
Title

Field of Application for:
The Moralt Laminesse FireSound
44mm Range of Doorsets Using in
Timber Based Door Frames

For 30 minutes Fire Resistance if
they were to be tested in
accordance with BS476 Part 22:
1987.

Proprietary Information redacted.

Assessment Report No.:

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Job Reference:



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Prepared for:

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The issue/revision number stated on the front of this report supersedes all previous issues/revisions, if applicable. Previous issues/revisions of the report, if applicable, cannot be used once an updated report has been issued/revised under a new revision.

Signatories and Revision History

Issue No.	FM No	Date	Report scope and Signatures
-	F14274	12.02.15	Initial report issued to Moralt AG
A	F15134	05.06.15	Addition of test data PF15040 for Odice seals
B	WF421105	06.12.19	Update to Warringtonfire format and in accord with the principles of BS EN 15725: 2010. Use of CS Group Acrovyn encapsulation assessed
C	WF554255	12.01.26	5 year technical review and revalidation, introduction of test DMT-DO-50-1433 in support of Mann McGowan leaf edge seals and various items of hardware. Introduction of further test data in support of the addition of further locking systems.
Assessor		Reviewer	
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Title: Senior Product Assessor		Title: Senior Product Assessor	
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*For and on behalf of Warringtonfire

Executive summary

This field of application report presents an assessment of the fire resistance performance of the specified proprietary Moralt Laminesse FireSound 44mm doorset designs, as fire tested and described in the reports detailed within Appendix A when modified as detailed herein.

The proposed modifications include leaf and frame design options, doorset configurations and sizes, glazing details, various hardware and installation parameters as discussed in the relevant sections below.

This assessment report is subject to the requirements and limitations described in Sections 2 and 15.

The findings of this report are that if Moralt Laminesse FireSound 44mm doorsets constructed in accordance with the specification documented in this field of application were to be tested in accordance with BS476 Part 22: 1987, it is expected that they would be capable of providing a minimum of 30 minutes integrity and insulation (subject to section 12).

This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS476 Part 22: 1987 as specified above, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.

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1 Introduction

This field of application report presents an assessment of the fire resistance performance of the specified proprietary Moralt Laminesse FireSound 44mm doorset designs, as fire tested and described in the reports detailed within Appendix A when modified as detailed herein.

Analysis of specific construction details that require assessment are given within this report against the relevant element of construction, as appropriate.

2 Assessment framework

An assessment is an opinion of the likely performance of a component or element of structure if it was subjected to a standard fire test.

This assessment report has been carried out in accordance with the Passive Fire Protection Forum (PFPF) '*Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence - 2021*' and has been written in accordance with the general principles outlined in BS EN 15725: 2023; *Extended application reports on the fire performance of construction products and building elements, as applicable*.

This scope document cannot be used as supporting documentation for either a CE or UKCA marking application nor can the conclusion be used to establish a formal classification against EN13501-2.

The scope presented in this report relates to the behaviour of the element 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 report 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) '*Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence - 2021*'. 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.

This report uses established empirical methods of extrapolation and experience of fire testing similar elements, 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 the test standard specified.

This report has been written using appropriate test evidence generated at UKAS accredited laboratories¹, to the relevant test standard. The supporting test evidence has been deemed appropriate to support the stated design and is summarised in Appendix A.

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).

3 General requirements and assumptions

The specified proprietary Moralt Laminesse FireSound 44mm doorset designs shall be constructed in a similar manner from materials and components of the same manufacturer and equivalent quality as those tested or otherwise assessed by Warringtonfire.

The following assumptions have been made in the preparation of this report:

- All densities referred to in this document are based upon an assumed moisture content of 12%.
- It is assumed that unless otherwise documented in the field of application sections of this report, the doorset subject to this report will be constructed in accordance with the test evidence referred to herein.
- For components created using solid timber sections referred to in this assessment, it is assumed that, for all timbers, they will be of a quality deemed to meet or exceed class J30 as specified in BS EN 942: 2007, subject to adequate repairs, other than glazing beads which must meet a minimum class J10. Note that areas under intumescent seals/gaskets are not considered to be concealed faces and defects must be repaired.
- Where timber is referred to within this document it is assumed that the timber element is made from a continuous solid piece, unless specifically detailed otherwise.
- All dimensions detailed herein may be varied by $\pm 2\%$ except where minimum, maximum or a range of dimensions are given.
- Where morticed items of hardware are used (within the leaf or frame) it is assumed that the preparation for such items are tight to the item (and where applicable intumescent protection) as tested with no excessive gaps, unless stated otherwise within a particular section of this report.

It is assumed that the end user will have an understanding of the tested specification as defined in the relevant test report(s) summarised in Appendix A.

Whilst specific items are included within this Field of Application report that may be used to provide additional performance characteristics (such as acoustic or smoke control for example), it is beyond the remit of this Field of Application report to provide scope for performance characteristics other than fire resistance integrity and (where applicable) insulation performance. Any other performance requirement for the door designs contained herein is to be subject to a separate analysis.

If a design variation or extension to scope is not explicitly detailed within the assessment it should not be assumed to be acceptable by omission.

4 Technical Specification

4.1 General

The technical specification for the proposed door assemblies is given in the following sections and is based on the test evidence for the door designs, summarised in Appendix A.

4.2 Intended Use

The intended use of the proposed door assembly 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 Door Leaf

Specific sections within this assessment must be referred to for design limitations and construction requirements.

Section 5 gives the description of the leaf in terms of composition and density etc.

The same leaf option must be used for door leaf, solid side panel and solid overpanel components of any individual doorset.

The door designs can include:

1. Glazing
2. Various hardware options
3. Decorative facings
4. Decorative planted on timber mouldings
5. PVC encapsulation.

4.4 Door Frames

Specific sections within this assessment must be referred to for design limitations and construction requirements.

Section 7 gives the description of the frame including composition and density and minimum dimensions.

Doorsets constructed using different frame options can include various design features as summarised below.

The same frame option must be used for any individual doorset.

Permitted frame and leaf combinations are detailed within section 4.5.4.

4.4.1 Frame 1 – Softwood or Hardwood Timber

The construction of the door frames is softwood/hardwood with minimum frame dimensions. For further information on the specification and construction of the door frames see section 7.

Specific sections within this assessment must be referred to for design limitations and construction requirements, where applicable.

4.4.2 Frame 2 – Softwood Timber

The construction of the door frames is hardwood with minimum frame dimensions. For further information on the specification and construction of the door frames see section 7.

Specific sections within this assessment must be referred to for design limitations and construction requirements, where applicable.

4.4.3 Frame 3 –Hardwood Timber

The construction of the door frames is hardwood with minimum frame dimensions. For further information on the specification and construction of the door frames see section 7.

Specific sections within this assessment must be referred to for design limitations and construction requirements, where applicable.

4.4.4 Frame 4 – MDF

The construction of the door frames is MDF.

The construction of the door frames is MDF with minimum frame dimensions. For further information on the specification and construction of the door frames see section 7.

Specific sections within this assessment must be referred to for design limitations and construction requirements, where applicable.

4.4.5 Frame 5 – WoodEx Engineered Timber

The construction of the door frames is WoodEx engineered timber.

The construction of the door frames is Engineered timber with minimum frame dimensions. For further information on the specification and construction of the door frames see section 7.

Specific sections within this assessment must be referred to for design limitations and construction requirements, where applicable.

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

The evaluation of the leaf size for the door leaf design and frame option and doorset configuration is based on the tests listed in Appendix A and takes into account:

- The margin of over performance above 30 minutes integrity for the design
- The characteristics exhibited during test and
- The doorset configuration tested

The evaluation of the permitted configurations included in this field of application is based on the configuration(s) tested. The principle is that the more components included in testing, the harder it becomes to pass a test.

This approach leads to the following statements:

- A test on a double doorset is more onerous than a test on a single doorset.
- A test on a doorset with a flush overpanel is more onerous than a test on a doorset without an overpanel. A flush overpanel has the same thickness as the door leaf and is flush with the leaf/leaves.
- A test on an unlatched doorset is more onerous than a test on a latched doorset as the leading edge is unrestrained and will deflect more in fire test conditions.
- A doorset with transomed overpanel is considered to perform comparably to a similar doorset without an overpanel. This is because the transom structurally separates the overpanel from the doorset.

The leaf size for each door leaf option and configuration is linked to the perimeter intumescent specification and frame option. The following section details the maximum leaf size for each door leaf option and configuration based on the intumescent specification and frame details tested.

Doorsets with reduced height and width dimensions from those tested are deemed to be less onerous. Therefore, doors with dimensions less than those given in the leaf size envelopes (for the relevant intumescent specification) in the following sections are covered and may be manufactured.

Minimum door leaf width must be no smaller than 300mm. Inclusion of specific design details may require restrictions to maximum or minimum leaf sizes.

4.5.2 Configuration

The table below shows the permitted configurations for the doorset design, with the abbreviation and full description of each configuration.

The following sections details the assessed maximum leaf size envelopes for each permitted configuration based on the intumescent specification and door frame tested.

Depiction	Abbreviation	Description
	LSASD	Latched Single Acting Single Doorset
	ULSASD	Unlatched Single Acting Single Doorset
	LSASD+OP	Latched Single Acting Single Doorset + Flush Overpanel
	ULSASD+OP	Unlatched Single Acting Single Doorset + Flush Overpanel
	LSADD	Latched Single Acting Double Doorset
	ULSADD	Unlatched Single Acting Double Doorset
	LSADD+OP	Latched Single Acting Double Doorset + Flush Overpanel
	ULSADD+OP	Unlatched Single Acting Double Doorset + Flush Overpanel

4.5.3 Orientation

The majority of primary fire resistance tests for these designs were conducted with the doorset hung such that the door leaf opened towards the fire, which is considered the most onerous orientation in terms of fire resistance performance. Based on this testing, assessment is made that the doorsets to this design may be hung 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.

4.5.4 Envelopes for each Configuration

The following sections detail the door leaf envelopes which indicate the permitted leaf sizes for the listed configurations based on the perimeter intumescent, door leaf option and door frame.

Unequal leaf double doorsets are covered by this assessment provided that all the following criteria are met:

- The relevant door leaf envelopes are not exceeded.
- Door leaf widths are no smaller than 300mm.

For equal double doorsets both leaves must comply with the door leaf envelope size limitations.

Single acting double doorsets are only considered acceptable when the leaves are hung to open in the same direction.

A table of essential hardware is given in section 10.3 for each doorset configuration, as a minimum requirement for the doorset described. Changes to hardware can affect the intumescent specification and frame details which are subsequently considered for each specific hardware component, where required.

4.5.4.1 General Note on Intumescent Seals

- Intumescent seals are to be fitted centrally to the thickness of the leaf unless stated otherwise.
- Intumescent seals are fully interrupted at hardware locations unless stated otherwise.
- Intumescent seals must run the full length of the leaf edge or frame reveals, with tightly formed abutting corner joints, unless stated otherwise.
- Vertical perimeter intumescent seals may include one tight butt joint in their length if needed.
 - Where two seals are fitted, the joints must be offset by a minimum of 100mm and may not be coincident.
 - Where one seal is fitted the joint must be in the lower half of the doorset.
- Intumescent seals are not to be concealed below lippings.
- While intumescent seals are not specified to be applied at the bottom edge of the leaf, their application may be a requirement for certain elements of building hardware. It is the opinion of Warringtonfire that the application of intumescent seals across the bottom edge of the leaf will not detract from the fire resistance performance under test conditions, when applied the intumescent may consist of either:
 - 1No. Intumescent seal no greater than 20mm wide centrally fitted or
 - 2No. Intumescent seals, each no greater than 10mm wide no greater than 10mm apart.
- Inclusion of specific design details (e.g. face grooves) and/or hardware may require a different intumescent seal specification compared to that stated for the leaf configurations in sections 4.5. Where this is the case, it is important that the following conditions are met:
 - The intumescent type given for the specific design detail must match that given for the required leaf configuration and leaf size (e.g. if graphite is given as the required seal type for a concealed closer, only leaf configurations and sizes approved for graphite type seals can be used).
 - The largest of the intumescent specifications given for the different design details must take precedence, which is to be determined by the total amount of intumescent required for that design detail (e.g. if the total amount of perimeter intumescent for a particular concealed closer is greater than that required for the associated leaf configuration and size, the intumescent detail stated for the concealed closer would take precedence).

4.5.4.2 Explanation for following sections

The performance of a doorset in terms of configuration and size is dependent on the leaf type, perimeter intumescent used and frame type. These elements are not automatically interchangeable. The following sections present the envelopes for the 1No leaf options and 4No frame options. Each envelope is linked to a specific perimeter intumescent which is given a unique reference and is based directly on test evidence.

The envelopes are presented as follows:-

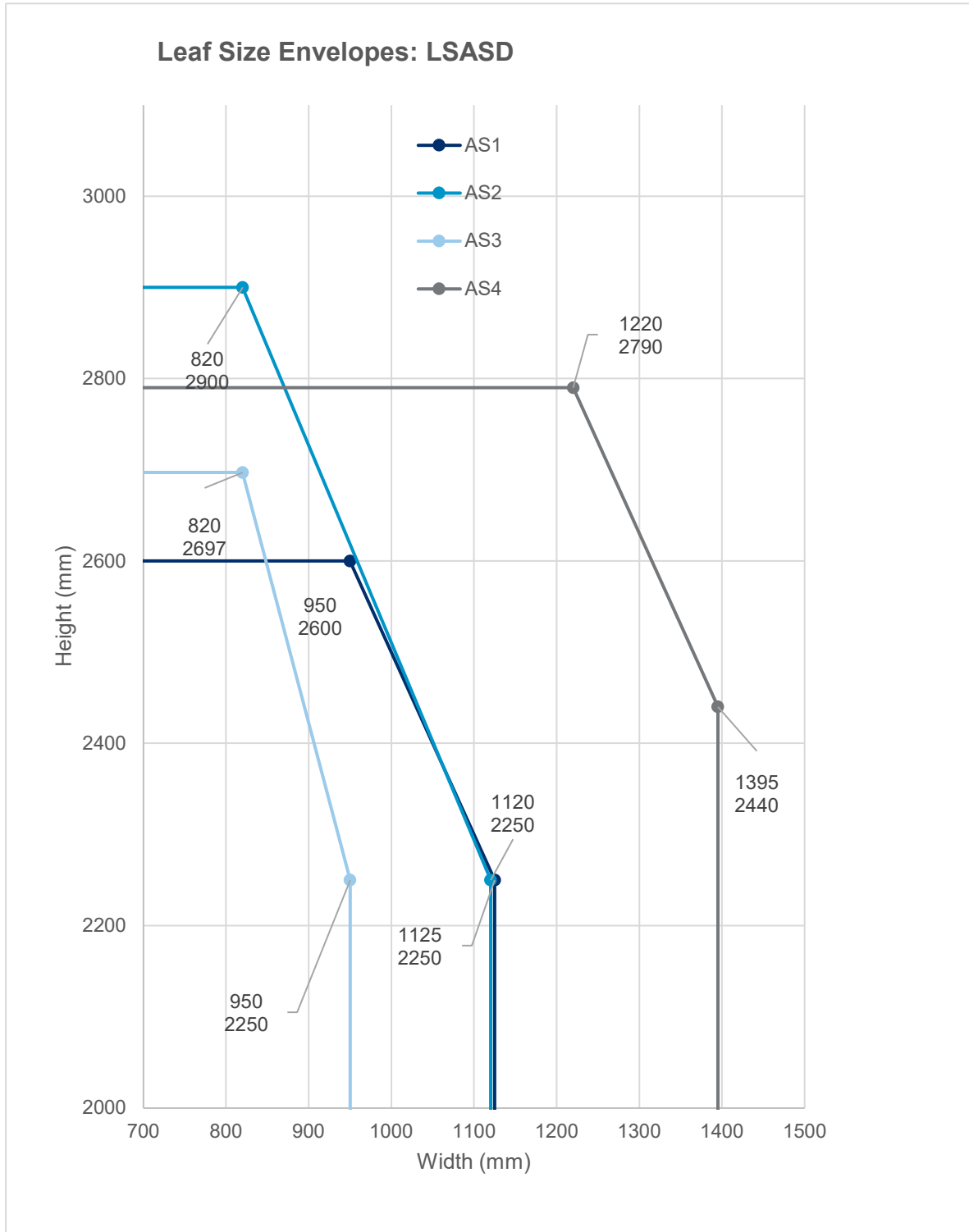
- for LSASD increasing in configuration complexity up to ULSADD+OP
- for each configuration, each leaf type is considered separately
- for each configuration and leaf type, each frame type is considered separately
- for each configuration, leaf type, frame type and intumescent specification is considered separately, and a unique envelope of permitted leaf sizes is presented based on the configuration, leaf type, frame type and intumescent and the envelope is directly linked to a unique test.

4.5.4.3 Summary of Permitted Configurations for each Leaf and Frame option

Permitted Configurations with frame option 1-5 with leaf option 1									
Frame	Configuration	LSASD	ULSASD	LSASD	ULSASD	LSADD	ULSADD	LSADD	ULSADD
				OP	OP			OP	OP
Frame	1 – Softwood/Hardwood*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	2 – Softwood*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	3 – Hardwood*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	4- MDF	Yes	Yes	No	No	Yes	Yes	No	No
	5 - WoodEX	Yes	Yes	No	No	Yes	Yes	No	No

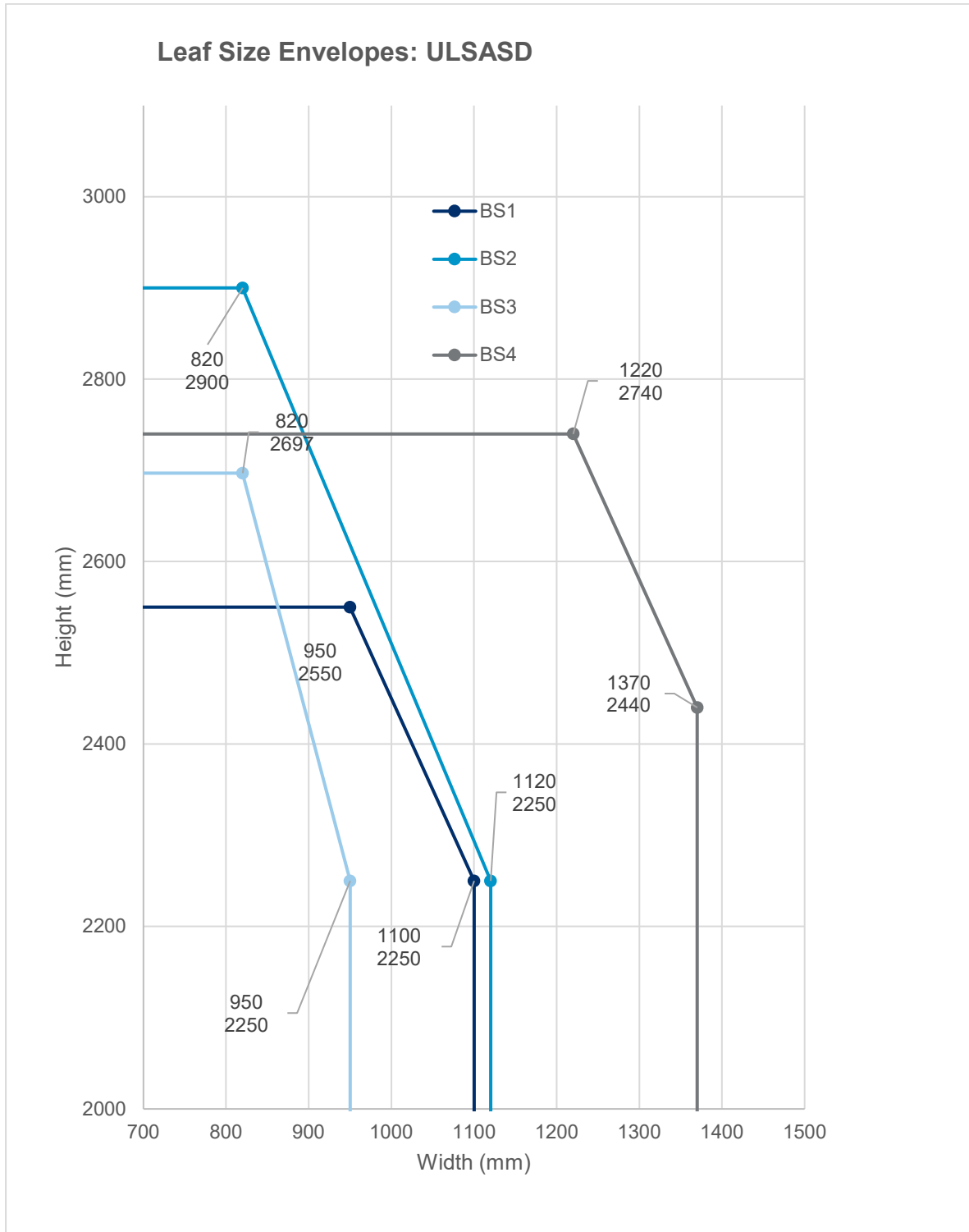
* See Section 7 for specific limitations with respect to the door frame types.

