

FIELD OF APPLICATION REPORT
PAR/12519/01 Revision E
August 2021

Moralt AG
Field of Application Report for Moralt
FD30 FireSmoke and FireSafe Door Leaves
Installed in Timber Frames
Fire Resistance Standard: BS476: Part 22: 1987

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PAR/12519/01	March 2013	PP	DC	–	-
Revision A	October 2013	PP	DC	Various	Inclusion of 54mm thick FireSmoke 35dB construction, additional fire resistance test report and associated changes
Revision B	March 2014	PP	DC	Various	Inclusion of additional test report and associated changes
Revision C	January 2015	PP	DC	Various	Inclusion of additional test evidence for grooves in leaf faces and associated changes
Revision D	April 2016	DC	DI	Various	Inclusion of additional test evidence and associated changes
Draft Revision E	July 2021	MB	CPH	All	Complete update to latest IFC format. Omission of double-acting doors. Omission of some test evidence. Revisions to scope and specifications in most sections /clauses. Addition of new evidence for recessed pull handles and dummy cylinders.
Revision E	August 2021	MB	CPH	References to Appendices	Formal issue following acceptance of draft by client. Format of Appendix A and B merged and all references to Appendices adjusted; but details unchanged.

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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 and FireSafe door leaves (44mm thick or 54mm thick) installed in timber frames, that are required to provide 30 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

In many cases, the approved parameters and scope of this report apply equally to 44mm or 54mm thick leaves; and apply equally to the FireSmoke or FireSafe door construction. However, 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.

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 30 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 C 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 & FireSafe doors

The approved leaf sizes and configurations of door assemblies comprising FireSmoke and FireSafe door leaves are outlined in Table 1, below. For clarity, although this table applies to two door types, this does not imply that door types can be ‘mixed’ in one assembly. Each framed assembly must only include leaves (and panels, where applicable), formed from the same door type. **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.**


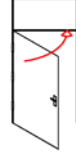
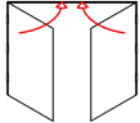
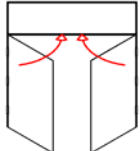
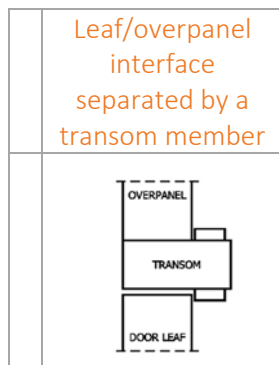


	CONFIGURATION	ENVELOPE OF APPROVED LEAF SIZES ^{NOTE 4}
	<ul style="list-style-type: none"> • Latched or Unlatched • Single Acting • Single Door • Without Overpanel • (or with overpanel above a transom ^{Note 1}) 	<p>Refer to Figures in Appendix A</p> <p>Different sizes apply with certain variations. Users should ensure the correct Figure is referenced.</p>
	<ul style="list-style-type: none"> • Latched or Unlatched • Single Acting • Single Door • With Overpanel ^{Note 2} 	<p>Refer to Figures in Appendix A</p> <p>Different sizes apply with certain variations. Users should ensure the correct Figure is referenced.</p>
	<ul style="list-style-type: none"> • Latched or Unlatched • Single Acting • Double Doors ^{Note 3} • Without Overpanel • (or with overpanel above a transom ^{Note 1}) 	<p>Refer to Figures in Appendix A</p> <p>Different sizes apply with certain variations. Users should ensure the correct Figure is referenced.</p>
	<ul style="list-style-type: none"> • Latched or Unlatched • Single Acting • Double Doors ^{Note 3} • With Overpanel ^{Note 2} 	<p>Refer to Figures in Appendix A</p> <p>Different sizes apply with certain variations. Users should ensure the correct Figure is referenced.</p>

Table 1. Approved leaf Configurations and Sizes

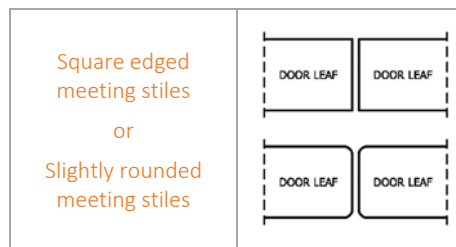
^{Note 1} Door assemblies which include an overpanel above a transom **MUST** incorporate the junction, shown below, between leaf head and overpanel;



Note 2 Door assemblies which include an overpanel without a transom, where approved above, must use the relevant junction shown below;

Single leaf doors must have a square leaf/overpanel interface	Double leaf doors must have an equally rebated leaf/overpanel interface
	

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



Double-acting doors are NOT approved by this report. If required, double-acting doors can be made using the specifications defined in the latest version of PAR/12519/02, for FireSmoke FD60 doors. (The full specification of PAR/12519/02 must be employed, even if an FD30 rating is required).

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, based upon using the intumescent seal specifications shown in Appendix A. 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. Unequal width pairs may be used 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). 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.

3.3 Door Leaf and Overpanel Specification

Full details of the Moralt LAMINESSE FireSmoke and FireSafe constructions have 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 C. 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 ^{Note 5}		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
<p>FACINGS</p> <p>Leaves/overpanels must have same 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>		Particleboard - FireSmoke door only	(Held on IFC confidential file)	3.8mm thick Or 6mm thick ^{Note 4}
		MDF - FireSmoke door only	(Held on IFC confidential file)	6mm thick ^{Note 4}
		Plywood (Cross-grain veneers) FireSafe door only	(Held on IFC confidential file)	3.8mm thick Or 6mm thick ^{Note 4}
LIPPINGS ^{Note 6}	SQUARE EDGES	Hardwood	640kg/m ³ ^{Note 7}	6–20mm thick ^{Note 8}
	REBATED OVERPANEL EDGES	Hardwood	640kg/m ³ ^{Note 7}	20mm thick ^{Note 9}
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		-	-	43.5mm Or 53.5mm
OPTIONAL ADDITIONAL DECORATIVE FINISHES		Timber veneer or decorative plastic-based laminate (to leaf faces only)	-	Maximum 2mm thick
		Paint or varnish	-	Maximum 0.5mm thick
Acrovyn Faces/Edges are approved for door leaves – see separate clause in Section 3.11				

Table 2. Door and Overpanel Specifications (see notes overleaf)

^{Note 4}Limited leaf sizes apply for 44mm thick doors with 6mm thick faces but the full range of leaf sizes is approved for 54mm thick doors with 6mm thick faces. See Appendix A for details.

- Note 5 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.
- Note 6 Lippings must be fitted to all four edges of doors and overpanels. Lippings must be applied after bonding the facings.
- Note 7 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 $11 \pm 2\%$ for UK market in heated buildings between 12-21°C (or to suit internal joinery moisture content specification of export countries). The machining of the core/lipping, and 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 single acting double 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 x half the door thickness.

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.

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 above. Such adjustments shall not negate compliance with all other parameters herein (e.g. aperture margins).
- 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 above. Such adjustments shall not negate compliance with all other parameters herein (e.g. aperture margins).

Feature Grooves

44mm and 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 door edges must be positioned minimum 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 of 44mm thick leaves, 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 an overpanel junction (single or double leaf). If 54mm thick leaves are used, with a back-to-back groove pattern, then grooves may extend to the leaf edge at meeting stiles and/or overpanel junction.
- Where multiple grooves/patterns are included, there must be a minimum of 90mm between each groove. (*Limitations for feature grooves continued overleaf*)

- 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 minimum 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.
- If feature grooves extend to the bottom edge of a leaf that also includes a drop seal, additional limitations apply; see Appendix B for hardware
- 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 softwood or hardwood given in Table 3a, below, may be used across the complete range of approved leaf sizes and configurations outlined in Appendix A, utilising the relevant intumescent seal specifications outlined in Appendix A.

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
Softwood or hardwood	510kg/m ³ Note 10	32mm, excluding stop Note 12	70mm (for 44mm thick doors) 80mm (for 54mm thick doors)	12mm Note 13

Table 3a

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

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
MDF	730kg/m ³ Note 11	30mm, excluding stop Note 12	70mm (for 44mm thick doors) 80mm (for 54mm thick doors)	12mm Note 13

Table 3b

Frames made from “Ash WoodEx” material (only supplied by James Latham Ltd) must utilise the frame specifications in Table 3c, overleaf. Assemblies with Ash WoodEx frames may be used in single leaf or double leaf configurations, without overpanels, but are limited to a maximum leaf size of 2100 x 926mm; superseding leaf sizes in Appendix A.

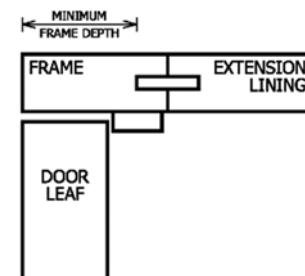
‘Level 1’ intumescent seal specifications (outlined in Appendix A) may be used if doors in WoodEx frames do not include glazing; but ‘Level 2’ intumescent seal specification (outlined in Appendix A) must be employed with glazed doors in WoodEx frames.

