

**FIELD OF APPLICATION REPORT**  
**PAR/12519/02 Revision E**  
August 2021

Moralt AG  
Field of Application Report for Moralt  
FD60 FireSmoke Door Leaves  
Installed in Timber Frames  
Fire Resistance Standard: BS476: Part 22: 1987

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**HEAD OFFICE ADDRESS:**

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

**REGISTERED ADDRESS:**

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

[+44 \(0\)1844 275500](tel:+441844275500)  
[info@ifcgroup.com](mailto:info@ifcgroup.com)

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Prepared on behalf of: [Moralt AG](#)  
[Obere Tiefenbachstrasse 1](#)  
[Hausham](#)  
[D-83734](#)

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## ISSUE RECORD

ISSUE/ REVISION	DATE	AUTHOR	REVIEW	SECTION	AMENDMENTS
PAR/12519/02	March 2013	PP	DC		-
Revision A	October 2013	PP	DC	Several	Inclusion of FireSmoke 35dB construction and associated changes
Revision B	March 2014	PP	DC	Several	Inclusion of additional test evidence and associated changes
Revision C	January 2015	PP	DC	Several	Inclusion of additional test evidence for grooves in leaf faces and associated changes
Revision D	April 2016	DC	DI	Several	Inclusion of additional test evidence and associated changes
Draft Revision E	August 2021	MB	CPH	All	Complete update to latest IFC format. Omission of FireSafe doors. Omission of some test evidence. Revisions to scope and specifications in most sections /clauses. Addition of test evidence for dummy cylinders, concealed closer and concealed hinge. Addition of test evidence for Acrovyn cladding to doors and frames.
Revision E	August 2021	MB	CPH	Appendix A&B.	Draft accepted by client, without changes. Format of Appendix A and B amended but technical details/scope remain as draft version.

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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 timber-based door assemblies, comprising Moralt FireSmoke door leaves (54mm thick) installed in timber frames, that are required to provide 60 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

For the sake of clarity, the scope of approval in this report does not include Moralt FireSafe doors.

This assessment has been produced using the principles outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of fire performance of construction products based on fire test evidence, 2021, Industry Standard Procedure'*.

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

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

It is proposed that variations to the tested specifications, as described in the following sections, may be accommodated into door assemblies, without reducing their potential to satisfy the integrity criteria for 60 minutes, 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 hinged timber door assemblies 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.

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

## 2. TEST EVIDENCE

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

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

Some of the tests were performed to BS EN 1634-1: 2000; or 2008. The test standard has been revised since the original testing, and the current version is BS EN 1634-1: 2014 but the revisions to the standard do not affect the performances obtained; nor the approvals in this Assessment Report.

### Comparison of EN 1634-1 and BS476: Part 22: 1987 test methods

The appropriate performance of fire resisting doorsets is defined in Approved Document B of the Building Regulations (2006 Edition with 2010 and 2013 Amendments), the Scottish Building Standards Technical Handbook (2013 Edition) or the Building Regulations (Northern Ireland) 2012.

Table C1 in Appendix C of Approved Document B, which applies to England and Wales, identifies doorsets by their performance under test to the latest version of BS EN 1634-1 or BS476: Part 22: 1987, in terms of integrity for a period of minutes, (e.g. E30/E60, if their performance is measured in terms of EN 1634-1, or FD30/FD60 for BS476: Part 22: 1987). It should be noted that a suffix (S) is added for doors where restricted smoke leakage at ambient temperatures is needed; but that aspect is not covered by this Assessment Report. The Scottish and Northern Ireland documents also refer to the British and European Standards in Section 2D and Section B3 respectively of these documents.

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

- a. The method of measuring the furnace (exposure) temperature in the EN 1634-1 test is by means of plate thermocouples. The 'plates' have a greater thermal inertia than the bead thermocouples used in the BS476: Part 22: 1987 test, and therefore the heat input is higher than that given in BS476 at any given time during approximately the first 15 minutes of a fire resistance test.
- b. The furnace pressure in the EN 1634-1 test is neutral at a position 500mm above the threshold, compared to a nominal 1 metre in the BS476: Part 22: 1987 test. As a consequence, the pressure over the upper part of the doorset is higher and, therefore, is more onerous in the EN test.

There are other minor procedural matters that also increase the severity of the EN method. These, combined with the issues identified in a) and b) above, mean that the EN 1634-1 test is generally accepted as being a more onerous test than BS476: Part 22: 1987. This is borne out by IFC's experience of fire resistance testing already performed since the introduction of the European test standard.

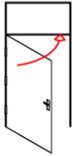
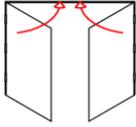
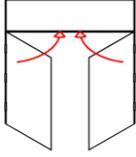
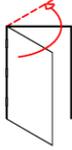
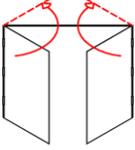
As such, it is reasonable to state that any test results on doorsets tested to EN 1634-1 can be utilised in situations requiring a performance defined against the BS476: Part 22 test method, or when making assessments and judgements against the BS476 criteria, but not vice versa.

### 3. SCOPE OF APPROVAL

#### 3.1 Door Assembly Configurations – FireSmoke doors

The approved leaf sizes and configurations of door assemblies comprising 54mm thick FireSmoke door leaves are outlined in Table 1, below.

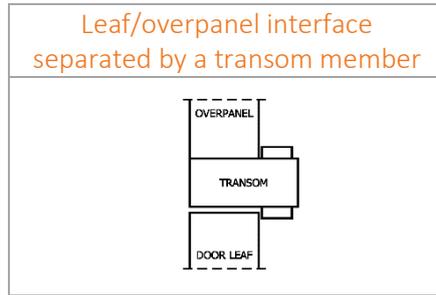
**Limitations to door leaf sizes apply with certain variations to door construction and/or frame options; so all sections and clauses of this report must be read to ensure full understanding and compliance.**

CONFIGURATION		ENVELOPE OF APPROVED LEAF SIZES <sup>NOTE 4</sup>
	<ul style="list-style-type: none"> <li>Latched or Unlatched</li> <li>Single Acting</li> <li>Single Door</li> <li>Without Overpanel</li> <li>(or with overpanel above a transom <sup>Note 1</sup>)</li> </ul>	See Figures in Appendix A & B (depending upon facings option)
	<ul style="list-style-type: none"> <li>Latched or Unlatched</li> <li>Single Acting</li> <li>Single Door</li> <li>With Overpanel <sup>Note 2</sup></li> </ul>	See Figures in Appendix A & B (depending upon facings option)
	<ul style="list-style-type: none"> <li>Latched or Unlatched</li> <li>Single Acting</li> <li>Double Doors <sup>Note 3</sup></li> <li>Without Overpanel</li> <li>(or with overpanel above a transom <sup>Note 1</sup>)</li> </ul>	See Figures in Appendix A & B (depending upon facings option)
	<ul style="list-style-type: none"> <li>Latched or Unlatched</li> <li>Single Acting</li> <li>Double Doors <sup>Note 3</sup></li> <li>With Overpanel <sup>Note 2</sup></li> </ul>	See Figures in Appendix A & B (depending upon facings option)
	<ul style="list-style-type: none"> <li>Unlatched</li> <li>Double Acting</li> <li>Single Door</li> <li>Without Overpanel</li> </ul>	See Figures in Appendix A & B (depending upon facings option)
	<ul style="list-style-type: none"> <li>Unlatched</li> <li>Double Acting</li> <li>Double Doors <sup>Note 3</sup></li> <li>Without Overpanel</li> </ul>	See Figures in Appendix A & B (depending upon facings option)

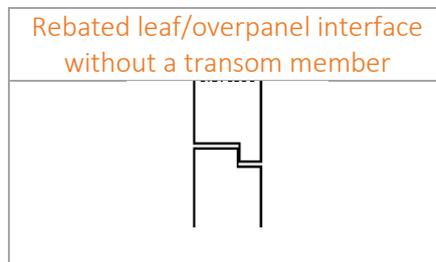
**Table 1. Approved leaf Configurations and Sizes**

Notes overleaf

Note 1 Single-Acting door assemblies which include an overpanel above a transom **MUST** incorporate the junction, shown below, between leaf head and overpanel;

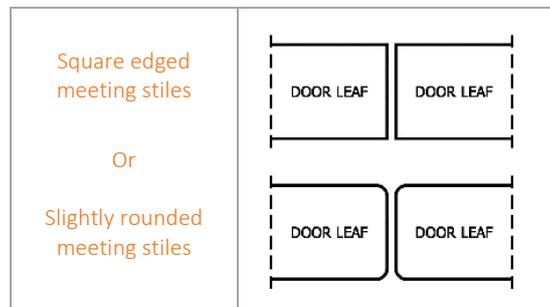


Note 2 Single-Acting door assemblies which include an overpanel without a transom, where approved above, must use an unequally rebated junction, as shown below;



The tested/approved detail is an unequal rebate; with a 37mm wide rebate in the bottom of the overpanel and an 18mm wide rebate in the top of the door leaf. Both rebates are 12mm deep.

Note 3 Single-acting or double-acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles, as shown below. (Maximum 2mm radius to rounded corners)



### 3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each door assembly configuration covered by this Field of Application Report are given in Appendix A & B, based upon using the intumescent seal specifications also shown in Appendix A & B.

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

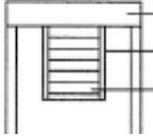
**Limitations to door leaf sizes apply with certain variations to door construction and/or frame options. Read all sections/clauses of this report to ensure full understanding and compliance.**

Double door assemblies may comprise leaves of the same width, up to the maximum width indicated in Appendix A & B. Alternatively, double leaf assemblies may include leaves of unequal width, subject to the parameters outlined below;

	LEAF CONFIGURATION/HEIGHT	PARAMETER
1	Double door assembly where leaf height is 2300mm, or less	Leaves may be of unequal width but the width of the large leaf must still be within the limitations in Appendix A & B; and the width of the small leaf shall never be less than 450mm, since this will affect its vertical stability relative to that of the larger leaf.
2	Double door assembly where leaf height is greater than 2300mm	Leaves may be of unequal width but the width of the ‘small’ leaf shall not be more than 200mm smaller than that of the large leaf (and the large leaf must still be within the limitations in Appendix A & B). In addition, the width of the small leaf shall never be less than 450mm, since this will affect its vertical stability relative to that of the larger leaf.
3	Double door assemblies with an overpanel, irrespective of leaf height	Parameters as for item 2, above.

### 3.3 Door Leaf and Overpanel Specification

Full details of the Moralt LAMINESSE FireSmoke construction has been agreed with Moralt AG and are summarised in the latest version of IFC report PAR/15571/01; held on IFC confidential files. The approved variations to construction of leaves (and overpanels) are defined in Table 2, below, based upon the details contained within the test evidence referenced in Appendix D. The table defines variations and tolerances, where it is considered that these will not adversely affect the intended fire resistance performance. The construction details are limited to the information available from the test reports.

COMPONENT	MATERIAL	MINIMUM DENSITY	DIMENSIONS
CORE <sup>Note 5</sup>	Moralt LAMINESSE core. (Details held on IFC confidential file – refer to PAR/15571/01 Revision E)	(Held on IFC confidential file – refer to PAR/15571/01 Revision E)	Core thickness depends on facing thickness (and door thickness)
STILES/RAILS	N/A	N/A	N/A
SPECIAL INSERT (in head of taller doors, as stipulated in Appendix A/B)	Strip of Laminesse material (see sketch) bonded with Urea formaldehyde		30mm deep x 25mm thick

**Table 2a. Door and Overpanel Specifications (continued overleaf)**

COMPONENT		MATERIAL	MINIMUM DENSITY	DIMENSIONS
<p>FACINGS</p> <p>Leaves/overpanels must have same facing option on each face; and all leaves/panels in each assembly must use identical facings.</p> <p>Facings are applied by Moralt, during manufacture, but are listed here to clarify the approved options.</p>		chipboard -	(Held on IFC confidential file)	3.8mm thick Or 6mm thick <sup>Note 4</sup>
		MDF -	(Held on IFC confidential file)	6mm thick <sup>Note 4</sup>
LIPPINGS <sup>Note 6</sup>	SQUARE EDGES	Hardwood (Not Beech)	640kg/m <sup>3</sup> <sup>Note 7</sup>	6–20mm thick <sup>Note 8</sup>
	REBATED OVERPANEL EDGES	Hardwood (Not Beech)	640kg/m <sup>3</sup> <sup>Note 7</sup>	20mm thick <sup>Note 9</sup>
ADHESIVE	CORE	(Held on IFC confidential file – refer to PAR/15571/01 Revision E)		
	FACING			
	LIPPINGS	Urea formaldehyde, cross-linking PVA or cross-linking polyurethane (PU)		
MINIMUM LEAF THICKNESS		-	-	53.5mm
OPTIONAL ADDITIONAL DECORATIVE FINISHES		Timber veneer or decorative plastic-based laminate (to leaf faces only)	-	Maximum 2mm thick
		Paint or varnish (faces and/or edges)	-	Maximum 0.5mm thick
Acrovyn Faces/Edges are approved for door leaves – see separate clause in Section 3.11				

**Table 2b. Door and Overpanel Specifications**

- <sup>Note 4</sup> Limited leaf sizes apply for doors with 6mm thick facings but the full range of leaf sizes is approved for doors with 3.8mm thick facings. See Appendix A & B for details.
- <sup>Note 5</sup> The Laminesse core is formed from fully bonded strips, to form a solid blank, but each leaf (or overpanel) shall be formed from one single piece of ‘Laminesse’ construction; no joints are permitted. The laminated strips shall be vertically aligned in all door leaves; and in an overpanel above a single leaf. The laminated strips shall be aligned horizontally in an overpanel above a double leaf; as tested.
- <sup>Note 6</sup> Lippings must be fitted to all four edges of door leaves and overpanels. Lippings must be applied after bonding the facings.
- <sup>Note 7</sup> Lippings shall be straight grained hardwood, with minimum measured density at 12% moisture content and of appropriate quality in accordance with BS EN 942: 2007. Moisture content to be 11 ± 2% for UK market in heated buildings between 12-21°C (or to suit internal joinery moisture content specification of export countries). The machining of the core/lipping, and the bonding process, must ensure that no gaps occur between core and lipping.

Note 8 If required, a radius may be formed on the meeting stile of double leaf doors but the lipping shall be at least 8mm thick and rounding shall not remove more than 2mm thickness of lipping, when measured on the door face; see the Figure forming part of Note 3 in Section 3.1.

Note 9 Dimensions of lipping to suit rebated edges, with a 12mm depth. (see Note 2 in Section 3.1)

### *Adjustment of door sizes*

- The doors do not include stiles and rails and so, before door edges are lipped, there is no limit on reduction in door height or width, prior to fabrication of a finished leaf
- Where door edges have already been lipped, and have square edges, a maximum of 2mm may be trimmed from each edge, after fabrication; but the minimum lipping thickness (defined in Table 2 above) must be maintained. If a greater adjustment is required, after fabrication, new lippings must be applied, complying with the details in Table 2. Such adjustments shall not negate compliance with all other parameters herein (e.g. aperture margins). The same principle applies to doors with the special insert in the leaf head.
- Where door edges have already been lipped, and have rebated edges, no trimming is permitted. If adjustment is required, after fabrication, new lippings must be applied, complying with the details in Table 2. Such adjustments shall not negate compliance with all other parameters herein (e.g. aperture margins).

