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Fire Resistance Assessment of:

Moralt Laminesse FireSound 44mm
Doorsets for:
30 Minutes Fire Resistance

WF Report No:

CNA/F14274 Revision B

WF Contract No:

WF421105

Prepared For:

Obere Tiefenbachstr.1,
83734 Hausham,
Germany

Valid From:

9th December 2019

Valid Until:

9th December 2024

Contents

1 Foreword

This field of application report has been commissioned by Moralt AG and relates to Laminesse FireSound 44mm doorsets, for 30 minute fire resisting performance doorset installations.

This field of application report is for National Application and has been written in accordance with the general principles outlined in BS EN 15725: 2010; Extended application reports on the fire performance of construction products and building elements, as appropriate.

This field of application (scope) uses established empirical methods of extrapolation and experience of fire testing similar door assemblies, in order to extend the scope of application by determining the limits for the designs based on the tested constructions and performances obtained. The scope is an evaluation of the potential fire resistance performance, if the variations specified herein were to be tested in accordance with BS 476: Part 22: 1987 and therefore can neither be considered for a CE marking application nor can the conclusion be used to establish a formal classification against EN13501-2.

This field of application has been written using appropriate test evidence generated at a UKAS or European accredited laboratory to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturers stated door design and is summarised in section 3 and appendix A.

The scope presented in this report relates to the behaviour of the proposed door design variations under the particular conditions of the test; they are not intended to be the sole criterion for considering the potential fire hazard of the door assembly in use.

This field of application has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the Passive Fire Protection Federation (PFPF) guidelines to undertaking assessments. The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used for building control and other purposes.

The PFPF guidelines are produced by the UK Fire Test Study Group (FTSG) an association of the major fire testing laboratories in the UK and are published by the PFPF, the representative body for the passive fire protection industry in the UK.

2 Proposal

It is proposed to consider the fire resistance performance of the doorset designs described in the technical specification in section 4 of this report, for 30 minutes fire resistance, if the doorsets, were to be tested to the requirements of BS 476: Part 22: 1987, Fire tests on building materials and structures – Part 22: *Method for determination of the fire resistance of non-load bearing elements of construction*.

The field of application defined in this report is based on the fire resistance test evidence for the doorset designs, which is summarised in section 3. Analysis of specific construction details that require assessment are given within this report against the relevant element of construction, as appropriate

3 Test Data

The test evidence summarised below has been generated to support the fire resistance performance of the Laminesse FireSound 59mm doorset designs that are the subject of this assessment.

3.1 Test report RF14205 Revision A

Test RF14205 Revision A was conducted on an unlatched, double leaf, single acting doorset, with glazing in one and flush overpanel. Test is presented as primary data for the Laminesse FireSound 44mm, 30 minute fire resisting doorset design.

Test Date	4th November 2014
Identification of test body:	BMTRADA, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Moralt AG
Summary of test construction (mm)	**Specimen:** Laminesse FireSound 44mm blank with 8mm thick hardwood lippings on all edges. **Leaf Size:** 2250 (h) x 950/950 (w) x 44 (t) with a flush overpanel 305 high. **Glazing:** 7mm thick Pyrobelite 7/30 was fitted in 2No apertures both of aperture size 1140(h) x 230(w), protected with Intumescent Seals Ltd Therm-A-Strip glazing system. **Hardware:** 3No 'Enduro Max' bearing butt type hinges ref: DSH1103 and a Rutland TS3204 overhead closer were fitted to each leaf, with a Briton DS5440 latch with a 235 high forend and aluminium handleset and Zoo steel flush bolts ref: DS03/200 fitted in the meeting edge. **Door frame**: European Redwood 32 thick of nominal density 510kg/m^3.with MDF architraves and a Beech astragal fixed to the overpanel lower edge. **Leaf Edge Intumescent Seals:** Lorient Polyproducts Ltd Type 617 were fitted in the frame jambs and leaf edges, with a Norsound NOR810dB+ dropseal in one leaf threshold.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 30; Insulation: 30 Tested opening in toward the furnace

3.2 Test report RF15040

Test RF15040 was conducted on 2No unlatched, double leaf, single acting doorsets, both with a flush overpanel. Test is presented as primary data for the Laminesse FireSound 44mm, 30 minute fire resisting doorset design using Pyroplex and Odice Intumescent Edge Seals.

Test Date	4th November 2014	
Identification of test body:	BMTRADA, now trading as Warringtonfire Testing and Certification. UKAS 1762	
Test Sponsor:	Moralt AG	
Summary of test construction (mm)	**Specimen A+B:** Laminesse FireSound 44mm blanks with 8mm thick hardwood lippings on horizontal and meeting edges, 14 thick on hanging edges. **All Leaf Size:** 2250 (h) x 820.5/260.5 (w) x 44 (t) with a flush overpanel 305 high. **Hardware, both doorsets:** 3No Cooke Bros bearing butt type hinges ref: 7700CB3 and a Dorma (UK) Ltd TS72 overhead closer were fitted to each leaf, with a Zoo Hardware latch with a 235 high forend ref: EP166/3470422 and aluminium handleset and Zoo steel flush bolts ref: ZAS03/RSS fitted in the meeting edge. **Door frame**: Sapele 30 thick of nominal density 640kg/m^3.with Redwood architraves and a Sapele astragal fixed to the overpanel lower edge. **Leaf Edge Intumescent Seals: Specimen A:** Odice S.A.S seals were fitted in the frame jambs and leaf edges, with a Norsound NOR810dB+ dropseal in left leaf threshold. **Specimen B:** Pyroplex Ltd seals ref: 30141, 8600 and 8700 were fitted in the frame jambs and leaf edges, with a Norsound NOR810dB+ dropseal in left leaf threshold.	
Test Standard:	BS EN 1634-1: 2000 and BS EN 1363-1: 1999	
Test Results (minutes) Tested opening in toward the furnace	Specimen A	Specimen B
	Integrity: 46 Insulation: 38	Integrity: 40 Insulation: 40

3.3 Test report FEF14102

Test RF14102 was conducted on 2No. unlatched, double leaf, single acting doorsets, only specimen B is relevant to this report. Test is presented as supporting data for the Laminesse FireSound 44mm, 30 minute fire resisting doorset design installed within James Latham timber based WoodEx 30 door frames.

Test Date	8th July 2014
Identification of test body:	Chiltern International Fire, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Details of the test sponsor are held on file, in confidence, at Warringtonfire
Summary of test construction (mm)	**Specimen B:** Graduated Density chipboard 44 thick blank with 8mm thick hardwood lippings on all edges. **Leaf Size:** 2040 (h) x 826/303 (w) x 44 (t). **Hardware:** 3No Royde & Tucker lift off butt type hinges ref: H101 and a Geze UK TS2000V overhead closer were fitted to each leaf, with a Zoo tubular latch with a 62 high forend and aluminium handleset and steel flush bolts fitted in the meeting edge. **Door frame**: Latham WoodEx Engineered European Redwood 30 thick of nominal density 510kg/m^3.with Redwood architraves. **Leaf Edge Intumescent Seals:** Lorient Polyproducts Ltd Type 617 were fitted in the frame jambs and leaf edges, with a Norsound NOR710 environmental seals fitted against the door stop.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 30; Insulation: 30 Tested opening in toward the furnace

Note:

Test FEP/F14102 was devised to investigate the influence of the WoodEx engineered timber as a door frame material for use with previously tested and approved door designs. The test is therefore suitable as supporting data for the hardwood WoodEx products with the Laminesse FireSound doorset designs.

3.4 Test report P1009/14-530

Test RF15040 was conducted on 2No unlatched, single leaf, single acting doorsets, only specimen B is relevant to this report. Test is presented as supporting data for the Laminesse FireSound 44mm, 30 minute fire resisting doorset design using Pyroplex Intumescent Edge Seals.

Test Date	26th September 2014
Identification of test body:	Slovenian National Building and Civil Engineering Institute. National accreditation LP-005
Test Sponsor:	Moralt AG
Summary of test construction (mm)	**Specimen B:** Laminesse FireSound 54mm blank with 8mm thick hardwood lippings on all edges. **Leaf Size:** 2145 (h) x 915(w) x 54 (t). **Glazing:** 23mm thick Pilkington Pyrostop 60-101 was fitted in an aperture size 12530(h) x 496(w), protected with Intumescent Seals Ltd Therm-A-Line and Therm-A-Bead glazing system. **Hardware:** 3No Union bearing butt type hinges ref: J-603BU and a Dorma (UK) Ltd TS73 overhead closer were fitted, with a SchlossFabrik latch with a 235 high forend ref: EP166/3470422 and Hoppe aluminium handleset. **Door frame**: Mahogany 32 thick of nominal density 640kg/m^3.with hardwood architraves. **Leaf Edge Intumescent Seals:** **Specimen B:** Pyroplex Ltd Rigid Box Seals ref: 8600 and 8700 were fitted in the frame jambs and leaf edges, with a Norsound NOR810dB+ dropseal in left leaf threshold.
Test Standard:	BS EN 1634-1: 2000 and BS EN 1363-1: 1999
Test Results (minutes) Tested opening in toward the furnace	Specimen B
	Integrity: 64 Insulation: 64

3.5 Assessment Report Chilt/A11129 Revision E

The referenced assessment, the essential details of which are summarised below, is to be used to support the fire resistance performance of the Laminesse FireSound 44mm doorsets, for 30 minute fire resisting performance when installed encapsulated in CS Group Acrovyn.

Validity period	From:	15th April 2019
	To:	15th April 2024
Identification of assessing body	Warringtonfire Testing and Certification Ltd	
Assessment Sponsor	Construction Specialties Ltd, 1010 Westcott Venture Park, Westcott, Aylesbury, Buckinghamshire, HP18 0XB	
Summary of Tested Products	The assessment covers the fire resistance of timber based doorsets fitted with PVC edge guards and/or lipped and faced with Acrovyn. This document evaluates a number of fire resistance tests on various timber based doorsets fitted with PVC edge guards and/or lipped and faced with Acrovyn. It extends the scope of application for the use of PVC edge guards and Acrovyn encapsulation to door types which must have been tested with Lorient Polyproducts Type 617 leaf edge seals.	
Test Standard	BS 476: Part 22: 1987	

4 Technical Specification

4.1 General

The technical specification for the Laminesse FireSound 44mm doorsets is given in the following sections and is based on the test evidence summarised in section 3.

4.2 Intended use

The intended use of the Laminesse FireSound 44mm doorsets is summarised below.

A pedestrian doorset including any frame, door leaf or leaves which is provided to give a fire resisting capability when used for the closing of permanent openings in fire resisting separating elements, which together with the building hardware and any seals (whether provided for the purpose of fire resistance or smoke control or for other purposes such as draught or acoustics) form the assembly.

4.3 General Description of Construction

Full details of the tested and assessed leaf construction are held on file, in confidence, at Warringtonfire

This assessment considers the following design variations:

1. FireSound 44mm - 3mm MDF facings
2. FireSound 44mm – 3mm Chipboard facings.

5 Leaf Sizes

The approval for increased leaf dimensions is based on the test listed in section 3 and takes into account the margin of over performance above 30 minutes integrity for the design and the characteristics exhibited during test. Data sheets specifying the maximum approved leaf sizes and graphs showing the permitted gradient between maximum height and width are contained in appendix C.

Doorsets with reduced dimensions are deemed to be less onerous. Therefore, doors with dimensions that are less than those tested and stated in appendix C, may be manufactured.

6 Configurations

Based on the test evidence listed in section 3, this assessment covers the following doorset configurations.

Abbreviation	Description
LSASD & ULSASD	Latched & unlatched, single acting, single doorset
DASD	Double acting, single doorset
LSASD+OP & ULSASD+OP	Latched & unlatched, single acting, single doorset with overpanel
LSADD & ULSADD	Latched & unlatched, single acting, double doorset
DADD	Double acting, double doorset
LSADD+OP & ULSADD+OP	Latched & unlatched, single acting, double doorset with overpanel

Unequal leaf double doorsets are covered by this assessment with no restriction on the smaller leaf dimension.

7 Leaf Size Adjustment

Door leaves to this design may be altered as follows.

Element	Reduction
Leaf	The manufactured size of the leaf may be reduced in height or width without restriction; lipping dimensions must remain as stated below
Timber lippings	The dimensions stated in section 11 may be reduced by 20% for site fitting purposes

8 Overpanels

8.1 Solid

Overpanels of the same construction as the door leaves may be used either flush with the leaf heads or when separated by a transom. In either case the overpanel must be fully contained within the door frame (see following diagram).

Doorsets installed with flush overpanels must fit a horizontal astragal, screwed to the overpanel using 50mm long wood screws at maximum 150mm centres. The astragal must be 18mm thick by 50mm wide and be hardwood of a minimum 640kg/m^3 density.

If a transom is used it must be to the same specification as the timber door frame (see section 10).

