

IFC FIELD OF APPLICATION REPORT

PAR/21569/01 Revision A

Prepared For:	Moralt AG
Product/System:	Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 Door Blanks
Assessed Performance:	30 and 60 Minutes Fire Resistance
Fire Resistance Standard:	BS476: Part 22: 1987

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ISSUE AND AMENDMENT RECORD

Revision	Date	Author	Reviewer	Section	Amendments
Final	March 2022	CPH	DC	-	-
Rev A	March 2022	CPH	DC	All	Inclusion of the Firesound 54 door design

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1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Moralt AG, to define the Field of Application for the Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door blanks for 30 and 60 minutes fire resistance, comprising timber door leaves installed in timber frames, that are required to provide 30 or 60 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 the 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 door assemblies, without reducing their potential to achieve a 30 or 60 minute integrity rating, as applicable, if tested in accordance with the method and criteria of BS476: Part 22: 1987.

The omission of information on any components or manufacturing methods does not imply a lack of approval of those details, but these would need to be the subject of a separate analysis. Only variations specifically mentioned are supported by this assessment document, all other aspects must otherwise be as proven in tests summarised herein.

It is more onerous to test timber door assemblies, hinged or pivoted, with the specimen installed with the leaf opening in towards the furnace. Testing in this orientation is therefore incorporated into Field of Application Reports to cover doors opening in the opposite direction. The principle is only applicable when the door construction, and any features within the door leaf, such as glazing, are symmetrical.

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.

3. SCOPE OF APPROVAL

3.1 Door Assembly Configurations

General Requirements/Notes
<ul style="list-style-type: none"> The table below provides an overview of the approved door assembly configurations when using a typical Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door assembly installed within a timber door frame. The approved leaf configurations may be further restricted when specific design details and/or hardware items are included. Figures A01 to A02, B01 to B05 and C01 to C05 in Appendices A, B and C, outline the full scope of door assembly configurations approved by this report. Flush overpanels are permitted with corresponding leaf sizes outlined for that particular configuration. Optional transomed overpanels are permitted for the single acting door assembly configurations approved.

Configuration		Fire Resistance			
Description	Code	FD30	FD60	Firesound 54, Firesound Plus 54	Firesound 59
Latched, Single Acting, Single Leaf	LSASD	✓	✓	✓	✓
Unlatched, Single Acting, Single Leaf	ULSASD	✓	✓	✓	✓
Double Acting, Single Leaf	DASD	✓	✓	✗	✓
Latched, Single Acting, Single Leaf With Flush Overpanel	LSASD+OP	✓	✓	✓	✓
Unlatched, Single Acting, Single Leaf With Flush Overpanel	ULSASD+OP	✓	✓	✓	✓
Latched, Single Acting, Double Leaf	LSADD	✓	✓	✓	✓
Unlatched, Single Acting, Double Leaf	ULSADD	✓	✓	✓	✓
Double Acting, Double Leaf	DADD	✗	✗	✗	✗
Latched, Single Acting, Double Leaf With Flush Overpanel	LSADD+OP	✓	✓	✓	✓
Unlatched, Single Acting, Double Leaf With Flush Overpanel	ULSADD+OP	✓	✓	✓	✓

3.2 Maximum Assessable Door Leaf Sizes

This Field of Application Report is based on fire resistance tests conducted on the Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door designs, which have been analysed using the empirically derived, non-construction specific methodologies which form the basis of IFC’s analysis. These methodologies allow the data obtained from the fire test evidence to be evaluated to determine permissible door leaf sizes, without any additional enhancements.

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.

Double door assemblies may each be of the same width, up to the maximum width indicated in Appendices A, B and C. For 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). The width of the small leaf shall not be less than 300mm, since this will affect its vertical stability relative to that of the larger leaf.

4. MORALT FIRESOUND 54, MORALT FIRESOUND PLUS 54 AND MORALT FIRESOUND 59 CONSTRUCTIONAL DETAILS

Constructional specifications for the Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door types can be found in the tables below.

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

4.1 Leaf Construction

4.1.1 Leaf Thickness

Minimum Leaf Thickness	
Moralt Firesound 54 and Moralt Firesound Plus 54	Moralt Firesound 59
54 (-0/+2)mm	59 (-1/+2)mm

Additional Requirements/Notes
The dimensions above exclude the thickness of the decorative leaf facings detailed in Section 4.3

4.1.2 Leaf Core Material

Core details held on confidential file by IFC

4.2 Door Lippings

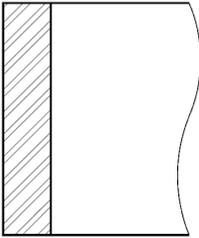
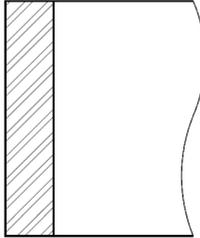
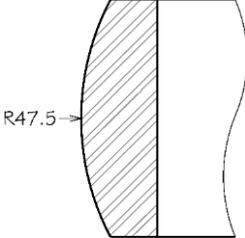
4.2.1 General

Fire Rating	Material	Minimum Density	Minimum Thickness	Profile	Lipping Adhesive
FD30	Softwood ^{Note 1} or Hardwood	470kg/m ³	Refer to Section 4.2.2	Refer to Section 4.2.2	<ul style="list-style-type: none"> • Urea formaldehyde • Phenol formaldehyde • Polyurethane
FD60	Hardwood	640kg/m ³	Refer to Section 4.2.2	Refer to Section 4.2.2	<ul style="list-style-type: none"> • Urea formaldehyde • Phenol formaldehyde • Polyurethane

^{Note 1} Softwood lippings may only be used for the leaf sizes and door configurations outlined in Appendix A.

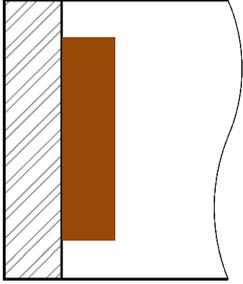
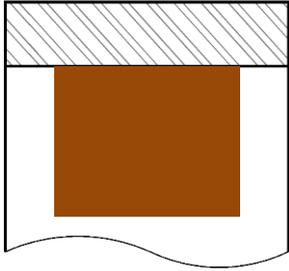
Additional Requirements/Notes
<ul style="list-style-type: none"> • Lippings must be installed to the top and both vertical leaf edges but are optional on the bottom leaf edge • Lippings must be applied to the bottom edge of flush overpanels but are optional on the top and vertical edges • Lippings are optional on all edges of transomed overpanels • Installed lippings may be reduced in thickness for site installation purposes, provided the minimum lipping thickness detailed in Section 4.2.2 is maintained • Timber inserts behind the lippings are required in Moralt Firesound 59 doors for 30 and 60 minutes in specific circumstances (See Section 4.2.3)

4.2.2 Lipping Thicknesses and Edge Profiles

Lipping Profile 1		Lipping Profile 2	
			
Edge Profile			
Square	Square	Radius	
Lipping Location			
Door leaf and overpanel edges (See Section 4.2.1)	Hanging leaf edges (See Section 4.2.1)	Hanging edge of double acting doors (See Section 4.2.1)	
Lipping Thickness			
4-10mm	4-19mm	10-19mm	
Additional Requirements/Notes			
<ul style="list-style-type: none"> • The exposed corners of the lipping may incorporate up to a 3mm radiused rounding if required • When fitting a concealed closer, the leaf head lipping may incorporate a 12mm deep x 5mm high rebate at the interface with a 12mm deep x 13.5mm high rebate in the door stop fitted to the frame head 			

4.2.3 Hardwood Timber Inserts

Hardwood timber inserts are required for Moralt Firesound 59 doors when used in a double acting configuration (it is not permitted to use Moralt Firesound 54 or Moralt Firesound Plus 54 in a double acting configuration) or when fitting concealed hinges or a concealed closer in either Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door designs. However, hardwood inserts, up to 10mm thick, may also be fitted to any leaf edge, if preferred, even when not used in conjunction with the ironmongery stated above.

Vertical and Horizontal leaf Edges	Horizontal Leaf Edges (Moralt Firesound 59 + floor spring)
	
Insert Size	
27-41mm wide x 8-10mm thick	41mm wide x 45mm thick
Insert Material	
Hardwood (minimum density 640kg/m ³)	
Adhesive	
Polyurethane or Urea formaldehyde	
Additional Requirements/Notes	
<ul style="list-style-type: none"> • Inserts may be combined with the lipping to form a 'T-shaped' lipping • If a cableway is to be incorporated within the Moralt Firesound 59 door leaf, without a dropseal, then a minimum 8mm thick timber insert must be used to cover the 12mm deep x 10mm wide cableway and a further lipping applied as per 'Lipping Profile 1' in Section 4.2.2. (See also Section D.5 in Appendix D). 	

4.3 Decorative Leaf Facings

Component/Area	Material	Maximum Thickness
Leaf faces only (These are in addition to the 54mm or 59mm leaf thickness, as applicable)	Timber Veneer	2mm
	High Pressure Laminate	2mm
	PVC Laminates (e.g. Acrovyn)	2mm
	Paper	1mm
	Decorative Foil	0.5mm

Additional Requirements/Notes
<ul style="list-style-type: none"> • Decorative facing materials must not extend onto the leaf edges • Decorative facing materials must not be applied to, or oversail, the glazing beads • With the exception of push/kick plates (Appendix D), metallic facings are not permitted

4.4 Decorative Leaf Finishes

Component/Area	Material	Maximum Thickness
Leaf faces, leaf edges and glazing beads	Paint	0.5mm, or a maximum of 5 coats, whichever is greater
	Lacquer	
	Varnish	

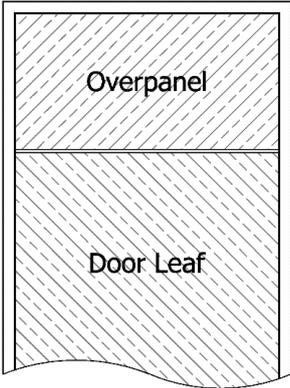
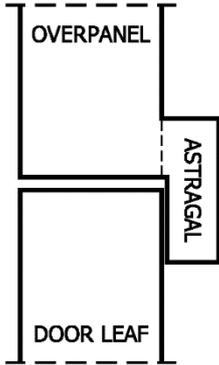
4.5 Overpanels

4.5.1 Overpanel Size, Configuration and Specification

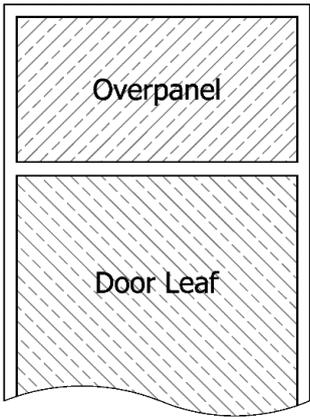
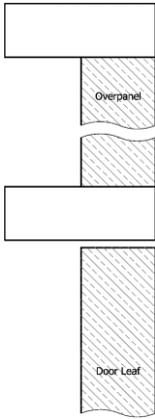
General Requirements/Notes
<ul style="list-style-type: none"> Overpanels must be of the same construction as the door leaf (refer to Section 4.1) Flush overpanels must always be on the same plane as the door leaf/leaves below Flush overpanels must have a square junction with the overpanel Only single acting doors may be fitted with a 'flush' overpanel. If double acting doors require an overpanel, a transom member must be used between the overpanel and leaf head (see Section 4.5.3) Only transomed overpanels in single acting door configurations may be offset from the plane of the door leaf

Maximum Overpanel Size	
Single Door Assemblies	Double Door Assemblies
2000mm high	1500mm high

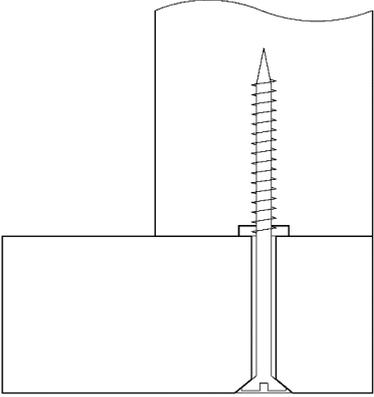
4.5.2 Flush Overpanels

Frame Material Options		Approved Leaf Configurations
FD30	Softwood or Hardwood (minimum density 470kg/m ³)	<ul style="list-style-type: none"> • Single or double leaves • Single acting doors only • Overpanel/leaf interface must have an astragal covering the joint, minimum 45mm x 16mm, of the same material specification as for the frame material, either screw/pin fixed or adhered to the bottom edge of the overpanel
FD60	Hardwood (minimum density 640kg/m ³)	
		

4.5.3 Transomed Overpanels

Transom Material Options		Approved Leaf Configurations
FD30	Softwood or Hardwood (minimum density 470kg/m ³)	<ul style="list-style-type: none"> • Single or double leaves • Single and double acting doors • Single and double acting doors must have the overpanel fitted in the same plane as the leaves below the transom
FD60	Hardwood (minimum density 640kg/m ³)	
Minimum Transom Size		Transom Joint
Single Acting	70mm wide x 32mm thick	Mortice and tenon or trench joint
Double Acting	70mm wide x 45mm thick	
		

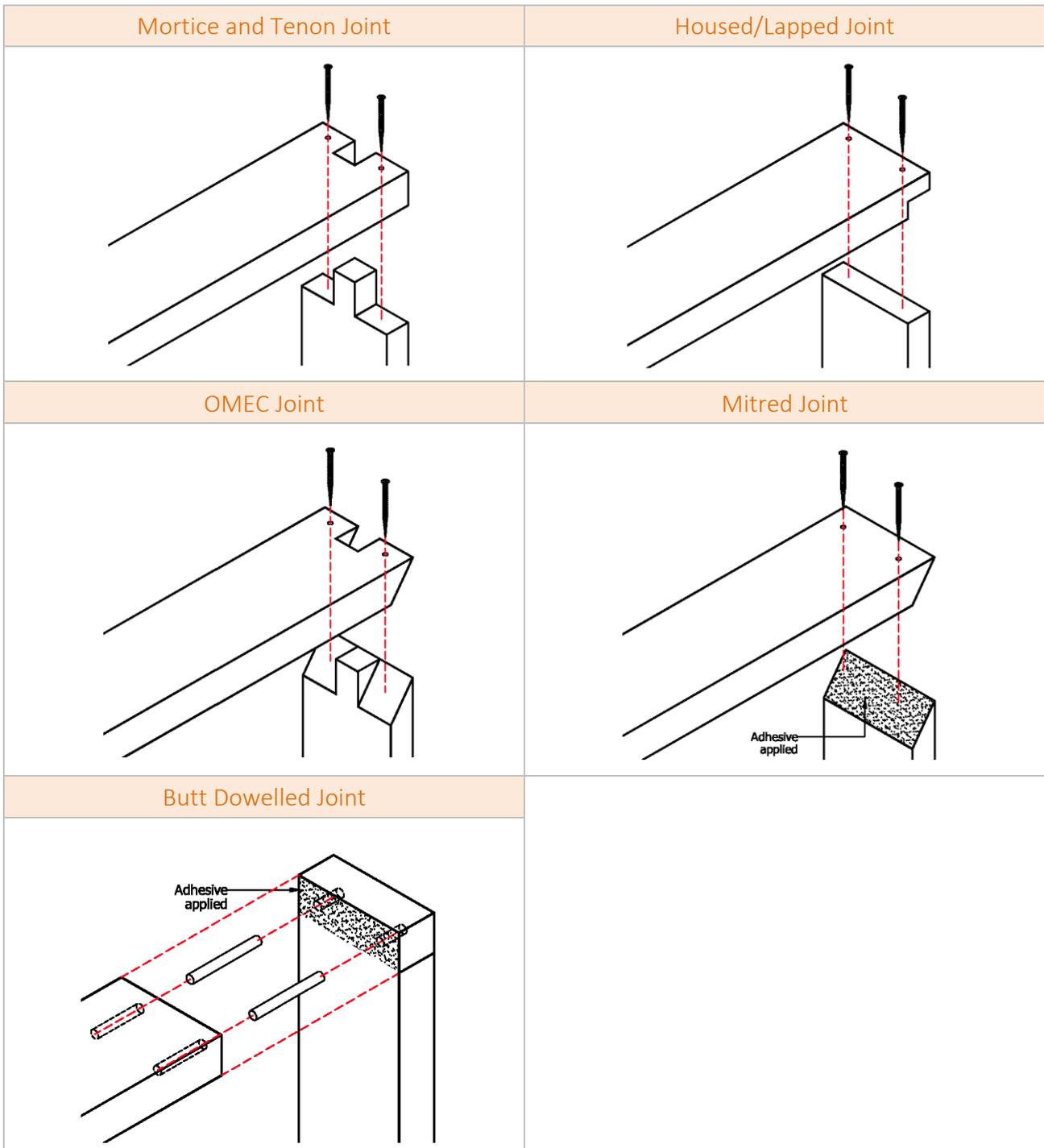
4.5.4 Overpanel Fixing Method

	Fixing Requirements	
	Minimum Screw Size	5mm x 72mm steel screws
	Minimum Quantity of Fixings	2no. screws per overpanel edge
	Fixing Positions	Maximum 100mm from each corner and on maximum 400mm centres thereafter
	Fixing Penetration	Minimum 40mm of screw penetration into the central thickness of the overpanel edge