### *Feature Grooves*

54mm thick Moralt FireSmoke door leaves, with 6mm thick MDF facings, may include optional feature grooves cut into the leaf faces, subject to the following limitations;

- Feature grooves shall be maximum 6mm wide x 4mm deep; but may be straight or curved.
- Feature grooves may be machined to create rectilinear 'mock panel' effects; but grooves that are parallel to the door edge must be positioned a minimum of 90mm away from the door edge.
- Linear feature grooves may generally extend over the full height and/or width of the leaf; e.g. to form a 'planked' effect. However, if a double leaf assembly includes grooves on both faces, such that grooves are 'back-to back' near the meeting stiles, then grooves shall not extend over the lippings at meeting edges. The same principle applies to grooves at an overpanel junction (single or double leaf).
- Where multiple grooves/patterns are included, there must be a minimum of 90mm between each groove.
- Feature grooves may cover a maximum of 5% of the door leaf surface.
- Feature grooves that run parallel to any edge of a glazed aperture must be positioned a minimum of 50mm away from the glazing beads. Feature grooves that 'intersect' the position of a glazing aperture shall not pass under the bolection return of the glazing bead.
- Feature groove patterns may be included in one or both faces and may be different on each face. It is the responsibility of other parties to ensure that grooves on one face, or dissimilar groove patterns on each face, do not unbalance the door leaf.
- Where leaves include feature grooves, this report imposes limitations upon the approved range of leaf sizes; as defined on the relevant Figures in Appendix A.

### 3.4 Frames

Timber frames, to the specification for hardwood given in Table 3a, below, may be used across the complete range of approved leaf sizes and configurations outlined in Appendix A&B, as applicable, utilising the relevant intumescent seal specifications outlined in Appendix A&B.

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH <sup>NOTE 12</sup>	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
Hardwood (NOT Beech)	640kg/m <sup>3</sup> <small>Note 10</small>	32mm for single-acting doors, excluding stop	90mm	12mm <small>Note 13</small>
Hardwood (NOT Beech)	640kg/m <sup>3</sup> <small>Note 10</small>	40mm for double-acting doors, including 8mm deep scallop at pivot jamb only	90mm	N/A

**Table 3a**

MDF frames may be used in single-acting single leaf or double leaf configurations without overpanels but otherwise with the complete range of approved leaf sizes outlined in Appendices A&B, to the specification in Table 3b, below, and relevant intumescent seal specifications in Appendix A&B.

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH <sup>NOTE 12</sup>	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
MDF	730kg/m <sup>3</sup> <small>Note 11</small>	30mm, excluding stop	90mm	12mm <small>Note 13</small>

**Table 3b**

Frames made from “Ash WoodEx” material (only supplied by James Latham Ltd) may also be used in single-acting single leaf or double leaf configurations without overpanels but limited to a maximum leaf size of 2100 x 926mm; as tested. Assemblies with Ash WoodEx frames must utilise the specifications in Table 3c, and the intumescent seal specification outlined in Appendix A&B.

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH <sup>NOTE 12</sup>	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
Ash WoodEx	640kg/m <sup>3</sup> <small>Note 10 &amp; 14</small>	30mm, excluding stop	90mm	15mm <small>Note 13</small>

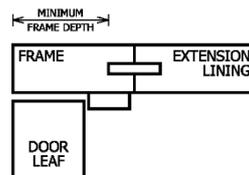
**Table 3c**

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

**Note 11** MDF to have a minimum measured density at 12% moisture content.

- Note 12** These dimensions assume that the rear of the frame is protected by the adjacent wall, (and firestopping), and that the frame does not project out from the wall. Projecting frames and shadow gaps are not approved. See also See Section 3.8.
- Note 13** Where the door stop is integral with the main door frame, the door stop is to comprise the same material as the door frame. Alternatively, a planted door stop may be used, formed from any approved frame material, pinned to the frame using 40mm long steel pins at maximum 300mm centres. In all cases, the minimum face thickness of the frame shall be within the limits defined in Tables 3a, 3b and 3c. The stop depth must be increased to 18mm for concealed closers, concealed hinges and multi-point locks; See Appendix C.
- Note 14** Ash WoodEx frames are ‘engineered timber’; but the test report does not state where joints occurred or how the overall sections were created. Within the scope of this assessment, the WoodEx may be formed from individual pieces of timber that are finger-jointed, in length, to form the required length of head/jamb. However, in the absence of evidence to the contrary, there shall be no joints to form the width or depth of each piece; i.e. no joints to form the 30mm dimension nor the 90mm dimension.

The overall frame depth may be increased (beyond that stated in Table 3) by the use of extension linings; but the joint between the main frame and the extension lining must not intrude within the minimum frame depth section outlined within this report (see sketch below).



Frames shall also comply with the parameters in the following tables/drawings.

**HEAD/JAMB JOINT:** Mortice and tenon, or half-lapped joint, head twice screwed to each jamb or mitred joint which is glued with a crosslinking adhesive e.g. UF or PU, and the head twice screwed to each jamb.

MORTICE AND TENON JOINT	HALF-LAPPED JOINT	MITRED JOINT

**Table 4a**

**ARCHITRAVES:** This report only approves assemblies where the face of the frame, and the door, are flush with the face of the wall; or where they are set-back from the face of the wall. In these scenarios, ‘loose’ architraves are optional, and have no fire performance requirements; and so can be freely specified, subject to adequate fire stopping. (See Section 3.8 regarding wall/frame gaps). Integral architraves are NOT approved by this assessment report.

**Table 4b**

TRANSOM MEMBERS	When a transom is used between a single-acting door and an overpanel, as defined in Table 1, the transom member shall be hardwood to the same material specification as outlined in Table 3a; and at least 38mm thick. The transom depth shall match that for the jambs (see Table 3a) and shall include door stops on both sides (i.e. making a minimum 90 x 62mm thick overall section). The transom must be fixed to the frame jambs with a mortice and tenon, or half-lapped joint. The overpanel must always be on the same plane as the door(s) below.
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**Table 4c**

Acrovyn cladding is approved for door frames – subject to certain limitations. See separate clauses in Section 3.11

### 3.5 Glazed Apertures

The proposed door type has been proven to accept glazed apertures and apertures are thus approved within the scope of this report, subject to the specifications and parameters in the following clauses.

#### 3.5.1 Glass types/Glazing media

Table 5, below, summarises the glass types that are approved for use in the doors considered, herein. The table also defines which approved glazing system, and bead profile, is approved with each glass type; based upon test evidence generated by each glass manufacturer. Some restrictions on pane size apply for some options/combinations, which supersede the general approvals for aperture sizes given in Section 3.5.2.

Beads shall be fixed using screws, as defined in Table 5. Fixings shall be maximum 50mm from each corner and at maximum 150mm centres; fixed at an angle of 30-40 degrees relative to the plane of the glass.

All of the approved glass types are suitable for glazed door assemblies that are required to satisfy the integrity criteria of BS476: Part 22: 1987 for 60 minutes.

Where door assemblies are glazed and are also required to satisfy the insulation criteria of BS476: Part 22: 1987 for 30 minutes, then 15mm thick Pyrostop (Pilkington) or 16mm thick Pyrobel (AGC Flat Glass) must be employed.

Where door assemblies are glazed and are also required to satisfy the insulation criteria of BS476: Part 22: 1987 for 60 minutes, then 23mm thick Pyrostop (Pilkington) or 25mm thick Pyrobel (AGC Flat Glass) must be employed.

Glass panes must be installed using two setting blocks under each pane; as tested. Expansion allowances for all glass types shall be as recommended/proven by the glass manufacturer.

GLASS TYPE/ MANUFACTURER	GLAZING MEDIA	BEAD MATERIAL/ PROFILE/SIZE	PANE SIZE	BEAD FIXINGS
10mm thick Pyrodur 60-10 (Pilkington)	20 x 3mm Hodgsons Firestrip 60 <u>and</u> 50 x 2mm Norseal Flexible glazing liner	Hardwood square or splayed/ 20mm high plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws
11mm thick Pyroguard EW60 (CGI International)	20 x 3mm Sealmaster Intumescent Foam Glazing Tape <u>and</u> 52 x 2mm Therm-A-Sol glazing liner	Hardwood splayed/ 25mm high plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws
12mm thick Pyrobelite (AGC Flat Glass)	25 x 2mm Superwool X607 (not capped) <u>and</u> 54 x 2mm Sealmaster GL60 glazing liner	Hardwood splayed/ 25mm high plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws
13mm thick Pyrodur 60-20 (Pilkington)	20 x 4mm Fireglaze OR 20 x 4mm Therm-A-Bead (must also use 54 x 2mm Sealmaster GL60 glazing liner with either media)	Hardwood splayed/ 20mm high plus 4mm bolection	1300mm x 240mm with Fireglaze OR 600mm x 240mm with Therm-A-Bead	60mm long screws
15mm thick Pyrostop (Pilkington)	Lorient System 36/15 <u>and</u> 54 x 2mm Palusol glazing liner	Hardwood splayed/ height to suit System 36/15 plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws
16mm Pyrobel (AGC Flat Glass)	12 x 3mm closed cell foam capped with DC796 or DC797 silicon <u>and</u> 54 x 2mm Sealmaster GL60 glazing liner	Hardwood splayed/ 25mm high plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws
25mm Pyrobel (AGC Flat Glass)	25 x 2mm Superwool X607 (not capped) <u>and</u> 54 x 2mm Sealmaster GL60 glazing liner	Hardwood splayed/ 25mm high plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws
23mm thick Pyrostop 60-101 (Pilkington)	20 x 3mm Hodgsons Firestrip 60 <u>and</u> 50 x 2mm Norseal Flexible glazing liner	Hardwood square or splayed/20mm high plus 4mm bolection	Up to maximum parameters in Table 6	60mm long screws

**Table 5. Approved Glass types, Glazing Media, Bead profile**

### 3.5.2 Glazing materials and systems

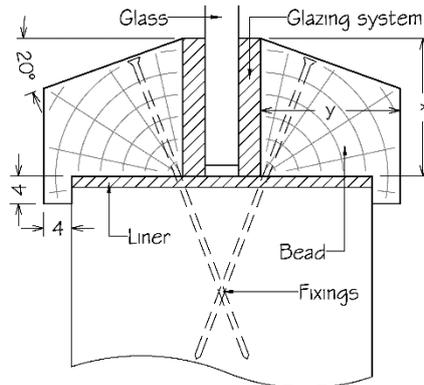
The approved glazing materials/systems, for use with doors considered, herein, are listed in Table 5; which also lists the compatible glass types.

### 3.5.3 Bead profiles and installation

The approved bead sizes and profiles, and relevant fixing details, are listed in Table 5; but also shown on Sketch no.'s 1 and 2 below.

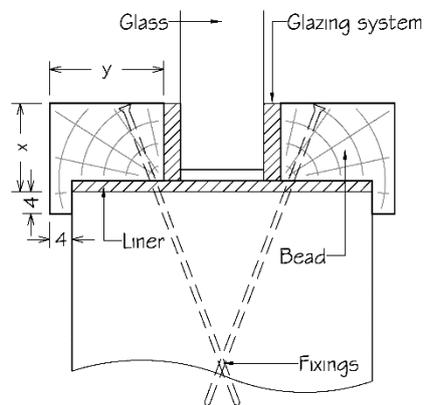
- Sketch no 1 25mm deep, 20° splayed top, plus bolection moulding not less than 4mm deep/wide. (A variant of this bead shall be used with Lorient System 36/15 channel but with bead height to suit channel height)
- Sketch no 2 20mm deep, flat top, plus bolection moulding not less than 4mm deep/wide.

Glazing beads shall be formed from hardwood with a minimum density of 640kg/m<sup>3</sup>, (NOT Beech), when measured at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be 11 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).



Dimension x to be as stated in text of report.  
Dimension y depends upon glass and seal thickness

**Sketch no 1 - Splayed bead**



Dimension x to be as stated in text of report.  
Dimension y depends upon glass and seal thickness

**Sketch no 2 – Square/Flat-top bead**

### 3.5.4 Assessed aperture sizes

Based upon the size of apertures tested, and subsequent analysis, Table 6 outlines limitations that apply to glazed apertures in the door leaves considered herein. Note that these parameters are also limited by minimum margins; so aperture sizes will also be restricted by leaf sizes.

<b>Maximum dimensions of aperture</b>	-	<p>maximum height 1400mm <small>Note 15 &amp; 16</small></p> <p>maximum width 240mm <small>Note 15 &amp; 16</small></p> <p>but subject to a maximum area of 0.30m<sup>2</sup> <u>per aperture</u></p> <p>More than one aperture may be included in each door but subject to a maximum area of 0.385 m<sup>2</sup> <u>per leaf</u></p>
<b>Minimum distance from leaf edge (top)</b>	-	<p>where door height is 2400mm or smaller, the minimum top margin shall be 200mm.</p> <p>Where door height is 2401mm or greater, the top of the aperture shall be no more than 2200mm above the bottom of the door.</p>
<b>Minimum distance from leaf edge (sides)</b>	-	125mm
<b>Minimum distance between apertures</b>	-	200mm
<b>Minimum distance from bottom of leaf</b>	-	300mm

**Table 6. Approved Aperture Sizes and Glazing Margins** Note 15, 16 & 17

Use of certain hardware items may impose further limits upon margins; refer to Appendix C.

Note 15 Maximum aperture height and width cannot be used simultaneously; and are restricted by the maximum area. More than one aperture may be included in one leaf, but the maximum area, and other parameters still apply.

Note 16 Refer to Section 3.5.1 for restrictions in size of apertures with 13mm thick Pyrodur.

Note 17 Any aperture(s) for intumescent air transfer grilles, (see Section C.6.4), must also be included in the total area permitted for apertures given above. Margins between apertures apply whether for glazing or grilles.

Apertures are created by cutting directly into the Moralt FireSmoke door, with beads fitted directly to the core. Alternatively, if required, (e.g. to improve retention of fixings), an 8 – 12mm thick hardwood lipping may be applied to the aperture perimeter, using the specification for lippings and adhesive defined in Section 3.3.

### 3.5.5 Circular glazing

The leaves are approved for the incorporation of circular glazing up to aperture dimensions of 500mm diameter, subject to the parameters for margins and total area of glazing per leaf, described in Section 3.5.4. However, this is subject to all other aspects of the glazing being proven in fire testing, by other parties, in a suitably similar FD60 door construction.

The method of forming the curved beads must have been successfully proven, by others, to the required rating/standard. The bead profile proven (by others) as a curved bead must match one of the profiles approved in Section 3.5.3; i.e. with a bolection moulding and splayed top edge. The testing of curved beads (by others) must also have included one of the glass types and glazing systems approved, herein, to prove that the glass/glazing system can each be suitably modified.

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

### 3.6 Overpanels

Overpanels may have square or equally rebated junctions with the door head (as defined in Table 1 herein); or be separated from the leaf by a transom member. Intumescent seals at the panel/frame interface shall be as defined in Appendix A & B. Transom members shall be in accordance with Section 3.4. The installation shall be as defined in Section 3.8.

The size of overpanels is limited to the full width of the leaf/leaves contained within the door assembly and, based on the tested size, overpanels are subject to the following limit in height:

Configuration	Maximum Height of Overpanel
Overpanel above a Single leaf:	- 2000mm high - if fitted above a transom member <sup>Note 18</sup>
Overpanel above a Single leaf:	- 400mm - with an unequal rebate junction to the door
Overpanel above Double leaves:	- 1500mm - high if fitted above a transom member <sup>Note 18</sup>
Overpanel above Double leaves:	- 400mm - with an unequal rebate junction to the doors

<sup>Note 18</sup> Approval of this overpanel height only considers the performance of the overpanel within the frame. It is the responsibility of other parties to ensure that the supporting construction is able to provide sufficient support and restraint for the resultant height of door assembly, under fire test conditions.

In all cases, the overpanel must be a single piece panel across the frame width; i.e. a “double door” overpanel shall not be used above double door leaves. The laminated strips of the door core shall be vertically aligned in an overpanel above a single leaf but the laminated strips shall be aligned horizontally in an overpanel above a double leaf; as tested.

Approval of an overpanel size by IFC does not indicate that such a size can be fabricated. This should be checked with the manufacturer, and will be subject to the ability of the supporting construction providing adequate restraint. The overpanel must be on the same plane as the door(s) below.