4.5.5 LSASD Configuration: Leaf Sizes & Intumescent Specification, frame types 1 to 5



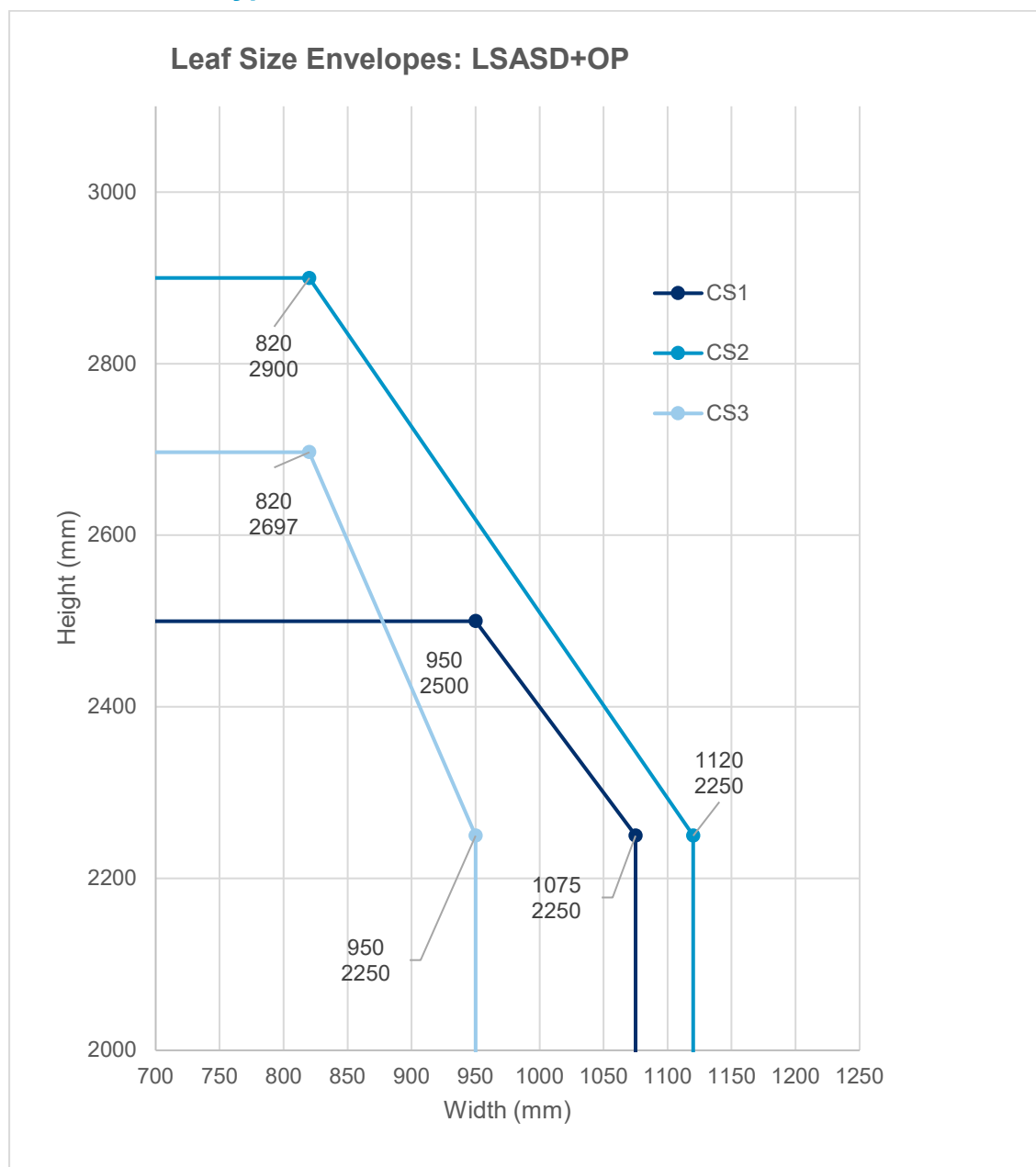
Intumescent Specification for LSASD with frame types 1 - 5			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
AS1 (RF14205 Revision A)	Type 617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p>
AS2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head: 1No 25 x 1.8mm seal exposed and fitted centrally to the thickness of the leaf.</p> <p>Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p>
AS3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head: 1No 25 x 4mm 8600 exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveal.</p>
AS4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveal.</p>

4.5.6 ULSASD Configuration: Leaf Sizes & Intumescent Specification, frame types 1 to 5



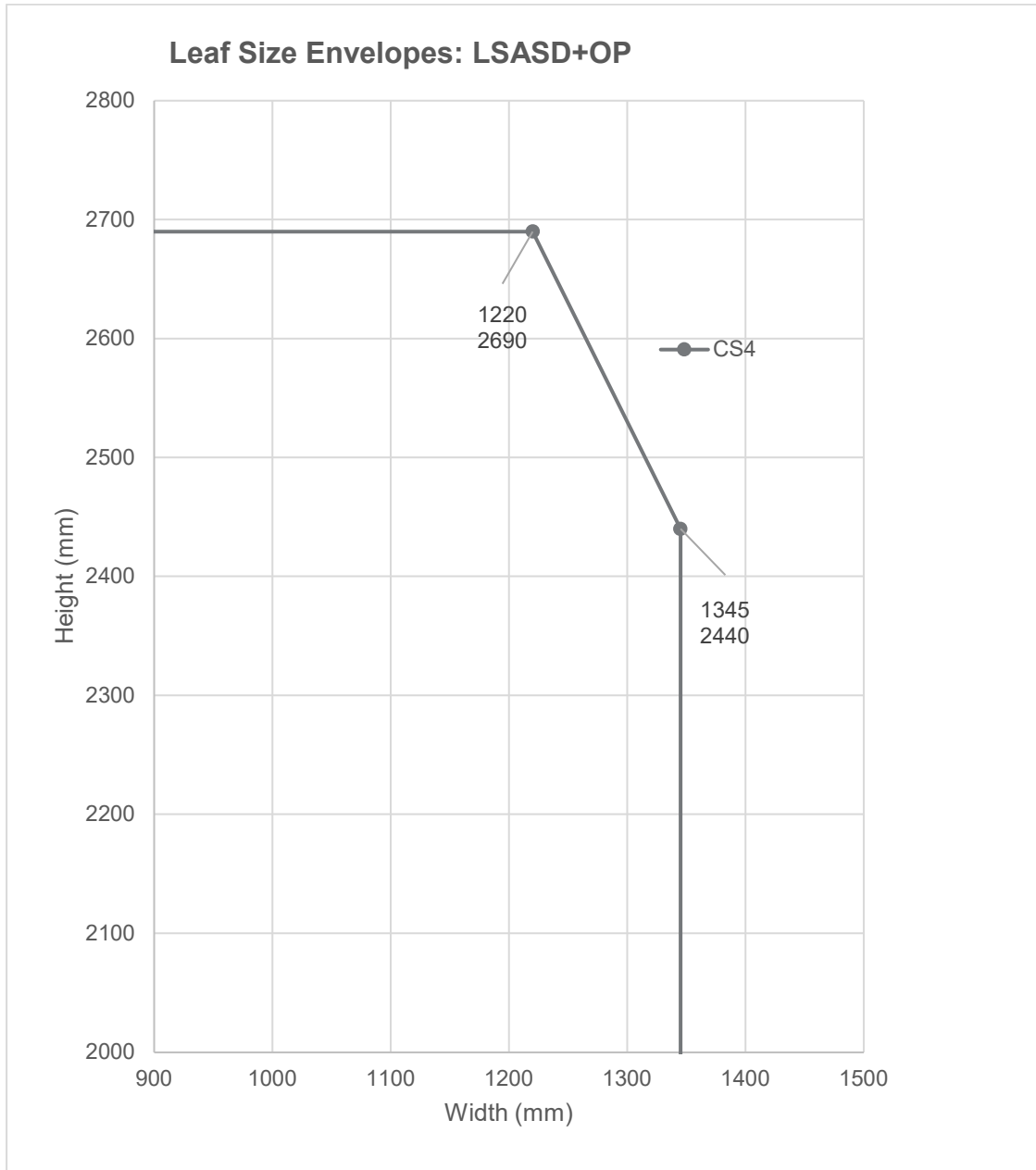
Intumescent Specification for ULSASD with frame types 1 - 5			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
BS1 (RF14205 Revision A)	Type 617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p>
BS2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head: 1No 25 x 1.8mm seal exposed and fitted centrally to the thickness of the leaf.</p> <p>Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p>
BS3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head: 1No 25 x 4mm 8600 exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveal.</p>
BS4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveal.</p>

4.5.7 LSASD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 3



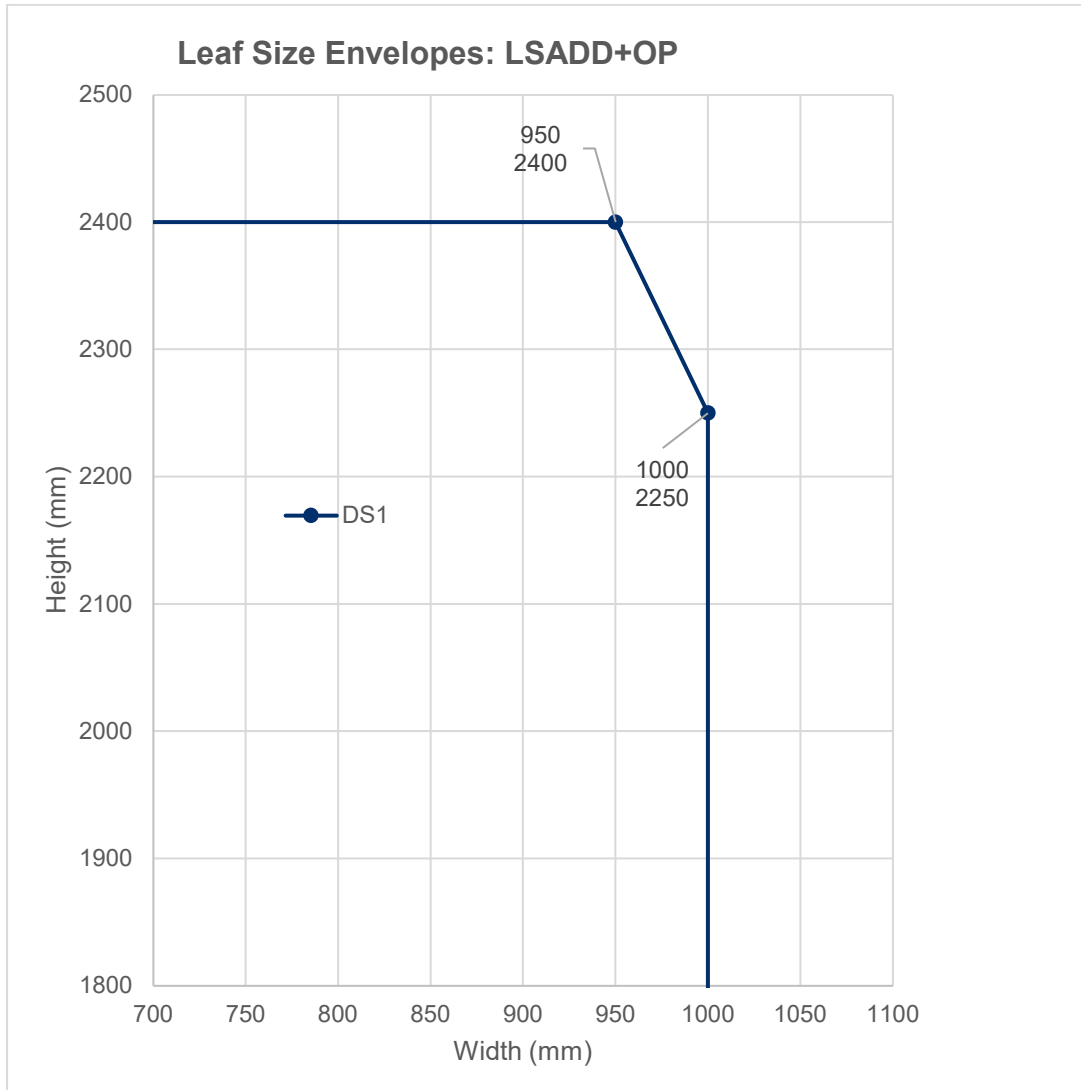
Intumescent Specification for LSASD+OP with frame type 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
CS1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveals.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>
CS2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head & Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p> <p>Overpanel: 1No 25 x 1.8mm seal exposed and fitted centrally in the panel bottom edge</p>
CS3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head & Jambs: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveals.</p> <p>Overpanel: 1No 25 x 4mm 8600 seal exposed and fitted centrally in the panel bottom edge</p>

4.5.8 LSASD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 2 or 3



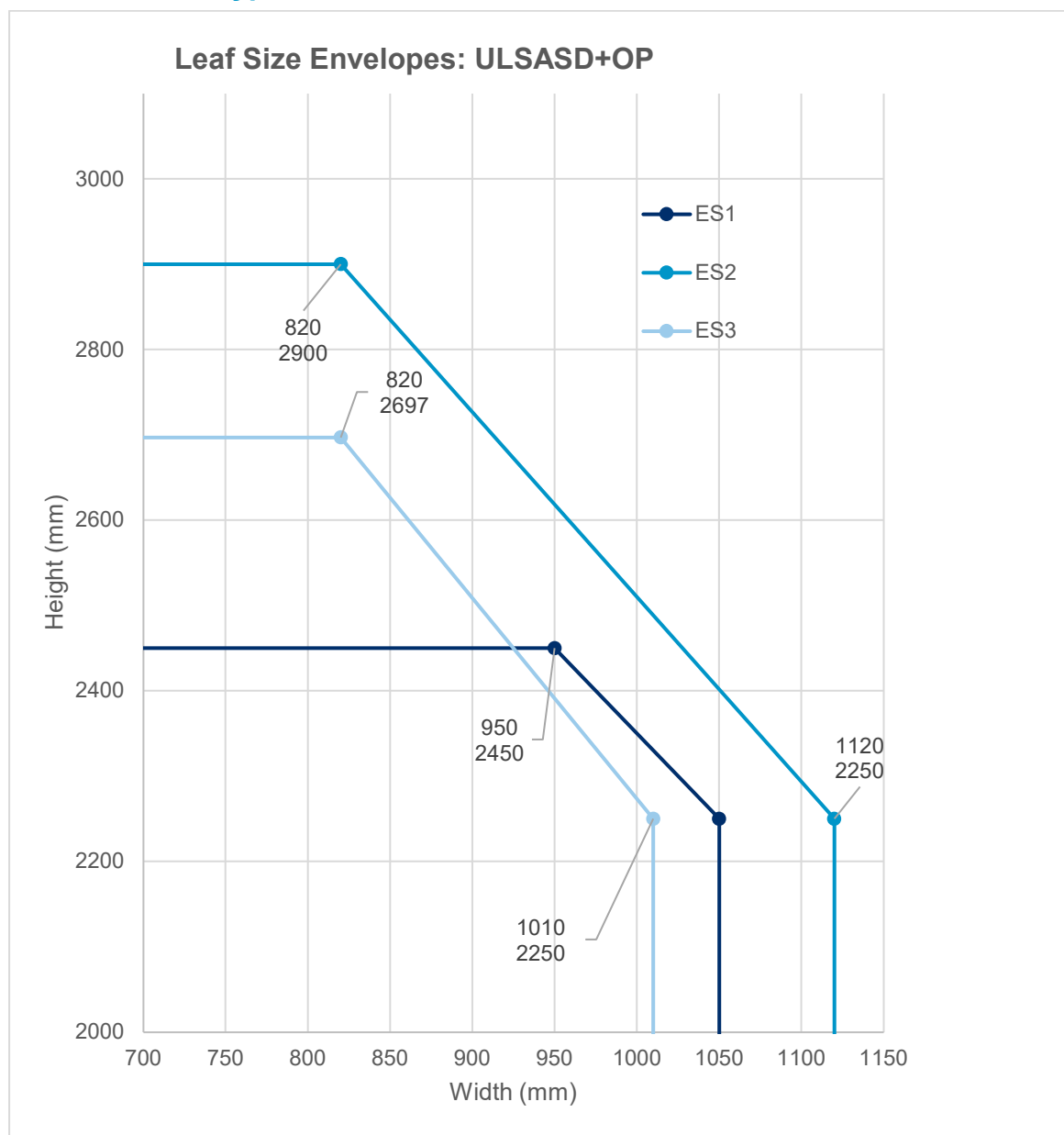
Intumescent Specification for LSASD+OP with frame type 2 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
CS4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveals.</p> <p>Overpanel: 1No 15 x 4mm exposed and fitted centrally in the panel bottom edge</p>

4.5.9 LSASD+OP Configuration: Leaf Sizes & Intumescent Specification, frame types 1 or 3



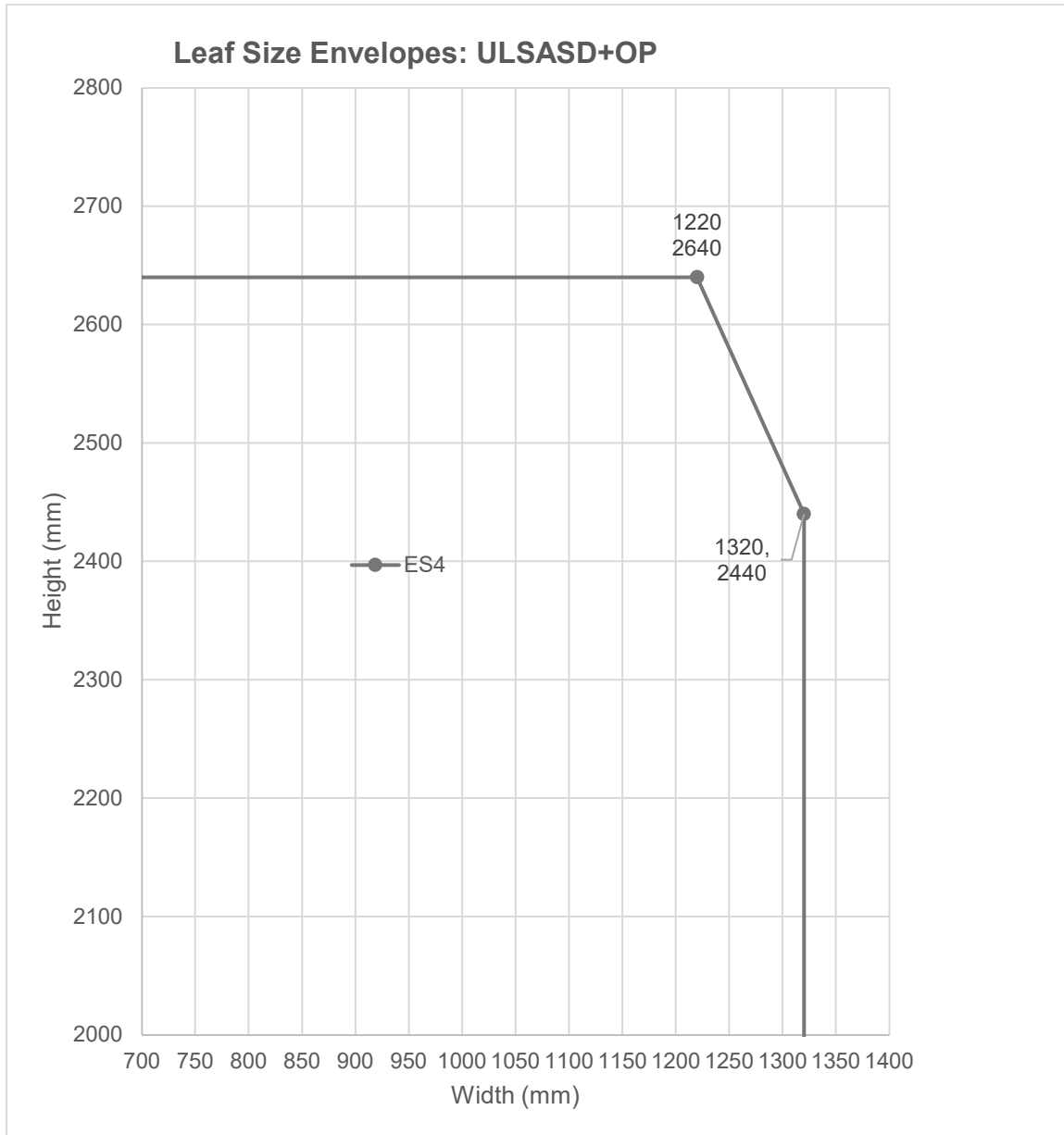
Intumescent Specification for LSASD+OP with frame types 1 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
DS1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveals.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>

4.5.10 ULSASD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 3



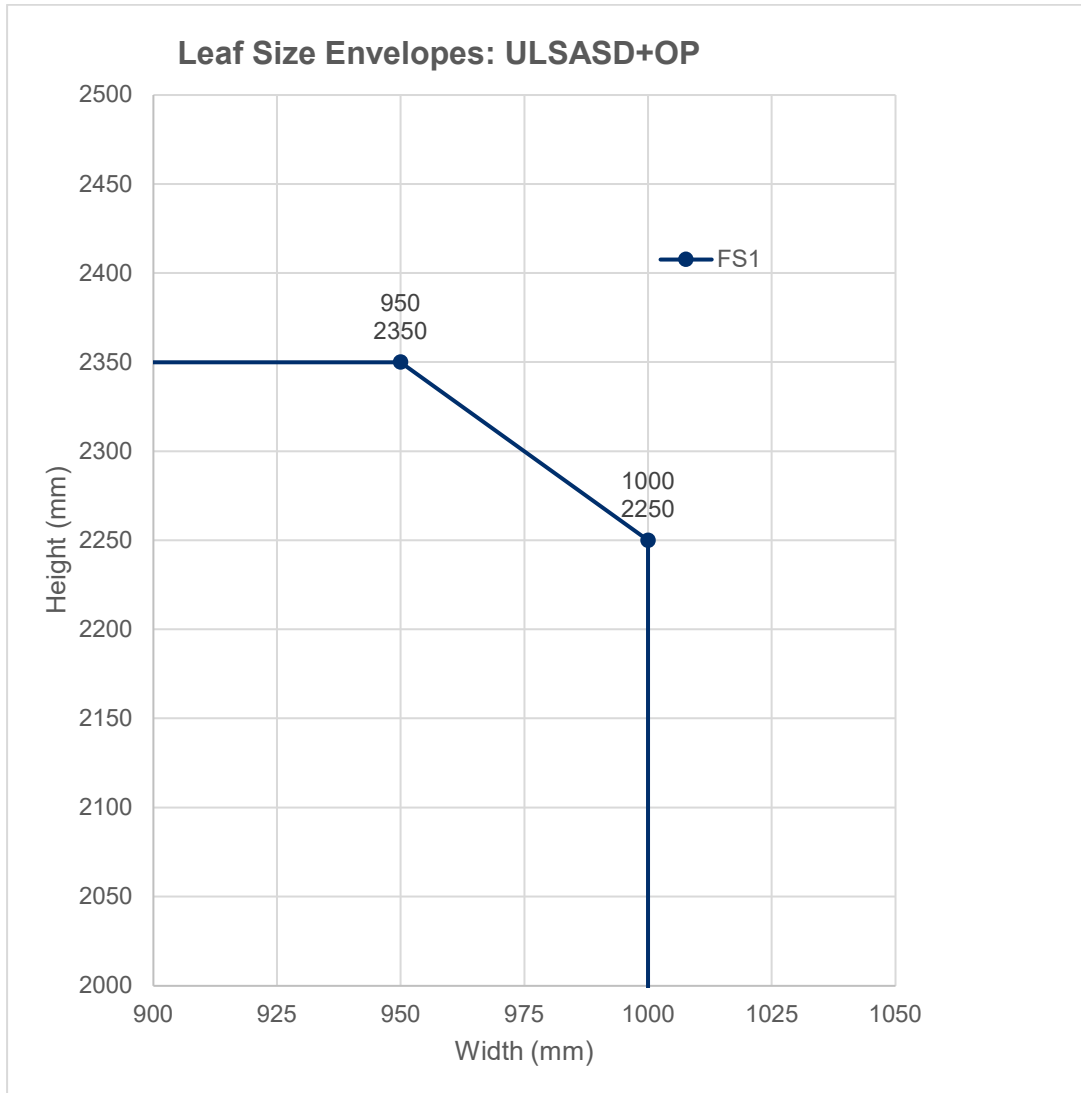
Intumescent Specification for ULSASD+OP with frame type 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
ES1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveals.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>
ES2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head & Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p> <p>Overpanel: 1No 25 x 1.8mm seal exposed and fitted centrally in the panel bottom edge</p>
ES3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head & Jambs: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveals.</p> <p>Overpanel: 1No 25 x 4mm 8600 seal exposed and fitted centrally in the panel bottom edge</p>