4.6 Door Frames

4.6.1 Head Joints

- The frame head must be secured to each jamb using either 2no. minimum 5mm x 80mm screws or 12mm diameter x 90mm long hardwood (minimum density 600kg/m³) dowels glued in position using PU adhesive
- In addition to screw fixings, mitred and butt joints must also be glued with cross-linking adhesive e.g. Polyurethane or Urea Formaldehyde



4.6.2 Specifications and Profiles

Planted Stop		Fire Rating	FD30	FD60	
		Frame Material	Softwood or Hardwood	Hardwood	
		Minimum Density		470kg/m ³	640kg/m ³
		Minimum Thickness	Single Acting	30mm	30mm
			Double Acting	45mm (640kg/m ³ hardwood only)	45mm
		Minimum Frame Depth		100mm	100mm
		Minimum Stop Depth		18mm	18mm
Additional Requirements/Notes					
<ul style="list-style-type: none"> The minimum frame thickness detailed above excludes the door stop The doorstop is to comprise the same material as the door frame and must be fixed in place using 40mm long steel pins at minimum 300mm centres Minimum 45mm wide x 16mm thick architraves to be fitted comprising the same material specification as outlined in the table above When fitting a concealed closer, the door stop fitted to the frame head may incorporate a 12mm deep x 13.5mm high rebate at the interface with a 12mm deep x 5mm high rebate in the leaf head lipping 					

Integral Stop		Fire Rating	FD30	FD60	
		Frame Material	Softwood or Hardwood	Hardwood	
		Minimum Density		470kg/m ³	640kg/m ³
		Minimum Thickness	Single Acting	30mm	30mm
			Double Acting	45mm (640kg/m ³ hardwood only)	45mm
		Minimum Frame Depth		100mm	100mm
		Minimum Stop Depth		18mm	18mm
Additional Requirements/Notes					
<ul style="list-style-type: none"> The minimum frame thickness detailed above excludes the integral door stop. Minimum 45mm wide x 16mm thick architraves to be fitted comprising the same material specification as outlined in the table above When fitting a concealed closer, the door stop fitted to the frame head may incorporate a 12mm deep x 13.5mm high rebate at the interface with a 12mm deep x 5mm high rebate in the leaf head lipping 					

4.6.3 Timber Door Frames – Decorative Finishes

Decorative Finishes	
Material	Maximum Thickness
Paint	0.5mm, or a maximum of 5 coats whichever is greater
Varnish	
Lacquer	

4.7 Glazed Apertures

4.7.1 General

General Requirements/Notes
<ul style="list-style-type: none"> The tables displayed in Section 4.7.3 detail the permitted combinations of glass type, glazing system and bead profile The maximum permitted glazed aperture dimensions are detailed within each individual table. Corresponding aperture widths/heights will need to be adjusted until the proposed aperture area falls within the maximum aperture area detailed within the relevant table. Drawings for the approved glazing bead profiles along with the required bead fixing methods can be found in Section 4.7.4 All glass is to be installed in accordance with the manufacturer’s instructions for expansion allowance, setting blocks etc

4.7.2 Glazed Aperture Shape

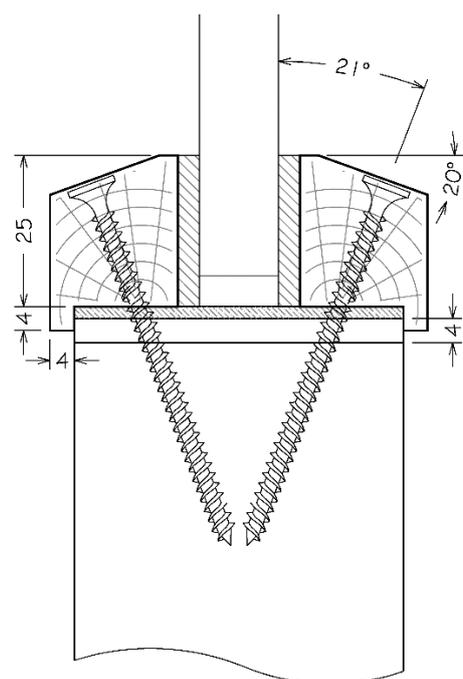
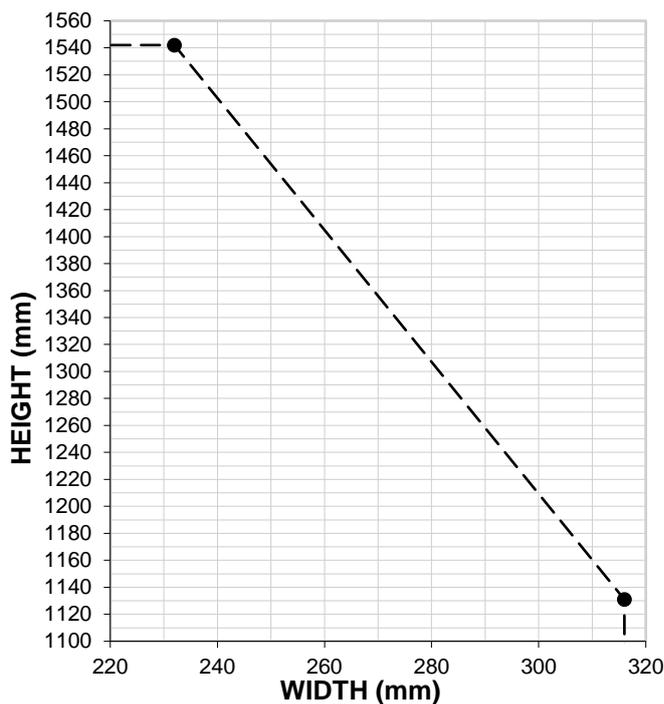
General Requirements/Notes
<ul style="list-style-type: none"> The leaves are approved for the incorporation of glazing with shapes other than rectilinear, subject to the margins and total area of the glazing per leaf, falling within the parameters outlined in the tables displayed in Section 4.7.4 The method of forming the curved beads must remain as tested Care must be taken to ensure the glass type specified is suitable for installation in non-rectilinear configurations

4.7.3 Glazed Aperture Position

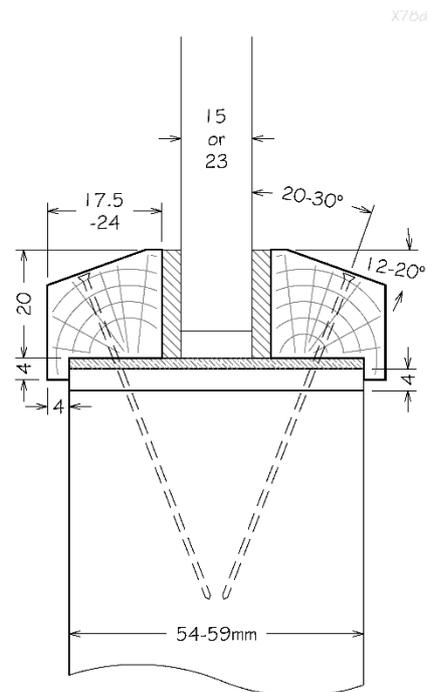
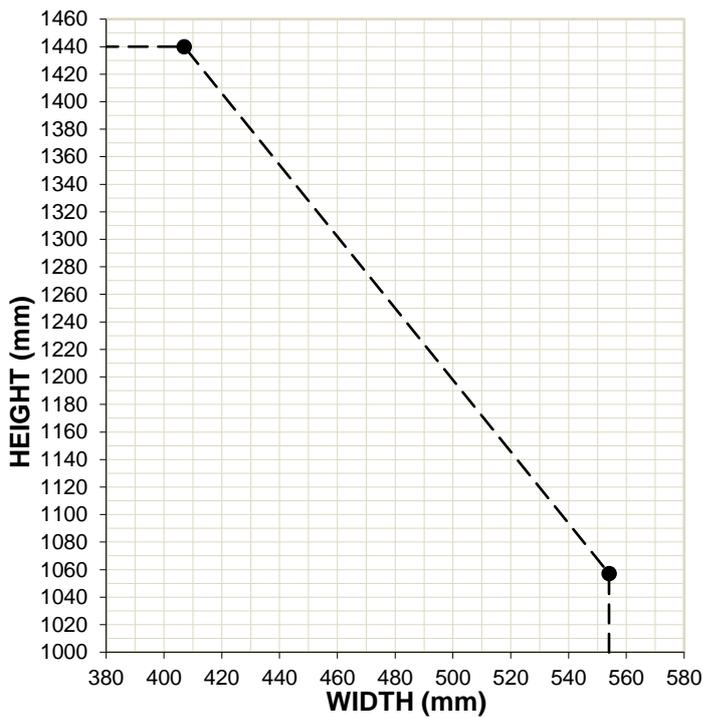
General Requirements/Notes	
Minimum distance from head	250mm
Minimum distance from vertical leaf edges	200mm
Minimum distance from bottom edge of leaf	250mm
Minimum distance between apertures	80mm

4.7.4 Approved Glass Types, Glazing Systems and Bead Profiles – Single Glazed

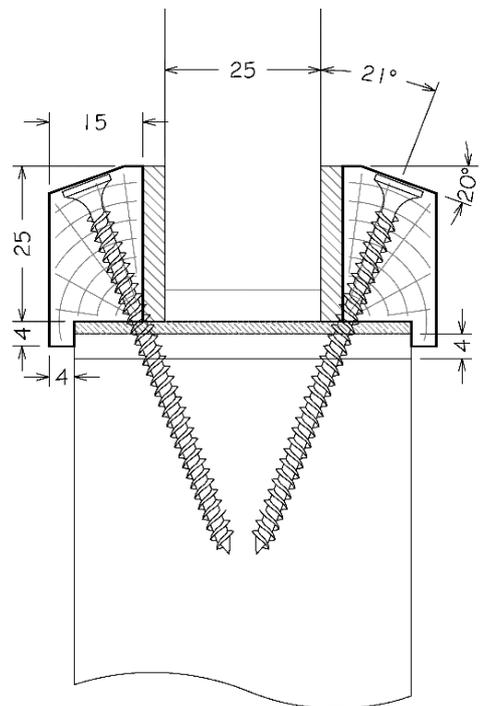
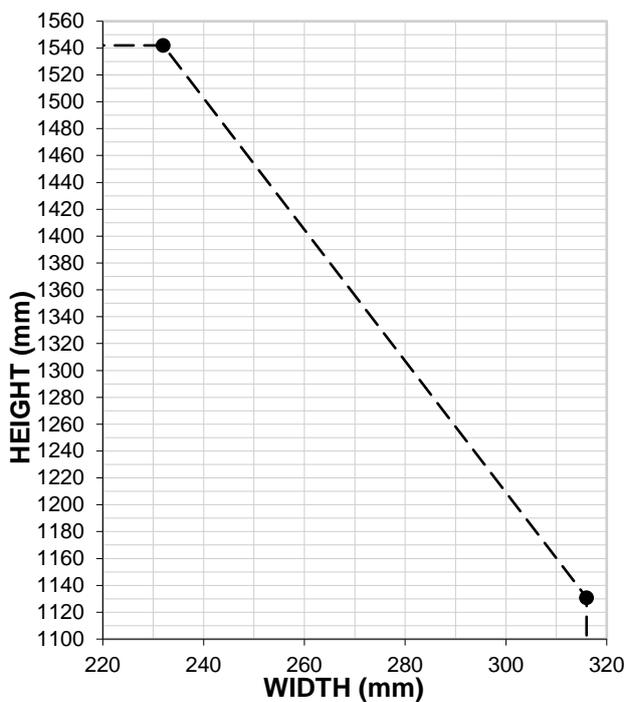
Fire Rating		FD30			
Boor Blank Type		Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59			
Glass Type		Pyroguard T EW60	Pyrodur 60-20	Pyrostop 30-103	Pyrobel
Glass Manufacturer		Pyroguard UK Ltd	Pilkington Glass Ltd	Pilkington Glass Ltd	Glaverbel
Glass Thickness		13mm thick	13mm thick	14mm thick	16mm thick
Glazing System	Between bead/ glass	Mann McGowan Pyroglaze 60 – 25mm high x 3mm thick			
	Lining the aperture	Mann McGowan Pyrostrip 100 ECSA – 52mm x 2mm thick liner			
Glazing Bead Material		Hardwood (minimum density 640kg/m ³)			
Glazing Bead Size		29mm high x 18.5-21.5mm deep (including a 4 x 4mm bolection return) with a 20 degree chamfer			
Aperture Liner		4mm thick x (the thickness of the leaf) hardwood (minimum density 640kg/m ³) adhered in place using PU adhesive			
Glazing Bead Fixings		Minimum 60mm long x 3.2mm thick steel screws fitted at 21 degrees to the plane of the glass, 50mm from corners and at 220mm centres thereafter			
Approved Glass Size Envelope		Height	1542mm	232mm	
		Width	316mm	1131mm	
Approved Glass Size Envelope		The above sizes relate to maximum individual aperture size. It is permissible to include double the area of the maximum individual aperture size, providing two or more apertures are included and the spacings outlined in Section 4.7.3 are adhered to			



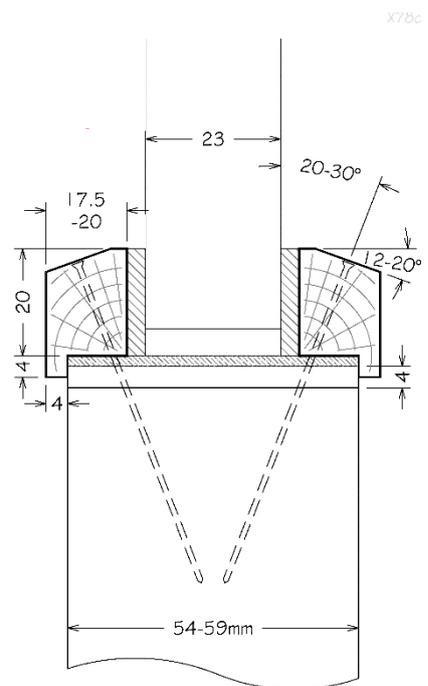
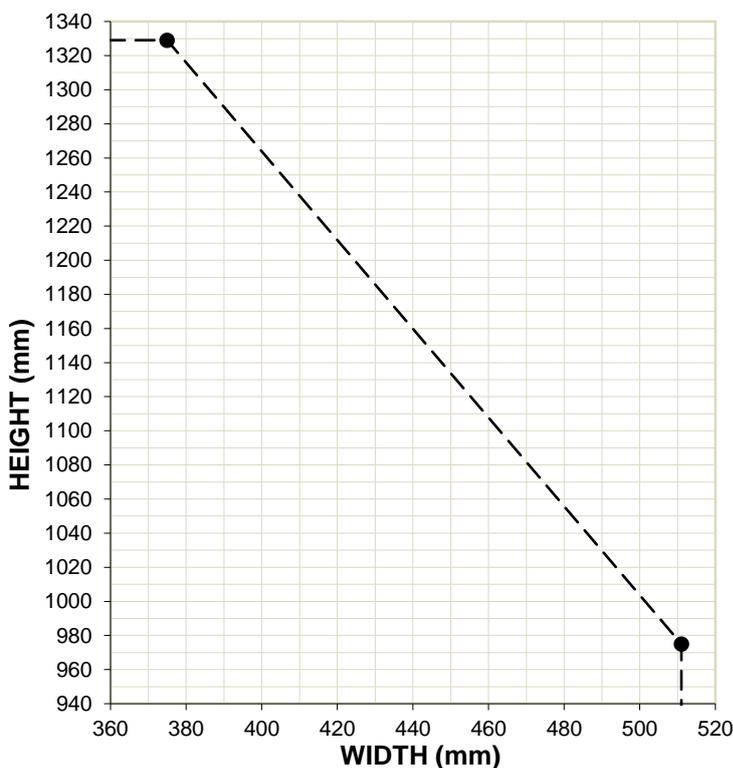
Fire Rating		FD30	
Boor Blank Type		Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59	
Glass Type		Pyrostop 30-103	Pyrostop 60-1
Glass Manufacturer		Pilkington Glass Ltd	
Glass Thickness		15mm thick	23mm thick
Glazing System	Between bead/ glass	Kerafix 2000 (15x2mm) <u>Or</u> Intumescent Seals Ltd Therm-A-Glaze 45 (15x2mm)	
	Lining the aperture	Intumescent Seals Ltd Therm-A-Line (54x2mm) liner	
Glazing Bead Material		Softwood or hardwood (minimum density 470kg/m ³)	
Glazing Bead Size		Minimum 24mm high x 17.5-24mm deep (including a 4 x 4mm bolection return) with a 12-20 degree chamfer	
Aperture Liner		4mm thick x (the thickness of the leaf) softwood or hardwood (minimum density 470kg/m ³) adhered in place using PU adhesive	
Glazing Bead Fixings		Minimum 50mm long x 2mm thick pneumatic pins or screws fitted at 20-30 degrees to the plane of the glass, 45mm from corners and at 140mm centres thereafter	
Approved Glass Size Envelope		Height	1440mm 407mm
		Width	554mm 1057mm
		The above sizes relate to maximum individual aperture size. It is permissible to include double the area of the maximum individual aperture size, providing two or more apertures are included and the spacings outlined in Section 4.7.3 are adhered to	