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
Ash WoodEx	640kg/m ³ Note 10 & 14	30mm, excluding stop Note 12	70mm (for 44mm thick doors) 80mm (for 54mm thick doors)	15mm ^{Note 13}

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. See Section 3.8 regarding projecting frames and shadow gaps.
- 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.
- 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. For the purpose 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 70/80mm 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 <u>or</u> mitred joint which is glued with a crosslinking adhesive e.g. UF or PU, and the head twice screwed to each jamb. |
|------------------|---|

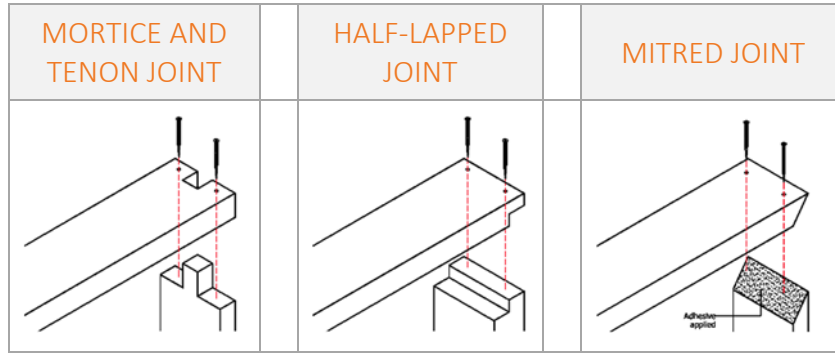


Table 4a

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 assesssmtn report.

TRANSOM MEMBERS When a transom is used between a door and an overpanel, as defined in Table 1, the transom member shall be softwood or 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 70 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.

Table 4b.

Acrovyn cladding is approved for door frames – subject to certain limitations - see separate clause in Section 3.11

3.5 Glazed Apertures

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

Any doors that contain glazed apertures must include the ‘level 2’ intumescent strip specifications (see Appendix A); irrespective of leaf size.

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.

GLASS TYPE/ MANUFACTURER	GLAZING MEDIA	BEAD MATERIAL/ PROFILE/SIZE	PANE SIZE	BEAD FIXINGS
7mm thick Pyran S (Schott Glass)	Lorient 'Figure 1' system	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	60 x 1.5mm pins
7mm thick Pyroguard Clear (Pyroguard)	10 x 2mm Interdens	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50 x 1.5mm pins
7mm thick Pyrobelite (AGC Flat Glass)	12 x 3mm Superwool X607 capped with DC815 silicon	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50mm screws
10mm thick Pyrodur 60-10 (Pilkington)	15 x 3mm Hodgsons Firestrip 60	Hardwood square or splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50mm screws
7mm Pyrodur Plus 30-104 (Pilkington)	15 x 4mm Therm-A-Bead	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	40 x 1.5mm pins
12mm thick Pyrobelite (AGC Flat Glass)	15 x 2mm Superwool X607 not capped	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50mm screws
13mm thick Pyrodur 60-20 (Pilkington)	15 x 4mm Fireglaze OR 15 x 4mm Therm-A- Bead	Hardwood splayed/15mm high plus 4mm bolection	1300 x 550mm with Fireglaze 600 x 500mm with Therm-A- Bead	50mm screws
15mm thick Pyrostop 30-10 (Pilkington)	12 x 3mm Hodgsons Firestrip 30	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50mm screws
15mm thick Pyranova 30 2.0, or, 19mm thick Pyranova 30 2.1 (Schott Glass)	12 x 3mm ceramic fibre tape capped with Wurth sealant	Hardwood square or splayed/ 15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50mm screws
16mm Pyrobel (AGC Flat Glass)	12 x 3mm closed cell foam capped with DC796 or DC797 silicon	Hardwood splayed/15mm high plus 4mm bolection	Up to maximum parameters in Table 6	50mm screws

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

Beads shall be fixed using pins or screws, as defined in Table 5, above. Fixings shall be maximum 50mm from each corner and at maximum 150mm centres; with fixings installed at 30-40 degrees relative to the face 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 30 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), 16mm thick Pyrobel (AGC Flat Glass) or 15/19mm thick Pyranova must be employed.

Glass 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.

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.

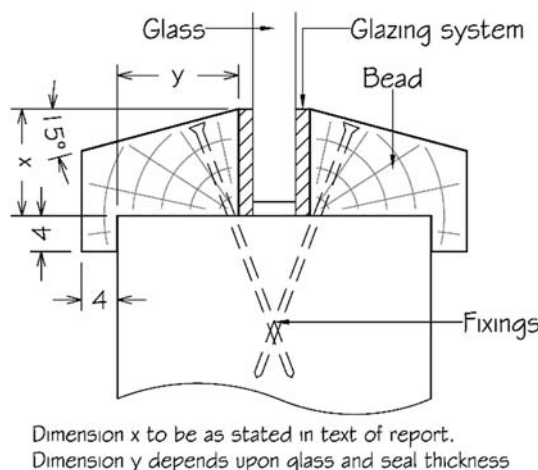
3.5.3 Bead profiles and installation

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 15mm deep, 15° splayed top, plus bolection moulding not less than 4mm deep/wide.

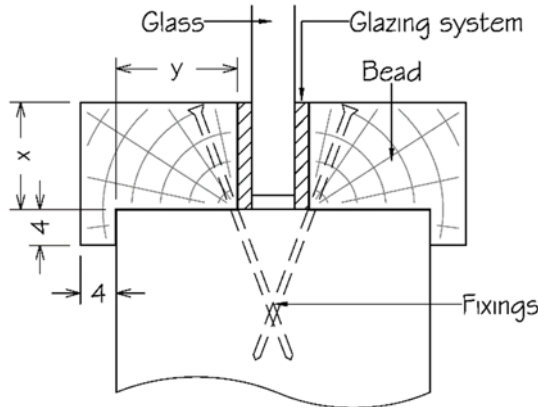
Sketch no 2 15mm deep, flat top, plus bolection moulding not less than 4mm deep/wide.

Glazing beads shall be formed from hardwood with a minimum density of 640kg/m³, 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).



Sketch no 1 - Splayed bead

Where 54mm thick doors are employed, in conjunction with splayed beads, the visible bead height at the 'front' of the bead will be 'reduced'; due to the angle of the splayed surface. If preferred, the 15mm bead height (against the glass) may be increased to 20mm; but the depth of the selected glazing media shall also be increased by 5mm, to suit.



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, below, outlines limitations that apply to glazed apertures in the door leaves considered herein. Note that these parameters depend upon the glass type and aspect ratio of aperture and are limited by minimum margins; so aperture sizes will also be restricted by leaf sizes.

Maximum dimensions of rectangular or square aperture when using Pyran S glass <u>only</u>	- maximum height of aperture 2070mm - maximum width of aperture 930mm - subject to a maximum area of 1.65m ² each leaf
Maximum dimensions of tall/narrow aperture using other approved glass types	- maximum height 1400mm - maximum width 250mm - subject to a maximum area of 0.30m ² each leaf
Maximum dimensions of rectangular or square aperture using other approved glass types	- maximum height or width 700mm - subject to a maximum area of 0.44m ² each leaf
Minimum distance from leaf edge (top)	- 200mm (with all glass types)
Minimum distance from leaf edge (sides)	- 100mm when using Pyran S glass - 195mm with other glass types
Minimum distance between apertures	- 110mm when cut directly into door core (see also Section 3.5.6 for smaller margins using solid hardwood glazing bars)
Minimum distance from bottom of leaf	- 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 B.

- Note 15 Maximum aperture height and maximum aperture width cannot be used simultaneously; and are restricted by the maximum area; which varies in each case. 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 specific glass types and/or glazing systems.
- Note 17 Any aperture(s) for intumescent air transfer grilles, (see Section F.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 or FireSafe 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 FD30 door construction.

The method of forming the curved beads must have 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. 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 and glazing system can each be suitably modified to a curved shape.

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.

3.5.6 Narrow Glazing Bars

Test evidence has been presented to demonstrate options for creating 'narrow' glazing bars; or narrow margins between adjacent apertures.

Test PB-271-38418-PK6 included a specimen whereby adjacent glazed apertures, in the leaf, were separate by a 40mm wide 'glazing bar'. The glazing bar was formed from solid oak, 40mm wide x 45mm thick in section (i.e. to suit the 45mm thick door thickness); and was bonded in place using PVAc. The joint at each end of the glazing bar (interfacing with the door core) was reinforced using two 6mm thick tongues. Tongues were each 30mm wide, so that they engaged by 15mm into the edge of the glazing aperture and glazing bar, respectively.

This concept is approved in the proposed doors but subject to the following limitations;

- For the sake of clarity, both ends of each glazing bar must be fixed to the door core (using the tested design, described above); and must not be fixed to another glazing bar.
- More than one glazing bar may be used in one aperture; but glazing bars must be either vertical or horizontal in that aperture – not of mixed orientation, nor crossed.
- Maximum length of glazing bar is 500mm.
- Glazing bars may be included to ‘sub-divide’ a larger aperture that is otherwise within the maximum area permitted in Section 3.5.4. Alternatively, the glazing bars may be used to separate smaller apertures that are within the individual parameters for maximum height/width of apertures; but the total area of apertures (formed in this way) must not exceed the maximum area defined in Section 3.5.4.
- Glazing beads shall be one of the approved bead profiles with a bolection moulding (see Section 3.5.3 herein); and beads shall be fixed to the glazing bar with screws or pins, (as described in Section 3.5.1), depending upon the glass type.

