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Title

Field of Application for:

Moralt LAMINESSE FireSmoke 54mm Doorsets for 60 Minutes Fire Resistance

Report No.:

Chilt/A13059 Revision D

Issue Date:

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Valid Until:

12th October 2025

Job Reference:

WF 433075

Prepared for:

Moralt AG
Obere Tiefenbach Str. 1
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Germany

The version/revision stated on the front of this Field of Application supersedes all previous versions/revisions and must be used to manufacture doorsets from the stated validity date on this front cover. Previous revisions of the Field of Application cannot be used once an updated Field of Application has been issued under a new revision.

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1 Foreword

This Field of application report has been commissioned by Moralt AG and relates to 60 minute fire resisting doorsets.

The 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*.

This Field of Application (scope) uses established empirical methods of extrapolation and experience of fire testing similar doorsets, 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 476-22: 1987.

This Field of Application has been written using appropriate test evidence generated at UKAS accredited laboratories[1], 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.

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 Forum (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 published by the PFPF, the representative body for the passive fire protection industry in the UK.

CERTIFIRE and assessment supporting documentation has been used to enhance the scope of application within this evaluation. At the time of issue of this document, the relevant documentation has remaining validity. The referenced supporting documentation must retain validity, with the same conclusions maintained for the aspects considered herein, in order that the relevant scope generated within this field of application report remains valid. This may necessitate a review of more recent iterations of supporting documentation, against those referenced in this assessment report. If the scope of the relevant supporting documentation changes, then Warringtonfire must be consulted to review the changes, and to consider their effect on the outcomes of this assessment report.

[1] Test evidence from overseas laboratories has also been considered as supporting evidence for the designs in this assessment report. The test evidence is from a laboratory that has been accredited by a national accreditation body that is a signatory of the International Laboratories Accreditation Co-operation (ILAC).

2 Proposal

It is proposed to consider the fire resistance performance of the specified proprietary LAMINESSE FireSmoke 54mm doorset designs, for 60 minutes fire resistance integrity performance (and where appropriate insulation performance), if the doorset designs were to be tested to the requirements of BS 476-22: 1987, *Methods for determination of the fire resistance of non-loadbearing elements of construction.*

The field of application defined in this report is based on the fire resistance test evidence for the doorset design, 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 door designs that are the subject of this field of application. The summary details are considered to be the key aspects of the design tested.

Note:

1. Dimensions are in mm unless otherwise stated.
2. Abbreviations: (h) = height; (w) = width; (t) = thickness; (d) = deep: (l) = long.
3. Latches fitted but disengaged for the test, are reported as ‘unlatched’.

The primary test evidence has been generated on an unlatched double leaf doorset design with secondary data supporting specific design options related to hardware and glazing.

All of the test evidence used in the evaluation is over 5 years old. In accordance with industry guidance, the evidence has been reviewed to consider its suitability. Warringtonfire are satisfied that there have been no significant revisions to the relevant test standards which would render the evidence irrelevant.

The evidence has been generated to BS 476 Part 22: 1987 and EN 1634-1. The latter is known to be more onerous than the BS 476: Part 22: 1987 standard, primarily due to the use of plate thermocouples within the furnace to record the furnace temperature.

The same time temperature curve is used to control the temperature within the furnace for both test methods (the heating curve given within ISO 834-1). However, the plate thermocouple used to record the temperature within the furnace for the EN test method, requires a higher thermal inertia to read the same temperature as the probe thermocouple that is used for the BS 476: Part 22: 1987 test, particularly during the early stages of the test. Furthermore, the neutral pressure regime is positioned lower relative to the specimen height in a European fire door test, therefore resulting in greater relative positive pressure conditions than those expected in a BS 476-22: 1987 test, which has the potential to increase hot gases and flaming on the unexposed side. These factors result in more onerous test conditions for doorsets tested to the BS EN 1634-1 test standard compared with the BS 476: Part 22: 1987 test standard, which has been demonstrated by testing the same products to both standards.

It is therefore the opinion of Warringtonfire that the evidence citied in the following section, tested to both named standards referenced above can be utilised in this assessment which will conclude in terms of the fire resistance performance of the LAMINESSE FireSmoke doorset designs if tested in accordance with BS 476: Part 22: 1987.

3.1 Primary Test Evidence

3.1.1 Test Report XF 11016

This test was conducted on an unlatched, one and a half leaf, single acting doorset with glazing. Test is presented as primary data for the LAMINESSE FireSmoke 54mm, 60 minute fire resisting doorset design with head rail insert and with 6mm thick particleboard facings being considered in this field of application.

Test Date	17th November 2011
Identification of test body:	Chiltern International Fire, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Moralt AG
Tested Product:	Unlatched, single acting, double door (ULSADD)
Tested Orientation:	Leaves oriented to open towards fire test conditions
Sampling Information:	No information on sampling is available. The component parts of the doorsets were identified based on information provided by the client and verified and agreed by the laboratory insofar as reasonably practicable
Summary of test construction (mm)	**Specimen:** LAMINESSE FireSmoke 54mm blank with 10mm thick hardwood lippings on all edges, 6mm thick particleboard facings and head rail insert. **Leaf Size:** 2040 (h) x 926/425 (w) x 54(t) **Glazing:** 7 thick Pilkington Pyroshield 2 glass in an aperture 1210(h) x 410(w) was protected with the Intumescent Seals Ltd Therm-A-Glaze 60 and 'Liner S' liner behind hardwood beads 30(h) x 25(w). **Hardware:** 3No Royde & Tucker H102 butt type hinges and a Boss TS4.224 overhead closer were fitted, with a Newstar sashlock latch with a 235 high forend ref: SL1-SSS, 204 long disengaged flush bolts and a Sherringham aluminium handleset. **Door frame**: White Beech of nominal density 720kg/m^3 installed without architraves. **Leaf Edge Intumescent Seals:** Lorient Polyproducts Ltd Type 617 seals were fitted in the frame reveals and leaf meeting edges.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes) Tested opening into the furnace	Integrity: 68 Insulation: 68* *In accordance with the note to clause 7.6.1.1 of BS 476: Part 22: 1987, the glazing was not evaluated for insulation.

3.1.2 Test Report RF07055

Test is presented as secondary data to support double acting hardware and larger leaf sizes with a head rail insert and an enhanced intumescent seal arrangement at the head of the leaves. The test has been deemed acceptable to support these design options with the 6mm particleboard faced LAMINESSE FireSmoke design due to the similarities in the products and the enhanced intumescent specification tested:

Test Date	1st May 2007
Identification of test body:	BMTRADA, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Moralt AG
Tested Product:	Double acting, double door (DADD)
Tested Orientation:	Leaves opening in both directions with respect to fire test conditions
Sampling Information:	No information on sampling is available. The component parts of the doorsets were identified based on information provided by the client and verified and agreed by the laboratory insofar as reasonably practicable
Summary of test construction (mm)	**Specimen:** LAMINESSE FireSmoke 54mm blank with 9mm thick hardwood lippings on all edges except hanging edges which were 15 thick, 4mm thick particleboard facings and head rail insert. **Leaf Size:** 2600 (h) x 950/950 (w) x 54(t) **Glazing:** 6 thick wired Pilkington Pyroshield glass in an aperture 1200(h) x 200(w) was protected with Mann McGowan Pyroglaze and a Palusol liner behind hardwood beads 26(h) x 25(w). **Hardware:** Dorma Door Controls Top strap ref: 8066 and Dorma bottom strap ref: 7421 with Dorma floor springs ref: BTS80 fitted in the threshold, no latch was installed. **Door frame**: Sapele 40 thick (radiused at hanging jambs to 32) of nominal density 640kg/m^3.with Sapele architraves. **Leaf Edge Intumescent Seals:** Lorient Polyproducts Ltd Type 617 seals were fitted in the frame reveals and leaf meeting edges.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 61* Insulation: 61* *61 minutes was the time to the failure of the glazing, the failure at the perimeter of the leaf was 72minutes and it is this performance that has been used to calculate increased leaf sizes. In this instance, the fire resistance performance of the glazing can be separated from the perimeter performance of the doorset to provide increased leaf dimensions as a function of over-run beyond 60 minutes

3.1.3 Test Report FER/F14102

Test RF14102 was conducted on 2No. unlatched, double leaf, single acting doorsets, only specimen A is relevant to this report. Test is presented as supporting data for the LAMINESSE FireSmoke 54mm, 60 minute fire resisting doorset designs installed within James Latham timber based WoodEx 60 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:	James Latham, Unit 2, Swallow Park, Fenway Road, Hemel Hempstead, Hertfordshire, HP2 7QU
Tested Product:	Unlatched, single acting, double door (ULSADD – unequal pair)
Tested Orientation:	Leaves oriented to open towards fire test conditions
Sampling Information:	No information on sampling is available. The component parts of the doorsets were identified based on information provided by the client and verified and agreed by the laboratory insofar as reasonably practicable
Summary of test construction (mm)	**Specimen B:** Graduated Density chipboard 54 thick blank with 8mm thick hardwood lippings on all edges. **Leaf Size:** 2040 (h) x 826/303 (w) x 54 (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 Ash 30 thick of nominal density640kg/m3 with Sapele 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 BMT/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 failure of doorset A was attributable to the latch and has been deemed a result of inadequate intumescent protection. Had the doorset been tested with the approved intumescent specification it would have achieved a minimum of 60 minutes integrity, when tested to BS 476: Part 22: 1987. The failure is therefore completely remote from the door frame and was not influenced by the type of door frame material used. The test is therefore suitable as supporting data for the WoodEx 60 product with the LAMINESSE FireSmoke 54mm, 60 minute doorset designs.

3.1.4 Test Report FEP/F14256

Test is deemed acceptable for use as secondary data to support specific items of hardware and a drop seal with the LAMINESSE FireSmoke 54mm, 60 minute fire resisting doorset design with head rail insert and 6mm particleboard facings

Test Date	10th November 2014
Identification of test body:	BMTRADA, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Moralt AG
Tested Product:	Unlatched, single acting, single door (ULSASD)
Tested Orientation:	Leaf oriented to open towards fire test conditions
Sampling information:	No information on sampling is available. The component parts of the doorsets were identified based on information provided by the client and verified and agreed by the laboratory insofar as reasonably practicable
Summary of test construction (mm)	**Specimen A:** LAMINESSE FireSmoke 54mm blank with 8mm thick hardwood lippings on all edges, and 4mm deep grooves in 6mm thick MDF integral facings. **Leaf Size:** **Specimen B:** 2135 (h) x 926 (w) x 54(t) **Hardware:** 3No Eclipse bearing butt type hinges and a Rutland TS3204 overhead closer, Euro spec latch with a 235 high forend and steel Glutz handleset. **Door frame**: CND Beech 32 thick of nominal density 720kg/m^3.with MDF architraves. **Leaf Edge Intumescent Seals:** Pyroplex Ltd Triple Flipper Seals ref: 30141 were fitted in the frame reveals with a Norsound NOR710dB+ drop seal in the threshold of the leaf.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes) Tested opening in toward the furnace	Specimen A
	Integrity: 64 Insulation: 64

3.1.5 Test Report WF 382394

Test WF382394 was conducted on 2No. unlatched, single leaf doorsets, only specimen B is relevant to this report. The test has been deemed acceptable for use as secondary data to support specific items of hardware with the LAMINESSE FireSmoke 54mm, 60 minute fire resisting doorset design with head rail insert and 6mm particleboard facings:

Test Date	8th July 2014
Identification of test body:	Exova Warringtonfire, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Details of the test sponsor are held on file, in confidence, at Warringtonfire
Tested Product:	Unlatched, single acting, single Leaf
Tested Orientation:	Leaf oriented to open towards test conditions
Sampling Information:	No information on sampling is available. The component parts of the doorsets were identified based on information provided by the client and verified and agreed by the laboratory insofar as reasonably practicable
Summary of test construction (mm)	**Specimen B:** LAMINESSE FireSmoke 54 thick blank with 8mm thick hardwood lippings on all edges and with 6mm thick MDF facings. **Leaf Size:** 2250 (h) x 1000 (w) x 54 (t). **Hardware:** 3No Simonswerk Tectus concealed hinges ref: TE5273.SSE FD60 and a Dorma ITS96 concealed closer with ITS slide arm and channel guide, with a Glutz multipoint latch with a 1788 high forend and aluminium handleset and security Euro cylinder. **Door frame**: Hardwood 38 thick of nominal density 650kg/m^3.with MDF architraves. **Leaf Edge Intumescent Seals:** Pyroplex Ltd Rigid Box Seals ref: 6700 and 30141 were fitted in the frame jambs.
Test Standard:	BS 476 Part 22: 1987
Test Results (minutes)	Integrity: 69; Insulation: 69 Tested opening in toward the furnace

3.1.6 Assessment Report Chilt/A11129 Revision E

The referenced document, the essential details of which are summarised below, is to be used to support the fire resistance performance of the LAMINESSE FireSmoke, for 60 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	

3.1.7 Test Report P1009/14-530-1

The referenced test, the essential details of which are summarised below, has been deemed acceptable to support the use of the Norseal NOR710 drop seal in the 60 minute fire resisting timber doorset design being considered in this assessment.

