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Title

Field of Application for:

Moralt Laminesse Firesmoke 44/54mm Doorsets in Timber Based Door Frames

For 30 minutes Fire Resistance if they were to be tested in accordance with BS 476: Part 22: 1987

Assessment Report No.:

Chilt/A13058 Revision E

Issue Date:

7th October 2025

Valid Until:

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Job Reference:

WF553700

Prepared for:

Moralt AG

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Signatories and Revision History

Issue No.	Date	FM No.	Report scope and Signatures
A	09.02.2015	CNA/F14308	Addition of WoodEx30 door frame, additional facing options and grooving options added
B	29.05.2015	CNA/F15133	Addition of 42mm thick core option
C	22.08.2018	WF399353	Changed into Exova Warringtonfire format and technically reviewed and revalidated for a further 5 years. Test WF382394 included which enabled, concealed closers, concealed hinges and multipoint locking included. Acoustic clad on panel included.
D	11.12.2019	WF421102	Update to Warringtonfire format and in accord with the principles of BS EN 15725: 2010.
E	07.10.2025	WF553700	Additional test evidence considered is listed below: • DMT-DO-50-1433. The specific scope introduced for this revision: • Use of softwood timber for door frame, lippings and glazing beads. • Option for Mann McGowan intumescent seals - with associated leaf size envelopes. • Use of multiple glazed apertures and flush beads • Use of the tested RFID locks/handles • Enhanced specification for overpanel above double leaf doorsets - as tested • Additional tested hardware - concealed hinges and closer. • Updated details for clad-on panel • Specification for Yeoman Shield edge protectors • Use of Pilkington Glass products - specific screen details • Additional tested hardware: Maglocks, Ellen dropseals, Rutland closers, Assa Abloy range of. • Specify details for PVC encapsulation of the leaf based on supporting test data within Chilt/A11129 owned by Construction Specialities Ltd.

Assessor	Reviewer
Name: Andrew Winning*	Name: E Power*
Title: Senior Product Assessor	Title: : Senior Product Assessor
Signature: Signed by: DE15B987D373423...	Signature: Signed by: DE5B8657DAF149D...

*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 of Moralt AG doorset designs (Laminesse FireSmoke 44/54mm), 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 AG (Laminesse FireSmoke 44/54mm) doorsets constructed in accordance with the specification documented in this field of application were to be tested in accordance with BS 476: 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 the test standard 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.

Contents

1. Introduction

This field of application report presents an assessment of the fire resistance performance of the specified proprietary of Moralt AG doorset designs (Laminesse FireSmoke 44/54mm), 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 laboratories[1], 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 of Moralt AG (Laminesse FireSmoke 44/54mm) 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 ±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.

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

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

4.3.1 Leaf – Laminesse FireSmoke – 44/54mm thick

The door designs can include:

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

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/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 – Engineered Timber

The construction of the door frames is MDF/WoodEx.

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 each door leaf option 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, for example, double door leaves and an overpanel – the harder it becomes to pass a test. In this specific example it is because the junction between two door leaves or door leaf and overpanel introduces a discontinuity into the doorset which can be a means of failure.

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 test on an unlatched single acting doorset is considered to be equivalent to a double acting doorset, due to the known deflection of an unlatched single acting doorset towards the furnace conditions i.e. away from the door stop. However, this does not cover doorsets with flush overpanels.
- 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.

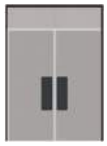
Doorsets with reduced height and width dimensions from those tested are deemed to be less onerous. Therefore, doors with dimensions less than those given in the leaf size envelopes (for the relevant intumescent specification) in the following sections are covered and may be manufactured.

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 Laminesse FireSmoke leaf options and Hardwood/softwood and engineered 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 Moralt AG Doorset Design (Laminesse and FireSmoke 44/54)

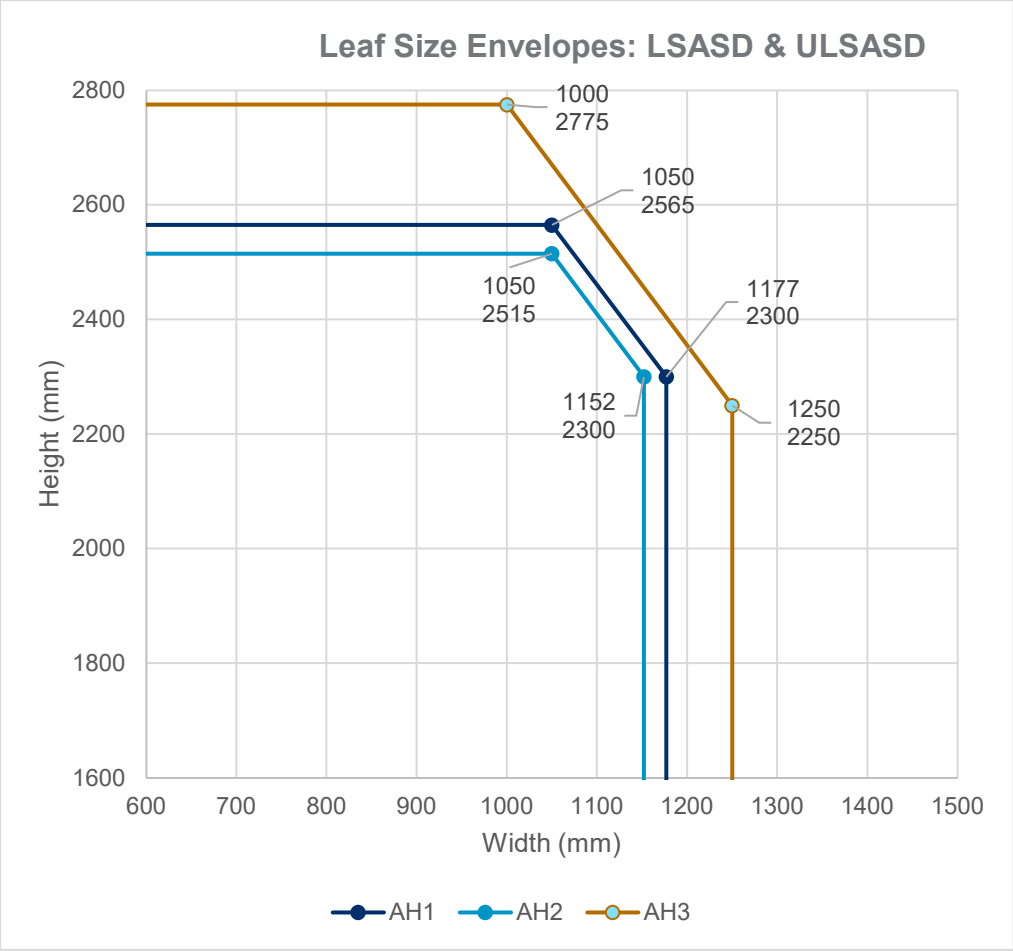
Permitted Configurations with frame option 1-2 with leaf option (Laminesse FireSmoke 44)									
		Configuration							
		LSASD	ULSASD	LSASD OP	ULSASD OP	LSADD	ULSADD	LSADD OP	ULSADD OP
Frame	1 – Softwood or hardwood frame*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	2 – Engineered timber frame*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* See Section 7 for specific limitations with respect to the framing types

Permitted Configurations with frame option 1-2 with leaf option (Laminesse FireSmoke 54)									
		Configuration							
		LSASD	ULSASD	LSASD OP	ULSASD OP	LSADD	ULSADD	LSADD OP	ULSADD OP
Frame	1 – Softwood or hardwood frame*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	2 – Engineered frame*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

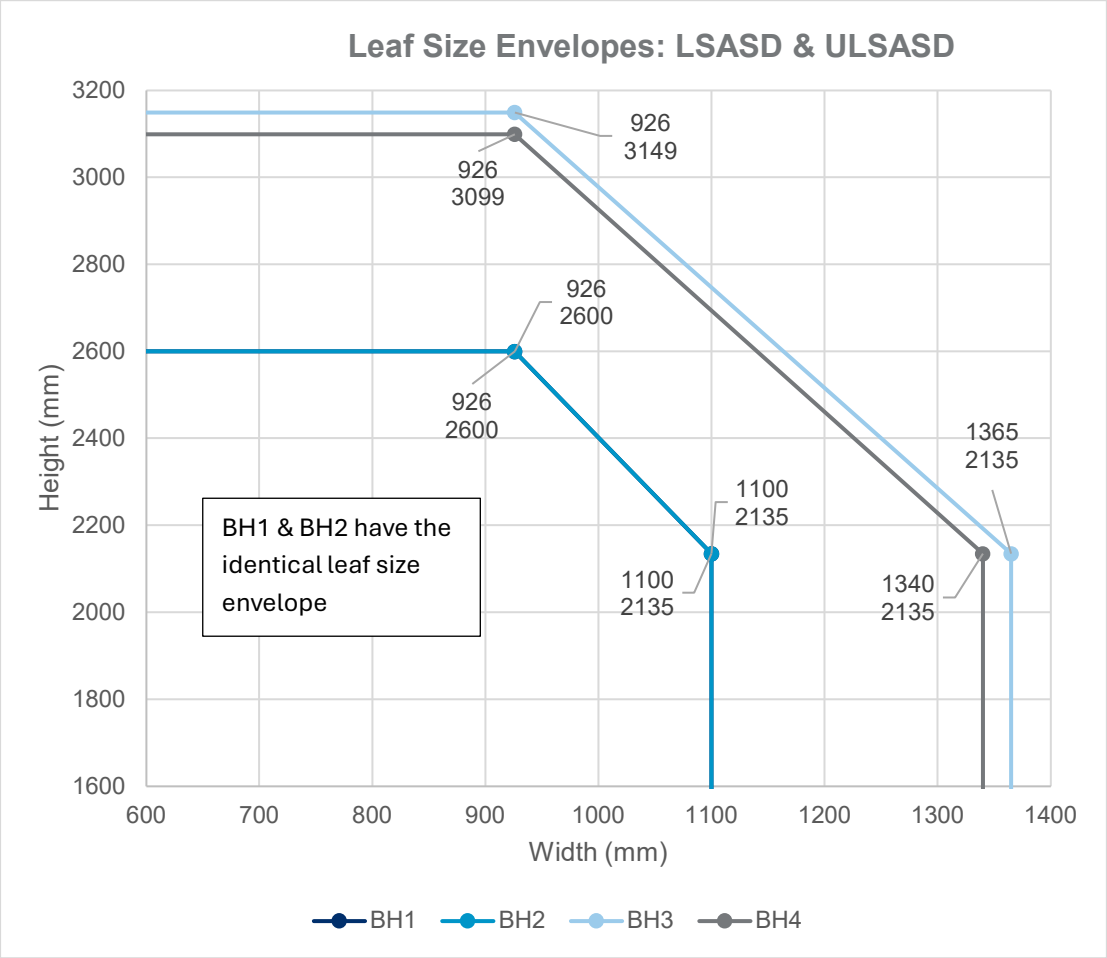
* See Section 7 for specific limitations with respect to the framing types