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. 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 ^{Note 18}
Overpanel above a Single leaf:	- 400mm - with a square junction to the door
Overpanel above Double leaves:	- 1500mm - high if fitted above a transom member ^{Note 18}
Overpanel above Double leaves:	- 400mm - with a rebated junction to the doors

^{Note 18} 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/support. The overpanel must always 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 B, 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 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 30 minutes fire resistance, at the required size, when incorporating door openings. If fitted into timber or steel stud partitions, the method of forming the door assembly aperture must be as tested by the partition and/or door assembly manufacturer.

Note 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.

There shall be no feature rebates or shadow gaps at the junction of the frame and wall with timber frames; 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, based upon tested details. PVC encased seals shall be employed across the complete range of door sizes and configurations approved herein.

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 B 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 3m³/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, 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 and FireSafe FD30 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.
- Acrovyn Door Edge Protectors shall only be applied on 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, preformed to an 8mm thick U-profile, and bonded to a 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. No additional intumescent protection is needed in double doors but the strikeplate must be bedded on 1mm thick Interdens in single leaf doors.
- Hinges shall comply with Appendix B, herein. The intumescent strip in the Edge Protector will be interrupted by hinges but no additional intumescent protection is needed in door or frame. 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.
- 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 B for more details.
- A 15 x 4mm Lorient 617 intumescent strip shall be fitted into the Edge Protector; positioned centrally in the door thickness. For clarity, both meeting stiles of double doors will include this intumescent strip.
- If an Edge Protector is fitted to both stiles of a leaf, a 15 x 4mm Lorient 617 intumescent strip must be centrally fitted in both frame jambs and a 25 x 4mm Lorient 617 intumescent strip must be centrally fitted in the frame head. These parameters supersede those specified in Appendix A, herein.
- If an Edge Protector is only fitted in the leading edge of a single leaf (or in meeting stiles of a double leaf), then a 20 x 4mm Lorient 617 intumescent strip must be centrally fitted in both jambs of the frame and a 25 x 4mm Lorient 617 intumescent strip must be centrally fitted in the frame head. These parameters supersede those specified in Appendix A, herein.

- Frames for FD30 assemblies shall be softwood or hardwood; 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.
- If required, Acrovyn cladding may be applied to single leaf doors with an overpanel; but, in the absence of evidence with rebated edges, Acrovyn cannot be applied to double 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 both vertical edges of the leaf/leaves; using JOWAT 609.38 PU adhesive. (Contact CS Specialities for application rates and method statement).
- The remainder of the door faces (i.e. between the return legs of the U-profiles) 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 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 and U-Profiles must extend over the full width/height of the leaf, as applicable; and no joints must be included in the length of each piece.
- 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 but no additional intumescent protection is needed at the latch or strike.
- Hinges shall comply with Appendix B, herein. The intumescent strip in the Edge Protector will be interrupted by hinges but no additional intumescent protection is needed at the hinges. It is the responsibility of others to ensure that the rounded profile of the Acrovyn 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.
- 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 B for more details.

- In single leaf assemblies, a 15 x 4mm Lorient 617 intumescent strip shall be fitted into the head and stiles of the leaf, positioned centrally in the door thickness. Identical strips shall also be fitted in the centre of the frame reveal. These parameters supersede those specified in Appendix A, herein.
- In double leaf assemblies, a 15 x 4mm Lorient 617 intumescent strip shall be centrally fitted in both meeting stiles. A 20 x 4mm Lorient 617 intumescent strip shall be fitted into the hanging jambs of the frame and a 25 x 4mm Lorient 617 intumescent strip must be fitted in the head of the frame. If that arrangement is used, no further intumescent strips need to be fitted in the door leaves.
- Alternatively, (in double doors), a 15 x 4mm Lorient 617 intumescent strip may be centrally fitted in the head and hanging stiles of the doors AND a 15 x 4mm Lorient 617 intumescent strip must be centrally fitted in the head and jambs of the frame. (A 15 x 4mm Lorient 617 intumescent strip shall be centrally fitted in both meeting stiles). These parameters supersede those specified in Appendix A, herein.
- Frames for FD30 assemblies shall be softwood or hardwood; 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).
- 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 Moralt FireSound or FireSafe 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 30 minutes.

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

Any door assemblies that include leaves without apertures are proven to satisfy the insulation criteria for at least 30 minutes; and can also be assessed to Section 6 of BS476: Part 22: 1987 for a 30 minute performance rating for both integrity and insulation.

Any door assemblies that include leaves with apertures glazed with 15mm Pyrostop, 16mm Pyrobel or 15mm/19mm Pyranova would satisfy the insulation criteria for at least 30 minutes; and can also be assessed to Section 6 of BS476: Part 22: 1987 for a 30 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/ 12519/01 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 confirm that any changes which are subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.
- We agree to withdraw this assessment from circulation should the component or element of structure, 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

Assessed Leaf Size Envelopes (and associated Intumescent Seal Specifications) for Moralt FireSmoke or FireSafe Door Leaves Installed in Timber Frames

Figures A01-A09

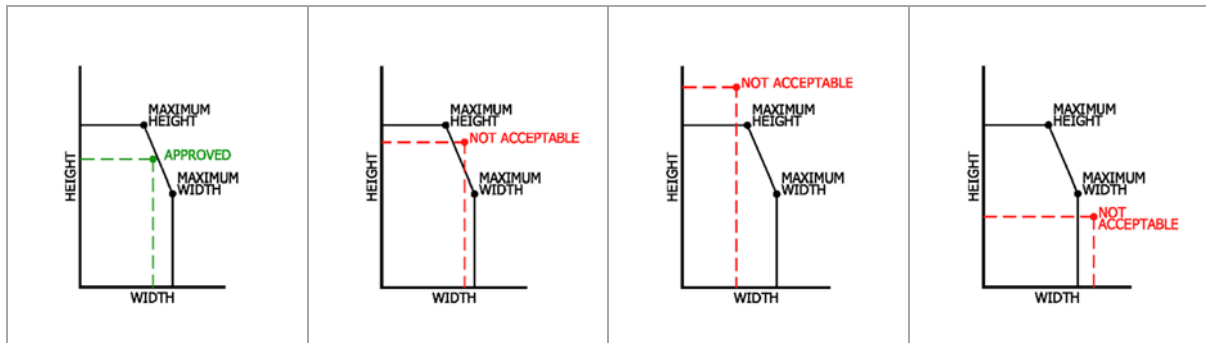


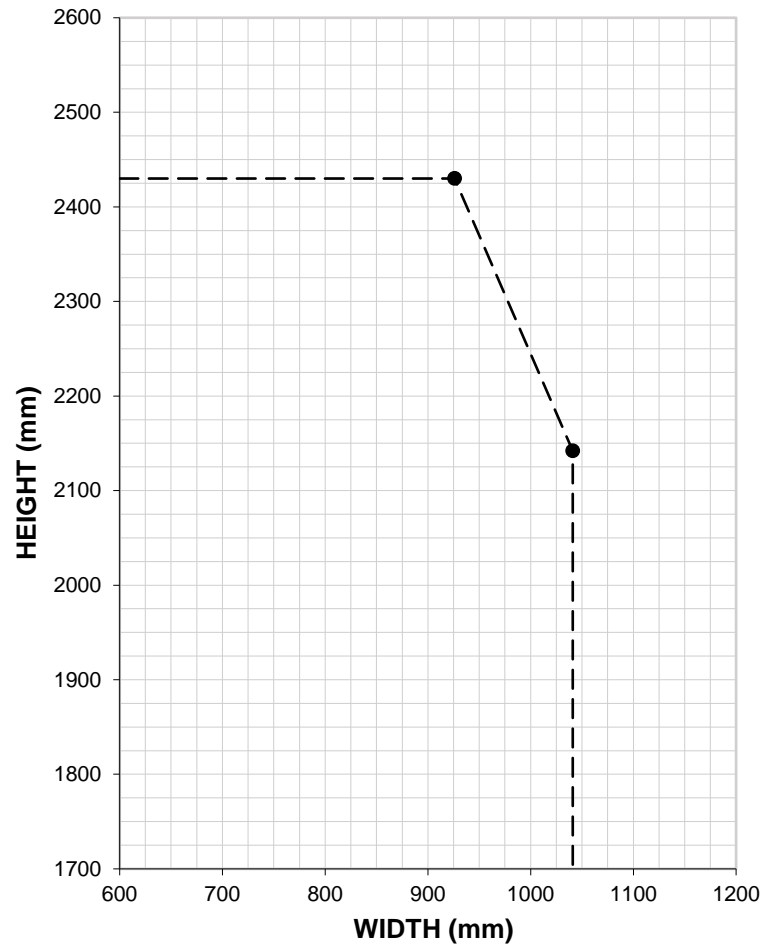
Figure A01

FD30

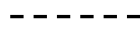
Single Door Assemblies

Timber Frames

Moralt FireSmoke and FireSafe (44mm or 54mm thick doors)



LSASD and ULSASD



Leaf Configuration

Leaf Height

Leaf Width

LSASD or ULSASD

2142mm

1041mm

2430mm

926mm

These leaf sizes apply to UNGLAZED doors only.

