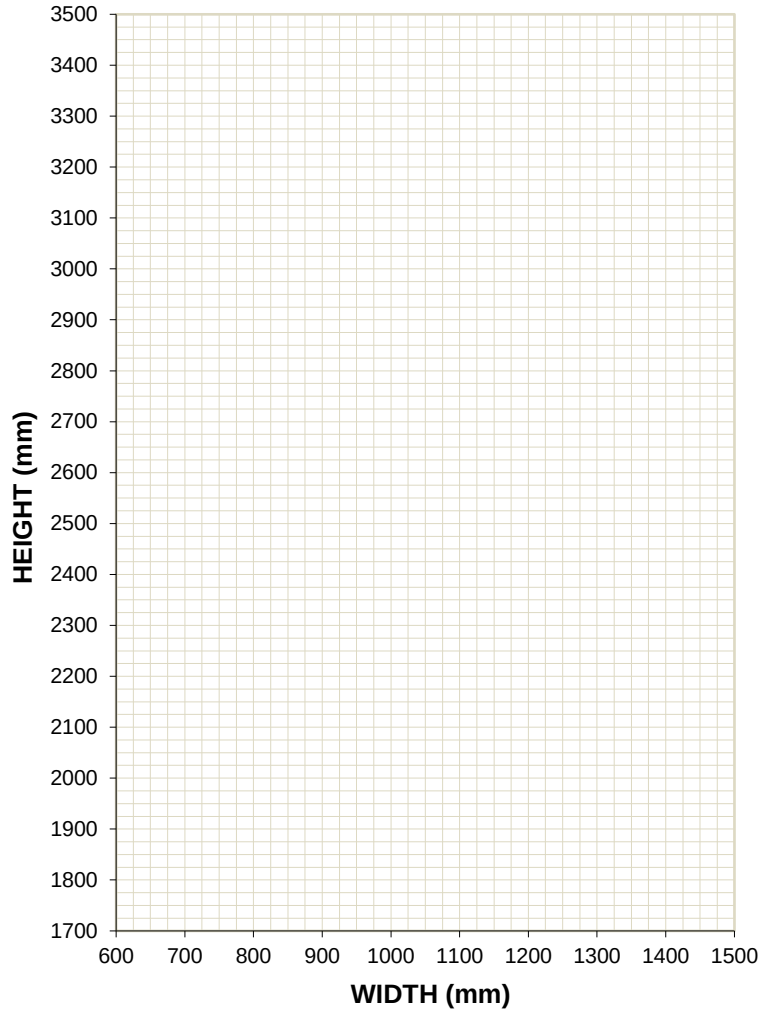
Figure C11	FD120	WSCP Mineral Composite Door	Configuration: DADD



Frame Type		Leaf Height	Leaf Width
Timber	---------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

Figure C12	FD120	WSCP Mineral Composite Door	Configuration: DADD + OP



Frame Type		Leaf Height	Leaf Width
Timber	---------	Not Approved	
Composite	————	Not Approved	

INTUMESCENT SEALS		
LOCATION		SPECIFICATION
FRAME REVEAL	HEAD	N/A
	JAMBS	N/A
LEAF EDGES	SQUARE MEETINGS STILES	N/A
	BOTTOM OF LEAF	N/A
	HEAD & JAMBS	N/A
INTERFACE BETWEEN OVERPANEL AND FRAME/TRANSOM		N/A
INTERFACE BETWEEN SIDE PANEL AND FRAME/MULLION		N/A

APPENDIX D

General Guidance on Installation of Hardware

D.1 Hinges

The following hinges have been tested with the WSCP mineral core design:

- Royde & Tucker Hi Load H105 and H207 lift-off type
- Hoppe UK Ltd Bearing-butt type hinges; Ref: AR8680
- Cooke Brothers Ltd bearing-butt type hinges; Ref 7700

Alternative hinges may be used, subject to compliance with the specifications below.

ELEMENT	SPECIFICATION
HINGE TYPE	Fixed pin, washered butt, ball bearing butt, lift-off type or journal supported hinges may be used.
NUMBER OF HINGES	Minimum: 3no (1½ pairs) per leaf. Leaves > 2200mm high must fit 4no. (2 pairs) per leaf, Leaves > 2800mm high must fit 5no. (2½ pairs) per leaf
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 second hinge must be set 500mm from the top hinge. All other hinges shall be equispaced between the second and bottom hinge. (All positions ±25mm).
FIXINGS	An appropriately sized pilot hole is required prior to fitting screws into composite stiles and frames. Coarsely threaded wood-type 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 shall be similar to hinges tested with the proposed door type.
HINGE BLADE SIZES	2.4–3.5mm thick x 89–110mm high x 30–32mm wide. (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	Steel or Stainless Steel. (Aluminium, Nylon or 'Mazac' are not permitted). No combustible or thermally softening material to be included.
ADDITIONAL PROTECTION	All hinge blades must be bedded on a minimum 2mm thick low-pressure forming intumescent material e.g. Interdens or Therm-A-Strip.