4.5.11 ULSASD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 2 or 3



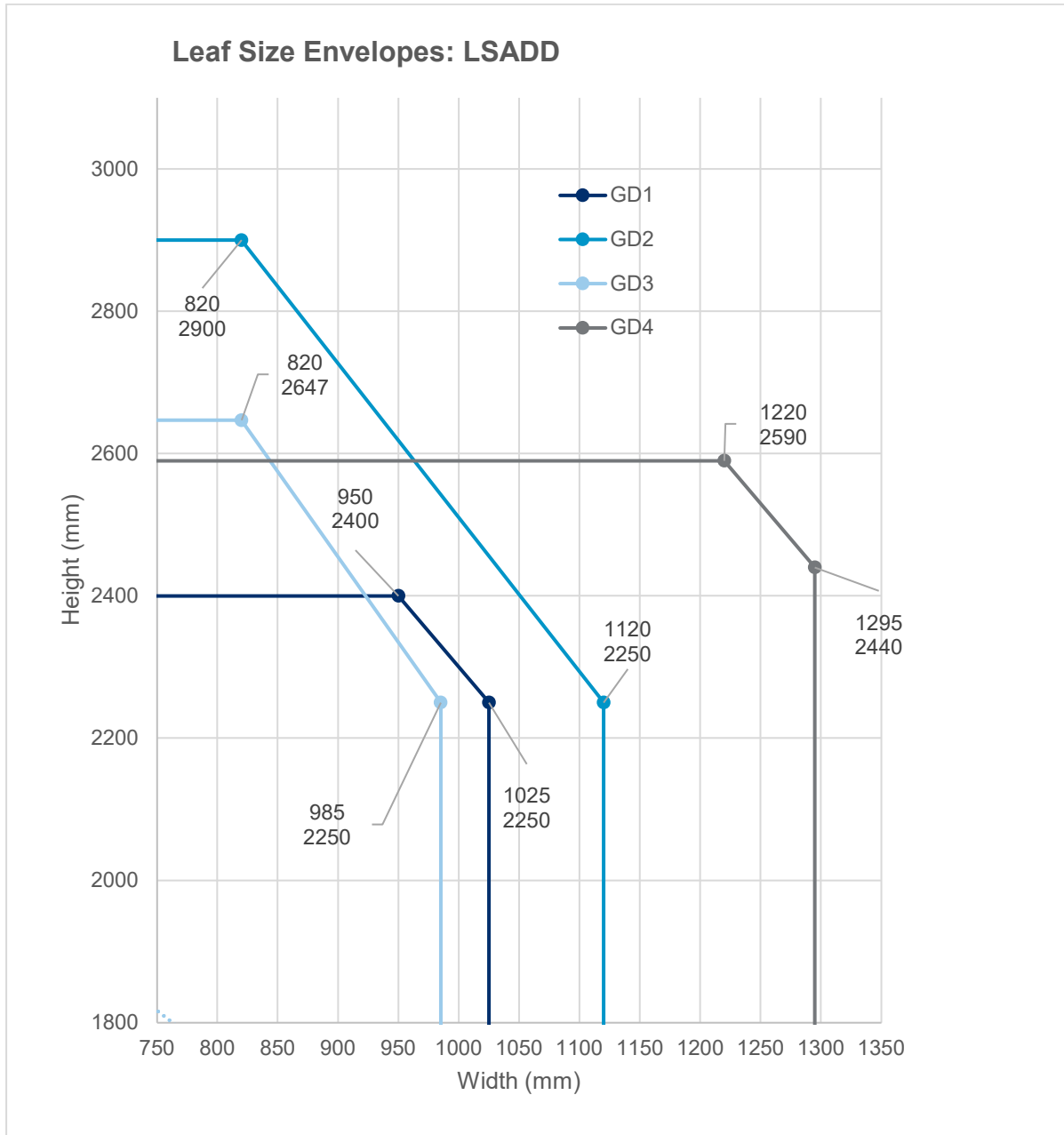
Intumescent Specification for ULSASD+OP with frame type 2 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
ES4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveals.</p> <p>Overpanel: 1No 15 x 4mm exposed and fitted centrally in the panel bottom edge</p>

4.5.12 ULSASD+OP Configuration: Leaf Sizes & Intumescent Specification, frame types 1 or 3



Intumescent Specification for ULSASD+OP with frame types 1 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
FS1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveals.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>

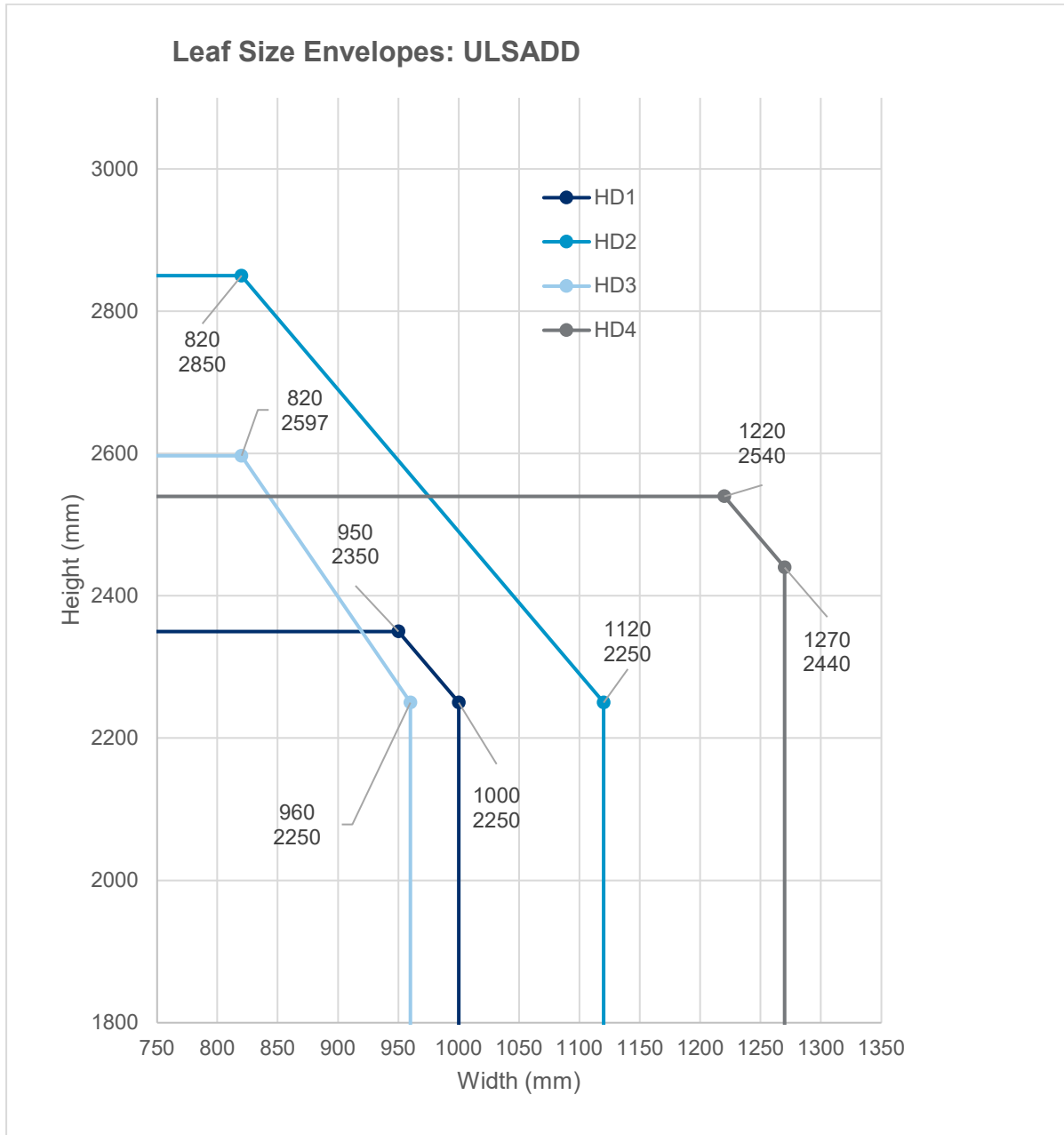
4.5.13 LSADD Configuration: Leaf Sizes & Intumescent Specification, frame types 1 to 5



Intumescent Specification for LSADD with frame types 1 to 5			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
GD1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Meeting Edge: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p>
GD2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head: 1No 25 x 1.8mm seal exposed and fitted centrally to the thickness of the leaf.</p> <p>Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p> <p>Meeting Edges: 1 No 15 x 1.8mm seal exposed and fitted 10mm from opening face in the primary leaf edge only.</p>
GD3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head: 1No 25 x 4mm 8600 exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveal.</p> <p>Meeting Edges: 1 No 15 x 4mm Triple flipper exposed and fitted 10mm from opening face in the primary leaf edge only.</p>

Intumescent Specification for LSADD with frame types 1 to 5			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
GD4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveals.</p> <p>Meeting Edges: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p>

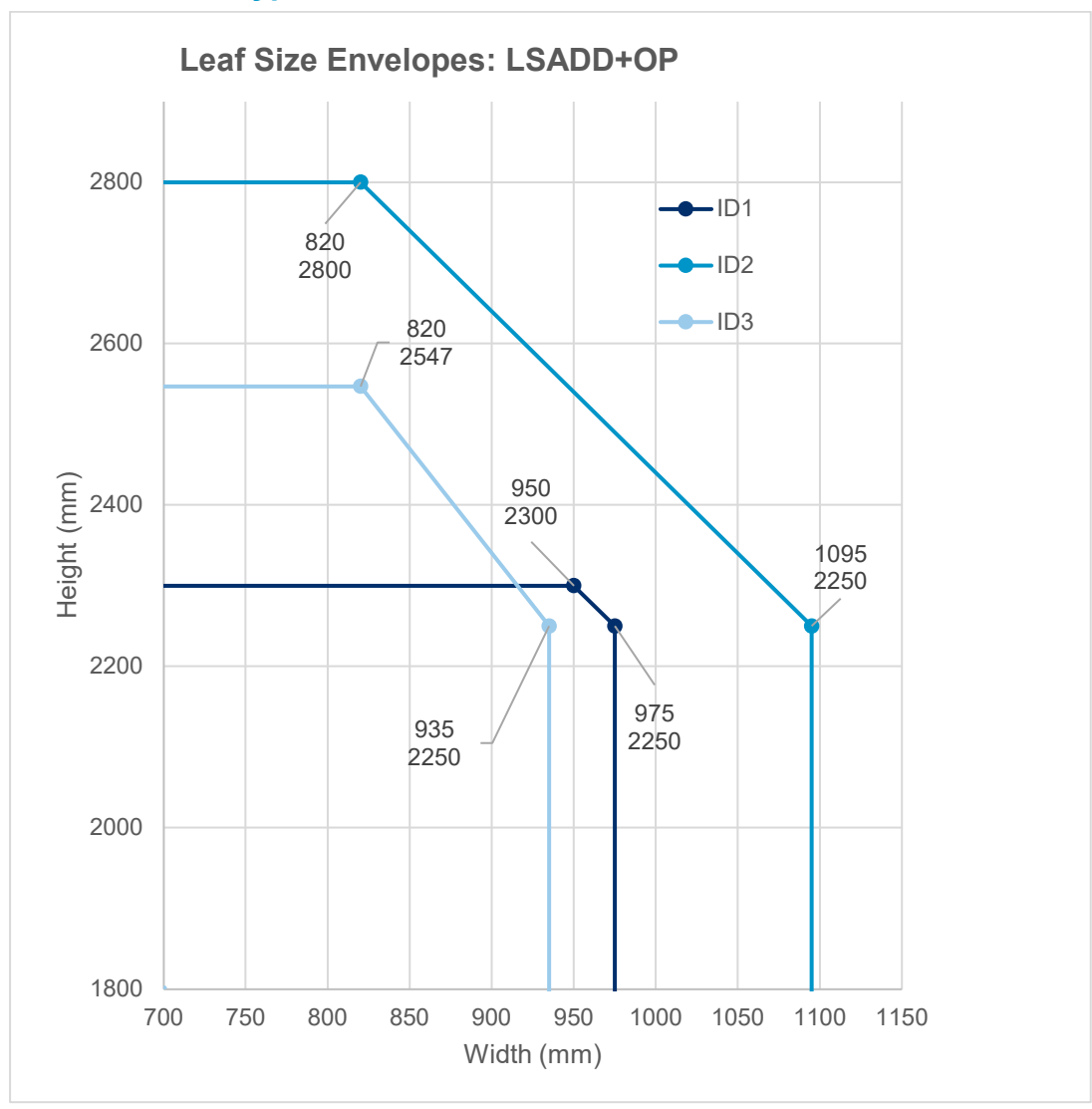
4.5.14 ULSADD Configuration: Leaf Sizes & Intumescent Specification, frame types 1 to 5



Intumescent Specification for ULSADD with frame types 1 to 5			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
HD1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Meeting Edge: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p>
HD2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head: 1No 25 x 1.8mm seal exposed and fitted centrally to the thickness of the leaf.</p> <p>Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p> <p>Meeting Edges: 1 No 15 x 1.8mm seal exposed and fitted 10mm from opening face in the primary leaf edge only.</p>
HD3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head: 1No 25 x 4mm 8600 exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveal.</p> <p>Meeting Edges: 1 No 15 x 4mm Triple flipper exposed and fitted 10mm from opening face in the primary leaf edge only.</p>

Intumescent Specification for ULSADD with frame types 1 to 5			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
HD4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveals.</p> <p>Meeting Edges: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p>

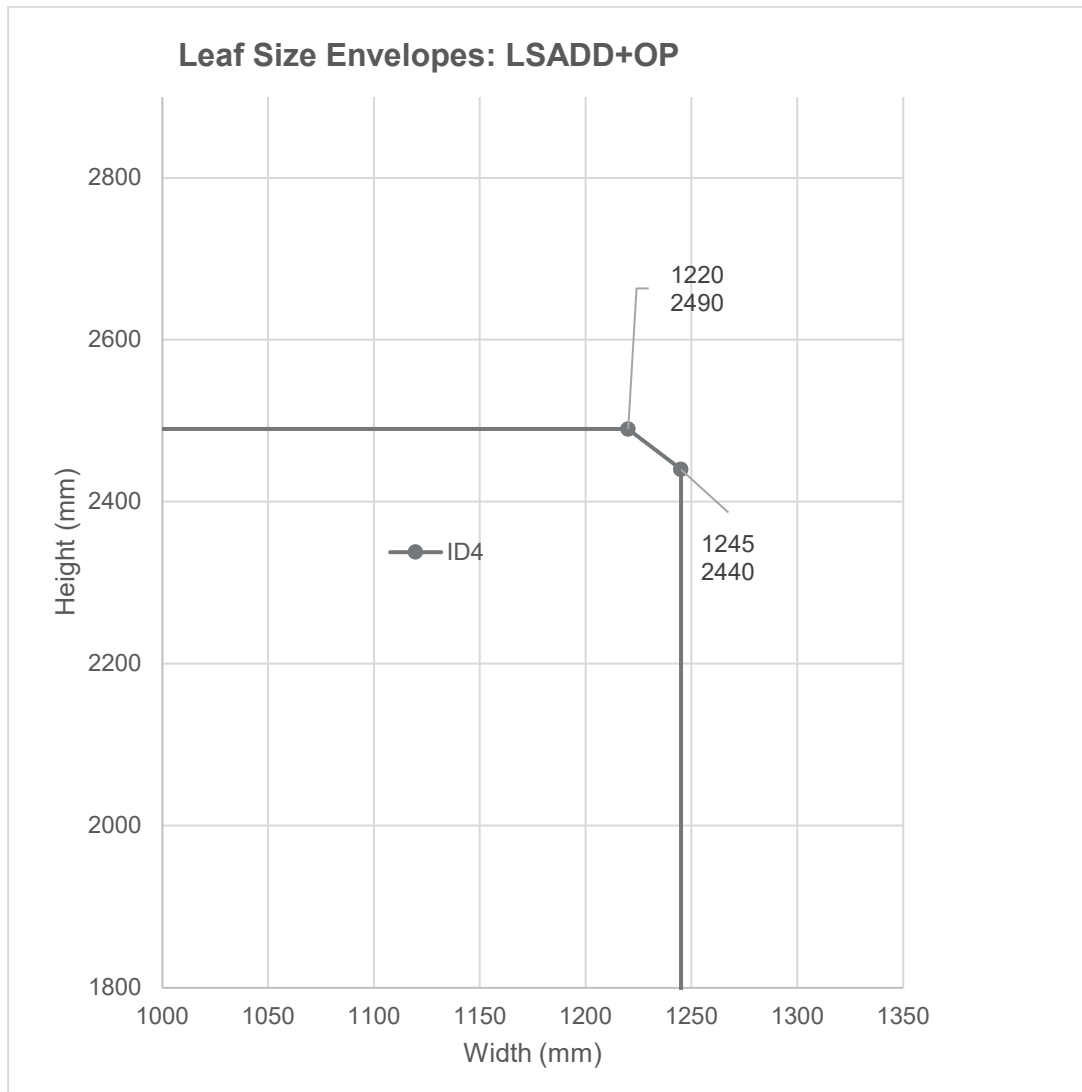
4.5.15 LSADD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 3



Intumescent Specification for LSADD+OP with frame type 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
ID1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Meeting Edge: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>
ID2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head: 1No 25 x 1.8mm seal exposed and fitted centrally to the thickness of the leaf.</p> <p>Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p> <p>Meeting Edges: 1 No 15 x 1.8mm seal exposed and fitted 10mm from opening face in the primary leaf edge only.</p> <p>Overpanel: 1No 25 x 1.8mm seal exposed and fitted centrally in the panel bottom edge</p>

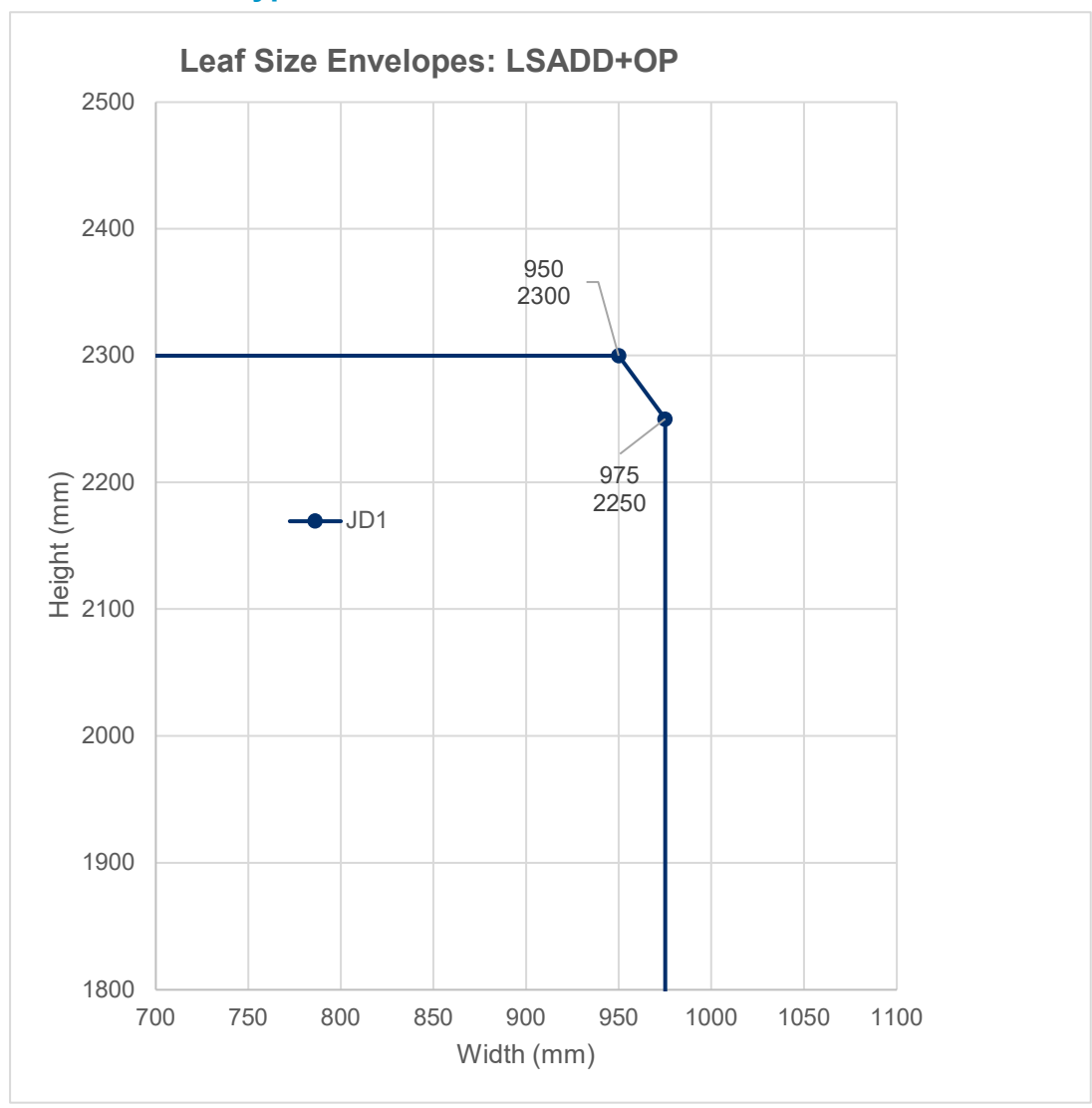
Intumescent Specification for LSADD+OP with frame type 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
ID3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head: 1No 25 x 4mm 8600 exposed and fitted centrally in the frame reveal.</p> <p>Jamb: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveal.</p> <p>Meeting Edges: 1 No 15 x 4mm Triple flipper exposed and fitted 10mm from opening face in the primary leaf edge only.</p> <p>Overpanel: 1No 25 x 4mm 8600 seal exposed and fitted centrally in the panel bottom edge</p>