4.5.5 LSASD & ULSASD Configuration: Leaf Sizes & Intumescent Specification



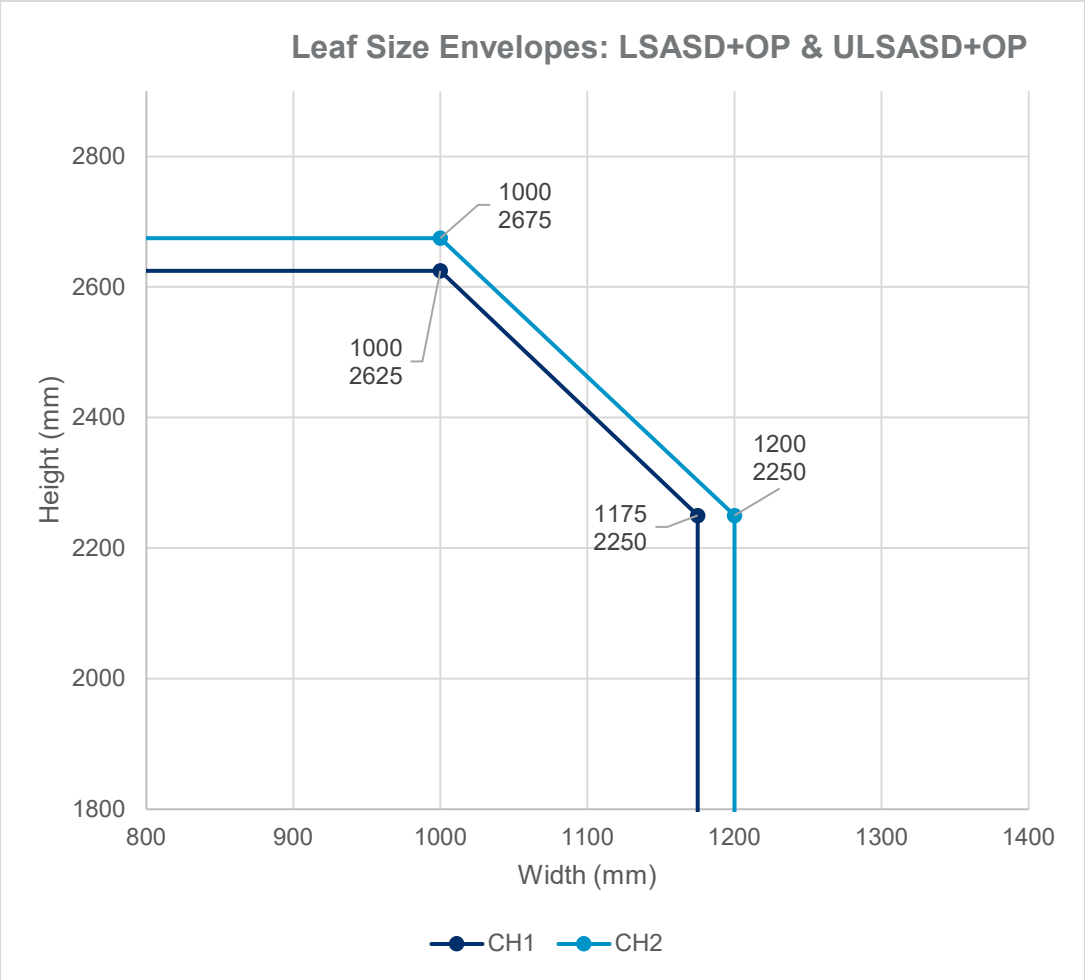
Intumescent Specification for LSASD & ULSASD Laminesse 44/54mm Doorsets			
Intumescent Spec. Reference	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
AH1 (LSASD) AH2 (ULSASD) (RF07028)	PVC Encapsulated Rigid Box Seal or Therm-A-Seal	Pyroplex Ltd Intumescent Seals Ltd	**Head & Jambs:** 1No 20 x 4mm seal fitted centrally in the leaf head or bottom edge of the overpanel
AH3 (LSASD & ULSASD) (DMT-DO-50-1433 Door 2)	Pyrostrip 500P	Mann McGowan	**Head & Jambs:** 1No 15 x 4mm seal fitted centrally in the leaf head or bottom edge of the overpanel

4.5.6 LSASD & ULSASD Configuration: Leaf Sizes & Intumescent Specification



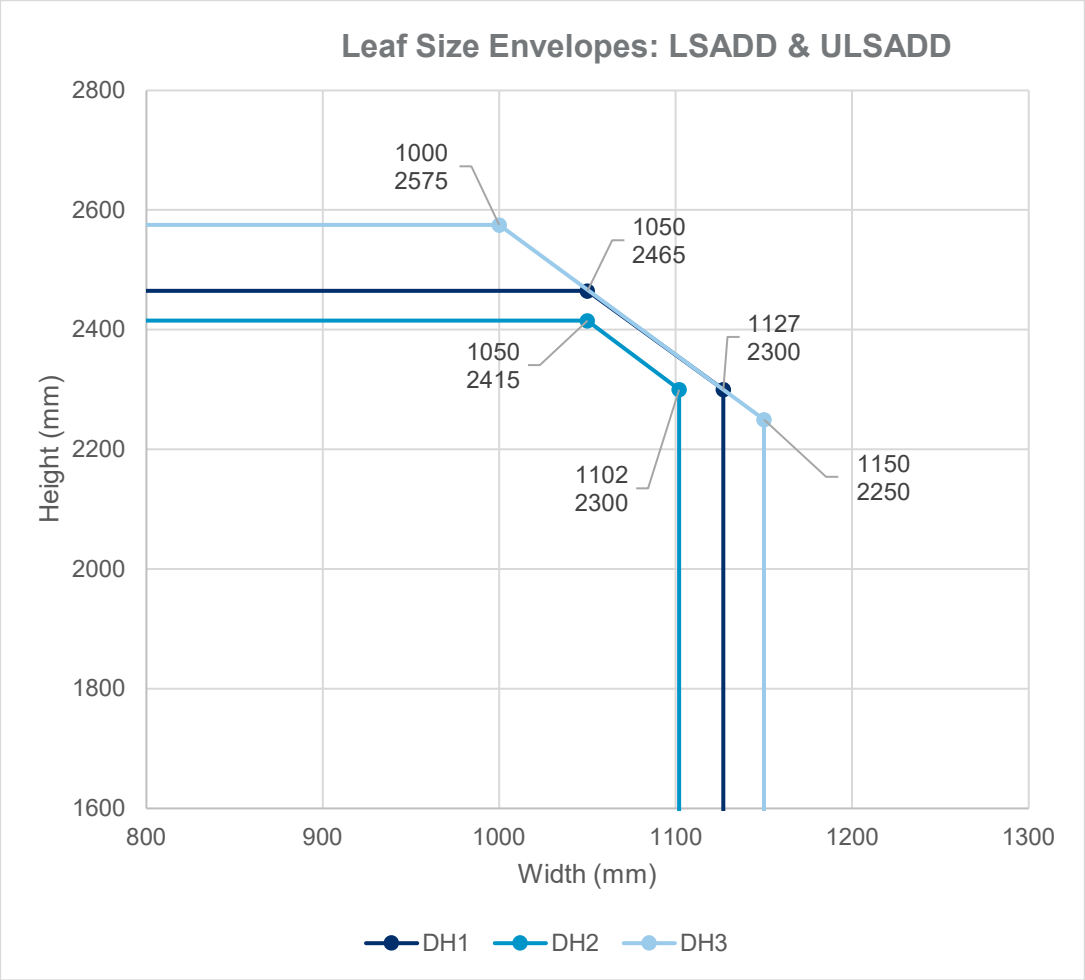
Intumescent Specification for LSASD & ULSASD Laminesse FireSmoke 54mm Doorsets			
Intumescent Spec. Reference	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
BH1 & BH2 (FEP/F14256)	PVC Encapsulated Therm-A-Seal Or Rigid Box Seal	Pyroplex Ltd	**Head & Jambs:** 1 No 20 x 4mm seal fitted centrally in the leaf head or bottom edge of the overpanel.
BH3 & BH4 (FEP/F14256)	PVC Encapsulated Therm-A-Seal Or Rigid Box Seal	Pyroplex Ltd	**Head & Jambs:** 1 No 25 x 4mm seal fitted centrally in the leaf head or bottom edge of the overpanel.

4.5.7 LSASD+OP & ULSASD+OP Configuration: Leaf Sizes & Intumescent Specification



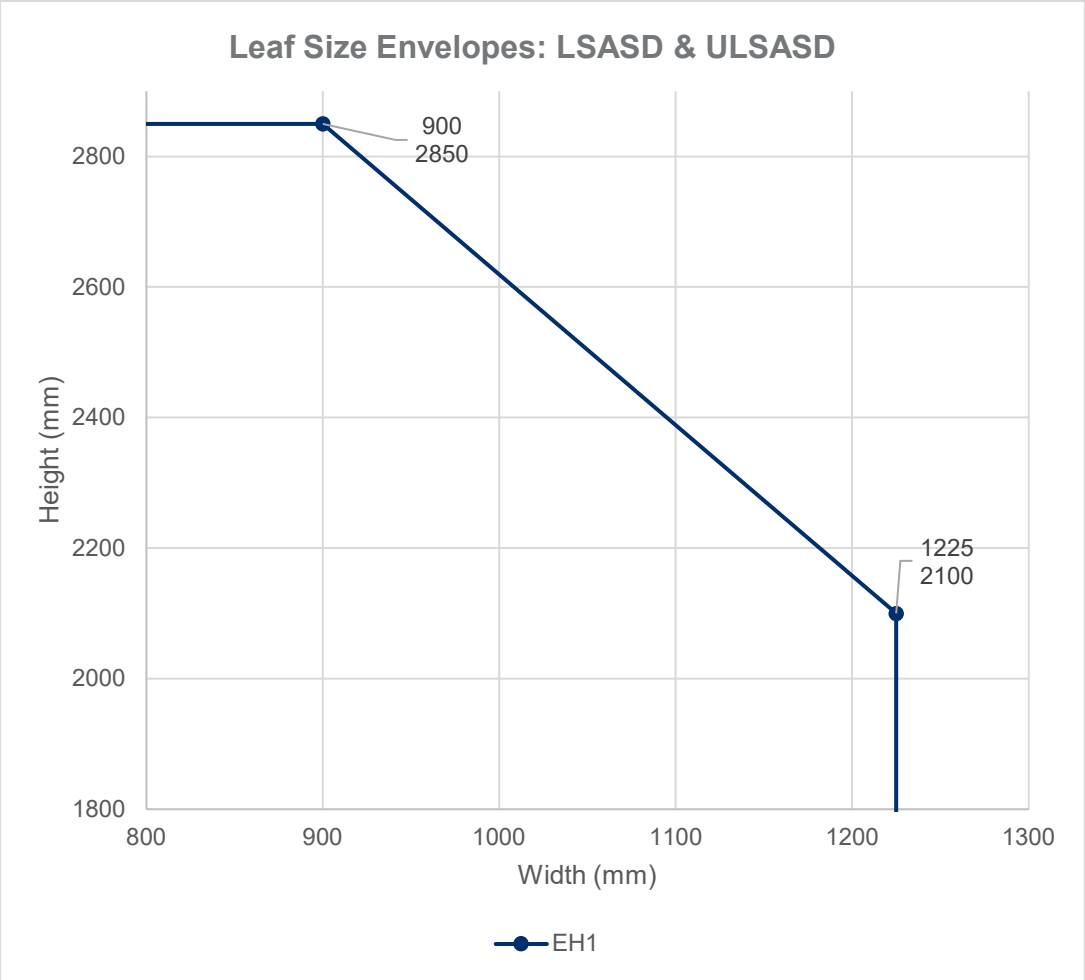
Intumescent Specification for LSASD+OP & ULSASD+OP Laminesse FireSmoke 44/54mm Doorsets			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
CH1 (LSASD+OP) & CH2 (ULSASD+OP) (DMT-DO-50-1433 Door 2)	Pyrostrip 500P	Mann McGowan	**Head & Jambs:** 1No 15 x 4mm exposed and fitted centrally in the leaf or frame head. **Overpanel:** 1No 15 x 4mm exposed and fitted centrally in the panel edge or frame reveal