Fire Rating		FD60		
Boor Blank Type		Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59		
Glass Type		Pyroguard T EI60		
Glass Manufacturer		Pyroguard UK Ltd		
Glass Thickness		25mm thick		
Glazing System	Between bead/glass	Mann McGowan Pyroglaze 60 – 25mm high x 3mm thick		
	Lining the aperture	Mann McGowan Pyrostrip 100 ECSA – 52mm x 2mm thick liner		
Glazing Bead Material		Hardwood (minimum density 640kg/m ³)		
Glazing Bead Size		29mm high x 15.5mm deep (including a 4 x 4mm bolection return) with a 20 degree chamfer		
Aperture Liner		4mm thick x (the thickness of the leaf) hardwood (minimum density 640kg/m ³) adhered in place using PU adhesive		
Glazing Bead Fixings		Minimum 60mm long x 3.2mm thick steel screws fitted at 21 degrees to the plane of the glass, 50mm from corners and at 220mm centres thereafter		
Approved Glass Size Envelope		Height	1468mm	221mm
		Width	301mm	1077mm
		The above sizes relate to maximum individual aperture size. It is permissible to include double the area of the maximum individual aperture size, providing two or more apertures are included and the spacings outlined in Section 4.7.3 are adhered to		



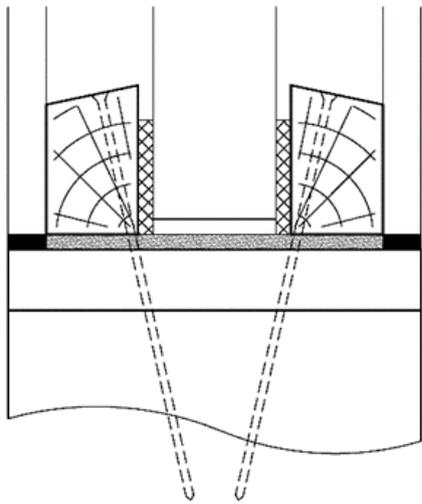
Fire Rating		FD60						
Door Blank Type		Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59						
Glass Type		PILKINGTON PYROSTOP 60-1						
Glass Manufacturer		Pilkington						
Glass Thickness		23mm						
Glazing System	Between bead/ glass	Intumescent Seals Ltd Therm-A-Glaze 45 (15x2mm)						
	Lining the aperture	Intumescent Seals Ltd Therm-A-Line (54x2mm) liner						
Glazing Bead Material		Hardwood (minimum density 640kg/m ³)						
Glazing Bead Size		24mm high x 17.5-20mm deep (including a 4 x 4mm bolection return) with a 12-20 degree chamfer						
Aperture Liner		4mm thick x (the thickness of the leaf) hardwood (minimum density 640kg/m ³) adhered in place using PU adhesive						
Glazing Bead Fixings		Minimum 50mm long x 2mm thick pneumatic pins or screws fitted at 20-30 degrees to the plane of the glass, 40mm from corners and at 140mm centres thereafter						
Approved Glass Size Envelope		<table border="1"> <tr> <td>Height</td> <td>1329mm</td> <td>375mm</td> </tr> <tr> <td>Width</td> <td>511mm</td> <td>975mm</td> </tr> </table>	Height	1329mm	375mm	Width	511mm	975mm
		Height	1329mm	375mm				
		Width	511mm	975mm				
<p>The above sizes relate to maximum individual aperture size. It is permissible to include double the area of the maximum individual aperture size, providing two or more apertures are included and the spacings outlined in Section 4.7.3 are adhered to</p>								



4.7.5 Approved Glass Types, Glazing Systems and Bead Profiles – Triple Glazed

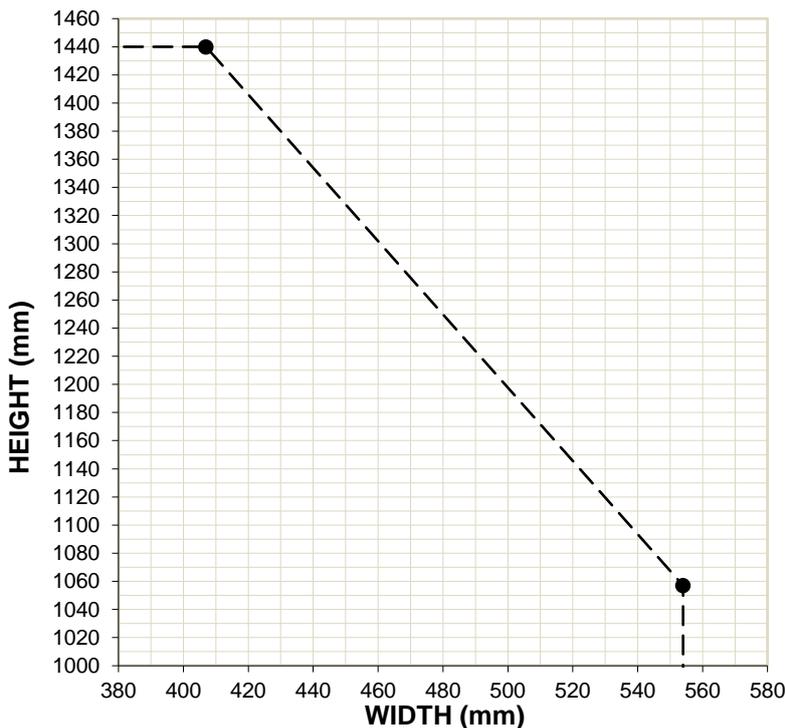
Fire Rating	FD30
Door Blank Type	Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59
Glass Type	PILKINGTON PYROSTOP + Acrylic outer panes
Glass Manufacturer	Pilkington
Glass Thickness	15mm(30-1) or 23mm(60-1)
Outer Panes	5mm Acrylic (fitted to finish flush with the leaf face and retained in position using a 3mm wide bead of silicone sealant around the perimeter)

Approved Bead System



Glazing System	Between bead/glass	Kerafix 2000 (15x2mm) Or Intumescent Seals Ltd Therm-A-Glaze 45 (15x2mm)
	Lining the aperture	Intumescent Seals Ltd Therm-A-Line (44x2mm) liner
Glazing Bead Material		Softwood (minimum density 470kg/m ³)
Glazing Bead Size		20mm high x 8-12.5mm deep with a 12 degree chamfer
Aperture Liner		6-10mm thick softwood (minimum density 470kg/m ³)
Glazing Bead Fixings		Minimum 50mm long x 2mm thick pneumatic pins or screws fitted at 20-30 degrees to the plane of the glass, 45mm from corners and at 140mm centres thereafter

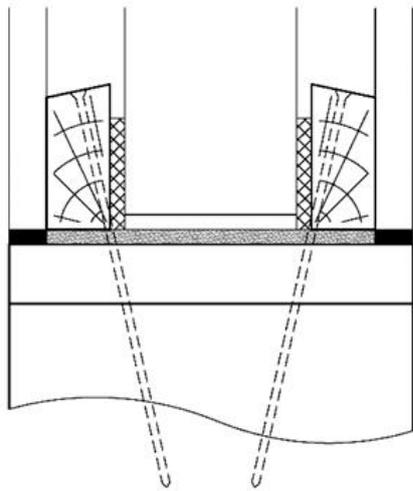
Approved Glass Size Envelope



Size (mm)		
Height	1440	407
Width	554	1057

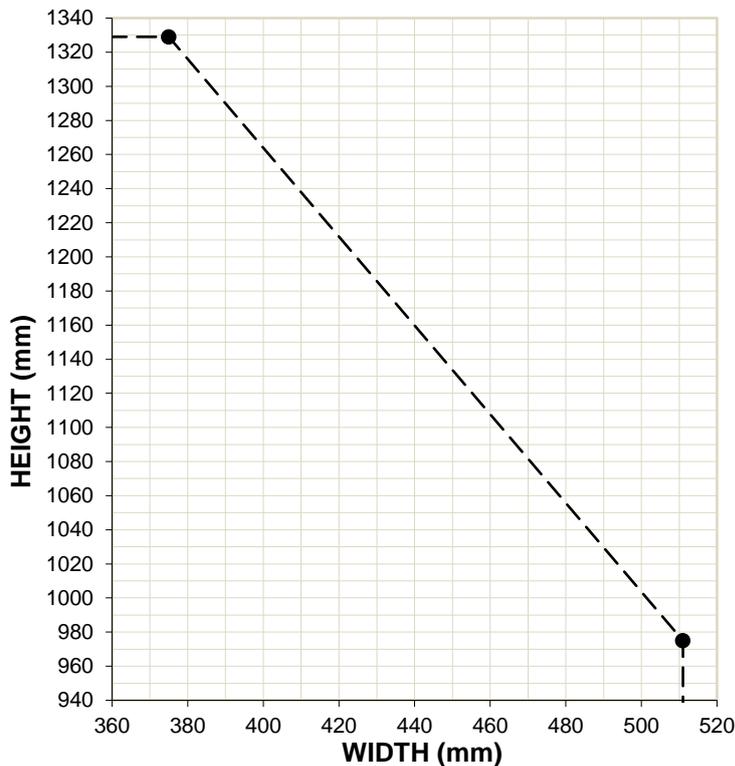
Fire Rating	FD60
Door Blank Type	Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59
Glass Type	PILKINGTON PYROSTOP + Acrylic outer panes
Glass Manufacturer	Pilkington
Glass Thickness	23mm(60-1)
Outer Panes	5mm Acrylic (fitted to finish flush with the leaf face and retained in position using a 3mm wide bead of silicone sealant around the perimeter)

Approved Bead System



Glazing System	Between bead/glass	Intumescent Seals Ltd Therm-A-Glaze 45 (15x2mm)
	Lining the aperture	Intumescent Seals Ltd Therm-A-Line (44x2mm) liner
Glazing Bead Material		Hardwood (minimum density 640kg/m ³)
Glazing Bead Size		20mm high x 8mm deep with a 12 degree chamfer
Aperture Liner		6-10mm thick hardwood (minimum density 640kg/m ³)
Glazing Bead Fixings		Minimum 50mm long x 2mm thick pneumatic pins or screws fitted at 20-30 degrees to the plane of the glass, 40mm from corners and at 140mm centres thereafter

Approved Glass Size Envelope



Size (mm)		
Height	1329	375
Width	511	975

4.8 Hardware

Hardware items which are approved for use with the Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door blanks are detailed in Appendix D of this report.

All hardware items must be installed in accordance with the manufacturer’s instructions, except where specific installation requirements or limitations have been detailed by IFC.

4.9 Installation and Supporting Construction

Supporting Construction

The supporting construction may be timber or steel stud plasterboard partition, blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 30 or 60 minutes fire resistance, as applicable, at the required size, when incorporating door openings. If fitted into timber or steel stud partitions, the method of forming the door assembly aperture must be as tested by the partition and/or door assembly manufacturer

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

Door Frame Fixing Requirements

Timber door frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm on the vertical edges (minimum 200mm from the top and bottom), and a minimum of one fitted centrally across the width of the frame head of double doors. Screws shall be of sufficient length to penetrate the wall by at least 40mm and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws).

Door Frame Packers

Packers shall be used at all fixing positions, although if combustible or thermally softening packers are employed, they must be cut short and be capped with a layer of approved mastic and maintain compliance with one of the approved back of frame sealing methods given in the following sections.

The fire stopping materials required for the installation, depending on the gaps, as appropriate, and described in following sections, must be fitted tight up to the packers with no gaps. All packers must be tightly fitted with no gaps between individual packers.

Projecting Door Frames/ Door Leaves

The approval in this report does not apply where the wall/partition includes decorative ‘cladding’ on the face of the fire-resisting construction, (e.g. timber panelling on battens, or plasterboard on dabs), such that any part of the frame is aligned within the plane of this decorative cladding.

Architraves

Loose architraves must be fitted to all door assemblies to the specification outlined in Section 4.6.2. The architraves must be pin fixed to the door frame with minimum 40mm long steel pins at minimum 300mm centres or glue fixed to the frame using a crosslinking adhesive.

Door Edge Gaps

	Between Leaf & Frame	Leaf Meeting Stiles	Overpanel Junctions	Bottom of Door (Fire)	Bottom of Door (Fire & Smoke)
Gap Width	1.5mm to 4mm	1.5mm to 4mm	1.5mm to 4mm	6mm	3mm*

**Gaps in excess of 3mm are permissible provided a suitable smoke seal is included*

Door Leaf Alignment

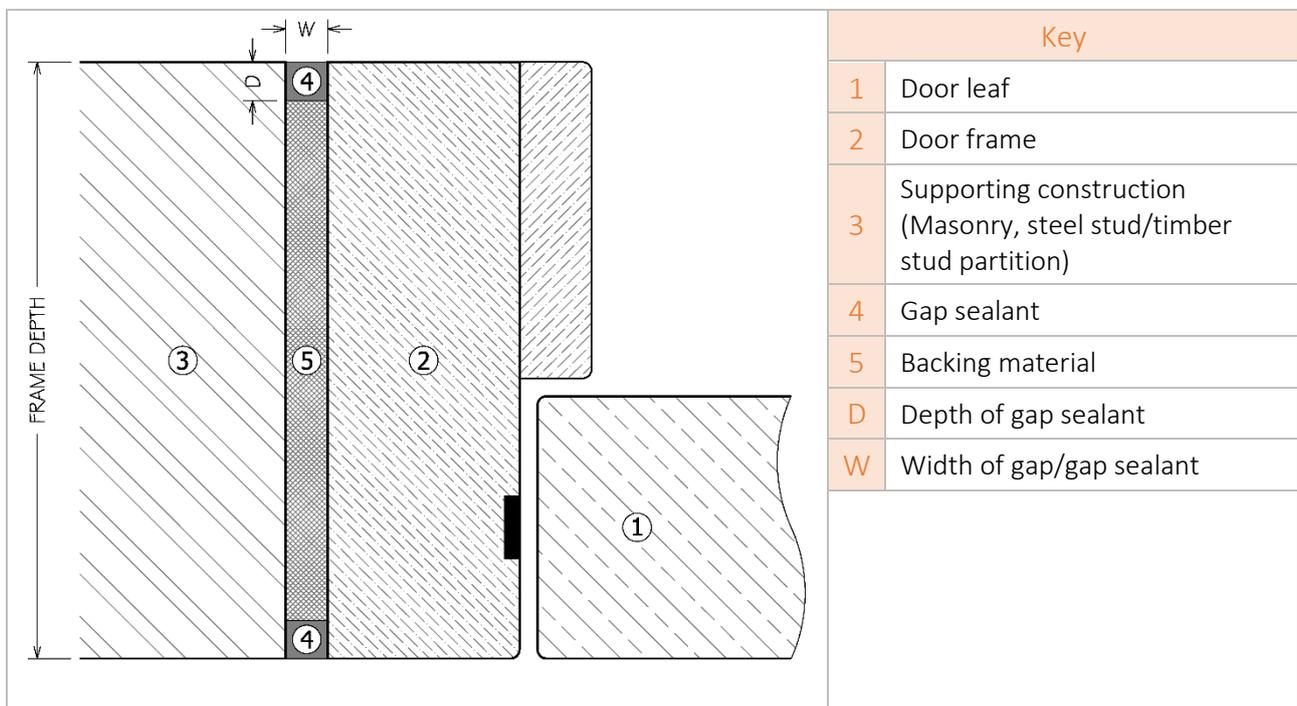
The door assembly design shall be such that when closed, single acting leaves are fully flush within the frame. The face of leaves in double door assemblies shall be flush with each other at meeting stiles when closed.