4.5.16 LSADD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 2 or 3



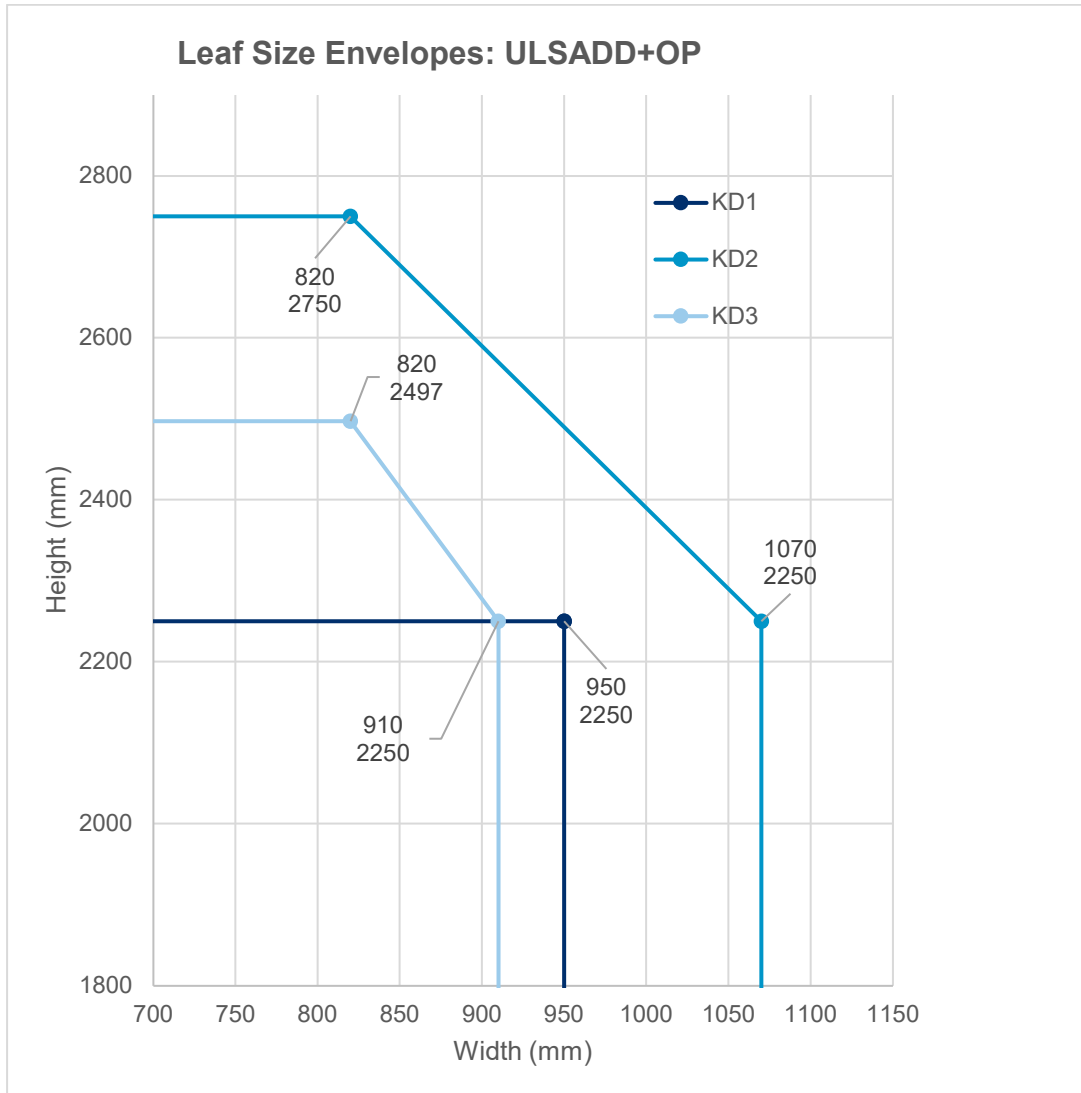
Intumescent Specification for LSADD+OP with frame type 2 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
ID4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveals.</p> <p>Meeting Edges: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p> <p>Overpanel: 1No 15 x 4mm exposed and fitted centrally in the panel bottom edge</p>

4.5.17 LSADD+OP Configuration: Leaf Sizes & Intumescent Specification, frame types 1 or 3



Intumescent Specification for LSADD+OP with frame types 1 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
JD1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Meeting Edge: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>

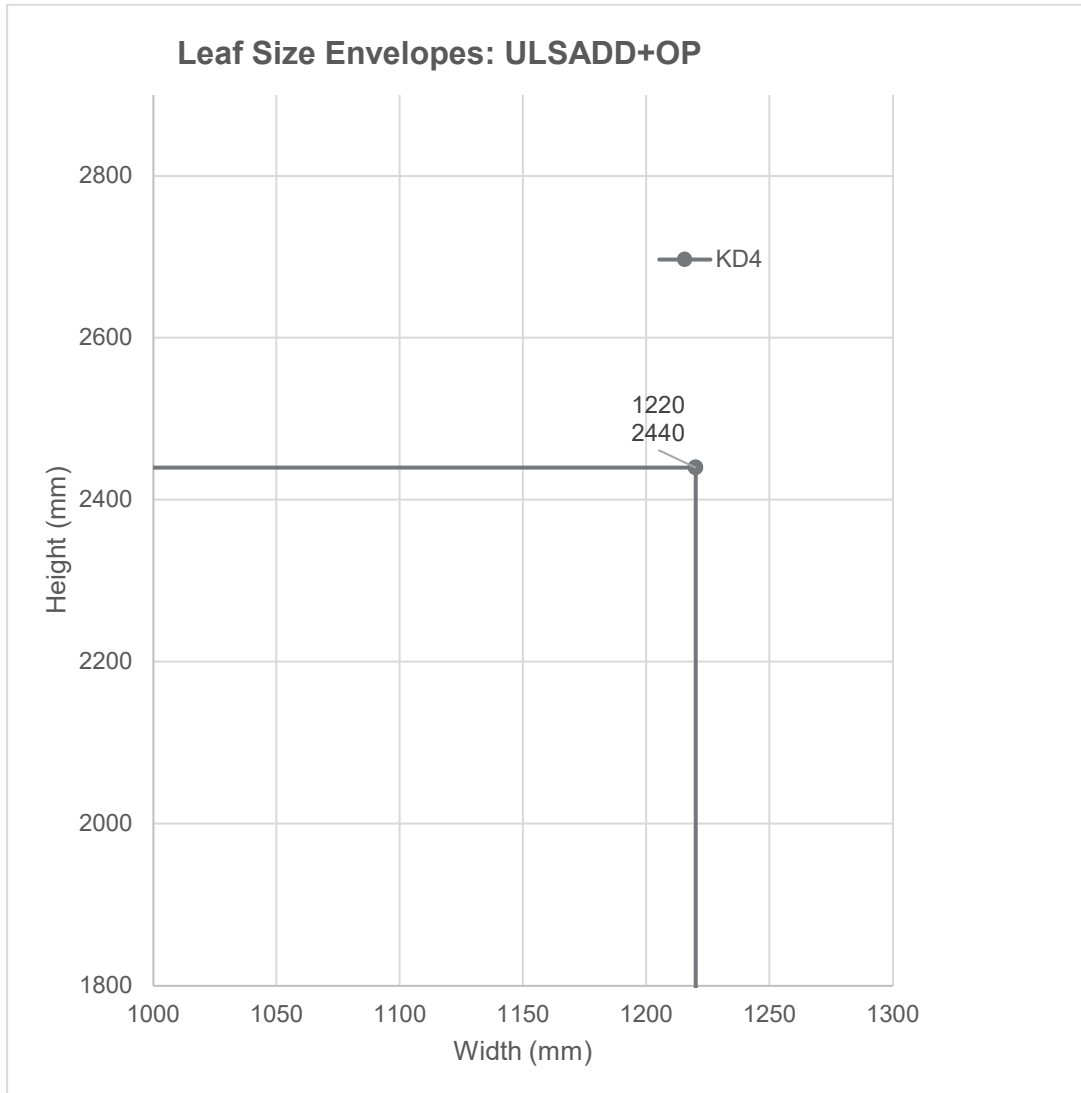
4.5.18 ULSADD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 3



Intumescent Specification for ULSADD+OP with frame type 1 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
KD1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Meeting Edge: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>
KD2 (F15040 Doorset A)	Odice	Odice S.A.S.	<p>Head: 1No 25 x 1.8mm seal exposed and fitted centrally to the thickness of the leaf.</p> <p>Jambs: 1No 15 x 1.8mm seal exposed and fitted 20mm from opening face in frame reveals.</p> <p>Meeting Edges: 1 No 15 x 1.8mm seal exposed and fitted 10mm from opening face in the primary leaf edge only.</p> <p>Overpanel: 1No 25 x 1.8mm seal exposed and fitted centrally in the panel bottom edge</p>

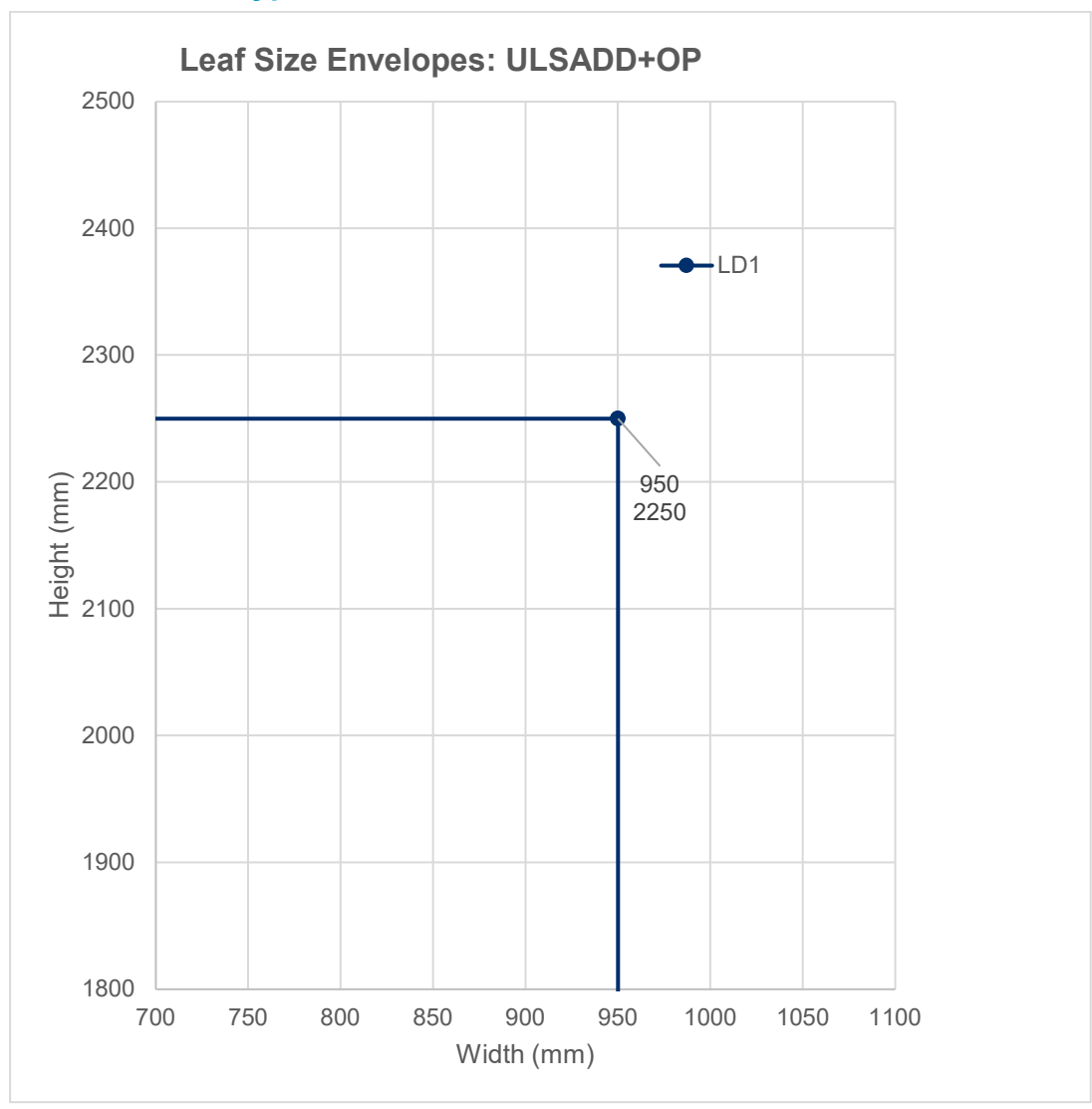
Intumescent Specification for ULSADD+OP with frame type 1 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
KD3 (F15040 Doorset B)	Rigid Box Seal 8600 +8700 & Triple Flipper 30141	Pyroplex Ltd	<p>Head: 1No 25 x 4mm 8600 exposed and fitted centrally in the frame reveal.</p> <p>Jamb: 1No 15 x 4mm 8700 seal exposed and fitted centrally frame reveal.</p> <p>Meeting Edges: 1 No 15 x 4mm Triple flipper exposed and fitted 10mm from opening face in the primary leaf edge only.</p> <p>Overpanel: 1No 25 x 4mm 8600 seal exposed and fitted centrally in the panel bottom edge</p>

4.5.19 ULSADD+OP Configuration: Leaf Sizes & Intumescent Specification, frame type 2 or 3



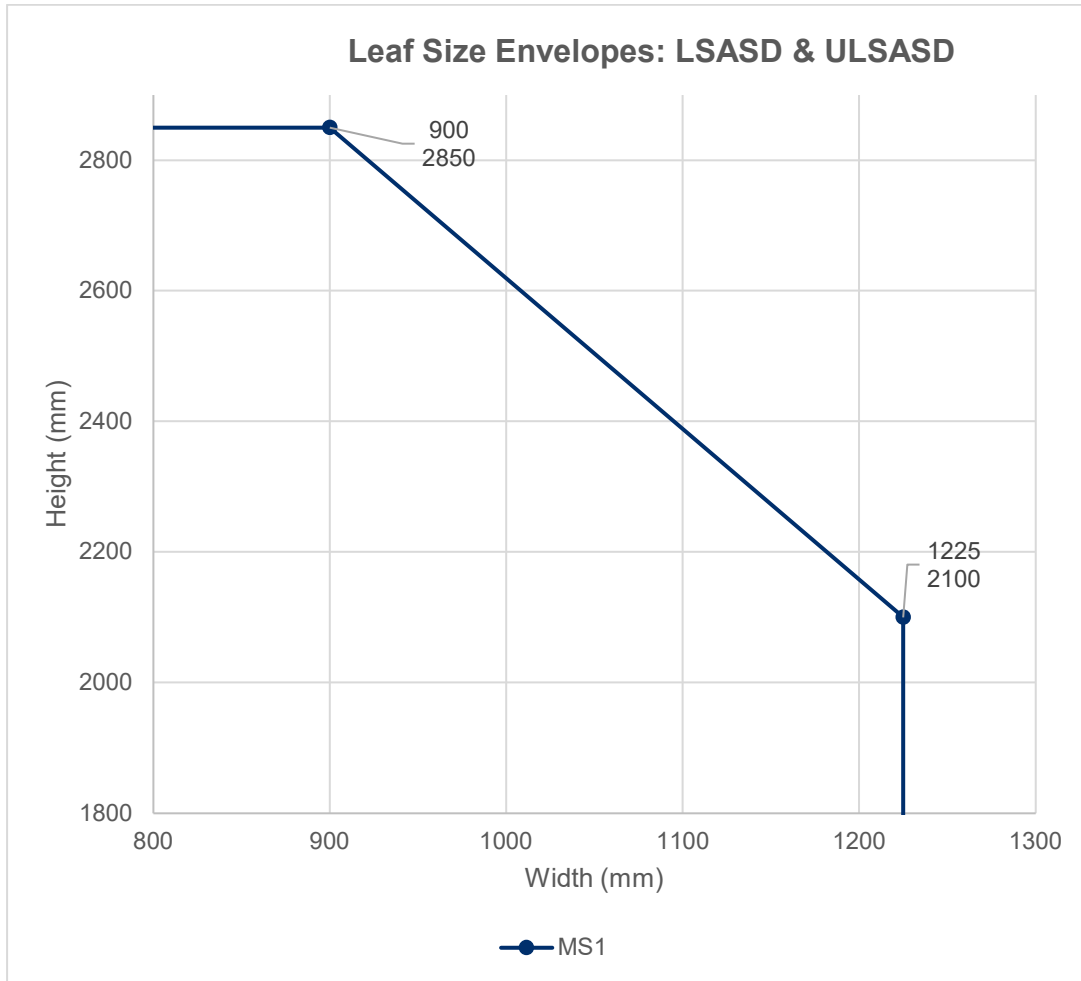
Intumescent Specification for ULSADD+OP with frame type 2			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
KD4 (DMT-DO-50-1433)	Pyrostrip 500P	Mann McGowan	<p>Head & Jambs: 1No 15 x 4mm exposed and fitted centrally frame reveals.</p> <p>Meeting Edges: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p> <p>Overpanel: 1No 15 x 4mm exposed and fitted centrally in the panel bottom edge</p>

4.5.20 ULSADD+OP Configuration: Leaf Sizes & Intumescent Specification, frame types 1 or 3



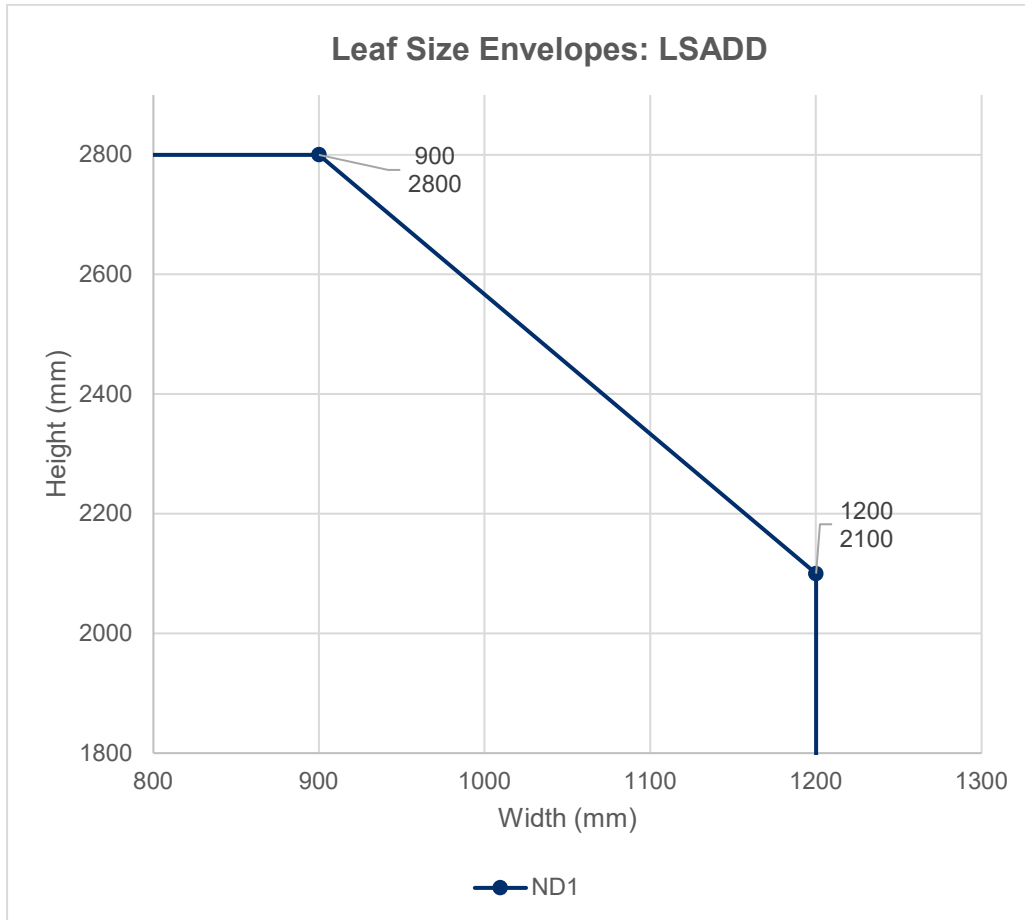
Intumescent Specification for ULSADD+OP with frame types 1 or 3			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
LD1 (RF14205 Revision A)	Type617	Lorient Polyproducts Ltd	<p>Head: 1No 20 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Jambs: 1No 15 x 4mm exposed and fitted centrally in the frame reveal.</p> <p>Meeting Edge: 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.</p> <p>Overpanel: 1No 20 x 4mm exposed and fitted centrally in the panel edge or frame reveal</p>

4.5.21 LSASD & ULSASD Configuration: Leaf Sizes & Intumescent Specification/ CS Edge Protectors/Acrovyn Wrap



Intumescent Specification for LSASD & ULSASD			
Laminesse FireSound 44mm Doorsets – CS Edge Protectors/Acrovyn Wrap			
Intumescent Spec. Reference & (Chilt/RF11059)	Make / Type	Manufacturer / Supplier	Location & Size
MS1	Type 617	Lorient Polyproducts Ltd	Head & Jambs: 1No. 20 x 4mm strips centrally fitted in the leaf head or frame reveal.

4.5.22 LSADD Configuration: Leaf Sizes & Intumescent Specification/ CS Edge Protectors/Acrovyn Wrap



Intumescent Specification for LSADD Laminese FireSound 44mm Doorsets – CS Edge Protectors/Acrovyn Wrap			
Intumescent Spec. Reference & (Chilt/RF11059)	Make / Type	Manufacturer / Supplier	Location & Size
ND1	Type 617	Lorient Polyproducts Ltd	<p>Head & Jambs:</p> <p>1No. 20 x 4mm strips centrally fitted in the leaf heads or frame reveal.</p> <p>Meeting Edge:</p> <p>1No. 15 x 4mm strip centrally fitted in the meeting edge of both leaves.</p>

5 General Description of Construction

5.1 Leaf Core 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. 3mm MDF facings - minimum density 750kg/m³
2. HDF (High Density MDF or HD-MDF) - minimum density 821kg/m³.

Notes:

1. The leaf must be lipped as specified in section 5.3.
2. The minimum leaf thickness after calibration is 43mm (i.e. a maximum of 0.5mm from both sides).
3. The minimum leaf thickness after finishes applied is 44mm.
4. Leaf Edge Inserts

Where softwood lippings are specified, as detailed in section 5.3, timber inserts must be inserted behind the lippings to vertical and top edges of the leaf and bottom edge of flush overpanels, glued into grooves, central to the leaf edges.

- Inserts must be softwood or hardwood of minimum density of 448kg/m³
- Vertical edge inserts must be 27mm wide x 8mm
- Top edge insert must be increased to 27mm wide x 20mm thick when the slide rail of a concealed closer is proposed for use.
- Insert to the bottom edge of flush overpanels must be 27mm wide x 8mm thick
- Adhesive must be PUR.
- Joints in the inserts along their length are not permitted.

5.2 Leaf Size Adjustment During Manufacture

Door leaves may be altered as follows prior to the machining for hardware.

Element	Pre-Machining Leaf Size Adjustment Specification
Leaf	The size of the leaf may be reduced in height or width without restriction for manufacturing purposes, providing the finished leaf is lipped in accordance with section 5.3
Timber Lipping	The timber lipping thickness can be reduced after it has been glued in place providing it is not reduced below the minimum stated in section 5.3

5.3 Timber Lippings

The testing documented in Appendix A has generally been undertaken using 5 - 12mm thick lippings applied to all edges using species at varying densities. A number of different adhesives have also been used to seal the lippings.

On the above basis, Moralt Laminesse FireSound 44mm door blanks must be lipped with the following specification, for all leaf types and solid panels (overpanels or sidepanels), where appropriate.