4.5.8 LSADD & ULSADD Configuration: Leaf Sizes & Intumescent Specification



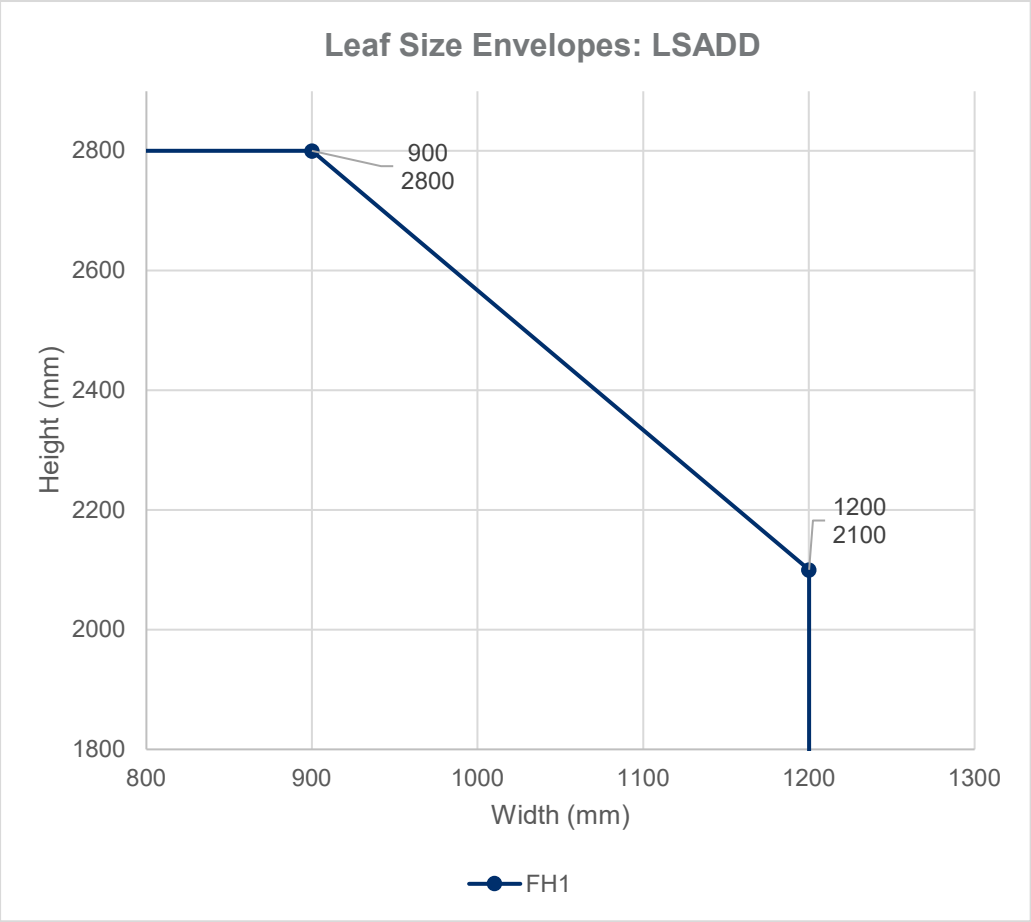
Intumescent Specification for LSADD & ULSADD Laminesse FireSmoke 44/54mm Doorsets			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
DH1 & DH2 (RF07028)	**PVC Encapsulated Therm-A-Seal**	**Intumescent Seals Ltd**	**Head & Jambs:** 1No 20 x 4mm exposed and fitted centrally in the leaf or frame head. **Meeting Edge:** 1 No 20 x 4mm exposed and fitted centrally in one leaf edge only.
DH3 (DMT-DO-50-1433 Door 2)	Pyrostrip 500P	Mann McGowan	**Head & Jambs:** 1No 15 x 4mm exposed and fitted centrally in the leaf or frame head. **Meeting Edge:** 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only.

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



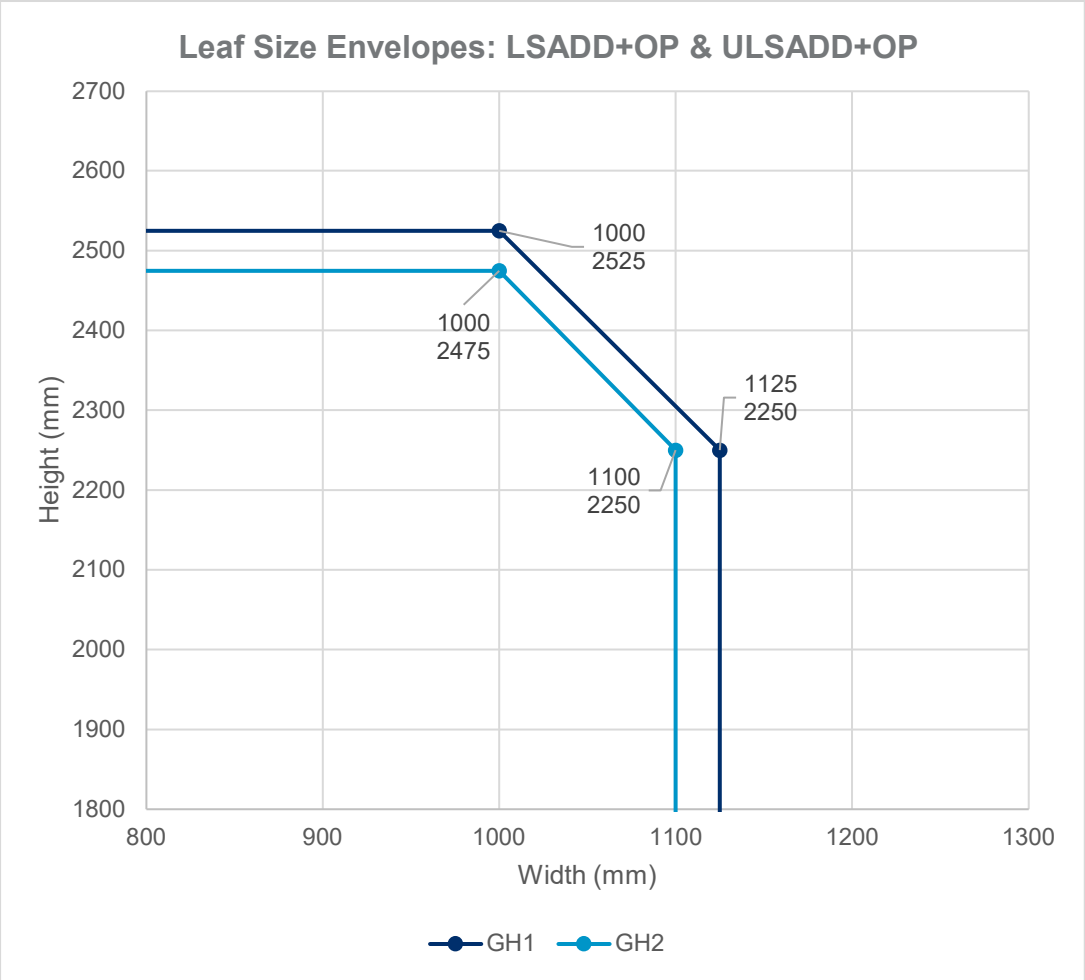
Intumescent Specification for LSASD & ULSASD Laminesse FireSmoke 44/54mm Doorsets – CS Edge Protectors/Acrovyn Wrap			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
EH1 (Chilt/RF11059)	**Type 617**	**Lorient Polyproducts Ltd**	**Head & Jambs:** 1No. 20 x 4mm strips centrally fitted in the leaf head or frame reveal.

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



Intumescent Specification for LSADD Laminesse FireSmoke 44/54mm Doorsets – CS Edge Protectors/Acrovyn Wrap			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
FH1 (Chilt/RF11059)	Type 617	Lorient Polyproducts Ltd	**Head & Jambs:** 1No. 20 x 4mm strips centrally fitted in the leaf heads or frame reveal. **Meeting Edge:** 1No. 15 x 4mm strip centrally fitted in the meeting edge of both leaves.