4.10 Gap Sealing

4.10.1 General

General Requirements/Notes

Gap sealing products must meet **all** of the requirements detailed in Section 4.10.2



4.10.2 Gap Sealing Products – Requirements for Approval

General Requirements				
Gap sealing products used in conjunction with Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door blanks, must have been successfully fire tested for 30 or 60 minutes fire resistance, as applicable, in accordance with BS476: Part 22: 1987 or BS EN 1634-1:2014. In addition, they must meet all of the requirements detailed below;				
Fire Test Pressure Regime				
Must have been successfully fire tested when sealing a gap located above the neutral pressure axis				
Supporting Construction				
Must have been successfully fire tested when sealing a linear gap between the rear of a timber frame and a steel/timber stud partition or be representative of the substrate into which it is being used.				
Gap Size				
Must have been successfully fire tested when sealing a linear gap, equal to, or larger than, that proposed.				
Sealant Depth				
Must be applied to a depth, equal to, or greater than, that used when it was fire tested and finish flush with the outer face of the door frame.				
Backing Material				
Tested Backing Material	Permitted Backing Material Options			
No backing material included	None	CC Polyethylene backing rod	Expanding FR PU foam*	Mineral rock fibre
Closed cell polyethylene backing rod		CC Polyethylene backing rod	Expanding FR PU foam*	Mineral rock fibre
Expanded FR PU foam			Expanding FR PU foam*	Mineral rock fibre
Mineral rock fibre				Mineral rock fibre only
* Must have been successfully fire tested when sealing a linear gap between the rear of a timber frame and a steel/timber stud partition, or be representative of the substrate into which it is being used.				
Architraves				
Tested Architrave Material	Permitted Architrave Material			
No architraves fitted	None fitted	MDF	Softwood	Hardwood
MDF		MDF		Hardwood
Softwood			Softwood	Hardwood
Hardwood				Hardwood

4.11 Intumescent Seals

Intumescent Seal Types	Approved Manufacturers/Suppliers	Size/Positions
<ul style="list-style-type: none"> Lorient 617 Rigid Box Graphite Pyrostrip 500 	<ul style="list-style-type: none"> Lorient Polyproducts Ltd Pyroplex Mann McGowan Fabrications Ltd 	Refer to Appendices A, B and C
Additional Requirements/Notes		
<ul style="list-style-type: none"> Intumescent protection is also required to specific items of building hardware – refer to Appendix D 		

4.12 Ambient Temperature Smoke Seals

Smoke seals or combined intumescent/smoke seals (using the specification approved in Appendices A, B and C), 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 3m³/m/hr at 25Pa may be used in conjunction with the proposed door assemblies to provide smoke control.

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

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

5. CONCLUSION

It is the opinion of International Fire Consultants Ltd that if the proposed door assemblies comprising Moralt Firesound 54, Moralt Firesound Plus 54 and Moralt Firesound 59 door blanks installed in timber door frames were manufactured and installed within 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 30 or 60 minutes, as applicable.

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 so could, therefore, be evaluated to this standard if the maximum total aperture area is less than 20% of the leaf size.

The leaves may include small apertures, up to a maximum of 20% of the leaf size and can be evaluated to Section 7 in BS 476: Part 22: 1987 as partially insulating door assemblies for 30 or 60 minutes fire resistance, as applicable.

The doors can also be assessed to Section 6 of BS476: Part 22: 1987 for a 30 or 60 minute performance rating, as applicable, for both integrity and insulation, without apertures in or with apertures incorporating fully insulating glass.

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 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.

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 opinion as to what the fire performance of the construction/system would be should it to be tested to the named standard. It is IFC's experience that such an opinion is normally acceptable in support of an application for building approvals, certainly throughout the UK and in many parts of Europe and the rest of the world.

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

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

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.

The assessment is valid initially for a period of five years after which time it is recommended that it be submitted to International Fire Consultants Ltd for re-evaluation. For this reason, anyone using this document after March 2027 should confirm its ongoing validity.

This assessment report is not valid unless it incorporates the declaration, in Section 8, duly signed by the applicant.

Prepared by:



Chris Houchen

BSc AIFireE

Associate Director of Product Evaluation

International Fire Consultants Ltd. (IFC)

Reviewed by:



David Cooper

BEng (Hons) AIMMM AIFireE ACABE

Director of Product Evaluation

International Fire Consultants Ltd. (IFC)

8. DECLARATION BY THE APPLICANT

IFC Engineering Assessment Report

PAR/21569/01 Revision A

Client

Moralt AG

We, the undersigned, confirm that we have read and complied with the obligations placed on us by the Passive Fire Protection Forum (PFPF), details of which are outlined in the following document;

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

'Guide to Undertaking Technical Assessments of the 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

Christian Daschner

Position

R&D Manager

Company name

Moralt AG

Date

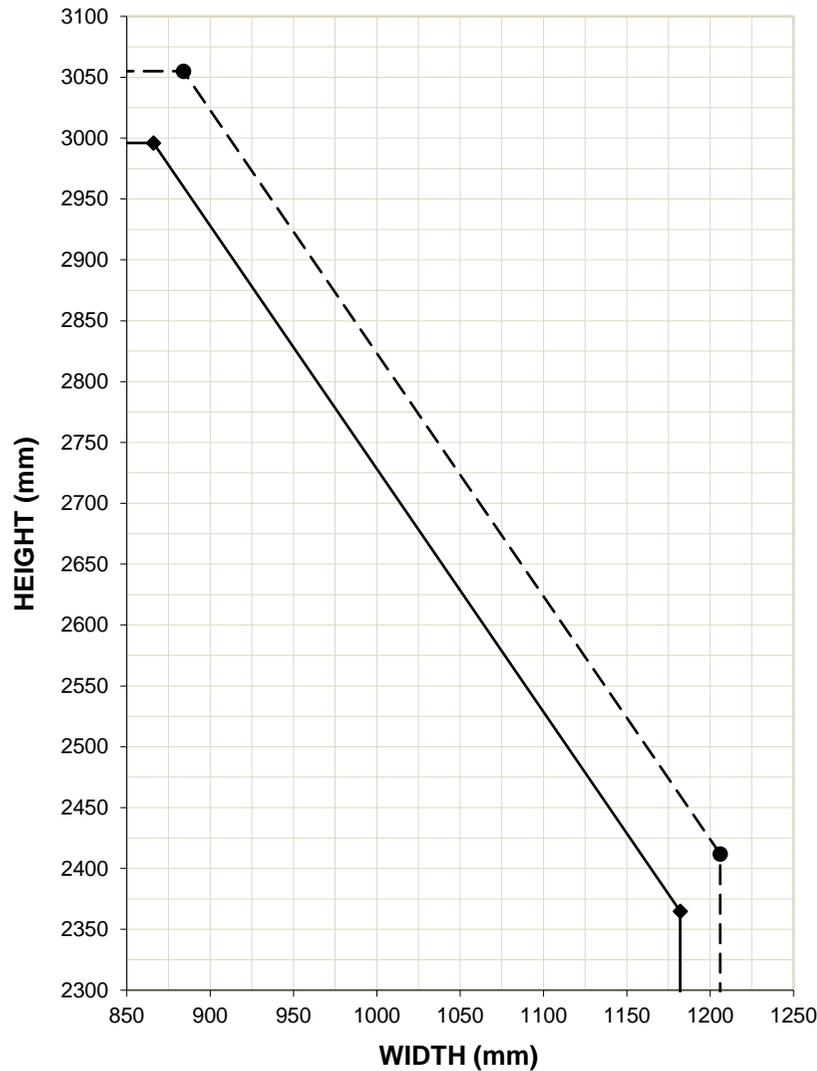
23/03/2022

APPENDIX A – FD30 - LEAF SIZE ENVELOPES AND INTUMESCENT SPECIFICATIONS

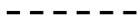
SOFTWOOD FRAMES AND LIPPINGS

Description	Code		
Latched, Single Acting, Single Leaf Without Flush Overpanel	LSASD		
Unlatched, Single Acting, Single Leaf Without Flush Overpanel	ULSASD		
Latched, Single Acting, Single Leaf With Flush Overpanel	LSASD+OP		
Unlatched, Single Acting, Single Leaf With Flush Overpanel	ULSASD+OP		

Figure A01 **FD30** **SOFTWOOD FRAMES AND LIPPINGS**



LSASD



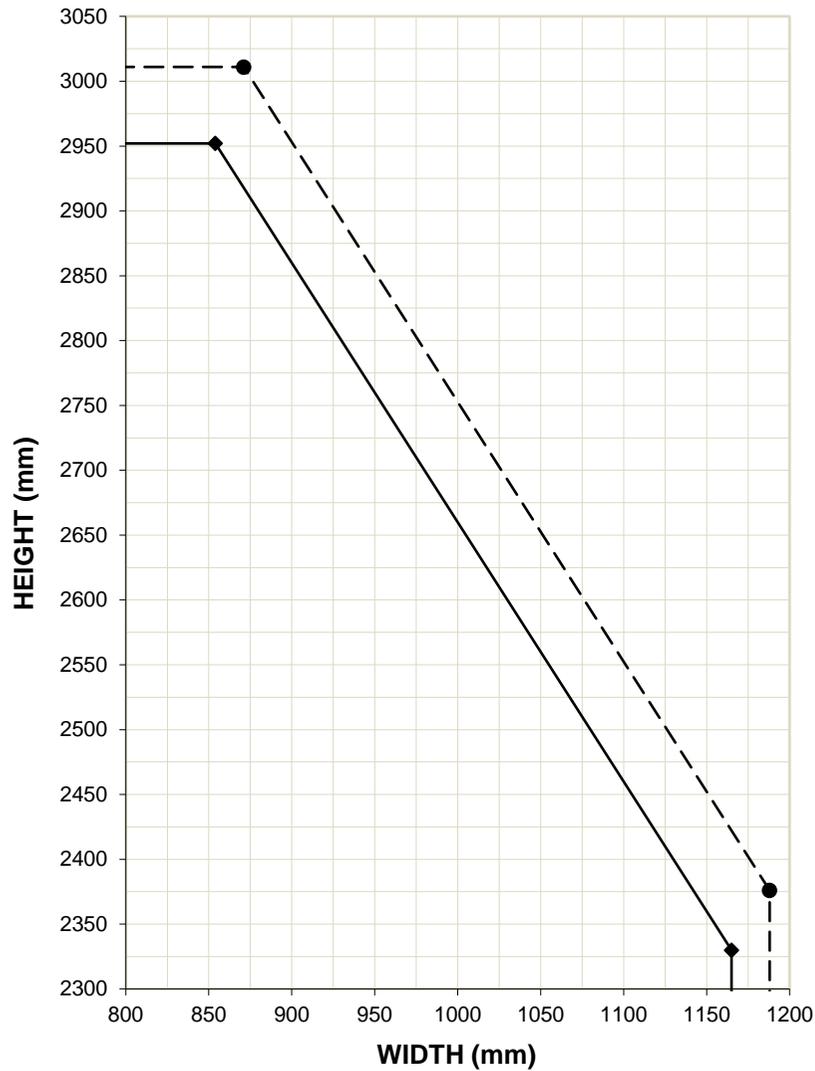
ULSASD



Firesound 54, Firesound Plus 54 and Firesound 59

Leaf Configuration	Leaf Height	Leaf Width
LSASD	2412mm	1206mm
	3055mm	884mm
ULSASD	2365mm	1182mm
	2996mm	866mm
Maximum Transomed Overpanel Height		2000mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	1no. 20x4mm intumescent seal, fitted centrally in the leaf head or frame reveal
	Leaves over 2500mm high	2no. 15 x 4mm intumescent seals, centrally fitted, spaced 10mm apart in the leaf head or frame reveal
Jambs	1no. 15x4mm intumescent seal, fitted centrally in the leaf edge or frame reveal	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood or Softwood (minimum density 470kg/m ³)

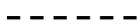
Figure A02 **FD30** **SOFTWOOD FRAMES AND LIPPINGS**



Firesound 54, Firesound Plus 54 and Firesound 59

Leaf Configuration	Leaf Height	Leaf Width
LSASD+OP	2376mm	1188mm
	3011mm	871mm
ULSASD+OP	2330mm	1165mm
	2952mm	854mm
Maximum Flush Overpanel Height		2000mm
Intumescent Seal Specification		
Flush Overpanel Leaf Head Interface	Leaves up to 2499mm high	1no. 20x4mm intumescent seal fitted centrally in the bottom edge of the overpanel
	Leaves over 2500mm high	2no. 15 x 4mm intumescent seals, centrally fitted, spaced 10mm apart in the bottom edge of the overpanel
Head	1no. 15x4mm intumescent seal, fitted centrally in the frame reveal or top overpanel edge	
Jambs	1no. 15x4mm intumescent seal, fitted centrally in the frame reveal or vertical leaf/overpanel edges	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood or Softwood (minimum density 470kg/m ³)

LSASD+OP



ULSASD+OP

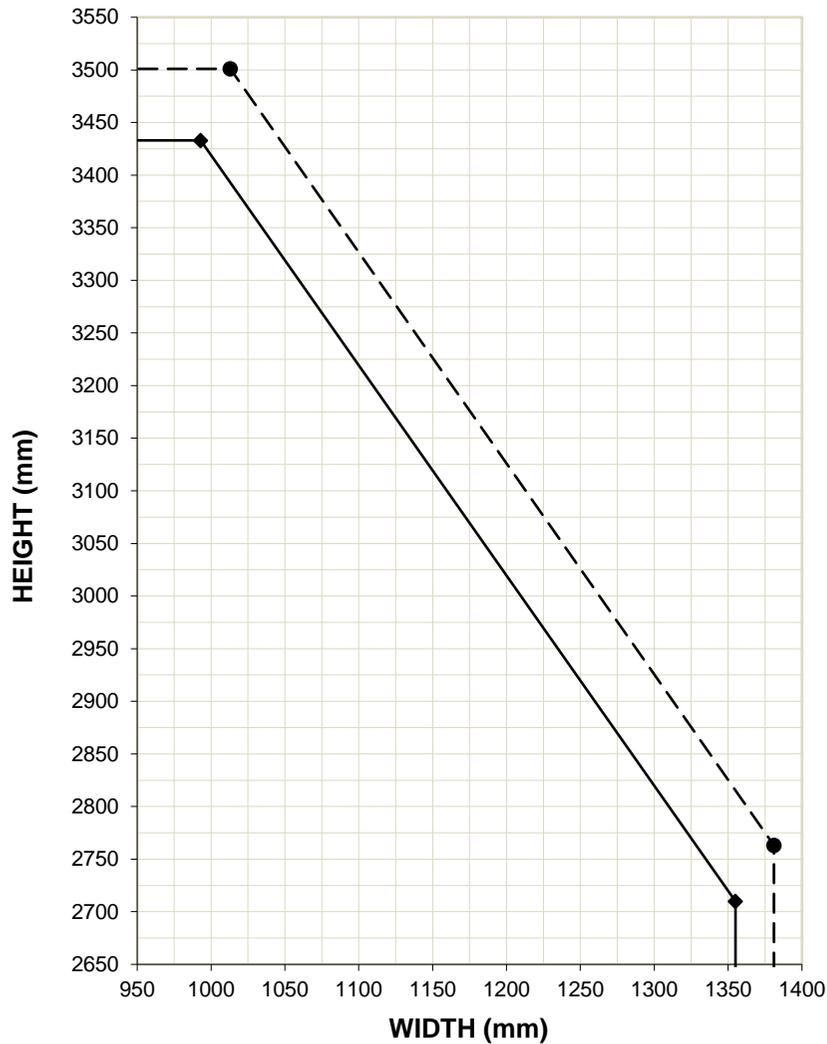


APPENDIX B – FD30 - LEAF SIZE ENVELOPES AND INTUMESCENT SPECIFICATIONS

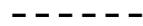
HARDWOOD FRAMES AND LIPPINGS

Description	Code		
Latched, Single Acting, Single Leaf	LSASD		
Unlatched, Single Acting, Single Leaf	ULSASD		
Double Acting, Single Leaf (Firesound 59 only)	DASD		
Latched, Single Acting, Single Leaf With Flush Overpanel	LSASD+OP		
Unlatched, Single Acting, Single Leaf With Flush Overpanel	ULSASD+OP		
Latched, Single Acting, Double Leaf	LSADD		
Unlatched, Single Acting, Double Leaf	ULSADD		
Latched, Single Acting, Double Leaf With Flush Overpanel	LSADD+OP		
Unlatched, Single Acting, Double Leaf With Flush Overpanel	ULSADD+OP		