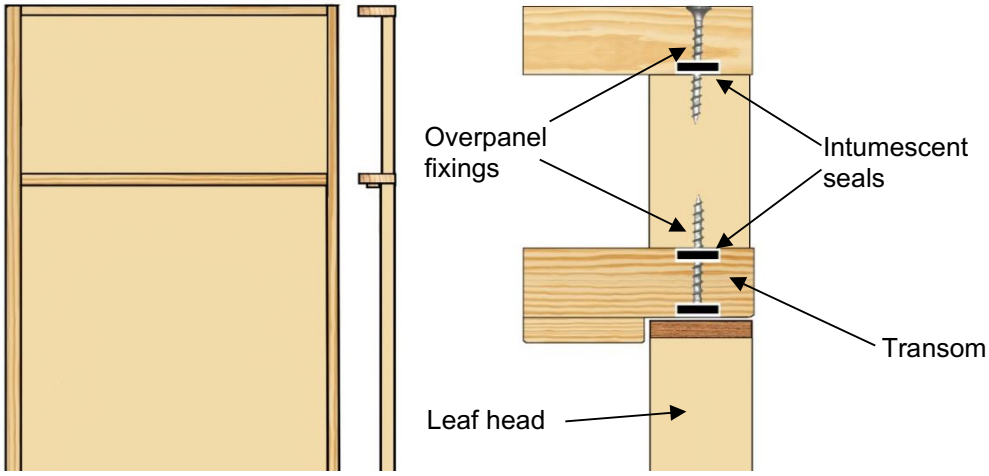
Door frame joints must be either mortise and tenon joints or butt joints (see section 10.2). Either method requires joints to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Butt joints must be additionally bonded with urea formaldehyde or equivalent.

Overpanels must be fixed by inserting steel screws through the rear of the door frame, passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.

Maximum overpanel heights are as follows:

- Single doorsets - 2000mm
- Double doorsets - 1500mm

The intumescent seals specified for the jambs in appendix C, must also be fitted to all edges of the overpanel, except the bottom edges of flush overpanels – see appendix C for details. The seals may be fitted in the overpanel edges or alternatively in the frame reveal. A maximum 2mm gap is permitted between the edge of the overpanel and the frame reveal.



Note: Drawing is representative of doorset construction only; actual construction must be as the text within this document specifies.

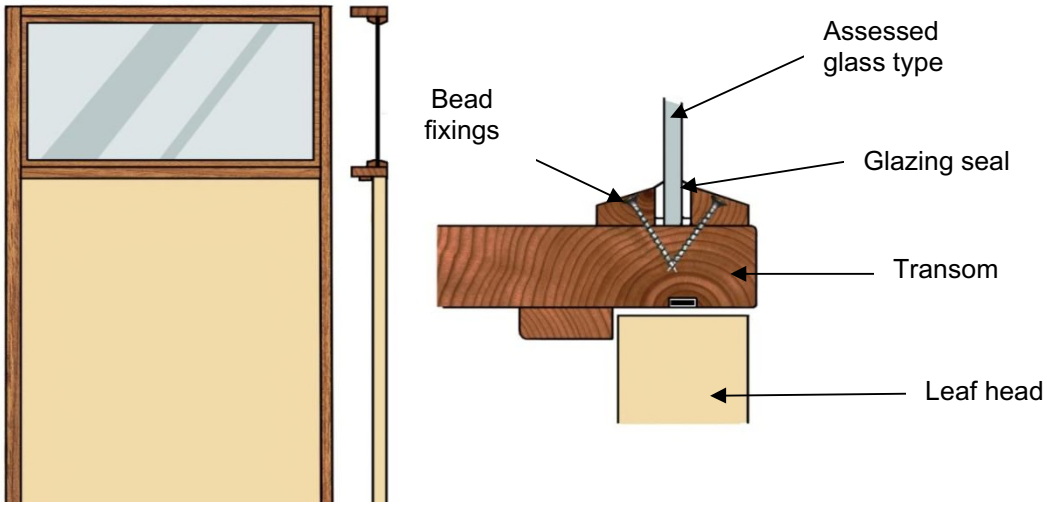
8.2 Glazed Fanlights

Moralt Laminesse FireSound 44mm doorsets including a transom may include a glazed fanlight. The timber door frame and glazing beads must be hardwood with a minimum density of 640kg/m^3, whilst the frame section for the transom must be a minimum of 70mm x 44mm. Timber door frame and transom construction must comply with the specification contained in section 10.

The maximum assessed fanlight dimensions are detailed in the table below, subject to the following restriction:

- The glazing system and glass must be able to demonstrate adequate performance when tested as a window or screen in accordance with BS 476: Part 22: 1987 or BS EN 1634-1, at the pane dimensions to be installed.

Configuration	**Height** (mm)	**Width** (mm)
All which include a transom	≤600	Overall door width



Note: Drawing is representative of doorset construction only; actual construction must be as the text within this document specifies.

9 Glazing

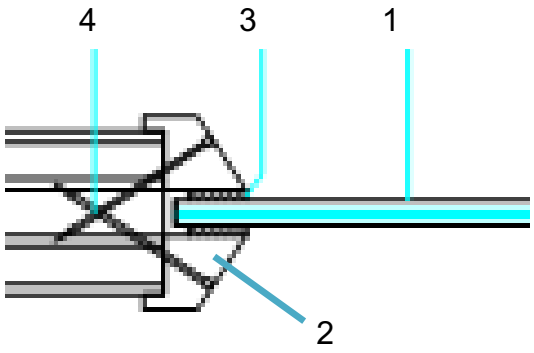
9.1 General

The testing conducted on the Moralt Laminesse FireSound 44mm design has demonstrated that the design is capable of tolerating glazed apertures, whilst providing a margin of over performance. Glazing is therefore acceptable within the following parameters.

The maximum assessed glazed area for all configurations is 0.9m². The glazing system must be either the tested system described in section 9.2 or one of the proprietary systems in section 9.3.

9.2 Tested Glazing System

Element	**Make/Material**	**Size** (mm)	**Dimension/Location**
1. Glass	Glass types 5 - 11 as specified in 9.4	7 – 16 thick	Max area – 0.9m^2
2. Glazing beads	Hardwood	21 high x 21 deep including a 4 x 5 bolection return and a 20° chamfer	Density – Minimum 720 kg/m^3
3. Glazing perimeter Seal	Intumescent Seals Ltd Therm-A-Strip	10 x 2 (height x thickness)	Fitted between glass and bead on both faces
4. Glazing bead fixings	Steel pins	44 long	Fitted 50mm from corners at 200mm centres (maximum)



9.3 Assessed Glazing Systems

Glazing System	Manufacturer	Maximum Area (m^2)
1. Fireglaze 30	Sealmaster Ltd.	0.9
2. Firestrip 30	Hodgsons Sealants Ltd.	0.9
3. Therm-A-Strip 30	Intumescent Seals Ltd.	0.9
4. 8193	Pyroplex Ltd.	0.9
5. 30049	Pyroplex Ltd	0.9
6. Pyroglaze 30	Mann McGowan Ltd	0.9
7. System 36/6 Plus	Lorient Polyproducts Ltd.	0.9
8. Flexible Figure 1	Lorient Polyproducts Ltd.	0.9

9.4 Assessed Glass Products

Glass Type	Manufacturer	Thickness (mm)	Max. Area (m^2)
1. Pyroshield 2	Pilkington UK Ltd.	6 & 7	0.9
2. Pyran S	Schott Glass Ltd.	6	0.9
3. Pyrostem	Pyroguard Ltd.	6	0.9
4. Pyroguard EW30	Pyroguard Ltd.	7	0.9
5. Pyrobelite 7	AGC Glass UK	7	0.9
6. Pyrodur 30-104	Pilkington UK Ltd.	7	0.9
7. Pyrodur 60-10	Pilkington UK Ltd.	10	0.9
8. Pyroguard EW MAXI	Pyroguard Ltd.	11	0.9
9. Pyranova 15-S2.0	Schott UK Ltd.	11	0.9
10. Pyrobelite 12	AGC Glass UK	12	0.9
11. Pyrostop 30-10	Pilkington UK Ltd.	15	0.9
12. Pyrobel 16	AGC Glass UK	16	0.9

Notes:

1. All glass types must be fitted strictly in accordance with the manufacturer's tested details/installation requirements
2. Glass types 9 – 12 are fully insulating for 30 minutes in terms of the criteria set out in BS 476: Part 20: 1987.

9.5 Glazing Beads & Installation

Glazing beads must be from hardwood as specified in the following table.

Material	Profile	Min. Density (kg/m^3)	Application
Hardwood	Splayed	640	All proprietary systems detailed in 9.3 and depicted in appendix B and all glass types listed in 9.4
Hardwood	Square	640	Proprietary systems 1 - 3 as specified in 9.3 and glass types 4 - 12 as specified in 9.4

Drawings of approved proprietary glazing systems are contained in appendix A.

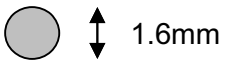
Notes:

1. A square bead profile may be used as an alternative to the splayed beads required for the proprietary systems, subject to the restricted glass types and glazing systems specified in the table above (see appendix A for square bead profile options).
2. Glazing beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 screws, inserted at 35 - 40º to the plane of the glass (or perpendicular to the bead splay) at no more than 50mm from each corner and at 150mm maximum centres.
3. The following minimum pin specification is permitted and is considered suitable for gun (pneumatically) fired applications:

   3.1 Option 1 – Round, Oval and Rectangular shaped pins:

   - Minimum Standard Wire Gauge (SWG) 16
   - Minimum cross section area of $2.03mm^2$
   - Minimum linear dimension 1.6mm in any direction

   Round pin diameter (mm) = minimum 1.6mm

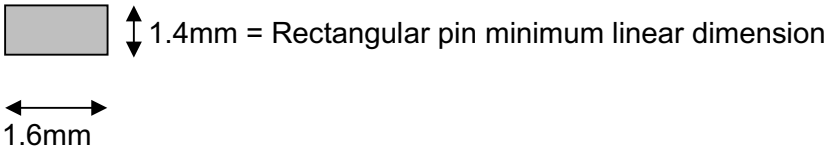
   

   Oval/rectangular pin minimum diameter linear dimension = 1.6mm

   3.2 Option 2 – Rectangular shaped pins:

   - Minimum Standard Wire Gauge (SWG) 16
   - Minimum cross section area of $2.24mm^2$
   - Minimum linear dimension 1.4mm in any direction

   Note: Pins with smaller dimensions than those listed above are not approved.

4. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape

5. Glazed openings must not be less than 165mm from any door edge. Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 135mm of core between apertures
6. All timber for glazing beads must be hardwood of straight grained, joinery quality, free from knots, splits and checks.

10 Door Frames

10.1 Door Frame Construction

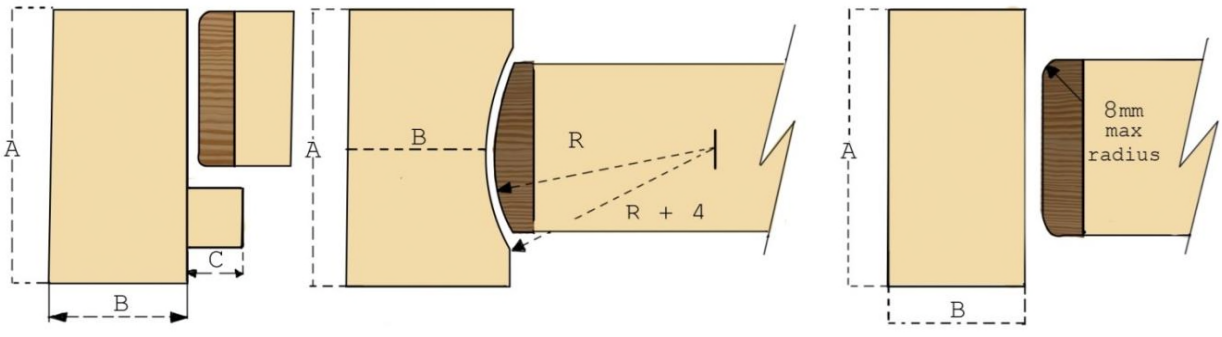
Timber based door frames for this design must meet the following specification.

Material	**Min. Section Size** (including stop - mm)	**Min. Density** (kg/m³)
Softwood/Hardwood	70 x 32	510
Hardwood[1]	70 x 40	640
MDF	70 x 32	700 +/-30
WoodEx 30	70 x 32	510

Notes:

1. Doorsets using hardwood frames of minimum density 640 kg/m³ and minimum section size 70 x 40mm thick are assessed for use with larger door leaf dimensions. See data sheets in appendix C for leaf size envelopes
2. If the doorset features a transomed overpanel, the door frame must be softwood or hardwood (not MDF or WoodEx 30) with a minimum section of 70mm x 32mm and of the minimum density stated above
3. All door frame timber must meet or exceed class J30 as specified in BS EN 942: 2007, providing any defects are adequately repaired
4. Stops may be integral (in one piece with the door frame) or planted; a minimum 14mm thickness of stop (15mm for WoodEx 30) is adequate for single acting frames
5. The maximum radius to the corners of the leaf is 8mm (see below)
6. Frame joints must be one of the types shown in section 8.2, and with no gaps. All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws.