4.5.11 LSADD+OP & ULSADD+OP Configuration: Leaf Sizes & Intumescent Specification

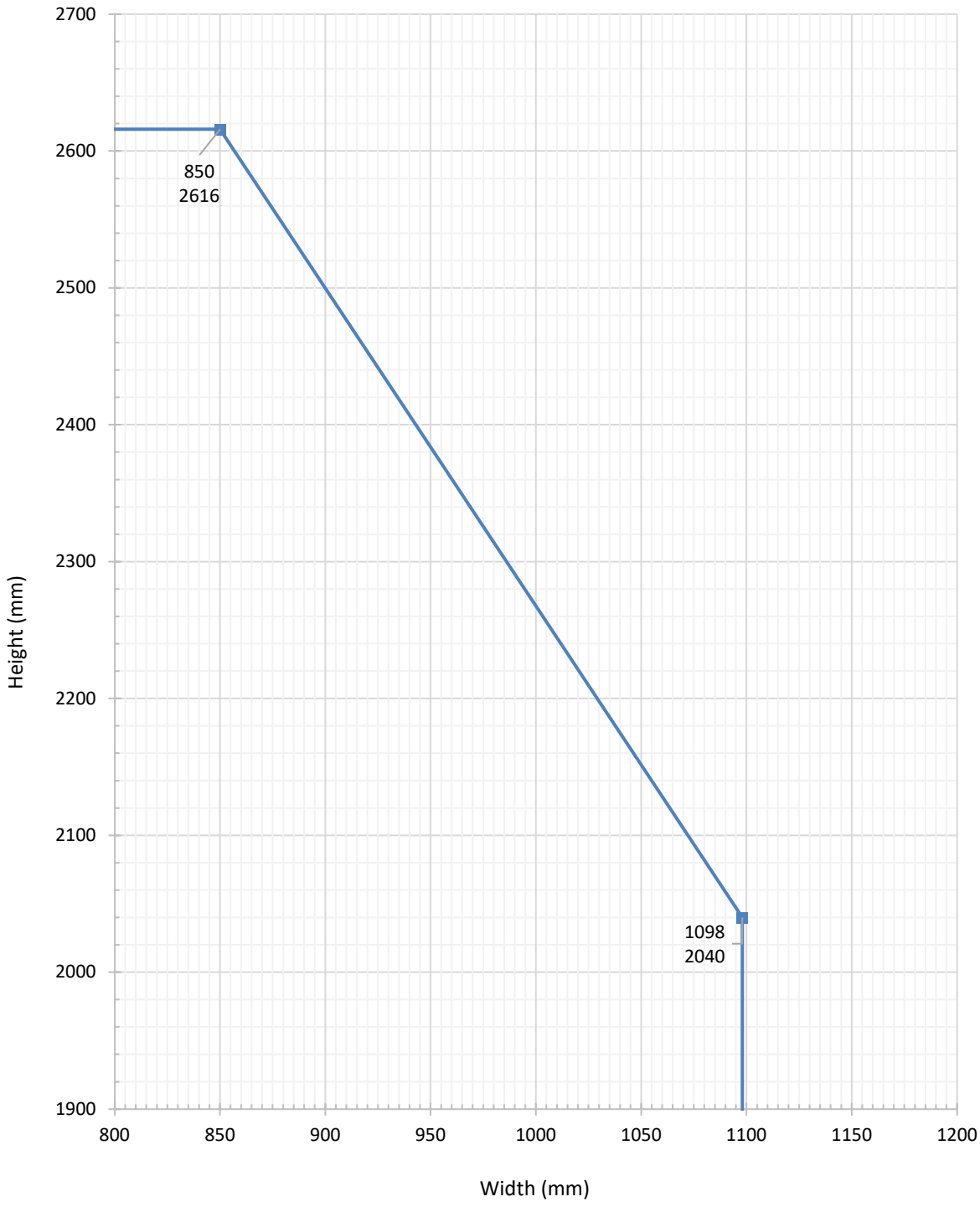


Intumescent Specification for LSADD+OP & ULSADD+OP Laminesse FireSmoke 44/54mm Doorsets			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
GH1 (LSADD+OP) & GH2 (ULSADD+OP) (DMT-DO-50-1433 Door 2)	Pyrostrip 500P	Mann McGowan	**Head & Jambs:** 1No 15 x 4mm exposed and fitted centrally in the leaf or frame head. **Meeting Edge:** 1 No 15 x 4mm exposed and fitted centrally in one leaf edge only. **Overpanel:** 1No 15 x 4mm exposed and fitted centrally in the panel bottom edge or frame reveals

4.5.12 Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors

4.5.12.1 LSASD & ULSASD Configuration

Doorset created from Leaf options 1 & 2 with frame option 1



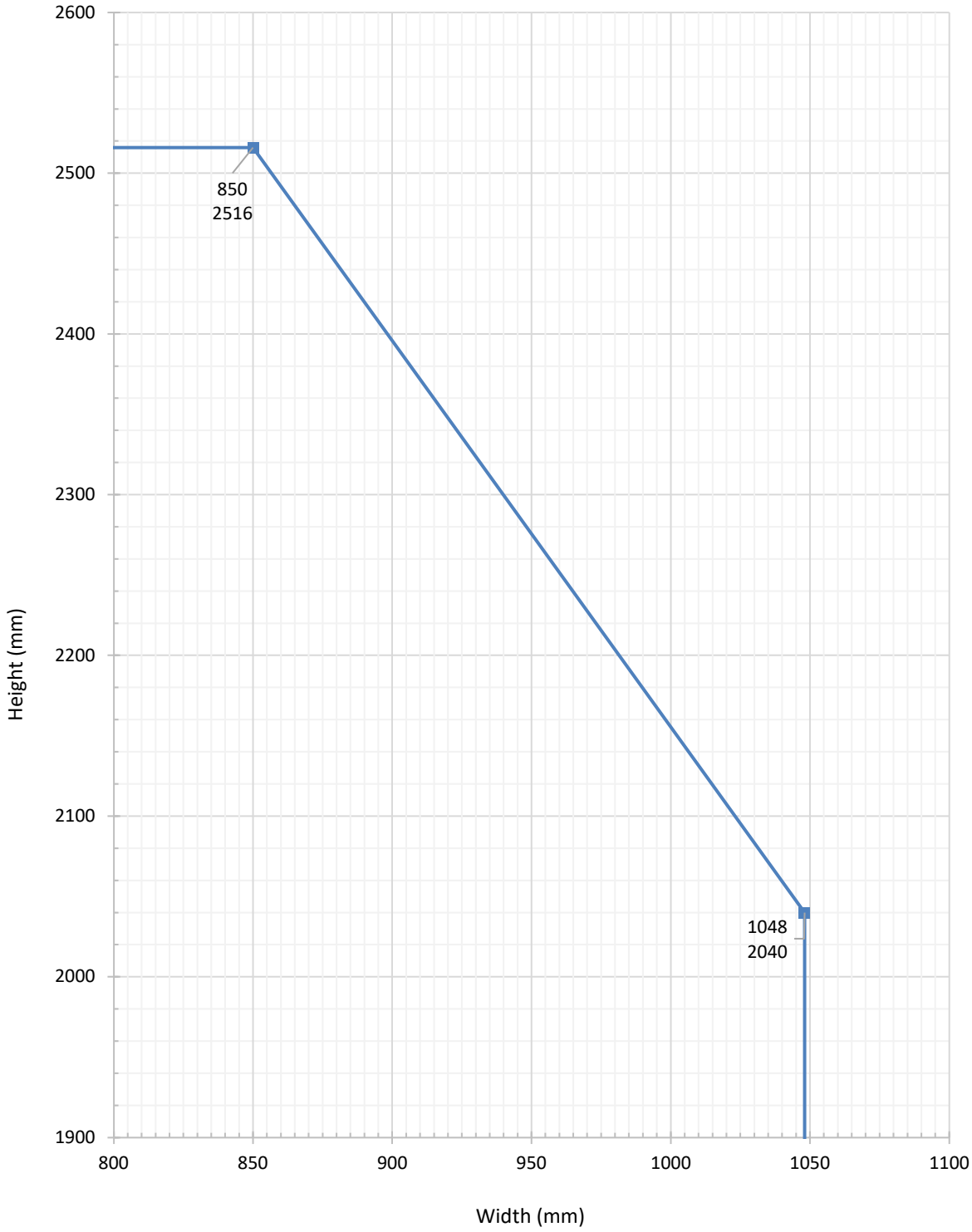
Intumescent Specification for LSASD & ULSASD Leaf option 1 & 2 with frame option 1			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
GS1/1 (Chilt/RF07140 Revision B Specimen A)	LP1504 Type 617	Lorient Polyproducts Ltd.	**Frame or Leaf Head:** 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf head or frame reveal. **Vertical Leaf Edges (Edge Protector):** 1no. 15x4mm seal installed centrally in the edge protector[1]

Note:

1. If it is only required to fit an edge protector to one edge of the leaf (see section 5.4.3), the intumescent specification for the edge not fitted with an edge protector must match that given for the leaf head in the table above.

4.5.12.2 LSADD & ULSADD Configuration:

Doorset created from Leaf options 1 & 2 with frame option 1



Intumescent Specification for LSADD & ULSADD Leaf option 1 & 2 with frame option 1			
Intumescent Spec. Reference	Make / Type	Manufacturer / Supplier	Location & Size
HD1/1 (Chilt/RF07140 Revision B Specimen A)	LP1504 Type 617	Lorient Polyproducts Ltd.	**Frame or Leaf Head Reveal:** 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf head or frame reveal. **Vertical Leaf Edges (Edge Protector):** 1no. 15x4mm seal installed centrally in the edge protector**

Note:

1. If it is only required to fit edge protectors to the meeting edges of the leaves (see section 5.4.3), the intumescent specification for the edges not fitted with an edge protector must match that given for the leaf head in the table above.

5. General Description of Construction

5.1 Leaf Core Construction

The two door leaf options detailed below are approved by this assessment.

5.1.1 Laminesse FireSmoke – 44/54mm thick

The basic tested construction of this door leaf design comprises the following:

Element	Material		Dimensions (mm)	Minimum Density (kg/m^3)
Core	Lamincore[1]		32 (t)	450
Stiles	-		-	-
Rails	-		-	-
Facing	MDF Chipboard	On both sides of the core	6 (t)	640

Notes:

1. Details held on file, in confidence, at Warringtonfire.
2. The leaf must be lipped as specified in section 5.3.
3. The minimum leaf thickness after calibration is 43mm (i.e. a maximum of 0.5mm from both sides).
4. The minimum leaf thickness after finishes applied is 44mm.

5.1.2 Laminesse FireSmoke – Comparison of 44/54mm thick Cores

The construction of the Laminesse FireSmoke 44mm utilises a 31 – 32mm (in total) thick core resulting in the overall 44mm thick leaf. It is permitted to increase the core thickness to 42mm (in total) which will result in a 54mm thick leaf.

Either core thickness may be used without restriction, unless specifically excepted in the following sections. Where reference is made to Laminesse 'FireSmoke 44mm', the 54mm leaf may also be utilised.

The 54mm thick variant also permits alternative hardware which is not acceptable in the 44mm thick variant, see section 10.3, and the addition of an acoustic panel, see section 5.4.5.

5.2 Leaf Size Adjustment During Manufacture

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

Pre-Machining Leaf Size Adjustment Specification	
Element	**Reduction**
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 Lipping

The testing documented in Appendix A has generally been undertaken using 8-12mm 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 AG door blanks must be lipped with the following specification, for all leaf types and solid panels (overpanels or sidepanels), where appropriate.

Timber Lipping Specification for Moralt AG door blanks		
Material	**Size (mm)**	**Min Density (kg/m^3)**
Hardwood	1. Flat = 5 – 14 thick 2. Rounded = Not permitted 3. Rebated = 20 – 30mm thick with an equal rebate 12mm deep[5]	640
Softwood[1]	1. Flat = 5 – 6 thick 2. Rounded = Not Permitted 4. 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 1 only.
2. All lippings are to be the same thickness as the door leaf.
3. Overpanels separated from the leaf heads with a transom must also be lipped.
4. Overpanels flush with the leaf heads must be lipped on all edges.
5. Single doorsets with flush overpanels may use either a square or rebated overpanel junction
6. Double doorsets may not use rebated meeting edges.
7. Lippings can be bonded with UF, PF or PVAc. 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.
8. 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.
9. If flat lippings are used on a doorset which includes a flush overpanel refer to section 5.7 for astragal requirements.

5.4 Edge Protectors

5.4.1 General

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

5.4.2 PVC Edge Protectors & Post-Formed Facings

5.4.2.1 CS Group Edge Protectors

The Moralt FireSmoke 44/54 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 data sheets in section 4.5.9. 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.

5.4.2.2 Post-Formed CS Group Acrovyn

It is possible to encapsulate the Moralt FireSmoke 44/54 designs by post-forming the leaf in CS Group Acrovyn, based on the supporting test evidence in Chilt/RF11059 for 30-minute applications and the following specification:

1. CS Group Acrovyn may be wrapped around the vertical edges of the leaf, or the leaf can be fully encapsulated on all four edges.
2. The vertical edge detail prior to post-forming must either be lipped with 8mm thick PVC adhered to the leaf edge using WC127 PVC weld cement, or hardwood as detailed in this assessment (see section 5.3). Rebated timber lippings are not permitted.
3. The horizontal edge detail prior to post-forming does not require lipping but may be lipped with 8mm thick PVC adhered to the leaf edge using WC127 PVC weld cement, or hardwood as detailed in this assessment (see 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 4.5.4.1 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 for maximum permitted leaf sizes.
8. The maximum thickness of CS Group Acrovyn used must be 2mm, as per test evidence.
9. The CS Group Acrovyn can be provided as pre-formed trays with dimensions to suit the proposed leaf sizes, as well as sheets for post-forming by the door manufacturer.
10. It is permitted to hang leaves fitted with CS Group Acrovyn in solid timber door frames (i.e. frame type 1) only, meeting the specification given in section 7.
11. Not permitted with the use of flush bolts located at the meeting edge.
12. Applied acoustic panels described in section 5.7 may abut the edge protector but must not over sail onto the leg of the edge protector.