The same leaf sizes apply to 44mm thick doors and 54mm thick doors, with any 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

'Level 1' Intumescent Specification

Head

1no 15 x 4mm seal fitted centrally in frame reveal

Jambs

1no 15 x 4mm seal fitted centrally in frame reveal

Perimeter of overpanel

1no 15 x 4mm seal fitted centrally in frame reveal

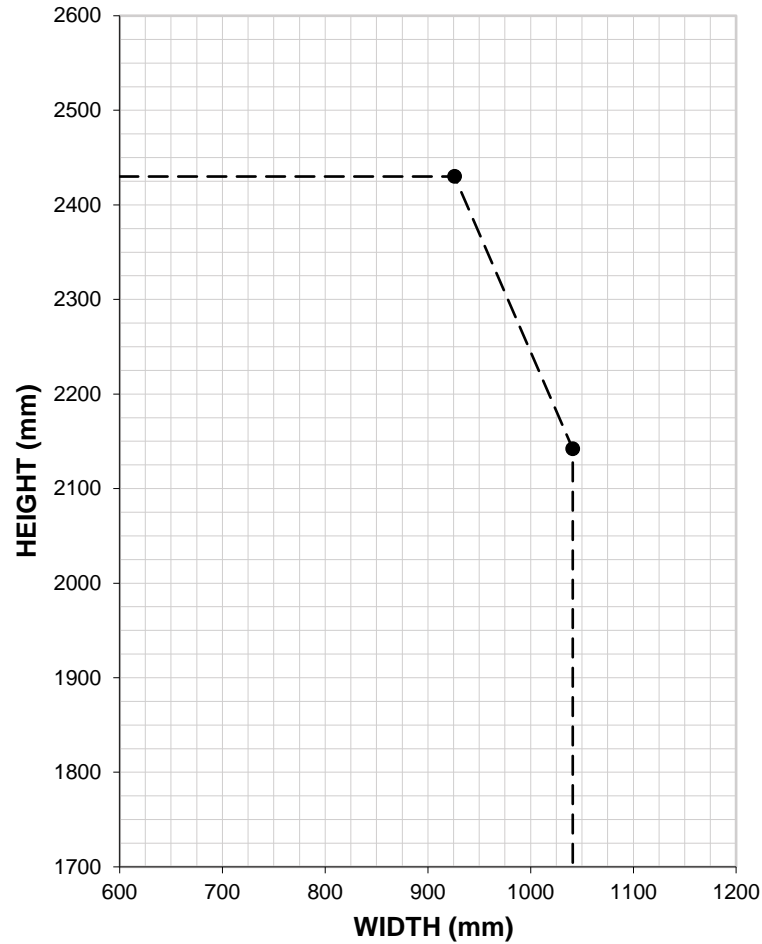
Lorient 617 type seals, manufactured by Lorient Polyproducts Ltd, or graphite-based seals, made by Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions, are approved by this report. (Although options of product/manufacture are approved, all seals in each door assembly must be the same brand/type; 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).

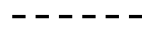
Figure A02

FD30

Single Door Assemblies



LSASD and ULSASD



Timber Frames

Moralt FireSmoke and FireSafe (44mm thick doors)

Leaf Configuration	Leaf Height	Leaf Width
LSASD or ULSASD	2142mm	1041mm
	2430mm	926mm

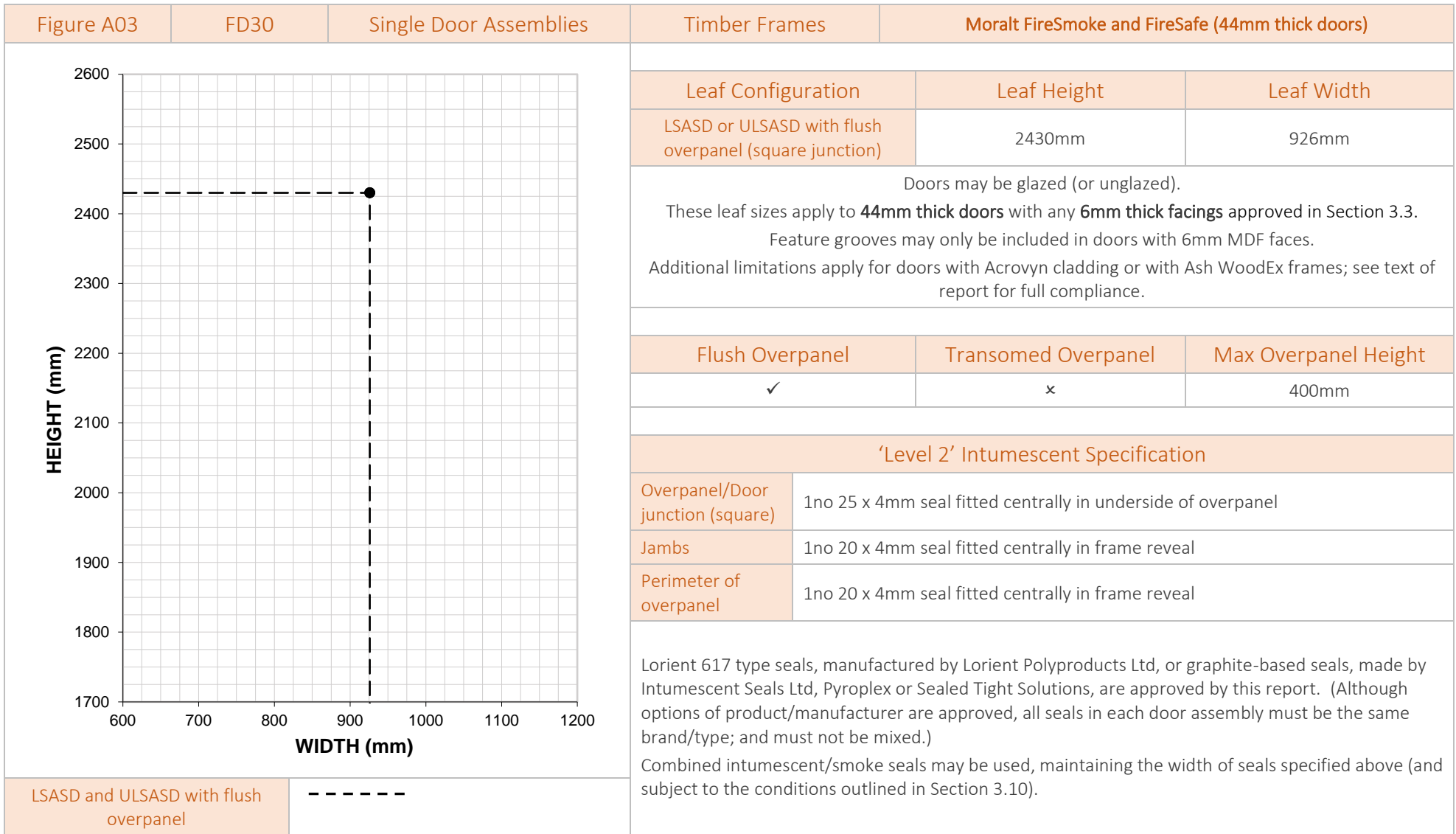
Doors may be glazed (or unglazed).
 These leaf sizes apply to **44mm thick doors** with any **6mm thick facings** approved in Section 3.3.
 Feature grooves may only be included in doors with 6mm MDF faces.
 Additional limitations apply for doors with Acrovyn cladding or with Ash WoodEx frames; see text of report for full compliance.