The following depicts the assessed frame profiles and dimensions.



Standard **Scalloped** **Profiled edges**

A = min 70mm B = min 32 - 40mm (see table above) C = min 14mm

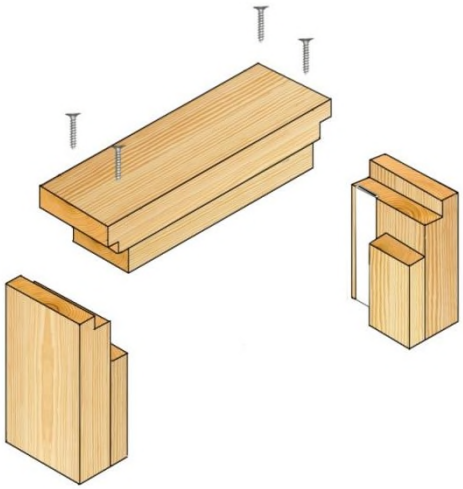
Profiled edges: A maximum curve radius of 8mm to create a maximum 2mm deep edge profiling

10.1.1 CS Group Acrovyn

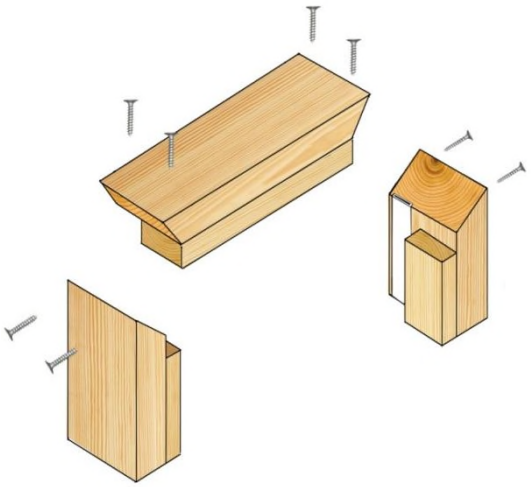
Based on the evidence generated in support of Chilt/A11129 Revision E, timber and WoodEx door frames may be encapsulated in CS Group Acrovyn meeting the following specification. All other details must remain as required in section 10.1 above, as appropriate:

1. The intumescent detail as specified in the relevant (CS Group headed) data sheets contained in Appendix C of this assessment must be replicated
2. CS Group Acrovyn must be bonded to the door frame using 3M Scotch-Grip cement 10 contact adhesive
3. See relevant (CS Group headed) data sheets in Appendix C of this assessment for maximum permitted leaf sizes
4. The maximum thickness of CS Group Acrovyn used must be 2mm, as per test evidence.

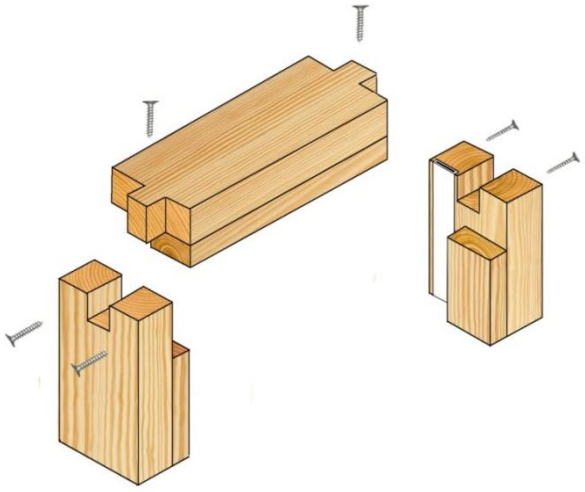
10.2 Door Frame Joints



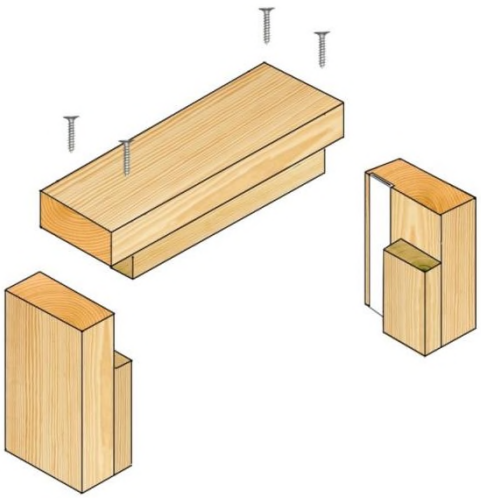
Half Lapped Joint



Mitre Joint



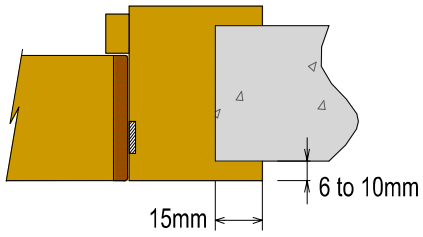
Mortise and Tenon Joint



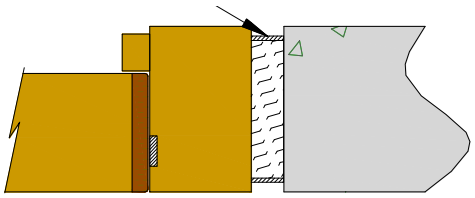
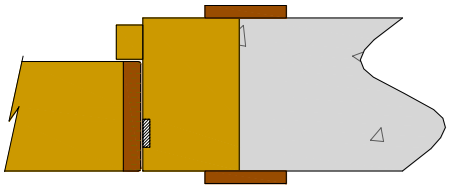
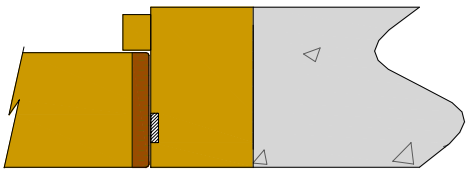
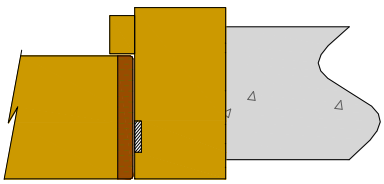
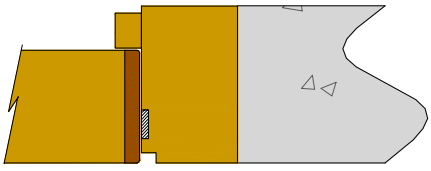
Butt Joint

10.3 Door Frame Installation

The following diagrams indicate acceptable and unacceptable frame installations:

<table>
<tr><th colspan="2">Permitted Installations</th></tr>
<tr><td> 

6-10mm is the maximum a frame is permitted to be proud of the structural surround when combined with a 15mm bolection return. Projecting frames outside these dimensions will require specific test evidence or assessment

Not permitted for 90 minute applications.</td><td>Max 10 x 10mm shadow gap with 2mm intumescent mastic capping or
10 x 4mm PVC encased intumescent seal
 
Shadow gaps are permitted as shown in the above diagram providing the frame to structural surround is infilled with timber of the same density as the frame or a non-combustible material such as plasterboard. Other shadow gap dimensions will require specific test evidence or assessment.
Not permitted for 90 minute applications.</td></tr>
<tr><td> 
Architraves overlapping the frame to structural surround junction are always permitted where required but may be mandatory depending on the size of frame to surround junction gap and the fire stopping used. See section on Sealing to the Structural Surround.</td><td> 
Depending on the size of the frame to surround junction gap and the fire stopping methods used, it may be permitted to install doorsets without architraves. See section on Sealing to the Structural Surround.</td></tr>
<tr><th colspan="2">Not Permitted Installations</th></tr>
<tr><td> 
Projecting frames without bolection returns are not permitted without specific test evidence or assessment due to the potential for increased charring to the back of the frame.</td><td> 
Quirks between the leaf and frame are not permitted without specific test evidence or assessment due to the potential for increased charring of the leaf to frame gap.</td></tr>
</table>

The diagrams above are representative; actual installation must be as the text within this document specifies. See section 19 for sealing to structural opening.

11 Timber Lippings

The Laminesse FireSound 44mm doorset design must be lipped on all edges; lippings must meet the following specification.

Material	**Size** (mm)	**Min. Density** (kg/m³)
Hardwood which must meet or exceed class J30 as specified in BS EN 942: 2007, providing any defects are adequately repaired	1. Flat = Overall 8 - 17 thick	640
	2. Rounded = 11 – 21 thick with a radius matching the distance between leaf edge and floor pivot (see section 8.1)	
	3. Rebated = Not permitted	

Notes:

1. A maximum of 2mm profiling is permitted at corners of lipping (see section 10.1)
2. A 2.5^0 chamfer is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 16.

12 Leaf Facing Materials

The overall 44mm thick leaf construction may be achieved by the following leaf construction variations:

1. FireSound 44mm - 3mm MDF facings (minimum density 720kg/m³)
2. FireSound 44mm – 3mm Chipboard facings (minimum density 700kg/m³).

12.1 Decorative & Protective Facings

The following additional facing materials are permitted for this door design since they would degrade rapidly under test conditions without significant effect.

Facing Material	**Maximum Permitted Thickness** (mm)
Paint	0.5
Timber veneers	2.0
PVC	2.0
Plastic laminates	2.0
Decorative paper / non-metallic foil	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates
2. Materials must not conceal intumescent strips
3. PVC and plastic laminates must not return around the leaf edges without specific test evidence.

12.2 PVC Edge Protectors & Post-Formed CS Group Acrovyn

12.2.1 General

It is possible to fit proprietary edge protectors to this doorset design providing they have suitable supporting test evidence to BS 476: Part 22: 1987 or BS EN 1634-1, when fitted to timber doorsets of similar construction to this design. The end user must satisfy themselves that the test evidence supports the proposed end use application.

12.2.2 CS Group Edge Protectors

The Moralt Firesound 44mm designs have been assessed for use with CS Group edge protectors. CS Group edge protectors are supplied pre-formed with the approved intumescent material. The CS Group edge protectors must be used as part of a complete intumescent system and the required intumescent specification and leaf sizes are given in the relevant data sheets in Appendix D. CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

12.2.3 Post-Formed CS Group Acrovyn

It is possible to encapsulate the Moralt Firesound 44mm designs by post-forming the leaf in CS Group Acrovyn, based on the supporting test evidence in Chilt/A11129 Revision E, and the following specification:

1. CS Group Acrovyn may be wrapped around the vertical edges of the leaf, or the leaf can be fully encapsulated on all four edges
2. The vertical edge detail prior to post-forming must either be lipped with 8mm thick PVC adhered to the leaf edge using WC127 PVC weld cement, or hardwood as detailed in this assessment (see sections 10.1 & 10.2). Rebated timber lippings are not permitted
3. The horizontal edge detail prior to post-forming does not require lipping but may be lipped with 8mm thick PVC adhered to the leaf edge using WC127 PVC weld cement, or hardwood as detailed in this assessment (see sections 10.1 & 10.2). Rebated timber lippings are not permitted
4. The maximum radius of the lipping at the corners of the vertical edges before post-forming must be 9mm, which provides for 11mm external radius after the CS Group Acrovyn has been applied
5. The intumescent detail as specified in the relevant (CS Group headed) datasheets contained in Appendix C of this assessment must be replicated
6. CS Group Acrovyn must be bonded to the leaf using 3M Scotch-Grip cement 10 contact adhesive
7. See relevant (CS Group headed) datasheets in Appendix C of this assessment for maximum permitted leaf sizes
8. The maximum thickness of CS Group Acrovyn used must be 2mm, as per test evidence
9. The CS Group Acrovyn can be provided as pre-formed trays with dimensions to suit the proposed leaf sizes, as well as sheets for post-forming by the door manufacturer
10. It is permitted to hang leaves fitted with CS Group Acrovyn in timber or MDF door frames meeting the specification given in section 10.1 (not encapsulated with CS Group Acrovyn) or section 10.1.1 (encapsulated with CS Group Acrovyn).

13 Intumescent Materials

The intumescent materials tested and assessed for this doorset design are as follows.

Application	Location	Product/Manufacturer
Edge seals	Fitted in the frame jambs or leaf edges	1. PVC encased Type 617 – Lorient Polyproducts Ltd 2. Rigid Box Seals – Pyroplex Ltd 3. Odice S.A.S.
Hinges	Under both hinge blades	1. 1mm Interdens – Dufaylite Developments Ltd 2. 1mm MAP paper – Lorient Polyproducts Ltd 3. 1mm Pyrostrip 300 – Mann McGowan 4. 1mm Therm-A-Strip – Intumescent Seals Ltd 5. G30 – Intumescent Seals Ltd
Lock/latches	Under forend and keep	
	Encasing Latch Body	Not required
Top pivots & flush bolts	Lining all sides of the mortices	1. 2mm Interdens – Dufaylite Developments Ltd 2. 2mm MAP paper – Lorient Polyproducts Ltd 3. 2mm Pyrostrip 300 – Mann McGowan 4. 2mm Therm-A-Strip – Intumescent Seals Ltd 5. 2mm Therm-A-Flex – Intumescent Seals Ltd 6. 2mm Flexilodice Graphite – Odice S.A.S

The seal specification for each doorset configuration is contained in appendix C.