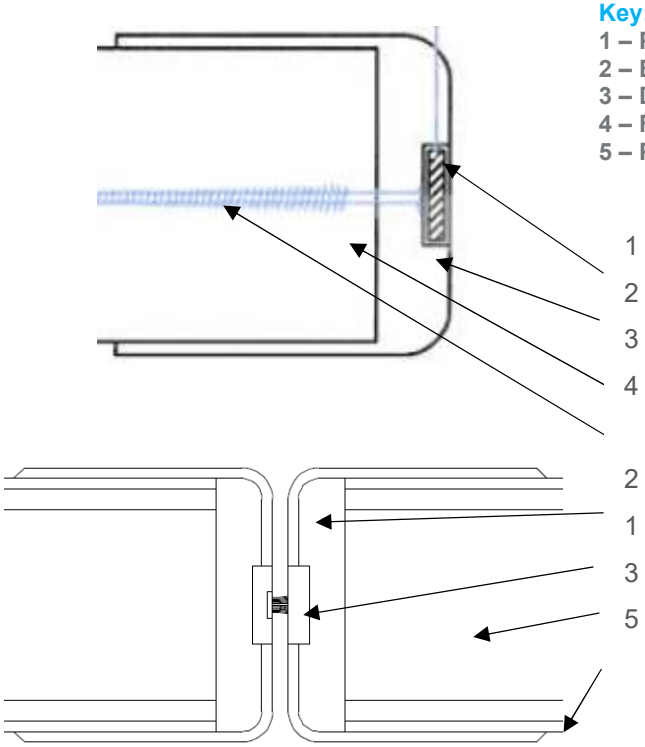
5.4.3 Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors

The Moralt FireSmoke 44/54 designs have been assessed for use with Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors as detailed in test Chilt/RF07140 Revision B. Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors are supplied pre-formed with the approved intumescent material. The Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors must be used as part of a complete intumescent system and the required intumescent specification and leaf sizes are given in the relevant data sheets in section 4.5.12. Yeoman Shield/Lorient Polyproducts Ltd. must be contacted for precise installation and fixing details.

Installation Requirements

The Yeoman Shield/Lorient PVCu door edge protectors must be constructed and installed to the specification tested, as depicted below. The test evidence summarised in appendix A justifies the use of Yeoman Shield/Lorient Polyproducts Ltd. PVC edge protectors when fitted to single and double doorsets. The following requirements must also be adhered to when installing the edge protectors.

- Yeoman Shield/Lorient PVCu door edge protectors may only be fitted to the vertical edges of doorsets. It is permitted to fit the edge protectors to the closing edge and/or hanging edge of single leaf doorsets. It is permitted to fit the edge protectors to one or both hanging edges of double leaf doorsets.
- Where edge protectors are fitted to the meeting edges of a double doorset, they must be fitted to both meeting edges.
- The intumescent specification permitted for the maximum leaf size for each fire resistance performance; frame option and configuration are given in section 4.5.10.
- The PVC protectors may be used on latched or unlatched, single acting, double and single leaf doorsets.
- The edge protector must be constructed from 2mm thick PVC outer shell formed around a 9mm thick toughened PVC insert, which is wrapped around the door leaf edge via 50mm long legs. If the door leaf is encapsulated, the edge protector must travel over the PVC leaf facings as depicted in the drawing below.
- Based on the testing conducted in LOR1254 flushbolts of maximum dimensions 250(h) x 20 (w) mm
- The edge protectors must be glued into position using PVA or PU adhesive for 30 minutes integrity fire resistance performance. All edge protectors must be additionally fixed using 50mm long screws at a maximum 200mm centres. Double doorset configurations incorporating flush bolts must include a screw installed a maximum 50mm from the flush bolt and at the maximum centres given above. See drawing below for fixing location.



Key:
1 – Perimeter intumescent seal.
2 – Edge protector
3 – Door leaf
4 – Fixing
5 – PVC leaf facing (encapsulated door).

5.4.4 Locks and Latches for PVC Edge Protectors and Post-formed Doorsets

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. 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 & 2 (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. E *s Easi-T latch 2. Laidlaw Orbis 6105 3. Noberne Group mortice cylinder latch

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

Element		Specification
Maximum forend and strike plate dimensions	30 mins	235mm high x 25mm wide x 4mm thick
	60 mins	125mm high x 25mm wide x 4mm thick
Maximum body dimensions	30 mins	165mm high x 100mm wide x 20mm thick
	60 mins	100mm high x 100mm wide x 20mm thick
Intumescent protection - Under latch forend and keep and fully encasing the entire latch body		1. 1mm thick MAP Lorient Polyproducts Ltd. 2. 2mm thick Therm-A-Line Intumescent Seals Ltd. 3. 2mm thick Therm-A-Flex Intumescent Seals Ltd. 4. 2mm thick Therm-A-Line Intumescent Seals Ltd. - additional 2 no. layers (6mm thick in total) to rear face of latch body
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 ≥ 800ºC

5.4.5 Acoustic /Cladding Panels

The following panels may be applied to the face of the door leaf, with the following limitations:

1. Permitted doorset configurations: LSASD, ULSASD, LSADD, ULSADD
2. Cladding Panel Types
   - Moralt Acoustic Panel - thickness upto 27mm
   - Panels consisting of cellulosic or non-combustible materials, as examples (but not limited to) timber lamels with MDF facings or MDF panels – maximum thickness 27mm
   - Panels consisting of cellulosic or non-combustible materials, as examples (but not limited to) timber lamels with MDF facings or MDF panels with a maximum 2mm thick Aluminium sheet – maximum thickness 29mm
3. Fitment of panels must not impede the operation of the door leaf.

The inclusion of the cladding panel 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.

- Applied panels up to 27mm thick

  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:

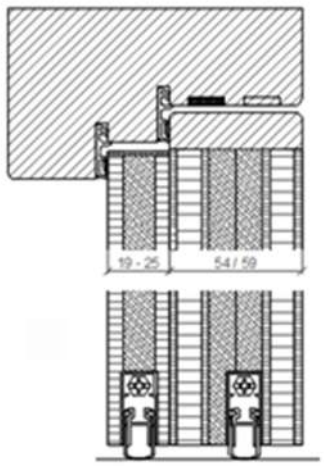
  - Maximum Height: 2345mm
  - Maximum Width: 940mm
  - At a maximum area of: 1.92m^2
  - Maximum Weight of Applied Panel: 39kg.

  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 only 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.
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 below.
10. Hardware that requires either a mortice into, or a bore hole through the cladding panel and door leaf (e.g. through fixings, door viewers, letterplates etc.) must be lined with either 1mm Interdens or graphite based intumescent material. The hardware must be approved for use within a door leaf range of 81 – 99mm and be physically able to be installed within the increased total leaf thickness.
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:
    i. Extended fixings (penetrating into a maximum of $^1/_3$ of the leaf thickness),
    ii. Through fixings (bored through the panel and door leaf).
    iii. 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.
- The length of the fixings into the panel may be increased to suit the thickness of the panel.

13. The aluminium sheet is to be adhered to the timber cladding panel using silicon-based sealant / adhesive. The aluminium sheet must not return down the sides 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 5.6. In addition, any machining over the fixing locations of the cladding panel must retain a minimum cladding panel thickness of 18mm.
15. Threshold seals meeting the requirements of section 10.9.7 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 10.9.6 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.

Decorative & Protective Facing Specification	
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 44/54mm 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 Feature Grooves

Decorative mouldings were included within test reference FEP/F14256 without being of detriment to the overall performance of the doorset. The doorset they were included within achieved 49 minutes integrity performance.

Feature grooves may be applied to the leaves hung within frame option 1 and 2.

Both sides of the door leaves may be grooved to the following specification.

Feature grooves cannot be located within 20mm of any mortice for hardware (i.e. any item which requires material to be removed from the door)

The following section details the tested grooving arrangement, and the limitations associated with each groove option.

5.6.1 Groove

Groove Option A		
Element	**Details**	
Max. groove size (mm)	6mm wide x 4mm deep	
Inserts	Not essential. Inserts are permitted to provide a decorative detail if required. Inserts must be Hardwood (minimum density 640kg/m³) or MDF. The insert can be grooved without restriction.	
Adhesive	See Section 9 (Adhesives)	
Proximity to door edges (mm)	Horizontal Grooves	≥ 250 from top and bottom
	Vertical Grooves	≥ 150 from sides
Groove spacing (mm)	No closer than 50mm apart. Vertical and horizontal grooves may intersect each other.	
Orientation	Horizontal or Vertical	
Configuration	Latched & unlatched, single & double acting, single leaf doorsets	
Leaf option	Leaf 1 and 2	
Leaf size range (mm)	Maximum 2320 x 1020	
Perimeter intumescent seal specification minimum dimensions (mm)	15 wide x 4 thick	
Frame option	Frame 1 & 2	

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 250mm centres, the screws shall penetrate into the substrate by at least 15mm and no greater than ½ 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 4.3.

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 8.1.2.

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 & WF172705 Issue 2).

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.

6.1.1 Maximum Permitted Glazed Aperture Dimensions

The maximum total 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 Laminesse FireSmoke 44/54mm door leaves (WF172705 Issue 2)		
Maximum Height (mm)	Maximum Width (mm)	Maximum Area (m^2)
1800	800	1.44

Multiple apertures are acceptable within the permitted total assessed aperture area, 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 6mm, 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 AG Laminesse FireSmoke 44/54mm 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 Laminesse FireSmoke 44/54mm door design, subject to the following.