Date of test	16th October 2014
Identification of test body:	Slovenian National Building and Civil Engineering Institute, Ljubljana
Sponsor:	Details of the test sponsor are held on file, in confidence, at Warringtonfire
Tested Product:	Latched, single acting, double leaf specimen comprised of Moralt FireSound 59 core leaf with the vertical edges lipped with 15mm thick Mahogany of nominal density 640kg/m^3 The leaves measured 2135mm (h) x 915/490mm (w) x 58mm (t) and were hung in a Mahogany hardwood frame.
Tested Orientation:	Leaves oriented to open towards test conditions
Sampling Information:	No information on sampling is available. The component parts of the doorsets were identified based on information provided by the client and verified and agreed by the laboratory insofar as reasonably practicable
Summary of test specimen:	The tested specimen included 3No. H101 bearing butt steel hinges, an overhead face fixed closer, a mortice lock with a 110mm high forend, a Norsound NOR710 drop seal in the centre of the leaf threshold and an edge mounted flush bolt in the edge of the secondary leaf. 2No. 15 x 1.8mm ODICE Flexilodice graphite perimeter intumescent seals were fitted in the frame reveal of the head and jambs and in one leaf meeting edge. The hinge blades and latch body were protected with 1mm thick Interdens intumescent gaskets. The doorset was oriented to open in towards the furnace for the test.
Test Standard	EN 1634-1: 2014 and EN 1363-1: 2012
Test Results (minutes)**:**	**Integrity:** Cotton Pad: 82 Continuous Flaming: 82 Gap Gauges: 83
	Insulation: I_1: 78 I_2: 83

4 Technical Specification

4.1 General

The technical specification for the LAMINESSE FireSmoke 54mm doorset design is given in the following sections and is based on the primary test evidence for the door design, summarised in section 3.1.1.

4.2 Intended Use

The intended use of the proposed LAMINESSE FireSmoke 54mm doorset design 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.

5 General Description of Construction

5.1 Leaf Construction

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

The door leaf option detailed below is approved by this assessment.

- LAMINESSE FireSmoke 54mm – 6mm Particleboard facings

The LAMINESSE FireSmoke 54mm design with 6mm particleboard facing has been tested with a head rail insert, which is required for all design options contained in this assessment.

The requirements for the head rail insert are given below.

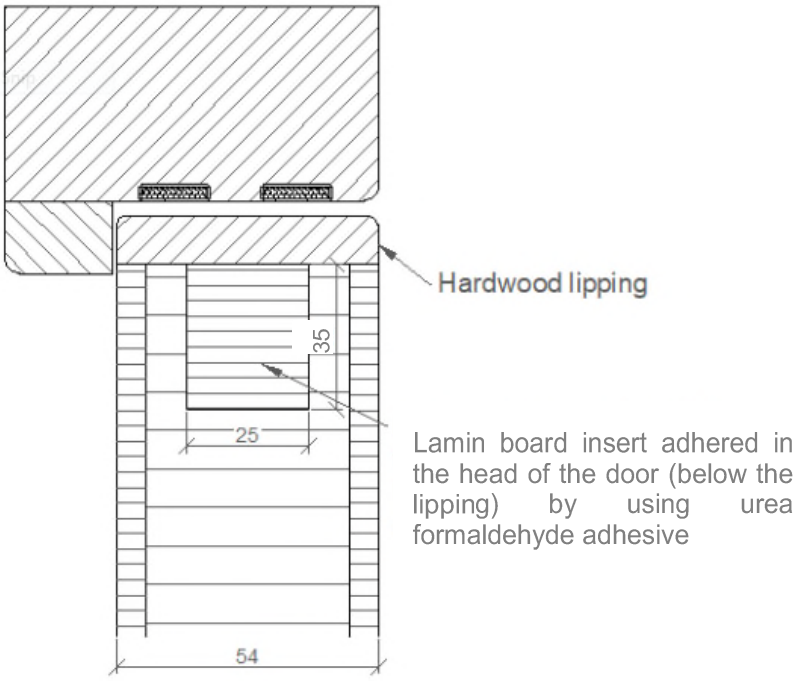


Fig 1 – Cross section through head of door leaf showing position of lamin board head rail insert

The insert is

- Constructed using the lamin board in the core of the door leaf
- located centrally in the leaf
- fitted tightly into the groove
- fitted with the lamels perpendicular to the lamels of the door blank

See below for illustration and required dimensions.

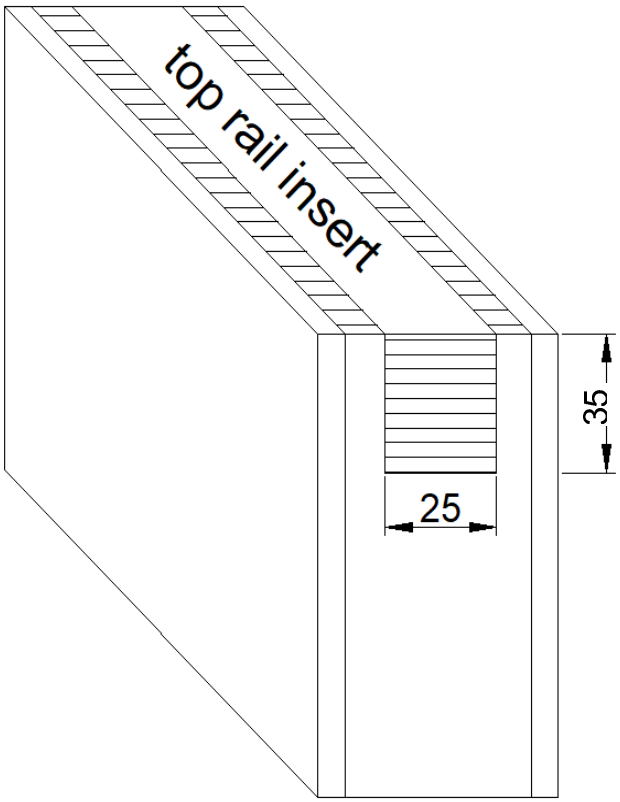


Fig 2 – Isometric cross section of the head of the leaf with head rail insert in position (required lipping not shown)

The head rail insert must remain in position at the top of the door leaf. The head rail insert has been increased by 5mm in height from that originally tested (increased from 30mm to 35mm (h), to allow for the head of the leaf to be reduced by a maximum of 5mm prior to fitting the lipping.

A maximum of 5mm reduction is permitted at the head, as this will result in a head rail of dimensions no smaller than that orginally tested.

Leaf size adjustment is not restricted at the vertical edges and from the bottom of the door leaf prior to fitting the lippings as required (see section 12).

6 Leaf Sizes

The approval for increased leaf dimensions is based on the tests listed in section 3 and takes into account the margin of over performance above 60 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.

7 Configuration and Orientation

7.1 Configuration

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
LSADD & ULSADD	Latched & unlatched single acting single doorset
DADD	Double acting double doorset

7.2 Orientation

The primary fire resistance test for this design was conducted with the doorset hung such that the door leaves opened towards the fire, which is considered the most onerous orientation in terms of fire resistance performance for timber based doorsets. Based on this testing, assessment is made that doorsets to this design may be hung to open either away from or towards the fire risk side of the doorset. The rationale behind the direction of fire testing timber based doorsets opening towards the fire test conditions is further explained in Annex C of BS EN 1634-1:2014 +A1:2018.

8 Leaf Size Adjustment

LAMINESSE FireSmoke 54mm door leaves may be altered as follows.

Element	Reduction
Leaf	For the purpose of manufacturing doorsets containing smaller door leaves, the door leaf may be reduced in height or width without restriction from the vertical edges and the bottom of the door leaf. The head rail insert must remain in position but can be reduced by a maximum of 5mm (see section 5.1 for details)
Lipping	The dimensions stated in section 12 may be reduced by 20% for fitting purposes. Lipping must be fitted to all edges of the door leaf

9 Overpanels

9.1 Transomed Overpanels

The following specification for doorsets with overpanels has been deemed acceptable as the door leaf section that is used to form the overpanel is retained on all four sides with mechanical fixings, and additonally protected with perimeter intumescent strips. The mechanical fixings will remain in position for the majority of the duration of the test, given the central location and protection offered by the charring timber, and the strips will help to fill any gaps around the perimeter of the panel, in additon to holding the panel in place for the required period of fire resistance. It is therefore reasonable to expect the overpanel to provide at least the same level of fire reistance as the tested doorset design with swinging leaves, providing the specification outlined below is followed.

Overpanels of the same construction as the door leaves may be used, only when separated from the leaf head by a transom. The overpanel must be fully contained within the door frame (see following diagram).

The timber frame must meet or exceed class J30 as specified in BS EN 942: 2007, providing any defects are adequately repaired and with a minimum density of 640 kg/m^3; whilst the frame section for the transom must be a minimum of 70mm x 44mm. Timber door frame and transom construction method must comply with the specification contained in section 11.

The use of Beech (Fagus Sylvatica), is not permitted for 60 minute applications.

The transom must be to the same specification as the door frame (see section 11).

The transom to door frame joint must utilise one of the following two methods: mortise and tenon joints; butt joints (see section 11.4).

All methods require frame 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 screwing through the rear of the frame with steel screws 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.

The intumescent seals specified for the jambs in appendix C, may be fitted in the overpanel edges or frame reveal, if required for the manufacturing process.

Maximum overpanel heights are as follows.

Configuration	**Max Overpanel height** (mm)
Single doorsets	2000
Double doorsets	1500

The following figures provide further information on the required over panel installation. The drawing is representative of doorset and over panel construction and must be read in conjunction with the full requirements of this assessment report.

Fig 3 – Front elevation and cross section of a single leaf door with over panel

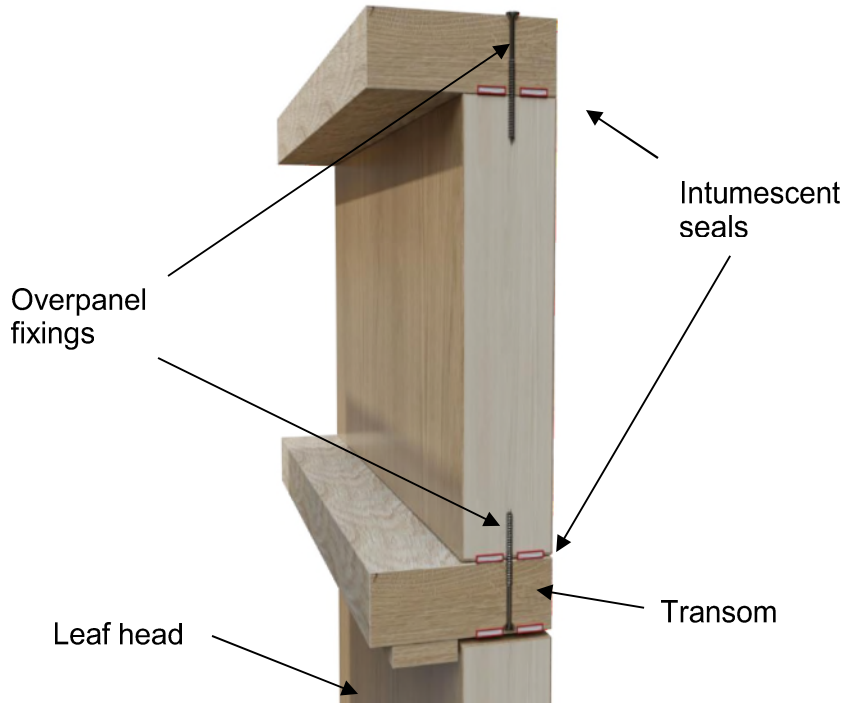


Fig 4 – 3 dimensional drawing of a cross section through transomed overpanel

9.2 Glazed Fanlights

The following specification for doorsets with fanlights has been deemed acceptable providing the minimum specification outlined below is followed (i.e. minimum density, section size of hardwood framing and construction method) and evidence is sourced to support the glass type and glazing to be used for the fanlight. This assessment does not support fanlights without additional suitable supporting evidence as outlined below.

Timber frame doorsets including a transom may include a glazed fanlight. The timber framing must meet or exceed class J30 as specified in BS EN 942: 2007, providing any defects are adequately repaired, whilst glazing beads must be straight grained joinery quality hardwood, free from knots, splits or checks.

All timber must be a minimum density of 640 kg/m^3; the frame section for the transom must be a minimum of 70mm x 44mm. Timber door frame and transom construction method must comply with the specification contained in section 11 and as section 9.1 for transom joints

The use of Beech (Fagus Sylvatica), is not permitted for 60 minute applications.

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 fanlight as part of a doorset in accordance with BS 476: Part 22: 1987 or BS EN 1634-1, at the pane dimensions to be installed. The glass must be installed in accordance with the relevant supporting test evidence with all other details as stated in section 9.2 of this assessment.