### 3.7 Hardware

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

General guidance for all items of hardware is outlined in Appendix C, based upon the range of items tested. All hardware must have been subjected to fire resistance testing, (in accordance with BS:476: Part 22: 1987 or EN1634-1), and/or be assessed by a notified body, to support its use in FD60 door assemblies where the leaf construction and thickness, and all details at the frame interface, are similar to those proposed herein.

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

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

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 60 minutes fire resistance, at the required size, when incorporating door openings. If fitted into timber or steel stud partitions, the method of forming the door assembly aperture must be as tested by the partition and/or door assembly manufacturer.

**Note 19** Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers, with symmetrical plasterboard on both faces of the studs. This report does not approve use of the proposed door assemblies in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and door assemblies therein.

No part of the rear of the frame section shall be exposed once installed; and frames must not project beyond the exposed face of the wall.

Integral architraves are not permitted and there shall be no feature rebates or shadow gaps at the junction of the frame and wall; although such features could be considered on an individual basis.

This report only applies to scenarios where the frame is fully aligned within the plane of the fire-resisting wall/partition. 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 studs/dabs), such that any part of the frame is aligned within the plane of this decorative cladding. This detail is likely to adversely affect the fire resistance of the door assembly, and IFC should be consulted for specific advice, to determine upgrading measures that will be required in such cases.

The gaps between the supporting construction and timber frames should be sealed following the recommendations given in Section 9.4 of BS8214: 2016, '*Timber-based fire door assemblies – Code of practice*', using a product proven in such timber applications.

The gap between the door and the frame, or between meeting stiles of double doors, (and between a door and an overpanel, where applicable) shall be 1.5–4mm. Gaps under the door(s) shall not exceed 6mm for fire performance, although, if smoke control is also required, these gaps shall only be 3mm, or smoke seals shall be included (see also Section 3.10 regarding suitability of smoke seals).

The door assembly design shall be such that, when closed, the 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. The face of the leaf shall be flush with the face of any overpanel, when closed.

Overpanels shall be secured into the frame using steel screws fixed through the rear of the frame members, passing at least 40mm into the centre line of the overpanel thickness. (Screws must not be fixed through the overpanel into the stops, or vice versa). Screws must be no more than 100mm from each corner of the overpanel, and at maximum 400mm centres, with a minimum of 2no. screws per overpanel edge. This specification for fixings applies to overpanels used with or without a transom. The gap between overpanel and frame should not exceed 3mm.

### 3.9 Intumescent Seals

The approved intumescent seal specifications, widths, and positions are shown in Appendix A & B, based upon tested details. PVC encased seals shall be employed across the complete range of door sizes and configurations approved herein; except in rebated overpanel junctions (see Appendix A & B).

It is recommended that the intumescent seals are manufactured or supplied by members of the Intumescent Fire Seals Association (IFSA) or that the product is included in a Third-Party Certification scheme, such as that provided by IFC Certification, to ensure product quality and consistency. Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacture are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.)

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

### 3.10 Ambient Temperature Smoke Seals

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

It is the responsibility of other parties to ensure that the orientation of the seals, door edge gaps, degree of hardware interruption, and leaf configuration, are all 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. If these conflict with the intumescent seal widths and positions as described in Appendix A & B, the latter shall take precedence; and smoke sealing may not be affected.

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

### 3.11 Acrovyn Cladding to Doors and Frames

Test evidence has been generated by CS Specialities, to support the use of Acrovyn sheet applied to the edges and face of timber fire doors; and to timber frames. This is approved for Moralt FireSmoke FD60 doors, subject to the parameters and conditions outlined below;

#### Acrovyn Door Edge Protectors –

- Maximum leaf size 2150 x 926mm, in all cases. Single acting doors only. In the absence of evidence with rebated edges, Edge Protectors cannot be applied to doors with an overpanel.
- Acrovyn Door Edge Protectors shall only be applied on the vertical edges of doors. Edge Protectors may be fitted on the hanging edge stile and/or the leading edge stile of a single leaf door. Edge Protectors may be fitted on the hanging edge stiles and/or on both meeting stiles of double leaf doors.
- Acrovyn Door Edge Protectors are formed from 2mm thick Acrovyn sheet, pre-formed to an U-profile, and bonded to an 8mm thick composite insert; as tested. Maximum radius on outer corners of Edge Protector shall be no greater than tested.
- A hardwood lipping need not be fitted 'underneath' the Edge Protector(s) but all other edges of the leaf must include hardwood lippings; as described in Section 3.3 herein.
- Edge Protectors shall be fixed to door edges with 35mm long steel screws positioned 150mm maximum from top/bottom of leaf and at 300mm maximum centres thereafter.
- The machining of the door edge must ensure that no gaps occur between core and Edge Protector. Edge Protectors must extend over the full height of the leaf; and no joints must be included over their length.
- A latch may be fitted in doors with Acrovyn Edge Protectors but the forend size is limited to a maximum of 160 x 22mm. The intumescent strip in the Edge Protector will be interrupted by the forend/strike. The latch body, forend and strike shall all be bedded on/wrapped in 1mm thick mono-ammonium phosphate (MAP) intumescent sheet.
- Flush bolts may NOT be fitted in doors with Acrovyn Edge Protectors. If required for cold-state service, face-fixed barrel bolts may be fitted to double leaf doors; see Appendix C for more details.
- Hinges shall comply with Appendix C, herein; and both blades of hinges shall be bedded on 1mm thick mono-ammonium phosphate (MAP) intumescent sheet. It is the responsibility of others to ensure that the rounded profile of the Edge Protector does not prevent hinges from being securely fixed and 'seated' on the door edge. Length of hinge fixings should also allow for adequate retention into the timber door.
- Where an Edge Protector is fitted to the leading edge of a single leaf, or to both meeting stiles of double leaf assemblies, a single 15 x 4mm Lorient 617 intumescent strip shall be fitted into the Edge Protector (positioned centrally in the door thickness). These parameters supersede those specified in Appendix A & B, herein.
- Where an Edge Protector is fitted to the hanging stiles of a leaf, (either single leaf or double leaf), the Edge Protector shall not include an intumescent strip; but strips shall be included in the frame (see next bullet point).
- 2no. 15 x 4mm Lorient 617 intumescent strips (spaced 10mm apart) must be centrally fitted in both frame jambs and in the frame head. (This applies in all cases, irrespective of whether Edge Protectors are fitted on the hanging stiles of doors).

- Frames shall be hardwood, NOT Beech; the sectional size and density of which shall comply with the specifications in Section 3.4 herein.
- When doors are in the closed position, the return leg of the Edge Protector (on the 'pull' face of the leaf) may project beyond the face of the frame; but the 'timber' face of the leaf must be flush with the face of the frame (i.e. the stops on the frame must be positioned to allow for the thickness of the return leg of the Edge Protector on the push face of the leaf).

### **Acrovyn cladding to doors and frames**

If required, the complete door assembly may be encapsulated with Acrovyn sheet; i.e. door and frame. (For clarity, these specifications must be used in their entirety; i.e. it is not permitted to clad the door without cladding the frame, or vice-versa).

- Maximum leaf size of 2150 x 926mm, in all cases. Single acting doors only.
- In the absence of evidence with rebated edges, Acrovyn cannot be applied to doors with an overpanel.
- Prior to application of the Acrovyn, ALL edges of the leaf must include hardwood lippings; as described in Section 3.3 herein.
- Flat strips of 2mm thick Acrovyn shall be bonded to the top and bottom edges of the leaf/leaves; using JOWAT 609.38 PU adhesive. (Contact CS Specialities for application rates and method statement).
- Acrovyn U-Profiles, pre-formed from 2mm thick Acrovyn sheet, shall be bonded to the hanging stile(s) of the leaf/leaves; using JOWAT 609.38 PU adhesive. (Contact CS Specialities for application rates and method statement).
- Acrovyn U-Profiles must NOT be fitted to the leading edge of single leaves or both meeting stiles of double doors. Acrovyn Edge Protectors (each including a 15 x 4mm Lorient 617 intumescent strip) must be fitted at these locations; following the details described in the preceding clauses for Edge Protectors.
- The remainder of the door faces (i.e. between the return legs of the U-profiles and Edge Protectors, respectively) shall be covered by 2mm thick Acrovyn sheet, bonded using JOWAT 609.38 PU adhesive. (Contact CS Specialities for application rates and method statement).
- Maximum radius on outer corners of Acrovyn U-profiles shall be no greater than tested. The Acrovyn faces shall not be rounded at the top/bottom of the leaf; but the 'sharp' edge of door facings may be chamfered (within the thickness of the Acrovyn.)
- The lippings on door edges must be suitably flat to ensure that no gaps occur between the lippings and Acrovyn. Acrovyn strips, U-Profiles (hanging edges) and Edge Protectors (leading edge/meeting stiles) must extend over the full width/height of the leaf, as applicable; and no joints must be included in the length.
- A latch may be fitted in doors with Acrovyn cladding but maximum forend size is 160 x 22mm. The intumescent strip in door edges will be interrupted by the forend/strike. The latch body, forend and strike shall all be bedded on/wrapped in 1mm thick mono-ammonium phosphate (MAP) intumescent sheet.
- Flush bolts may NOT be fitted in doors with Acrovyn cladding. If required for cold-state service, face-fixed barrel bolts may be fitted to double leaf doors; see Appendix C for more details.

- Hinges shall comply with Appendix C, herein. The intumescent strip in the Edge Protector will be interrupted by hinges but both blades of all hinges shall be bedded on 1mm thick mono-ammonium phosphate (MAP) intumescent sheet. It is the responsibility of others to ensure that the rounded profile of the Acrovyn U-Profile does not prevent hinges from being securely fixed and 'seated' on the door edge. Length of hinge fixings should also allow for adequate retention into the timber door.
- In single leaf assemblies, 2no. 15 x 4mm Lorient 617 intumescent strips (spaced 10mm apart) must be centrally fitted in both frame jambs and in the frame head. As noted previously, a 15 x 4mm Lorient 617 intumescent strip shall be fitted into the Edge Protector on the leading stile of the leaf. These parameters supersede those specified in Appendix A & B, herein.
- In double leaf assemblies, 2no. 15 x 4mm Lorient 617 intumescent strips (10mm apart) must be centrally fitted in both frame jambs and in the frame head. As noted previously, a 15 x 4mm Lorient 617 intumescent strip shall be fitted into the Edge Protector on both meeting stile of each leaf. These parameters supersede those specified in Appendix A & B, herein.
- Frames shall be hardwood, NOT Beech; the sectional size and density of which shall comply with the specifications in Section 3.4 herein. Acrovyn U-Profiles, pre-formed from 2mm thick Acrovyn sheet, shall be bonded to the visible edges of the frame; and a smaller U-profile bonded to the stop, in all cases, using JOWAT 609.38 PU adhesive. (Contact CS Specialities for application rates and method statement). The intumescent strips in the frame must not be concealed under the Acrovyn cladding.
- When doors are in the closed position, the Acrovyn on the 'pull' face of the leaf must be flush with the Acrovyn on the face of the frame. (i.e. the stops on the frame must be positioned to allow for the thickness of Acrovyn on the leaf/frame).

Doors with Acrovyn cladding on the faces may include glazed apertures but, in the absence of test evidence, Acrovyn must not be applied to glazing beads.

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## 4. CONCLUSION

Based upon the available test evidence, and subsequent analysis performed by International Fire Consultants Ltd, if the proposed door assemblies, utilising 54mm thick Moralt FireSmoke door leaves installed in timber 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 60 minutes.

Partially insulating door assemblies are determined using the criteria given in section 7 of BS476: Part 22: 1987. These assemblies are evaluated as partially insulating door assemblies on the basis that the 'solid' part of the leaf satisfies the temperature criteria given in section 10.4 of BS 476: Part 20: 1987 and any non-insulating features, such as glazing, are less than 20% of the surface area of the leaf. The assemblies outlined, herein, are permitted to have glazed areas and air transfer grilles, and so could, therefore, be evaluated to this standard if the maximum total aperture area is less than 20% of the leaf size. In those cases, 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 60 minutes fire resistance.

Any door assemblies that include leaves without apertures are proven to satisfy the insulation criteria for at least 60 minutes; and can also be assessed to Section 6 of BS476: Part 22: 1987 for a 60 minute performance rating for both integrity and insulation.

Any door assemblies that include leaves with apertures glazed with 15mm Pyrostop or 16mm Pyrobel would satisfy the insulation criteria for at least 30 minutes; and can therefore be assessed to Section 6 of BS476: Part 22: 1987 for a 60 minute performance rating for integrity and 30 minute performance rating for insulation.

Any door assemblies that include leaves with apertures glazed with 23mm Pyrostop or 25mm Pyrobel would satisfy the insulation criteria for at least 60 minutes; and can thus be assessed to Section 6 of BS476: Part 22: 1987 for a 60 minute performance rating for both integrity and insulation.

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

## 5. DECLARATION BY THE APPLICANT

IFC Engineering Assessment Report

PAR/ 12519/02 Revision E

Project Address

Obere Tiefenbachstrasse 1  
Hausham  
D-83734

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

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

**‘Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence’**

- We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.
- We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.
- We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

Signature

Name

Position

Company name

Moralt AG

Date

## 6. LIMITATIONS

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

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

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

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

As per the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of fire performance of construction products based on fire test evidence, 2021, Industry Standard Procedure'*, appropriate action has been taken to mitigate the risk of a conflict of interest arising during the preparation of this report. All individuals involved in the production, or subsequent review, of this assessment have declared any perceived conflicts of interest, with regards to the sponsor or subject(s) of this report, prior to working on this project.

The assessor and reviewer have been deemed suitable for involvement in the production of this assessment in accordance with the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of fire performance of construction products based on fire test evidence, 2021, Industry Standard Procedure'*.

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

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

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

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

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

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

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

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

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

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

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 August 2026 should confirm its ongoing validity.

This assessment report is not valid unless it incorporates the declaration, in Section 5, duly signed by the applicant.