- The minimum thickness of glass permitted for alternative glass types is 6mm.
- 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 m^2) 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	3	4
				Lorient flexible 1 (FF1)	System 36 plus	Therm-A-Strip	Pyrostrip 100 ECSA
				Lorient Polyproducts Ltd	Lorient Polyproducts Ltd	Intumescent Seal Ltd	Mann McGowan
			Fire Test Reference	WF172705 Issue 2	DMT-DO-50-1433	RF07028	DMT-DO-50-1448
1	Pyran S	6	WF172705 Issue 2	Area: 1.44 Height: 1.8 Width: 0.8			
2	Pyrodur 30-105	7	DMT-DO-50-1433		Area: 0.57 Height: 1.51 Width: 0.435		
3	Pyroshield	6	RF07028			Area: 0.36 Height: 0.6 Width: 0.6	
4	Pyrodur 60-10	10	DMT-DO-50-1448				Area: 0.44 Height: 0.78 Width: 0.56

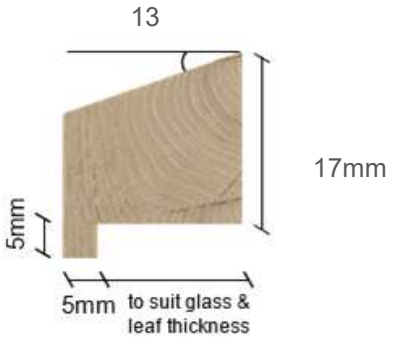
Notes:

1. 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)

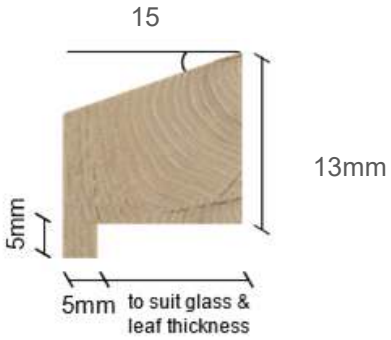
The following sections detail the permitted glazing beading, aperture lining requirements and minimum fixing details for the above detailed glass and glazing systems. Each section deals with a specific type of glazing bead and indicates which glass and or glazing system it is applicable to. Glazing beads 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, 3 & 4
	
• 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 (not Beech fagus species) of a minimum 640kg/m^3 density. • Glazing beads must be retained in position with minimum length of 50mm long steel pins or 50mm long No. 6-8 screws, inserted at 35-40º 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 6 – 10mm thick square aperture liner is optionally permitted for use with the above bead providing it is constructed from hardwood (not Beech fagus species) of minimum density 640kg/m^3 and glued in position using a UF, PVA or PU type adhesive. • The fitting of the 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)

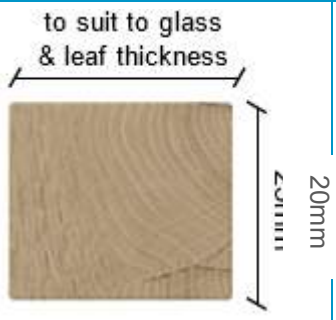
Permitted Glazing Systems (Defined in Section 6.3)	2

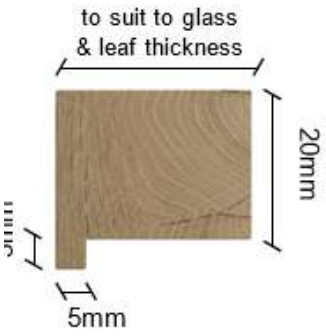


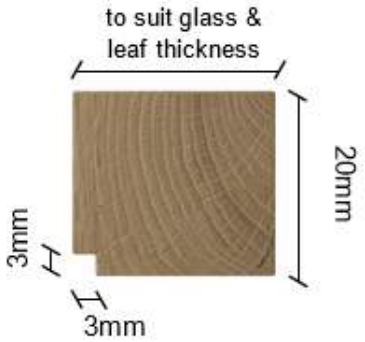
- The bolection as shown above may be increased in thickness and height if required, with the dimensions shown being the minimum, bolection returns are not required.
- The glazing beads may be created from softwood/hardwood of a minimum 448kg/m^3 density.
- Glazing beads must be retained in position with minimum length of 50mm long, 3.2 diameter, steel screws, inserted at 15-20^o to the vertical.
- Fixings must be at 350mm maximum centres and no more than 50mm from each corner.
- The fitting of the 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

6.3.1.3 Square Beads (option 1)

Permitted Glazing Systems (Defined in Section 6.3)	3





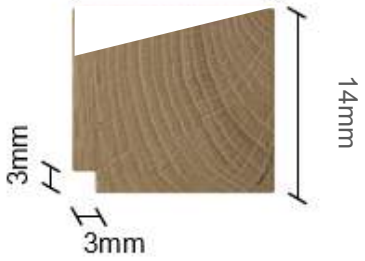


- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum. In addition, it is permitted to apply up to a 15º splay to the bolected bead as detailed above. A splay must not be applied to the bead designs without a bolection.
- The glazing beads must be created from hardwood (not Beech fagus species) of a minimum 640kg/m^3 density.
- Glazing beads must be retained in position with minimum of 50mm long steel pins or 50mm long No. 6-8 screws, inserted at 35-40º 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 6 – 10mm thick square aperture liner is optionally permitted for use with the above bead providing it is constructed from hardwood (not Beech fagus species) of minimum density 640kg/m^3 and glued in position using a UF, PVA or PU type adhesive
- The fitting of the 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

6.3.1.4 Square Beads (option 2)

Permitted Glazing Systems (Defined in Section 6.3)	2

16mm wide, 15 degree chamfer



- The glazing beads must be created from softwood or hardwood of a minimum 448kg/m^3 density.
- Glazing beads must be retained in position with minimum length of 50mm long 3.2mm diameter screws, inserted at 15-30º 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 6 – 10mm thick square aperture liner is optionally permitted for use with the above bead providing it is constructed from hardwood (not Beech fagus species) of minimum density 640kg/m^3 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.

6.3.2 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

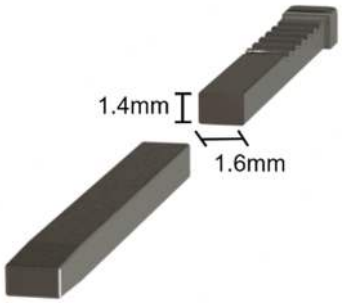
The following dimension of pin has been approved for round, oval and rectangular shaped pins which are hand applied:

- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.03mm^2.
- 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 2.24mm^2.
- 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 may be no greater than 2.0mm.



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

7. Door Frame Construction

7.1 Details for Frame

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.

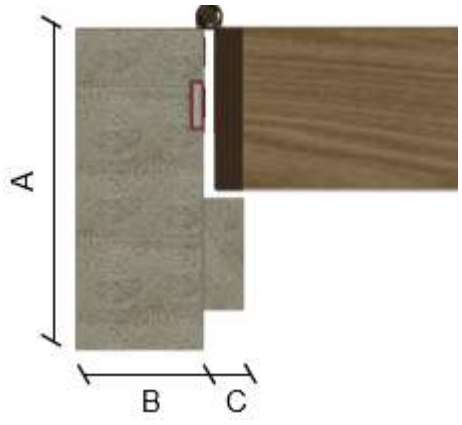
Frame Specification				
Frame Type	Material	Minimum Section Size (mm)	Minimum Density (kg/m^3)	Acceptable Leaf Type
1	Softwood / Hardwood	Frame: 70 (d) x 32 (w) (excluding stop) Stop: 12 (w) (integral or planted on)	510	44/54
2	MDF[2]	70 x 30	700	44/54
3	WoodEx 30	70 x 30	510	44/54

Note:

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 12mm 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 10.4, and with no gaps. All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws.

7.1.1 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 = 12mm minimum

Minimum section size when using a transomed overpanel:
A: Frame depth = 70mm minimum
B: Frame width = 32mm minimum
C: Stop width = 12mm minimum

7.2 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

7.3 Decorative Facings

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.

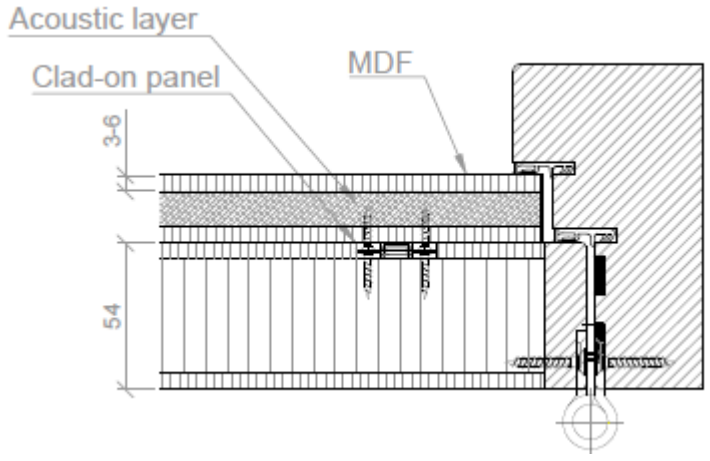
7.4 CS Group Acrovyn

Based on the test evidence generated as cited in Appendix A, timber and WoodEx 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 4.5.4.1 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 4.5.4.1 for maximum permitted leaf sizes.
4. The maximum thickness of CS Group Acrovyn used must be 2mm, as per the test evidence.

7.5 Double rebated frame option

The Moralt acoustic clad on panel can be fitted within a double rebated frame as shown below on the 54mm thick Laminesse FireSmoke. The minimum timber details for the standard door frame must be complied with as shown in section 7.1.1 and further details of the clad on panel are given in section 5.4.5 It is not permitted to encapsulate double rebated frames as above.



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 & Flush).

Framing options are detailed in the following sections.

It is only permitted to fit an overpanel as part of any individual doorset design.

8.2 Framing

The following framing options as detailed below are permitted for the doorset design and are permitted depending on solid panel arrangement or glazed fanlight utilised. Information on the frame type permitted for the solid panel is detailed in sections 8.2.1 – 8.2.3.

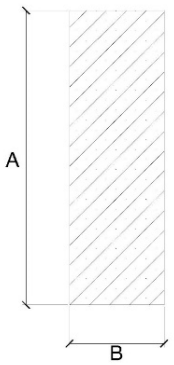
8.2.1 Modular Framing

Modular framing for the purpose of this document is considered to be an element (panel) which is independently framed and fixed to the frame of a doorset design. This has been assessed based on the performance of the doorsets tested in the test evidence cited in Appendix A.

8.2.1.1 Standard Frame Detail (Modular Framing)

The frame listed below is 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 (mm)**	**Minimum density (kg/m^3)**
Softwood/Hardwood, frame type 1 (see section 2.1)	Frame: 70 (d) x 32 (w)	640



A: Frame depth = 70mm minimum

B: Frame width = 32mm minimum

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.

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 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. Ø5 x 80mm steel screws.

8.2.1.3 Attachment Technique (Modular Framing)

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

Screws must be fixed between 50mm and 100mm from corners at maximum of 300mm centres. 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)

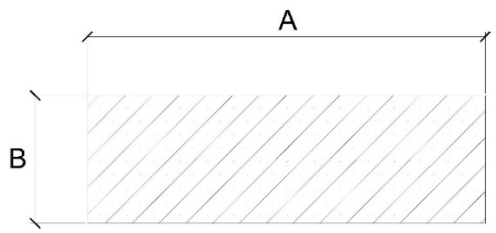
It is possible to include a transom to separate an overpanel within a door frame from the door leaf. It is not permitted to include a mullion within a doorset which is constructed using the shared framing design. When applied the transom shall meet the following specification:

Transom Frame specification		
Frame Type	**Minimum section size (mm)**	**Minimum density (kg/m^3)**
Frame 1 only	Transom: 70 (d) x 32 (w)	640

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. Ø5 x 80mm steel screws.



A: Transom depth = 70mm minimum
B: Transom width = 32mm minimum

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. Ø5 x 80mm 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.

The tested junction between the head of the leaf and flush overpanel may comprise flat or rebated lippings as detailed in section 5.3.

Flush overpanels where permitted are detailed within the permitted configurations and require specific perimeter intumescent specifications, these are found within sections 4.5.7 & 4.5.11.

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 & 4.5.11 which detail the required intumescent specification.