Configuration	**Height** (mm)	**Width** (mm)
Single & Double leaf doorsets	≤600	Overall door width

Fig 5 – Front elevation and cross section of a single leaf doorset with fanlight

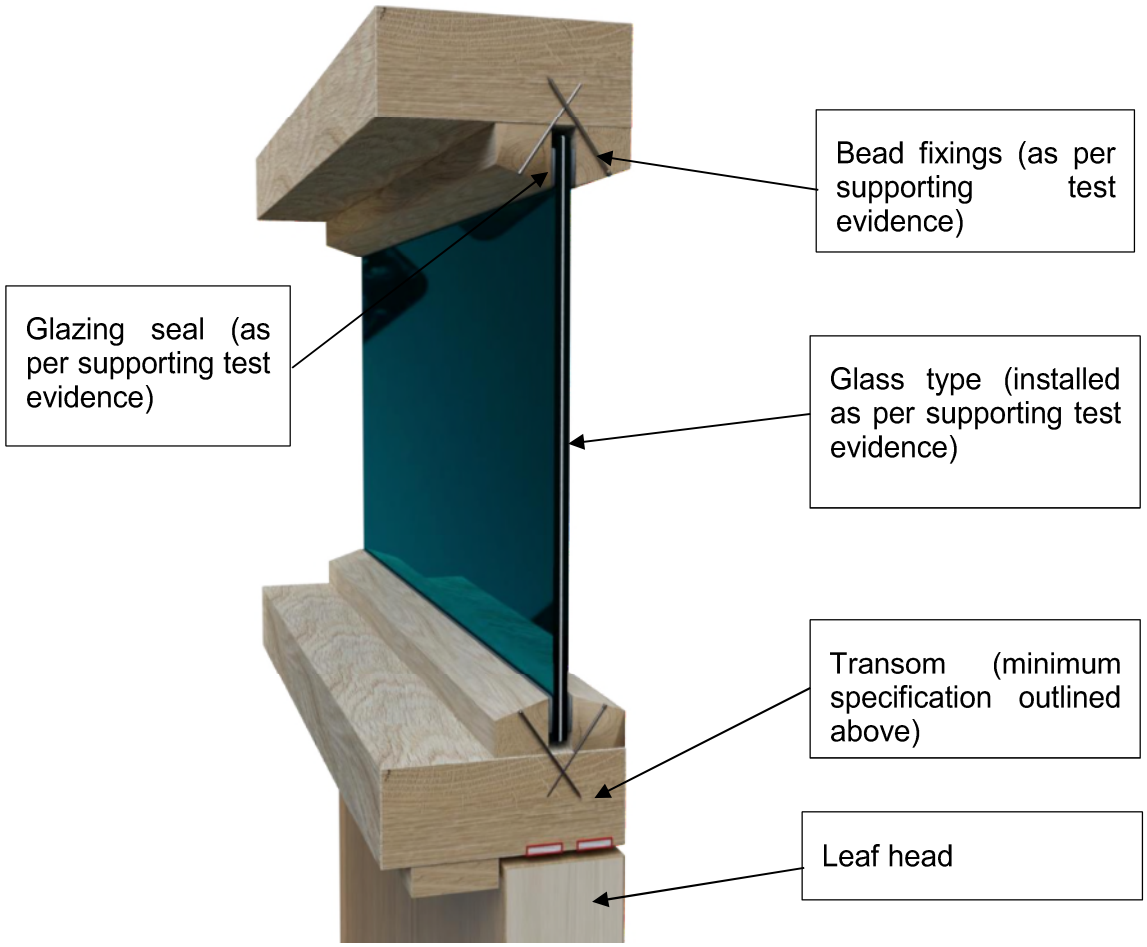


Fig 6 – 3 dimensional drawing of a cross section through a fanlight

10 Glazing

10.1 General

The testing conducted LAMINESSE FireSmoke 54mm 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 total area of glazing is 0.56m^2

10.2 Assessed Glazing Systems

The glazing system must be one of the following proprietary tested systems, which have supporting test evidence and/or certification in timber doorsets, and have been deemed as suitable options to the glazing system tested with the LAMINESSE FireSmoke design with 6mm particleboard facings (Therm-A-Glaze 60).

Glazing System	Manufacturer	Maximum Area (m^2)
1. Fireglaze 60	Sealmaster Ltd	0.56
2. Therm-A-Glaze 60	Intumescent Seals Ltd	0.56
3. System 36/15	Lorient Polyproducts Ltd	0.56
4. System 90+	Lorient Polyproducts Ltd	0.56
5. System 63 (circular apertures only)	Lorient Polyproducts Ltd	0.56
6. Pyroglaze 60	Mann McGowan Ltd	0.56

Note: Pyroglaze 60 must be used with 60mm long steel screw fixings for the beads.

10.3 Assessed Glass Products

Assessed glass types are as follows. The inclusion of the following glass types is based on the Pyroshield glass tested in the primary evidence for the door design with all other glass types known to have at least the same fire resistance integrity performance and better insulation perfromance:

Glass Type	Manufacturer	Thickness (mm)	Max Area (m^2)
1. Pyroshield	Pilkington UK Ltd	6 & 7	0.56
2. Pyroshield 2	Pilkington UK Ltd	6 & 7	0.56
3. Pyran S	Schott Glass Ltd	6	0.56
4. Pyrostem	Pyroguard UK Ltd	6	0.56
5. Pyrodur 60-10	Pilkington UK Ltd	10	0.56
6. Pyroguard EW 60	Pyroguard UK Ltd	11	0.56
7. Pyranova 15-S2	Schott UK Ltd	11	0.56
8. Pyrobelite 12	AGC Glass UK Ltd	12	0.56
9. Pyrodur 60-20	Pilkington UK Ltd	13	0.56
10. Contraflam EW60	Vetrotech Saint Gobain	14	0.56
11. Pyranova 15-S3.0	Schott UK Ltd	15	0.56
12. Pyroguard EI 30	Pyroguard UK Ltd	15	0.56
13. Pyrostop 30-10	Pilkington UK Ltd	15	0.56
14. Pyrobel 16	AGC Glass UK Ltd	16	0.56

Notes:

1. All glass types must be fitted strictly in accordance with the manufacturers' tested details/installation requirements, particularly with reference to suitable tolerances for expansion of the glass pane
2. Glass types 5 and 8-14 are fully insulating for 30 minutes in terms of the criteria set out in BS 476: Part 20: 1987

10.4 Glazing Beads & Installation

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

Bead Profile	Min Density (kg/m^3)	Application
Splayed	640	All proprietary systems detailed in 10.2 and appendix A
Square	640	Proprietary system 1 and 2 as specified in 10.2 and glass types 8 - 14 as specified in 10.3

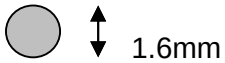
Notes:

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 60mm long steel pins or 60mm 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

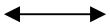


Oval/rectangular pin minimum diameter linear dimension = 1.6mm

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

1.4mm = Rectangular pin minimum linear dimension



1.6mm

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

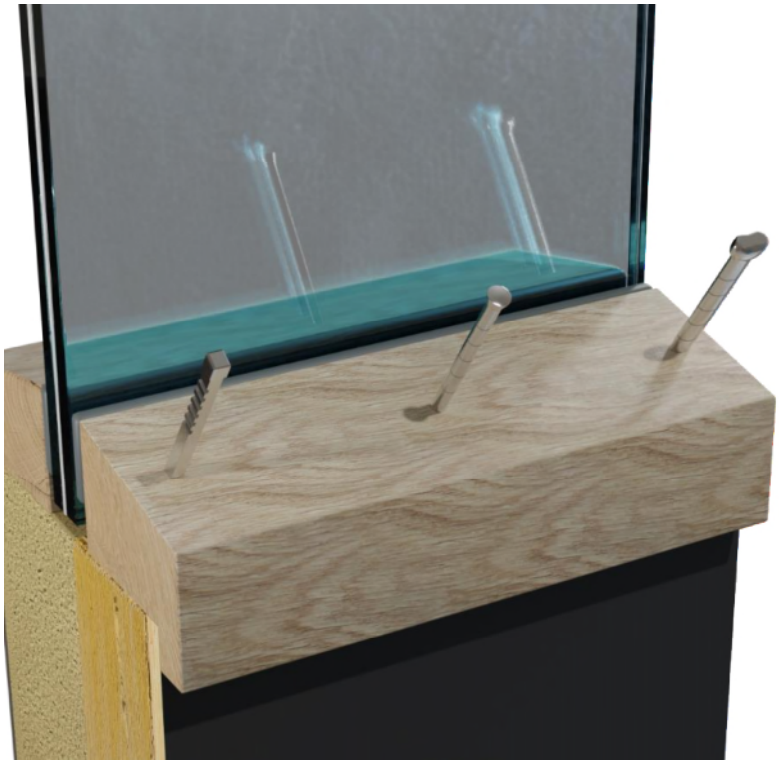


Fig 7 – 3-D cross section depicting round, oval and rectangular pins

4. Glazed openings must not be less than 100mm from any door edge. Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 80mm of LAMINESSE FireSmoke 54mm core between apertures
5. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
6. Timber for glazing beads must be straight grained joinery quality hardwood, free from knots, splits or checks with a minimum density of 640 kg/m^3. Beech, (Fagus Sylvatica), is not permitted for 60 minute applications.
7. Gaps between glass and framing, to permit expansion, should be set at 2 - 3mm on all edges, and using non-combustible or hardwood setting blocks at the bottom edge
8. **Pyroshield 2**; the following table details the maximum pane sizes and approved glazing systems permitted for Pyroshield 2 in the LAMINESSE FireSmoke 54mm doorset design.

Glass Type	**Glazing System** (section 10.2)	**Maximum Pane Dimensions*** (height & width – mm)	**Maximum Area (m²)**
Pyroshield 2	2	1300 & 550	0.56
	4	1300 & 310	0.4

*The heights and widths listed are the maximum single dimension allowable for an individual pane utilising the relevant glazing system; maximum area listed takes precedence over pane dimensions; maximum dimensions may not be increased even if the other dimension for the pane is reduced.

9. False glazing beads must not be fitted to the face of Pyroshield or Pyroshield 2 glasses.

11 Door Frames

11.1 Door frame construction

Timber based door frames for LAMINESSE FireSmoke 54mm must be constructed to meet the following specification.

Material	**Minimum Section Size** (mm)	**Min Density** (kg/m^3)
Hardwood	70 x 32	640
WoodEx 60	70 x 32	640

Notes:

1. If the doorset features a transomed overpanel, the transom must be hardwood with a minimum density of 640kg/m^3 and with a minimum section of 70mm x 44mm. WoodEx 60 is not permitted for use as an overpanel transom
2. If the door is to be hung on Simonswerk concealed hinges, the frame must be a minimum of 38mm (t)
3. All door frame timber must meet or exceed class J30 as specified in BS EN 942: 2007, providing any defects are adequately repaired with a minimum density of 640kg/m^3. The use of Beech (*Fagus Sylvatica*), is not permitted for 60 minute applications
4. A 12mm (15mm for WoodEx 60) deep planted or integral stop is adequate for single acting frames whilst double acting frames may be scalloped or square (see diagram below)
5. Frame joints may be mortice and tenoned, mitred, half lapped or butted and glued; and with no gaps. All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws.

11.1.1 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 11.1 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. Up to 2.5mm thick Acrovyn which must be bonded to the frame using 3M Scotch-grip cement 10 contact adhesive or Jowat 609.38 PUR 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 2.5mm, as per test evidence.

11.2 Double rebated frame option

The Moralt acoustic clad on panel can be fitted with a double rebated frame as shown below. The minimum timber details for the standard frame dimensions A, B and C in section 11.3 must be complied with.