14 Adhesives

The following adhesives must be used in construction.

Element	Adhesive Type
Timber lippings	Details held on file, in confidence, at Warringtonfire
Inner Core to Outer Core	
Outer Core Layers	

15 Hardware

15.1 General

The following sections detail the scope and constraints for fitting hardware to the door design.

The following items of hardware must also bear the CE mark: locks and latches (EN 12209), electro mechanically operated locks (EN 14846), single axis hinges (EN 1935), controlled door closing devices (EN 1154), electrically powered hold open devices (EN 1155), door co-ordinators (EN 1158), emergency exit hardware (EN 179), panic exit hardware (EN 1125).

15.2 Tested Hardware

The following hardware has been successfully incorporated in the tests on this design.

Element	Product	Size (mm)	Location (mm)
Hinges	Enduro Max bearing butt type hinge Ref. DSH1103	36 x 100 (blade size)	-
	Cooke Brothers 7700CB range bearing butt hinge	101 x 30 x3 (blade size)	-
Closer	Rutland TS3204 overhead type closer	220 x 59 (footprint size)	Fitted on the exposed face
	Dorma (UK) Ltd TS72 overhead type closer	240 x 68 (footprint size)	
Latch – disengaged	Briton DS5440 mortice latch	235 x 20 (forend)	Latch -1000mm from the threshold of the leaf
		145 x 25 (keep)	
	Zoo Hardware KFV EP166/3470422	235 x 20 (forend)	Spindle fitted 1026mm from the threshold
		205 x 24 (keep)	
Threshold drop seal	Norsound NOR810dB+	35 high x 14 wide	Fitted in the leaf threshold
Flush Bolts	Zoo steel flush bolts Ref. DS03/200	205 x 20 (forend) 45 x 20 (keep)	Fitted at the head and threshold
	Zoo Hardware, product reference ZAS03RSS	205 high x 20 wide x 38 deep	Fitted at the head of leaf only
		42 x 18 (keep)	
Furniture	Eurospec aluminium lever type handle Ref. CSL1190	Ø52 (rose size)	Fitted appropriate to the latch
	Hoppe Paris FS-K138/353K lever type handle	165 x 45 (footprint size)	

15.3 Additional & Alternative Hardware

15.3.1 Certifire

The Certifire third party certification scheme approves various items of hardware for different door types and different fire ratings and has its own set of requirements relating to that item of hardware.
Where the alternative hardware sections in this report allow alternatives to the tested hardware, Certifire approved hardware may be used as an alternative, subject to the following provisos:

- In all cases, the requirements of this report must take precedence.
- The hardware must comply with the requirements of the relevant section e.g. hinges.
- The hardware must comply with the limitations specified in terms of design, materials and dimensions.

15.3.2 Latches & Locks

Latches and locks must either be as tested, or alternatively components with the following specification are acceptable.

Element	Specification
Maximum forend and strike plate dimensions	235mm high by 25mm wide by 4mm thick
Maximum body dimensions	18mm thick by 100mm wide by 165mm high.
Intumescent protection	See section 11
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel or brass (with melting point ≥ 800°C)
Location	1000 – 1200mm above threshold

15.3.3 Hinges

Door leaves must be hung on a minimum of 3 hinges. Hinges with the following specification are acceptable. Leaves over 2400mm high must fit 4 hinges.

Element		Specification	
Blade height		90 - 120mm	
Blade width (excluding knuckle)		30 - 35mm	
Blade thickness		2.5 - 4mm	
Fixings		Minimum of 4No. 30 long No. 8 or No. 10 steel wood screws per blade	
Materials		Steel or stainless steel or brass (melting point = or >800°C)	
Hinge positions (to top of hinge blade)	Leaf dimensions <2400mm	Top	180 - 220mm from the head of the leaf to the centreline of the hinge
		2nd	Minimum 200mm from centreline of top hinge to centreline of second hinge OR equally spaced between top and bottom hinge
		Bottom	280 - 320mm from the foot of the leaf to the centreline of the hinge
	Leaf dimensions >2400mm	Top	180 - 220mm from the head of the leaf to the centreline of the hinge
		2nd	Minimum 200mm from centreline of top hinge to centreline of second hinge
		3rd	Equally spaced between 2nd hinge and bottom hinge
		Bottom	280 - 320mm from the foot of the leaf to the centreline of the hinge
Intumescent protection		See section 13	

15.3.4 Automatic Closing

Automatic closing devices, must either be as tested or components of equal specification that have demonstrated contribution to the required performance of this type of 30 minute doorset design, when tested to BS 476: Part 22: 1987 or BS EN 1634-1.

Notes: The top pivots to floorspring assemblies must be protected with 2mm thick intumescent gasket (see section 13) or alternatively the manufacturers tested intumescent gaskets.

15.3.5 Pull Handles

These may be surface-fixed or bolted through the door providing they are steel, stainless steel or brass and the length is limited to 1200mm between the fixing points. No additional intumescent protection is required provided that the hole for the bolt through the leaf is tight.

15.3.6 Push Plates/Kick Plates

Steel, stainless steel or aluminium face-fixed hardware such as push plates and kick plates may be fitted to the doorsets provided that their fitting requires the removal of no part of the door leaf. These items of hardware must not amount to more than 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a contact or other thermally softening adhesive. Plates must not return around the door edges.

15.3.7 Door Security Viewers

Door security viewers with brass or steel bodies of a diameter less than or equal to 15mm may be used provided that the through-hole is bored tight to the case of the viewer (maximum tolerance +1mm). Lenses must be glass and the item must be bedded into a tested intumescent mastic.

15.3.8 Panic Hardware

Panic hardware, manufactured from steel or non-combustible materials, may be fitted, provided that its installation does not require the removal of any timber from the leaf, stop or frame reveal and it in no way interferes with the self-closing action of the door leaf.

15.3.9 Air Transfer Grilles

Air transfer grilles may be fitted providing the product has suitable test evidence to BS 476: Part 22: 1987 or BS EN 1634-1 that demonstrates a minimum 30 minutes integrity performance when installed within a timber based doorset of comparable thickness. Margins to the leaf edges will remain as detailed for glazing and the position of the unit will be dictated by the pressure regime tested in the proving evidence (normally below mid-height). The area occupied by the air transfer grille must not exceed 0.1m^2 and must be deducted from the area of glazing, if both elements are fitted.

15.3.9.1 Cold Smoke Control

Doorsets fitted with an air transfer grille cannot be identified as smoke control doorsets as defined in section 18; unless the transfer grille is connected to a smoke/alarm system such that it will be mechanically closed in the event of smoke being detected.

15.3.10 Environmental Seals

Silicon based flame retardant acoustic, weather and dust seals (e.g. Lorient IS1212, IS1511, IS7025 or IS7060) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self closing function of the leaves.

15.3.11 Threshold Seals

The following types of automatic threshold drop seals may be recessed in to the bottom rail of leaves to this design without compromising the performance.

Manufacturer	Product Reference
Lorient Polyproducts Ltd.	IS8010si
	LAS8005si
Raven	RP8Si
Athmer	Schall-Ex Duo L-15
Norsound Ltd.	810 range
STS Ltd	ST422

15.3.12 Letter Boxes/Plates

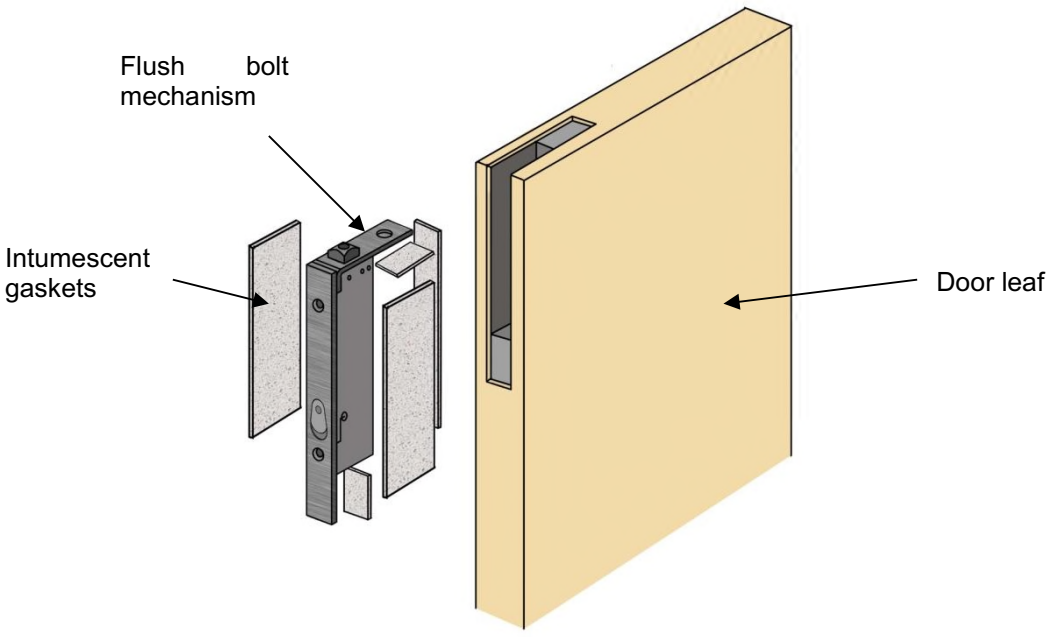
Letter boxes/plates may be fitted providing the product can demonstrate contribution to the required performance of this type of 30 minute doorset design, when tested to BS 476: Part 22: 1987 or BS EN 1634-1 and installed at the proposed location, within a timber based doorset of comparable thickness. Margins to the leaf edges must remain as specified for glazing.

15.3.13 Flush Bolts

Flush bolts may be incorporated centrally into the top and bottom of one meeting edge, providing the following maximum dimensions are not exceeded and the components are fitted opposite the edge fitted with intumescent strips:

- 210mm long x 20mm deep x 20mm wide

Flush bolts must be steel or brass and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice must be protected with intumescent gaskets as specified in section 11. Alternatively the hardware manufacturers tested gaskets may be used. See diagram below for example of intumescent protection to flush bolt.



16 Door Gaps

For fire resistance performance, door gaps and alignment tolerances must fall within the following range.

Location	Dimension
Door edge gaps	A minimum of 2mm and a maximum of 4mm
Alignment tolerances	Leaves must not be proud of the door frame or each other by more than 1mm
Threshold	10mm between bottom of leaf and top of floor covering

17 Supporting Construction

The door assemblies are approved for installation within standard rigid and flexible supporting constructions that have demonstrated a minimum of 30 or 60 minutes fire resistance, as applicable, when tested to BS 476: Part 22: 1987. Consideration must be given to the suitability of the supporting construction for supporting the proposed door assemblies.

18 Fixings

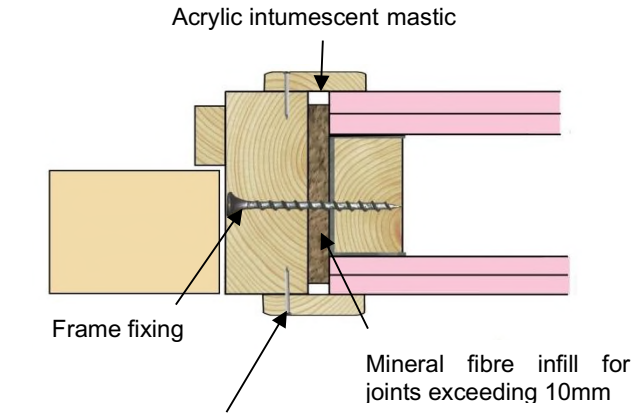
The door assemblies must be fixed back to the supporting structure using steel screw fixings appropriate for the substrate. The fixings are to be inserted at 500mm centres to all edges, with a fixing no more than 150mm from any corner and they must penetrate the supporting structure to a depth of 50mm. The fixings must be positioned to avoid exposure during fire conditions, which may necessitate a twin line of screws. Packers must be inserted at the fixing locations.