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.

D.2 Mortice latches/locks

The following locks and latches have been tested with the WSCP mineral core design:

- Lever Legge lock/latch
- Dorma 752F sash lock & Dale NP30/10/30 double cylinder 7200 (SD)
- Dale 97170 tubular mortice latch
- Hoppe UK Ltd mortice sashlock Ref: AR910 (SD)
- Hoppe UK Ltd stainless steel eurocylinder Ref: E42S (SD)
- Hoppe UK Ltd lock escutcheon plate Ref: AR361/27 (SD)
- Zoo Architectural Hardware Ltd steel latch, Ref: ZDL CE1121 (DD)

Alternative mortice locks/latches may be used, subject to compliance with the specifications below.

ELEMENT	SPECIFICATION	
LATCH/LOCK TYPE	Mortice latches, tubular mortice latches, sashlocks and deadlocks	
MAXIMUM DIMENSIONS	FOREND PLATE:	235mm long x 24mm wide
	LATCH BODY:	18mm thick
	STRIKEPLATE:	180mm long x 24mm 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.	
LOCATION	Where mortice latches or locks are fitted, they shall be centred at 1000mm (± 200mm), above the bottom of the door leaf.	
ADDITIONAL PROTECTION	The latch forend and keep must be bedded on minimum of 2mm thick graphite based intumescent material for all periods of fire resistance e.g. WSCP Flex-seal.	

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.

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 they are normally kept locked shut and labelled as such with an appropriate sign which complies with the BS 5499 series of standards.

It is essential that all closers 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.

Surface Mounted Closers

A variety of surface mounted closers has been successfully tested with the WSCP mineral core door assemblies.

- Dorma TS83V overhead closer
- Briton 2003SES overhead closer

Other closers may be used, subject to compliance with the specifications below.

Surface mounted overhead door closers (and accessories such as soffit brackets) may be used if they have been tested, assessed, or otherwise approved for use on unlatched, cellulosic or mineral core door leaves. 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. Additionally, the fixing position and type must be similar to the closers tested with the WSCP Mineral core design, as listed above, to ensure they remain secure and do not increase the potential for damage and delamination of the outer face.

Concealed Closers

One type of concealed overhead closer has been considered for inclusion in WSCP mineral core door assemblies, which is the Hoppe UK Ltd concealed overhead closer Ref: AR7883. The closer may be used in timber and Tectonite door frames for up to 120 minutes of fire resistance when the slide arm body and closer body are fully encased in 2mm thick Interdens from Lorient Polyproducts Ltd or Dufaylite Developments Ltd. No other type of concealed (head or jamb mounted) closer is permitted for use with this door design unless subjected to fire resistance testing in the WSCP mineral core door design and/or assessed for inclusion within this assessment by International Fire Consultants.

D.4 Bolts

One of the tests referenced in this report included a double leaf door assembly fitted with flush bolts. Additional testing has demonstrated that bolts are not necessary for the doors to achieve up to 120 minutes of fire resistance (subject to an appropriate self-closing device being fitted).

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

- Maximum size of flush bolt is 204mm long x 20mm wide and 20mm deep;
- The head of the leaf and/or frame should contain a minimum 10mm width of intumescent material on either side of the bolt/keep plate;
- The mortise shall be lined with a 1mm thick graphite intumescent sheet;
- Edge fixed bolts shall be positioned centrally in the leaf thickness (the intumescent seals defined in Appendices A, B and C, are fitted in the active and inactive lead. The flush bolt interrupts the seal in the meeting edge of the inactive leaf by approximately 50%);
- There should be a minimum 10mm width of intumescent seal in the door edge, past the body of the bolt. The intumescent seal in the active leaf is uninterrupted;
- Face fixed flush bolts shall be fixed so that there is a minimum of 50mm between the bolt and the door edge, and any aperture;
- 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 a thread for the full screw length.

D.5 Non-Essential Hardware Items

D.5.1 Push plates, kick plates etc

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.

D.5.2 Pull handles

These may be fixed to the face of doors, 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, and fixings passing through the leaf shall be steel. The hole for any through fixings shall be lined with a 'sleeve' of 1mm thick Interdens. Handles/fixings shall be at least 40mm away from the door edge and any aperture.