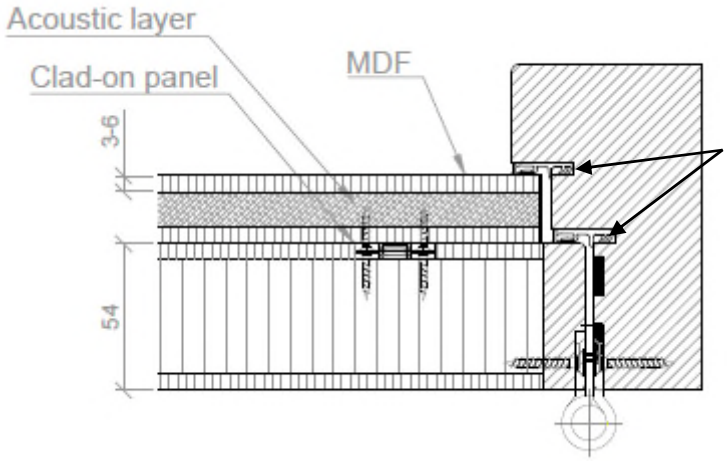


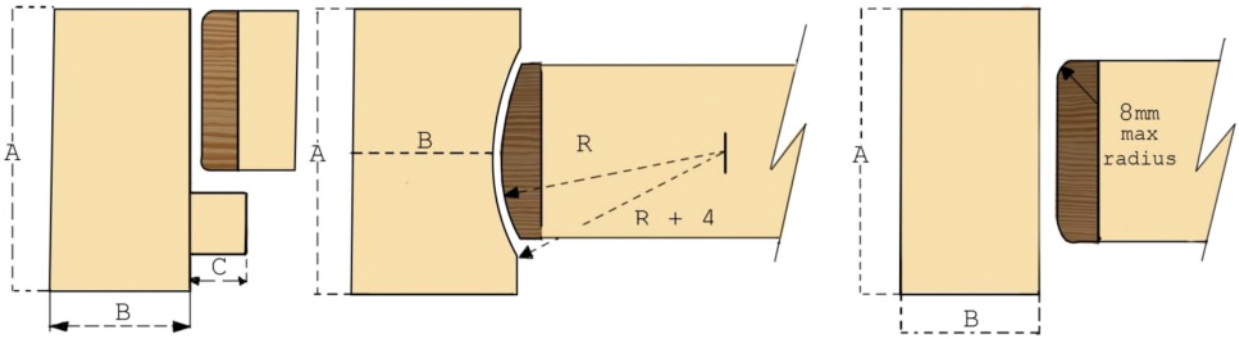
Fig 8: Schematic of Moralt acoustic clad on panel

11.3 Frame Section details

The following diagram depicts the assessed frame profiles and dimensions:

A = min 70mm B = 32 mm C = min 12mm

R = radius from floor spring 8mm max radius to create a maximum 2mm edge profiling



Standard – edge of single acting door

Scalloped – hanging edge of double acting door[1]

Square – closing edge of single leaf double acting door[2]

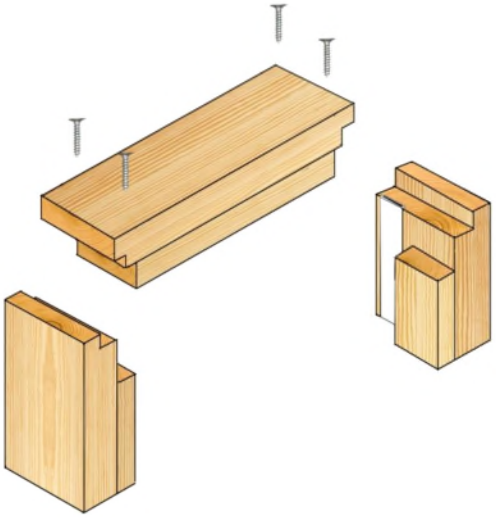
Notes:

1 – Diagram also shows permitted hanging edge radius for doors on floor springs

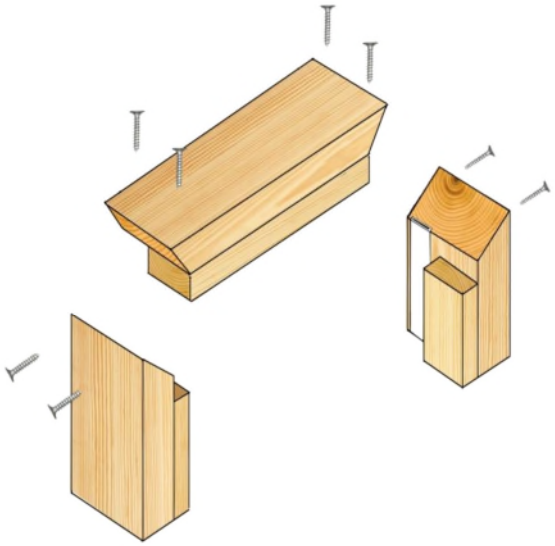
2 – Diagram also shows permitted radius for 2mm edge profiling of lippings

Fig 9: Profiles of door frames and leaf edges

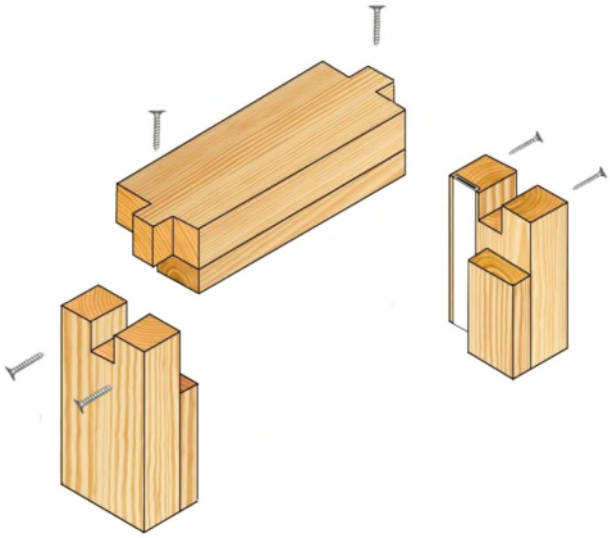
11.4 Door Frame Joints



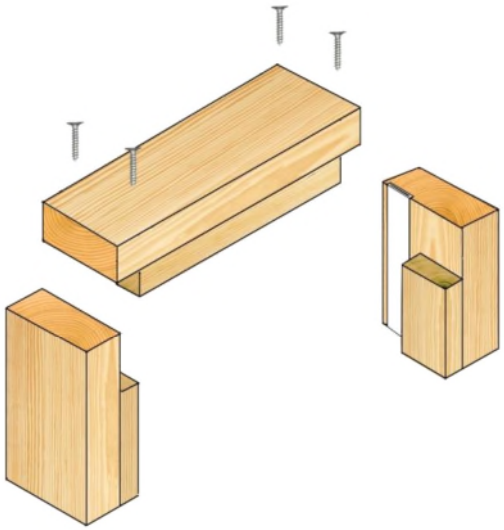
Half Lapped Joint



Mitre Joint



Mortice and Tenon Joint



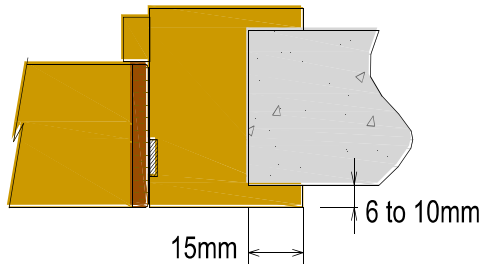
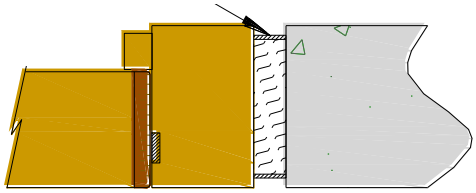
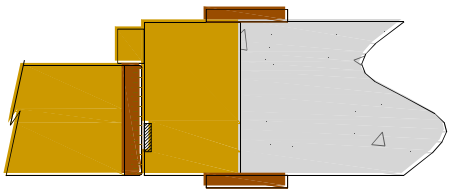
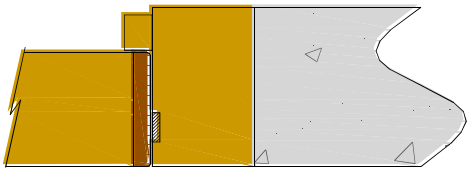
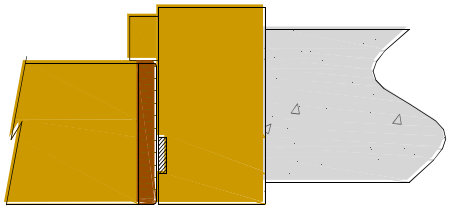
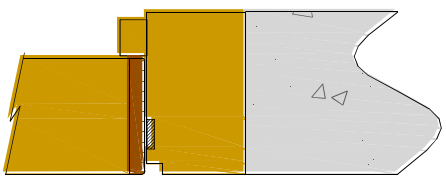
Butt Joint

Note: Drawing is representative of each type of door frame joint, actual construction in terms of intumescent seal location and material etc. must be as the text within this document specifies.

Fig 10: Drawings of approved frame joints

11.5 Door frame installation

The following diagrams indicate acceptable and unacceptable door frame installations:

Permitted Installations	
 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.	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.
 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.	 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.
Installations Not Permitted	
 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.	 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.

Notes:

1. The drawings are representative of door frame installation only; actual installation must be as the text within this document specifies. See section 18 for specification on sealing to structural opening
2. For the shadow detail depicted (top right), the sub-frame material must be the same material as is approved for the door frame; or a non-combustible board tightly fitted between frame and supporting construction with no gaps.

12 Lipping Material

12.1 Timber Lippings

LAMINESSE FireSmoke 54mm must be lipped on all edges in accordance with the following specification.

Material	**Size** (mm)	**Min Density** (kg/m^3)
Hardwood	1. Flat = 8 – 18 thick with a maximum of 2mm profiling permitted at corners of lipping (see section 11) 2. Rounded = 15 – 20 thick with a radius matching the distance between leaf edge and floor pivot (see section 11) 3. Rebated = Not permitted	640

Notes:

1. Overpanels must be lipped on all edges
2. Timber for lippings must be straight grained joinery quality hardwood, free from knots, splits or checks, with a minimum density of 640 kg/m^3. Beech, *Fagus Sylvatica,* is not permitted for 60 minute applications.
3. Lippings must not conceal intumescent materials.
4. 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

13 Leaf Construction and Facing Materials

13.1 General

The overall 54mm thick leaf construction must comprise the following leaf facing material:

1. FireSmoke - 6mm Chipboard facings

13.2 Grooves

Both faces of LAMINESSE FireSmoke 54mm door leaves may be grooved to the following specification. Grooves may coincide with the top and bottom of glazed apertures if desired.

Element	Details	
Max groove size (mm)	6 wide x 4 deep	
Proximity to door edges (mm)	Horizontal Grooves	≥ 250 from top and bottom
	Vertical Grooves	≥ 150 from sides
Groove spacing (mm)	Horizontal Grooves	≥ 100
	Vertical Grooves	≥ 100
Orientation	Vertical or horizontal	
Configuration	Latched and unlatched, single and double acting, single leaf doorsets	
Leaf size range (mm)	2206mm x 956mm	
Intumescent seal dimensions (mm)	See Appendix C	

A maximum of 6 No. vertical and 6 No. horizontal grooves are permitted perpendicular to one another providing all other details meet the specification given in the table above.

13.3 Decorative and 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
Cellulosic papers / non-metallic foils	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates
2. The door leaf thickness may be reduced by a total maximum of 0.5mm for calibration purposes in order to accommodate the chosen finish
3. Materials must not conceal intumescent strips
4. PVC and plastic laminates must not return around the leaf edges without specific test evidence.

13.4 PVC Edge Protectors & Post-Formed CS Group Acrovyn

13.4.1 CS Group Edge Protectors

The LAMINESSE FireSmoke 54mm 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 C. CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

13.4.2 Post-Formed CS Group Acrovyn

It is possible to encapsulate the LAMINESSE FireSmoke 54mm 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 door must be lipped at the vertical edges with the hardwood and approved adhesive specified for the chosen doorset or with 8mm thick PVC lippings bonded to the door using Jowat 609.38 PUR adhesive. PVC lippings must be bonded directly to the door core (not onto a separate lipping)
3. The horizontal edge detail prior to post-forming must be lipped with hardwood as detailed in this assessment (see sections 12.1 & 12.2). 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. The 2.5mm thick Acrovyn pre-formed or post formed sheet must be bonded to the leaf and vertical lippings (whether hardwood or PVC) using 3M Scotch-grip cement 10 contact adhesive or Jowat 609.38 PUR adhesive, as tested
7. See relevant (CS Group headed) datasheets in Appendix C of this assessment for maximum permitted leaf sizes
8. 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
9. It is permitted to hang leaves fitted with CS Group Acrovyn in timber or MDF door frames meeting the specification given in section 11.1 (not encapsulated with CS Group Acrovyn) or section 11.1.1 (encapsulated with CS Group Acrovyn).

13.4.3 Moralt acoustic clad on panel

The Moralt acoustic clad on panel has been included into the LAMINESSE FireSmoke 54mm thick designs to improve acoustic performance. See below for the details of the panel and fixing. The panel is held in position by a minimum of 6 clips (note only 4 shown on the figure. The following limitations apply:-

- This board can only be attached to unglazed doors.
- The panel must be a single piece covering the entire face of the door leaf.
- Any item of hardware which is required to be morticed into the edge of the door must be morticed into the timber door core and not into the clad on panel.
- The location of the seals must remain on the doorleaf.
- The panel must be located on a minimum of 6 fixing points
- Clips secured by screws 3.5 by 16mm long or 3.5 by 20mm long
- It is not permitted to apply the Moralt acoustic clad on panel in addition to encapsulating the leaf as in section 13.4.2 above, or to apply the panel and then encapsulate the complete assembly.

These door designs have been found to be fully insulating which means the unexposed face temperature has not risen more than 140 deg C. The panel is primarily a Rockwool core with MDF facings, which would not in the opinion of Warringtonfire adversely affect the performance of the door.