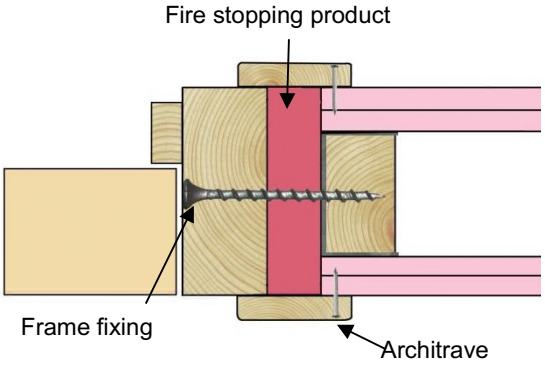
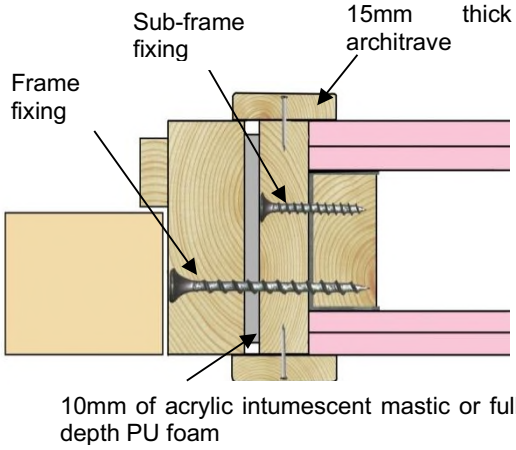
19 Sealing to Structural Opening

The door frame to structural opening gap must be protected using one of the following methods.

1. Gaps up to 10mm must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.

2. Gaps between 10mm and 20mm must be tightly packed with mineral fibre capped on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional.



3. Gaps up to 20mm filled with proprietary fire stopping product (e.g. expanding PU foam or preformed compressible intumescent foam). Products must be tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.	
4. Timber based or non-combustible sub-frame up to 50mm thick, with gaps up to 10mm between the components filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.	

Guidance for various methods of sealing the frame to structural opening gap is also given in BS 8214: 2016, *Timber-based fire door assemblies. Code of practice*, which may be referred to where appropriate.

Note: Drawings are representative of doorset installation only; actual installations must be as the text within this document specifies.

20 Smoke Control

20.1 General

If the doorset design is required to provide a smoke control function to comply with Building Regulations, the doorset must meet one of the following criteria (unless pressurization techniques complying with BS EN 1201-6 are used);

(a) have a leakage rate not exceeding $3m^3/m$/hour (head and jambs only) when tested at 25Pa under BS 476 *Fire tests on building materials and structures*, Section 31.1 - *Methods for measuring smoke penetration through doorsets and shutter assemblies, Method of measurement under ambient temperature conditions*; or

(b) meet the additional classification requirement of Sa when tested to BS EN 1634-3:2004 - *Fire resistance tests for door and shutter assemblies*, Part 3 – *Smoke control doors*.

Smoke seals or combined intumescent/smoke seals that are fitted to the door to achieve the performance requirements specified above, must have been tested in accordance with the associated test method. Providing the smoke seals, any interruptions, door gaps, and the type/configuration of the doorset are consistent with the detail tested, the doorset will comply with current smoke control legislation under approved document B; and a suffix ‘S’ or ‘Sa’, as appropriate, may be added to the designation. Any other components installed where smoke leakage may occur must also be taken into account.

Note The incorrect specification and fitting of smoke seals may impair the operation of a doorset and therefore compromise the fire resistance performance. Advice should be sought from the seal manufacturers regarding the correct specification and installation of smoke seals or combined smoke and intumescent seals.

20.1.1 Further Considerations

Other guidance is available, including BS EN 9999-2017 - *Code of practice for fire safety in the design, management and use of buildings*, which may impose different or additional requirements. It is the responsibility of the relevant parties to stipulate the precise smoke control specification, prior to commencing manufacture and/or installation.

21 Insulation

Insulation performance may be claimed for a doorset to this design meeting the following.

Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Unglazed doorsets or doorsets glazed with insulating glass (see section 9.4)

22 Conclusion

If the Moralt AG Laminesse FireSound 44mm fire resisting doorset design, constructed in accordance with the specification documented in this global assessment, were to be tested in accordance BS 476: Part 22: 1987, it is the opinion of Warringtonfire that they would provide a minimum of 30 minutes integrity and insulation, subject to the provisos stated.

23 Declaration by the Applicant

1) We the undersigned confirm that we have read and comply with obligations placed on us by FTSG Resolution No 82: 2001
2) We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which this assessment is being made
3) We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made
4) We are not aware of any information that could adversely affect the conclusions of this assessment
5) If we subsequently become aware of any such information we agree to ask the assessing authority to withdraw the assessment.

Signed:

Name:

Klaus Feile

For and on behalf of Moralt AG

24 Limitations

The following limitations apply to this assessment:

1. This assessment addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.

2. This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, Warringtonfire reserves the right to withdraw the assessment unconditionally but not retrospectively.

3. This assessment has been carried out in accordance with Fire Test Study Group Resolution No 82: 2001.

4. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

5. This assessment relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.

6. This assessment represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 22: 1987, on the basis of the evidence referred to herein. We express no opinion as to whether that evidence, and/or this assessment, would be regarded by any Building Control authority as sufficient for that or any other purpose. This assessment is provided to the client for its own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.

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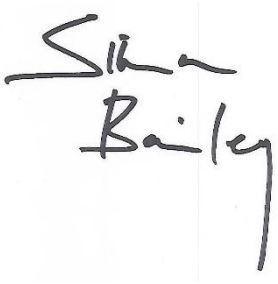
25 Validity

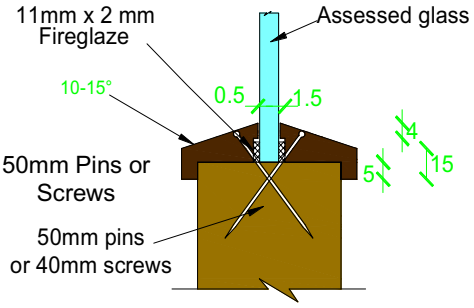
1) The assessment is valid initially for a period of five years from the date of issue, after which time it must be submitted to Warringtonfire for technical review.

2) This assessment report is not valid unless it incorporates the declaration given in Section 23 duly signed by the applicant.

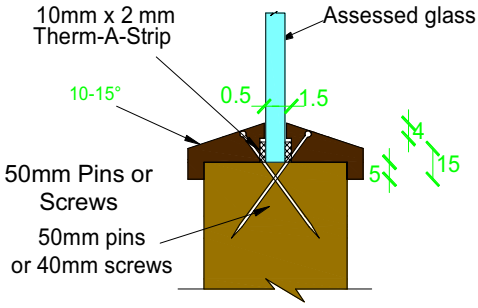
Signature:		
Name:	**A M Winning**	**S Bailey**
Title:	Senior Product Assessor	Senior Product Assessor

Appendix A

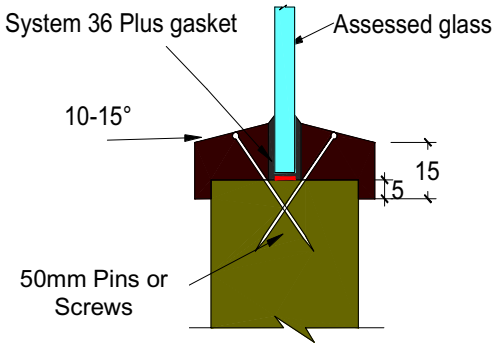
Proprietary 30 Minute Glazing Systems



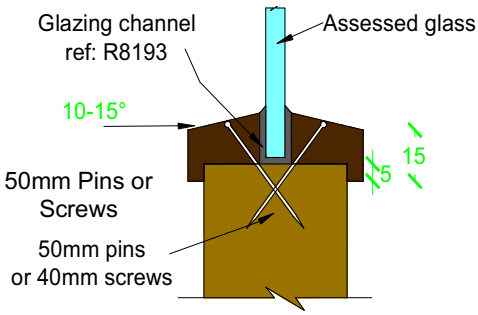
Fireglaze
Sealmaster Ltd



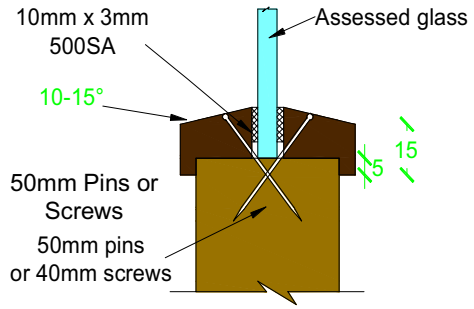
Therm-A-Strip
Intumescent Seals Ltd



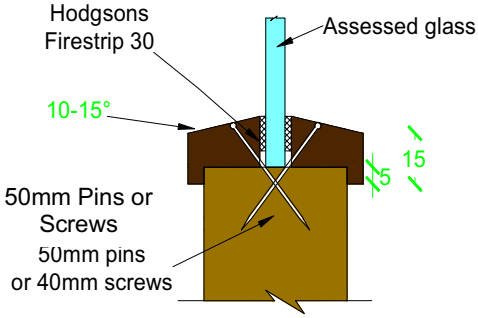
System 36 Plus
Lorient Polyproducts Ltd



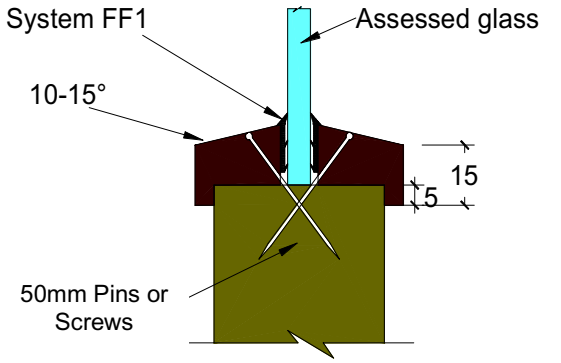
Pyroplex Ltd



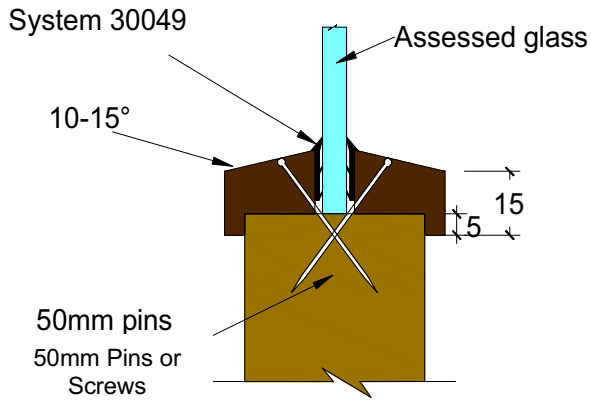
Pyroglaze 30
Mann McGowan Ltd



Firestrip 30
Hodgsons Sealants Ltd



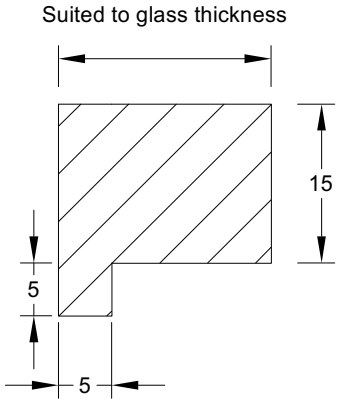
System FF1
Lorient Polyproducts Ltd



Pyroplex Ltd

Assessed Square Glazing Bead Profiles

The following square bead profile may be used as an alternative to the splayed beads detailed above - refer to section 9 for glazing system and glass restrictions.



Appendix B

Revisions

Revision	Warringtonfire Reference	Date	Description
A	CNA/F15134	05.06.15	Addition of test data PF15040 for Odice seals
B	WF421105	09.12.19	Update to Warringtonfire format and in accord with the principles of BS EN 15725: 2010. Use of CS Group Acrovyn encapsulation assessed

Appendix C

Data Sheets

for:

Moralt AG
Laminesse FireSound 44mm
30 Minute Doorsets

Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Any Assessed Frame Material

Latched and Unlatched Single Acting & Double Acting Single Doorsets

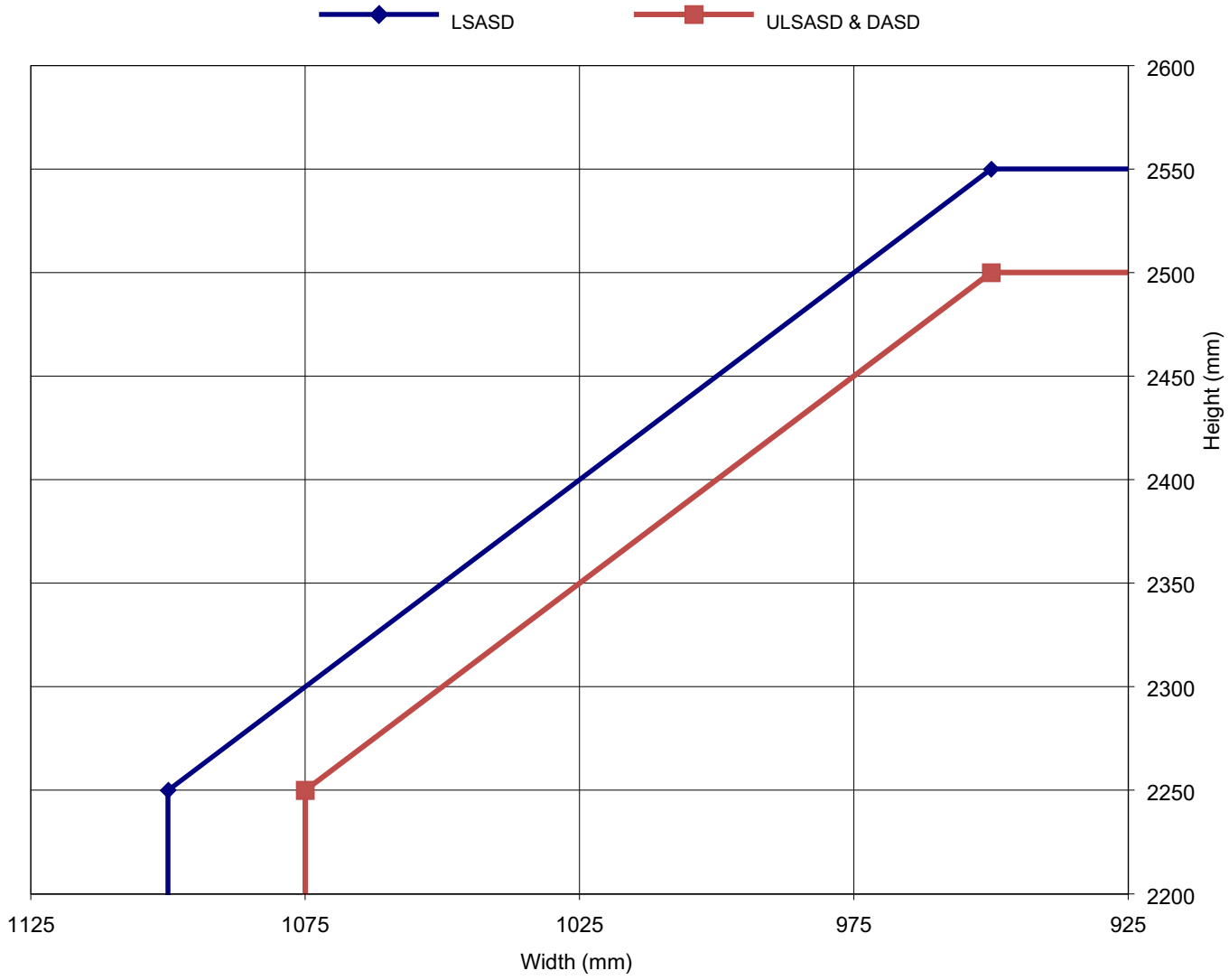
	Configuration		**Height** (mm)		**Width** (mm)
Leaf Sizes	LSASD	From:	2250	x	1100
		To:	2550	x	950
	ULSASD+DASD	From:	2250	x	1075
		To:	2500	x	950
Maximum Overpanel Height (mm)		Transomed	2000		

Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick FO8600 Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal.

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Hardwood Door Frame

Latched and Unlatched Single Acting & Double Acting Single Doorsets

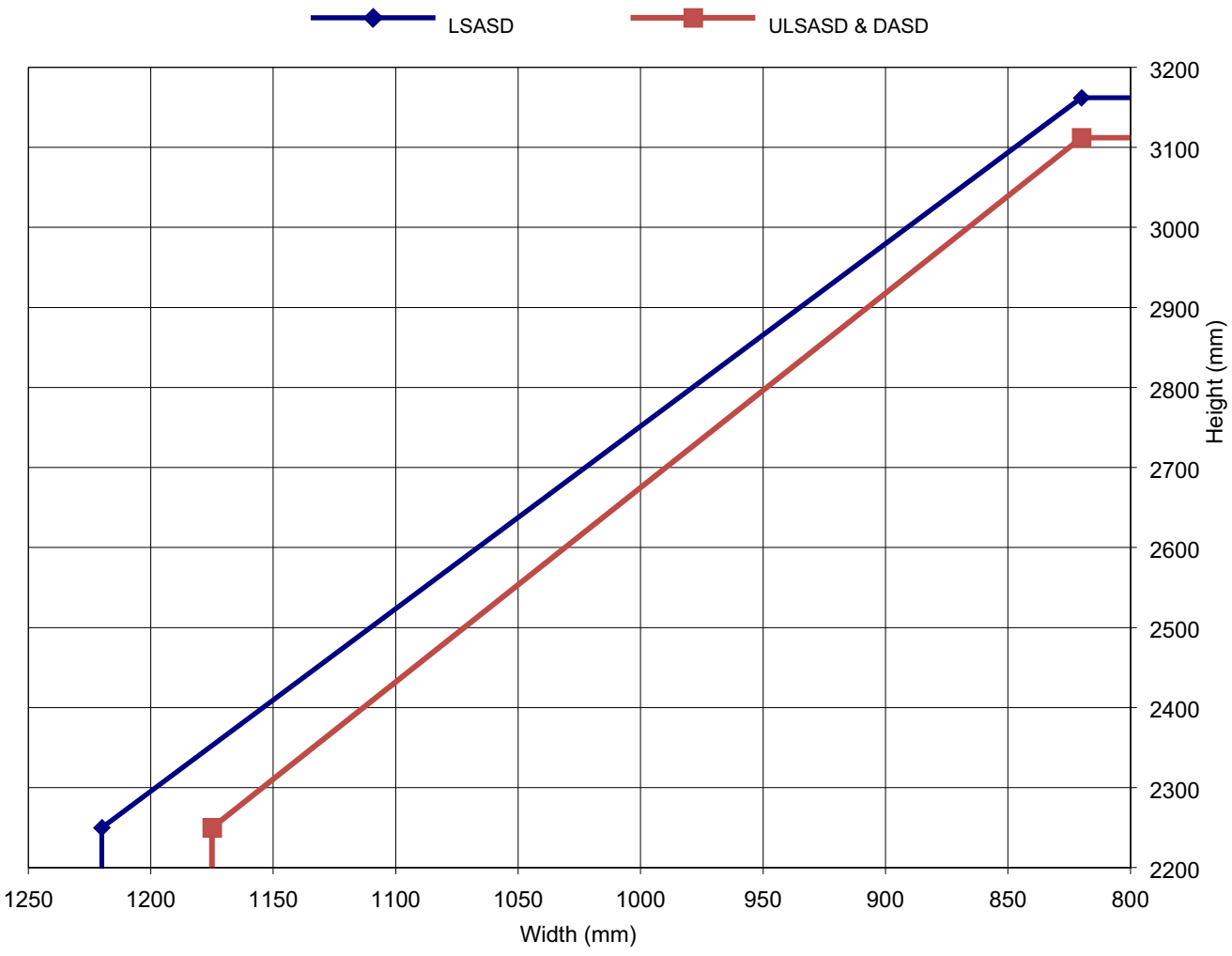
	Configuration		**Height** (mm)		**Width** (mm)
Leaf Sizes	LSASD	From:	2250	x	1220
		To:	3162	x	820
	ULSASD+DASD	From:	2250	x	1175
		To:	3112	x	820
Maximum Overpanel Height (mm)		Transomed	2000		
Door Frame (see section 8)		Hardwood – minimum 640kg/m^3	70 x 40mm thick		

Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick FO8600 Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal. For leaves over 2600mm high and/or 1050mm wide increase to 20mm wide seals

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Any Assessed Frame Material

Latched and Unlatched Single Acting Single Doorsets + Flush Overpanel

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD+OP	From:	2250	x	1050
		To:	2450	x	950
	ULSASD+OP	From:	2250	x	1025
		To:	2400	x	950
Maximum Overpanel height (mm)		Flush	2000		

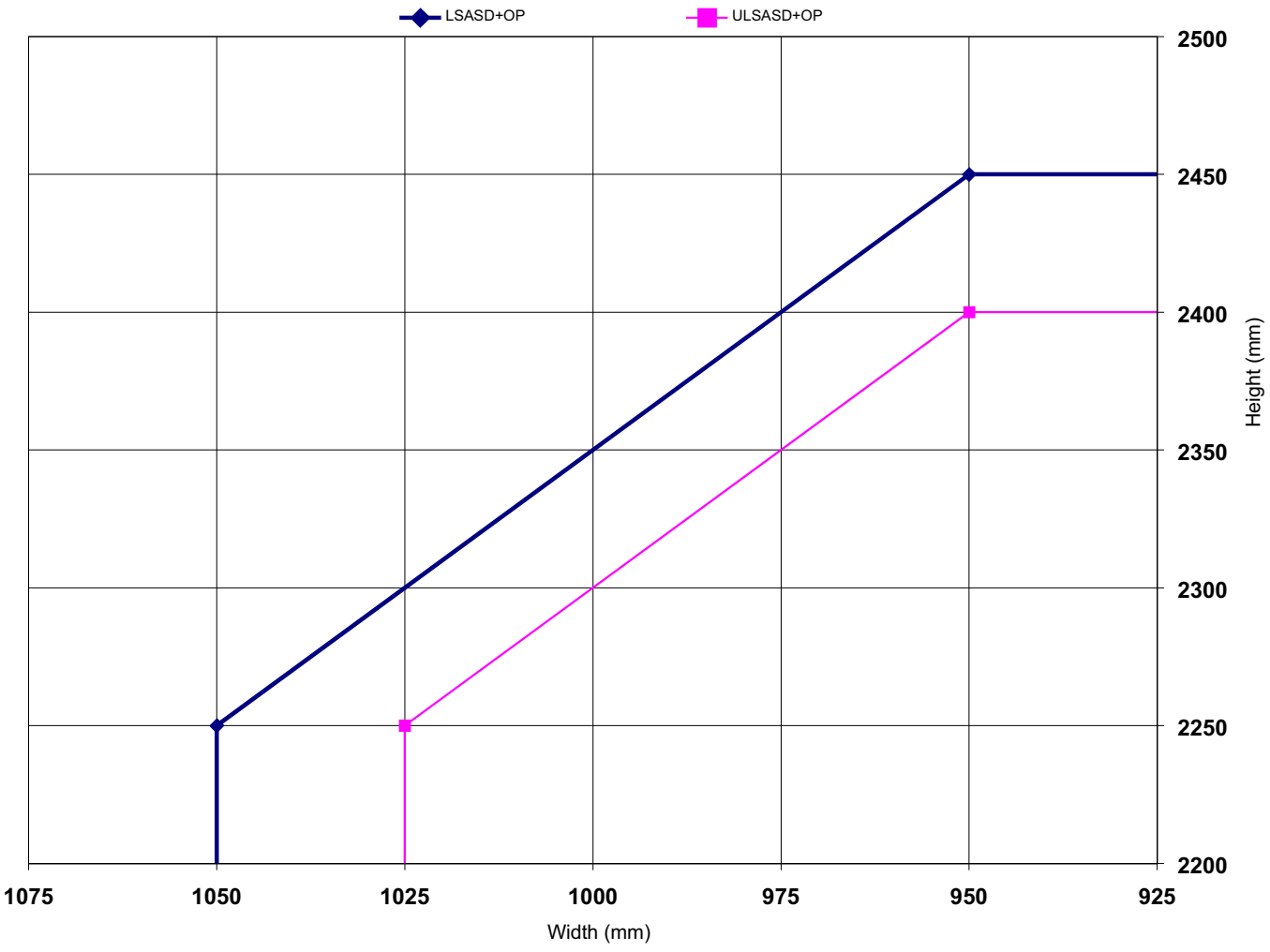
Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal.

Bottom Edge of Flush Overpanel: 1No. 20mm wide Type 617 seal or 1No 25mm wide FO8700 Rigid Box Seal or 1No 25mm wide Odice S.A.S. seal; fitted centrally in the bottom edge.