Figure B01 **FD30** **HARDWOOD FRAMES AND LIPPINGS**



LSASD



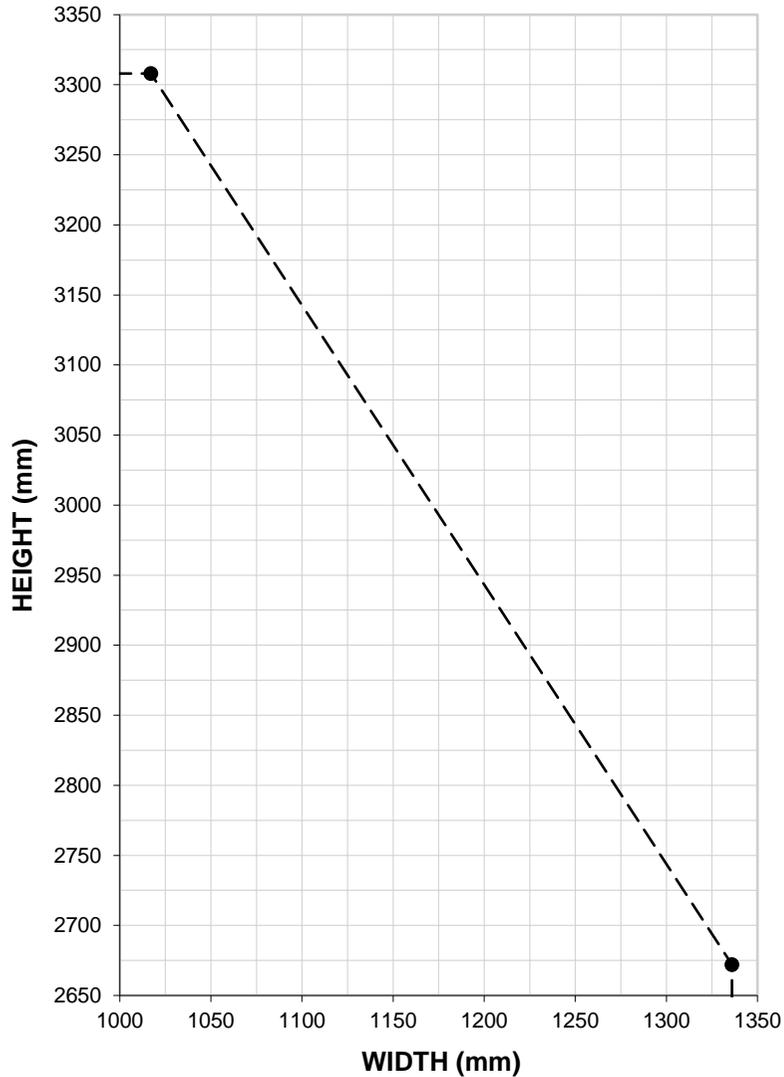
ULSASD



Firesound 54, Firesound Plus 54 and Firesound 59

Leaf Configuration	Leaf Height	Leaf Width
LSASD	2763mm	1381mm
	3501mm	1013mm
ULSASD	2710mm	1355mm
	3433mm	993mm
Maximum Transomed Overpanel Height		2000mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in either the leaf head or frame reveal, opposing the 2no. 15x4mm intumescent seals above (can finish 10mm short of the leaf head if required)
Jamb	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood (minimum density 640kg/m ³)

Figure B02 **FD30 HARDWOOD FRAMES AND LIPPINGS**



DASD



Firesound 59 Only

Leaf Configuration	Leaf Height	Leaf Width
DASD	3308mm	1017mm
	2672mm	1336mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 15mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 15mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in the leaf head, opposing the 2no. 15x4mm intumescent seals in the frame reveal (can finish 10mm short of the leaf head if required)
Jamb	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 15mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Pyroplex Rigid Box graphite		Hardwood (minimum density 640kg/m ³)

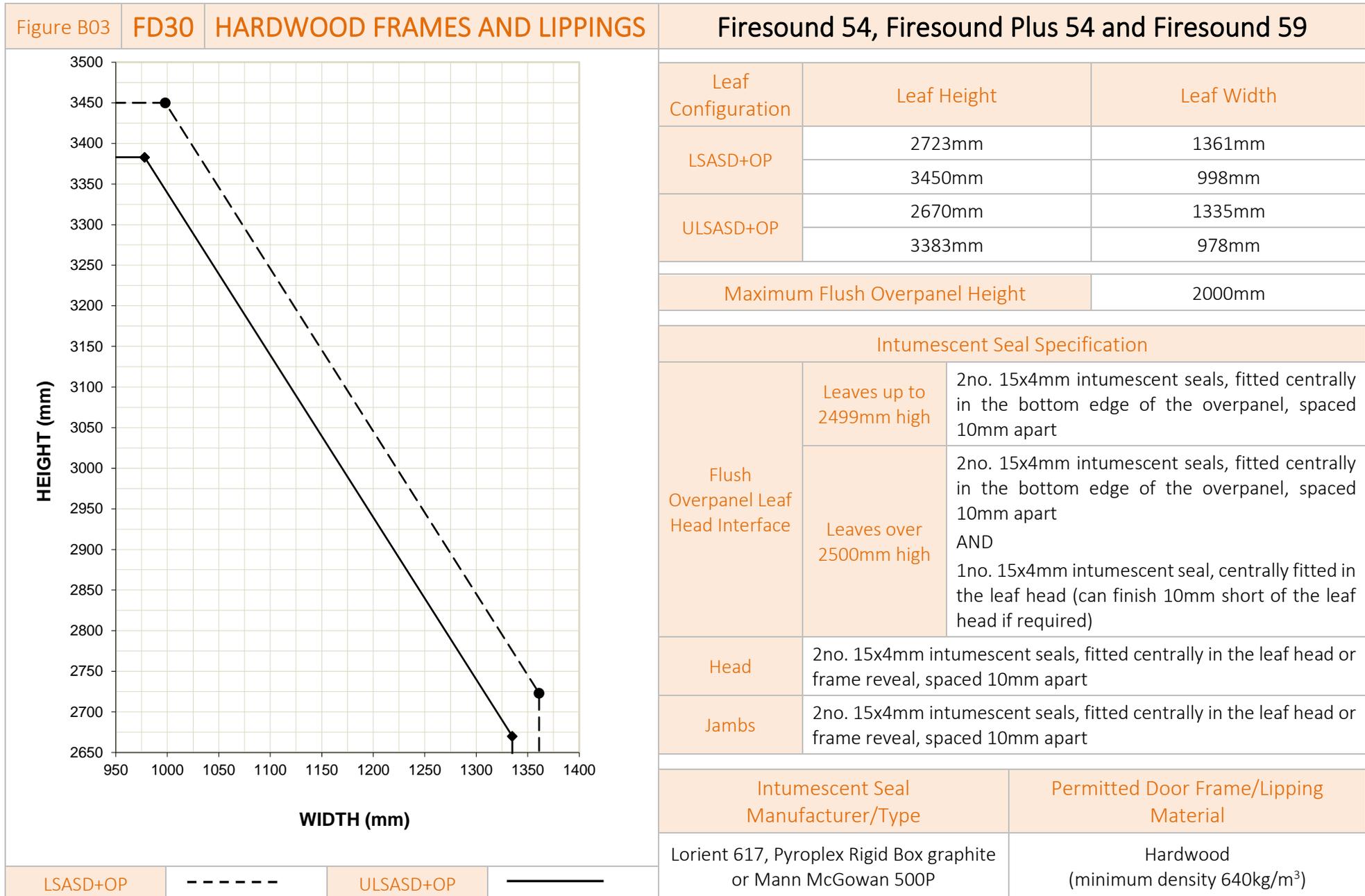
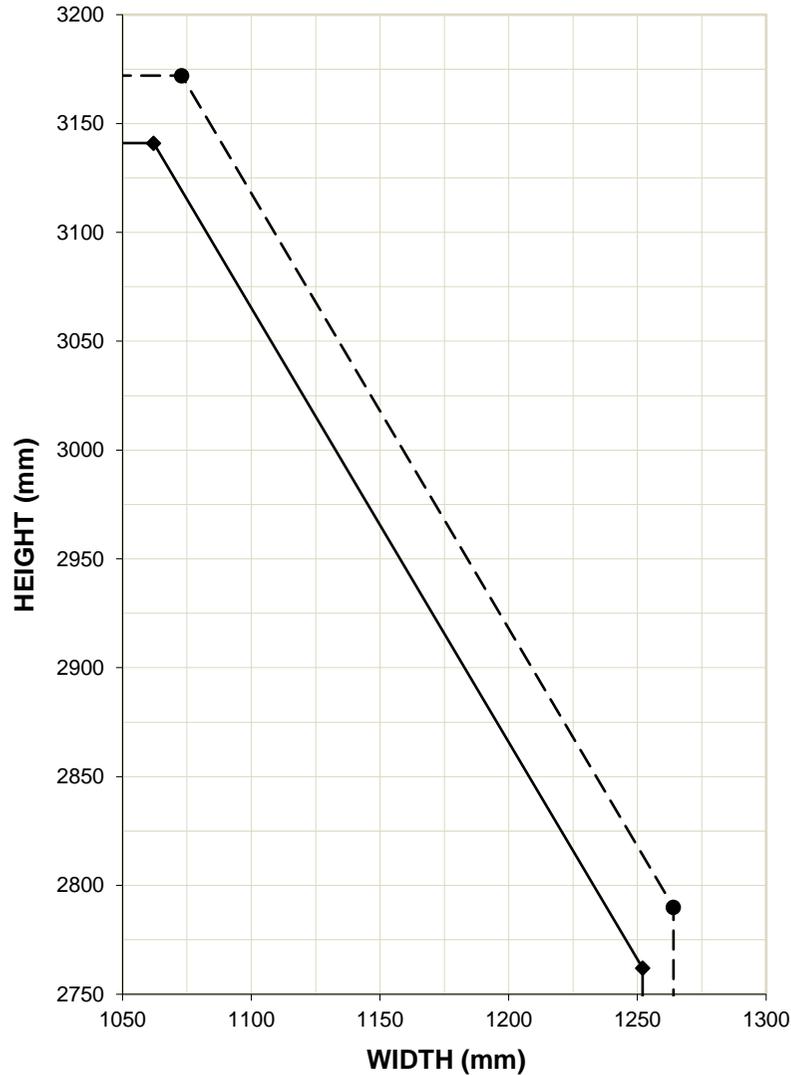


Figure B04 **FD30 HARDWOOD FRAMES AND LIPPINGS**

Firesound 54, Firesound Plus 54 and Firesound 59



Leaf Configuration	Leaf Height	Leaf Width
LSADD	2790mm	1264mm
	3172mm	1073mm
ULSADD	2762mm	1252mm
	3141mm	1062mm
Maximum Transomed Overpanel Height		1500mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in either the leaf head or frame reveal, opposing the 2no. 15x4mm intumescent seals above (can finish 10mm short of the leaf head if required)
Jambs	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart	
Meeting Stiles	2no. 15x4mm intumescent seals, fitted centrally in the active leaf edge, spaced 10mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood (minimum density 640kg/m ³)

LSADD



ULSADD

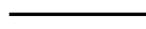
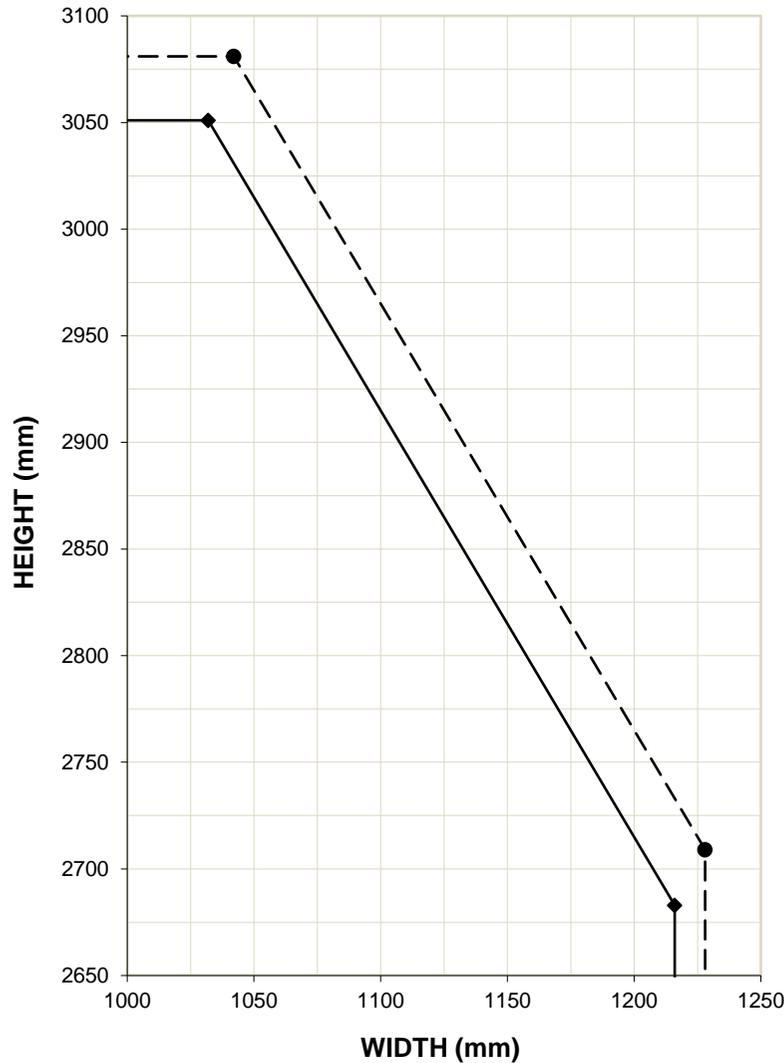
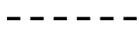


Figure B05 **FD30 HARDWOOD FRAMES AND LIPPINGS**

Firesound 54, Firesound Plus 54 and Firesound 59



LSADD+OP



ULSADD+OP

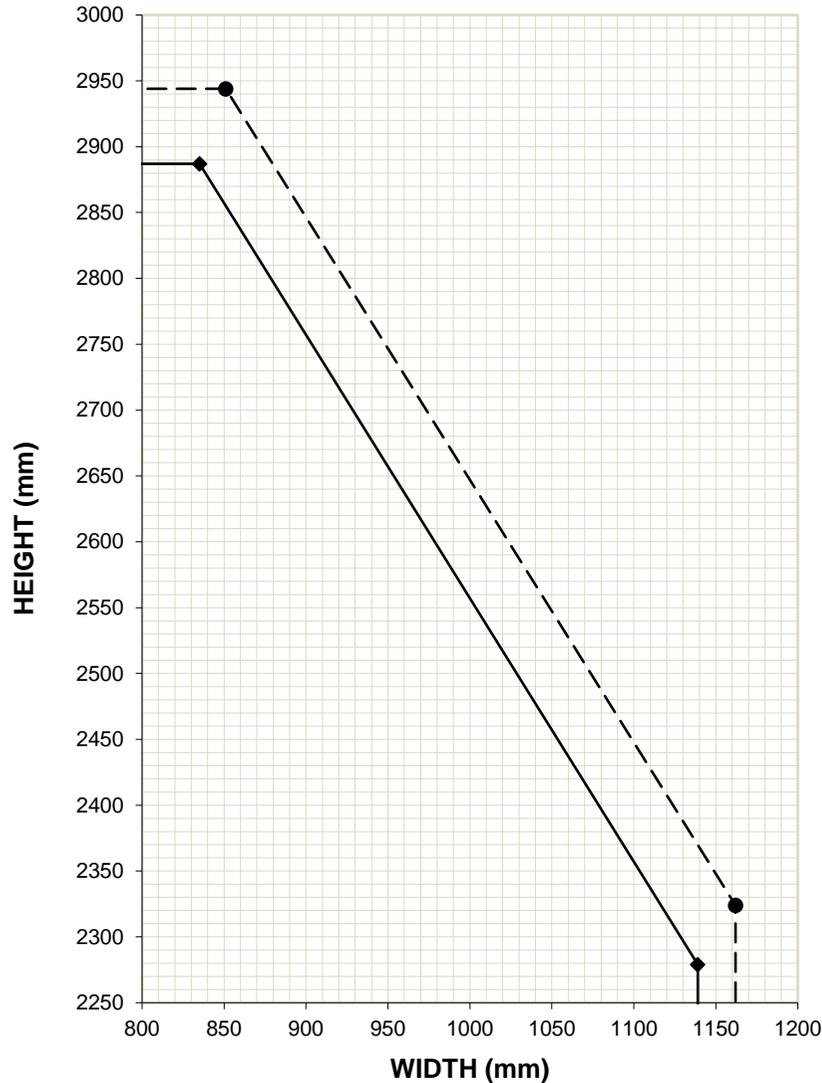


Leaf Configuration	Leaf Height	Leaf Width
LSADD+OP	2709mm	1228mm
	3081mm	1042mm
ULSADD+OP	2683mm	1216mm
	3051mm	1032mm
Maximum Flush Overpanel Height		1500mm
Intumescent Seal Specification		
Flush Overpanel Leaf Head Interface	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the bottom edge of the overpanel, spaced 10mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the bottom edge of the overpanel, spaced 10mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in the leaf head (can finish 10mm short of the leaf head if required)
Head	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart	
Jambs	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart	
Meeting Stiles	2no. 15x4mm intumescent seals, fitted centrally in the active leaf edge, spaced 10mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood (minimum density 640kg/m ³)

APPENDIX C - FD60 - LEAF SIZE ENVELOPES AND INTUMESCENT SPECIFICATIONS HARDWOOD FRAMES AND LIPPINGS

Description	Code		
Latched, Single Acting, Single Leaf	LSASD		
Unlatched, Single Acting, Single Leaf	ULSASD		
Double Acting, Single Leaf (Firesound 59 only)	DASD		
Latched, Single Acting, Single Leaf With Flush Overpanel	LSASD+OP		
Unlatched, Single Acting, Single Leaf With Flush Overpanel	ULSASD+OP		
Latched, Single Acting, Double Leaf	LSADD		
Unlatched, Single Acting, Double Leaf	ULSADD		
Latched, Single Acting, Double Leaf With Flush Overpanel	LSADD+OP		
Unlatched, Single Acting, Double Leaf With Flush Overpanel	ULSADD+OP		