Prepared by:



**Mark Billingham**  
Technical Manager  
International Fire Consultants Ltd. (IFC)

Reviewed by:



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

## APPENDIX A

### Figures A01 – A08

Assessed Leaf Size Envelopes and Associated Intumescent Seal Specifications for Moralt FireSmoke Door Leaves with 6mm thick chipboard or 6mm thick MDF facings

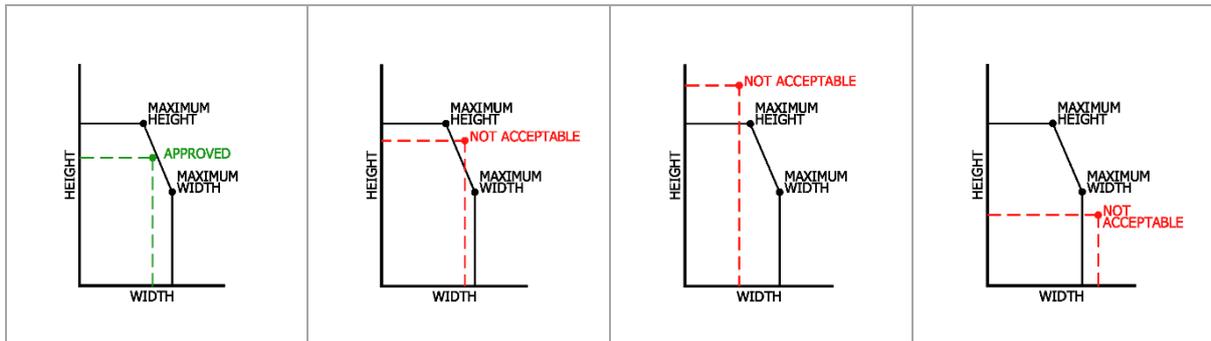


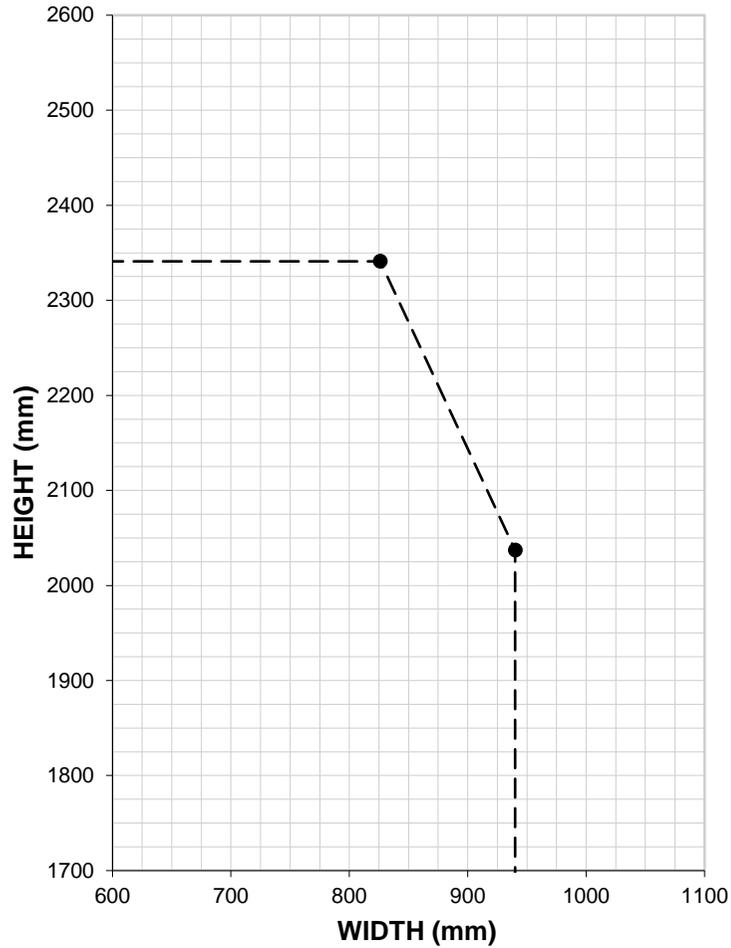
Figure A01

FD60

Single Door Assemblies

PAR/12519/02 Revision E

Moralt FireSmoke (54mm thick doors)



LSASD and ULSASD



Leaf Configuration	Leaf Height	Leaf Width
LSASD or ULSASD	2037mm	978mm
	2341mm	826mm

These leaf sizes apply to doors with 6mm thick chipboard or MDF facing options, approved in Section 3.3.  
 Feature grooves may only be included in doors with 6mm MDF faces.  
 Additional limitations apply for doors with Acrovyn cladding or with Ash WoodEx frames; see text of report for full compliance.

Flush Overpanel	Transomed Overpanel	Max Overpanel Height
x	✓	2000mm

Intumescent Specification	
Head	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal
Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal
Perimeter of overpanel	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal

Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacturer are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.)  
 Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).

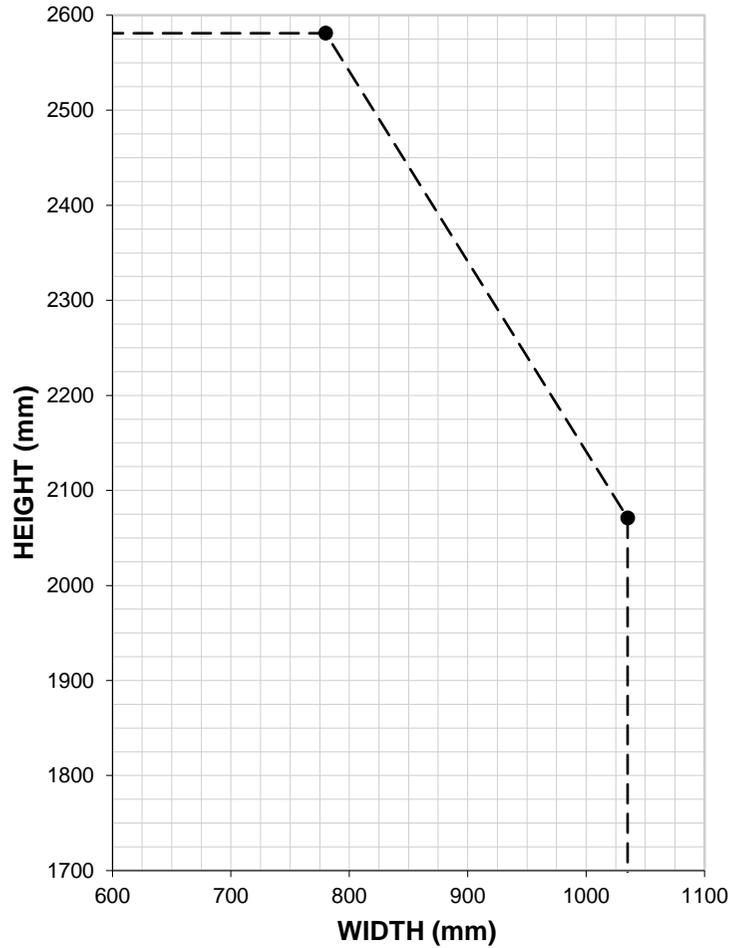
Figure A02

FD60

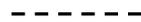
Single Door Assemblies

PAR/12519/02 Revision E

Moralt FireSmoke Doors (54mm thick leaves)



LSASD and ULSASD with special insert in leaf head



Leaf Configuration	Leaf Height	Leaf Width
LSASD or ULSASD with special insert in leaf head	2071mm	1035mm
	2581mm	780mm

These leaf sizes apply to doors with 6mm thick chipboard or MDF facing options, As approved in Section 3.3; **and with special insert in leaf head.**  
 Feature grooves may only be included in doors with 6mm MDF faces.  
 Additional limitations apply for doors with Acrovyn cladding or with Ash WoodEx frames; see text of report for full compliance.

Flush Overpanel	Transomed Overpanel	Max Overpanel Height
x	✓	2000mm

Intumescent Specification	
Head	1no 40 x 6mm seal fitted centrally in frame reveal
Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal
Perimeter of overpanel	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal

Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacturer are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.)  
 Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).

Figure A03	FD60	Single Door Assemblies	PAR/12519/02 Revision E	Moralt FireSmoke (54mm thick doors)						
			<table border="1"> <thead> <tr> <th>Leaf Configuration</th> <th>Leaf Height</th> <th>Leaf Width</th> </tr> </thead> <tbody> <tr> <td>DASD</td> <td>2150mm</td> <td>950mm</td> </tr> </tbody> </table>		Leaf Configuration	Leaf Height	Leaf Width	DASD	2150mm	950mm
			Leaf Configuration	Leaf Height	Leaf Width					
DASD	2150mm	950mm								
			<p>These leaf sizes apply to doors with 6mm thick chipboard or MDF facing options, approved in Section 3.3.</p> <p>Feature grooves may only be included in doors with 6mm MDF faces.</p> <p>Double-acting doors not approved with Acrovyn cladding or Ash WoodEx frames.</p>							
			<table border="1"> <thead> <tr> <th>Flush Overpanel</th> <th>Transomed Overpanel</th> <th>Max Overpanel Height</th> </tr> </thead> <tbody> <tr> <td>x</td> <td>x</td> <td>N/A</td> </tr> </tbody> </table>		Flush Overpanel	Transomed Overpanel	Max Overpanel Height	x	x	N/A
Flush Overpanel	Transomed Overpanel	Max Overpanel Height								
x	x	N/A								
			<p align="center"><b>Intumescent Specification</b></p>							
			<table border="1"> <tbody> <tr> <td>Head</td> <td colspan="2">2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal</td> </tr> <tr> <td>Jambs</td> <td>2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in <u>both</u> DOOR stiles (grooves in pivot stile must be machined so that faces of seals are flush with curve of door edge – see sketch)</td> <td></td> </tr> </tbody> </table>		Head	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal		Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in <u>both</u> DOOR stiles (grooves in pivot stile must be machined so that faces of seals are flush with curve of door edge – see sketch)	
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			<p>Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacturer are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.)</p>							
<p>DASD</p>			<p>Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).</p>							

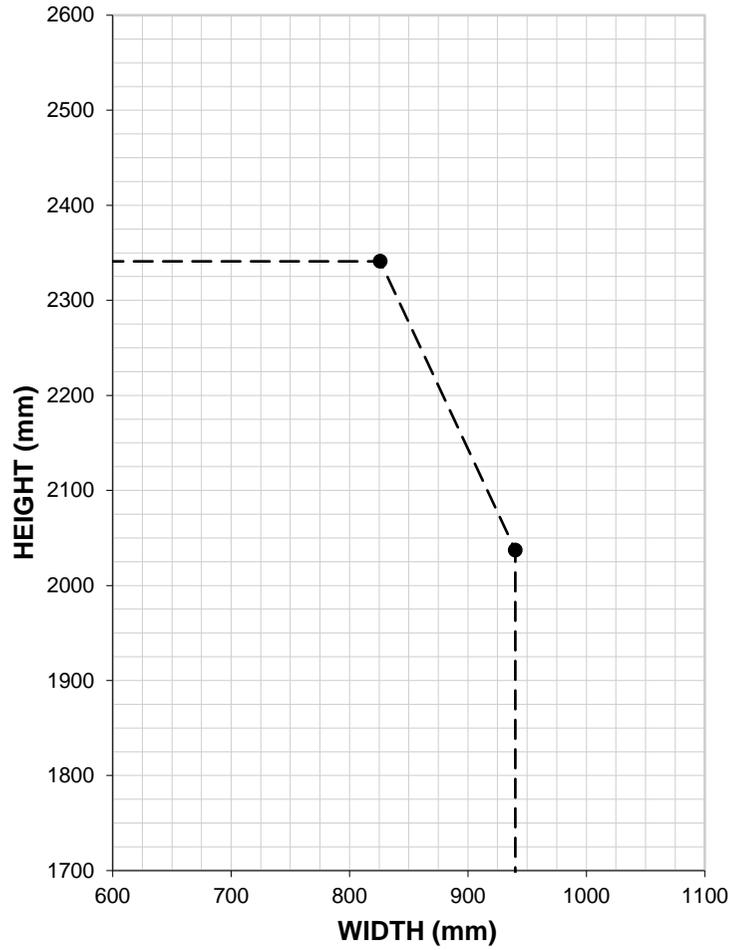
Figure A04

FD60

Single Door Assemblies

PAR/12519/02 Revision E

Moralt FireSmoke Doors (54mm thick leaves)



LSASD and ULSASD with flush overpanel (unequal rebate)



Leaf Configuration	Leaf Height	Leaf Width
LSASD or ULSASD with flush overpanel (unequal rebate)	2037mm	940mm
	2341mm	826mm
These leaf sizes apply to doors with 6mm thick chipboard or MDF facing options, approved in Section 3.3. Feature grooves may only be included in doors with 6mm MDF faces. Doors with overpanels not approved with Acrovyn cladding or with Ash WoodEx frames.		
Flush Overpanel	Transomed Overpanel	Max Overpanel Height
✓	✗	400mm
<b>Intumescent Specification</b>		
Overpanel/Door junction (rebated)	1no. 25 x 4mm seal centrally fitted in the large rebate in the bottom of the overpanel; AND 1no. 10 x 2mm seal fitted 1mm away from the upstand of the small rebate in the leaf head; AND 1no. 10 x 2mm seal fitted in the large nib on the top of the leaf, set 16mm away from the pull face of the leaf.	
Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	
Perimeter of overpanel	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	
4mm thick seals are pvc-encased products and shall be either Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions. 2mm thick seals are non-encased graphite-based seals, either made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions. (Although options of product/manufacture are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.) Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).		

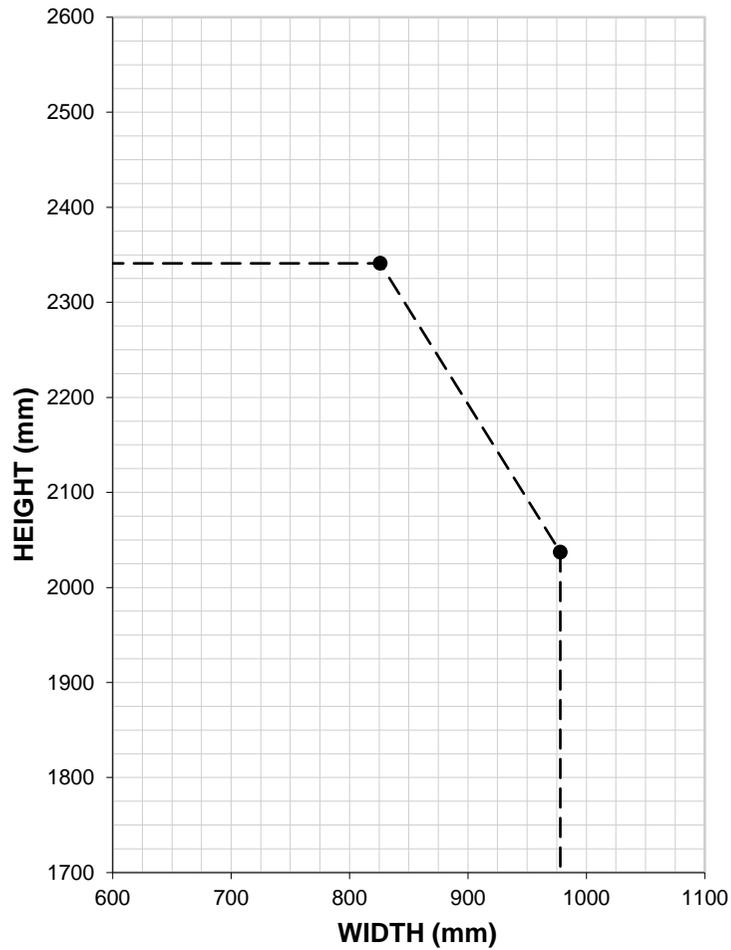
Figure A05

FD60

Double Door Assemblies

PAR/12519/02 Revision E

Moralt FireSmoke Doors (54mm thick leaves)



LSADD and ULSASDD

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Leaf Configuration	Leaf Height	Leaf Width
LSADD or ULSADD	2037mm	978mm
	2341mm	826mm
These leaf sizes apply to doors with 6mm thick chipboard or MDF facing options, approved in Section 3.3. Feature grooves may only be included in doors with 6mm MDF faces. Additional limitations apply for doors with Acrovyn cladding or with Ash WoodEx frames; see text of report for full compliance.		
Flush Overpanel	Transomed Overpanel	Max Overpanel Height
x	✓	1500mm
Intumescent Specification		
Head	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	
Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	
Meeting Stiles	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in the active leaf	
Perimeter of overpanel	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	
Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacturer are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.) Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).		