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Hardwood Door Frame

Latched and Unlatched Single Acting Single Doorsets + Flush Overpanel

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD+OP	From:	2250	x	1150
		To:	3062	x	820
	ULSASD+OP	From:	2250	x	1125
		To:	3012	x	820
Maximum Overpanel height (mm)		Flush	2000		
Door Frame (see section 8)		Hardwood – minimum 640kg/m^3	70 x 40mm thick		

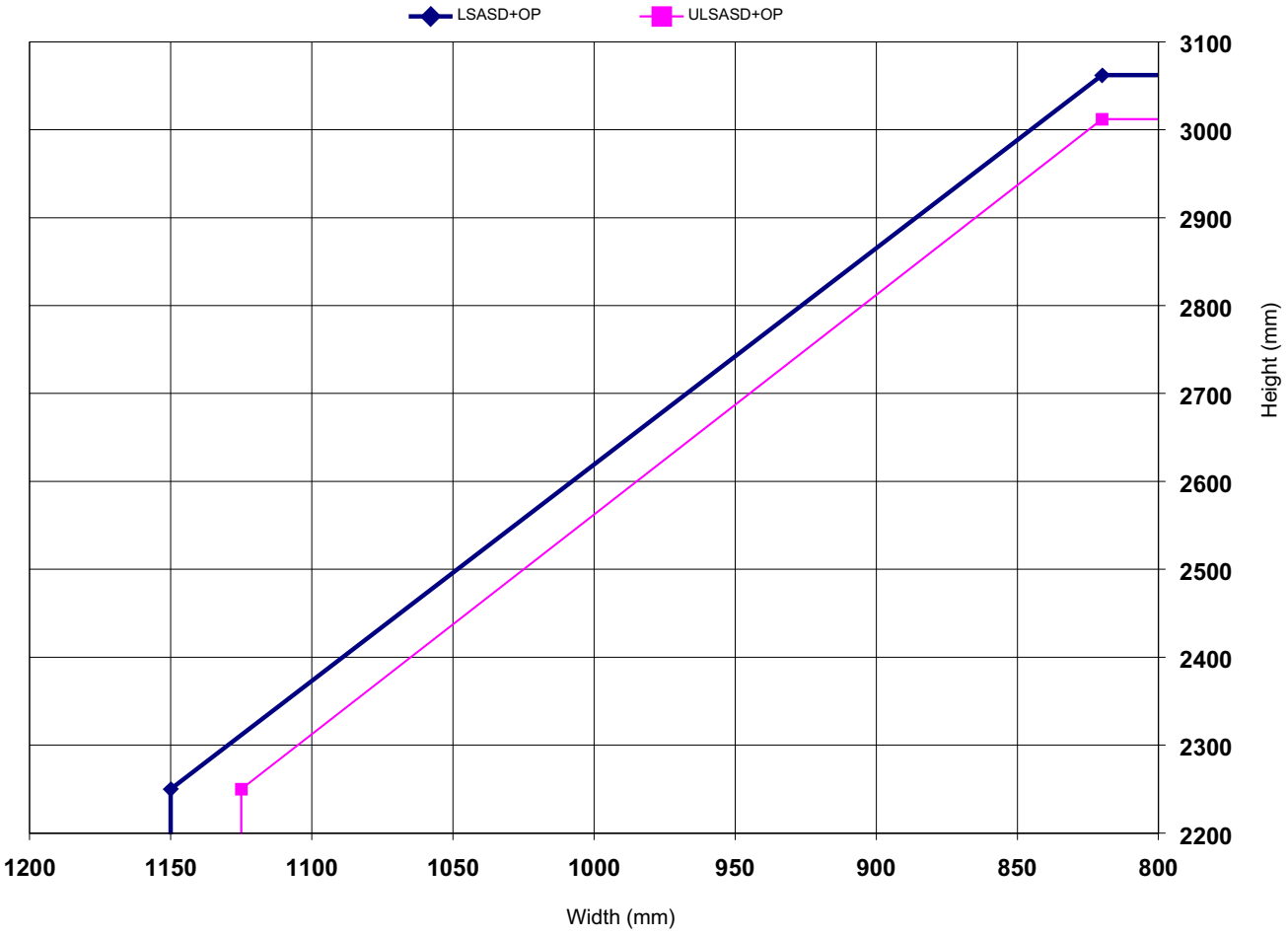
Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal. For leaves over 2600mm high and/or 1050mm wide increase to 20mm wide seals

Bottom Edge of Flush Overpanel: 1No. 20mm wide Type 617 seal or 1No 25mm wide FO8700 Rigid Box Seal or 1No 25mm wide Odice S.A.S. seal; fitted centrally in the bottom edge.

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Any Assessed Frame Material
Latched and Unlatched Single Acting & Double Acting Double Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2250	x	1000
		To:	2350	x	950
	ULSADD & DADD	From:	2250	x	975
		To:	2300	x	950
Maximum Overpanel Height (mm)		Transomed	2000		

Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick FO8600 Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal.

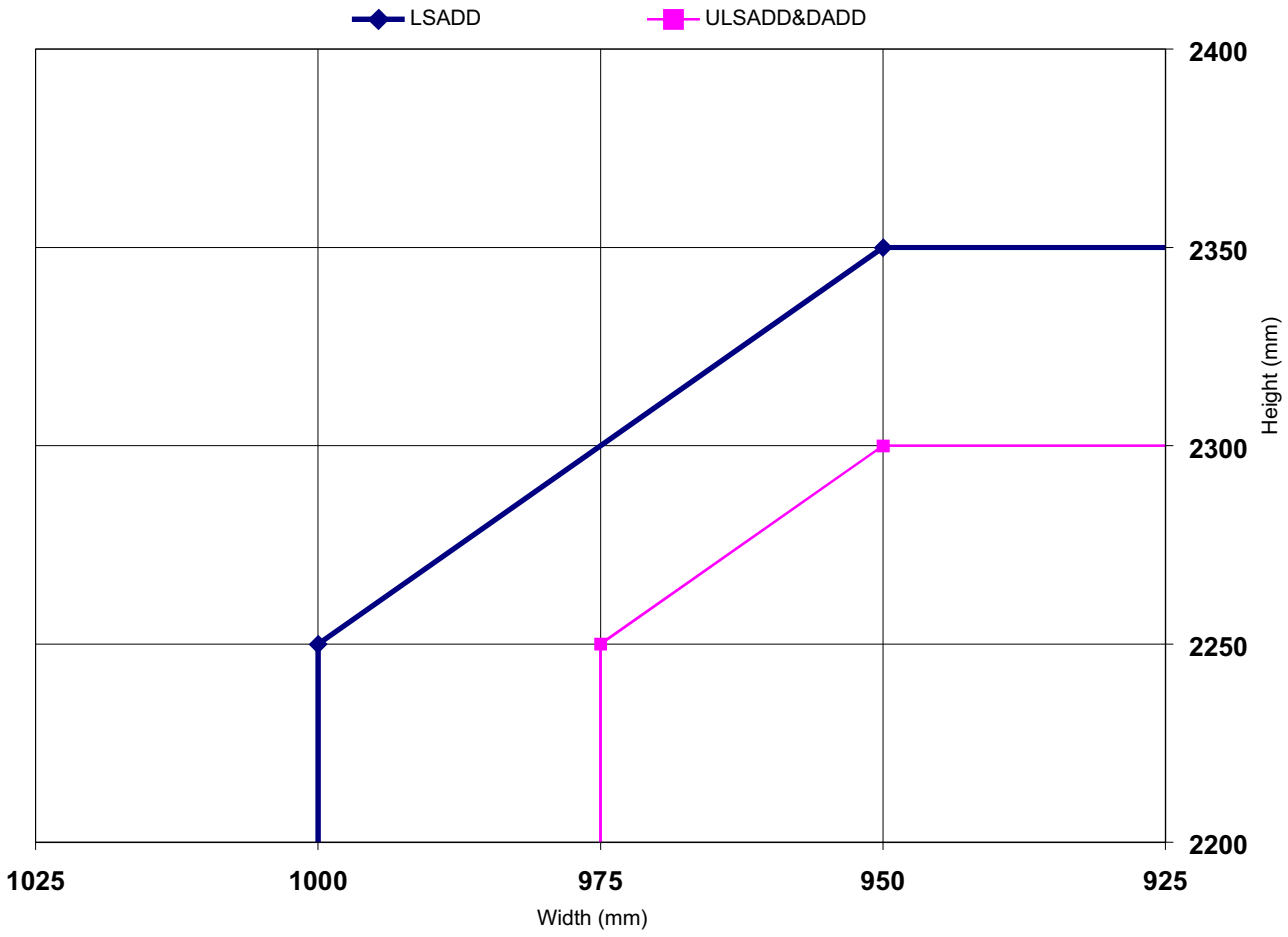
Meeting Edges:

Square: 1 No 15mm wide seal of any of the types above; exposed and fitted centrally in one leaf edge only.

Rebated: Not permitted.

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Hardwood Door Frame
Latched and Unlatched Single Acting & Double Acting Double Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2250	x	1100
		To:	2962	x	820
	ULSADD & DADD	From:	2250	x	1075
		To:	2912	x	820
Maximum Overpanel Height (mm)		Transomed	2000		
Door Frame (see section 8)		Hardwood – minimum 640kg/m^3	70 x 40mm thick		

Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick FO8600 Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal. For leaves over 2600mm high and/or 1050mm wide increase to 20mm wide seals

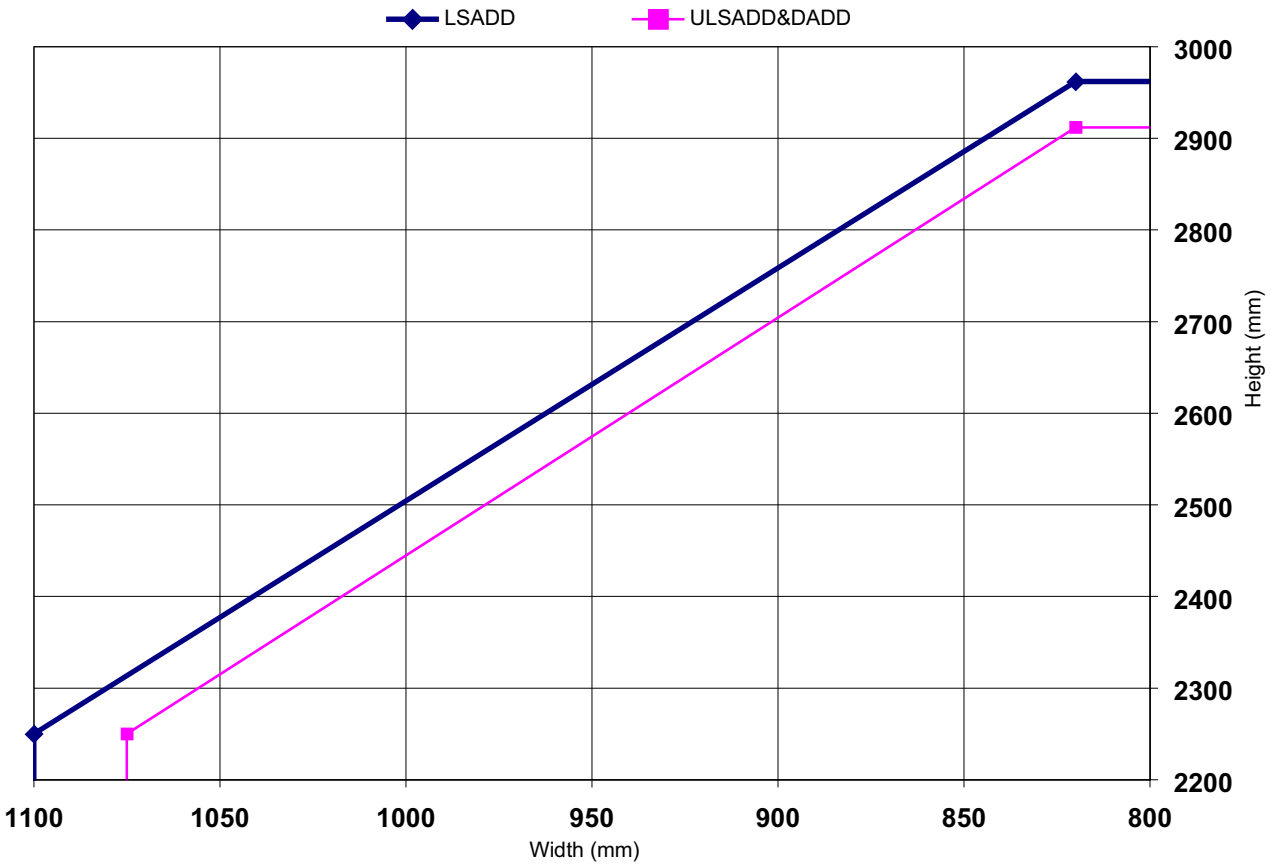
Meeting Edges:

1 No 15mm wide seal of any of the types above; exposed and fitted centrally in one leaf edge only.

Rebated: Not permitted.

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Any Assessed Frame Material

Latched and Unlatched Single Acting Double Doorsets + Flush Overpanel

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD+OP & ULSADD+OP	Maximum Leaf Size	2250	x	950
Maximum Overpanel height (mm)		Flush	1500		

Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal.

Bottom Edge of Flush Overpanel: 1No. 20mm wide Type 617 seal or 1No 25mm wide FO8700 Rigid Box Seal or 1No 25mm wide Odice S.A.S. seal; fitted centrally in the bottom edge.