Figure C01 **FD60** **HARDWOOD FRAMES AND LIPPINGS**



LSASD



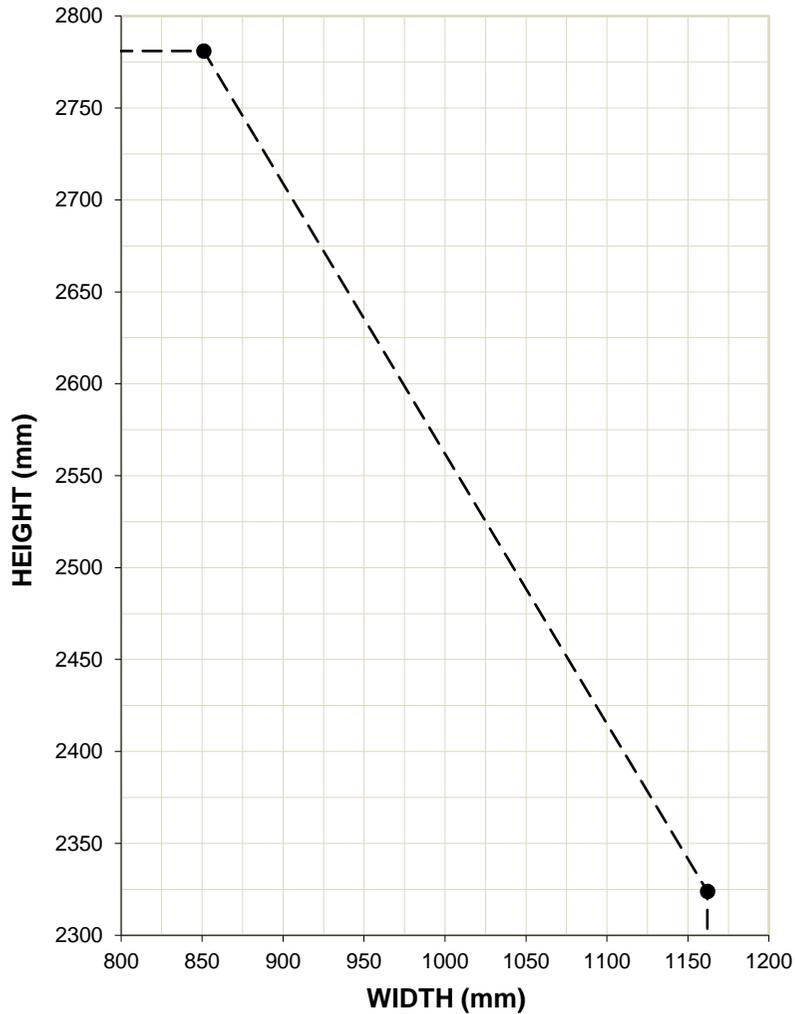
ULSASD



Firesound 54, Firesound Plus 54 and Firesound 59

Leaf Configuration	Leaf Height	Leaf Width
LSASD	2944mm	851mm
	2324mm	1162mm
ULSASD	2887mm	835mm
	2279mm	1139mm
Maximum Transomed Overpanel Height		2000mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in either the leaf head or frame reveal, opposing the 2no. 15x4mm intumescent seals above (can finish 10mm short of the leaf head if required)
Jamb	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 10mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood (minimum density 640kg/m ³)

Figure C02 **FD60** **HARDWOOD FRAMES AND LIPPINGS**



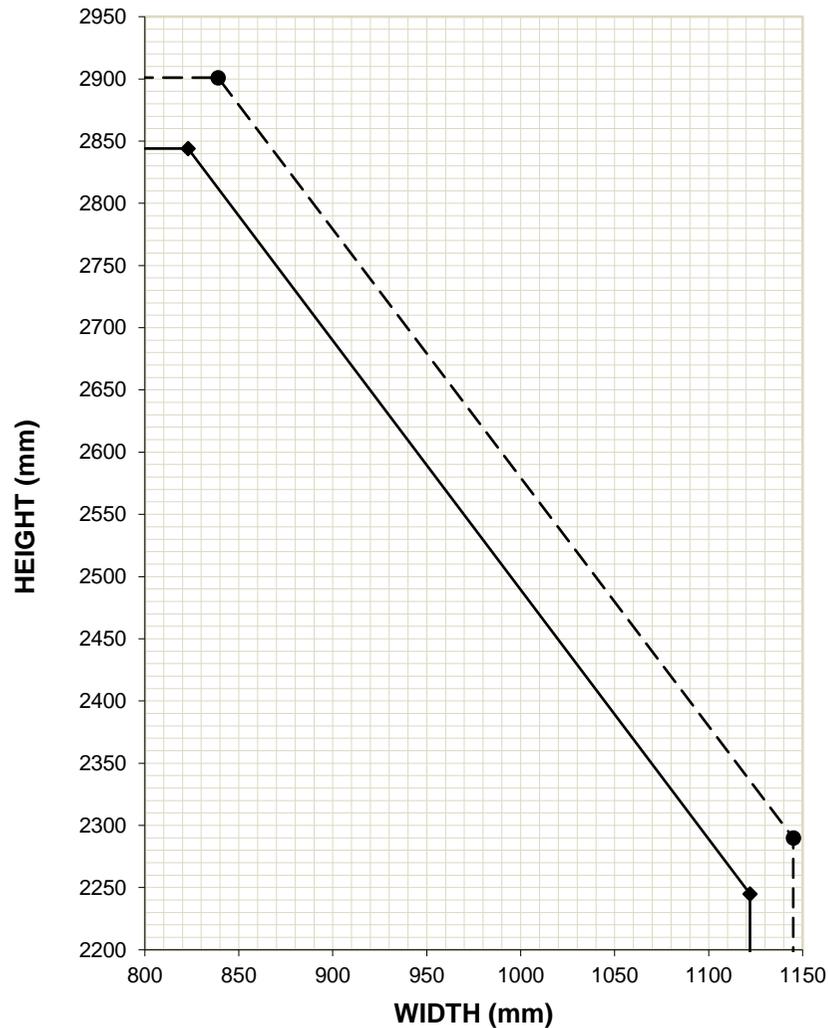
DASD

Firesound 59 Only

Leaf Configuration	Leaf Height	Leaf Width
DASD	2781mm	851mm
	2324mm	1162mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 15mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 15mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in the leaf head, opposing the 2no. 15x4mm intumescent seals in the frame reveal (can finish 10mm short of the leaf head if required)
Jambs	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 15mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Pyroplex Rigid Box graphite or		Hardwood (minimum density 640kg/m ³)

Figure C03 **FD60** **HARDWOOD FRAMES AND LIPPINGS**

Firesound 54, Firesound Plus 54 and Firesound 59



Leaf Configuration	Leaf Height	Leaf Width
LSASD+OP	2901mm	839mm
	2290mm	1145mm
ULSASD+OP	2844mm	823mm
	2245mm	1122mm

Maximum Flush Overpanel Height 2000mm

Intumescent Seal Specification

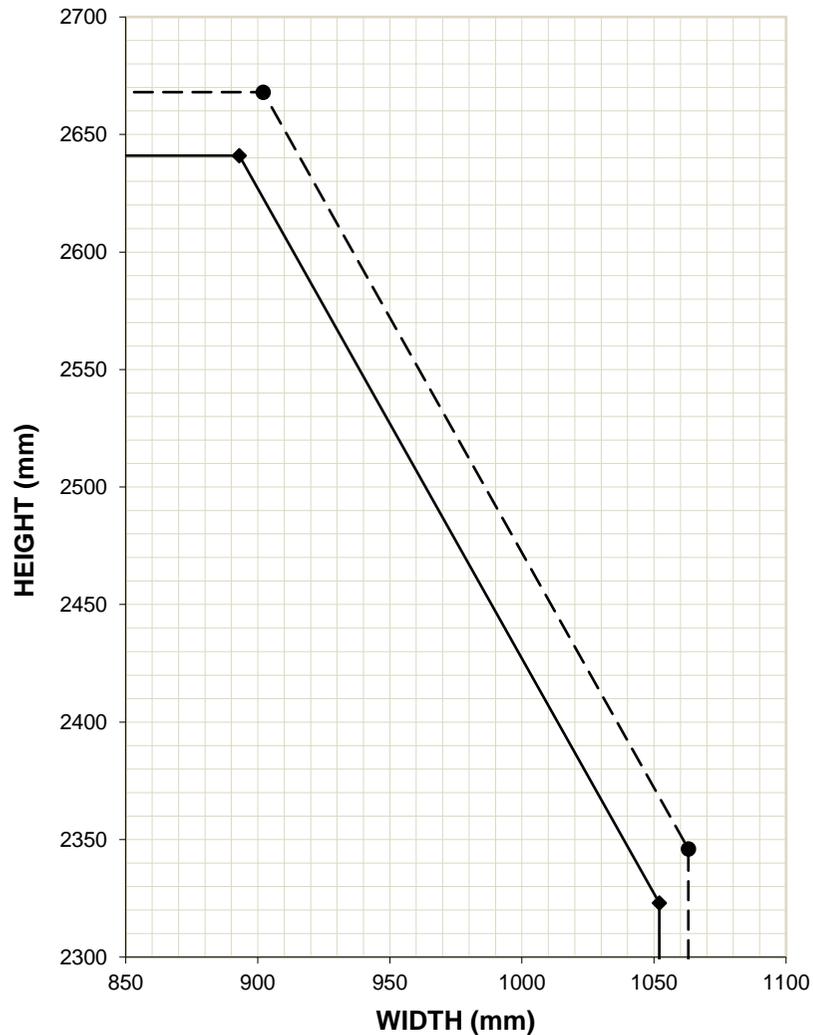
Flush Overpanel /Leaf Head Interface	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the bottom edge of the overpanel, spaced 10mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the bottom edge of the overpanel, spaced 10mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in the leaf head (can finish 10mm short of the leaf head if required)
Head	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 10mm apart	
Jambs	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 10mm apart	

Intumescent Seal Manufacturer/Type	Permitted Door Frame/Lipping Material
------------------------------------	---------------------------------------

Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P	Hardwood (minimum density 640kg/m ³)
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LSASD+OP - - - - - ULSASD+OP —————

Figure C04 **FD60** **HARDWOOD FRAMES AND LIPPINGS**



Firesound 54, Firesound Plus 54 and Firesound 59

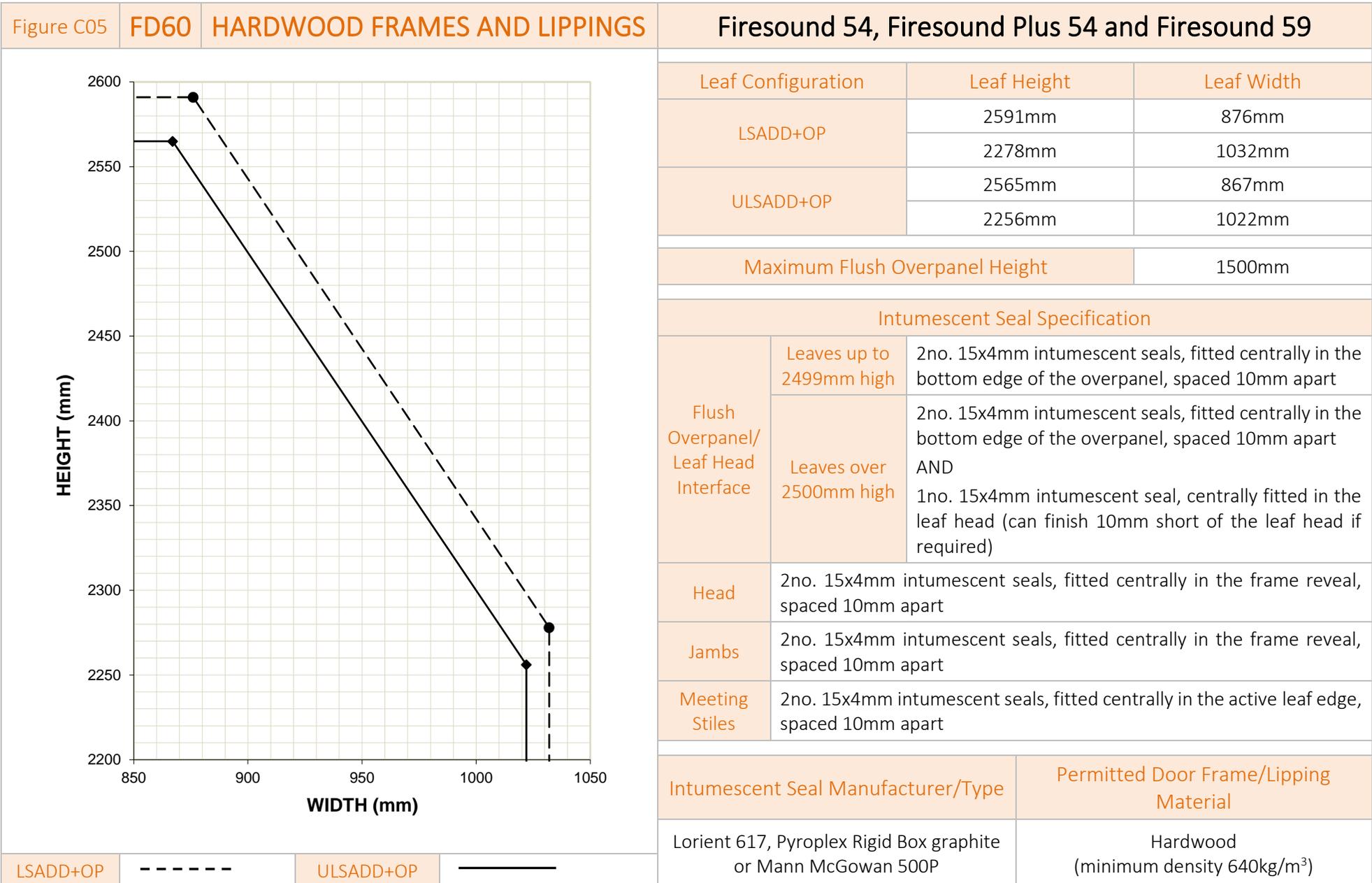
Leaf Configuration	Leaf Height	Leaf Width
LSADD	2668mm	902mm
	2346mm	1063mm
ULSADD	2641mm	893mm
	2323mm	1052mm
Maximum Transomed Overpanel Height		1500mm
Intumescent Seal Specification		
Head	Leaves up to 2499mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart
	Leaves over 2500mm high	2no. 15x4mm intumescent seals, fitted centrally in the leaf head or frame reveal, spaced 10mm apart AND 1no. 15x4mm intumescent seal, centrally fitted in either the leaf head or frame reveal, opposing the 2no. 15x4mm intumescent seals above (can finish 10mm short of the leaf head if required)
Jambs	2no. 15x4mm intumescent seals, fitted centrally in the frame reveal, spaced 10mm apart	
Meeting Stiles	2no. 15x4mm intumescent seals, fitted centrally in the active leaf edge, spaced 10mm apart	
Intumescent Seal Manufacturer/Type		Permitted Door Frame/Lipping Material
Lorient 617, Pyroplex Rigid Box graphite or Mann McGowan 500P		Hardwood (minimum density 640kg/m ³)

LSADD



ULSADD





APPENDIX D – INSTALLATION OF HARDWARE

GENERAL REQUIREMENTS	
General Installation	<ul style="list-style-type: none"> All hardware items must be installed in accordance with the manufacturer's instructions, except where specific installation requirements or limitations have been detailed herein by IFC Mortices and holes must be cut/drilled tightly, such that there are no gaps around the hardware items/cables/fixings (and intumescent protection, if included) when they are installed
Door Closing Devices	<p>Except in those situations where Approved Document B ^{See Note 2} or the project fire strategy permits the omission of self-closing devices, every hinged fire door (both leaves in double doors), including flat entrance doors and doors between a dwelling and an integral garage, must be fitted with a self-closing device.</p> <p>However, it is a requirement of this Field of Application Report, that when not in use, any Fire door not fitted with a self-closing device, must be closed fully into the frame reveal and retained shut by an engaged latch or lock.</p> <p>Door closing devices must also meeting all of the following requirements:</p> <ul style="list-style-type: none"> Meet the requirements of BS EN 1154:1997 Be adjusted so that they are capable of fully closing the door leaf, against any friction imposed by the latch, perimeter seals and/or other items of hardware, from any position of opening. Where the door closing device is motor driven, it must be capable of fulfilling the above requirements in the event of electrical power loss. <p><i>Note 2 Approved Document B permits Fire doors to cupboards and Fire doors within flats or dwellings to be installed without self-closing devices</i></p>
Hardware Margins	<p>Unless specified otherwise herein, there must be:</p> <ul style="list-style-type: none"> A minimum 100mm margin between each hardware item A minimum 50mm margin between each item of hardware and any glazed apertures, feature grooves, recessed panels/areas and/or concealed cableways The above dimensions must be measured edge-to-edge not centre-to-centre
Hardware Quantity	<p>Unless specifically noted otherwise herein, it is only permitted to fit 1no. of each approved hardware item per door leaf (with the exception of hinges)</p>
Intumescent Protection	<ul style="list-style-type: none"> The type/size/quantity of intumescent protection detailed, herein, may differ from that contained within the standard intumescent protection kit/s supplied by the hardware manufacturer/s. If this is the case, the intumescent protection specified by IFC, herein, takes precedence and must be used If no intumescent protection requirement is stipulated by IFC herein, then standard intumescent protection kits supplied by the hardware manufacturer may still be fitted

D.1 Single Axis Hinges

Tested and Approved Hardware	
<ul style="list-style-type: none"> Royde & Tucker H207 101 x 28mm Hi-Load concealed bearing butt hinges 	

Alternative Hinge Specification		
Element	Specification/Quantity/Dimensions	
Hinge Types	Fixed pin, washered butt, ball bearing butt, lift-off type or journal supported	
Blade Height	89 - 110mm	
Blade Width	28 - 36mm	
Blade Thickness	2.5 - 3.5mm	
Material	Brass (FD30 only), Phosphor Bronze, Steel or Stainless Steel	
Fixings	Minimum 31mm long x 4mm diameter steel screws	
Minimum Number	Leaves up to 2299mm high leaves	3no. hinges
	Leaves over 2300mm high	4no. hinges
Positions	Top	120 - 200mm down from the leaf head to the top of the hinge
	Intermediate	Either equi-spaced between the top and bottom hinges or second hinge positioned 200 – 250mm below the top hinge and the remaining hinge/s, if using, equi-spaced between the second and bottom hinge
	Bottom	150 - 225mm up from the bottom of the leaf to the bottom of the hinge blade
Intumescent Protection	FD30	None required
	FD60	All hinge blades to be bedded on 1mm thick mono-ammonium phosphate e.g. Interdens or Therm-A-Strip
Additional Requirements /Notes	<ul style="list-style-type: none"> Rising butts, cranked butts and spring hinges (single or double action) are not approved under the scope of this Assessment Additional hinges (up to maximum of 5no. per leaf) may be installed if preferred/required for mechanical purposes Single axis hinges must have been successfully type tested for conformity to all the requirements of BS EN 1935: 2002, including the additional requirements for fire/smoke door use Single axis hinges must have a Door Mass Grade, as defined in BS EN 1935: 2002, which demonstrates the hinge is capable of supporting a door leaf weight, equal to, or greater than, that proposed. 	