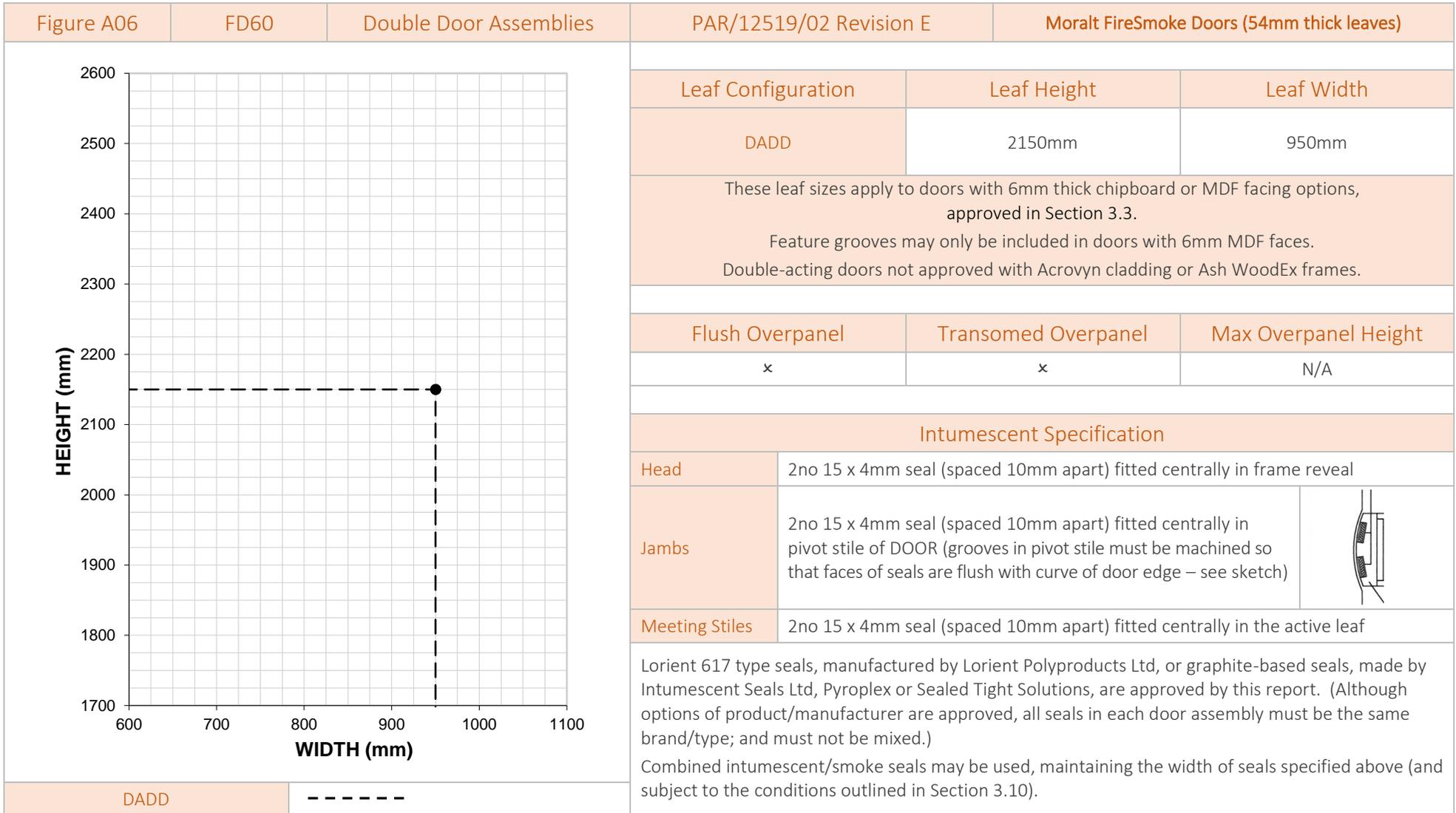


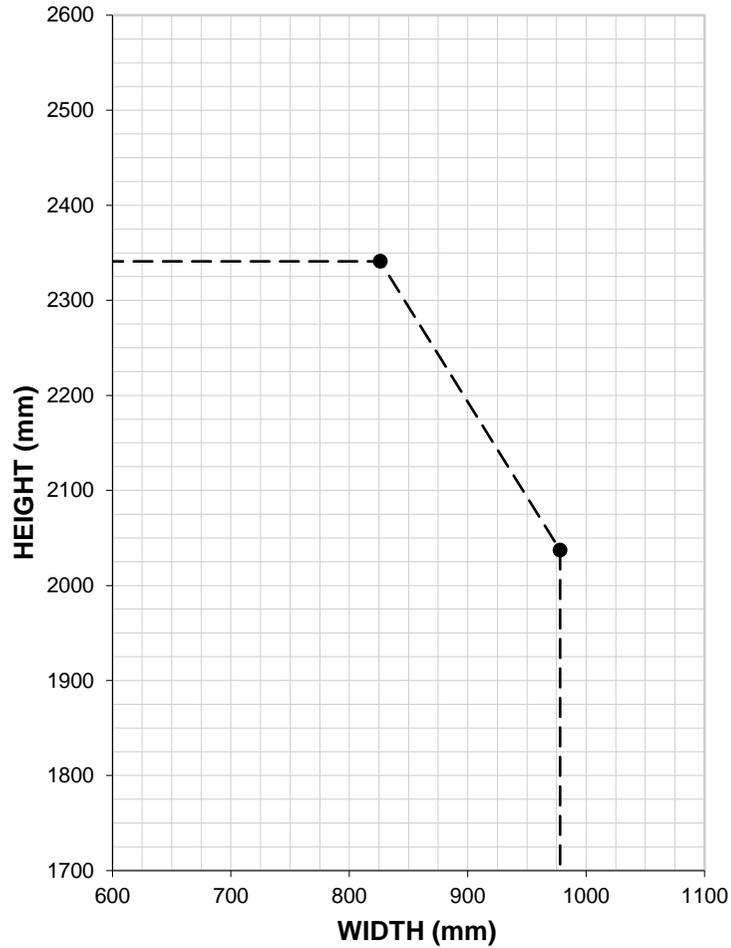
Figure A07

FD60

Double Door Assemblies

PAR/12519/02 Revision E

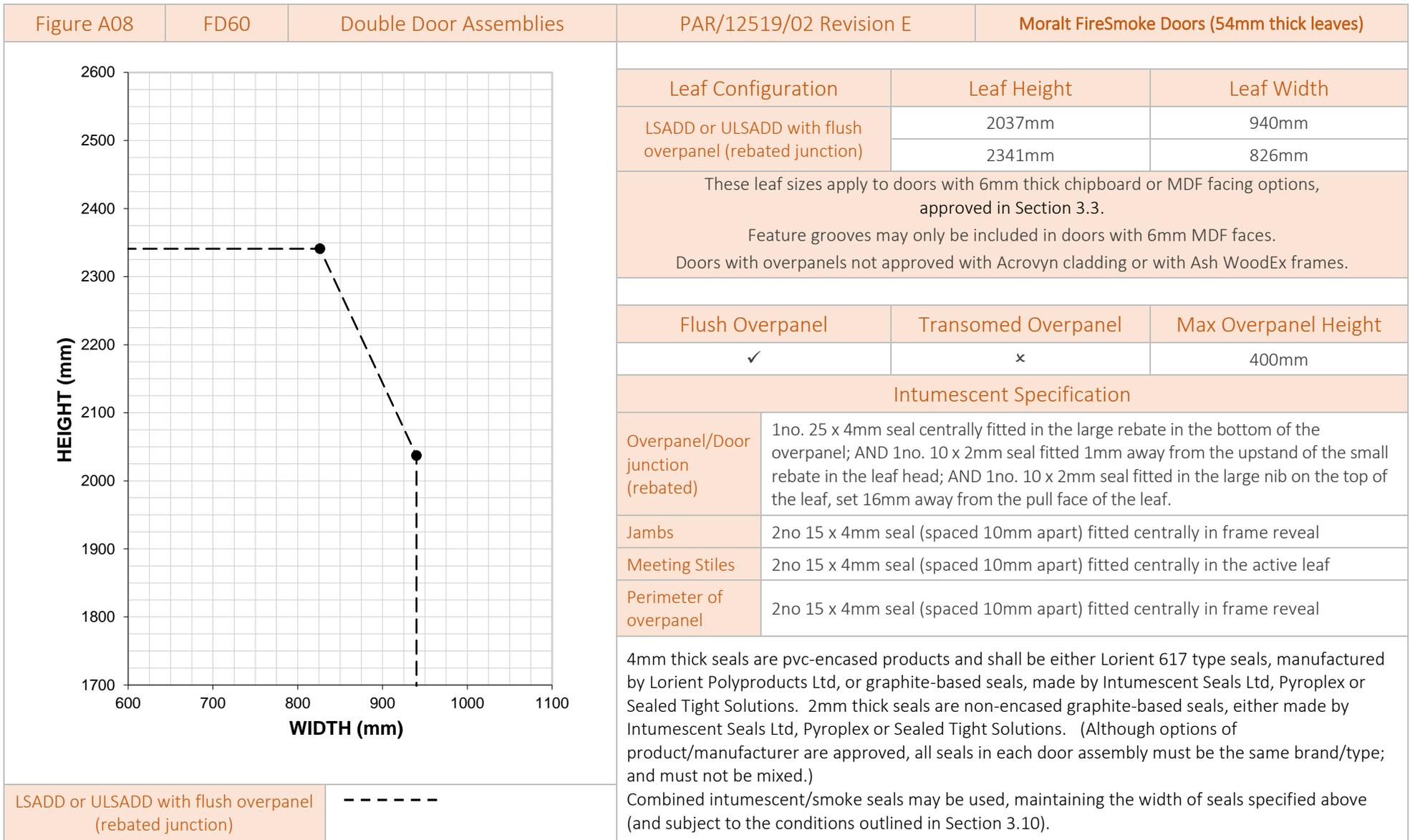
Moralt FireSmoke Doors (54mm thick leaves)



DADD with special insert in leaf head



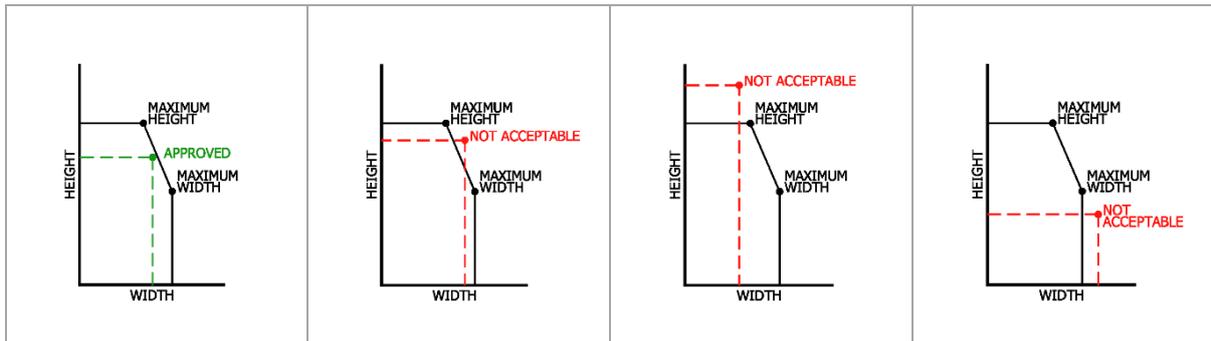
Leaf Configuration	Leaf Height	Leaf Width
DADD with special insert in leaf head	2037mm	978mm
	2341mm	826mm
These leaf sizes apply to doors with 6mm thick chipboard or MDF facing options, approved in Section 3.3; <b>and with special insert in leaf head.</b> Feature grooves may only be included in doors with 6mm MDF faces. Double-acting doors not approved with Acrovyn cladding or Ash WoodEx frames.		
Flush Overpanel	Transomed Overpanel	Max Overpanel Height
x	x	N/A
Intumescent Specification		
Head	1no 40 x 6mm seal fitted centrally in frame reveal	
Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in pivot stile of DOOR (grooves in pivot stile must be machined so that faces of seals are flush with curve of door edge – see sketch)	
Meeting Stiles	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in the active leaf	
Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacturer are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.) Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).		



## APPENDIX B

Figures B01 – B07

Assessed Leaf Size Envelopes and Associated Intumescent Seal Specifications for Moralt FireSmoke Door Leaves with 3.8mm thick facings