Where flush overpanels are used, an astragal must be fitted to the lower face of the overpanel overlapping the head of the leaves below. The astragal must be softwood or hardwood of minimum density 448kg/m^3 and be of minimum dimensions 60mm wide x 17mm thick. The astragal must overlap the leaf heads by a minimum of 20mm and be screwed at maximum 50mm centres to the overpanel.

8.3.1 Solid Panel Construction (Over Panels)

Based on the testing undertaken on the doorset design, it has been assessed to include the tested leaf 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 construction specification in section 5 for the leaf makeup shall be met.

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 43mm (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 5.4.

The minimum panel thickness after finishes applied is 44mm.

8.3.2 Intumescent Sealing Arrangement (Over Panels)

Solid overpanels when included within a doorset design (in either modular, flush or shared framing) shall include the intumescent requirements outlined within sections 4.5.7 & 4.5.11.

Permitted intumescent specifications are detailed in section 4.5, and the specification used for the panel shall match the specification used on the door leaf.

8.3.3 Fixing Arrangement (Over 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) or flush 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.

8.3.4 Maximum Dimensions (Over Panels)

Based on the testing undertaken within the doorset design the following maximum dimensions are permitted for any single panel.

Solid Panel & Frame Type	Height (mm)	Width (mm)
Flush Overpanel	607	overall doorset width
Overpanel	1200	

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
Timber lipping & decorative facings	UF, PF, or PVAc
Core elements and facing	Manufacturers' specification

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/manufacturer options listed in the table may be used in the specific application noted. However, only 1No 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**
Hinges	Must be used under both blades where frame type 1 is specified	1mm Interdens 15SA – Mann McGowan
	For frame types 2 and 3 - Not required unless leaves are over 2500mm high	1. 1mm Interdens 2. 1mm MAP paper – Lorient Polyproducts Ltd 3. 1mm Pyrostrip 300 – Mann McGowan 4. 1mm Therm-A-Strip – Intumescent Seals Ltd 5. G30 – Intumescent Seals Ltd.
Lock/latches	Under forend & keep if the forend or keep exceeds 150mm up to the maximum assessed dimension	
Top pivots & flush bolts	Lining all sides of the mortices	1. 2 mm Interdens – Dufaylite Developments Ltd 2. 2 mm MAP paper – Lorient Polyproducts Ltd 3. 2 mm Pyrostrip 300 – Mann McGowan 4. 2 mm Therm-A-Strip – Intumescent Seals Ltd 5. 2 mm Therm-A-Flex – Intumescent Seals Ltd
Flush Bolts	Back of rebate in leaf edge only	Pyrostrip 500FSA 10x2mm – Mann McGowan (Moralt ref: M-MVPM-DB-T-023-01).
Concealed overhead closers	Encasing the entire body of the concealed closer and slide arm including the back surface of the face plate	Manufacturers tested intumescent protection pack
Concealed hinges	Lining all sides of mortice in frame and leaf	1mm BASF exterdens Graphite TE 527 3D intumescent pack or 1mm MMG Pyrohinge
Multipoint locking	Lining mortices of lock/latch and top and bottom locks all keeps	1mm thick BASF Interdens kit

Notes:

When multipoint locking systems are used, see section 10.4.2

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	• Latch • Handle • Hinges • Self-closing device (closer)
ULSASD	• Hinges • Self-closing device (closer)
LSASD+OP	• Latch • Handle • Hinges • Self-closing device (closer)
ULSASD+OP	• Hinges • Self-closing device (closer)
LSADD	• Latch • Hinges • Self-closing device (closer) • Flush bolt
ULSADD	• Hinges • Self-closing device (closer) • Flush bolt

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:

Leaf options: Laminesse FireSmoke 44/54mm

Frame options: 1 and 2.

Configurations: LSASD, LSASD+OP, LSADD & LSADD+OP

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

Element	Manufacturer & Product Reference
Locks & latches	• BMH-Beyer & Muller GmbH & Co – 911.55.087 – (DMT-DO-50-1433) • Doorfit Product Ltd/Consort Architectural Hardware Ltd – CH7260 (DMT-DO-50-1448) • Assa Abloy – VingCard Novel P001170024-100-301 (DMT-DO-50-1446) • Glutz Mortise Lock 24100.7/60 (DMT-DO-50-1447) • Euro spec latch with a 235 high forend and steel Glutz handleset (FEP/F14256) • Salto LE7S1570R01IMB XS4 Original RFID lock (DMT-DO-50-1366 & DMT-DO-50-1447 Door 2) • Salto LE7S1770R03IMS & AFB0IBA8 (DMT-DO-1216) • Advance Trillium RFID (Technalia 088745-002-1-a) • Assa Abloy Inoxi handleset operating a EL520 mortice latch and EL520 keep. (DMT-DO-50-1148) • DormaKaba RT Plus handleset (DMT-DO-50-1148) • Häfele Dialock handleset

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

Single & Double leaf 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 ≥ 800ºC

Notes:

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

10.4.2.1 Abloy Oy Mortice Latches

At the specific request of Moralt AG, the following range of Abloy Oy latches have been assessed based on test WF364240.

The tested EL520/100 represents the most onerous lockcase design, having the largest lockcase dimensions and backset of the range below. The EL520 also incorporates electromechanical components and was tested in WF364240 complete with the associated cable loop and cableway installed which represents a more onerous condition in fire resistance terns compared to mechanical lock variants.

The tested EA329 strike plate represents the largest strike plate design including the largest apertures for bolts.

Based on the above and provided that the lock and forend dimensions are not increased over those tested, it is reasonable to assume the following range of Abloy Oy latches and strike plates may be incorporated in the FireSmoke 54mm designs for 30 minutes integrity performance.

The intumescent protection detailed in section 10.2 must be installed protecting all locksets.

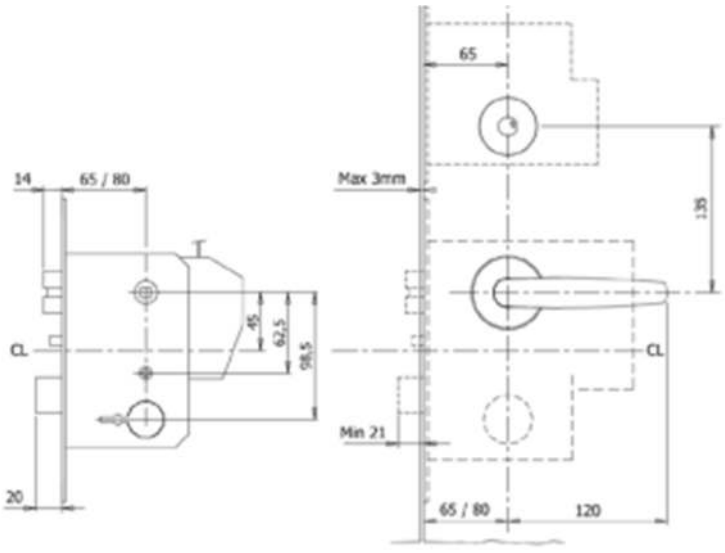
Motor Locks	Solenoid Locks	Mechanical Locks	Strike Plates	
EL520	EL560	EL160	EA321	EA327
EL532	EL561	EL162	EA322	EA328
EL522	EL562	EL163	EA323	EA329
EL524	EL563	EL165	EA324	EA330
EL534	EL564	EL360	EA325	EA331
EL535	EL565	EL362	EA326	EA332

10.4.2.2 Entry System Locksets

A number of different entry system locksets have been proven to not be a cause of premature failure in the tests cited in appendix A. Provided the card reader or digilock element is surface mounted to the leaf face requiring no additional holes through the leaf thickness, the installation of these elements would not be expected to be a cause of premature integrity failure. The entry system hardware must conceal the latch spindle protecting the through holes from attack by fire in the way a lever handle on its rose would.

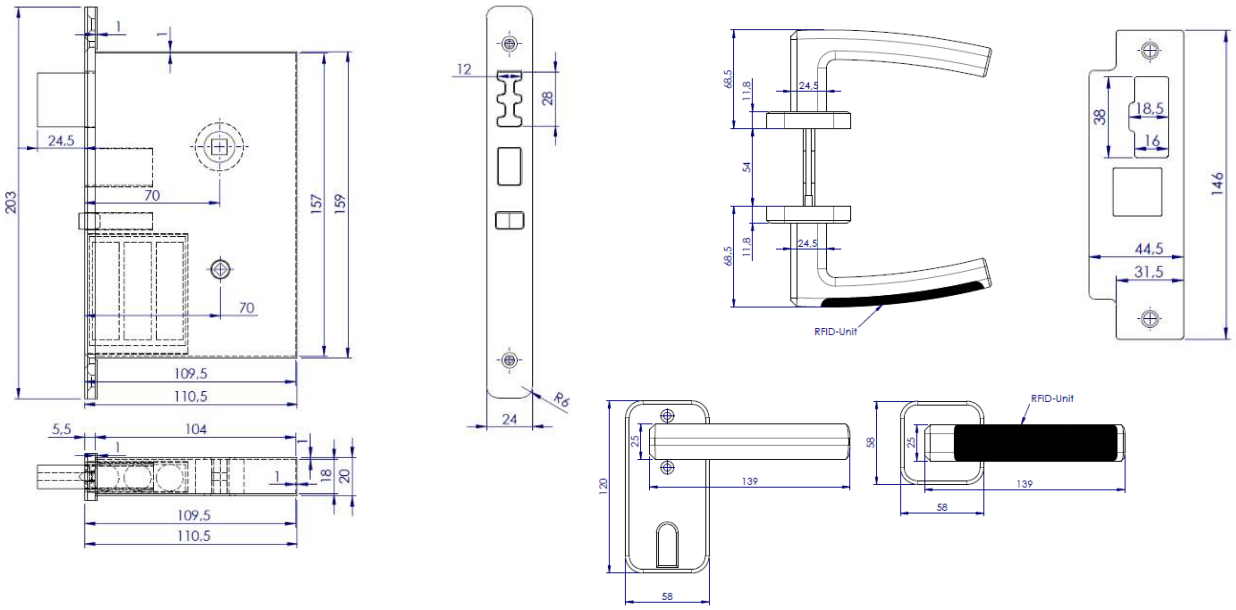
Assa Abloy 'Vingcard' Signature

The Assa Abloy 'Vingcard Signature MPA 4G RFID' with Assa Abloy steel handles ref: 2035 was successfully tested in DMT-50-1010, installed within the rebates shown below, the lower lockcase is of essentially the same dimensions as those given in the table above, further justifying the use of alternative 'Euro' size locksets. Where the Assa Abloy 'Vingcard Signature MPA 4G RFID' is used the Mann McGown MMG630 intumescent pack must be used protecting all sides of the required mortices and behind the forend and keep.



ASSA Abloy Vingcard Novel lockcase and lever handles

The Assa Abloy 'Vingcard Novel' RFID lock (Item Ref. P001170024-100-301) with Assa Abloy Novel handles was successfully tested in DMT-50-1446, the lock, lever handle and keep dimensions are shown below. DMT-50-1446 included two Assa Abloy 'Vingcard Novel' RFID locks in opposed orientations and therefore demonstrates the fire performance of the lock and handles on both the exposed and insulated faces of the door leaf. Where the Assa Abloy 'Vingcard Novel' RFID lock is used the ASSA Abloy T/A Lorient 1mm thick Mono Ammonium Phosphate must be used protecting all sides of the lock and behind the forend and keep.