D.2 Concealed Hinges

GENERAL			
ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS		
Minimum Number	Leaves up to 2499mm high	3no. hinges	
	Leaves over 2500mm high	4no. hinges	
Positions	Top	175 - 225mm down from the leaf head to the top of the hinge	
	Middle	Option 1	Equi-spaced between the top and bottom hinges
		Option 2	2nd hinge positioned 200 – 250mm below the top hinge, with remaining intermediate hinges, if using, equi-spaced between the second and bottom hinges
Bottom	225-275mm up from the bottom of the leaf to the bottom of the hinge		
Additional Requirements/Notes	<ul style="list-style-type: none"> The door frame hanging jamb must comply with the minimum thickness as specified in the tables below for specific hinge types It must be ensured that the correct number of hinges are fitted to ensure that the door leaf is supported for the full fire resistance period 		

D.2.1 Bartels PIVOTA DXS 100 3-D (Design)

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS
Hinge Body (Frame)	180mm high x 27mm wide x 30mm deep
Hinge Body (Door)	180mm high x 24mm wide x 30mm deep
Material	Steel/Stainless steel
Fixings	Steel screws - 50mm long x 4.5mm diameter
Intumescent Protection	Hinge body mortises lined with Mann McGowan MMG567 intumescent sheet material
Additional Requirements/Notes	The door frame hanging jamb must be a minimum of 38mm thick

D.2.2 Tectus TE527 3D FR Concealed Hinge

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS
Hinge Body (Frame)	155mm high x 26mm wide x 33mm deep
Hinge Body (Door)	155mm high x 26mm wide x 38mm deep
Material	Stainless steel
Fixings	Steel screws - 40mm long x 5.2mm diameter (No.10)
Intumescent Protection	The sides of the hinge mortises in both the frame and the door leaf to be lined with 1mm Interdens intumescent sheet material
Additional Requirements/Notes	The door frame hanging jamb must be a minimum of 44mm thick

D.3 Mechanical Single Point Mortise Locks/Latches

Tested and Approved Hardware	
<ul style="list-style-type: none"> • Glutz 4621-7/60 mortise lock/latch 	

Alternative Lock/Latch Specification			
Element		Specification/Quantity/Dimensions	
Latch/Lock Type		Mortise latches, tubular mortise latches, sashlocks and deadlocks	
Maximum Forend Dimensions		235mm high x 25mm wide x 3mm thick	
Maximum Strike Plate Dimensions		180mm high x 26mm wide (excluding tongue)	
Maximum Body Dimensions		165mm high x 100mm wide x 15mm thick	
Material		Steel based with no essential part of the lock/latch to comprise polymeric or other low melting point (<800°C) materials and should not contain any flammable materials	
Position		Centred at 1000mm (± 200mm) above the bottom of the door leaf	
Intumescent Protection	FD30	Single Doorsets	None required
		Double Doorsets	1mm thick mono-ammonium phosphate e.g. Interdens or Therm-A-Strip intumescent sheet material under the lock/latch forend and strike plate
	FD60	Single and Double Doorsets	1mm thick mono-ammonium phosphate e.g. Interdens or Therm-A-Strip intumescent sheet material encapsulating the lock/latch body and under the forend and strike plate
Additional Requirements/Notes		<ul style="list-style-type: none"> • Where glazed 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 mortise • It is a condition of this assessment that the margin must be at least 50mm wider than the lock/latch mortise. If the mortise lock/latch is fitted in line with a 'rail' between two apertures, no part of the lock mortise shall be closer than 50mm to the edge of any aperture • Over-morticing is to be avoided; mortises shall be as tight as possible to the latch. • If there are gaps around the case (not exceeding 2mm) then these must be made good with intumescent mastic or sheet material. • Holes for spindles or cylinders shall be kept as small as is compatible with the operation of the hardware • Mortise locks/latches must have been successfully type tested for conformity to all the requirements of BS EN 12209: 2016 including the additional requirements for fire/smoke door use • Mortise locks/latches must have achieved the appropriate Grade in respect of suitability of use in fire resisting doors, as defined in BS EN 12209:2016. This constitutes Grade B for latched door configurations and Grade N for unlatched door configurations 	

D.4 Electronic Locks/Latches and Handlesets – Battery Operated

D.4.1 Assa Abloy Signature MPA 4G RFID

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS	
	Signature Lock/Latch	
Forend Dimensions	235mm high x 24mm wide x 3mm thick	
Strike Plate Dimensions	200mm high x 40mm wide x 3mm thick (including tongue)	
Body Dimensions	150mm high x 152mm wide x 16mm thick	
Material	Steel	
	Signature Battery Cover ref: 2028 010	Signature Control Unit ref: 2028 AHS 00075
Dimensions	140mm high x 80mm wide x 10mm thick	68mm high x 43mm wide x 17mm thick
Material	Steel and PVC	PVC
	Hospitality RFID Reader ref: 1825 AHS 01531	Signature Mounting Plate for Hospitality RFID Reader ref: 1804 AHS 02590
Dimensions	90mm high x 60mm wide x 17mm thick	90mm wide x 80mm high x 10mm thick
Material	Stainless steel and PVC	Steel and PVC
Position	The lock must be centred at 1000mm (± 200mm) above the bottom of the door leaf in the closing leaf edge	
Intumescent Protection	Lock body	1mm Mann McGowan Interdens to both sides of the lock case and 2mm graphite to the back and top lock edges (ref: MMG568)
	Forend	Forend bedded on 1mm Mann McGowan Interdens (part of the MMG568 kit)
	Keep	2mm Mann McGowan Interdens fitted to the back of the keep (part of the MMG568 kit)
	Reader fixing holes	1mm Exterdens lining the 3no. drill and access holes (part of the MMG568 kit)
Additional Requirements/Notes	None	

D.4.2 Assa Abloy Vingcard Essence RFID

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS	
	Essence Lock/Latch	Essence Morticed Battery/RFID Unit
Forend Dimensions	203mm high x 24mm wide x 1.5mm thick	150mm high x 24mm wide x 1.5mm thick
Strike Plate Dimensions	124mm high x 32mm wide (excluding tongue)	N/A
Body Dimensions	158mm high x 107mm wide x 25mm thick	103mm high x 108mm wide x 21mm thick
Material	Steel	Steel case containing plastic electronic components and 3no. AA batteries
	Essence RFID Reader	Surface Battery Pack
Dimensions	40mm diameter	N/A
Material	Plastic	
Position	<ul style="list-style-type: none"> The lock must be centred at 1000mm (\pm 200mm) above the bottom of the door leaf in the closing leaf edge located on the centreline of the leaf thickness The battery/RFID unit is located directly above the lock, offset 192mm (centre to centre) 	
Intumescent Protection	Lock and morticed battery body	1mm Interdens to both sides of the lock case and 2mm graphite/ Interdens to the back and top lock edges
	Forend	Forend bedded on 1mm Interdens
	Keep	2mm Interdens fitted to the back of the keep
Additional Requirements/Notes	None	

D.4.3 ONITY Advance Trillium RFID + Euro 5470H Electronic Lock (FD30 Only)

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS		
	Euro 5470H Electronic Lock		
Forend Dimensions	240mm high x 23mm wide x 3mm thick		
Strike Plate Dimensions	185mm high x 24.5mm wide (35.5 including tongue)		
Body Dimensions	174mm high x 100mm wide x 14mm thick		
Material	Steel		
	ONITY Advance Trillium RFID Reader		
	Handle With Battery Compartment	RFID Card Reader	Handle Escutcheon
Dimensions	309mm high x 94mm wide x 23-32mm thick	58.8mm high x 87mm wide x 20mm thick	87mm diameter x 28mm thick
Material	Metal and Plastic	Metal and Plastic	Metal and Plastic

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS	
Position	The lock must be centred at 1000mm (± 200mm) above the bottom of the door leaf in the closing leaf edge located on the centreline of the leaf thickness	
Intumescent Protection	Lock/Latch Body	1mm Interdens fully encapsulating the lock body
	Forend	Bedded on 1mm Interdens
	Strike Plate	Bedded on 1mm Interdens
	Inner Handle Mounting Plate	Bedded on 1mm Interdens
	RFID Card Reader	Bedded on 1mm Interdens
	Handle Escutcheon	Bedded on 1mm Interdens
Additional Requirements/Notes	FD30 door assemblies only	

D.5 Cableways

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS
Cableway Dimensions	12mm deep x 10mm wide
Position	<ul style="list-style-type: none"> Runs around the lower perimeter of the door leaf, commencing at a lock in the closing leaf edge and terminating at a cable loop in the hanging leaf edge The cableway is to be machined into the vertical leaf edges after the groove for the hardwood insert has been machined and prior to being covered by the hardwood insert and lipping The cableway is to be machined into the bottom leaf edge as an extension of the dropseal groove. If no dropseal is fitted, a hardwood insert and lipping must be fitted to the bottom leaf edge and the cableway machined as per the vertical leaf edges The cableway must commence and terminate at a maximum of 1000mm up from the bottom leaf edge The cableway may be either centred on the leaf thickness or abut either side of the centreline of the leaf thickness The horizontal and vertical cableway grooves may be joined via a 10mm diameter hole, drilled at nominally 45-60 degrees to each other, which starts no further than 80mm from the bottom corner of the leaf. Any part of the cableway grooves which are not to contain a cable, must be completely infilled with hardwood (minimum density 640kg/m³), glued in place with polyurethane or urea formaldehyde adhesive
Insert Material	8mm thick x 27mm wide hardwood (minimum density 638kg/m ³) inserts must be used to cover the cableway in the vertical leaf edges and bottom leaf edge if no dropseal is fitted
Infill Adhesive	Polyurethane
Intumescent Protection	The full length of one inner face of the cableway must be lined with 10mm wide x 2mm thick Mann McGowan Pyrostrip 500 graphite intumescent sheet material
Additional Requirements/Notes	None

D.6 Cable Loop – Assa Abloy EA280

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS	
Cable Loop Body	258mm long x 24mm wide x 17mm deep (324mm long including fixing tabs)	
Flexible Tube	250mm long x 12mm diameter	
Tube Retaining Plate	50mm long x 17mm wide	
Position	<ul style="list-style-type: none"> The cable loop body is fitted in the hanging frame jamb and the tube retaining plate is fixed to the hanging leaf edge Must be fitted on the centreline of the leaf thickness Fitted a maximum of 800mm up from the bottom leaf edge 	
Materials	Steel	
Intumescent Protection	Closer Loop Body	All faces lined with 2mm thick ITD-Abloy-EA280 Interdens intumescent sheet
Additional Requirements/Notes	None	

D.7 Door Closers

General Requirements/Notes
<p>Every hinged fire door (both leaves in double doors), including flat entrance doors and doors between a dwelling and an integral garage, must be fitted with a self-closing device, with the exception of the following;</p> <ul style="list-style-type: none"> Fire doors which are normally kept locked shut and labelled with an appropriate sign which complies with BS5499: Part 1: 1990 Fire doors to cupboards Fire doors within flats or dwellings <p>IFC recommends that the fire strategy for the proposed project is reviewed, as this may detail specific requirements for door closing devices, which takes precedence over the details outlined above.</p> <p>This report evaluates 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 door closing device, or locked shut, as applicable. If no door closing device is fitted, good management practice must be in place to ensure the doors are fully closed into the frame reveal when not in use.</p> <p>All door closing devices must be fitted according to the manufacturer's instructions (unless stipulated otherwise herein) 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.</p>

D.7.1 Surface Mounted Door Closers

Tested and Approved Hardware
<ul style="list-style-type: none"> • Arrone surface mounted overhead closer – AR1500

General Requirements/Notes
<ul style="list-style-type: none"> • Surface mounted door closers must have been fire tested or assessed by IFC for use on unlatched FD30 or FD60 timber door leaves hung within timber frames • If a surface mounted closer is to be fitted within 100mm (in the vertical plane) of apertures containing uninsulated glass, 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

D.7.2 Concealed Door Closers

GENERAL REQUIREMENTS/NOTES	
ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS
Position	<ul style="list-style-type: none"> • The closer body is located in the leaf head and the closer slide arm channel is located in the frame head/transom • Must be located on the centreline of the leaf thickness
Additional Requirements/Notes	<ul style="list-style-type: none"> • Transoms must be a minimum of 44mm thick when used in conjunction with concealed overhead door closers • Where concealed overhead door closers are installed in the 'top rail' between a glazed aperture and a door edge, the 'top rail' must be at least 200mm high

D.7.3 Geze Boxer Concealed Door Closer - 2-4 Model

ELEMENT	SPECIFICATION/QUANTITY/DIMENSIONS	
Slide Arm Channel	440mm long x 20mm wide x 12mm deep	
Closer Body Top Plate	340mm long x 32mm wide x 3mm thick	
Closer Body	240mm long x 32mm wide x 42mm deep	
Intumescent Protection	Slide Arm Channel Mortice	All faces lined with 1mm thick Interdens intumescent sheet (Mann McGowan MMG107)
	Closer Body Mortice	All faces lined with 1mm thick Interdens intumescent sheet (Mann McGowan MMG109)
	Top of Closer Body	Covered in 1mm thick Interdens intumescent sheet (Mann McGowan MMG579)
Additional Requirements/Notes	<ul style="list-style-type: none"> • Door stop thickness/rebate depth must be a minimum of 18mm • A 27mm wide x 8mm thick timber insert must be fitted into the leaf head (see Section 4.1.3) covered by a minimum 8mm thick hardwood (minimum density 640kg/m³) lipping 	

D.8 Floor Springs (Moralt Firesound 59 only)

Tested and Approved Hardware
<ul style="list-style-type: none"> • Dorma BTS 80 F EN6 floor spring

General Requirements/Notes
<ul style="list-style-type: none"> • If the floor spring is to be used as the door closing device, it must be adjusted so that it is capable of fully closing the door leaf against any friction imposed by the latch and smoke seals (if fitted), from any position of opening • No removal of timber or intumescent strip (where fitted) is permitted at the hanging leaf edge, except for a 6-8mm diameter access hole for the top strap adjustment screw, if required • Frame heads must be a minimum of 45mm thick • Only the Moralt Firesound 59 door design may be used in conjunction with a floor spring

D.8.1 Dorma BTS 80 F EN6 floor spring (Moralt Firesound 59 only)