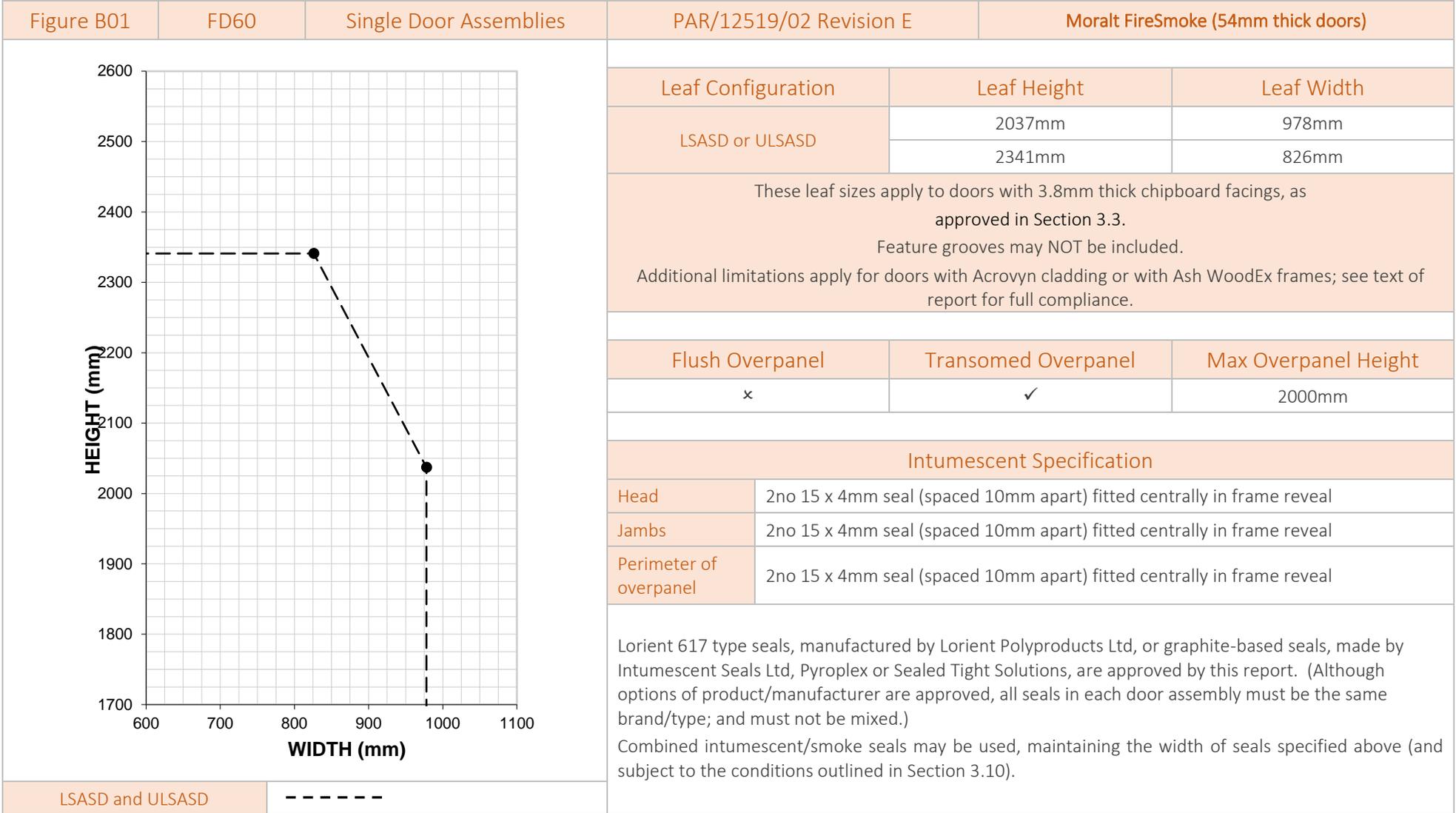


Figure B02	FD60	Single Door Assemblies	PAR/12519/02 Revision E	Moralt FireSmoke Doors (54mm thick leaves)	
			Leaf Configuration	Leaf Height	Leaf Width
			DASD	2150mm	950mm
<p>These leaf sizes apply to doors with 3.8mm thick chipboard facings, as approved in Section 3.3. Feature grooves may NOT be included. Double-acting doors not approved with Acrovyn cladding or Ash WoodEx frames.</p>			Flush Overpanel	Transomed Overpanel	Max Overpanel Height
			x	x	N/A
<p>DASD</p>			Intumescent Specification		
			Head	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	
<p>Jambs</p>			2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in <u>both</u> DOOR stiles (grooves in pivot stile must be machined so that faces of seals are flush with curve of door edge – see sketch)		
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Figure B03		FD60	Single Door Assemblies	PAR/12519/02 Revision E	Moralt FireSmoke Doors (54mm thick leaves)								
<p>HEIGHT (mm)</p> <p>WIDTH (mm)</p>				<table border="1"> <thead> <tr> <th>Leaf Configuration</th> <th>Leaf Height</th> <th>Leaf Width</th> </tr> </thead> <tbody> <tr> <td rowspan="2">LSASD or ULSASD with flush overpanel (unequal rebate)</td> <td>2037mm</td> <td>940mm</td> </tr> <tr> <td>2341mm</td> <td>826mm</td> </tr> </tbody> </table>		Leaf Configuration	Leaf Height	Leaf Width	LSASD or ULSASD with flush overpanel (unequal rebate)	2037mm	940mm	2341mm	826mm
				Leaf Configuration	Leaf Height	Leaf Width							
LSASD or ULSASD with flush overpanel (unequal rebate)	2037mm	940mm											
	2341mm	826mm											
				<p>These leaf sizes apply to doors with 3.8mm thick chipboard facings, as approved in Section 3.3.</p> <p>Feature grooves may NOT be included.</p> <p>Doors with overpanels not approved with Acrovyn cladding or with Ash WoodEx frames.</p>									
				<table border="1"> <thead> <tr> <th>Flush Overpanel</th> <th>Transomed Overpanel</th> <th>Max Overpanel Height</th> </tr> </thead> <tbody> <tr> <td>✓</td> <td>✗</td> <td>400mm</td> </tr> </tbody> </table>		Flush Overpanel	Transomed Overpanel	Max Overpanel Height	✓	✗	400mm		
Flush Overpanel	Transomed Overpanel	Max Overpanel Height											
✓	✗	400mm											
				<p><b>Intumescent Specification</b></p>									
				<table border="1"> <tbody> <tr> <td>Overpanel/Door junction (square)</td> <td>1no. 25 x 4mm seal centrally fitted in the large rebate in the bottom of the overpanel; AND 1no. 10 x 2mm seal fitted 1mm away from the upstand of the small rebate in the leaf head; AND 1no. 10 x 2mm seal fitted in the large nib on the top of the leaf, set 16mm away from the pull face of the leaf.</td> </tr> <tr> <td>Jambs</td> <td>2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal</td> </tr> <tr> <td>Perimeter of overpanel</td> <td>2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal</td> </tr> </tbody> </table>		Overpanel/Door junction (square)	1no. 25 x 4mm seal centrally fitted in the large rebate in the bottom of the overpanel; AND 1no. 10 x 2mm seal fitted 1mm away from the upstand of the small rebate in the leaf head; AND 1no. 10 x 2mm seal fitted in the large nib on the top of the leaf, set 16mm away from the pull face of the leaf.	Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal	Perimeter of overpanel	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal		
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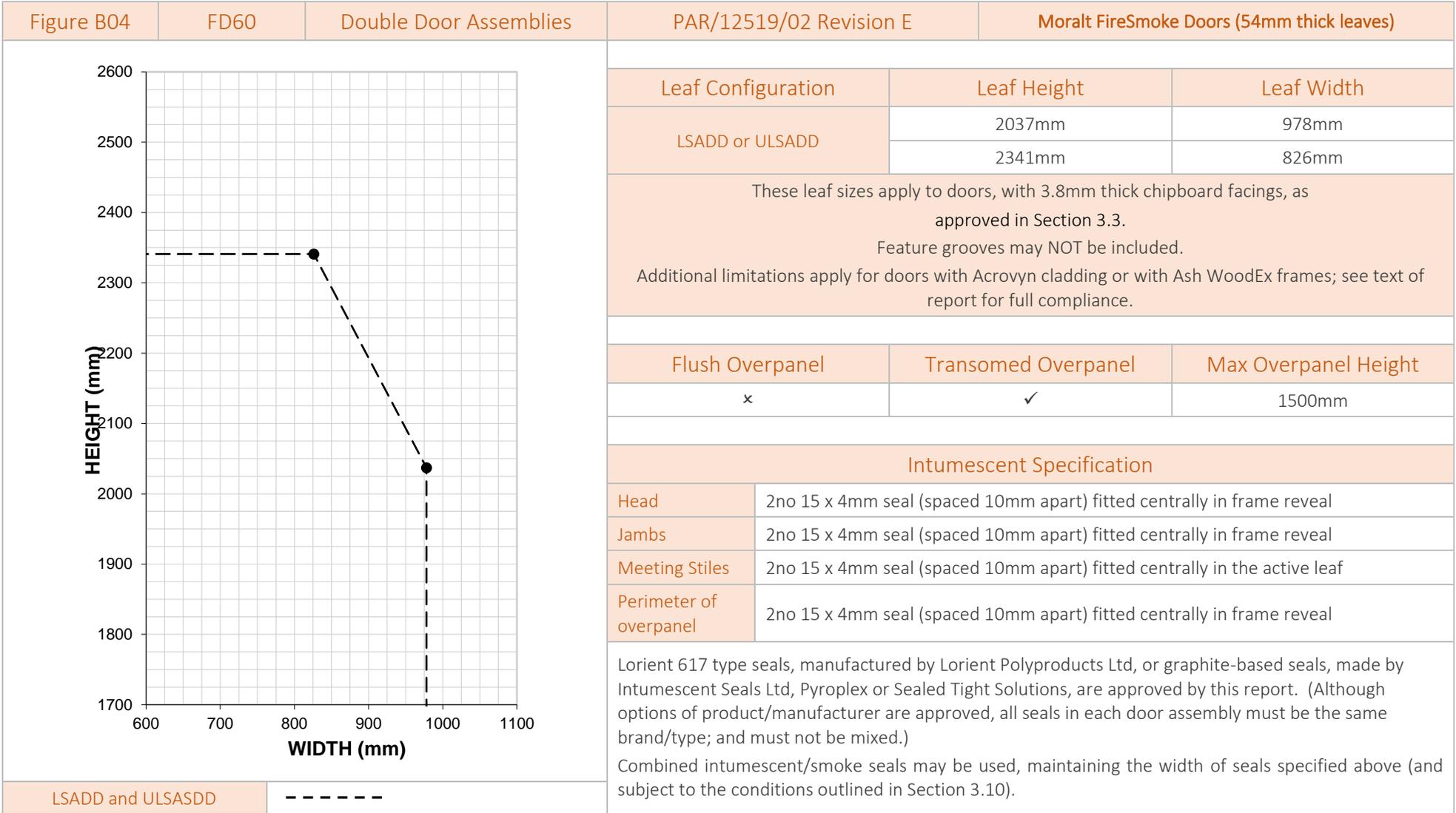
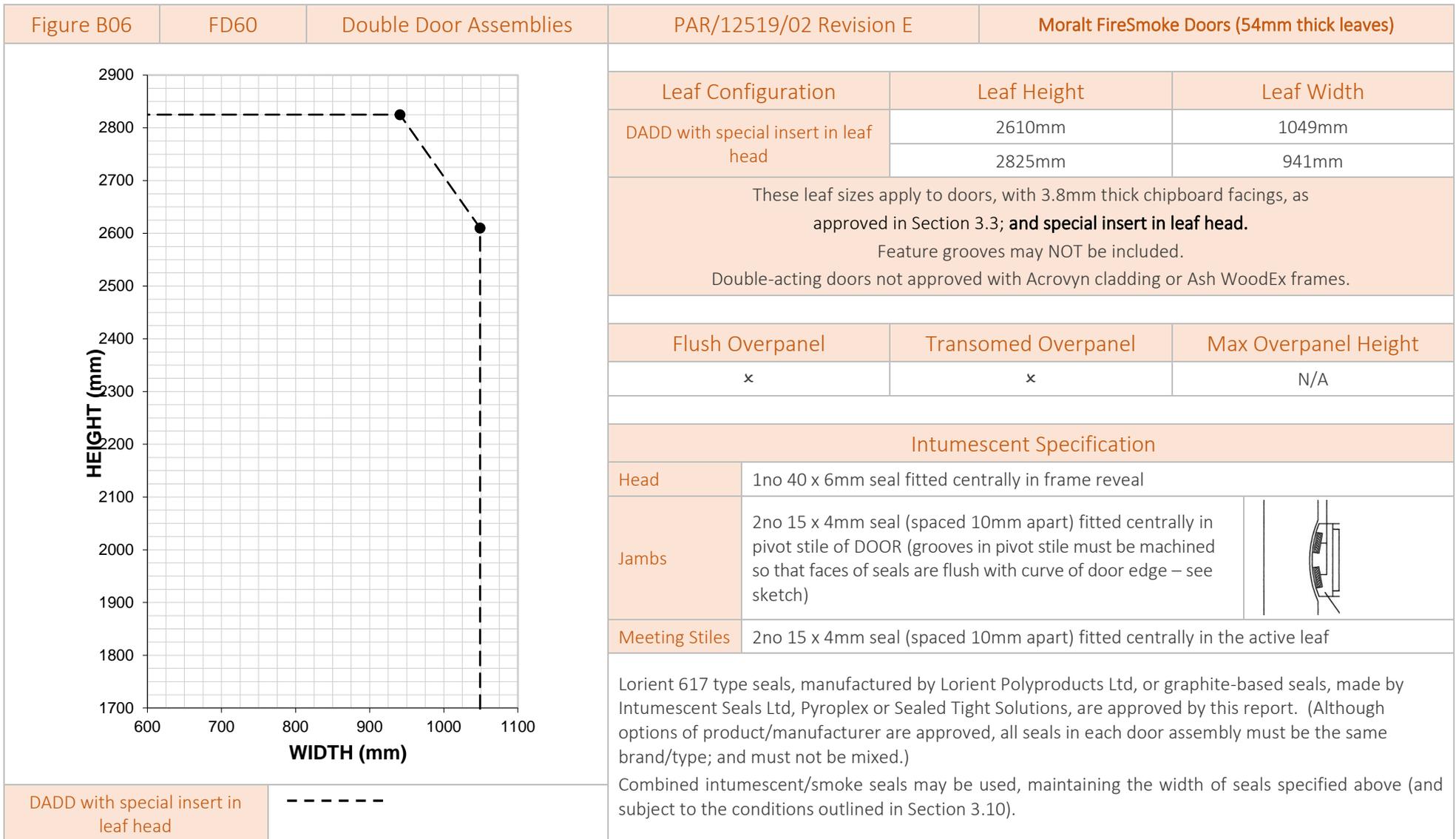
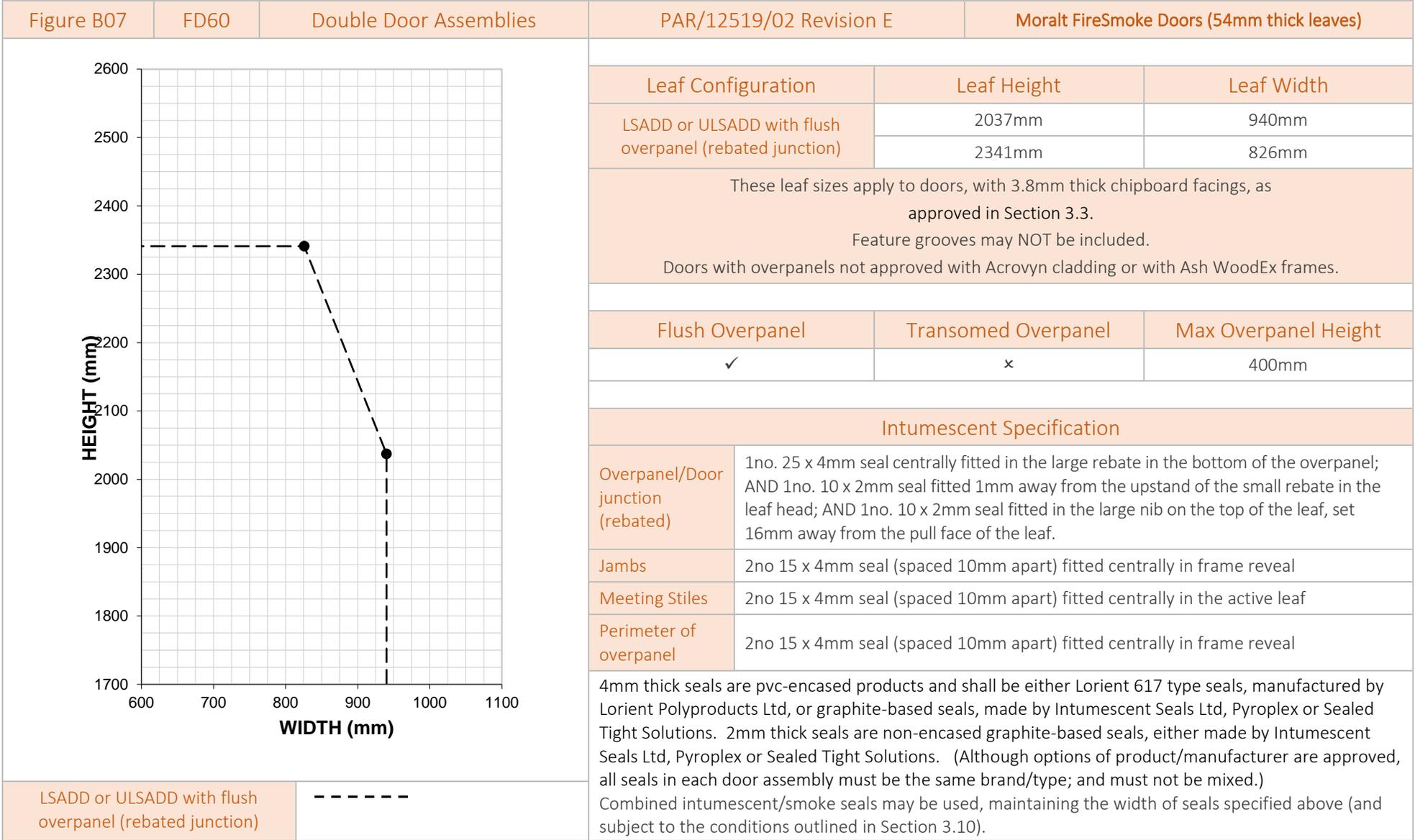


Figure B05	FD60	Double Door Assemblies	PAR/12519/02 Revision E	Moralt FireSmoke Doors (54mm thick leaves)							
		<table border="1"> <thead> <tr> <th>Leaf Configuration</th> <th>Leaf Height</th> <th>Leaf Width</th> </tr> </thead> <tbody> <tr> <td>DADD</td> <td>2150mm</td> <td>950mm</td> </tr> </tbody> </table>			Leaf Configuration	Leaf Height	Leaf Width	DADD	2150mm	950mm	
		Leaf Configuration	Leaf Height	Leaf Width							
DADD	2150mm	950mm									
<p>These leaf sizes apply to doors, with 3.8mm thick chipboard facings, as approved in Section 3.3. Feature grooves may NOT be included. Double-acting doors not approved with Acrovyn cladding or Ash WoodEx frames.</p>											
<p>DADD</p> <p>-----</p>		<table border="1"> <thead> <tr> <th>Flush Overpanel</th> <th>Transomed Overpanel</th> <th>Max Overpanel Height</th> </tr> </thead> <tbody> <tr> <td>x</td> <td>x</td> <td>N/A</td> </tr> </tbody> </table>			Flush Overpanel	Transomed Overpanel	Max Overpanel Height	x	x	N/A	
		Flush Overpanel	Transomed Overpanel	Max Overpanel Height							
x	x	N/A									
<p><b>Intumescent Specification</b></p> <table border="1"> <tbody> <tr> <td>Head</td> <td colspan="2">2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal</td> </tr> <tr> <td>Jambs</td> <td>2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in pivot stile of DOOR (grooves in pivot stile must be machined so that faces of seals are flush with curve of door edge – see sketch)</td> <td></td> </tr> <tr> <td>Meeting Stiles</td> <td colspan="2">2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in the active leaf</td> </tr> </tbody> </table> <p>Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacture are approved, all seals in each door assembly must be the same brand/type; and must not be mixed.) Combined intumescent/smoke seals may be used, maintaining the width of seals specified above (and subject to the conditions outlined in Section 3.10).</p>			Head	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in frame reveal		Jambs	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in pivot stile of DOOR (grooves in pivot stile must be machined so that faces of seals are flush with curve of door edge – see sketch)		Meeting Stiles	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in the active leaf	
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Meeting Stiles	2no 15 x 4mm seal (spaced 10mm apart) fitted centrally in the active leaf										