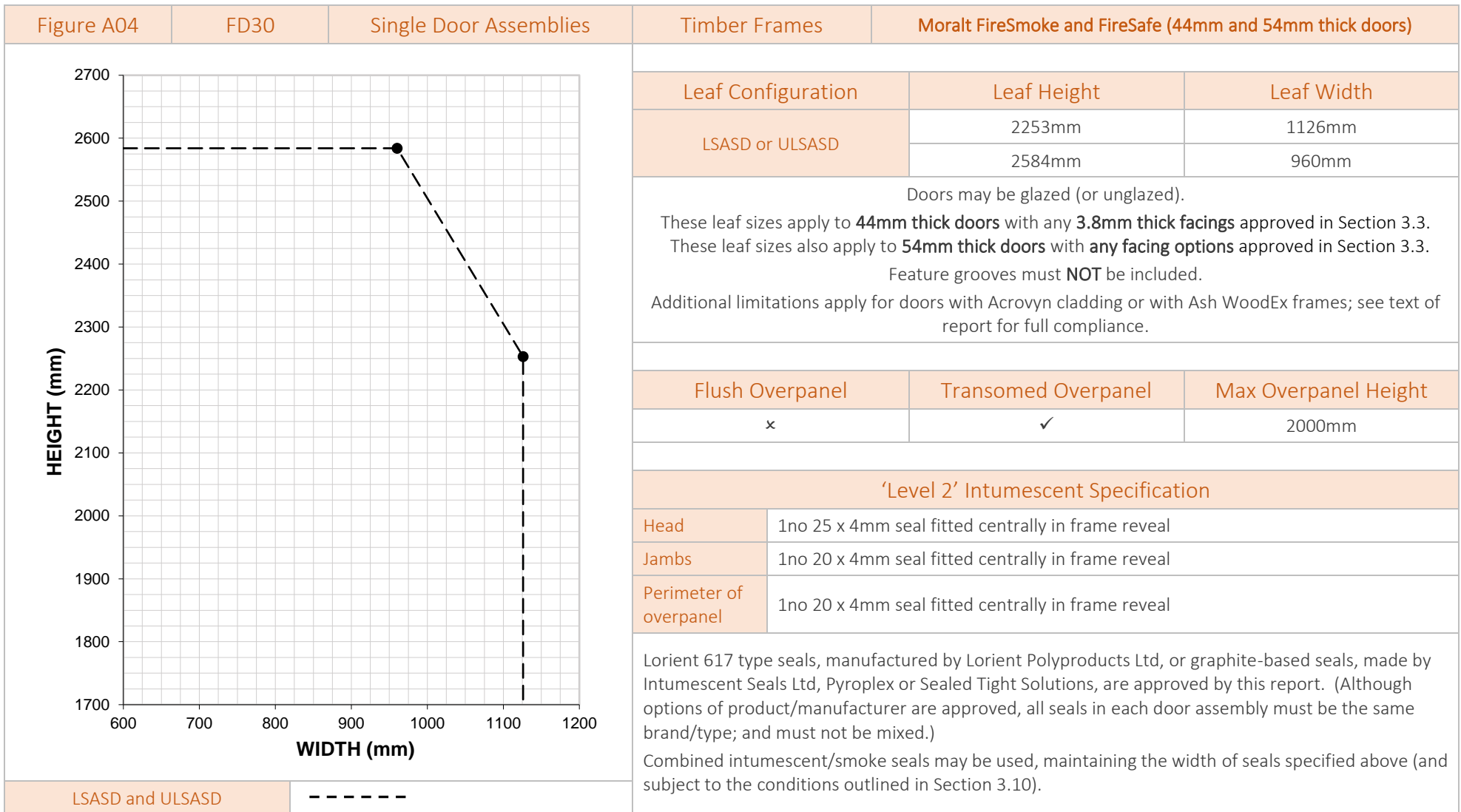
Flush Overpanel	Transomed Overpanel	Max Overpanel Height
x	✓	2000mm

'Level 2' Intumescent Specification

Head	1no 25 x 4mm seal fitted centrally in frame reveal
Jambs	1no 20 x 4mm seal fitted centrally in frame reveal
Perimeter of overpanel	1no 20 x 4mm seal 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/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).





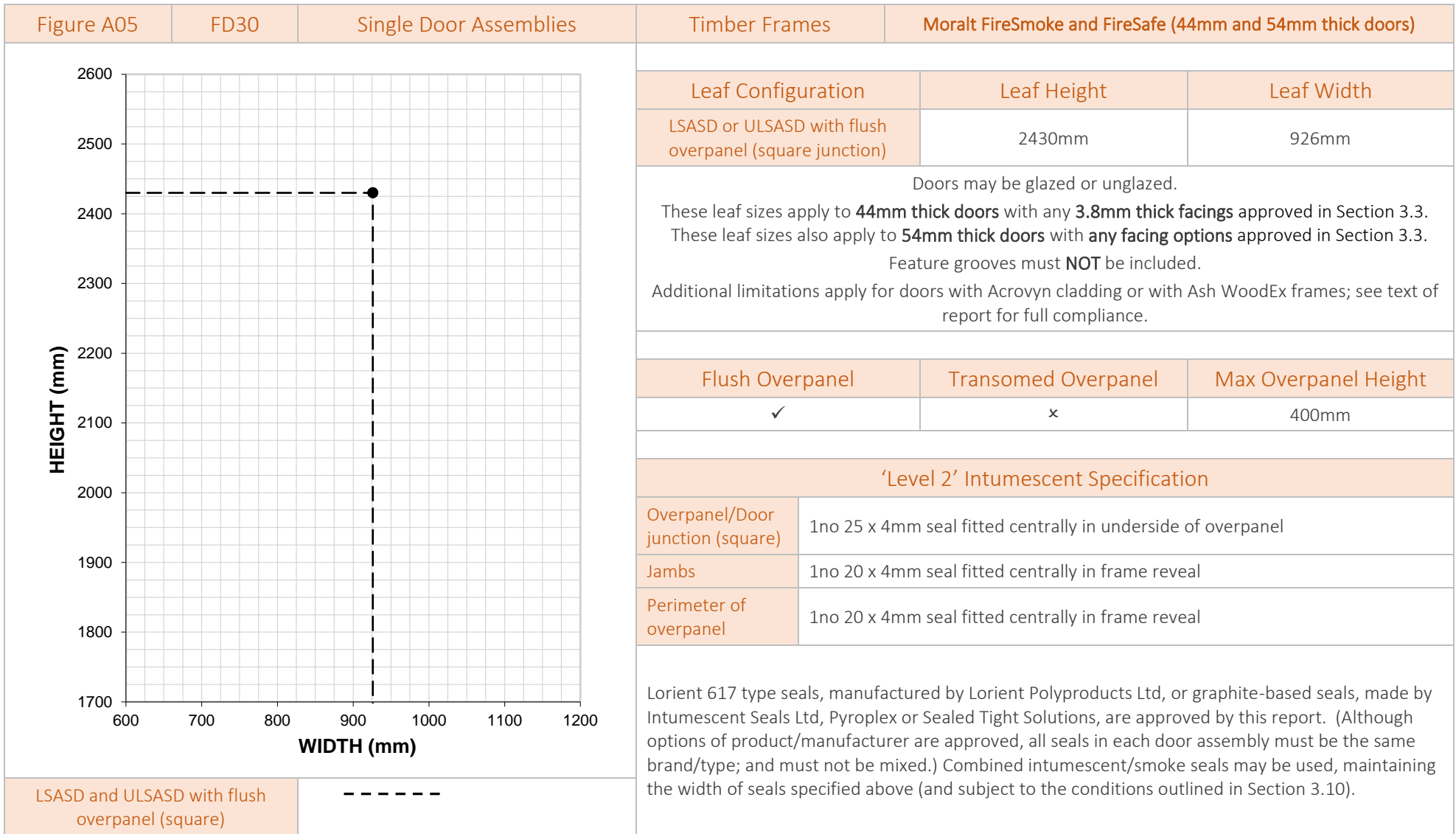
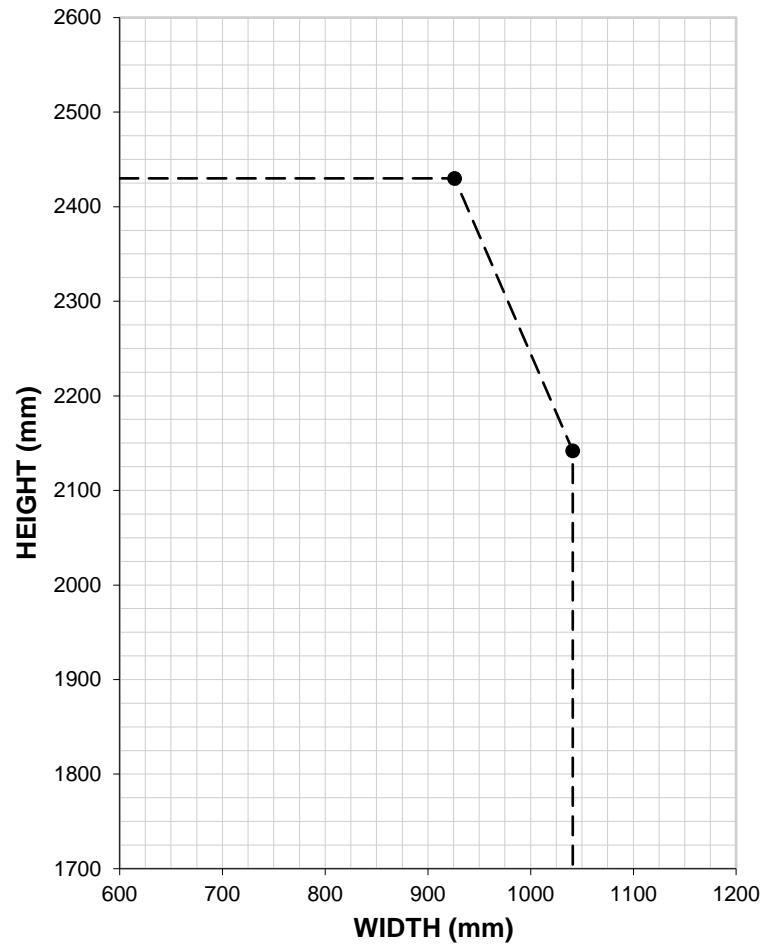


Figure A06

FD30

Double Door Assemblies



LSADD and ULSADD



Timber Frames

Moralt FireSmoke and FireSafe (44mm thick doors)

Leaf Configuration	Leaf Height	Leaf Width
LSASD or ULSASD	2142mm	1041mm
	2430mm	926mm

Doors may be glazed (or unglazed).
 These leaf sizes apply to **44mm thick doors** with any **6mm thick facings** 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

'Level 2' Intumescent Specification

Head	1no 25 x 4mm seal fitted centrally in frame reveal
Jambs	1no 20 x 4mm seal fitted centrally in frame reveal
Meeting Stiles	1no 20 x 4mm seal fitted centrally in the active leaf
Perimeter of overpanel	1no 20 x 4mm seal 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/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).