Element	Specification/Quantity/Dimensions	
Materials	Floor spring	Aluminium body with steel spring, spindle and cover plate
	Top centre and top/bottom straps	Steel
Floor Spring Dimensions	341mm long x 78mm wide x 60mm deep	
Bottom Strap Model and Dimensions	Dorma 7421 235mm long x 24mm wide x 20mm thick	
Top Strap Model and Dimensions	Dorma 8066 122mm long x 29mm wide x 15mm thick	
Top Centre Model and Dimensions	Dorma 8066 165mm long x 25mm wide x 42mm deep	
Intumescent Protection (FD30 and FD60)	Bottom Strap (leaf)	2mm thick mono-ammonium phosphate e.g. Interdens or Therm-A-Strip, intumescent sheet material lining the bottom strap mortice
	Top Strap (leaf)	2mm thick mono-ammonium phosphate e.g. Interdens or Therm-A-Strip, intumescent sheet material lining the top strap mortice
	Top Centre (frame)	None required
	Floor Spring (threshold)	2mm thick graphite-based sheet material lining the floor spring mortice

D.9 Flush Bolts

Tested and Approved Hardware	
<ul style="list-style-type: none"> Zoo Hardware ZAS03RSS 	

Alternative Flush Bolt Specification	
Element	Specification/Quantity/Dimensions
Maximum Size	205mm long x 20mm wide x 19mm deep
Material	Steel based with no essential part of the flush bolt to comprise polymeric or other low melting point (<800°C) materials and should not contain any flammable materials
Position	<ul style="list-style-type: none"> Positioned at the top and bottom of the vertical meeting edge of the passive leaf Must be located on the centre line of the leaf thickness
Intumescent Protection	1mm thick mono-ammonium phosphate e.g. Interdens or Therm-A-Strip, intumescent sheet material lining the mortise for the flush bolt and under the return forend and opposing keep plate

D.10 Push/Kick Plates

Element	Specification/Quantity/Dimensions
Maximum Dimensions	Maximum 0.4m ² per leaf face in any orientation
Fixing	<ul style="list-style-type: none"> Mechanically fixed with short screws (maximum 25mm long) <p>or</p> <ul style="list-style-type: none"> Glued with a thermally softening adhesive (e.g. contact adhesive)
Material	Steel, aluminium or PVC
Intumescent Protection	None required
Additional Requirements/Notes	<ul style="list-style-type: none"> Must be cut short of door stops and glazing beads but may be located under handle rose/escutcheons Must not return round onto the leaf edges Push/kick plates must be surface fixed only and not be recessed into the leaf face

D.11 Surface Mounted Pull Handles

Element	Specification/Quantity/Dimensions
Max Dimensions	Outer fixing points must be no greater than 800mm apart
Material	Steel or aluminium
Intumescent Protection	Bolt-through fixings must be wrapped in 1mm thick graphite-based or mono-ammonium phosphate e.g. Interdens or Therm-A-Strip, intumescent sheet material
Additional Requirements/Notes	Pull handles that are fixed through the leaf shall use clearance holes as close fitting as possible to the bolt

D.12 Panic Hardware

Element	Specification/Quantity/Dimensions
Maximum Dimensions	No restrictions
Material	Steel or aluminium
Position	Surface mounted to the door leaf or frame
Intumescent Protection	None required
Additional Requirements/Notes	<ul style="list-style-type: none"> Doors fitted with panic hardware must be treated as being unlatched The installation of panic hardware must not involve the removal of any material from the door leaf or door frame The installation of panic hardware which includes a battery pack or requires the addition of a cableway through the door or frame is not approved

D.13 Drop Seals

Element	Specification/Quantity/Dimensions	
Drop Seal Models	<ul style="list-style-type: none"> 35x14mm Lorient LAS8001si 30x15mm Athmer Schall ExL 15/30 WS 28.5x13mm Mann McGowan DD-1703ACU 	
Maximum Dimensions	35mm high x 15mm thick x full width of door leaf	
Position	May be either centred on the leaf thickness or fitted either side, but adjacent to, the centreline of the leaf thickness	
Intumescent Protection	FD30	None required
	FD60	1mm thick graphite-based or mono-ammonium phosphate e.g. Interdens or Therm-A-Strip, intumescent sheet material lining the mortice
Additional Requirements/Notes	None	

APPENDIX E - SUMMARY OF FIRE TEST EVIDENCE

Test Report information		Items/Details Supported by Test Evidence
Test Report	BMT/FEP/F16156 Rev B	<p><u>Door A</u></p> <ul style="list-style-type: none"> Frame: 100x30mm doweled spruce (470kg/m³) + 18mm planted stop. Mortice and tenon jointed and screwed. Architraves: 45x16mm spruce (470kg/m³) to the frame/partition joint Astragal: 45x16mm spruce (470kg/m³) covering the joint between leaf head and overpanel Leaf: Firesound (Plus) 54 PK02 FD30 (Full leaf construction details held on confidential file by IFC). 7mm thick Spruce lippings (470kg/m³) to all leaf and overpanel edges, apart from leaf hanging edge which was 15mm thick, adhered using PVA or PU adhesive Hinges: 3no. 101x28mm R&T H207 butt hinges (155, 1060 + 1962 from leaf head) (no intumescent protection) Overhead closer: Arrone AR1500 surface mounted overhead closer Lock: Glutz 4621-7/60 mortise lock 235x25mm forend/163x93x13.5mm body/170x26mm strike (no intumescent protection) Drop seal: 35x14mm Lorient LAS8001si drop seal fitted centrally in the bottom leaf edge (no intumescent protection) Intumescent: 15x4mm Lorient 617 intumescent seal central in frame reveal and 20x4mm Lorient 617 intumescent seal central in bottom edge of overpanel Glazed Aperture: 1106x406mm aperture, 15mm Pilkington Pyrostop 30-1 inner pane with 5mm acrylic outer panes (flush to leaf faces). 8mm spruce (470kg/m³) lining the aperture. 20mm high x 12.5mm deep spruce (470kg) beads with 50mm pneumatic pins, 45mm from corners and at 140mm centres. ISL 15x2mm TAGlaze 45 between beads and glass and 44x2mm TALine lining the aperture. <p><u>Door B</u></p> <ul style="list-style-type: none"> Frame: 100x30mm doweled sipo/mahogany (640kg/m³) + 18mm planted stop. Mortice and tenon jointed and screwed. Architraves: 45x16mm sipo/mahogany (640kg/m³) to the frame/partition joint Astragal: 45x17mm sipo/mahogany (640kg/m³) covering the joint between leaf head and overpanel Leaf: Firesound 54 (Plus) PK01 FD60 (Full leaf construction details held on confidential file by IFC). 8mm thick sipo/mahogany lippings (640kg/m³) to all leaf and bottom overpanel edges, apart from leaf hanging edge which was 15mm thick, adhered using PU adhesive Hinges: 3no. 101x28mm R&T H207 butt hinges (155, 1060 + 1962 from leaf head) (1mm Lorient MAP) Overhead closer: Arrone AR1500 surface mounted overhead closer Lock: Glutz 4621-7/60 mortise lock 235x25mm forend/163x93x13.5mm body/170x26mm strike (1mm Lorient MAP to body, forend and keep) Flush bolts: (disengaged) 205 x 20mm flush bolts fitted top and bottom of passive leaf (1mm Lorient MAP lining bolt mortise) Drop seal: 35x14mm Lorient LAS8001si drop seal fitted centrally in the bottom leaf edge (1mm Lorient MAP) Intumescent: 2no.15x4mm Lorient 617 intumescent seals central in frame reveal, spaced 10mm apart, and in bottom edge of overpanel and closing edge of passive leaf Glazed Aperture: 1106x406mm aperture, 23mm Pilkington Pyrostop 60-1 inner pane with 5mm acrylic outer panes (flush to leaf faces). 8mm sipo/mahogany (640kg/m³) lining the aperture. 20mm high x 8.5mm deep sipo/mahogany (640kg/m³) beads with 50mm pneumatic pins, 40mm from corners and at 140mm centres. ISL 15x2mm TAGlaze 45 between beads and glass and 44x2mm TALine lining the aperture.
Test Sponsor	James Latham	
Test Laboratory	Warringtonfire	
Test Date	23 June 2016	
Door Configuration	Door A = ULSASD + OP Door B = ULSADD + OP	
Leaf size (mm)	<p><u>Door A</u> - 2250 x 916 x 54 + 305 OP</p> <p><u>Door B</u> - 2250 x 916/332 x 54 + 305 OP</p>	
Test Standard	BS476: Part 22: 1987	
Test result	Door A = 51 minutes Door B = 74 minutes	

Test Report information		Items/Details Supported by Test Evidence
Test Report	WF 382394 Rev A AR1	<ul style="list-style-type: none"> • Frame: 100x45mm sapele (650kg/m³) no stop. Dowelled joint, glued and screwed. • Architraves: 45x18mm MDF (750kg/m³) to the frame/partition joint • Leaf: Firesound LAMINESSE 59 (Full leaf construction details held on confidential file by IFC). 41x8mm sapele(650kg) insert to stiles and 41x45mm sapele (650kg/m³) insert to top and bottom leaf edges. 5mm thick sapele(650kg) lippings to all leaf edges, apart from leaf hanging edge which was 15.6mm radiused to 5mm thick, adhered using PU adhesive • Floor Spring: Dorma BTS 80 F EN6 floor spring with Dorma 7421 bottom strap and 8066 top strap (2mm Interdens lining top and bottom strap mortices and 2mm Odice Flexodice lining floorspring mortice) • Intumescent: 2no.15x4mm Pyroplex intumescent seals central in frame reveal spaced 15mm apart. • Drop seal: 30x15mm Athmer Schall ExL 15/30 WS drop seal fitted towards the exposed face in the bottom leaf edge (1mm Odice Flexodice graphite lining mortice)
Test Sponsor	Moralt AG	
Test Laboratory	Warringtonfire	
Test Date	17 May 2017	
Door Configuration	Door A = ULDASD	
Leaf size	Door A - 2250 x 1000 x 59mm	
Test Standard	BS476: Part 22: 1987	
Test result	Door A = 75 minutes	

Test Report information		Items/Details Supported by Test Evidence
Test Report	DMT-DO-50-1010	<ul style="list-style-type: none"> • Frame: 100x38mm sapele (640kg/m³) + 18mm sapele stop. Glued (PU) dowelled butt joint. Door stop to frame head incorporated a 12x13.5mm rebate with corresponding rebate to leaf head. • Architraves: 70x20mm sapele (640kg/m³) to the frame/partition joint • Leaf: Moralt LAMINESSE FireSound Plus 54 (Full leaf construction details held on confidential file by IFC). 27x8mm thick sapele (638kg/m³) insert to stiles and top leaf edges, glued using PU adhesive. Sapele (676kg/m³) lippings, 5mm thick to vertical leaf edges and 8mm thick to top edge, adhered using PU adhesive • Glazed Aperture: Pyroguard EI60 glass, 1255x255x25mm thick. Aperture lined with 4mm sapele(PUR). 29hx15.5 sapele beads including 4x4mm bolection with 20degree splay. Beads fixed using 60x3.2mm screws, 50mm from corners at 220mm centres at 21degrees to the glass. 25x3mm MMG Pyroglaze 60 with 52x2mm MMG Pyrostrip 100 liner. Apertures 400mm from leaf head, 205mm from leaf edge and 80mm between apertures • Hinges: 3no. Bartels PIVOTA DXS 100 3-D Design steel concealed hinges, 180x30 x27mm, fitted 200, 1105 and 2010mm from leaf head to top of hinge • Closer: GEZE Boxer EN 2-4 concealed closer with 440x20x12mm guide rail with 1mm Interdens protection (MMG107, MMG109 & MMG579) liner closer and guide rail mortise and to the top of the closer body • Latch/Lock: Assa Abloy Signature MPA 4G RFID lock with Assa Abloy 1825 AHS 01531 reader fitted to the unexposed face and Assa Abloy 2028 010 battery cover and control unit 2028 AHS 00075 on exposed face. MMG568 1mm Interdens to lock body sides and under forend with 2mm graphite to back and top. 1mm Exterdens lining reader drill holes and 2mm Interdens to back of keep plate. 200x40x3mm strike plate • Cable Loop: Assa Abloy EA280 – 324x24x17mm (2mm Interdens lining mortice) • Cableway: 12mm deep x 10mm wide under the sapele insert, above the dropseal with 10x2mm Pyrostrip 500 lining the bottom of the groove • Intumescent: 2no.15x4mm Mann McGowan Pyrostrip 500 intumescent seals central in frame reveal spaced 10mm apart. • Smoke seal: Mann McGowan ACS1 12x12mm against door stop and Enviroseal Tri-Blade 8x3mm to vertical and top leaf edges fitted in groove • Drop seal: 28.5x13mm Mann McGowan DD-1703ACU drop seal fitted towards the unexposed face in the bottom leaf edge (2mm Interdens to top of drop seal)
Test Sponsor	Moralt AG	
Test Laboratory	DMT-Test Laboratory for Fire Protection	
Test Date	01 November 2021	
Door Configuration	Door A = ULSASD Door B = ULSASD	
Leaf size (mm)	Door A and B - 2440 x 1000 x 54mm	
Test Standard	BS476: Part 22: 1987	
Test result	Door A-42minutes(glass) (69minutes -leaf) Door B-54minutes(glass) (69minutes -leaf)	

Secondary Test Evidence

Test Report information		Items/Details Supported by Test Evidence
Test Report	WF 367907	<ul style="list-style-type: none"> • Frame: 93x56mm sapele (640kg/m³) including a 20mm rebate • Leaf: Halspan Prima door blank. Sapele lippings, 8mm thick to vertical leaf edges only, adhered using UF adhesive • Latch/Lock: Assa Abloy Vingcard Essence RFID lock. 100w x 152h x 25t body, 203h x 28w forend and 124h x 32w strike plate. • Intumescent: 2no.15x4mm Pyroplex intumescent seals fitted centrally in frame reveal spaced 8mm apart.
Test Sponsor	ASSA ABLOY Hospitality Ltd	
Test Laboratory	Exova Warringtonfire	
Test Date	10 th July 2016	
Door Configuration	Door A = LSASD Door B = LSASD	
Leaf size (mm)	Door A and B - 2040 x 932 x 54mm	
Test Standard	BS EN 1634-1: 2014	
Test result	Door A-62minutes Door B-65minutes	

Test Report information		Items/Details Supported by Test Evidence
Test Report	088745-002-1-a	<ul style="list-style-type: none"> • Frame: 151x30mm MDF (640kg/m³), lipped with 4mm oak plus an 18mm MDF stop • Leaf: 38mm thick particleboard core with 8mm thick particleboard facings, lipped on all four leaf edges with 8mm oak • Latch/Lock: EURO 5470H lock. 100w x 174h x 14t body, 240h x 23w forend and 185h x 24.5w strike plate. RFID reader • RFID Reader: ONITY Advance Trillium RFID Reader 309h x 94w x 32t handle including battery compartment. 58.8h x 87w x 20t outer card reader. 87Ø x 28t handle escutcheon • Intumescent protection: 1mm Interdens encasing lock body and forend, strike plate, handle mounting plate, handle escutcheon and RFID reader bedded on 1mm Interdens • Intumescent: 2no.15x4mm Sealed Tight Solutions intumescent seals fitted centrally in frame reveal spaced 10mm apart
Test Sponsor	ONITY S.L.	
Test Laboratory	Tecnalía	
Test Date	22 nd July 2020	
Door Configuration	Door A = LSASD (Out) Door B = LSASD (In)	
Leaf size (mm)	Door A and B - 2229 x 958 x 54mm	
Test Standard	BS EN 1634-1: 2014 +A1: 2018	
Test result	Door A-42minutes* Door B-42minutes**	

Test Report information		Items/Details Supported by Test Evidence
Test Report	DMT-DO-50-1012	<ul style="list-style-type: none"> • Frame: 100x57mm sapele (640kg/m³) including a 18mm high rebate • Leaf: Moralt LAMINESSE SmartCore 55 (Full leaf construction details held on confidential file by IFC). 27x8mm thick sapele (638kg/m³) insert to stiles, glued using PU adhesive. Sapele (676kg/m³) lippings, 5mm thick to vertical and top leaf edges, adhered using PU adhesive • Latch/Lock: Assa Abloy Vingcard Signature MPA 4G RFID lock. 152w x 150h x 16t body, 235h x 24w forend and 200h x 40w • RFID Reader: Assa Abloy 1825 AHS 01531 90h x 60w x 17t. all 3no. installation holes lined with 1mm Exterdens • Battery Cover: Assa Abloy 2028 010 140h x 80w x 10t. all 3no. installation holes lined with 1mm Exterdens • Intumescent: 2no.15x4mm Mann McGowan Pyrostrip 500 intumescent seals central in frame reveal spaced 10mm apart
Test Sponsor	Moralt AG	
Test Laboratory	DMT-Test Laboratory for Fire Protection	
Test Date	03 September 2021	
Door Configuration	Door A = ULSASD Door B = ULSASD	
Leaf size (mm)	Door A and B - 2440 x 1000 x 54mm	
Test Standard	BS476: Part 22: 1987	
Test result	Door A-65minutes Door B-62minutes	

* Failure at lock fitted with reduced level of intumescent protection, no subsequent failure of lock with enhanced intumescent protection before 60 minutes

** Failure of door leaf, not related to lock, no subsequent failure at lock position before 60 minutes