Material	Size (mm)	Min Density (kg/m ³)
Hardwood	<ol style="list-style-type: none"> 1. Flat = 8 – 13 thick 2. Rounded = Not Permitted 3. Rebated = Not permitted. 	640
Softwood ¹	<ol style="list-style-type: none"> 1. Flat = 5 – 6 thick 2. Rounded = Not Permitted 3. Rebated = Not permitted. 	448

Notes:

1. Softwood lippings may only be used where Mann McGowan Pyrostrip 500P leaf edge seals are also specified, doorsets must be installed in frame type 2 or 3 only. Timber inserts as detailed in section 5.1 must always be installed behind softwood lippings.
2. All lippings are to be the same thickness as the door leaf.
3. Overpanels separated from the leaf heads with a transom must be lipped on all edges.
4. Overpanels flush with the leaf heads must be lipped on all edges.
5. Single and double door leaves must be lipped on all edges.
6. Lippings can be bonded with UF or PU. These may be hand applied or may be applied using an edgebander. With either method it must be ensured that sufficient glue is applied to across the entire surface area between the 2No substrates being adhered to guarantee a robust bond. Other manufacturers guidance should be followed, for either installation application.
7. For flat lippings it is permitted to apply maximum 8mm radius to the corners of the lipping at vertical edges to create a maximum 2mm edge profiling.
8. If flat lippings are used on a doorset which includes a flush overpanel refer to section 5.7 for astragal requirements.

5.4 PVC Edge Protectors & Post-Formed Facings

5.4.1.1 CS Group Edge Protectors

The Moralt FireSound 44 designs have been assessed for use with CS Group edge protectors as detailed below. 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 leaf sizes in sections 4.5.21 or 4.5.22 for LSASD, ULSASD and LSADD configurations only.

CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

The CS Group Edge Protectors are not permitted with use of flush bolts located at the meeting edge.

Applied acoustic panels described in section 5.4.2 may abut the edge protector but must not over sail onto the leg of the edge protector.

5.4.1.2 Post-Formed CS Group Acrovyn

It is possible to encapsulate the Moralt FireSound 44 designs by post-forming the leaf in CS Group Acrovyn, based on the supporting test evidence in Chilt/RF11059, Chilt/IF13094 and Chilt/IF11010A for 30-minute applications and the following specification:

1. Configurations: LSASD, ULSASD & LSADD
2. CS Group Acrovyn may be wrapped around the vertical edges of the leaf, or the leaf can be fully encapsulated on all four edges.
3. Prior to post-forming, all leaf edges 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 section 5.3). 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 details as specified in sections 4.5.21 or 4.5.22 must be replicated.
6. CS Group Acrovyn must be bonded to the leaf using 3M Scotch-Grip cement 10 contact adhesive.
7. See sections 4.5.21 or 4.5.22 for maximum permitted leaf sizes.
8. The maximum thickness of CS Group Acrovyn used must be 2mm, as per test evidence.
9. It is permitted to hang leaves fitted with CS Group Acrovyn in solid timber door frames (i.e. frame types 1 to 3) only, meeting the specification given in section 7.
10. Not permitted with the use of flush bolts located at the meeting edge.

5.4.1.3 Locks and Latches for PVC Edge Protectors/Post-formed Doorsets

Only 1No. lock or latch shall be applied within any individual doorset which includes PVC edge protectors or post-forming. When fitted the lock or latch body shall be installed within the vertical edge of the door leaf in all cases, in all instances the location of the handle must be between 850 – 1200mm from the threshold. Refer to specific notes contained within each section for further considerations on lock or latch type.

These items are suitable in the following applications only:

Frame options: 1 & 3 (see table in section 7)

Configurations: LSASD & LSADD

The table below details the latches and locks that were tested with the edge protectors. To be fitted to a doorset with edge protectors, they must also be permitted in the primary doorset assessment the edge protectors are being fitted to.

Element	Manufacturer & Product Reference
Locks & latches	1. Arrone steel mortice latch with 157(h) x 22(w) forend plate

Alternatively, components with the following specification, are also deemed acceptable.

Element	Specification
Maximum forend and strike plate dimensions	215mm high x 25mm wide x 4mm thick
Maximum body dimensions	150mm high x 100mm wide x 20mm thick
Intumescent protection	Not required
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point $\geq 800^{\circ}\text{C}$

5.4.2 Acoustic / Cladding Panels

Panels may be applied to the face of the door leaf, meeting the following limitations:

1. Permitted doorset configurations: LSASD, ULSASD, LSADD, ULSADD
2. Permitted Cladding Panel Specification
 - Moralt Acoustic Panel - thickness upto 27mm as tested in DMT-DO-50-1446 and DMT-DO-50-1447. See note 13 below for aluminium faced panels.
 - Panels consisting of timber lamels with MDF facings or MDF panels – maximum thickness 27mm

The inclusion of cladding panels adds significant weight to each door leaf and overall doorset weight. This must be considered when specifying hinges, closer and other hardware that has an impact on the operation of the door leaf along with sufficient fixity to the supporting construction.

Any proposed weight increase should be carefully considered, and guidance must be sought from the hardware manufacture(s) and/or Moralt AG to ensure that the selected hardware is sufficiently capable of supporting the leaf weight and that controlled operation of the door leaf is achievable at the required dimensions and resultant leaf weight.

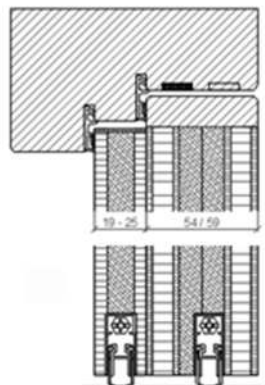
Fitment of panels must not impede the operation of the door leaf.

3. Based on the successful testing of the applied panel in fire tests DMT-DO-50-1446 & DMT-DO-50-1447 the maximum permitted weight and dimensions for applied panels up to 29mm thick must not exceed:
 - Maximum Height: 2345mm
 - Maximum Width: 940mm
 - At a maximum area of: 1.92m²
 - Maximum Weight of Applied Panel: 39kg.

Note: The above permitted weight and dimensions are based on the size and recorded density of the panels within DMT-DO-50-1446 & DMT-DO-50-1447.

4. Cladding panels are permitted to be fitted to the stop (closing) side of the door leaves only.
5. Cladding panels may be lipped if required as per the leaf lipping details in Section 5.3. Lippings for the panel and leaf edges must be separate.
6. Decorative or protective facings may be applied as outlined in Section 5.5.
7. It is not permitted to use cladding panels in combination with PVC edge protectors or PVC leaf encapsulation.
8. Cladding panels are not permitted to be used with glazed doorsets
9. The panels must not be fitted under the frame stop, i.e. the panels may not be full width of the leaf on the closing face. However, where clad on panels are used, it is permitted to extend the door frame to be double rebated where the panel would be under the second stop area as detailed in section 7.9.
10. Other than dropseals as discussed in note 15 below and section 7.9, hardware that requires fitting within a mortice may not be installed within cladding panels. Holes required through the cladding panel to allow access to hardware fitted within the door leaf (e.g. door handles, through fixings, door viewers, letterplates etc.) must be lined with either 1mm Interdens or graphite based intumescent material.

11. Hardware such as surface mounted closers, maglocks, electronic entry systems, pull or lever handles must not be fixed solely to the applied panel. One of the options noted below must be used:
- Extended fixings (penetrating into a maximum of $\frac{1}{3}$ of the leaf thickness),
 - Through fixings (bored through the panel and door leaf).
 - A margin from the leaf edge to the panel to accommodate the hardware.
12. The cladding panel is to be fixed using either:
- Knapp Duo secret fixings with 2 No. screw fixings at each location - Ø3 x 16mm into the panel and Ø3 x 25mm into the face of the door leaf. The Knapp Duo fixings are to be positioned at 50mm in from the corners of the panel and at maximum 360mm spacing in both the height and width of the door leaf. All recessing required for the Knapp Duo fixings is to be into the panel.
 - Button fixings with 3 No. screw fixings at each location - Ø3 x 16mm into the panel and Ø3 x 25mm into the face of the door leaf. The Button fixings are to be positioned at 50mm in from the corners of the panel and at maximum 290mm spacing in both the height and width of the door leaf. All recessing required for the button fixings is to be into the panel.
- Note:** The length of the fixings into the panel may be increased to suit the thickness of the panel.
13. As tested in DMT-DO-50-1446, a maximum 2mm thick aluminium sheet may be adhered to the Moralt Acoustic Panel using silicon-based sealant/adhesive. The aluminium sheet must not return around any side of the cladding panel.
14. Grooves and panel recessing – the cladding panels (except where faced with aluminium) may be grooved to any design. The depth and/or width of any grooves or recessing is not restricted provided the grooves do not cut into the facings described in section 5.1. In addition, any machining over the fixing locations of the cladding panel must retain a minimum cladding panel thickness of 18mm.
15. Threshold drop-seals meeting the requirements of section 10.9.6 may be recessed into the bottom edge of the Moralt Acoustic Panel without compromising the fire resistance performance. It is beyond the remit of this assessment to comment on the effectiveness of a threshold seal installed in this location.
16. The fitting of environmental seals as discussed in section 10.9.5 is permitted as illustrated below.



5.5 Decorative & Protective Facings

Relatively thin leaf facing materials are deemed to be decorative and their application is not considered to be of detriment to the overall stability or performance of the doorset design. In fact, when applied as an additional component on top of the minimum facing material required by the door blank, they are likely to provide a small enhancement in performance as an additional barrier to fire spread, although, this is likely to be negligible.

The following additional facing materials are therefore permitted to the leaf for this door design since they would have limited influence under fire resistance test conditions.

Facing Material	Maximum Permitted Thickness (mm)
Paint ⁵	0.5
Timber veneers ³	2
Plastic laminates ³	2
PVC ³	2
Cellulosic and non-metallic foils ³	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates.
2. The door leaf thickness may be reduced on both sides by a maximum of 0.5mm for calibration purposes in order to accommodate the chosen finish. The minimum overall leaf thickness must remain at 44mm after finishing has been applied.
3. Materials may over sail lippings but must not return around leaf edges.
4. For all options, materials must not conceal intumescent strips.
5. Intumescent paints are not permitted.

Decorative finishes listed above may be painted within the limits for paint finish, above.

5.6 Decorative Planted on Timber Mouldings

Decorative mouldings can be applied to the Moralt Laminesse FireSound 44mm design providing the following criteria is adhered to:

The mouldings:

1. Are surface applied to the door
2. May not be applied in combination with acoustic panels as detailed in section 5.4.2
3. May not be applied in combination with post formed Acrovyn facings as detailed in section 5.4.1.2
4. Are no higher than 30mm i.e. proud of the door
5. Are no wider than 50mm
6. Cover no more than 20% of the door leaf area
7. Are no closer than 80mm to the door leaf edge
8. May be bonded in position or mechanical fixings may be used, which must penetrate no more than 25mm into the leaf
9. When bonded using any glue which is suitable for bonding the lipping of the door.

5.7 Astragal

The inclusion of timber astragals is permitted providing they meet the following specification:

- The astragal shall consist of the same material as the door frame used in doors assembly construction with at least the same or greater density.
- The astragal shall be mechanically fixed using steel screws at no greater than 150mm centres, the screws shall penetrate into the substrate by at least 15mm and no greater than $\frac{1}{2}$ the thickness of the substrate.
- The astragal shall be positioned centrally over the junction and be of minimum dimensions 50mm wide x 20mm thick.
- Astragals may be fitted concurrently with edge protectors.
- See section 8.1.2 for details when fitting an astragal to flush overpanels, which details take precedence over those above.

Other materials or dimensions of astragals are not permitted, the astragal may be encapsulated to the same specification as the leaf, detailed in section 5.4.1.2.

The addition of the astragal element will provide further protection at the perimeter gaps increasing the time in which failure modes may develop.

Astragals are permitted in the following designs:

- Optionally permitted at meeting edges of double doors.
- Required to be fitted at the junction between flush overpanel(s) and the top of the door leaf, see section 8.

Astragals may only be fitted to one side of any single doorset design.

When fitted to double doors, a door selector as defined within section 10.9.4 shall be fitted to the doorset to ensure functionality.

6 Glazing within the Leaf

6.1 General

The testing conducted on doorset design has demonstrated that they are capable of tolerating glazed apertures, whilst providing a margin of over performance, this is supported by the summarised test evidence within Appendix A.

Glazing is therefore acceptable within the following parameters.

Apertures must not be less than 120mm from top and side edges and 150mm from the bottom edge. (Supported by DMT-DO-50-1433).

Aperture shapes considered herein are rectilinear and as such are permitted unless alternative shapes are detailed within this document for specific glass or glazing systems.

Apertures cannot be rotated (e.g. a square to be rotated to create a diamond effect) unless explicitly stated within this document for specific glass or glazing systems.

Double glazed units are not permitted.

6.1.1 Maximum Permitted Glazed Aperture Dimensions

The maximum single assessed aperture area for any individual door leaf based on the test evidence detailed within Appendix A is as follows.

Maximum total permitted aperture within the door leaves (DMT-DO-50-1433)		
Maximum Height (mm)	Maximum Width (mm)	Maximum Area (m ²)
1508	435	0.57

Multiple apertures are acceptable within a permitted total assessed aperture area of 0.95m², with a minimum dimension of 100mm of core between apertures (as demonstrated in DMT-DO-50-1433).

Maximum glass thickness permitted is 16mm for single pane glazing.

Minimum glass thickness permitted is 7mm, as tested and may not be reduced.

The subsequent sections within this report detail the permitted glass and glazing systems with their associated size ranges permitted within the Moralt Laminasse FireSound 44mm doorset design.

The maximum glazed areas given in each subsection supersede those given above and must be adhered to. However, the dimensional restrictions given above shall not be exceeded under any circumstance.

It is possible to include glass within the door leaf at smaller dimensions than given for any particular glass type or glazing system.

6.2 Certifire Single Pane Glass and Glazing System Options

Alternative glass and glazing systems with a Certifire certificate – valid at the date of manufacture of the doorset which has been written in accordance with Warringtonfire Testing & Certification Ltd, Technical Schedule TS25 - may be used to glaze the Moralt Laminasse FireSound 44mm door design, subject to the following.

- The minimum thickness of glass permitted for alternative glass types is 7 mm.
- The maximum thickness of glass permitted for alternative glass types is 16mm.
- Where a Certifire certificate is utilised to justify glazing the doorset, the full requirements given within that certificate for the glass and glazing system specified must be complied with.
- All parameters in section 6.1 above must take precedence over those in the supporting Certifire certificate, e.g. the glazed area, maximum height and width permitted in section 6.1 above may not be increased on the basis of the area, height and width permitted within the Certifire certificate. If the area, height and width in the proposed Certifire certificate is smaller than that in section 6.1, the smaller dimension will take precedence for the proposed glass or glazing system.
- The general requirements within the proposed Certifire certificate are still applicable, the Certifire certificate must include the option for the certificated glass and / or glazing system to be fitted within a timber / cellulosic based door leaf within a timber / cellulosic frame with a leaf thickness of 44mm. Where the Certifire certificate requires a timber aperture liner, these must always be fitted.
- Bead fixings – The required pin or screw specification as given in the supporting Certifire certificate must be used, alternatives fixing details are not permitted.

6.3 Single Pane Glass and Glazing Systems (Timber Beading)

The tested and assessed glass and glazing system(s) combinations, detailed within the table below may be used, subject to the limitations and scope detailed in section 6.1 above.

The table below specifies the maximum assessed height, width and area of glazing for each permitted glass type and glazing system.

The numerical figures in the main body of the table are the maximum height, width (m) & area of glass (in m²) that is considered acceptable for an individual glazed aperture, based upon the specific system. Where a '-' is applied the glass type and glazing system has not been considered compatible.

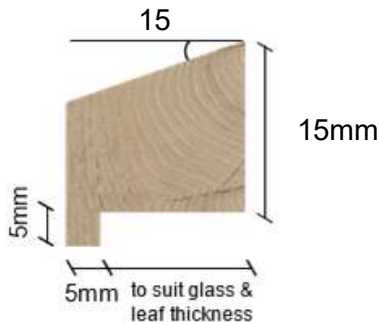

Glass & Glazing System Specification			Maximum Assessed Area (m ²), Height & Width (m)		
Glass Type Manufacturer	Thickness	System & Manufacturer	1	2	
			System 36Plus	Therm-a-Strip 10 x 2mm	
		Lorient Ltd	Intumescent Seals Ltd		
		Fire Test Reference	DMT-DO-50-1433		
1	Pyrobelite 7/30 AGC Glass	7	RF14205 Revision A	-	Area: 0.32 Height: 1.368 Width: 0.276
2	Pyrodur 30-105 Pilkington	7	DMT-DO-50- 1433	Area: 0.57 Height: 1.510 Width: 0.435	-

- All glass types must be fitted fully in accordance with the manufacturers tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.

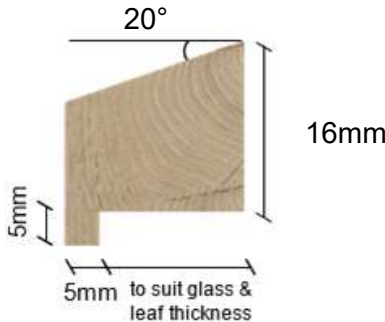

6.3.1 Permitted Glazing Beading and Glass Retention (Timber Beads)

The following sections detail the permitted glazing beading, aperture lining requirements and minimum fixing details for the above detailed glass and glazing systems. Each section deals with a specific type of glazing bead and indicates which glass and or glazing system it is applicable to. Glazing beads shall only be used with the permitted glass and glazing system as identified.

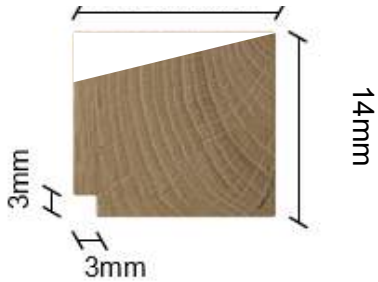
6.3.1.1 Chamfer Bead (Option 1)

Permitted Glazing Systems (Defined in Section 6.3)	1
	
<ul style="list-style-type: none"> • The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum. • The glazing beads must be created from hardwood of a minimum 448kg/m³ density. • Glazing beads must be retained in position with minimum length of 50mm long 3.2mm diameter screws, inserted at 15-30° to the vertical. • Fixings must be at 150mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3.2 below. • A 4 – 10mm thick square aperture liner is required for use with the above bead, which must be constructed from softwood or hardwood of minimum density 448kg/m³ and glued in position using a UF, PVA or PU type adhesive. • The fitting of the System 36Plus glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. • Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires 	

6.3.1.2 Chamfer Bead (Option 2)

Permitted Glazing Systems (Defined in Section 6.3)	2
	
<ul style="list-style-type: none"> • The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum. • The glazing beads must be created from softwood or hardwood of a minimum 640kg/m³ density. • Glazing beads must be retained in position with minimum length of 44mm long steel pins or 44mm long No. 6-8 screws, inserted at 35-40° to the vertical. • Fixings must be at 200mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are not acceptable. • A 4 – 10mm thick square aperture liner is required for use with the above bead, which must be constructed from hardwood of minimum density 480kg/m³ and glued in position using a PU type adhesive to all 4 edges of the aperture. • The fitting of the glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. An intumescent aperture liner is not required. • Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires. 	

6.3.1.3 Square Beads

Permitted Glazing Systems (Defined in Section 6.3)	1 only
<p>16mm wide, 15 degree chamfer</p>  <p>The diagram shows a square glazing bead with a 15-degree chamfer on the top-left corner. The overall width is 16mm and the height is 14mm. The chamfered edge has a depth of 3mm. The bottom-left corner is also chamfered with a 3mm depth.</p>	
<ul style="list-style-type: none"> • The glazing beads must be created from softwood or hardwood of a minimum 448kg/m³ density. • Glazing beads must be retained in position with minimum length of 50mm long 3.2mm diameter screws, inserted at 15-30° to the vertical. • Fixings must be at 150mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are not acceptable. • A 4 – 10mm thick square aperture liner is required for use with the above bead, which must be constructed from softwood or hardwood of minimum density 448kg/m³ and glued in position using a PU type adhesive to all 4 edges of the aperture. • The fitting of the System 36Plus glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. • Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires. 	

6.3.2 Pneumatically Fired Pins

The following pin specification is permitted and has been considered suitable for applications where a pin fixing is permitted for glazing beads.

Option 1 – Round, Oval & Rectangular Pins

The following dimension of pin has been approved for round, oval and rectangular shaped pins which are hand applied:

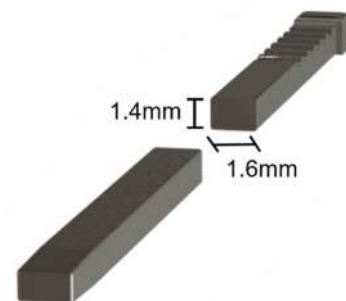
- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.03mm².
- Minimum linear dimension of 1.6mm in any direction, see figure below. The maximum pin diameter or any linear dimensions may be no greater than 2.0mm.



Option 2 – Gun (Pneumatically) Fired Rectangular Pins

The following dimension of rectangular pin has been deemed suitable for gun (pneumatically) fired applications.

- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.24mm².
- Minimum linear dimensions as shown in the figure.
- The 1.6mm dimension is predominately oriented perpendicular to the glass, where possible.
- The maximum pin diameter or any linear dimensions no greater than 2.0mm.



may be

Pins with dimensions less than those stated above are not covered by this assessment.

7 Door Frame Construction

The door frames listed below are the minimum size and density which have been successfully tested and assessed by this report. The frame must be constructed to meet the following specification for single and double acting frames, where applicable.

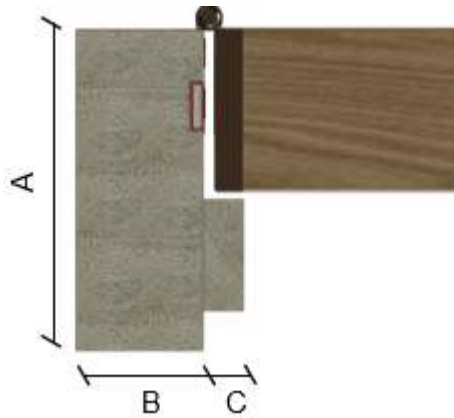
Frame Type	Material	Minimum Section Size (mm)	Minimum Density (kg/m ³)
1	Softwood / Hardwood	Frame: 70 (d) x 32 (w) (excluding stop) Stop: 14 (w) (integral or planted on)	510
2	Softwood	Frame: 100 (d) x 38 (w) (excluding stop) Stop: 15 (w) (integral or planted on)	448
3	Hardwood	Frame: 70 (d) x 30 (w) (excluding stop) Stop: 14 (w) (integral or planted on)	640
4	MDF	Frame: 70 (d) x 30 (w) (excluding stop) Stop: 14 (w) (integral or planted on)	720
5	Wood Ex30 Engineered Timber	Frame: 70 (d) x 32 (w) (excluding stop) Stop: 15 (w) (integral or planted on)	510

Notes:

1. Minimum section size is subject to size of hardware and the use of transomed overpanel (see frame details below).
2. If the doorset features a transomed solid 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 be straight grained, joinery quality, free from knots, splits and checks
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, the maximum radius to the corners of the leaf is 8mm
5. Frame joints must be one of the types shown in section 7.6, and with no gaps. All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws.