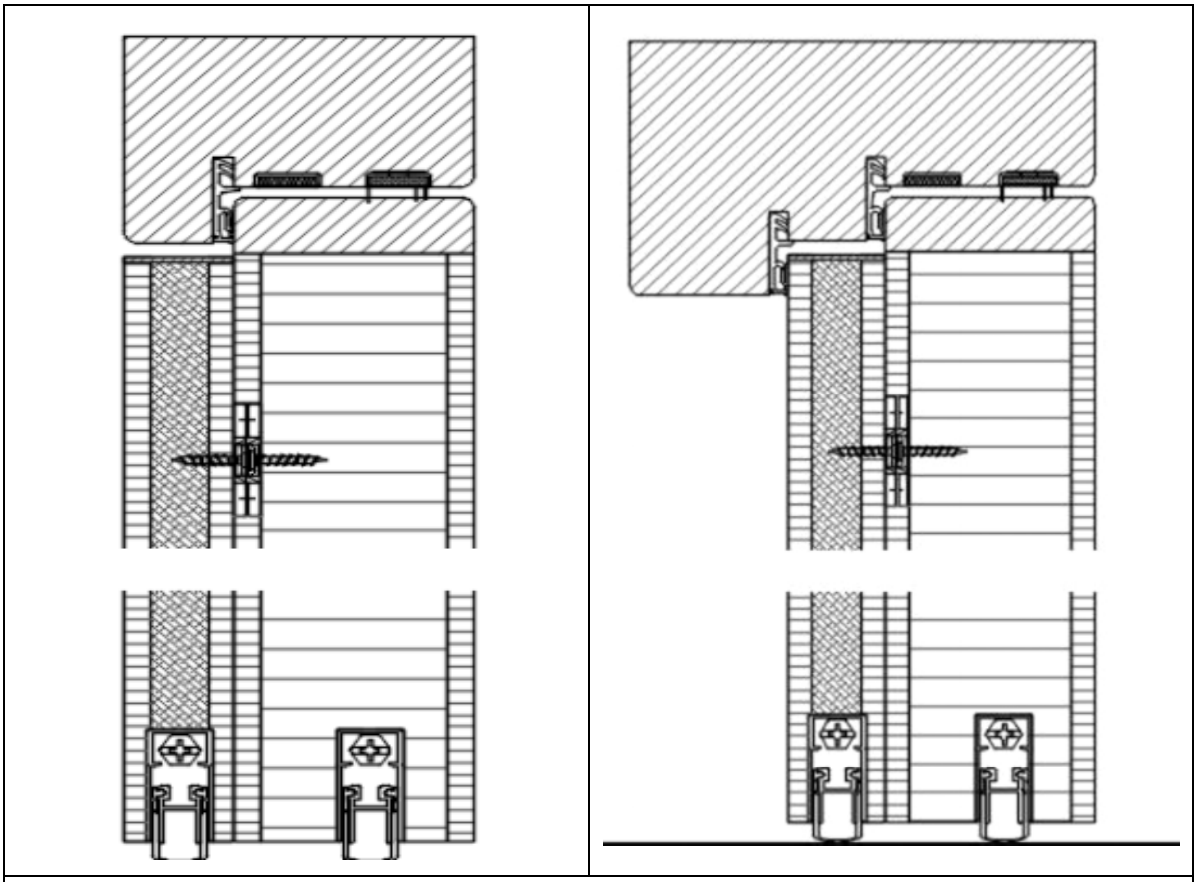


Fig 11: Vertical Sections Showing Single and Double rebate details

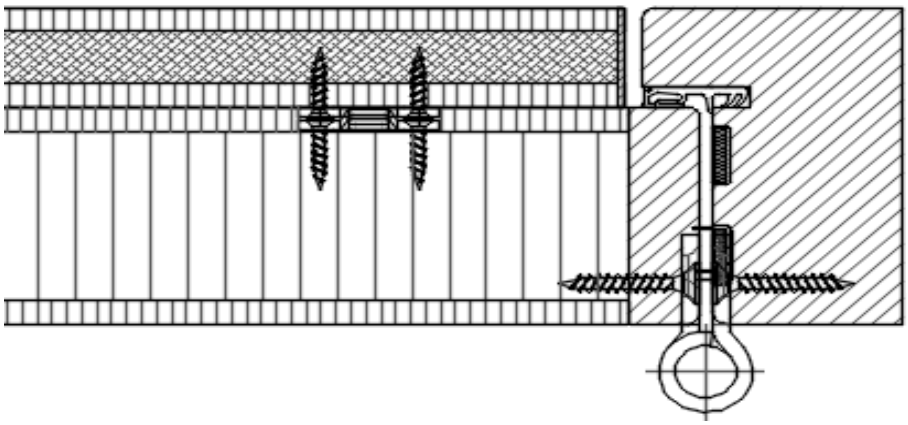


Fig 12: Horizontal Section Showing Single Rebate Details

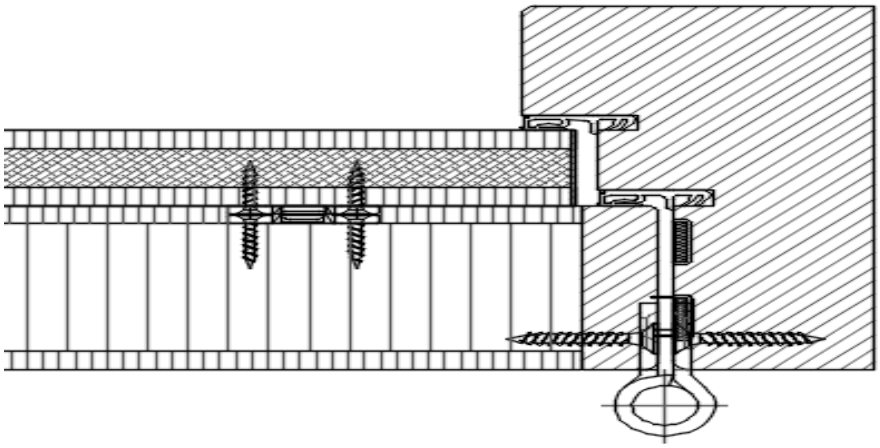


Fig 13: Horizontal Section Showing Double Rebate Details

14 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 **note 1**	1. PVC encased Type 617 – Lorient Polyproducts Ltd 2. PVC encased seal ref: 30141 - Pyroplex Ltd 3. Rigid box seal ref 8700 - Pyroplex Ltd
	Meeting Edge of Double Doorsets	
Hinges	Underneath 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
Lock/latches	Under forend & keep	
Top pivots	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
Concealed closer	Lining all sides of the closer and slide arm mortices	Manufacturers tested intumescent protection pack
Concealed hinges	Lining all sides of mortice in frame and leaf	1mm BASF exterdens Graphite TE 527 3D intumescent pack
Multipoint locking	Lining mortices of lock/latch and top and bottom locks all keeps	1mm thick BASF interdens kit

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

Note 1 when multipoint locking systems are used the edge seals must go in the frame.

15 Adhesives

The following adhesives must be used in construction.

Element	Product/Manufacturer
Facings	Held on file in confidence by Warringtonfire
Lippings	UF, Phenol Formaldehyde, or PU
Core Lamels	Held on file in confidence by Warringtonfire

16 Hardware

16.1 General

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

16.2 Tested Hardware

16.2.1 Primary

The following hardware has been successfully incorporated in the tests on LAMINESSE FireSmoke 54mm doorset design with 6mm particleboard facing:

Item	Make/type	Size (mm)
Overhead Closer	Boss TS4.224 overhead door closer	220 x 58 (footprint size)
Hinges	Royde & Tucker H102 hi-load	101x 35 (blade size)
Latch/lock	Newstar SL1-SSS sashlock	235 x 25 (forend size)
		185 x 24 (keep size)
Hardware	Aluminium lever handles	185 x 24 (keep size)

16.2.2 Supplementary

The supplementary evidence listed in section 3 supports the following items of hardware for use with the FireSmoke 54mm design with 6mm particleboard facings.

Item	**Make/type**	**Size** (mm)
Top pivot /strap	Dorma Door Controls ref: 8066	122 long x 25 wide
Bottom strap	Dorma Door Controls ref: 7421	235 long x 24 wide
Bottom strap protection	None fitted	-
Floor springs	Dorma Door Controls BTS 80	341 (w) x 60 (h) x 78 (d)
Overhead Closer	Rutland TS3204	220 x 60 (footprint size)
Hinges	CNS steel butt	100 x 35 (blade size)
	Royde & Tucker H102 hi-load	101 x 35 (blade size)
	Eclipse bearing butt hinges	100 x 30 (blade size)
Latches	Legge cylinder type	75 long
Hardware	Aluminium lever handles	185 x 24 (keep size)
Concealed closer	Dorma ITS 96 with channel guide	52 x 34 x 340 (body) 31 x 22 x 440 (channel)
Concealed hinges	Simonswerk Tectus TE	155 x 26[1]
Multipoint locking system	Glutz Multipoint lock/latch (Ref 1839.7.60.78.1788)[2]	1788 x 20 (forend) 241 x 24 (strike) 110 x 24 (strike) Lock 200 x 89 x 20 Bolts 44 x 67.5 x 20

Note:

1. Simonswerk Tectus TE hinges must be used with a door frame minimum thickness 38mm (see section 11)
2. Multipoint locking systems are only permitted on single leaf doorsets

16.3 Additional & Alternative Hardware

16.3.1 CE Marked Hardware

When purchased for use with this fire door design, the following items of hardware, having harmonised standards, 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).

16.3.2 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.

16.3.3 Latches & Locks

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

Element	Specification
Maximum forend and strike plate dimensions:	235mm high by 25mm wide by 4mm thick[1]
Maximum body dimensions:	18mm thick by 100mm wide by 165mm high.
Intumescent protection:	See section 14
Materials:	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel
Position	800 – 1200mm above the threshold

Note:

1. When fitting locksets to doors with CS Edge protectors or Acrovyn wrap, the lock specification must be as follows:

Lock specification when using CS Edge Protectors or Acrovyn Wrap

Element	Specification
Maximum forend and strike plate dimensions:	155mm high by 25mm wide by 4mm thick[1]
Maximum body dimensions:	18mm thick by 100mm wide by 150mm high.
Intumescent protection:	See section 14
Materials:	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel
Position	800 – 1200mm above the threshold

16.3.3.1 Multipoint locking

The Glutz multipoint locking system has been tested successfully in a doorset similar to the FireSmoke 54mm design but with 6mm MDF facings (see section 3). The test evidence can be used to support the use of multi-point locks with the FireSmoke 54mm design covered by this assessment.

In addition to the tested Glutz multi-point lock, other multipoint locking systems can be fitted provided they have been successfully tested in timber based doorsets for 60 minutes to BS 476: Part 22: 1987 or BS EN 1634-1. The mortices must be no bigger than that detailed in section 16.2.2 for the Glutz multipoint locking system and the manufacturers tested intumescent protection system for the mortices must be installed. Furthermore the forend height and the dimensions of any alternative multi-point lock must not exceed the dimensions of the tested Glutz lock,

This includes the following Winkhaus systems:

- AV2 – The system variants acceptable to this assessment are those which fit into the mortices detailed in section 16.2.2 for multipoint locking systems.

When a multipoint locking system is used, the door edge seal must be in the frame.

Multipoint locking systems are only approved for use with single leaf doorsets and cannot be used with CS Edge protectors/Acrovyn wrap.

16.3.4 Hinges

Leaves ≤2400mm (h) must be hung on minimum 3 hinges. Leaves >2400mm (h) must be hung on 4 hinges. The door design has been tested with hinges that are smaller in height than the range given below. However, given that the hinges are bedded onto intumescent gaskets and the perimeter of the door design has been shown to work with interruption to the intumescent at the hinge locations, Certifire approved hinges with the following specification are acceptable.

Element		Specification	
Blade height:		90 - 120mm	
Blade width (excluding knuckle):		30 - 35mm	
Blade thickness		2.5 - 4mm	
Fixings:		Minimum of 4 No. 30mm long No. 8 or No.10 steel wood screws per blade	
Materials:		Steel or stainless steel	
Hinge positions:	If 3 hinges are required:	Top	100 –180mm from the head to top of hinge
		2nd	Minimum 200mm from bottom of top hinge or centrally fitted between top and bottom hinge
		Bottom	150 - 250mm from the foot of leaf to bottom of hinge
	If 4 hinges are required:	Top	100-180mm from the head to top of hinge
		2nd & 3rd	Equispaced between top and bottom or 2nd hinge 200mm from bottom of top hinge and 3rd hinge equally spaced between 2nd and bottom hinge
		Bottom	150 - 250mm from the foot of leaf to bottom of hinge
Intumescent protection:		See section 13	

16.3.5 Automatic closing

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

Test report WF 382394 cited in section 3 has been deemed suitable to support the use of concealed closers with the FireSmoke 54mm design with 6mm particleboard faces and head rail insert. The door tested in WF 382394 was tested without a head rail insert and with a different face material. However, given the stability of the chipboard faced design with head rail insert, the inclusion of the concealed overhead closer will not undermine the fire resistance performance, providing the closer is fitted with the tested intumescent protection.