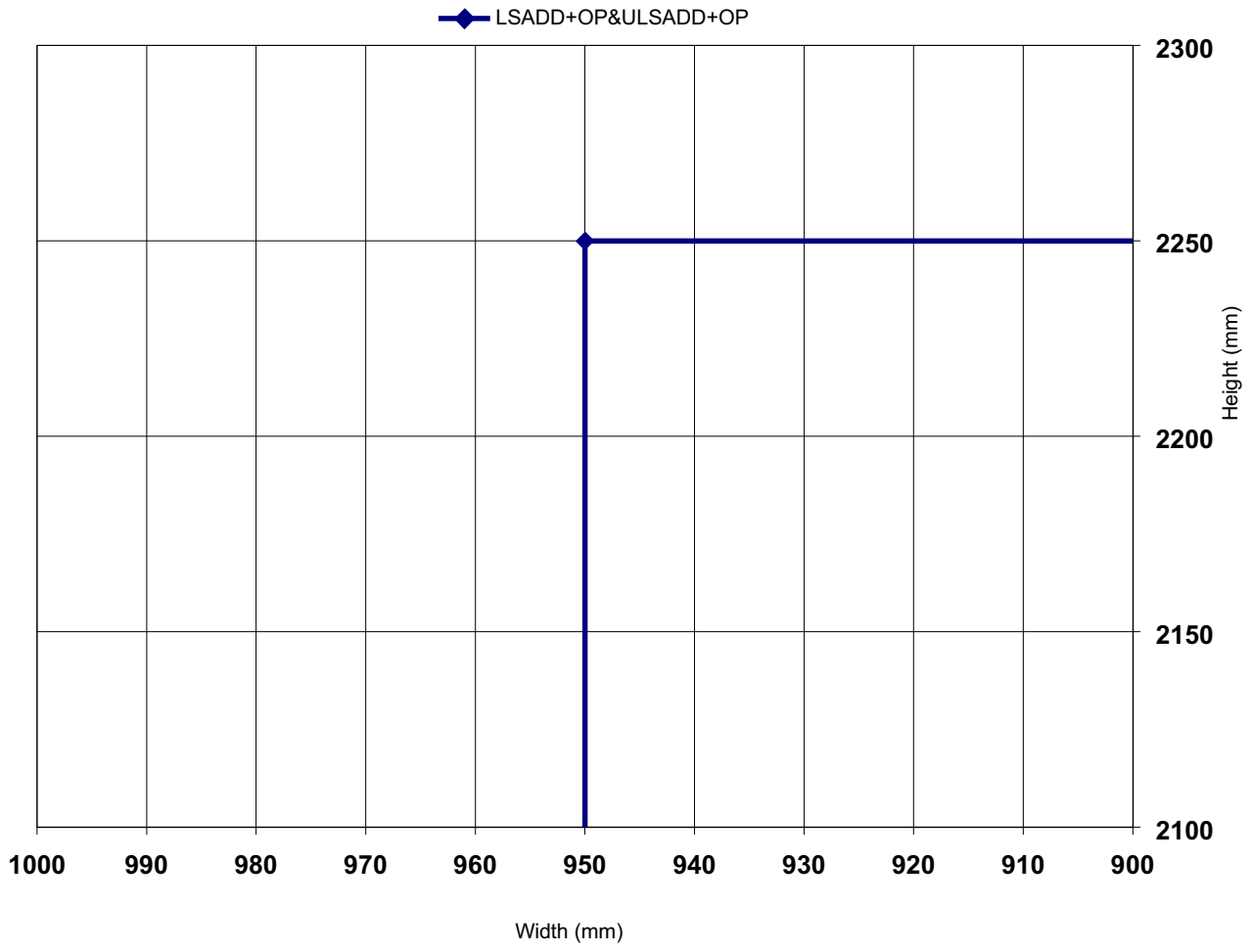
Meeting Edges:

1 No 15mm wide seal of any of the types above; exposed and fitted centrally in one leaf edge only.

Rebated: Not permitted.

Hardware Protection: see section 13

Maximum Door Leaf Size



Moralt AG Laminesse FireSound 44mm Fire Resisting Doorsets
Hardwood Door Frame

Latched and Unlatched Single Acting Double Doorsets + Flush Overpanel

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD+OP	From:	2250	x	1050
		To:	2862	x	820
	ULSADD+OP & DADD+OP	From:	2250	x	1025
		To:	2812	x	820
Maximum Overpanel height (mm)		Flush	1500		
Door Frame (see section 8)		Hardwood – minimum 640kg/m^3	Minimum: 70 x 40mm thick		

Intumescent Materials: Lorient Polyproducts Ltd – 4mm thick Type 617 or Pyroplex Ltd – 4mm thick Rigid Box Seal or Odice S.A.S – 1.8mm thick.

Head, Jambs & Overpanel: 1No. 15mm wide seal of any of the types above; fitted centrally in the leaf edge or frame reveal. For leaves over 2600mm high and/or 1050mm wide increase to 20mm wide seals

Bottom Edge of Flush Overpanel: 1No. 20mm wide Type 617 seal or 1No 25mm wide FO8700 Rigid Box Seal or 1No 25mm wide Odice S.A.S. seal; fitted centrally in the bottom edge.

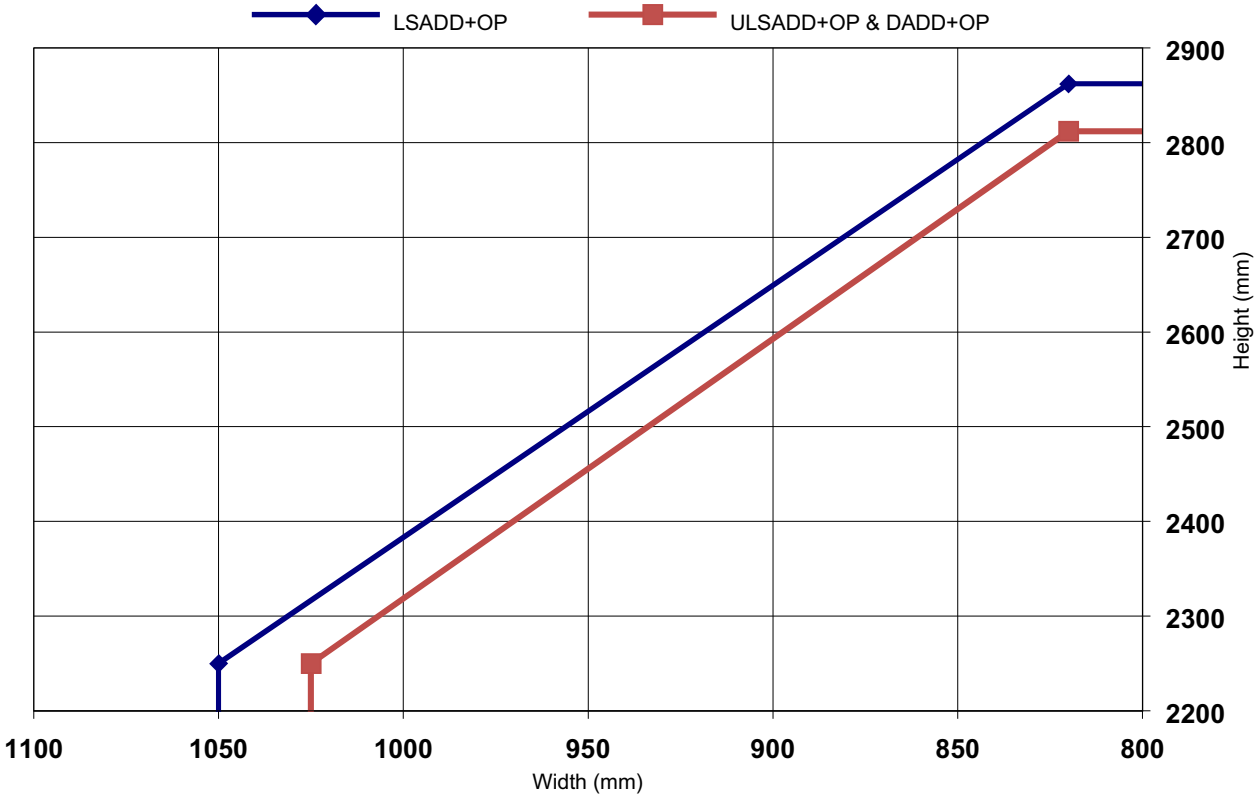
Meeting Edges:

1 No 15mm wide seal of any of the types above; exposed and fitted centrally in one leaf edge only.

Rebated: Not permitted.

Hardware Protection: see section 13

Maximum Door Leaf Size



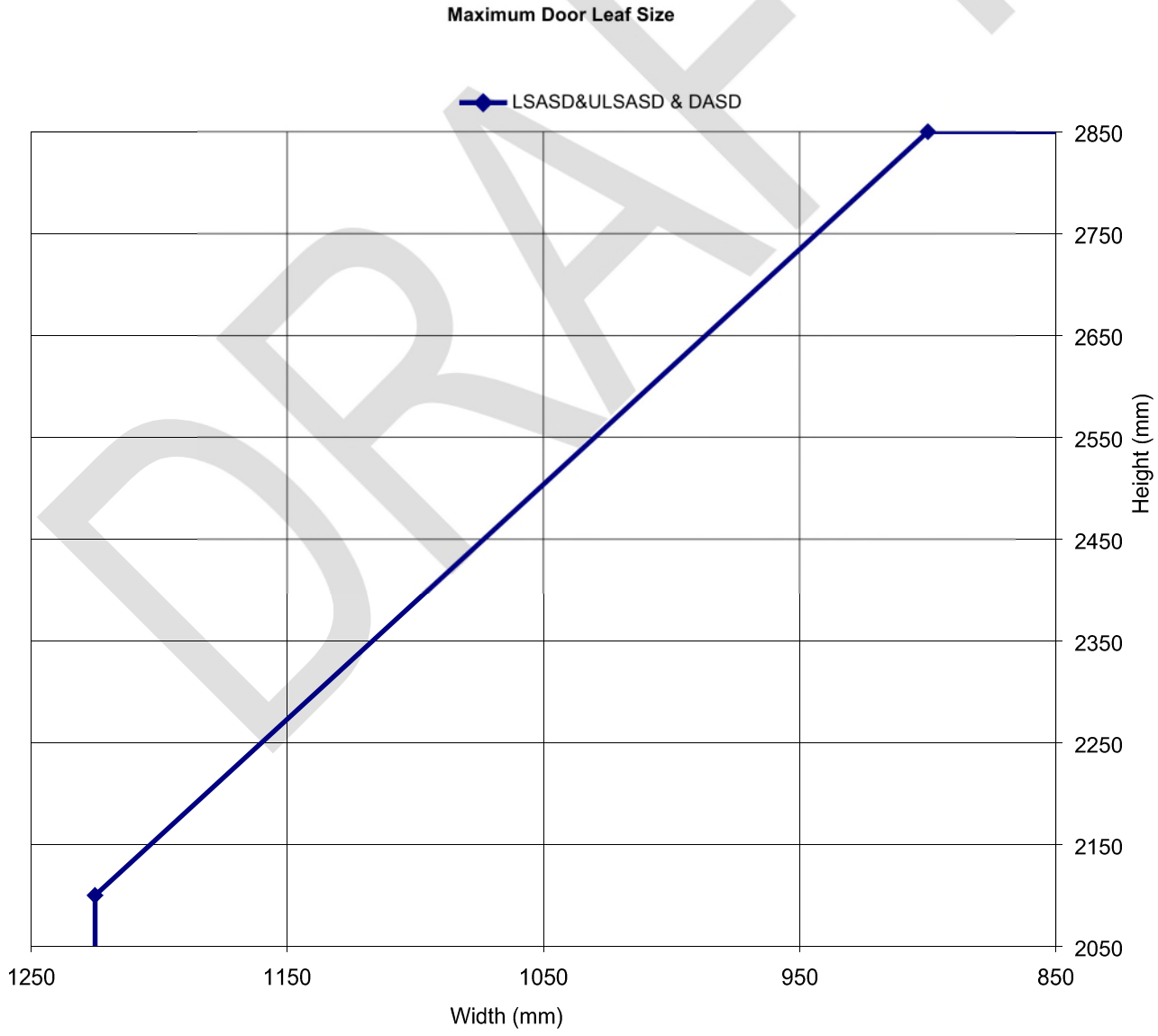
Moralt Laminesse FireSound 44mm Doorsets – 30 Minutes Fire Resistance CS Edge Protectors/Acrovyn Wrap

Latched & Unlatched, Single & Double Acting, Single Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD & ULSASD & DASD	From: To:	2100 2850	x x	1225 900
Max. Overpanel Height (mm)		Transomed	2000		

INTUMESCENT MATERIALS: Lorient Polyproducts Ltd - Type 617

HEAD:
Square: 1No. 15 x 4mm strips centrally fitted in the leaf head or frame reveal.
JAMBS & OVERPANEL: 1No. 15 x 4mm strips centrally fitted in the leaf edges or frame reveal.
HARDWARE PROTECTION: See section 13.



Moralt Laminesse FireSound 44mm Doorsets – 30 Minutes Fire Resistance CS Edge Protectors/Acrovyn Wrap

Latched & Unlatched, Single Acting, Double Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2100	x	1200
		To:	2800	x	900
Max. Overpanel Height (mm)		Transomed	1500		

INTUMESCENT MATERIALS: Lorient Polyproducts Ltd - Type 617

HEAD:
Square: 1No. 15 x 4mm strips centrally fitted in the leaf heads or frame reveal.
JAMBS & OVERPANEL: 1No. 15 x 4mm strips centrally fitted in the leaf edges or frame reveal.
Meeting Edges: Square: 1No. 15 x 4mm strip centrally fitted in the meeting edge of both leaves.
HARDWARE PROTECTION: See section 13.

Maximum Door Leaf Size