## APPENDIX C

### General Guidance on Installation of Hardware in Moralt FD60 FireSmoke doors

(Note: Different parameters apply for hardware on doors with Acrovyn Edge Protectors and/or cladding – see Section 3.11 for details)

### C.1.1 Butt Type Hinges

Moralt FireSmoke doors have been successfully tested with butt hinges; but other hinges may be used, subject to compliance with the specifications below:

ELEMENT		SPECIFICATION	
HINGE TYPE		Fixed pin, washered butt, ball bearing butt, lift-off type or journal supported. Rising butt, cranked butts or spring hinges (single or double action) are not approved.	
BLADE HEIGHT		89 - 115mm	
BLADE WIDTH		30 - 36mm	
BLADE THICKNESS		2.5 - 3.5mm	
MATERIAL		Phosphor Bronze, Steel or Stainless Steel. (No combustible or thermally softening materials to be included).	
FIXINGS		Steel screws, as recommended by the hinge manufacturer, but no smaller than 32mm long x 3.8mm diameter (No.8)	
MINIMUM NUMBER		3no. hinges per leaf for leaves up to 2200mm high 4no. hinges per leaf for leaves greater than 2200mm high	
POSITIONS	3NO.	TOP	120 - 200mm down from the leaf head to the top of the hinge
		MIDDLE	Either equi-spaced between the top and bottom hinges or positioned 200 – 250mm below the top hinge
		BOTTOM	150 - 225mm up from the bottom of the leaf to the bottom of the hinge blade
	4NO.	TOP	120 - 200mm down from the leaf head to the top of the hinge
		2 <sup>ND</sup> & 3 <sup>RD</sup>	Either equi-spaced between the top and bottom hinges or 2nd hinge positioned 200 – 250mm below the top hinge and the 3rd hinge equi-spaced between the 2nd and bottom hinge
		BOTTOM	150 - 225mm up from the bottom of the leaf to the bottom of the hinge blade
INTUMESCENT PROTECTION		All hinge blades shall be bedded on minimum 1mm thick graphite based or low-pressure forming intumescent material.  10mm width of the intumescent strip in the frame nearest to the stop (see Appendix A & B) shall be continuous alongside each hinge blade.	

### C.1.2 Concealed Tectus Hinges

Moralt FireSmoke doors have been successfully tested with Tectus TE concealed hinges (ref. 5273.SSE.FD60). This model is approved for doors within the scope of this report, subject to compliance with the specifications below:

ELEMENT		SPECIFICATION	
HINGE TYPE		Tectus TE concealed hinges (ref. 5273.SSE.FD60); by Simonwerk	
HINGE HEIGHT		155mm	
HINGE WIDTH		26mm	
HINGE THICKNESS		N/A	
MATERIAL		Steel	
FIXINGS		Steel screws, as recommended/proven by the hinge manufacturer.	
MINIMUM NUMBER		3no. hinges per leaf for leaves up to 2250mm high 4no. hinges per leaf for leaves greater than 2250mm high	
POSITIONS	3NO.	TOP	200mm down from the leaf head to the top of the hinge
		MIDDLE	Equi-spaced between the top and bottom hinges
		BOTTOM	225mm up from the bottom of the leaf to the bottom of the hinge
	4NO.	TOP	200mm down from the leaf head to the top of the hinge
		2 <sup>ND</sup> & 3 <sup>RD</sup>	Equi-spaced between the top and bottom hinges; unless otherwise specified by the hinge manufacturer.
		BOTTOM	225mm up from the bottom of the leaf to the bottom of the hinge
INTUMESCENT PROTECTION		All Tectus hinges are to be bedded on a BASF Exterdens TE 527 3D intumescent pack; as tested.  1no. 15 x 4mm intumescent strip fitted in the frame nearest to the stop (see Appendix A & B) shall be continuous alongside each Tectus hinge.	
ADDITIONAL LIMITATIONS		The door stops on the frame shall be at least 18mm deep (i.e. overlapping the face of the door by at least 15mm); as tested.	

### C.2.1 Single-point Mortice latches/locks

Moralt FireSmoke single-acting doors have been successfully tested with a ‘single-point’ morticed latch; in single leaf and double leaf doors. Other mortice latches or locks may be fitted, but must comply with the following specifications:

ELEMENT	SPECIFICATION
LATCH/LOCK TYPE	Mortice latches, tubular mortice latches, sashlocks and deadlocks
MAXIMUM FOREND DIMENSIONS	235mm long x 20mm wide
MAXIMUM STRIKEPLATE DIMENSIONS	185mm long x 20mm wide
MAXIMUM LATCH/LOCK BODY DIMENSIONS	20mm thick x 100mm wide (Height of body dictated by forend size; see above).
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
POSITIONS	Centred at 1000mm (± 200mm) above the bottom of the door leaf
INTUMESCENT PROTECTION	In ALL doors, the strike plate and forend must be bedded on 2mm thick low-pressure forming intumescent material e.g. Interdens; or 2mm thick graphite-based intumescent material e.g. Therm-A-Flex.  In single leaf doors, 8mm width of intumescent strip, fitted in the frame nearest to the stop (see Appendix A & B) shall be continuous alongside the strikeplate.  In double leaf doors, 10mm width of intumescent strip in the meeting edge (see Appendix A & B) shall be continuous along BOTH sides of the lock forend.

Latches must be fitted central in the leaf thickness. Over-morticing is to be avoided; mortices shall be as tight as possible to the latch. If gaps occur around the case (not exceeding 2mm), then these must be made good with intumescent mastic or sheet material. Holes for spindles or cylinders should be kept as small as is compatible with the operation of the hardware.

This report does not include approval of electronically operated latches/locks.

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 mortice. It is a condition of this assessment that the margin, between the aperture and the stile of the door, must be at least 75mm wider than the lock/latch mortice. If the mortice latch/lock is fitted in line with a ‘rail’ between two apertures, no part of the lock mortice shall be closer than 50mm to the edge of any aperture.

Double-acting doors may not be fitted with a latch or lock.

### C.2.2 Multi-point Mortice latches/locks

A Moralt FireSmoke FD60 door has been successfully tested with a ‘multi-point’ morticed latch; in a single leaf assembly. The Glutz 1893 mortice lock may be fitted to single leaf doors within the scope of this approval, subject to the following specifications:

ELEMENT	SPECIFICATION
LATCH/LOCK TYPE	Glutz 1893 multi-point mortice lock (code 1893.7.60.78.1788.SSS)
MAXIMUM FOREND DIMENSIONS	1788mm long x 20mm wide
MAXIMUM STRIKE PLATE DIMENSIONS	Strikeplate for main lock - 241mm long x 20mm wide
	Keep plates for upper and lower locks - 110mm long x 24mm wide
MAXIMUM LATCH/LOCK BODY DIMENSIONS	One main lock and two smaller locks; as tested
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
POSITIONS	Main lock centred at 1000mm (± 200mm) above the bottom of the door leaf. Secondary locks fitted 758mm above and below the main lock.
INTUMESCENT PROTECTION	The lock body, forend, strike plate and keeps must be bedded on 1mm thick BASF Interdens intumescent pack; ref 18931KFULL.  9mm width of one 15 x 4mm intumescent strip, fitted in the frame (see Appendix A & B), shall be continuous along ONE side of the strike for the main lock.  8mm width of BOTH 15 x 4mm intumescent strips, fitted in the frame (see Appendix A & B), shall be continuous along BOTH sides of the keeps for the upper/lower locks.
ADDITIONAL LIMITATIONS	The door stops on the frame shall be at least 18mm deep (i.e. overlapping the face of the door by at least 15mm); as tested.

Latches must be fitted centrally in the leaf thickness. Over-morticing is to be avoided; mortices shall be as tight as possible to the latch. If gaps occur around the case (not exceeding 2mm), then these must be made good with intumescent mastic or sheet material. Holes for spindles or cylinders should be kept as small as is compatible with the operation of the hardware.

This report does not include approval of electronically operated latches/locks.

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 mortice. It is a condition of this assessment that the margin, between the aperture and the stile of the door, must be at least 75mm wider than the lock/latch mortice. If the mortice latch/lock is fitted in line with a ‘rail’ between two apertures, no part of the lock mortice shall be closer than 50mm to the edge of any aperture.

### C.3 Door closing devices

Where required by regulatory guidance or specific fire strategy, each hinged door leaf must be fitted with a self-closing device; unless they are normally kept locked shut and labelled as such with an appropriate sign which complies with the BS 5499 series of standards.

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

Overhead surface-mounted closers are approved with the whole range of doors defined in this assessment; subject to the conditions below. A Dorma ITS96 concealed overhead closer is approved with a limited range of door configurations; subject to the conditions below.

Concealed jamb mounted closers, or transom mounted closers, are NOT approved for use on doors approved by this Report.

**Overhead Surface-mounted closers** may be used, subject to compliance with the specifications below.

- Face-fixed overhead door closers (and accessories such as soffit brackets) must be a type that has been included in a successful fire test on unlatched FD30 cellulosic door leaves in timber frames; when tested in accordance with BS:476: Part 22: 1987 or EN1634-1. Any accessory that is located within the door reveal must also have appropriate test evidence;
- In addition, where areas of uninsulated glazing are adjacent to the closer, the selected closer type must have been tested on the unexposed face of an uninsulated steel door, or a fully glazed door fitted with uninsulated glass, to demonstrate that the closer does not emit flammable fluids onto the glass face, that would otherwise cause integrity failure before the required period of fire resistance. (For clarity, the term 'uninsulated' in this clause applies to all of the glass types approved herein; except 25mm Pyrobel or 23mm Pyrostop).
- Where surface-mounted closers are fitted to doors with a rebated overpanel, the fixings to secure the arm and/or closer must NOT be fitted into the lipping at the bottom of the overpanel/top of the leaf, respectively.

**Dorma ITS96 concealed overhead closers** may be used, subject to compliance with the specifications below;

- The tested model was Dorma ITS96 (code GD3101), with a 34mm thick body. The code of the tested slide arm/channel was GD3101.SE, with a 31mm wide body;
- The ITS96 closer body must be morticed into the head of the leaf and the single arm/slide channel morticed into the frame head. Machining of a recess in the door head, to suit the arm, shall be as tested by Dorma;
- The ITS96 may only be used in **single** acting assemblies. Leaves may be latched or unlatched, and assemblies may be single leaf or double leaf; but the Dorma ITS96 concealed closer can NOT be used with overpanels;
- Minimum stop depth on the frame shall be 18mm, as tested;

- Inclusion of intumescent gasket kit (BASF code GD3602.HOUR) fitted around the closer body and around the slide arm channel; as tested.
- When using the concealed closer in a door with a glass opening 'underneath' the closer position, the top margin between the door head and the aperture must be at least 250mm;
- The slide arm channel shall be offset within the frame head (relative to the door thickness), so that a minimum 4mm width of intumescent is residual alongside the channel, nearest to the stop. (The closer body shall be central in leaf thickness).
- Maximum leaf height with a Dorma ITS96 closer is 2340mm.

The evidence, and this evaluation, does not support the substitution of other concealed closer models; nor does it support the use of the closer body fitted in the frame head.

#### C.4 Bolts (Double leaf Doors)

##### Flush bolts

Moralt FireSmoke doors have been successfully tested with Allart stainless steel flush bolts, in a double leaf door. This model, and other flush bolt models, may be fitted in the proposed doors; but they must all comply with the following specifications:

- The flush bolt must be a type that has been included in a successful fire test on FD60 cellulosic door leaves in timber frames, with similar meeting edge details and leaf thickness to that proposed; when tested in accordance with BS:476: Part 22: 1987 or EN1634-1.
- Maximum size of flush bolt is 210mm long x 20mm wide and 18mm deep.
- The body of the bolt shall be bedded on minimum 2mm thick graphite based or low-pressure forming intumescent material.
- Flush bolts may only be fitted into the edge of the door and bolts shall be positioned centrally in the leaf thickness. (The intumescent seals defined in Appendix A & B shall be fitted in the active leaf and so will not be interrupted by the flush bolts).
- If the keep plate for the upper bolt interrupts the intumescent seal in the frame head, the keep plate shall be bedded on 2mm thick low-pressure forming intumescent material. (If the keep plate only removes the outer pvc casing for the intumescent strips, leaving the intumescent core untouched, then no additional protection is necessary).

Flush bolts are NOT approved for use in doors with overpanels; nor with Acrovyn cladding.

##### Barrel Bolts

If preferred, face-fixed 'barrel bolts' may be fitted to the passive leaf, subject to the following limitations;

- Surface mounted barrel bolts shall not exceed 400mm in length, but there is no limitation on their width.
- Screws, for fixing the bolts to the door face, shall not cause damage or delamination of lippings. Where bolts are used in doors with an overpanel, the fixings to secure the bolt/keep must NOT be fitted into the lippings forming a rebated overpanel junction.
- A face-fixed self-closing device (see Section C.3) MUST be fitted to BOTH leaves; even if bolts are intended for 'permanent' use.

## C.5 Floor Springs and Accessories

Dorma BTS80 floor springs and accessories have been proven with a double-acting door assembly with Moralt FireSmoke doors. Alternative floor spring models may be used, subject to having appropriate fire test evidence when tested in an FD60 timber door assembly with similar leaf construction and thickness (and where all details at the frame interface are identical to that proposed). The following limitations apply to the Dorma products and to any alternative;

- Continuation of at least 7mm of the intumescent edge seals along BOTH sides of the top strap/pivot, in the frame head;
- Minimum 1mm thick Interdens intumescent sheet must line the mortise of the top strap and pivot in both the door leaf and frame head (or as supplied by the floor spring manufacturer);
- No removal of the timber or intumescent strip at the leaf stile (except for a 6-8mm diameter access hole for the top strap adjustment screw);
- Maximum size of top pivot/strap is 125 x 25mm; (Dorma 8066 tested). Maximum size of bottom strap is 235 x 24mm; (Dorma 7421 tested);
- Unless applicable evidence exists to the contrary, the floor spring must be fitted into a concrete floor; as tested.
- The floor springs must be installed and adjusted to ensure that leaves are fully aligned when in the closed position.

This approval does not include floor springs with single-acting straps and accessories. Nor does it apply to floor springs mounted in the frame head, nor transom-mounted closers.

## C.6 Non-Essential Hardware Items

### C.6.1 Letter plates

These are permitted but the selected model must be one that is tested, (in accordance with BS:476: Part 22: 1987 or EN1634-1), or otherwise approved, for use in 54mm thick (or less) fully cellulosic FD60 doors. They must be fitted in accordance with the manufacturer's instructions, including all intumescent liners and flaps. Letter plates must not be less than 150mm away from the leaf edge, or from any other aperture. Positioning above floor level will depend upon the test evidence for the letter plate.

**Note C1** The installation of such items in a door leaf may compromise its performance as a smoke control door assembly and it is the responsibility of other parties to establish the likely effects of such designs.

### C.6.2 Push plates, kick plates etc

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

### C.6.3 Pull handles

These may be fixed to the face of door assemblies, provided that the fixing points are no greater than 800mm apart. Pull handles that are fixed through the leaf should use clearance holes as close fitting as possible to the bolt; and fixings passing through the leaf shall be steel. Handles/fixings shall be at least 60mm away from the door edge, and from any aperture.

### C.6.4 Intumescent air transfer grilles

These must be tested, (in accordance with BS:476: Part 22: 1987 or EN1634-1), or otherwise approved for use with 54mm thick (or less) fully cellulosic FD60 doors. They must be fitted fully in accordance with the manufacturer's instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that tested. See Section 3.5.4, for restrictions on maximum size and placement of any apertures; these apply to those for grilles, which must also be included in the total area permitted for apertures given in Section 3.5.4. Positioning above floor level will depend upon the test evidence for the grille.