Alternative Certifire approved concealed closers can be fitted provided they have been successfully tested in timber based doorsets for 60 minutes to BS 476: Part 22: 1987 or BS EN 1634-1. The mortices must be no bigger than that detailed in section 16.2.2 for the Dorma ITS 96 and the manufacturers tested intumescent must be installed.

Note: The top pivots to floorspring assemblies must be protected with 2mm thick intumescent gasket (see section 14) or alternatively the manufacturers tested intumescent pack.

16.3.6 Pull Handles

Steel or stainless steel pull handles may be surface-fixed or bolted through the door leaf, providing they are steel or stainless steel and the length is limited to 1200 mm between the fixing points. If through fixed, there must be no more than 1mm clearance between the hole and stud.

Providing the handles are limited in height and are fitted as described, the handle will have negligible influence on the deflection of the leaf and integrity performance of the door core.

16.3.7 Push Plates and Kick Plates

Steel or Stainless steel face-fixed hardware such as push plates and kick plates may be fitted to the doorsets. These items of hardware are permitted up to a maximum of 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.

It is necessary to limit the area of the metal push/kick plate to limit the influence of the plate on the distortion of the leaf as the plate begins to heat in fire test conditions.

16.3.8 Panic Hardware

Panic hardware, manufactured from steel or non-combustible materials, may be fitted, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and it does not interfere with the self-closing action of the door leaf. Panic hardware must be Certifire approved. Details given in the relevant Certifire certificate must be complied with.

16.3.9 Door Selectors

Selectors may be fitted providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and they do not interfere with the self-closing action of the door leaf.

16.3.10 Environmental seals

Silicon based flame retardant acoustic, weather and dust seals (e.g. Norsound 710, Lorient IS1212, IS1511, IS7025, 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.

The following Deventer seals can be incorporated as shown in the figure in section 11.2.

- DS6955a
- DS6922a
- DS155a
- DS112a

16.3.11 Threshold seals

Test FEP/F14256 was conducted on a similar design of door leaf with a drop seal and provided the required period of fire resistance. It has therefore been deemed acceptable to permit the following types of automatic threshold drop seals to be recessed in to the bottom of the leaves to this design without compromising the performance

Manufacturer	Product Reference
Lorient Polyproducts Ltd.	IS8010si
	LAS8005si
Raven	RP8Si
Athmer	Schall-Ex L-15 (range)
Norsound Ltd.	810 range
Norsound Ltd.	NOR710dB+
STS Ltd	ST422
Planet	HS, RH and US

16.3.12 Letter Boxes/ Plates

Letter boxes/plates may be fitted, providing the product has demonstrated contribution to the required integrity performance of this type of doorset design, when tested to BS 476: Part 22: 1987 or BS EN 1634-1, when installed in a timber based doorset of comparable thickness. Products may be fitted up to 1200mm from floor level and no closer than 100mm to any leaf edge.

16.3.13 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, which demonstrates a minimum 60 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 that proven by the supporting fire test for the specific type of grille being used, and must be deducted from the area of glazing, if both elements are fitted. Air transfer grilles are not permitted with Moralt clad on acoustic panels or when encapsulated

16.3.14 Security viewers

Given the integrity performance of the door core in the primary test, door security viewers with brass (melting point >800^{o}C) 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 +1 mm). Lenses must be glass and the item must be protected with a tested acrylic intumescent mastic.

17 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 each other or from the door frame by more than 1mm.
Threshold	10mm between bottom of leaf and top of floor covering For ambient smoke control tolerances see section 21

18 Structural Opening

The door assemblies are approved for installation within standard rigid and flexible supporting constructions that have demonstrated a minimum of 60 minutes fire resistance, 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.

19 Fixings

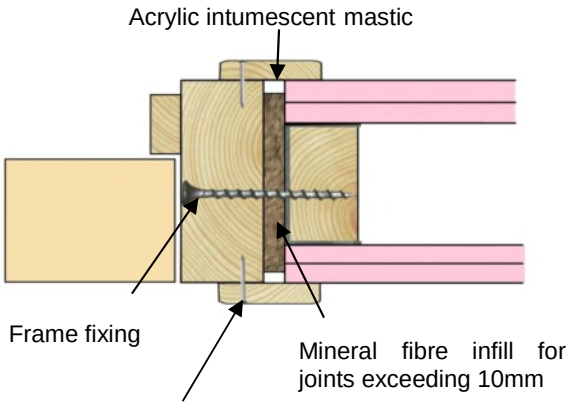
The door assemblies must be fixed back to the supporting structure using steel screw fixings appropriate for the substrate. The fixings are to be inserted at 500mm centres to all edges, with a fixing no more than 150mm from any corner and they must penetrate the supporting structure to a depth of 50mm. 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.

20 Sealing to Structural Opening

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

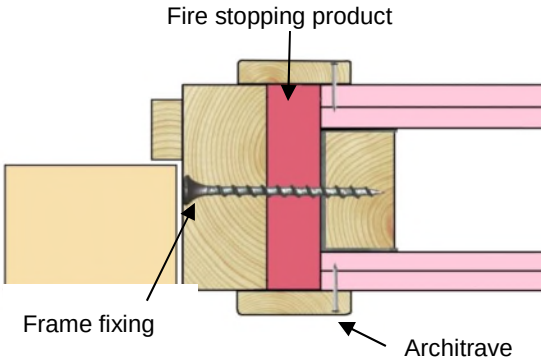
1. Gaps up to 10mm must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.

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.

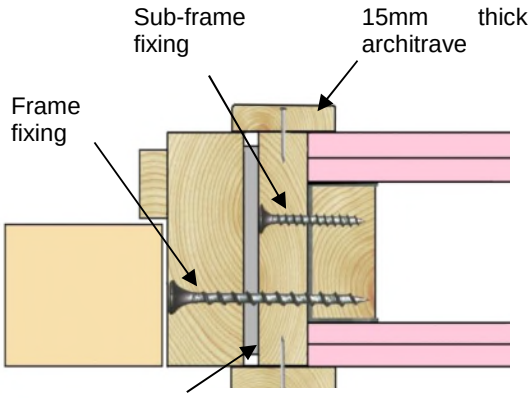


Architrave for joints not filled with mineral wool and optional for filled joints

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.



10mm of acrylic intumescent mastic or full depth PU foam

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.

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 or partially insulating glazing
Fully insulating	Unglazed doorsets

22 Smoke Control

22.1 General

If the doorset design is required to provide a smoke control function to comply with Building Regulations, in the absence of a suitable pressurisation system, the doorset must meet one of the following criteria:

a) have a leakage rate not exceeding 3m3/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 may be considered for compliance 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.

22.2 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.

23 Conclusion

If the Moralt LAMINESSE FireSmoke 54mm doorset design with 6mm particleboard facing and head rail insert, were constructed in accordance with the specification documented in this field of application and were to be tested in accordance with BS 476: Part 22: 1987, it is our opinion that they would provide a minimum of 60 minutes integrity and insulation (subject to section 21).

24 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 Feole MD

For and on behalf of: Moralt AG

25 Limitations

The following limitations apply to this assessment:

1) This field of application addresses itself solely to the elements and subjects discussed and do not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
2) This field of application report 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 report unconditionally but not retrospectively.
3) This field of application has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
4) Opinions and interpretation expressed herein are outside the scope of UKAS accreditation.
5) This field of application 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 field of application, the element is suitable for its intended purpose.
6) This field of application report 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 test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this field of application would be regarded by any Building Control authority as sufficient for that or any other purpose. This field of application report 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.
7) This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Warringtonfire. All work and services carried out by Warringtonfire Testing and Certification Limited are subject to, and conducted in accordance with, the Standard Terms and Conditions of Warringtonfire Testing and Certification Limited, which are available at https://www.element.com/terms/terms-and-conditions or upon request.
8) The version/revision stated on the front of this field of application supersedes all previous versions/revisions and must be used to manufacture doorsets from the stated validity date on this front cover. Previous revisions of the Field of Application cannot be used once an updated Field of Application has been issued under a new revision.

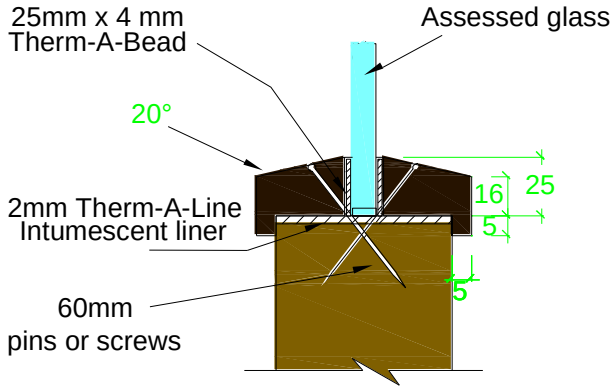
26 Validity

1) The assessment is initially valid for five years after which time it is recommended to be submitted to Warringtonfire for re-appraisal.
2) This assessment report is not valid unless it incorporates the declaration given in Section 24 duly signed by the applicant.

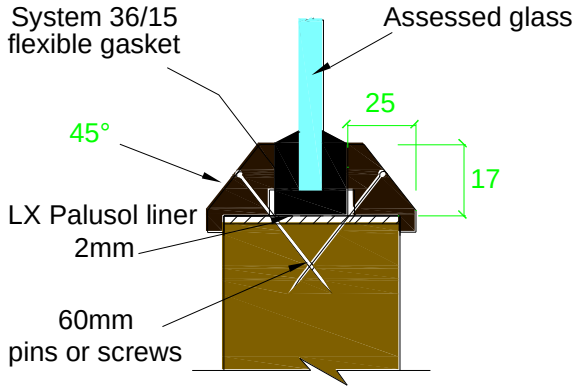
Signature:		
Name:	***Peter Barker**	***Andrew Winning**
Title:	Technical Manager	Senior Product Assessor

* For and on behalf of Warringtonfire

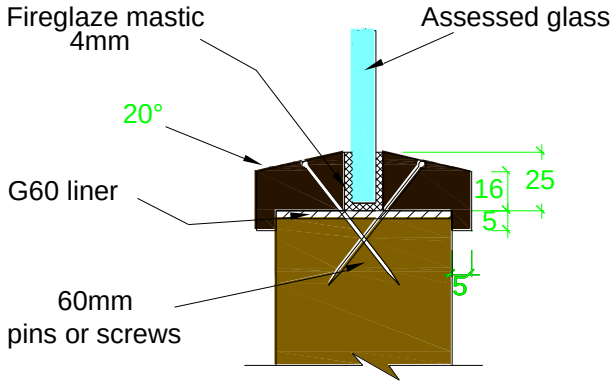
Appendix A: Proprietary 60 Minute Glazing Systems



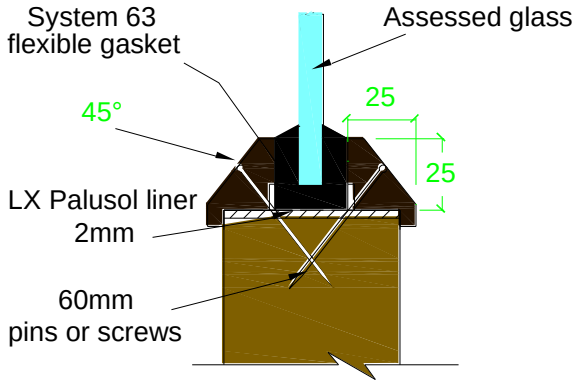
Therm-A-Glaze 60
Intumescent Seals Ltd



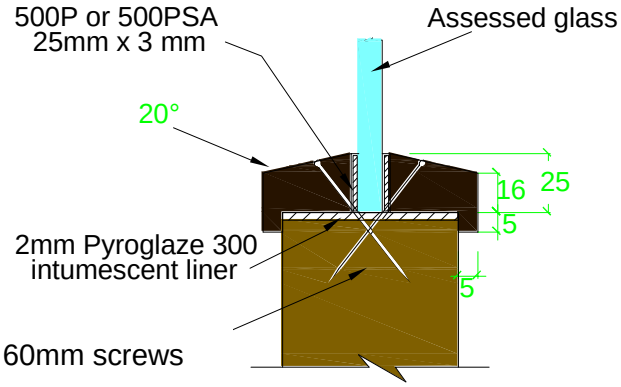
System 36/15
Lorient Polyproducts Ltd



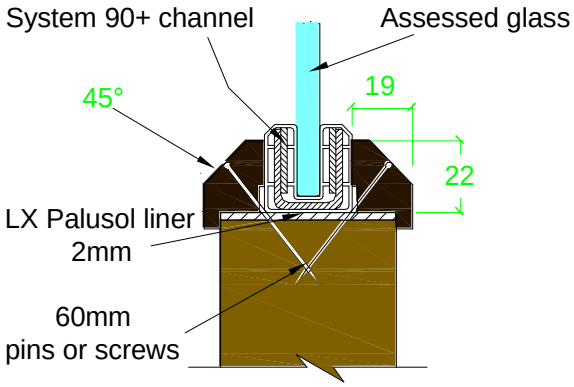
Fireglaze Mastic
Sealmaster Ltd



System 63
Lorient Polyproducts Ltd



Pyroglaze 60
Mann McGowan Ltd

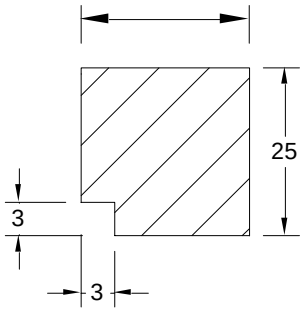


System 90+
Lorient Polyproducts Ltd

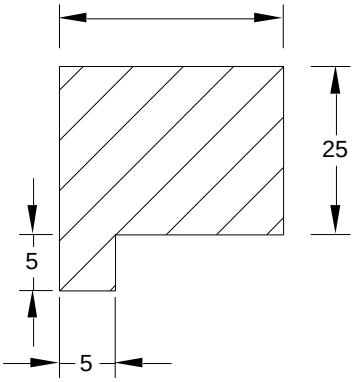
Assessed Square Bead Profile

The following square bead profile may be used as an alternative to the splayed beads detailed above - refer to section 10 for glazing system and glass restrictions.