7.1 Details for Frame 1 - Standard frame detail

The diagram below shows detail of the standard frame construction. Minimum section is permitted in two sizes subject to hardware size and the use of transom overpanel. Any radius to the lipping must comply with section 5.3.



A: Frame depth = 70mm minimum

B: Frame width = 32mm minimum

C: Stop width = 14mm minimum

Minimum section size when using a transomed overpanel:

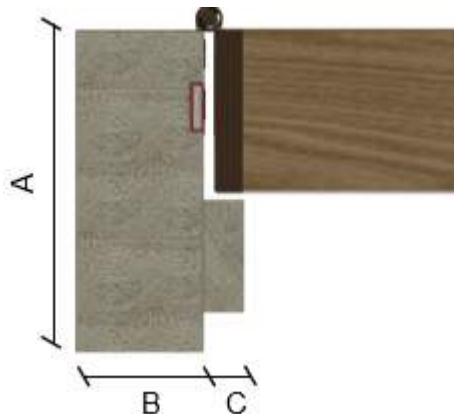
A: Frame depth = 70mm minimum

B: Frame width = 32mm minimum

C: Stop width = 14mm minimum

7.2 Details for Frame 2 - Standard frame detail

The diagram below shows detail of the standard frame construction. Minimum section is permitted in two sizes subject to hardware size and the use of transom overpanel. Any radius to the lipping must comply with section 5.3.



A: Frame depth = 100mm minimum

B: Frame width = 38mm minimum

C: Stop width = 15mm minimum

Minimum section size when using a transomed overpanel:

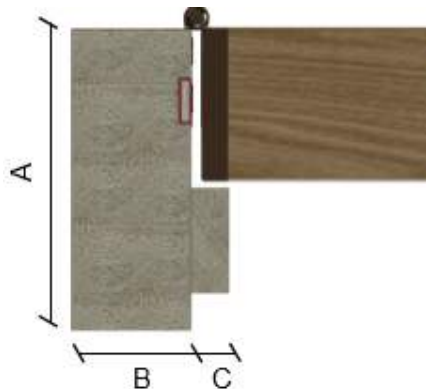
A: Frame depth = 100mm minimum

B: Frame width = 38mm minimum

C: Stop width = 15mm minimum

7.3 Details for Frame 3 – Standard Frame

The diagram below shows detail of the standard frame construction. Minimum section is permitted in two sizes subject to hardware size and the use of transom overpanel. Any radius to the lipping must comply with section 5.3.



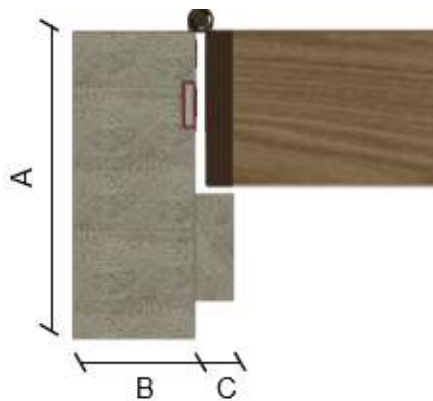
- A: Frame depth = 70mm minimum
- B: Frame width = 30mm minimum
- C: Stop width = 14mm minimum

Minimum section size when using a transomed overpanel:

- A: Frame depth = 70mm minimum
- B: Frame width = 32mm minimum
- C: Stop width = 14mm minimum

7.4 Details for Frame 4 - Standard frame detail

The diagram below shows detail of the standard frame construction. Minimum section is permitted in two sizes subject to hardware size and the use of transom overpanel. Any radius to the lipping must comply with section 5.3.



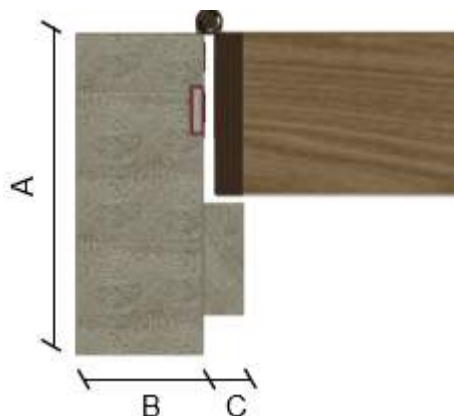
- A: Frame depth = 70mm minimum
- B: Frame width = 30mm minimum
- C: Stop width = 14mm minimum

Minimum section size when using a transomed overpanel:

- Not permitted

7.5 Details for Frame 5 - Standard frame detail

The diagram below shows detail of the standard frame construction. Minimum section is permitted in two sizes subject to hardware size and the use of transom overpanel. Any radius to the lipping must comply with section 5.3.



- A: Frame depth = 70mm minimum
- B: Frame width = 32mm minimum
- C: Stop width = 15mm minimum

Minimum section size when using a transomed overpanel:

- Not permitted

7.6 Door Frame Joints

Below are depictions of the door framing joints that are deemed acceptable. Please note that the drawings are provided as general illustrations 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. The door frame joints are required to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Frame joints may additionally be reinforced with any of the adhesives approved for the application of lippings, on the basis that the approved lipping adhesive has been proven to contribute to the positive fire resistance performance of the timber to timber junction at the door leaf edge.



Half Lapped Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint



Trenched Joint

Approved door frame jointing options

7.7 Frame Decorative Facings – All Options

Relatively thin facing materials are deemed to be decorative, and their application is not considered to be of detriment to the overall stability or performance of the doorset design.

The following additional facing materials are therefore permitted to the frame for this door design, including frame reveal, since they would have limited influence under fire resistance test conditions.

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint ³	0.2
Timber veneers	0.7

Notes:

1. Facing materials not listed above are not permitted.
2. For all options, materials must not conceal intumescent strips.
3. Intumescent paints are not permitted.

Decorative finishes listed above may be painted within the limits for paint finish, above.

7.8 CS Group Acrovyn

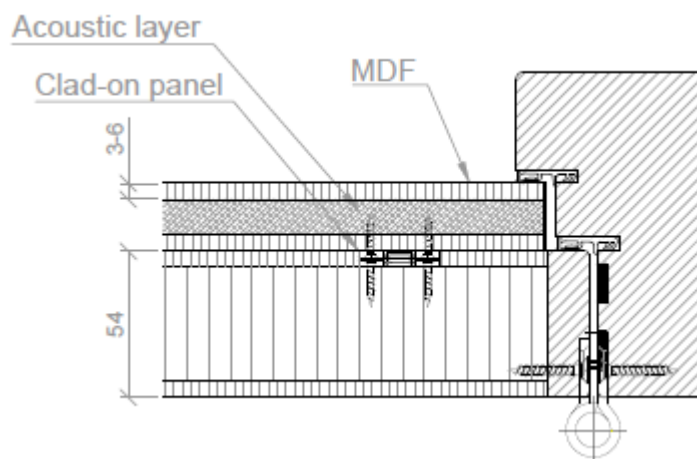
Based on test evidence RF11059 as cited in Appendix A, timber based and WoodEx30 door frames may be encapsulated in CS Group Acrovyn meeting the following specification. All other details must remain as required in sections above, as appropriate:

1. The intumescent detail as specified in the datasheets in sections 4.5.17 and 4.5.18 must be replicated.
2. CS Group Acrovyn must be bonded to the door frame using 3M Scotch-Grip cement 10 contact adhesive.
3. See datasheets in sections 4.5.17 and 4.5.18 for maximum permitted leaf sizes.
4. The maximum thickness of CS Group Acrovyn used must be 2mm, as per the test evidence.

7.9 Double Rebated Frame Option

The Moralt acoustic clad on panel as detailed in section 5.4.2 can be fitted within a double rebated frame as shown below on the 44mm thick Laminesse FireSound design. The minimum timber details for the standard door frame must be complied with as shown in sections 7.1 to 7.5 and further details of the clad on panel are given in section 5.4.2 It is not permitted to encapsulate double rebated frames as detailed above.

The additional cloaking of the leaf edges combined with the additional environmental seal will restrict gas flow around the leaf edges which would be expected to slow down erosion of the leaf edges. Although the effect on integrity performance is not quantifiable, it is the opinion of Warringtonfire this detail will not be the cause of premature integrity failure.



8 Overpanels

Overpanels are permitted based on the testing as summarised within Appendix A, the following sections outline the constructional details of each of the permitted elements and limitations associated with each configuration.

8.1 General

The testing undertaken on the doorset design allows for the application of Solid overpanels with three framing options

Modular, Transomed or Flush.

Framing options are detailed in the following section depending on the specification utilised.

8.2 Framing

The following framing options as detailed below are permitted for the doorset design and are permitted depending on solid panel arrangement utilised.

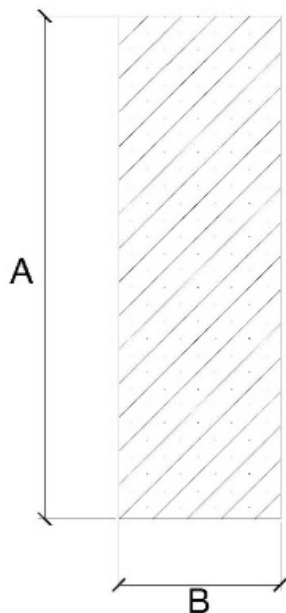
8.2.1 Modular Framing

Modular framing for the purpose of this document is considered to be an element (glazing or panel) which is independently framed and fixed to the frame of a doorset design.

Standard Frame Detail (Modular Framing)

The frames listed below are the minimum size and density which has been assessed by this report. The frame must be constructed to meet the following specification for modular units containing solid panels, the frame section shall meet this specification on all four edges.

Modular Frame specification		
Material	Minimum section size ² (mm)	Minimum density ² (kg/m ³)
Timber which must match the specification for the door frame fitted below (i.e. may be frame type 1, 2 or 3 in section 7. (see section 2.1).	Frame: 100 (d) x 30 (w)	As applicable



A: Frame depth = 70mm minimum
B: Frame width = 30mm minimum

Notes:

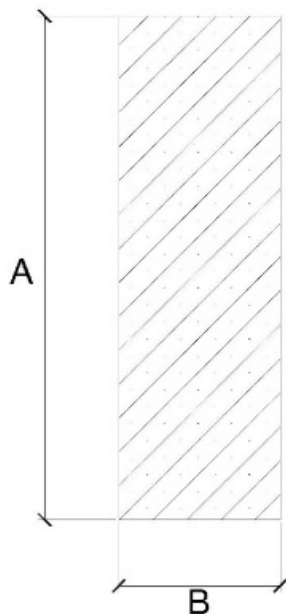
1. It is possible to include a 3mm x 3mm quirk detail to the rear edges of the frame where the jointing to the door frame or adjacent modular framing element shall occur.
2. The depth of the modular frame and the door frame shall be equal, this may result in increasing the depth of the permitted door frame (types 1, 2 or 3 only) to match the modular frame dimension, or vice versa. In all cases the greater dimension shall be used.

8.2.1.1 Mullion Detail (Modular Framing)

It is possible to include a single mullion within a modular unit applied to the head of a doorset.

When applied the transom or mullion shall meet the following specification:

Modular Frame specification		
Material	Minimum section size ² (mm)	Minimum density ² (kg/m ³)
Timber which must match the specification for the door frame fitted below (i.e. may be frame type 1, 2 or 3 in section 7. (see section 2.1).	Frame: 70 (d) x 30 (w)	As applicable



A: Frame depth = 70mm minimum

B: Frame width = 30mm minimum

Notes:

1. It is possible to include solid panel and glazing arrangements which are permitted as detailed in section 8.3 and 8.4 either side of a transom within a modular unit applied to the side of a doorset subject to the positioning requirement of the transom given above and the maximum permitted glass or panel size given in the following sections.
2. The depth of the modular frame and the door frame shall be equal, this may result in increasing the depth of the permitted door frame (types 1, 2 or 3 only) to match the modular frame dimension, or vice versa. In all cases the greater dimension shall be used.

8.2.1.2 Frame Jointing (Modular Framing)

Below are depictions of the framing joints that are deemed acceptable for corner jointing of modular framing. Please note that the drawings are provided as general illustrations of each type of frame joint; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies.



Double Rebated Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint



Trenched or Half Lapped Joint

The modular frame joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5mm x 76mm steel screws. Frame joints shall additionally be reinforced with the adhesives approved for the application frame jointing detailed within section 9.

8.2.1.3 Attachment Technique (Modular Framing)

The modular framing shall be affixed to the door frame or adjacent modular framed units utilising steel screws appropriate for use with timber substrates.

Screws must be fixed between 50mm and 100mm from corners at maximum of 200mm centres from each face. Fixings shall penetrate approximately half of the depth of the adjacent timber section.

8.2.2 Shared framing (Transomed)

Shared framing (Transomed) for the purpose of this document is considered to be when an element (panel) is contained within the frame for the doorset and separated from the door leaf by a shared transom. An example of a transomed solution is given below, though the construction of doorsets shall be as the text in this document specifies.



8.2.2.1 Standard Frame Detail (Transomed)

The permitted frame detail for the doorset shall meet the minimum requirements as outlined in section 7, where applicable. The detail for the permitted transom can be found within section 8.2.2.2 below.

8.2.2.2 Detail for Transom (Transomed)

It is possible to include a transom to separate a panelled overpanel within a door frame from the door leaf. It is not permitted to include a mullion within a doorset which is constructed using the shared framing design. When applied the transom shall meet the following specification.

Frame Type	Minimum section size (mm)	Minimum density (kg/m ³)
Frame 1	Transom: 70 (d) x 32 (w)	510
Frame 2	Transom: 100 (d) x 38 (w)	448
Frame 3	Transom: 70 (d) x 30 (w)	640
Frame 4	Not Permitted	
Frame 5		

Notes:

When applied the material for the transom shall match the timber species used for the frame surrounding the door frame.

The transom when applied shall be mortice and tenon or butt jointed as depicted in section 8.2.2.3. The joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5mm x 76mm steel screws.

8.2.2.3 Frame Jointing (Transomed)

Below are depictions of the framing joints that are deemed acceptable for corner jointing of transomed framing. Please note that the drawings are provided as general illustrations of each type of frame joint; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies.



Mortice & Tenon Joint



Butt Joint

The transom when applied shall be mortice and tenon or butt jointed as depicted above. The joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5mm x 76mm steel screws.

8.2.3 Flush Overpanels

Based on the testing undertaken on the doorset design it is possible to include solid flush overpanels.

A flush overpanel is where a solid over panel has been included within the door frame and has no additional separating element between the panel and the door leaf or leaves.

Flush overpanels, where permitted, are detailed within the permitted leaf configurations and require specific perimeter intumescent specifications, these are found within sections 4.5.7 – 4.5.10 and 4.5.13 to 4.5.16.

8.3 Solid Panels

Solid overpanels are permitted for use with the modular framing option given in section 8.2.1 above (Modular Framing).

Solid overpanels are also permitted for use with the shared framing option given in section 8.2.2 above. (Shared Framing).

Solid overpanels are also permitted for use as a flush over panel given in section 8.2.3 above, subject to meeting the requirements outlined within sections 4.5.7 – 4.5.12 and 4.5.15 to 4.5.22 which detail the required intumescent specification.

8.3.1 Solid Panel Construction

Based on the testing undertaken on the doorset design, it has been assessed to include the tested core construction as a solid fixed panel. This is because under test conditions the panel will be fixed within the perimeter framing limiting the deflection throughout the test duration and enhancing the expected fire resistance performance which was observed for the door leaf itself.

Therefore, the following specifications shall be met.

1. The panel must be a section of door leaf, comprised of the same leaf makeup given in section 5.1.
2. The panel must be lipped as specified in section 5.3, and the panel shall be constructed of a single board, joints are not permitted within any panels.

The minimum panel thickness after calibration is 44mm (i.e. a maximum of 0.5mm from both sides).

Decorative & protective facings may be applied to the surface of the solid panels in accordance with section 5.5.

The minimum panel thickness after finishes applied is 44mm.

8.3.2 Intumescent Sealing Arrangement for Over Panels

Solid overpanels, when included within a doorset design (in either modular or shared framing), shall include the same intumescent specification as utilised within the door leaf or frame reveal.

Solid flush overpanels shall include the intumescent specification as detailed within sections 4.5.7 – 4.5.12 and 4.5.15 to 4.5.22, as applicable.

Permitted intumescent specifications are detailed in section 4.5, while there may be multiple options for manufacturer and seal types only one specification can be utilised with any single doorset, and the specification used shall match the specification used on the door leaf.

8.3.3 Fixing Arrangement (Solid Panels)

Solid panels must be fixed into the framing solution by steel screws appropriate for the timber-based substrates.

Screws shall be applied nominally centrally to the thickness of the solid panel, through the rear of the frame to all edges and transom reveal where applicable and shall penetrate into the solid panel by at least 30mm.

Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.

When fitted the solid panel shall have no greater than 1mm between the panel edge and the adjacent framing element.

Where fitted within shared framing (transomed) the face of the solid overpanel shall be nominally in line with the face of the door leaf.

Where fitted within modular framing the panel may either be nominally in line with the face of the door leaf or centrally within the modular frame depth.

Where fitted in a flush arrangement the face of the solid overpanel shall be in line with the face of the door leaf.

8.3.4 Maximum Dimensions for Over Panels

Based on the testing undertaken within the doorset design the following maximum dimensions are permitted for any single panel, subject to the doorset not exceeding 2950mm in height and width including outer framing dimensions.

Solid Panel & Frame Type	Height (mm)	Width (mm)
Flush Over panel (with Astragal installed)	500 (based on results of DMT-DO-50-1433)	Overall doorset width
Overpanel (Shared Framing)	2000	
Overpanel (Modular Framing)	2000	

The overall assembly shall form a rectilinear shape.

9 Adhesives

The following adhesives must be used in the construction of the doorsets. These may be hand applied or may be applied using an edgebander. With either method it must be ensured that sufficient glue is applied across the entire surface area between the 2No substrates being adhered to guarantee a robust bond. Other manufacturers guidance should be followed, for either installation application used.

Element	Product/Material Type
Door blank core elements	At the request of Moralt AG, full details of the core makeup are held, in confidence, at Warringtonfire
Door blank outer facings to Lamincore	
Timber lipping & decorative facings	UF or PU
Leaf Edge Inserts	PUR
Door Frame Joints	

10 Hardware

10.1 General

The following section details the permitted scope and constraints for fitting hardware to this door design. The following items of hardware must also bear the UKCA or CE Mark in addition to the requirements outlined in the following sections. The UKCA or CE mark must indicate that the hardware is suitable for fire doors in the classification code and declaration of performance issued by the hardware manufacturer:

- Latches & locks: Test Standard EN 12209
- Single axis hinges: Test Standard EN 1935
- Controlled door closing devices: Test Standard EN 1154
- Electrically powered hold-open devices: Test Standard EN 1155
- Door co-ordinators: Test Standard EN 1158
- Emergency exit hardware: Test Standard EN 179
- Panic exit hardware: Test Standard EN 1125.

The following sections consider what tested and assessed alternative items of essential and non-essential hardware can be used on the doorset range.

Items of hardware have been considered and approved via the following means:

- The component has been successfully tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a suitably similar type of doorset e.g. timber leaf in timber frame
- As a result of an assessment of the appropriateness of the item of hardware, based on test evidence not commissioned by Moralt AG.
- As a result of the Certifire approval of the item of hardware

Each section will consider the named item of hardware and detail if there are any limitations associated with:

- Leaf size
- Configuration
- Intumescent seals
- Intumescent protection
- Frame configuration requirements

Hardware that is either morticed in or includes a through component or fixing may not be within 200mm of another item of hardware unless there is test evidence to demonstrate they can be in closer proximity.

Hardware items should generally be fitted in accordance with the manufacturer's instructions. However, the parameters and requirements of this assessment always take precedence, including specified protection such as hardware gaskets. Referenced Certifire approved hardware may be incorporated subject to the design, material and dimensional limitations identified within this assessment report and identified on the relevant Certifire certificate.

10.2 Intumescent to Hardware

The intumescent materials used to protect hardware that have been tested and assessed for this doorset design are detailed below. Note that any one of the product/matrix options listed in the table may be used in the specific application noted. However, only 1 manufacturer should be considered per doorset application.

The door gap perimeter intumescent seal specifications are documented in conjunction with the leaf envelope size limitations in section 4.

Hardware Intumescent Specification		
Item	Location	Product/Manufacturer
Butt Hinges	Under both hinge blades	1. 1mm Interdens 2. 1mm MAP paper – Lorient Polyproducts Ltd
Lock/latches	Under forend & keep	3. 1mm Pyrostrip 300 – Mann McGowan 4. 1mm Therm-A-Strip – Intumescent Seals Ltd 5. G30 – Intumescent Seals Ltd.
	Encasing Latch Body	Not required
Concealed overhead closers	See section 10.7.2	
Flush bolts	Encasing the entire body of the flush bolt including the back surface of the face plate	1. 2mm Interdens 2. 2mm MAP paper – Lorient Polyproducts Ltd 3. 2mm Pyrostrip 300 – Mann McGowan 4. 2mm 500FSA – Mann McGowan 5. 2mm Therm-A-Strip – Intumescent Seals Ltd 6. 2mm Therm-A-Flex – Intumescent Seals Ltd 7. 2mm Flexilodice Graphite – Odice S.A.S.
Concealed Hinges	See section 10.6.2	

Gaskets must be fitted where required by supporting evidence, for example, test evidence or Certifire certificates. If gaskets are not required by the supporting evidence but are within this Field of Application, the requirements of this Field of Application take precedence.

Where it is stated that intumescent is not required for a particular element of hardware, it is permitted to use up to 2mm thick MAP, Interdens or graphite-based gasket tested for the particular application [as appropriate for the hardware]. It is the opinion of Warringtonfire that the additional protection will not detract from the fire resistance performance under test conditions.

10.3 Essential Hardware

The following table details the essential hardware for the various doorset configurations that are referenced in this assessment.

Configuration	Hardware
LSASD	<ul style="list-style-type: none"> • Latch • Handle • Hinges • Self-closing device (closer)
ULSASD	<ul style="list-style-type: none"> • Hinges • Self-closing device (closer)
LSASD+OP	<ul style="list-style-type: none"> • Latch • Handle • Hinges • Self-closing device (closer)
ULSASD+OP	<ul style="list-style-type: none"> • Hinges • Self-closing device (closer)
LSADD	<ul style="list-style-type: none"> • Latch • Handle • Hinges • Self-closing device (closer) • Flush bolt
ULSADD	<ul style="list-style-type: none"> • Hinges • Self-closing device (closer) • Dead lock (Optional) • Flush bolt (optional)
LSADD+OP	<ul style="list-style-type: none"> • Latch • Handle • Hinges • Self-closing device (closer) • Flush bolt
ULSADD+OP	<ul style="list-style-type: none"> • Hinges • Self-closing device (closer) • Dead lock (Optional) • Flush bolt (optional)

10.4 Latches & Locks

Unless explicitly detailed within the sections below only 1No. lock or latch shall be applied within any individual doorset. When fitted the lock or latch body shall be installed within the vertical edge of the door leaf in all cases, at a height as detailed within the relevant section below. Refer to specific notes contained within each section for further considerations on lock or latch type.