**Note C2** The installation of such items in a door leaf may compromise its performance as a smoke control door assembly and it is the responsibility of other parties to establish the likely effects of such designs.

### C.6.5 Security viewers

These may be fixed into the proposed doors, subject to the following limitations;

- The selected viewer must be a type that has been subjected to fire resistance testing, (in accordance with BS476: Part 22: 1987 or EN1634-1), and/or be assessed by a notified body, to support its use in FD60 door assemblies where the leaf construction and thickness are similar to those proposed herein.
- If testing of the selected viewer included lining the viewer/hole with an intumescent sheet material, then this shall be included in the proposed doors;
- Viewers shall be at least 60mm away from the door edge, and from any aperture.

### C.6.6 Drop seals

The following drop seals can be fitted into single-acting assemblies using the proposed door leaf;

- Lorient IS8010,
- Norseal NOR810, NOR810S and NOR810DB
- Sealed Tight Solutions ST422

All drop seals must be positioned centrally within the door thickness. Drop seals must be encased in minimum 2mm thick low-pressure intumescent material e.g. Interdens. If a drop seal is included to contribute to smoke control, it is the responsibility of others to determine if effective smoke sealing is achieved.

Where a drop seal is fitted in the passive leaf of double leaf doors, the 'end-plate' of the drop seal in the meeting stile of the passive leaf must be bedded on 1mm thick low-pressure intumescent material. In the active leaf, at least 10mm width of both 15 x 4mm intumescent strips shall be continuous alongside the end-plate.

### C.6.7 Door selectors

These are used on double leaf door assemblies, with latches, to ensure that the leaves close in sequence. Only face fixed door selectors are approved. Door selectors must not be recessed into the leaf or frame; and must not intrude into the door edge interface or interrupt any intumescent strips. When fixing components to the face of doors, care must be taken to ensure that screws do not cause delamination of lippings and/or splitting of timber.

### C.6.8 Lever Handles

ELEMENT	SPECIFICATION
MATERIAL	Metal/alloy – should not contain any flammable materials
SPECIFIC INSTALLATION REQUIREMENTS	Holes through the leaf shall be as close fitting as possible to the spindles and/or fixing screws; which must be steel.  Screws to fix handles must be at least 25mm away from the door edge; and, in glazed doors, from the visible edge of the glazing bead.
INTUMESCENT PROTECTION	None required
ADDITIONAL NOTES	This generic approval only applies to traditional ‘mechanical’ lever handles and does not apply to electro-mechanical handlesets (with security functions); which must be the subject of independent fire testing, and further analysis by IFC

### C.6.9 Dummy Cylinders (in morticed locks)

Based upon secondary test evidence (DMT-DO-50-897), “dummy cylinders”, may be included within Moralt FireSmoke doors, in lieu of a standard lock cylinder, subject to the following conditions;

- The approval is limited to use with a lock that is within the parameters for locks defined in C2.
- Both faces of the lock body shall be wrapped with 2mm thick Interdens intumescent sheet material.
- This approval only applies to the dummy cylinder proven in the test; reference TI85, supplied by ABUS AG.

## APPENDIX D

### Summary of Fire Test Evidence

#### D1. Primary Fire Test Evidence

LSASD	=	Latched, Single Acting Single Leaf Door assembly
ULSASD	=	Unlatched, Single Acting. Single Leaf Door assembly
ULSADD	=	Unlatched, Single Acting, Double Leaf Door assembly
ULSADD.OP	=	Unlatched, Single Acting, Double Leaf Door assembly with Overpanel

Test Report information		Items/Details Supported by Test Evidence
Test Report	Chilt/RF 07055	<ul style="list-style-type: none"> <li>Primary evidence for leaf size of double acting doors; and for glazing.</li> <li><b>Frame:</b> 125x40mm Sapele (640kg/m<sup>3</sup>) frame (including 8mm deep scallop profile)</li> <li><b>Leaf:</b> Moralt FireSmoke – laminated timber core(450kg/m<sup>3</sup>), with special insert in leaf heads; details on IFC confidential file. Facings 3.8mm particleboard (680kg m<sup>3</sup>). Rock Maple lips, (9mm 650kg/m<sup>3</sup>) all edges. UF glue for facings, insert and lippings.</li> <li><b>Floor Springs:</b> Dorma BTS80 floor springs. Dorma 8066 top pivots and 7421 bottom straps; bedded on 1mm Interdens.</li> <li><b>Latch:</b> None fitted</li> <li><b>Glass Opening:</b> 1200 x 200mm in both leaves; 120mm side margin from meeting stile. Both glazed with Pyroshield and Mann McGowan Pyroglaze 60 + Palusol liner. Rock Maple beads (25mm high +5mm bolection) fixed with 65mm long pins.</li> <li><b>Intumescent Seals</b> 40 x 6mm Lorient 617 intumescent seal central in frame head. 2no 15 x 4mm Lorient 617 intumescent seals in pivot jamb; 8.5mm apart. 2no 15 x 4mm Lorient 617 intumescent seals in one meeting stile, 10mm apart.</li> <li>NO flush bolts (or other mechanical retention) on passive leaf.</li> </ul>
Test Sponsor	Moralt AG	
Test Laboratory	Chiltern Fire International	
Test Date	1 May 2007	
Door configuration	DADD	
Leaf size (mm)	2600 x 950/950 x 54	
Test Standard	BS 476: Part 22: 1987	
Test result	61 minutes (glazing) 72 minutes (top of m/s)	

Test Report information		Items/Details Supported by Test Evidence
Test Report	Chilt/FEX10003A	<ul style="list-style-type: none"> <li>• Primary evidence for hinged double door, MDF frame; and multiple apertures.</li> <li>• <b>Frame:</b> 90x30mm MDF (750kg/m<sup>3</sup>) frame +12mm stop</li> <li>• <b>Leaf:</b> Moralt FireSmoke – laminated timber core(450kg/m<sup>3</sup> with special insert in leaf heads; details on IFC confidential file. Facings 3.8mm particleboard (680kg m<sup>3</sup>). Sapele lips, (6mm 640kg/m<sup>3</sup>) all edges. UF glue for facings and insert. PVA/PU glue for lippings.</li> <li>• <b>Hinges:</b> 3no. 100x35mm hinges bedded on 1mm Interdens sheet.</li> <li>• <b>Overhead closer:</b> Dorma TS83 surface mounted overhead closer.</li> <li>• <b>Lock:</b> Ingersoll Rand with 235 x 20mm forend. Forend and strike both bedded on 2mm Therm-A-Flex</li> <li>• <b>Flush Bolts:</b> 203 x 19mm; bedded on 2mm Therm-A-Flex</li> <li>• <b>Glass Opening:</b> 2no 800 x 200mm apertures in large leaf. (125mm side margins and 200mm apart). Bespoke glazing unit in each aperture – not included in this assessment.</li> <li>• <b>Intumescent Seals</b> 2no 15 x 4mm Lorient 617 intumescent seals in frame head and both jambs; 10mm apart. 2no 15 x 4mm Lorient 617 intumescent seals in meeting stile of active leaf, 10mm apart.</li> </ul>
Test Sponsor	Moralt AG	
Test Laboratory	Chiltern Fire International	
Test Date	26 October 2010	
Door configuration	ULSADD	
Leaf size (mm)	2320 x 420/900 x 54	
Test Standard	BS 476: Part 22: 1987	
Test result	60 minutes (glazing) 66 minutes (top hanging corner)	

Test Report information		Items/Details Supported by Test Evidence
Test Report	BMT/FEP/F14256 (Door A)	<ul style="list-style-type: none"> <li>• Primary evidence for 6mm MDF faces; and for feature grooves.</li> <li>• <b>Frame:</b> 104x32mm CND Beech (720kg/m<sup>3</sup>) frame + 13mm stop</li> <li>• <b>Leaf:</b> Moralt FireSmoke – laminated timber core(450kg/m<sup>3</sup>); details on IFC confidential file. Facings 6mm MDF faces (730kg/m<sup>3</sup>). 8mm Oak lips, (650kg/m<sup>3</sup>) all edges. UF glue faces and PU glue lippings.</li> <li>• <b>Hinges:</b> 3no. 100x30mm hinges; bedded on intumescent sheet.</li> <li>• <b>Overhead closer:</b> Rutland TS3204 surface mounted overhead closer.</li> <li>• <b>Lock:</b> Latch with 255 x 20mm forend; 185 x 25mm strike. 1mm Palusol fitted around lock body; and under forend and strike.</li> <li>• <b>Glass Opening :</b> NO glazing/aperture.</li> <li>• <b>Intumescent Seals:</b> 2no 15 x 4mm Pyroplex intumescent seal in frame head and jambs; 10mm apart.</li> <li>• <b>Feature grooves:</b> 6 x 4mm deep grooves machined into faces. Horizontal grooves on one face (245mm apart); vertical grooves on reverse face (105mm apart).</li> <li>• <b>Drop Seal:</b> Norsound NOR810dB; lined with 1mm Palusol</li> </ul>
Test Sponsor	Moralt AG	
Test Laboratory	BM TRADA	
Test Date	10 November 2014	
Door configuration	ULSASD	
Leaf size (mm)	2135 x 926 x 54	
Test Standard	BS 476: Part 22: 1987	
Test result	64 minutes	

Test Report information		Items/Details Supported by Test Evidence
Test Report	WF 382394 Rev A AR1 (Door B)	<ul style="list-style-type: none"> <li>• Primary evidence for concealed closer, concealed hinges and multi-point lock.</li> <li>• <b>Frame:</b> 100x38mm Sapele (640kg/m<sup>3</sup>) frame + <u>18mm</u> stop</li> <li>• <b>Leaf:</b> Moralt FireSmoke – laminated timber core(450kg/m<sup>3</sup>); details on IFC confidential file. Facings 6mm MDF faces (780kg/m<sup>3</sup>). 8mm Sapele lips, (650kg/m<sup>3</sup>) all edges. Low formaldehyde glue faces and PU glue lippings.</li> <li>• <b>Hinges:</b> 3no. Simonswerk Tectus TE concealed hinges (ref. 5273.SSE FD60). BASF exterdens TE 527 3D intumescent pack. 1no. 15 x 4mm continuous past hinges.</li> <li>• <b>Concealed Overhead closer:</b> Dorma ITS 96 closer (GD3101) with SE arm/channel. BASF Interdens GD3602 intumescent pack fitted to closer body and channel. 4mm width of 1no. 15 x 4mm continuous past channel.</li> <li>• <b>Lock:</b> Glutz Multipoint 1893 Latch with 1788 x 20mm forend; 240 x 40mm central strike and 110 x 24mm upper/lower keeps. BASF Interdens MINT 18931 intumescent pack fitted to lock body and strike/keeps. Partial strips continuous past strike/keeps. The test report states that the latch/lock was disengaged for the test.</li> <li>• <b>Glass Opening :</b> NO glazing/aperture.</li> <li>• <b>Intumescent Seals:</b> 2no 15 x 4mm Pyroplex intumescent seal in frame head and jambs; 10mm apart.</li> </ul>
Test Sponsor	Moralt AG	
Test Laboratory	Warringtonfire	
Test Date	17 May 2017	
Door configuration	ULSASD	
Leaf size (mm)	2250 x 1000 x 54	
Test Standard	BS 476: Part 22: 1987	
Test result	69 minutes (burnthrough of leaf. No failure at hardware)	

## D2. Summary of Secondary Fire Test Evidence

Test Report information	Items/Details Supported by Test Evidence	
Test Report	BMT/FER/F13262 Door A	<ul style="list-style-type: none"> <li>Secondary evidence for doors with overpanel.</li> <li><b>Frame:</b> 119 x 32mm Sapele (640kg/m<sup>3</sup>) + stop</li> <li><b>Leaf:</b> Moralt FireSmoke – laminated timber core(450kg/m<sup>3</sup>); details on IFC confidential file. Facings 6mm MDF (780kg m<sup>3</sup>). 20mm Sapele lips (640kg/m<sup>3</sup>) to rebated edges. 8mm Sapele lips (640kg/m<sup>3</sup>) to other edges. UF glue faces and lippings.</li> <li><b>Hinges:</b> 4no. 102x35mm hinges. Interdens 2mm sheet under hinge blades.</li> <li><b>Overhead closer:</b> Rutland TS3204 surface mounted overhead closer on both leaves.</li> <li><b>Lock:</b> Latch with 255 x 20mm forend; 185 x 25mm strike. 1mm Interdens fitted around lock body; and under forend and strike.</li> <li><b>Glass Opening</b> NO glazing/aperture</li> <li><b>Intumescent Seals</b> 2no 15 x 4 Pyroplex intumescent seals in frame reveal; 10mm apart. 20 x 4mm Pyroplex intumescent seal in rebate on bottom of overpanel. 1no 10 x 2mm graphite seal in rebate <u>and</u> in nib of door head. 2no 15 x 4 Pyroplex intumescent seals in meeting stile of active leaf; 10mm apart.</li> <li>No flush bolts (or other mechanical retention) on passive leaf.</li> </ul>
Test Sponsor	Moralt AG	
Test Laboratory	Chiltern Fire International	
Test Date	29 January 2014	
Door configuration	ULSADD + Overpanel with offset rebate	
Leaf size (mm)	2335 x 940/435 x <u>52</u> (+ overpanel 285mm high)	
Test Standard	BS 476: Part 22: 1987	
Test result	45 minutes (bottom of meeting stiles) 62 minutes (top of meeting stiles/overpanel junction)	

### Other Secondary Evidence

TEST LABORATORY. REPORT NO. TEST DATE.	CONFIGURATION TESTED	LEAF SIZE TESTED	TEST STANDARD	INTEGRITY
BM TRADA BMT/FEP/F14102  8 July 2014 Test sponsored by James Latham	ULSADD (Both) Test referenced to prove Latham “WoodEx” “Ash” frame with a proprietary timber fire door (NOT Moralt).	Door A - 2040 x 826/300 x 54mm	BS 476: Part 22:  1987	Door A – 42 minutes (door frame 71) <i>Initial failures remote from door frame interface</i>
DMT-DO-50-897  DMT Dortmund 29 Sept 2020	Test referenced to prove inclusion of ‘dummy’ lock cylinder in Moralt 54mm FireSmoke door.	N/A	EN 1634-1:2014 + A1: 2018	66 minutes

continued overleaf...

*Secondary evidence continued*

TEST LABORATORY. REPORT NO. TEST DATE.	CONFIGURATION TESTED	LEAF SIZE TESTED	TEST STANDARD	INTEGRITY
BMT/FEP/F13095  10 September 2013  Test sponsored by Construction Specialities	ULSADD  Test referenced to prove Acrovyn cladding to face and all edges of proprietary timber fire doors. (NOT Moralt door leaves). Sapele frame also clad with Acrovyn. Latch fitted but disengaged. No flush bolt fitted. Intumescent strips fitted in head and both vertical edges of each leaf.	1400 x 900/300 x 54mm	BS 476: Part 22:  1987	60 minutes and 20 seconds
RF/11061  20 May 2011  Test sponsored by Construction Specialities Ltd	ULSADD  Test referenced to prove Acrovyn Door Edge Protectors on both vertical edges of proprietary timber fire doors. (Two identical assemblies tested, each using a different door type; but neither were Moralt door leaves). Sapele frame. Latch fitted but disengaged. No flush bolts fitted. Twin Intumescent strips fitted in door frame. Single intumescent strip in Edge Protectors on meeting edges of each leaf; but no strips in Edge Protector at hanging stiles.	2100 x 900/300 x 54mm (both assemblies)	BS 476: Part 22:  1987	Door A - 66 minutes  Door B - 68 minutes

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

Some of the test evidence is co-sponsored by a 3rd Party; but IFC have written permission from the co-sponsor, to use the evidence in support of this assessment.

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