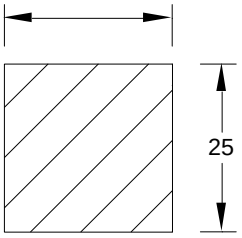
To finish flush with the leaf face



Suited to glass thickness



To finish flush with the leaf face



Appendix B: Revisions

Rev.	WF Ref.	Date	Description
A	CNA/F14309	10.02.15	Addition of WoodEx60 door frame and grooving options added
B	WF399354	22.08.18	Changed into Exova Warringtonfire format and Technically reviewed and revalidated for a further 5 years. Test WF382394 included which enabled, concealed closers, concealed hinges and multipoint locking to be included and new leaf size envelope. Annex Z created to cover door designs with insert. Acoustic clad on panel included.
C	WF421103	06.12.19	Update to Warringtonfire format and in accord with the principles of BSEN 15725: 2010. Option for Acrovyn encapsulation added.
D	WF433075	12.10.20	Assessment revised to provide a scope of application for Moralt Firesmoke 54mm with head rail inserts and 6mm chipboard faces only. The assessment is based on the primary test evidence for the Moralt Firesmoke 54mm design with 6mm chipboard faces and head rails inserts, referenced XF11016 and the approved leaf sizes and configurations in the revised assessment are based on this report. The assessment has been revised to include specific items of hardware and glazing from the following supplementary test reports: RF07055, WF382394 and FEP/F14256. The intumescent specification in RF07055 has been used to support large leaf dimensions. Test report FEP/F14102 has been used as supporting evidence for Woodex engineered timber door frames, the current revision of assessment Chilt/A11129 has been used to support the use of CS Group acrovyn encapsulation and test report P1009/14-530-1 has been used to support the Norseal NOR710 drop seal

Appendix C:

Data Sheets for

Moralt LAMINESSE FireSmoke 54mm
6mm Particleboard Faced with Head Rail Insert
60 Minute Fire Resisting Doorsets

LAMINESSE FireSmoke 54mm Doorsets – 60 Minutes Fire Resistance

Latched and Unlatched Single Acting & Double Acting Single Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2040	x	1062
		To:	2324	x	926
	ULSASD & DASD	From:	2040	x	1037
		To:	2274	x	926

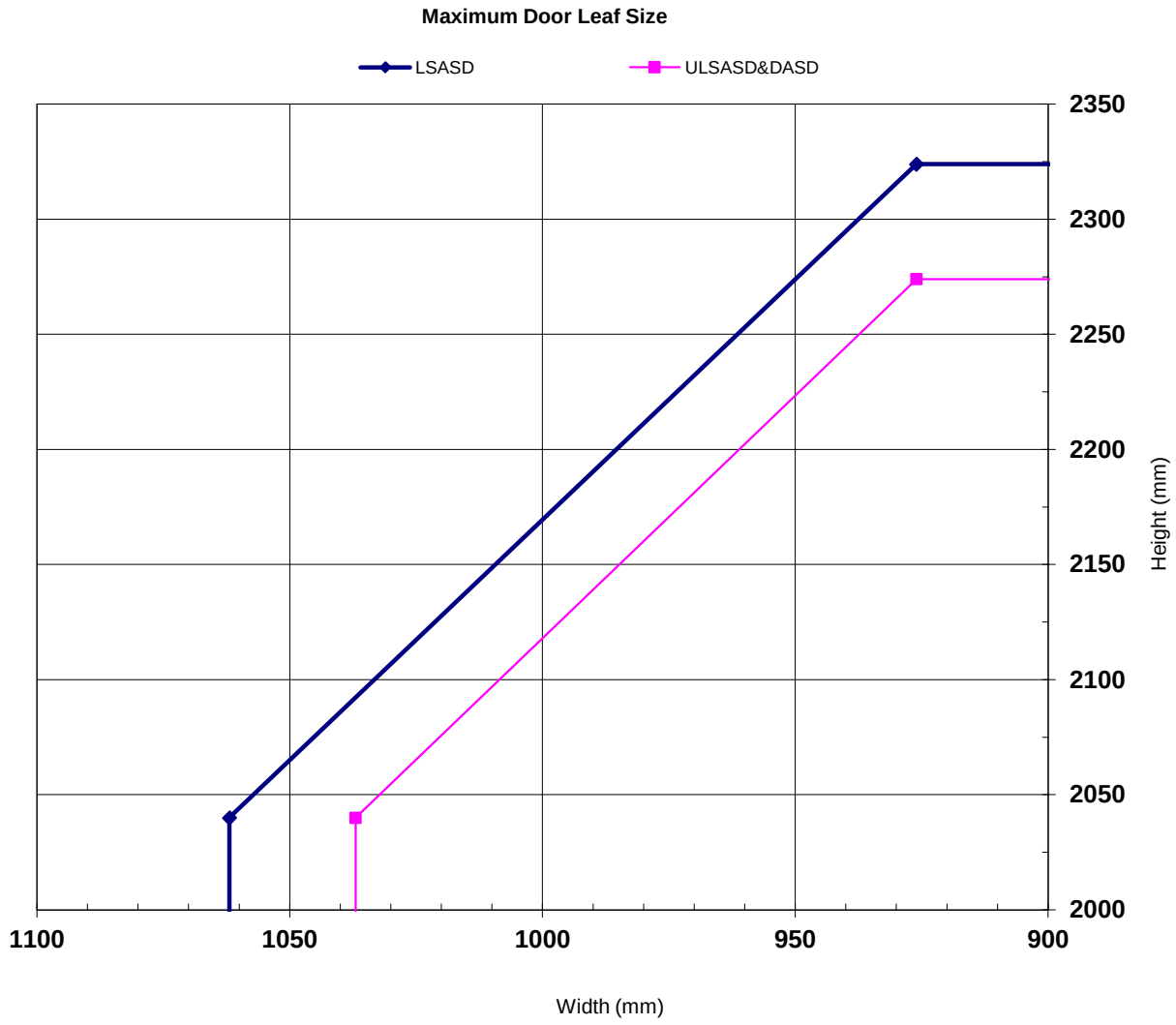
Intumescent Materials:

PVC encapsulated Type 617 - Lorient Polyproducts Ltd or 30141 - Pyroplex Ltd

Head: 2 No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head.

Jambs & Overpanel: 2 No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.

Hardware Protection: see section 14



LAMINESSE FireSmoke 54mm Doorsets – 60 Minutes Fire Resistance

Latched and Unlatched Single Acting & Double Acting Double Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2040	x	1012
		To:	2224	x	926
	ULSADD & DADD	From:	2040	x	987
		To:	2174	x	926

Intumescent Materials:

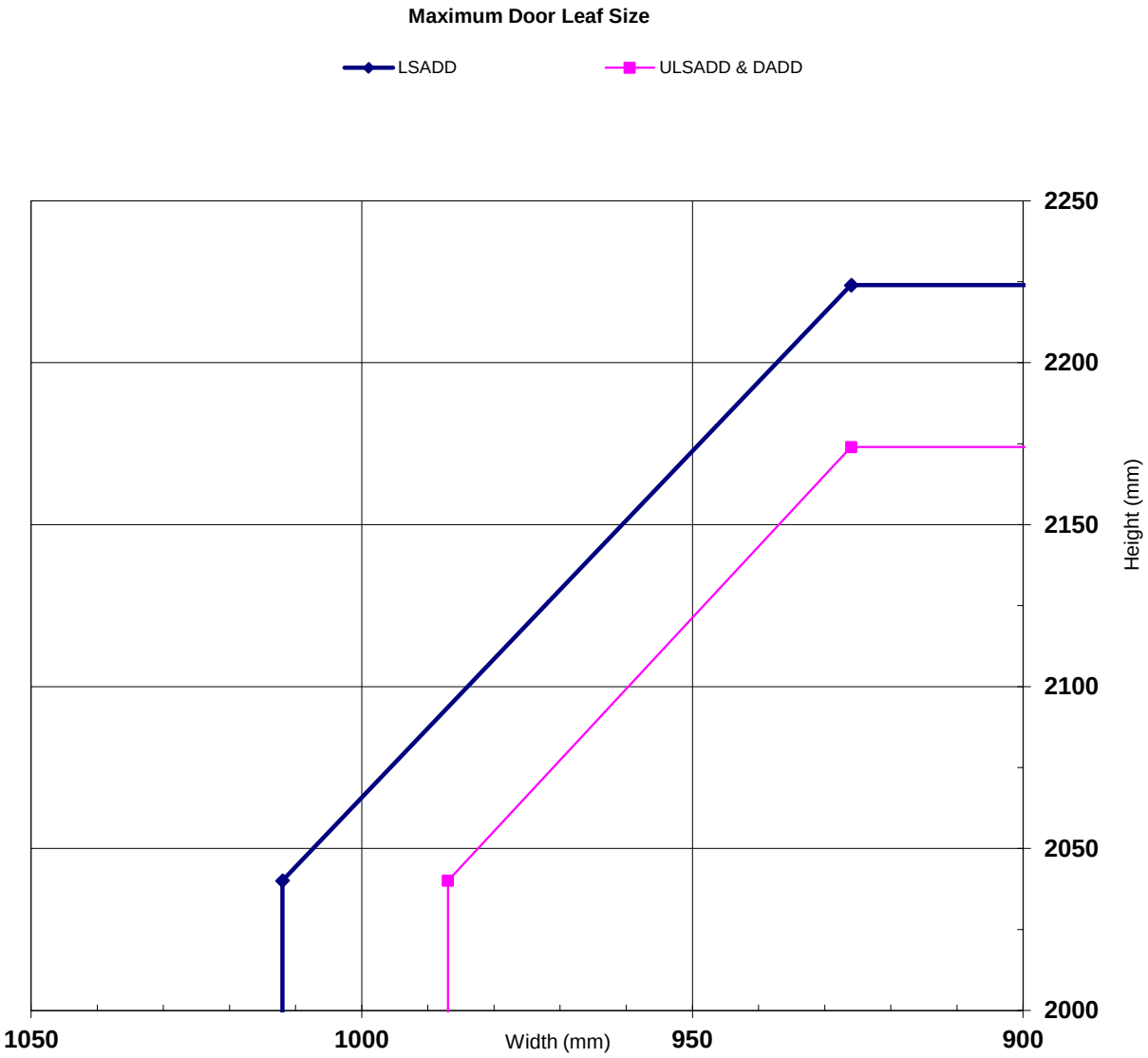
PVC encapsulated Type 617 - Lorient Polyproducts Ltd

Head: 2 No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head.

Jambs & Overpanel: 2 No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.