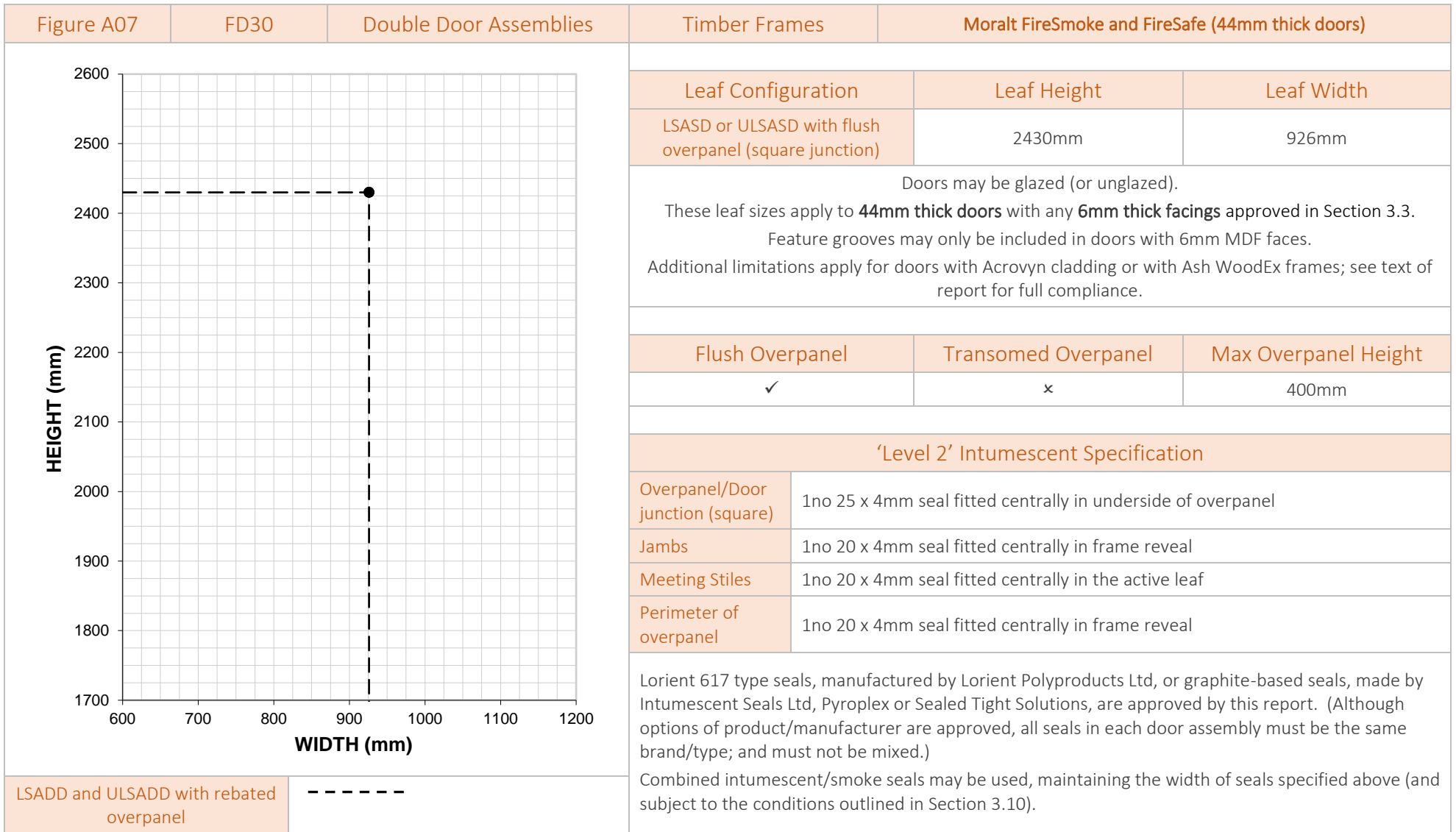
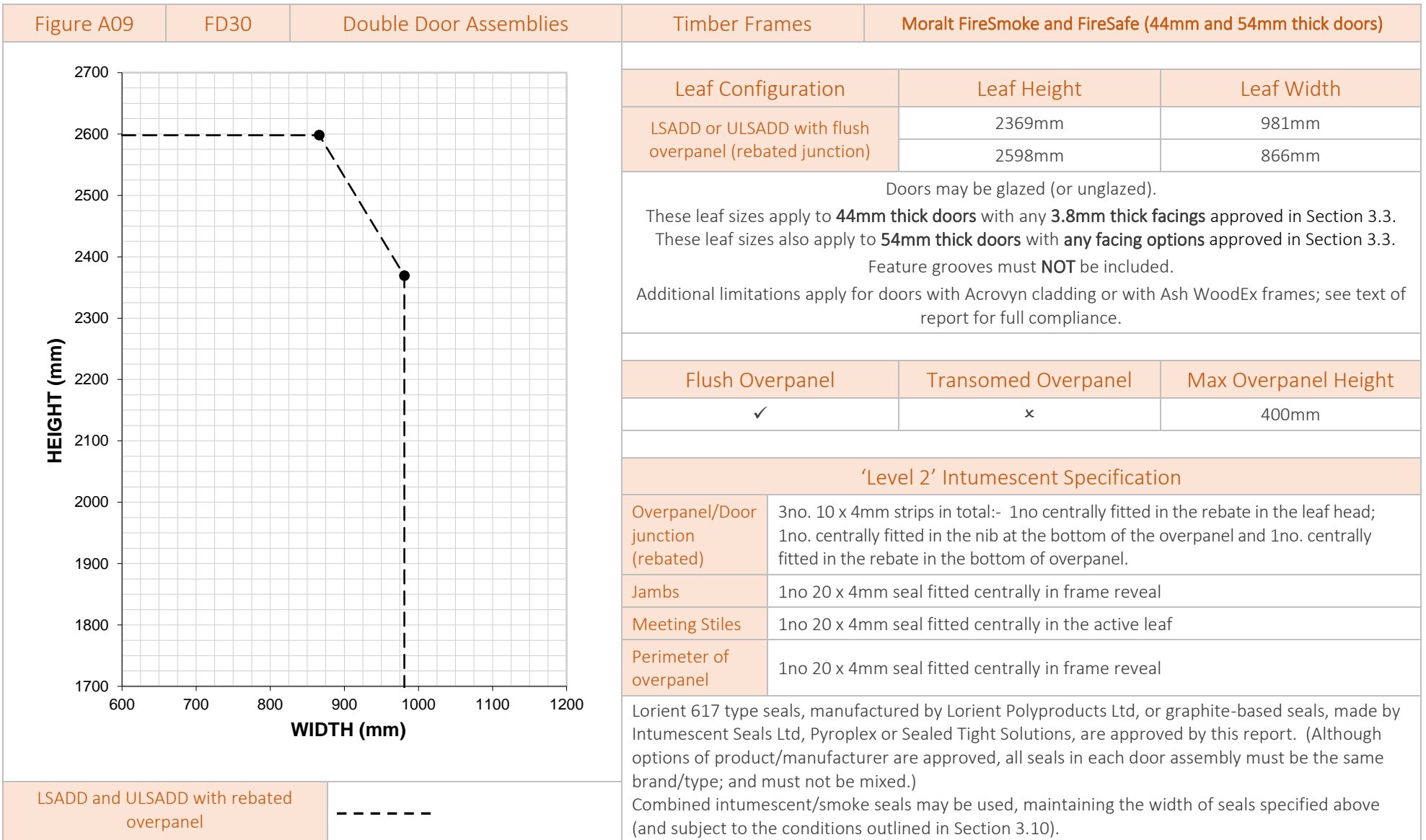