10.4.1 Single Point Engagement

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All permitted in section 4.5.

The table below details the tested latches and locks that are approved.

Element	Manufacturer & Product Reference
Locks & latches	<ul style="list-style-type: none"> • Briton DS5440 mortice latch (RF14205 Revision A) • Zoo Hardware KFV EP166/3470422 (RF15040) • BMH-Beyer & Muller GmbH & Co – 911.55.087 – (DMT-DO-50-1433).

Alternatively, components with the following specification are also deemed acceptable.

All doorsets

Element	Specification
Maximum forend and strike plate dimensions	235mm high x 25mm wide x 4mm thick
Maximum body dimensions	165mm high x 100mm wide x 18mm thick
Intumescent protection	see section 10.2
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point $\geq 800^{\circ}\text{C}$

Notes:

1. In all instances the location of the handle must be between 800 – 1200mm from the threshold.

10.4.2 Cylinders

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All permitted in section 4.5.

The table below details the tested cylinders that are approved.

Element	Manufacturer & Product Reference
Cylinder	<ul style="list-style-type: none"> • Glutz Euro cylinder, Ref. GC9991, (DMT-DO-50-1443) • Abus August (DMT-DO-50-1443) • Glutz Glutz 83704 E-Doppelzylinder (DMT-DO-50-1447)

Alternatively, components with the following specification are also deemed acceptable.

- Where required for use with either single or multi point latches, the cylinder must be constructed of either brass or steel with a melting point in excess of 8000C.
- The cylinder must be compatible with the lock/latch.
- Cylinder dimensions may be up to 33mm high x 17mm wide at the maximum dimension and may be of euro profile or oval.
- Single and double cylinders, along with cylinder & turn are permitted.
- Door preparation for single cylinders shall penetrate a maximum of 2/3rds of the door thickness.
- Intumescent protection and tightness of fitting:
 - If the lock body is not protected with an intumescent material, the maximum clearance between leaf and cylinder is 1mm to each edge.
 - If the lock body is protected with an intumescent material, maximum clearance between leaf and cylinder is 3mm to each edge.
 - 1mm thick MAP or non-pressure forming graphite intumescent around the cylinder is optionally permitted.

10.5 Handles & Escutcheons

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: – LSASD, LSASD+OP, LSADD, LSADD+OP

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference
Handles	<ul style="list-style-type: none"> Eurospec aluminium lever type handle Ref. CSL1190 (RF15040) Hoppe Paris FS-K138/353K lever type handle (RF14205 Revision A) Lever handle with RFID functionality - Hafele GmbH DT600/DT600c: 250(h) x 33(w) x 10(t) x 72mm projection (DMT-DO-50-1433)

Alternative handles are permitted providing they meet the specification given below:

- Steel, stainless steel, brass, aluminium or bronze are permitted
- Surface fixings or through fixings are permitted. If through fixed there must be no more than 0.5mm clearance between the hole and the fixing.
- The hole through the leaf to facilitate the spindle must be no greater than 20mm diameter.

The design may be either handle on rose or handle on back plate up to the following maximum sizes:

- Handle on rose with a rose diameter up to 54mm
- Handle on back plate with a back plate size up to 243mm high x 56mm wide
- Lever handle length 250mm

The handle must be compatible with the lock/latch, such that the closing action of the doorset is not impeded.

Alternative escutcheons are permitted providing they meet the specification given below:

- Steel, stainless steel, brass, aluminium or bronze are permitted
- Surface fixings or through fixings are permitted. If through fixed there must be no more than 0.5mm clearance between the hole and the fixing.
- The escutcheon may be up to Ø52mm overall and up to 8mm thick.

10.6 Hinges

10.6.1 Butt hinges

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: LSASD, ULSASD, LSASD+OP, ULSASD+OP, LSADD, ULSADD, LSADD+OP, ULSADD+OP

The table below details the tested butt hinges that are approved.

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> Enduro Max bearing butt type hinge Ref. DSH1103 (RF14205 Revision A) Cooke Brothers 7700CB range bearing butt hinge (RF15040)

Alternatively, components with the following specification are also deemed 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

In all instances, the hinges must have the following specification.

Element	Specification																
Hinge positions:	<table border="1"> <tr> <td rowspan="3">If 3 hinges are required:</td> <td>Top</td> <td>180 - 220mm from the head of the leaf to the centreline of the hinge</td> </tr> <tr> <td>2nd</td> <td>Minimum 200mm from centreline of top hinge to centreline of second hinge OR equally spaced between top and bottom hinge</td> </tr> <tr> <td>Bottom</td> <td>280 - 320mm from the foot of the leaf to the centreline of the hinge</td> </tr> <tr> <td rowspan="4">If 4 hinges are required:</td> <td>Top</td> <td>180 - 220mm from the head of the leaf to the centreline of the hinge</td> </tr> <tr> <td>2nd</td> <td>Minimum 200mm from centreline of top hinge to centreline of second hinge</td> </tr> <tr> <td>3rd</td> <td>Equally spaced between 2nd hinge and bottom hinge</td> </tr> <tr> <td>Bottom</td> <td>280 - 320mm from the foot of the leaf to the centreline of the hinge</td> </tr> </table>	If 3 hinges are required:	Top	180 - 220mm from the head of the leaf to the centreline of the hinge	2 nd	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	If 4 hinges are required:	Top	180 - 220mm from the head of the leaf to the centreline of the hinge	2 nd	Minimum 200mm from centreline of top hinge to centreline of second hinge	3 rd	Equally spaced between 2 nd hinge and bottom hinge	Bottom	280 - 320mm from the foot of the leaf to the centreline of the hinge
	If 3 hinges are required:		Top	180 - 220mm from the head of the leaf to the centreline of the hinge													
			2 nd	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														
	If 4 hinges are required:	Top	180 - 220mm from the head of the leaf to the centreline of the hinge														
		2 nd	Minimum 200mm from centreline of top hinge to centreline of second hinge														
		3 rd	Equally spaced between 2 nd hinge and bottom hinge														
		Bottom	280 - 320mm from the foot of the leaf to the centreline of the hinge														
Intumescent protection:	See section 10.2																

Note:

Leaves less than 2400mm (h) must be hung on a minimum of 3 hinges. Leaves greater or equal 2400mm (h) must be hung on 4 hinges.

10.6.2 Concealed Hinges

Concealed hinges have been successfully tested in the LAMINESSE FireSound 44mm door design for 30 minute applications in tests DMT-DO-50-1433.

10.6.2.1 Bartels Pivota Concealed Hinges

These items are suitable in the following applications only:

Frame options: 1, 2 and 3

Configurations: All Configurations permitted.

The table below details the tested concealed hinges that are approved.

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> Bartels GmbH - Pivota DXS 100 3-D design (DMT-DO-50-1433)

- The single action hinges must be fitted with the tested Mann McGowan kit ref: MMG Pyrohinge Interdens15 (Moralt reference M-MVPM-DB-T-018-1).
- The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.
- The mortice for concealed hinges must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf.
- The door frame jambs must be hardwood (frame type 2 or 3) of minimum thickness 38mm and minimum density 448kg/m³.
- Pivota concealed hinges are to be positioned as follows. It is not permitted to fit any more hinges than that stated in the table below, as appropriate for the required leaf height.

Element		Specification	
Hinge positions:	2 Hinges: Leaf height: ≤2440mm	Top	180 – 210mm from head of leaf to top of hinge
		Bottom	140 – 180mm from foot of leaf to bottom of hinge
	3 Hinges:	Top	180 – 210mm from head of leaf to top of hinge
		2 nd	Max - centrally between top and bottom hinge
		Bottom	180 – 210mm from foot of leaf to bottom of hinge
Intumescent protection:		The tested Mann McGowan kit ref: : MMG Pyrohinge Interdens15 (Moralt reference M-MVPM- DB-T-018-1)	

10.6.2.2 Simonswerk Tectus Concealed Hinges

These items are suitable in the following applications only:

Frame options: 3

Configurations: All Configurations permitted

The table below details the tested concealed hinges that are approved.

Manufacturer & Product Reference
Simonswerk Tectus TE527 3D (DMT-DO-50-1447)

- The single action hinges must be fitted with the tested 1mm thick BASF exterdens Graphite 'TE 527 - 3D' intumescent pack or encased in 1mm thick Interdens to the leaf and frame bodies (Moralt reference M-MVPM-DB-T-634-2).
- The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.
- The mortice for concealed hinges must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf.
- The door frame (type 3 only) must be hardwood of minimum thickness of 38mm and minimum density 640kg/m³.

Tectus concealed hinges are to be positioned as follows. It is not permitted to fit any more hinges than that stated in the table below, as appropriate for the required leaf height.

Element		Specification		
Hinge positions:	3 Hinges: Leaf height: 1201- 2400mm	Top	150 – 200mm from head of leaf to top of hinge	
		2 nd	Min - 200mm from top hinge Max - centrally between top and bottom hinge	
		Bottom	150 – 300mm from foot of leaf to bottom of hinge	
		4 Hinges: Leaf height: >2401mm	Top	150 – 200mm from head of leaf to top of hinge
			2 nd	Min - 200mm from top hinge Max - centrally between top and 3 rd hinge
			3 rd	Min – 200mm from bottom hinge Max – centrally between 2 nd and bottom hinge
			Bottom	150 – 300mm from foot of leaf to bottom of hinge

10.7 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers
- Concealed overhead closers.

Automatic doorset self-closing devices such as transom mounted and offset pivots used with floor springs or floor springs with top pivots and bottom straps are not considered acceptable for use with the Moralt Laminesse FireSound 44mm doorset range.

10.7.1 Overhead Face Fixed Closer

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: LSASD, ULSASD, LSASD+OP, ULSASD+OP, LSADD, ULSADD, LSADD+OP, ULSADD+OP

The table below details the tested overhead face-fixed closers that are approved.

Element	Manufacturer & Product Reference
Overhead face-fixed closers	<ul style="list-style-type: none"> • Rutland TS3204 overhead type closer (RF14205 Revision A) • Dorma (UK) Ltd TS72 overhead type closer (RF15040)

Alternatively, components with the following specification are also deemed acceptable.

- Certifire approved overhead face-fixed closers for 30-minute fire resistance applications on 44mm thick timber door and timber frames

Note:

It must be ensured that the closer is of sufficient strength and power to ensure the door.

10.7.2 Concealed Overhead Self Closing Device

These items are suitable in the following applications only, subject to the details in the table below:

Frame options: 2 and 3

Configurations: LSASD+OP, ULSASD+OP, LSADD+OP, ULSADD+OP.

The table below details the tested concealed overhead closers that are approved with the body of the concealed closer morticed into the top of the door leaf and the track morticed into the frame head.

Manufacturer & Product Reference (Test Reference)	Intumescent Protection	Closer Body Dimensions	Closer Slide Arm Dimensions	Perimeter Intumescent Specification	Minimum Head Stop Height (mm)
Dorma ITS96 EN 2-4 (DMT-DO-50-1433)	Mann McGowan Pyrokit 1mm Interdens (Moralt ref: MVPM-DB-T-015-01)	Body mm 45(h) x 338mm (l) x 32mm (w)	Track: 440mm (l) x 12mm (h) x 20mm (w)	See sections: 4.5.7, 4.5.9, 4.5.13 or 4.5.15	15
Geze Boxer EN 2-4 (DMT-DO-50-1433)	Mann McGowan Pyrocloser kit 1mm Interdens (Moralt ref: MVPM-DB-T-003-01)	Body mm 45(h) x 340mm (l) x 32mm (w)	Track: 440mm (l) x 12mm (h) x 20mm (w)	See sections: 4.5.7, 4.5.9, 4.5.13 or 4.5.15	15

Note:

- It must be ensured that the concealed overhead closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal.
- The dimensions of the concealed overhead door closer must not exceed the dimensions given within the table above.

10.8 Bolts

10.8.1 Flush Bolts

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: LSADD, LSADD+OP (OPTIONALLY ULSADD & ULSADD+OP)

As stated in section 5.4.1, the use of CS Group Edge Protectors is not permitted with use of flush bolts located at the meeting edge.

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:

- Top of inactive leaf 253mm long x 20mm deep x 20mm wide.
- Bottom of inactive leaf 210mm long x 20mm deep x 20mm wide.

Flush bolts must be steel, and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice of the keep and body must be protected with intumescent gaskets as specified in section 10.2. Alternatively, the hardware manufacturers tested gaskets may be used (i.e. Moralt pack ref: MVPM-DB-T-023-01).



Flush bolt installation and intumescent protection

10.8.2 Surface Mounted Face Fixed Bolts

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: LSADD, (OPTIONALLY ULSADD)

Surface mounted face fixed bolts constructed from steel, stainless steel, aluminium or bronze may be fitted to the top and bottom of one leaf within a double doorset design, providing the following maximum dimensions given below are not exceeded and the components are fitted at least 50mm from the meeting edge:

- 300mm long x 20mm wide (footprint).

Intumescent protection is not required.

10.9 Non-Essential Hardware

Only the following items of non-essential hardware are permitted in addition to the prescribed essential hardware as detailed within section 10.3.

10.9.1 Pull Handles

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All configurations

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

Pull handles must be positioned as follows:

- Through fixed components must be positioned such that the through going elements are no closer than 200mm to any adjacent morticed item of hardware, leaf edges or apertures.
- Surface mounted items may be applied without restriction, providing they do not inhibit the operation of the doorset design, nor interact with other items of hardware.

The above scope of application is provided as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted away from the edge of the door leaf, therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and therefore cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

10.9.2 Push Plates & Kick Plates

Frame options: 1 to 5

Configurations: All configurations

Components with the following specification are deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted away from the edge of the door leaf, therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and therefore cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

Approved specification:

- Polymeric or metal face-fixed hardware such as push plates and kick plates up to 2mm thick may be surface fitted to the doorset. 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.
- In all cases plates meeting the above specification shall not be applied under glazing beads or door stops.
- When mechanically fixed the fixings must not penetrate more than 50% of the thickness of the door leaf and must not interfere with other items of hardware applied to the door leaf design (e.g. drop seals).

10.9.3 Security Viewers

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All configuration

Up to 2no. viewers are permitted within a single door leaf, viewers are to be positioned no closer than 100mm to door edges, glazed apertures or any other hardware component.

Components with the following specification are deemed acceptable.

- 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 +1 mm). Lenses must be glass, and the item must be protected with a tested acrylic intumescent mastic and / or a 0.5 – 1.0mm thick graphite based intumescent wrap.

10.9.4 Door Selectors

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All double leaf door configurations

These may be freely applied, provided that they are not invasive in the leaf edges or door frames and they do not interfere with the self-closing action of the door leaf. Products that are invasive will require fire resistance test/assessment evidence to support their use.

10.9.5 Environmental Seals

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All configurations

Environmental seals have been successfully tested as part of the Moralt Laminasse FireSound 44mm doorset design. Based on this testing the table below details the approved environmental seals included within the summarised evidence within appendix A.

Product Reference & Manufacturer
(DMT-DO-50-1433)
Mann McGowan Enviroseal Tri-blade

Alternatively, on the basis of the testing undertaken, silicon or PVC based flame retardant acoustic, weather and dust seals 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.

Where required, the seals may be fitted either rebated into the timber door stop or rebated into the leaf face.

10.9.6 Threshold drop Seals

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All configurations

Drop seals have been successfully tested within the doorset design and are therefore, acceptable for use in the door designs considered herein. The table below details the permitted threshold Drop Seals as tested and summarised within appendix A.

Product Reference & Manufacturer	Intumescent Protection
Mann McGowan DD-1703ACU (DMT-DO-50-1433)	None installed
Ellenmatic Soundproof dropseal (DMT-DO-50-994)	

The above detailed drop-down seals are permitted for use without the requirement for any intumescent protection as demonstrated within DMT-DO-50-1433.

Alternatively, the components meeting all of the following specifications are also deemed acceptable, recessed into the bottom of leaves:

- Certifire approved threshold drop seals for 30-minute fire resistance applications on 44mm thick timber / cellulosic doors in timber / cellulosic frames.
- The threshold drop seal must not exceed:
 - Body dimensions of 30mm (h) x 14mm (t) and
 - Face plate dimensions of 50mm (h) x 21mm (w) x 1.5mm (t).
- The Certifire certificate shall be adhered to for intumescent protection and fitting requirements.

Note: In all instances, if a rebated drop seal is fitted to the doorset then flush bolts, if approved, may not be fitted to the bottom of the doorset.

10.9.7 Knockers, Numerals & Signage

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All configurations

Components with the following specification are deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted away from the edge of the door leaf, therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and therefore cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

Approved specifications:

Knockers:

- Steel, stainless steel, aluminium or bronze knockers, may be surface fixed or bolted through the door leaf, providing they are fitted no closer than 75mm from the leaf edge, other elements of building hardware or to any glazing and are no greater than 200mm high x 120mm wide. If through fixed, there must be no more than 1mm clearance between the hole and stud. It is only permitted to fit 1No. knocker to any one doorset.

Numerals & Signage:

- Steel, stainless steel, aluminium or bronze numerals or signage may be surface fixed to the door leaf, providing they are fitted no closer than 35mm from the leaf edge, other elements of building hardware or to any glazing. The dimension of each numeral or sign must be no greater than 200mm high x 100mm wide x 4mm thick. Up to 5No. numerals or signs may be applied to a doorset, numerals and signs may be applied adjacent to each other providing the 35mm from other elements as detailed above is maintained.

10.9.8 Security Chains

Components with the following specification are deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the doorset being considered. This is on the basis of the items being surface mounted with fixings positioned away from the edge of the door leaf and therefore unlikely to influence the junction between door leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the doorset and cause adverse deflection under test conditions. Lastly, the surface mounted arrangement of the features means no material is removed in terms of the overall thickness of the door leaf beyond the footprint of the item, therefore burn through of the leaf would not be expected.

Approved specification:

- Metallic security chains may be surface fixed to the face of the door leaf and frame, providing they are fitted such that they do not interfere with the junction between the leaf edge and the frame, and no material is removed in order to facilitate the fitting of the security chain. Screws to affix the security chain shall be no greater than 25mm long.

10.9.9 Fire Door Identification Plates

Plastic or metal fire door identification plates may be glued or screwed to the face of the door leaves providing they are fitted no closer than 35mm from the leaf edge, other elements of building hardware or to any glazing. The dimension of any applied plate must be no greater than 100mm high x 100mm wide x 3mm thick.

These may be required to identify the following:

- a) To be kept closed when not in use (Fire Door Keep Shut)
- b) To be kept locked shut when not in use (Fire Door Keep Locked Shut)
- c) Held open by an automatic release mechanism or free swing device (Automatic Fire Door Keep Clear).

When applied to a door leaf the plate shall be surface mounted to the face without removing material from the leaf.

10.9.10 Mag Lock

These items are suitable in the following applications only:

Frame options: 1 to 5

Configurations: All configurations

The table below details the tested maglocks, L and Z brackets that are approved.

Manufacturer & Product Reference	Body Dimensions	Armature Dimensions	Fixing Method
ASSA ABLOY /Adams Rite) ARMLOCK 280 Series (DMT-DO-50-1446 & DMT-DO-50-1447 Door 2)	266mm (l) x 67mm (w) x 40(d) mm	160mm (l) x 61mm (w) x 16(t) mm	Surface mounted to the face of the door leaf & frame using L & Z brackets (Ref 280-800)

Based on the successful fire testing cited in Appendix A, mag locks which have supporting fire resistance test evidence when applied to a timber-based door leaf in a timber frame which has achieved greater than 30 minutes integrity performance when tested to BS476 Part 22: 1987 or EN 1634-1, 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.

The fitting of mag locks is not considered to change the latching arrangement of the doorset and therefore the permitted leaf size shall be established using unlatched doorset configurations as detailed within section 4.5 where no additional mechanical latch is fitted.

11 Installation

11.1 General

This section considers the installation of doorsets. This section considers:

- the door frame and architrave installation position relative to the wall
- the fire stopping between the frame and the wall
- the fixing requirement including packers
- the requirements for door edge gaps
- the trimming of door edges.

11.2 Door Frame Installation

The following figures indicate the acceptable door frame installations. Please note that the firestopping element is provided in the below 3D models as a generic-coloured seal. For further clarification of the approved firestopping systems see section 11.3.


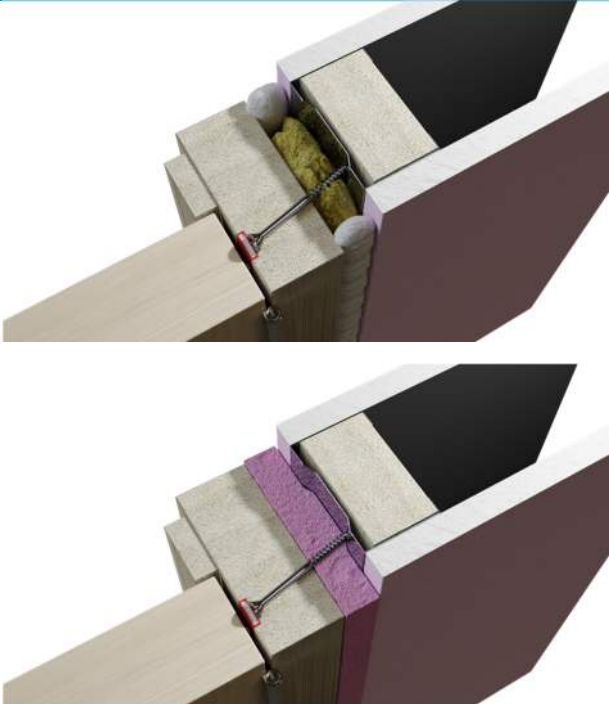
Permitted Installations	
	<p>Instances where the door frame and the wall of the same depth such that architraves are fitted flush to both faces. Note that the minimum door frame section size (width and depth) must be as per the requirements noted in this report – see door frame section. Architraves requirements are documented in the firestopping section of this report.</p>
	<p>Instances where the wall thickness is greater than the door frame depth. In this scenario timber architraves of minimum 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap, other than when the architrave abuts the wall.</p>
	<p>Split frames are permitted providing that both frame sections are secured to the wall in accordance with section 11.5. Furthermore, the main frame section (from which the door is hung) must be constructed to at least the minimum door frame section size (width and depth) as per the requirements noted in this report – see door frame section. The extension piece must be constructed using the same timber species as the main frame section.</p>

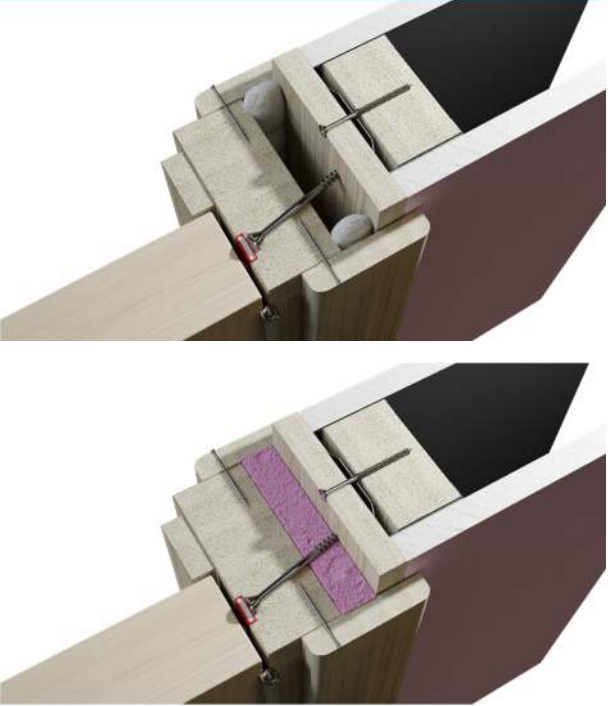
Notes:

1. The drawings are provided as a generalised illustration of the door frame installation only; actual installation must be as per the text within this document specifies.
2. When fitted within a masonry construction as detailed in section 11.5 the entire thickness of the leaf shall be within the thickness of the masonry element.