Meeting Edges: 2No 15 x 4mm exposed and fitted 5mm either side of the centreline in one leaf edge only

Hardware Protection: see section 14



LAMINESSE FireSmoke 54mm Doorsets – 60 Minutes Fire Resistance

Latched and Unlatched Single Acting & Double Acting Single Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSASD	From:	2600	x	1120
		To:	3010	x	950
	ULSASD & DASD	From:	2600	x	1095
		To:	2960	x	950

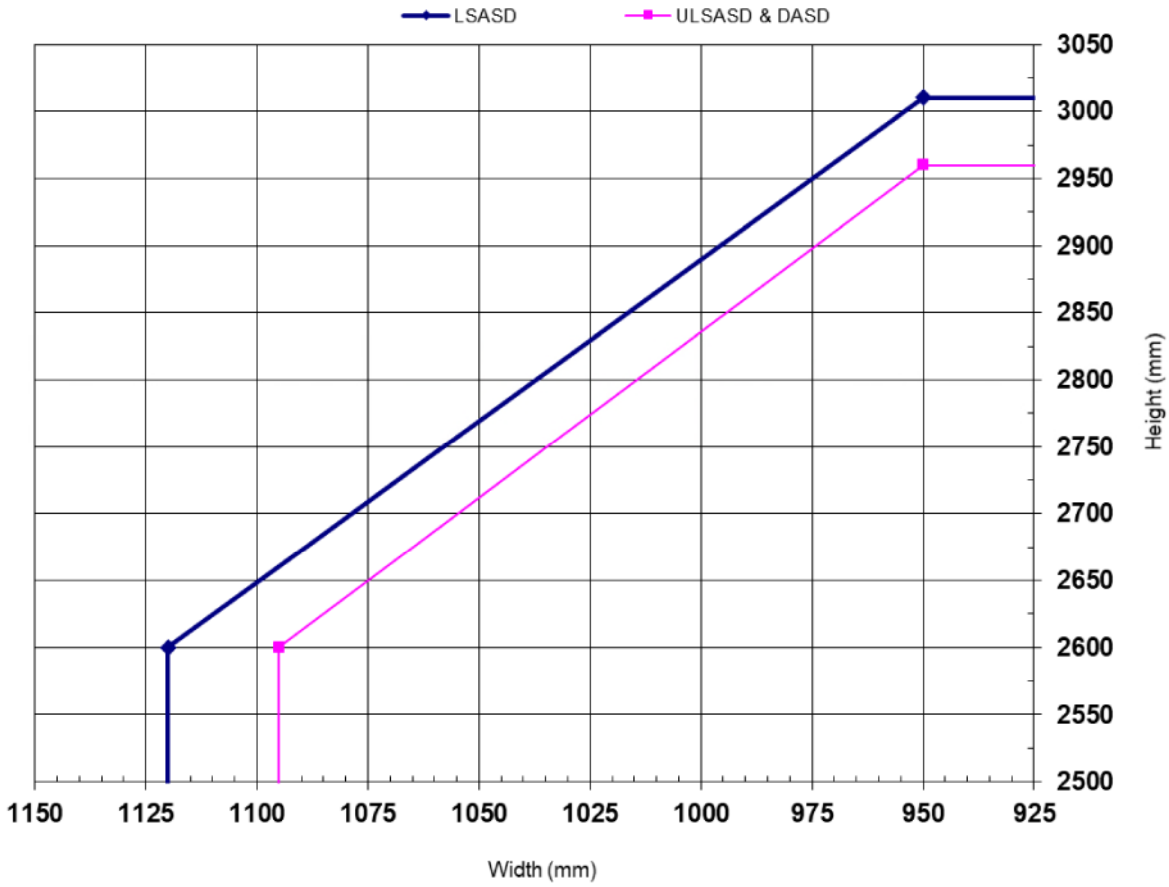
Intumescent Materials: PVC encapsulated Type 617- Lorient Polyproducts Ltd

Head: 1No 40 x 6mm exposed and fitted centrally in the leaf head or frame reveal

Jambs and Overpanel: 2No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal.

Hardware Protection: see section 14

Maximum Door Leaf Size



Laminesse FireSmoke 54mm Doorsets – 60 Minutes Fire Resistance

Latched and Unlatched Single Acting & Double Acting Double Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD	From:	2600	x	1070
		To:	2910	x	950
	ULSADD & DADD	From:	2600	x	1045
		To:	2860	x	950

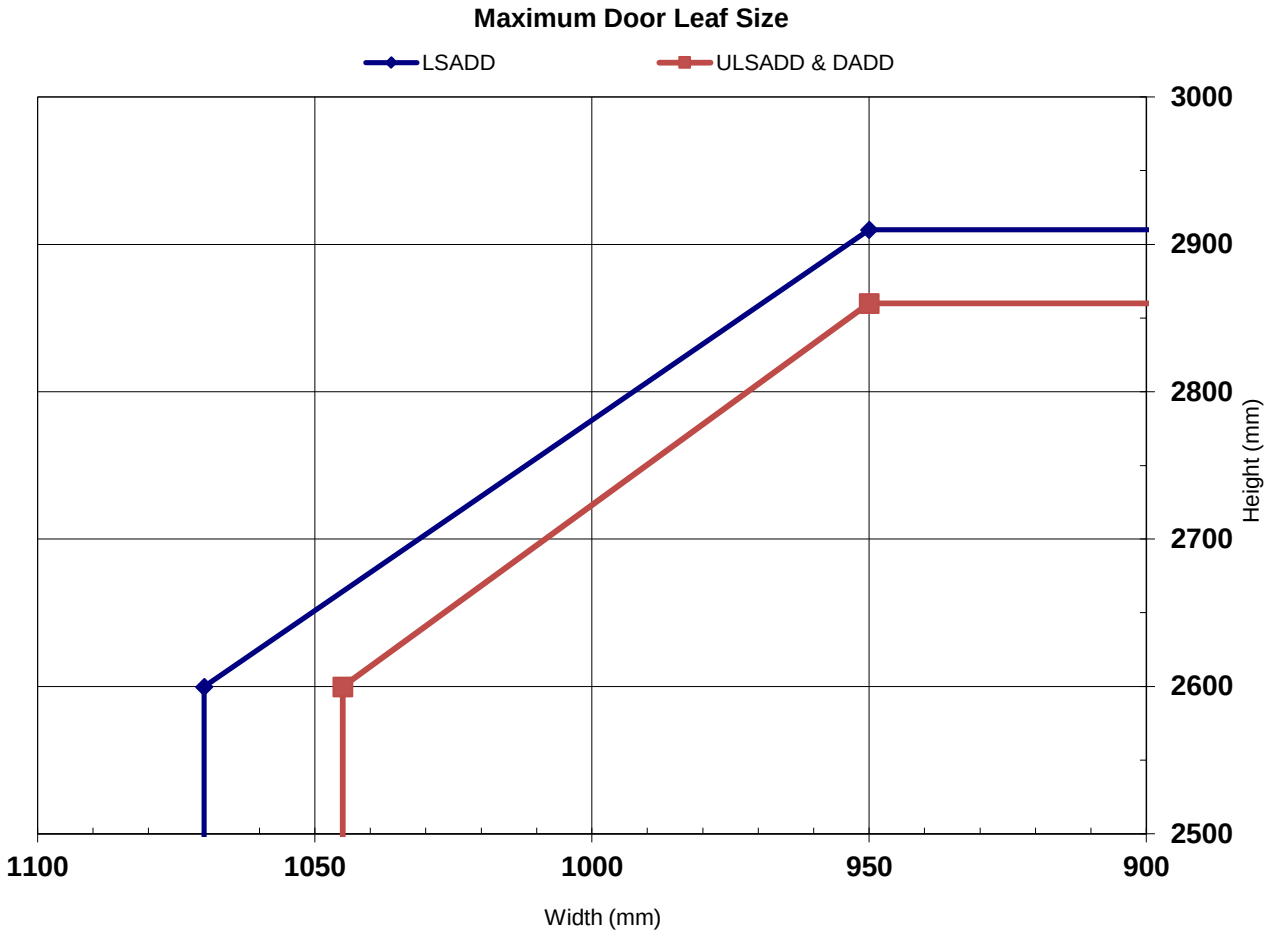
Intumescent Materials: PVC encapsulated Type 617 - Lorient Polyproducts Ltd

Head: 1No 40 x 6mm exposed and fitted centrally in the leaf head or frame reveal

Jambs and Overpanel: 2No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf edge or frame reveal

Meeting Edges: 2No 15 x 4mm exposed and fitted 5mm either side of the centreline in one leaf edge only

Hardware Protection: see section 14



Laminesse FireSmoke 54mm Doorsets – 60 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:	2250	x	1106
		To:	2482	x	900
Max. Overpanel Height (mm)		Transomed	2000		

INTUMESCENT MATERIALS: Lorient Polyproducts Ltd - Type 617

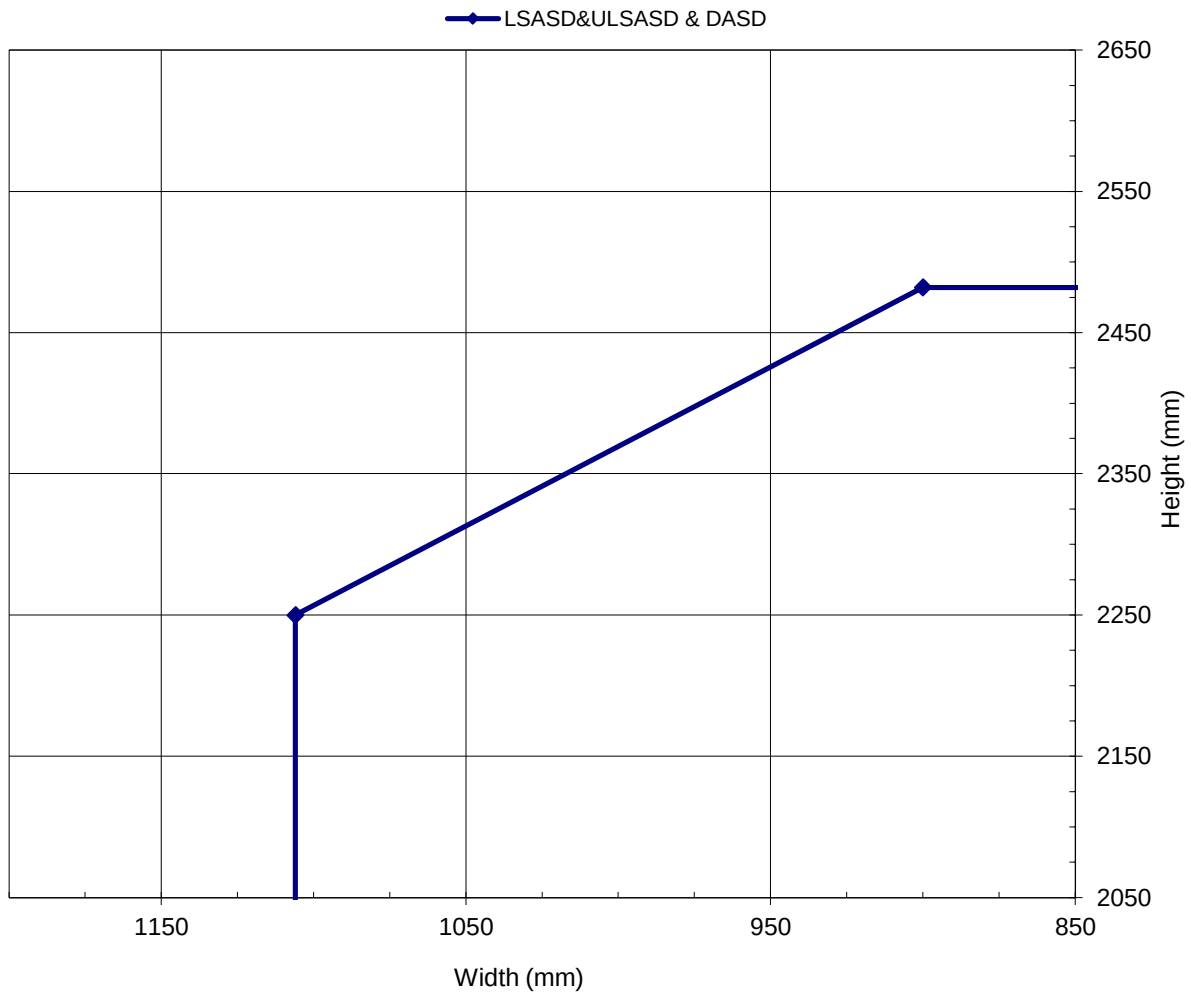
Head: 2 No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head

Jambs & Overpanel: 2No. 15 x 4mm strips centrally fitted in the frame reveal.

Hardware Protection: See section 14

NB: Lockset dimensions are restricted when using CS Edge Protectors/Acrovyn Wrap – see section 16.3.3

Maximum Door Leaf Size



Laminesse FireSmoke and FireSafe 54mm Doorsets – 60 Minutes Fire Resistance

CS Edge Protectors/Acrovyn Wrap

Latched & Unlatched, Single & Double Acting, Double Doorsets

	Configuration		Height (mm)		Width (mm)
Leaf Sizes	LSADD & ULSADD & DADD	From:	2100	x	1225
		To:	2850	x	900
Max. Overpanel Height (mm)		Transomed	2000		

INTUMESCENT MATERIALS: Lorient Polyproducts Ltd - Type 617

Head: 2 No 15 x 4mm exposed and fitted 5mm either side of the centreline in the leaf or frame head

Jambs & Overpanel: 2No. 15 x 4mm strips centrally fitted in the frame reveal

Meeting edges: 1No. 15 x 4mm strip centrally fitted in both meeting edges

NB: Lockset dimensions are restricted when using CS Edge Protectors/Acrovyn Wrap – see section 16.3.3

Maximum Door Leaf Size