Figure A08	FD30	Double Door Assemblies	Timber Frames	Moralt FireSmoke and FireSafe (44mm and 54mm thick doors)															
			<table border="1"> <thead> <tr> <th data-bbox="1039 344 1413 395">Leaf Configuration</th> <th data-bbox="1413 344 1785 395">Leaf Height</th> <th data-bbox="1785 344 2150 395">Leaf Width</th> </tr> </thead> <tbody> <tr> <td data-bbox="1039 395 1413 443" rowspan="2">LSASD or ULSASD</td> <td data-bbox="1413 395 1785 443">2253mm</td> <td data-bbox="1785 395 2150 443">1126mm</td> </tr> <tr> <td data-bbox="1413 443 1785 491">2584mm</td> <td data-bbox="1785 443 2150 491">960mm</td> </tr> </tbody> </table>			Leaf Configuration	Leaf Height	Leaf Width	LSASD or ULSASD	2253mm	1126mm	2584mm	960mm						
			Leaf Configuration	Leaf Height	Leaf Width														
LSASD or ULSASD	2253mm	1126mm																	
	2584mm	960mm																	
LSADD and ULSADD - - - - -			<p data-bbox="1039 491 2150 715"> Doors may be glazed or unglazed. These leaf sizes apply to 44mm thick doors with any 3.8mm thick facings approved in Section 3.3. These leaf sizes also apply to 54mm thick doors with any facing options approved in Section 3.3. Feature grooves must NOT be included. Additional limitations apply for doors with Acrovyn cladding, or WoodEx frames; see text of report for full compliance. </p> <table border="1" data-bbox="1039 746 2150 847"> <thead> <tr> <th data-bbox="1039 746 1413 799">Flush Overpanel</th> <th data-bbox="1413 746 1785 799">Transomed Overpanel</th> <th data-bbox="1785 746 2150 799">Max Overpanel Height</th> </tr> </thead> <tbody> <tr> <td data-bbox="1039 799 1413 847">x</td> <td data-bbox="1413 799 1785 847">✓</td> <td data-bbox="1785 799 2150 847">1500mm</td> </tr> </tbody> </table> <p data-bbox="1039 879 2150 938" style="text-align: center;">'Level 2' Intumescent Specification</p> <table border="1" data-bbox="1039 938 2150 1150"> <tbody> <tr> <td data-bbox="1039 938 1227 986">Head</td> <td data-bbox="1227 938 2150 986">1no 25 x 4mm seal fitted centrally in frame reveal</td> </tr> <tr> <td data-bbox="1039 986 1227 1034">Jambs</td> <td data-bbox="1227 986 2150 1034">1no 20 x 4mm seal fitted centrally in frame reveal</td> </tr> <tr> <td data-bbox="1039 1034 1227 1082">Meeting Stiles</td> <td data-bbox="1227 1034 2150 1082">1no 20 x 4mm seal fitted centrally in the active leaf</td> </tr> <tr> <td data-bbox="1039 1082 1227 1150">Perimeter of overpanel</td> <td data-bbox="1227 1082 2150 1150">1no 20 x 4mm seal fitted centrally in frame reveal</td> </tr> </tbody> </table> <p data-bbox="1039 1150 2150 1289"> 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.) </p> <p data-bbox="1039 1289 2150 1361"> 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>			Flush Overpanel	Transomed Overpanel	Max Overpanel Height	x	✓	1500mm	Head	1no 25 x 4mm seal fitted centrally in frame reveal	Jambs	1no 20 x 4mm seal fitted centrally in frame reveal	Meeting Stiles	1no 20 x 4mm seal fitted centrally in the active leaf	Perimeter of overpanel	1no 20 x 4mm seal fitted centrally in frame reveal
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Perimeter of overpanel	1no 20 x 4mm seal fitted centrally in frame reveal																		



APPENDIX B

General Guidance on Installation of Hardware

B.1 Hinges

Moralt FireSmoke and FireSafe doors have been successfully tested with Royde & Tucker H101 and H102 type 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		Brass, 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 ND & 3 RD	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		Door leaves greater than 2250mm high will require all hinge blades to be bedded on minimum 1mm thick graphite based or low-pressure forming intumescent material	

B.2 Mortice latches/locks

Moralt FireSmoke and FireSafe doors have been successfully tested with a large latch in a single leaf; but double leaf doors have only been tested with a tubular mortice latch. 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	Single doors - 44 or 54mm thick leaves	235mm long x 20mm wide
	Double doors - 44mm thick leaves only	75mm long x 20mm wide
	Double doors - 54mm thick leaves only	Up to 235mm long x 20mm wide BUT twin 15 x 4mm intumescent seals (centrally fitted spaced 10mm apart) must be fitted in the meeting stile of the active leaf.
MAXIMUM STRIKE PLATE DIMENSIONS	Single doors - 44 or 54mm thick leaves	200mm long x 20mm wide
	Double doors - 44mm thick leaves only	75mm long x 20mm wide
	Double doors - 54mm thick leaves only	Up to 200mm long x 20mm wide BUT twin 15 x 4mm intumescent seals (centrally fitted spaced 10mm apart) must be fitted in the meeting stile of active leaf.
MAXIMUM LATCH/LOCK BODY DIMENSIONS	20mm thick x 100mm wide Height of body restricted 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 1mm thick low-pressure forming intumescent material e.g. Interdens.	

Latches must be 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.

More limitations for latches, overleaf...

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.

B.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.

Overhead surface-mounted closers are the only devices approved by this assessment.

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

A variety of surface-mounted door closers have been successfully tested with Moralt FireSmoke and FireSafe door assemblies but other surface-mounted closers may be used, subject to compliance with the specifications below.

- 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;
- 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 Pyrobel, Pyrostop or Pyranova).
- 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.

Concealed overhead door closers are NOT approved by this report. If a concealed closer is required, these can be included in 54mm thick doors that are made using the full specifications defined in the latest version of PAR/12519/02; for FD60 door assemblies using Moralt FireSmoke leaves. (The full specification in PAR/12519/02 must be employed, in terms of leaf thickness, intumescent seals and frame details, even though only an FD30 rating is required).

B.4 Bolts (Double leaf Doors)

Flush bolts are NOT approved by this report. If flush bolts are required, these can be included in the meeting edge of 54mm thick doors that are made using the full specifications defined in the latest version of PAR/12519/02; for FD60 door assemblies using Moralt FireSmoke leaves. (The full specification in PAR/12519/02 must be employed, in terms of leaf thickness, intumescent seals and frame details, even though only an FD30 rating is required).

If a latch or lock is required in a double leaf door assembly, for cold-state service, (e.g. in order to achieve a degree of 'privacy' or low-level security), then face-fixed 'barrel bolts' may also 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. In particular, the fixings to secure the bolt/keep must NOT be fitted into the lippings forming a rebated overpanel junction.
- An appropriate self-closing device (see Section B.3) MUST be fitted to BOTH leaves; even if bolts are intended for 'permanent' use.

B.5 Floor Springs and Accessories

Floor springs are NOT approved by this report. If a double-acting door assembly is required, floor springs can be included in 54mm thick doors that are made using the full specifications defined in the latest version of PAR/12519/02; for FD60 door assemblies using Moralt FireSmoke leaves. (The full specification in PAR/12519/02 must be employed, in terms of leaf thickness, intumescent seals and frame details, even though only an FD30 rating is required).

B.6 Non-Essential Hardware Items

B.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 44mm thick (or less) fully cellulosic FD30 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.

B.6.2 Push plates, kick plates etc

Plastic, pvc or metal plates may be surface-mounted to the doors, but, if more than 800mm in length by nominally 200mm wide, they must be attached in a way that would prevent them distorting the door leaf, e.g. glued with thermally softening adhesive or screwed with short aluminium screws; and 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.

B.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.

B.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 44mm thick (or less) fully cellulosic FD30 doors. They must be fitted fully in accordance with the manufacturer's instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that 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.

B.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 BS:476: Part 22: 1987 or EN1634-1), and/or be assessed by a notified body, to support its use in 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.

B.6.6 Drop seals

The following drop seals can be fitted into this design of fire resisting 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 1mm thick low-pressure intumescent material e.g. Interdens, when fitted in 44mm thick leaves; but intumescent protection is not necessary if drop seals are fitted in 54mm thick doors.

Where a drop seal is fitted in the passive leaf of 44mm thick double leaf doors, the ‘end plate’ of the drop seal must be bedded on 1mm thick low-pressure intumescent material. When drop seals are fitted in 54mm thick doors, twin 15 x 4mm intumescent strips shall be fitted in the meeting stile of the active leaf.

Drop seals must not be fitted in 44mm thick leaves that also include feature grooves. Feature grooves can be included with drop seals, if fitted in 54mm thick doors.

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.

B.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.

B.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

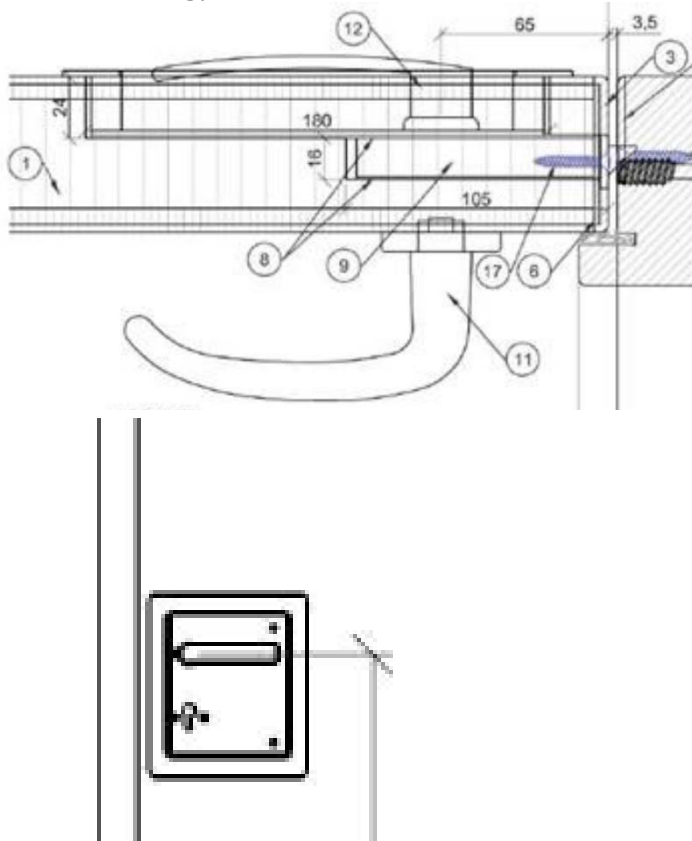
B.6.9 Recessed ‘Gym’ Handles

Test PB_FIRES-FR-215-12-AUNE2 included a stainless steel gym lever handle, fitted in a 60mm thick door; comprising a 54mm FireSmoke door with extra 3mm faces. See Sketches below, showing extracts from the test report.