D.5.3 Intumescent air transfer grilles

These must be tested, assessed or otherwise approved for use with 54mm thick (or less) composite mineral doors with up to 120 minutes fire resistance, as appropriate. 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 3.6, 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 glazed apertures given in Section 3.6. Positioning above floor level will depend upon the test evidence for the intumescent grille

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

APPENDIX E

Summary of Primary Fire Test Evidence

TEST LABORATORY AND REPORT NO	TEST DATE	CONFIGURATION TESTED	DOOR FRAME	LEAF SIZE TEST	TEST STANDARD	INTEGRITY	ASSESSED ITEMS
Chiltern International Fire Chilt/RF03070	01.07.2003	ULSADD	Composite	2100mm x 900mm + 900mm x 55mm	BS 476: Part 22: 1987	122 minutes	• Lock - 154x22 lock forend • Hinges – 100x30
Cambridge Fire Research CFR 1103111	11.03.2011	ULSADD	Timber (860-879kg/m^3)	2292mm x 1068mm + 1068mm x 57mm	BS 476: Part 22: 1987	151 minutes	• Hinges – R&T H105 98x22 • ISL intumescent seals
Cambridge Fire Research CFR 1009081	08.09.2010	LSADD	Composite	2236mm x 1036mm + 1037mm x 57mm	BS 476: Part 22: 1987	131 minutes	• Barrel bolt(unex face) – 76 x 25 • ISL intumescent seals
Cambridge Fire Research CFR 1007081	08.07.2010	LSASD	Timber (680kg/m^3)	2341mm x 1075mm x 57mm	BS 476: Part 22: 1987	105 minutes	• Lock - 235x20 lock forend
		LSASD	Timber (680kg/m^3)	2340mm x 1075mm x 57mm		91 minutes	
Cambridge Fire Research CFR 1007071	07.07.2010	LSADD	Timber (680kg/m^3)	2265mm x 1050mm x 57mm	BS 476: Part 22: 1987	115 minutes	• Barrel bolt(unex face) – 76 x 25

Summary of Secondary Fire Test Evidence

TEST LABORATORY AND REPORT NO	TEST DATE	CONFIGURATION TESTED	DOOR FRAME	LEAF SIZE TEST	TEST STANDARD	INTEGRITY	ASSESSED ITEMS
Intertek Testing Services WHI 495 PSV 1553	03.04.2002	Indicative specimen	16 gauge hollow metal frame	1050mm x 900mm x 44mm	UBC Standard 7-2 indicative	90 minutes	• Multi-piece stiles and rails
Warrington Fire Research Centre WF63295	21.03.1995	ULSADD	Gypsum based with hardwood lippings	2040mm x 826mm + 826mm x 44mm	BS 476: Part 22: 1987	149 minutes	• Lorient Glazing
IF12047 Revision A	30.05.2012	ULSASD Sample	N/A	1040mm x 996mm x 58mm	Generally in accordance with BS 476: Part 22: 1987	151 minutes	• Norsound Universal 90 and 6mm Schott Pyran S
Chiltern International Fire RF12178	09.02.2013	ULSASD	Timber (640kg/m^3)	2036mm x 916mm x 57mm	BS EN 1634-1 & BS EN 1363-1	121 minutes	
		ULSASD	Composite	2036mm x 918mm x 57mm		148 minutes	• Arrone hardware including timber door frames
Cambridge Fire Research CFR1504141	14.04.2015	ULSASD	Composite	2284mm x 1068mm x 58mm	Generally in accordance with BS EN 1634-1	117 minutes	• Therm-A-Glaze steel glazing cassette with Pyrostop 30-20

Cambridge Fire Research CFR 1410311	31.10.2014	ULSADD	Composite	2289mm x 1068mm + 1069mm x 58mm	BS EN 1634-1	200 minutes	• Hinge – ws 100x35 • Flushbolt – 204x(20)x20 • Intu – WSCP seals • Large leaf sizes with hardwood/tectonite door frame
Cambridge Fire Research CFR 1806192_1	19.06.2018	Fixed panel	N/A	2038mm x 527mm x 55mm	Principles of BS 476: Part 22: 1987	132 minutes	• Glazing system option 4
Chiltern International Fire Chilt/IF13013	05.03.2013	Fixed Panel	Timber (1000kg/m^3)	1039mm x 994mm x 57mm	Principles of BS 476: Part 22: 1987	125 minutes	• Glazing system option 5

LSASD = Latched, Single Acting Single leaf Door assembly

ULSASD = Unlatched, Single Acting. Single leaf Door assembly

ULSADD = Unlatched, Single Acting, Double leaf Door assembly

ULSADD.OP = Unlatched, Single Acting, Double leaf Door assembly with Overpanel

Some of the test evidence referenced in this Engineering Assessment Report is more than 5 years old. In accordance with industry practice, IFC have reviewed this test evidence, and have concluded that the evidence is still valid, and suitable to form the basis of this approval.

Some of the test evidence is not owned by Falcon Panel Products; but IFC have written permission from the test sponsor, to use the evidence in support of this assessment.

Note: *Where appropriate, fire test evidence from glass, hardware, and intumescent seal manufacturers has also been considered when preparing this Field of Application Report.*