11.3 Firestopping

The firestopping requirements between the back of frame and wall are dependent on the gap size between the substrates. The table below provides the requirements based upon the gaps size. Please note that in the 3D depictions noted below show the application where a door frame is of the same depth as the overall wall thickness.

Gap (mm)	Requirement	3D model depiction
0 – 2	In practice, unlikely to occur, but if present, must be sealed with architraves, as below, fitted over a bead of acrylic intumescent sealant, tested as below.	N/A
3 – 10	Gap must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS476 Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 15mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.	
10 – 20	Gap 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 or full depth expanding PU foam, fire tested for this application to BS476 Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 15mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.	

Gap (mm)	Requirement	3D model depiction
Over 20	<p>This would be considered a poor preparation of the structural opening. A timber based or non-combustible subframe up to 50mm thick can be inserted and fixed to the wall bedded on intumescent mastic, the gap between door frame and subframe filled as follows:</p> <p>Gaps 5 to 10mm filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS476 Part 22: 1987 or BS EN 1634-1.</p> <p>Timber architraves of a minimum 15mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.</p>	

11.4 Packers

Packers can be timber of equal density to the frame, or, plywood or plastic packers if fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1.

Packers must be present local to each fixing position.

11.5 Wall Types, Structural Opening & Fixity

11.5.1 Wall Types

The following wall types are approved for this doorset design:

- a) Plasterboard clad timber stud partitions
- b) Plasterboard clad steel stud partitions including timber lining
- c) Blockwork, masonry or homogenous concrete constructions.

Wall types a & b above must have supporting fire resistance test evidence which demonstrates that it is capable of staying in place and intact for a minimum of 30 minutes supporting a doorset design.

Wall type c above must be determined to be able to provide at least the same level of fire resistance of the doorset design.

All wall types detailed above shall provide a suitable medium to permit adequate fixity, it is anticipated that for:

- Plasterboard clad timber stud partitions, the timber stud will be of sufficient dimensions such that the fixing for the door frame penetrates into solid timber.
- Plasterboard clad steel stud partitions will include a timber lining of sufficient dimensions such that the fixing for the door frame penetrates into solid timber.
- Blockwork, masonry or homogenous concrete constructions are anticipated to be solid to receive the fixings.

Note: Other tested solutions to achieve adequate fixity may be detailed within the above noted supporting fire resistance test evidence.

11.5.2 Structural Opening

For all wall types the structural opening shall be square, plumb and provide a flat surface for installation of the doorset.

For flexible wall types such as steel and timber stud partitions the structural opening must be prepared in line with the test evidence provided by the wall manufacturer.

11.5.3 Fixity

In all instances the fixing position must be such that it provides adequate restraint to the element of construction throughout the exposure to fire. This may therefore sometimes necessitate a twin line of fixings.

For single leaf doorset without sidepanels, the frame jambs only are to be fixed to the supporting construction using steel fixings at 500mm maximum centres and maximum of 150mm from any corner. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 50mm. It is not necessary to fix the frame head, although packers must be inserted.

For all other configurations of doorset, the upper horizontal framing section abutting the structural opening must also be secured to the wall using steel fixings at 600mm maximum centres and maximum of 150mm from any corner. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 50mm.

11.6 Post Production (Onsite) Leaf Size Adjustment

The Moralt Laminesse FireSound 44mm range of doorsets may be altered as follows.

Leaf Size Adjustment Specification	
Element	Reduction
Lipping	The post-production lipping thickness may be reduced by 1mm for fitting purposes, providing that the door gaps and intumescent conditions remain as required by this assessment and the minimum limitations in terms of lipping thickness is still maintained

11.7 Door Gaps

Door gaps and alignment tolerances must fall within the following range:

Door Gap & Alignment Tolerance Specification	
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 but may be fitted to sit back from the opening face by up to 2mm.
Threshold/Bottom edge of the leaf	8mm between bottom of leaf and top of floor covering. This is the maximum tolerance for fire resistance only.

12 Insulation Performance

Insulation performance may be claimed for a doorset to this design in line with the following table:

Insulation Performance Criteria	
Type	Details
Non-insulating	Doorsets incorporating greater than 20% of non-insulating glazing
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Unglazed doorsets or doorsets including 30-minute insulating glazing (e.g. 15mm Pyrostop or 16mm Pyrobel)

13 Conclusions

If the Moralt Laminesse FireSound 44mm doorset design, constructed in accordance with the specification documented in this field of application were to be tested in accordance with BS476 Part 22: 1987, it is expected that they would provide a minimum of 30 minutes of integrity and insulation (subject to section 12).

14 Declaration

We the undersigned confirm that we have read and comply with obligations placed on us by the Passive Fire Protection Forum (PFPF) Guide to undertaking technical assessments and engineering evaluations based on fire test evidence 2021 Industry Standard Procedure

We confirm that any changes to a component or element of structure which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.

We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.

We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.

We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

(In accordance with the principles of FTSG Resolution No. 82: 2001)

Signed:

Signiert von:

E178F3EA31B14B0...

Name: Christian Daschner

Position: Director R&D

Date: 15-Jan-2026

For and on behalf of: **Moralt AG**

15 Limitations

This assessment report:

- Does not provide an endorsement by Warringtonfire of actual products supplied.
- Has been prepared based on information provided by the Applicant. Warringtonfire has not verified the accuracy or completeness of that information and will not be responsible for any errors or omissions that might be incorporated into this report as a result.
- Any figures included in this report are provided for illustrative purposes only and may not fully reflect the actual scope being assessed. Warringtonfire cannot guarantee the accuracy of the drawings against the scope being assessed. The scope of this report is limited to assessments of the modifications to the tested systems as described herein.
- This report addresses itself solely to the elements and subjects discussed and do not cover any other criteria or modifications. All other details not specifically referred to should remain as tested or assessed.
- This report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to Warringtonfire, the assessment will be unconditionally withdrawn, and the applicant will be notified in writing. Similarly, the assessment should be re-evaluated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.
- This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
- Opinions and interpretation expressed herein are outside the scope of UKAS accreditation.
- This assessment report relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions that are stipulated in the standard this assessment concludes to. 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.
- This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with the standard to which this assessment concludes, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.
- 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.
- Previous versions of the report(s), if applicable, are withdrawn from the date of the up-issued assessment report with immediate effect. That means that they may no longer

be relied upon in support of any products being placed on the market (or for the stated project/address where applicable) from the issue date stated on the front cover of this report. The withdrawal of an assessment report does not affect any reliance placed on the report up to the issue date stated on the front cover of this assessment; however, going forward, the up-issued report must be referenced in any literature or product specifications in place of the previous versions of the assessment.

16 Validity

This assessment report is not valid unless signed by all signatories identified within the Signatories and Revision History section of this report.

This assessment report is not valid unless it incorporates the declaration given in Section 14 duly signed by the applicant.

The assessment validity is as stated on the front cover of this report, after which time it is recommended that it be submitted to the assessing authority for re-evaluation.

Appendix A

Summary of supporting 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. These test summaries are not intended to be a definitive guide to constructing a doorset. The details for the construction of a doorset must be taken from other sections within this Field of Application.

Some 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 longer thermal exposure 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 cited 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 Moralt Laminesse FireSound 44mm doorset designs if tested in accordance with BS476 Part 22: 1987.

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'.

Appendix B Primary Evidence

B.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)	<p>Specimen: Laminesse FireSound 44mm blank with 8mm thick hardwood lippings on all edges.</p> <p>Leaf Size: 2250 (h) x 950/950 (w) x 44 (t) with a flush overpanel 305 high.</p> <p>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.</p> <p>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.</p> <p>Door frame: European Redwood 32 thick of nominal density 510kg/m³.with MDF architraves and a Beech astragal fixed to the overpanel lower edge.</p> <p>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.</p>
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 30; Insulation: 30 Tested opening in toward the furnace

B.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)	<p>Specimen A+B: Laminesse FireSound 44mm blanks with 8mm thick hardwood lippings on horizontal and meeting edges, 14 thick on hanging edges.</p> <p>All Leaf Size: 2250 (h) x 820.5/260.5 (w) x 44 (t) with a flush overpanel 305 high.</p> <p>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.</p> <p>Door frame: Sapele 30 thick of nominal density 640kg/m³.with Redwood architraves and a Sapele astragal fixed to the overpanel lower edge.</p> <p>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.</p> <p>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.</p>	
Test Standard:	BS EN 1634-1: 2000 and BS EN 1363-1: 1999	
Test (minutes) Tested opening in toward the furnace	Results	
	Specimen A	Specimen B
	Integrity: 46 Insulation: 38	Integrity: 40 Insulation: 40

B.3 Test DMT-DO-50-1433

This test was conducted on an unlatched, double leaf, single acting doorset, with glazing. Test is presented as primary data for the Laminesse FireSound44 & FireSmoke44 for 30 minute fire resisting doorset design. Only the Laminesse FireSmoke44 is relevant to this FoA.

Date of test	06th August 2024
Testing body:	DMT Test Laboratory for Fire Protection
Sponsor:	Moralt AG
Tested Product:	Two double leaves wooden doors in wooden block frame
Tested Orientation:	Opening in towards the heating conditions
Summary of test specimen:	<p><u>LEAF A: Laminesse FireSound44</u></p> <p>Leaf size (active): 2440(h) x 1220(w) x 44(t)</p> <p>Leaf size (inactive): 2440(h) x 595(w) x 44(t)</p> <p>At the request of Moralt AG, full details of the core makeup are held in confidence at Warringtonfire.</p> <p>Facing: 3.3mm (t) HDF (761 kg/m³) on both outer faces.</p> <p>Lipping/ edge banding (active): 1210 (h) x 44 (w) x 5 (t) at the lateral and leaf top</p> <p>Lipping (inactive): 585 (h) x 44 (w) x 5 (t) at the lateral and leaf top.</p> <p><u>FRAME:</u></p> <p>Head & Jambs: 100 (w) x 38 (t)</p> <p>Stop: 40 (d) x 15 (w). MDF insert: 10 x 3 (positioning aid).</p> <p>Frame Fixing: glued with 2No 12(Ø) x 73 (l) dowels each.</p> <p>Astragal: 80 (w) x 18 (d)</p> <p><u>OVERPANEL:</u></p> <p>1824 (w) x 316 (h) x 44 (t)</p> <p>Lipping: 1824 (h) x 44 (w) x 5 (t)</p> <p><u>INTUMESCENT:</u></p> <p>4No. 15 (w) x 4 (t) Mann McGowan Pyrostrip 500P each at the frame top, hinge side, panel (at bottom of the overpanel) and (18mm, only in the meeting stiles of active door) leaf.</p> <p><u>SMOKE SEAL:</u></p> <p>1No. 12 (w) x 12 (h) M. McGowan.</p> <p>Leaf edge: 1No. 5 (w) x 8.6 (h) M. McGowan Enviroseal Tri-Blade.</p> <p><u>GLAZING:</u></p>

Date of test	06th August 2024	
	<p>Glass type: Pyrodur 30-105 (Pilkington)</p> <p>Glass size: 1242/824(h) x 348(w) x 7(t) fitted 120/1470mm from the head of the leaf and 120mm from the closing edge of the leaf.</p> <p>Sight size: 1220/799(h) x 323</p> <p>Beading: Solid timber Spruce (448 Kg/m³).</p> <p><u>INTUMESCENT TO GLAZING:</u></p> <p>12(h) x 15 (w) x 2.6 (t) Lorient Ltd graphite based intumescent</p> <p><u>HARDWARE:</u></p> <p>Hinges: 5No. 180 (h) x 24/27 (w) x 30 (t) BaSys PIVOTA DX 100 3D concealed hinge fitted 200mm, 1129mm and 2058mm from the (active) leaf head and 200mm and 2058mm from the (inactive) leaf head.</p> <p>Closer: 338 (h) x 32 (w) x 45 (d) ITS96 EN 2-4 Dormakaba concealed closer on the active leaf</p> <p>Lockset/Latch: 113(h) x 12(w) x 165(d) fitted 1047 from the base of the leaf.</p> <p>Cylinder: 85(h) x 33(w) x 10/17 (t) Abus August Dummy cylinder.</p> <p>Lever handle: 250(h) x 33(w) x 10(t) x 72mm projection Sphinx Electronics door terminal module (ref: Hafele GmbH DT600/DT600c).</p> <p>Flush bolt: 253(h) x 17(w) x 15(t) Athmer TK-15/T at the top, meeting stiles of inactive door leaf.</p> <p><u>HARDWARE PROTECTION:</u></p> <p>Hinge: Hinge encased with intumescent Interdens 15 SA Mann McGowan 1mm Pyrohinge</p> <p>Closer: 1mm total encased intumescent kit Mann McGowan Pyrokit Interdens.</p>	
Test Standard:	Principles and conditions of EN 1634-1:2014 + A1 2018 in conjunction with EN 1363-1:2020	
Performance	<p><u>Doorset A</u></p> <p>Integrity: 30 minutes</p> <p>Insulation: 11 minutes</p>	<p><u>Doorset B</u></p> <p>Integrity: 34 minutes</p> <p>Insulation: 12 minutes</p>

Appendix C Secondary Evidence

C.1 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:	James Latham, Unit 2, Swallow Park, Fenway Road, Hemel Hempstead, Hertfordshire, HP2 7QU
Summary of test construction (mm)	<p>Specimen B: Graduated Density chipboard 44 thick blank with 8mm thick hardwood lippings on all edges.</p> <p>Leaf Size: 2040 (h) x 826/303 (w) x 44 (t).</p> <p>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.</p> <p>Door frame: Latham WoodEx Engineered European Redwood 30 thick of nominal density 510kg/m³.with Redwood architraves.</p> <p>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.</p>
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.

C.2 Test report DMT-DO-50-994

Date of test	13 th April 2021
Identification of test body	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany
Sponsor	Elton B.V, 2e Energieweg 5, 9301 LL Roden, Netherlands
Tested Product	One timber based door leaf, 63mm tested opening into furnace. The leaf was 1235 (w) x 2485 (h) and mounted in a hardwood timber frame on 2No hinges, latched at mid-height with a sashlock.
Test Standard	EN1634-1:2014+A1 2018 and EN 1363-1:2020
Test Results (minutes)	No integrity or insulation failures were recorded prior to termination of the test at 91 minutes.
DMT-DO-50-994 has been incorporated as supporting data to permit consideration the Elton B.V dropseals discussed in section 10.9.6.	
Summary of test specimen	Specimen incorporated an 'Ellenmatic Soundproof' dropseal no additional intumescent protection was installed.

C.3 Test report DMT-DO-50-1446

Date of Test:	22nd September 2024
Identification of Test Body:	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany
Sponsor:	Moralt AG
Tested Product:	1 No. Latched single acting single leaf doorsets (LSASD) comprising a 55mm thick Moralt FireSound Plus 54 with applied cladding panel and hardwood frame.
Tested Orientation:	Opening in towards heating condition
Sampling information:	The Moralt FireSound Plus 54 doorleaf was sampled by BM Trada on 10 th July 2024.
Test Standard:	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020
Performance:	Integrity: 78 minutes Insulation: 78 minutes
Reason for Use	<p><u>Doorleaf:</u> Applied cladding panel (27mm Spruce panel with a 2(t) aluminium facing).</p> <p><u>Hardware:</u></p> <ul style="list-style-type: none"> • Hinges: CEAM AMADEO SPA 1131S Concealed hinges • Closer: ASSA Abloy DC700G-CM (Close Motion) • Maglock: ASSA Abloy / Adams Rite ARMLOCK 280 Series (Ref. 281-00) • Lockset: ASSA Abloy Vingcard - (P001170024-100-301) comprising: <ul style="list-style-type: none"> • Lock: ASSA Abloy Vingcard Novel (P001170024-100-301) – 2 locksets fitted in opposite orientations. • Lever Handles: ASSA Abloy Vingcard • Escutcheon: ASSA Abloy Vingcard • Drop Seal: ASSA Abloy (Lorient) LAS8001 • Aluminium Threshold Plate: ASSA Abloy LAS4014Si - 125(w) x13(h)mm

C.4 Test report DMT-DO-50-1447

Date of Test:	12th September 2024	
Identification of Test Body:	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany	
Sponsor:	Moralt AG	
Tested Product:	Door 1: 1 No. Unlatched single acting single leaf doorsets (ULSASD) comprising a glazed 54mm thick Moralt FireSound Plus 54. Door 2: 1 No. Unlatched single acting single leaf doorsets (ULSASD) comprising a 55mm thick Moralt SmartCore 55, with applied cladding panel and hardwood frame.	
Tested Orientation:	Opening in towards heating condition	
Sampling information:	The door leaves were sampled by BM Trada on 5 th June 2024 under sampling contracts SC24125T (Door 1) and SC24126T (Door 2)	
Test Standard:	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020	
Performance:	Door 1: Integrity: 87 minutes Insulation: 87 minutes	Door 2: Integrity: 62 minutes Insulation: 62 minutes
Reason for Use	<p><u>Door 1:</u> <u>Hardware:</u></p> <ul style="list-style-type: none"> • Hinges: Consort concealed hinges CCH340.SSS • Closer: Boss Door Controls ICK1955V / BOSS TS5.225 • Lock: Glutz Mortise Lock 24100.7/60 • Lever Handles: Glutz 48050 Lugano • Cylinder: Glutz 83704 E-Doppelzylinder • Escutcheon: Glutz AG – 48200 – Ø53 x 8mm projection Glutz AG – 48283 – Ø53 x 8mm projection • Drop Seal: Athmer Schall-EX L-15/30 WS <p><u>Glazing:</u></p> <ul style="list-style-type: none"> • Glass: Fireswiss Foam – 2154(h) x 964(w) x 23(t)mm • Glazing Bead: 27(h) x 13.5 or 11.5(w) fixed with Ø3.2x50mm screws – angled 15° from the glass face, 50mm in from the corners and at maximum of 270mm centres. • Glazing System: Mann McGowan Pyroglaze 60 25x3mm • Glazing Liner: Mann McGowan Pyrostrip 100 ECSA (Pyroglaze 60) – 47(w) x 2(t) mm. • Timber Aperture Liner: Hardwood (Density 640kg/m³), 54(w) x 5(t)mm <p><u>Door 2:</u> <u>Cladding Panel:</u> Applied cladding panel (27mm Spruce panel with a 10(w) x 10(d) grooves. <u>Door 2: Hardware:</u></p> <ul style="list-style-type: none"> • Hinges: Simonswerk Tectus TE527 3D concealed hinge. • Closer: Dorma ITS96 EN 2-4 Concealed Closer • Maglock: ASSA Abloy / Adams Rite ARMLOCK 280 Series (Ref. 281-00) • Lockset: Lock: LE7S1570R01IM8 XS4 Original RFID lock • Drop Seal: Athmer Schall-EX L-15/30 WS 	

Note:

Based on details issued by Pyroguard and supplied by Moralt AG, that are held on file by Warringtonfire, it is permitted to substitute the Fireswiss Foam 23mm glass for the 23mm thick Pyroguard EI60 INT glass.

C.5 Test Report Chilt/RF11059

Supporting evidence to support the use of the Construction Specialities – Acrovyn edge protectors for 30 minutes integrity performance.

The left doorset was designated doorset A and the right doorset was designated doorset B. The left leaf of each doorset measured 2100mm high x 900mm wide x 44mm thick and the right leaf of each doorset measured 2100mm high x 300mm wide x 44mm thick. Vertical leaf edges were protected with CS Group Acrovyn door edge protectors and the right hand jambs of both doorsets were protected with 2mm thick Acrovyn. Both doorsets were orientated with leaves opening towards the furnace, considered to be the most onerous direction based on experience of testing similar door constructions. It is therefore the opinion of Warringtonfire that the test results can be applied to doors opening in either direction. Both doorsets were fitted with latches disengaged for the test.

When tested in accordance with the requirements of BS 476: Part 22: 1987, the specimens achieved the following performance:

Criteria	Doorset A – Particleboard Core	Doorset B – Lamel Core
Integrity:	43 minutes	39 minutes
Insulation:	43 minutes	39 minutes

C.6 Test Report Chilt/IF11010A

Supporting evidence to support the use of the Construction Specialities – Acrovyn edge protectors for 30 minutes integrity performance.

The left doorset was designated doorset A and the right doorset was designated doorset B. Each leaf of each doorset measured 980mm high x 226mm wide x 44mm thick. Meeting edges of both specimens were protected with CS Group Acrovyn door edge protectors. Both doorsets were orientated with leaves opening towards the furnace, considered to be the most onerous direction based on experience of testing similar door constructions. It is therefore the opinion of Warringtonfire that the test results can be applied to doors opening in either direction. Both doorsets were fitted with latches disengaged for the test.

When tested in accordance with the requirements of BS 476: Part 22: 1987, the specimens achieved the following performance with no failures observed prior to termination of the test:

Criteria	Doorset A – Particleboard Core	Doorset B – Particleboard Core
Integrity:	36 minutes	36 minutes

C.7 Fire Resistance Test Chilt/IF13094

An unlatched double leaf doorset - the leaves measured 1400mm high x 900mm and 300mm wide x 48mm thick. Top and bottom edges were lipped with 2.5mm thick Acrovyn and the leaves faced with 2.5mm thick Acrovyn. Vertical edges were protected with 2mm thick Acrovyn edge protectors. The doorset was orientated opening towards the furnace, which is considered to be the most onerous direction based on experience of testing doors of similar construction. It is therefore the opinion of Warringtonfire that the test results can be applied to doors opening in either direction. The doorset was fitted with a latch disengaged for the test.

When tested utilizing the temperature and pressure conditions of BS 476: Part 20: 1987 and in accordance with the principles of BS 476: Part 22: 1987, the specimen achieved the following performance with no failures observed prior to termination of the test.

Criteria	Blankfort 30 (lamel core) based door leaves
Integrity:	45 minutes