This is approved in FD30 doors formed from Moralt FireSmoke doors, subject to the following limitations;

- This approval only applies to the handle assembly proven in the test; lever handle reference 72/1023 and gym handle reference 77/7950, supplied by FSB GmbH.
- The lock body, forend and strike plate shall comply with the limitations in B.2 herein.
- The handle recess must be cut accurately, to accommodate the handle, and the recess lined with 2mm thick Interdens intumescent sheet material.

- The recessed handle may only be fitted on the face subjected to fire test exposure. It is the responsibility of others to establish whether the fire risk will occur on one face and agree this approach with the relevant Approval Body for every project where the handle is fitted.
- The approval is limited to use in a 60mm thick door, formed by bonding 3mm thick MDF on both faces of a 54mm thick Moralt FireSmoke door. (Extra faces to be bonded using thermo-setting adhesive, e.g. UF, by the door fabricator; not by Moralt).
- The mortice lock must also be slightly offset, in the door thickness, to accept the alignment of the recessed gym handle.



Extract from test report PB_FIRES-FR-215-12-AUNE2; showing section and elevation of gym handle

B.6.10 Dummy Cylinders (in morticed locks)

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

- The approval is limited to use in a 54mm thick door; and 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 T185, supplied by ABUS AG.

APPENDIX C

Summary of Fire Test Evidence

C1. 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 07028	<ul style="list-style-type: none"> Primary evidence for leaf size of double doors; and glazing. Frame: 70x32mm Softwood (510kg/m³) frame +12mm stop Leaf: Moralt FireSafe – laminated timber core(450kg/m³); details on IFC confidential file. Facings 2mm cross-grain+ veneer (500kg m³). 9mm Rock Maple lips, (650kg/m³) all edges. UF glue faces and lippings. Hinges: 4no. 102x33mm hinges. G30 sheet under hinges in RH leaf. Overhead closer: Dorma TS73V surface mounted overhead closer on both leaves. Lock: Legge tubular mortise latch; disengaged. 58 x 25mm forend; no size stated for latch body or strike. G30 under forend/strike. Glass Opening LH 1200 x 200mm. RH 600 x 600mm. Both glazed with Pyroshield and 10 x 2mm Therm-A-Strip. Sapele beads (14mm high + bolection) fixed with 50mm long pins. Intumescent Seals 25 x 4mm Therm-A-Seal intumescent seal central in frame head. 20 x 4mm Therm-A-Seal intumescent seal slightly offset in frame jambs. 20 x 4mm Therm-A-Seal intumescent seal central in one meeting stile NO flush bolts (or other mechanical retention) on passive leaf.
Test Sponsor	Moralt AG	
Test Laboratory	Chiltern Fire International	
Test Date	21 March 2007	
Door configuration	ULSADD	
Leaf size (mm)	2300 x 1050/1050 x 44	
Test Standard	BS 476: Part 22: 1987	
Test result	33 minutes	

Test Report information		Items/Details Supported by Test Evidence
Test Report	WF 172505	<ul style="list-style-type: none"> Primary evidence for leaf size of single door; and larger aperture. Frame: 70x32mm Softwood (510kg/m³) frame +12mm stop Leaf: Moralt FireSafe – laminated timber core(450kg/m³); details on IFC confidential file. Facings 2mm cross-grain faces +1mm veneer (no density stated). 10mm Sapele lips, (650kg/m³) all edges. UF glue faces and lippings. Hinges: 3no. 100x35mm hinges. No intumescent sheet. Overhead closer: Dorma TS71 surface mounted overhead closer. Lock: No latch fitted Glass Opening Door A - 1808 x 808mm. Door B - 1608 x 708mm Both glazed with Pyran S and Lorient Figure 1. Sapele beads (14mm high + bolecion) fixed with 65mm long pins. Intumescent Seals 25 x 4mm Lorient intumescent seal central in frame head. 20 x 4mm Lorient intumescent seal central in frame jambs.
Test Sponsor	Moralt AG/Schott GMBH	
Test Laboratory	Warrington Fire Research	
Test Date	7 May 2008	
Door configuration	2no. ULSASD	
Leaf size (mm)	2320 x 1020 x 44 (A) 2120 x 970 x 44 (B)	
Test Standard	BS 476: Part 22: 1987	
Test result	33 minutes Door A 31 minutes Door B	

Test Report information		Items/Details Supported by Test Evidence
Test Report	BMT/FEP/F14256 (Door B)	<ul style="list-style-type: none"> Primary evidence for 6mm MDF faces; and for feature grooves. Frame: 104x32mm Tulipwood (490kg/m³) frame + stop Leaf: Moralt FireSmoke – laminated timber core(450kg/m³); details on IFC confidential file. Facings 6mm MDF faces (730kg/m³). 8mm Oak lips, (650kg/m³) all edges. UF glue faces and lippings. Hinges: 3no. 100x30mm hinges. No intumescent sheet. Overhead closer: Rutland TS3204 surface mounted overhead closer. Lock: Latch with 255 x 20mm forend; 145 x 25mm strike. 1mm Palusol fitted under forend and strike. Glass Opening : NO glazing/aperture. Intumescent Seals: 15 x 4mm Pyroplex intumescent seal central in frame head and jambs. Feature grooves: 6 x 4mm deep grooves machined into faces. Horizontal grooves on one face (245mm apart); vertical grooves on reverse face (105mm apart).
Test Sponsor	Moralt AG	
Test Laboratory	BM TRADA	
Test Date	10 November 2014	
Door configuration	ULSASD	
Leaf size (mm)	2135 x 926 x 44	
Test Standard	BS 476: Part 22: 1987	
Test result	49 minutes Door B	

Test Report information		Items/Details Supported by Test Evidence
Test Report	BTC 15415F	<ul style="list-style-type: none"> Primary evidence for doors with overpanel; and chipboard faces. Frame: Komfort aluminium extrusion frame with integral stop Leaf: Moralt FireSmoke – laminated timber core(450kg/m³); details on IFC confidential file. Facings 3.8mm chipboard (700kg m³). 22mm Maple lips (650kg/m³) to rebated edges. 10mm Maple lips (740kg/m³) to other edges. UF glue faces; PVA lippings. Hinges: 3no. 102x30mm hinges. Interdens 1mm sheet under hinge blades in door leaves. Overhead closer: Dorma TS68 surface mounted overhead closer on both leaves. Lock: No latch fitted Glass Opening NO glazing/aperture Intumescent Seals 22 x 2mm graphite intumescent seal central in frame reveal. 10 x 4mm Palusol intumescent seal and 15 x 2mm graphite seal in rebated overpanel junction. 20 x 4mm Palusol intumescent seal central in one meeting stile No flush bolts (or other mechanical retention) on passive leaf.
Test Sponsor	Komfort/Moralt AG	
Test Laboratory	Chiltern Fire International	
Test Date	30 August 2007	
Door configuration	ULSADD + Rebated Overpanel	
Leaf size (mm)	2398 x 900/900 x 44 (+ overpanel 200mm high)	
Test Standard	BS 476: Part 22: 1987	
Test result	34 minutes	

C2. Summary of Secondary Fire Test 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” frame with a proprietary timber fire door (NOT Moralt). Door A with WoodEx Ash frame. Door B with WoodEx Redwood frame.	Door A - 2040 x 826/300 x 54mm Door B - 2040 x 826/300 x 44mm	BS 476: Part 22: 1987	Door A – 42 minutes (door frame 71) Door B – 30 minutes (door frame 50) <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
PB_271 38418_PK6 Ift Rosenheim 6 April 2009	Test referenced to prove inclusion of narrow margins between apertures and hardwood glazing bars in Moralt 44mm FireSmoke door. Test also proves use of 15mm or 19mm Pyranova glass (442 x 1037mm apertures) in Moralt 44mm FireSmoke door.	N/A	EN 1634-1:2008	37 minutes
PB_FIRES-FR-215-12-AUNE2 FIRES Slovak Republic 31 October 2012 Test sponsored by Odice S.A.S.	Reduced scale specimen. LSASD. Moralt 54mm FireSmoke with additional 3mm MDF faces; 60mm thick overall. Test referenced to prove use of recessed gym handle (ref. 77/7950 by FSB GmbH); fitted on exposed face.	N/A	EN 1634-1:2008	34 minutes

continued overleaf...

Secondary evidence continued

TEST LABORATORY. REPORT NO. TEST DATE.	CONFIGURATION TESTED	LEAF SIZE TESTED	TEST STANDARD	INTEGRITY
BMT/FEP/F13094 9 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). Softwood 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 44mm	BS 476: Part 22: 1987	45 minutes
RF/11059 19 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). Softwood frame. Latch fitted but disengaged. No flush bolts fitted. Intumescent strips fitted in door heads and in Edge Protectors on both vertical edges of each leaf.	2100 x 900/300 x 44mm (both assemblies)	BS 476: Part 22: 1987	Door A - 43 minutes Door B - 39 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.