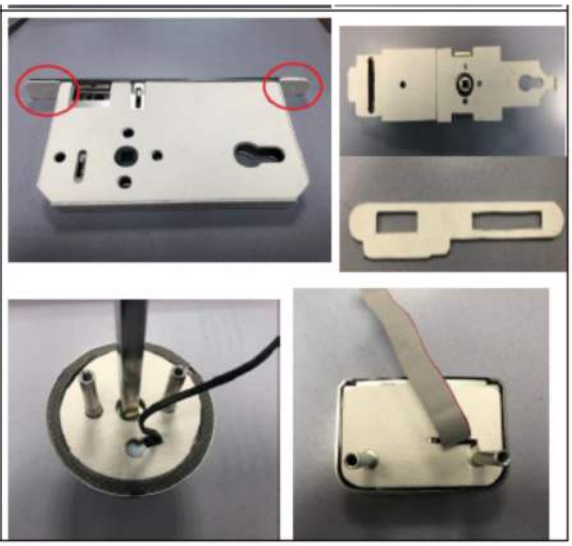


Onity Advance Trillium

Based on the results of Tecnalia test 088745-002-1-a, cited in appendix A, the Onity card reader and handle ref: Advance Trillium RFID may be installed, subject to the following intumescent protection being installed.

1mm thick 'Interdens 15' must be installed as tested referred to as 'option 2' - encasing the lockcase, under forend & keep, inside card reader mounting plate, handle rosette and under RFID reader mounting plate.

Option 2:	Protection: "Interdens 15" 1 mm thick in mortise, faceplate, strike, inside mounting plate, rosette and RFID reader. Location of the latch: 1675 mm from the bottom of the door. Latch disengaged.



Salto locksets ref LE7 and LE8

Based on the results of tests WF383782, WF383783, DMT-DO-50-1216 and DMT-DO-50-1366 cited in Appendix A the Salto LE7 and LE8 locksets may be installed, subject to the following intumescent protection being installed.

The Mann McGown MMG651 & MMG652 intumescent packs (Moralt references M-MVPM_DB_T-020-08 & M-MVPM_DB_T-020-05) comprised of 1mm thick Interdens 15 must be installed as tested - encasing all faces of lockcase and under the forend & keep.

	LE7 Lockcase and keep showing tested keep box.
	E96P0U001M48K Handleset and electronic escutcheon
	E9150RUIMB49 Handleset and electronic escutcheon

	Salto lever handles XS4 ref. EM452U72IMB48. Salto cylinder Ref. NME3140N50CSBD (DMT-DO-1366 & DMT-DO-50-1447 Door 2)
	Salto LE7S1770R03IMS with AFB0IBA8 control unit with reader. Salto Systems R1SJRIM480 lever handles and RSPZRIM5 escutcheon. (DMT-DO-1216)

Consort CHL89 RFID lockset

The Consort CHL89 – RFID lock and lever handles was successfully tested in DMT-50-1288, the primary dimensions of the lock and keep dimensions are shown below. DMT-50-1288 included two Consort CHL89 – RFID locks in opposed orientations and therefore demonstrates the fire performance of the lock and handles on both the exposed and insulated faces of the door leaf.

Consort CHL89 – RFID lock set Dimensions

- Lock:
  - Forend: 295 (h) x 32(w) x 3(t)mm
  - Body: 235(h) x 21.5(w) x 112(d)mm
- Keep:
  - 123(h) x 31.5(w) / 47.5(w) x 2(t)mm
- Lever Handles
  - Length: 135mm.
  - Projection: 72mm
  - Base: 65(w) X 11(d)mm
- Cylinder
  - 27(l) x Ø29mm
  - RFID unit with plastic cover – 43x10mm on cylinder

The Consort CHL89 – RFID lockcase body was fully encased, while the forend and keep were fitted with intumescent to the rear with Consort Architectural Hardware self-adhesive graphite sheet, 0.8mm thick.

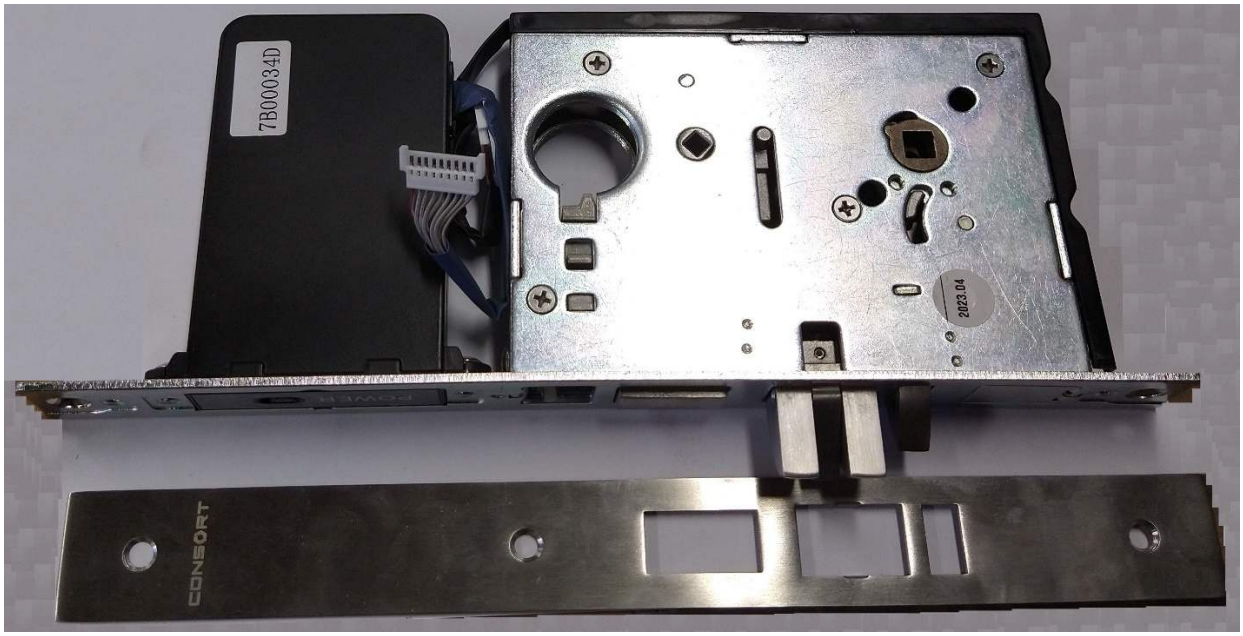


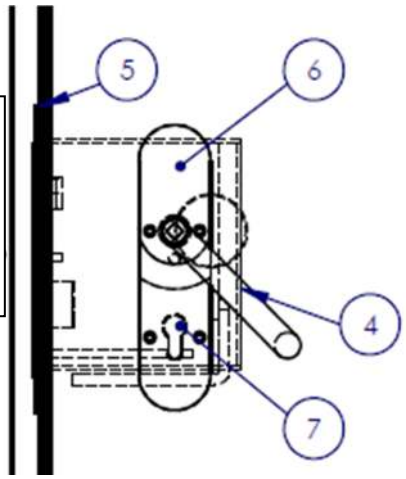
Image of the lockcase prior to application of intumescent material

Assa Abloy Inoxi handleset and EL520 mortice latch

Based on the results of DMT-DO-50-1148, cited in Appendix A, the Inoxi handleset (ref: 3-19/242/115 PZBL DIN Exit) operating an EL520 mortice latch and EL520 keep may be installed, subject to the following intumescent protection being installed.

- Lockcase must be protected with the tested intumescent pack ref: ITL-Abloy-EL560-100 – 2mm thick gaskets.

Key:
4 – EL520 latch
5 – Keep
6 - Inoxi Handle
7 - Cylinder



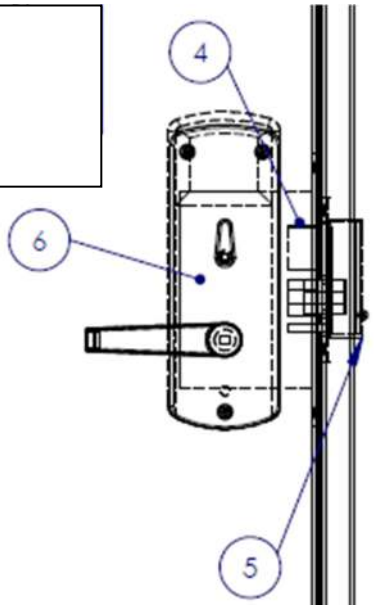
Hafele Dialock DT600/DT700/DT710 Handles

These products may be used as lever handles to operate rebated locks/latches. These surface mounted products, and their accessories may not replace any part of the latch(es) as assessed in section 10.4.1 and must be installed with the Mann McGowan MMG633 (Moralt reference M-MVPM_DB_T-011-06), MMG655 (Moralt reference M-MVPM_DB_T-011-04.1) & MMG656 (Moralt reference M-MVPM_DB_T-011-04.2) intumescent packs.

DormaKaba RT Plus handleset

Specimen 7 within test DMT-DO-50-1148 incorporated a DormaKaba RT Plus handleset with protective steel plate (ref: PS7901012ER30-626) operating a rebated mortice latch protected with the Mann McGown MMG631 intumescent pack. This surface product may be used as lever handles to operate rebated locks/latches. This product and accessories may not replace any part of the latch(es) as assessed in section 10.4.

Key:
4 – Latch Body
5 – Keep
6 - RT Plus Handleset



10.4.2 Latches & Locks – Multi Point Engagement

The table below details the tested multi point latch that is approved.

Leaf options: Laminesse FireSmoke 54mm

Element	Manufacturer & Product Reference
Locks & latches	• Glutz multipoint locking system (1893.7.60.78.1788. SSS) • Glutz Multipoint lock/latch – 1893.7.60.78.1788.SSS (WF382394 Rev A AR1)

The Glutz multipoint locking system has been tested successfully in LAMINESSE FireSmoke 54mm doorsets. Other multipoint locking systems can be fitted provided they have been successfully tested in 54mm thick timber based doorsets for 30 minutes to BS 476: Part 22: 1987 or BS EN 1634-1. The mortices must be no bigger than that detailed in the table above for the Glutz multipoint locking system and the manufacturers tested intumescent protection system for the mortices must be installed.

This includes the following Winkhaus systems

- AV2– The system variants acceptable to this assessment are those which fit into the mortices detailed in the table above for multipoint locking systems. However, if the manufacturer assessments permit other system variants for the 54mm thick door construction and this fire rating, then they can be used providing the recommendations contained in that assessment are applied.

Notes:

1. When a multi-point latch is fitted, the leaf perimeter edge intumescent must be located into the frame reveal along the closing edge.
2. The top and bottom hook locks do not need to be engaged for fire performance.
3. Intumescent protection is not required underneath the latch body, keeps or forend.
4. The centre, top and bottom keep plates must be the same as those tested, as supplied by the manufacturer.
5. In all instances the location of the handle must be between 800–1200mm from the threshold. The multi-point latch may be fitted along the entire length of the door edge, if required and as tested in report reference WF382394 Rev A AR1.

10.4.3 Cylinders

The table below details the tested cylinders that are approved.

Element	Manufacturer & Product Reference
Cylinder	• Abus August Bremicker Sohne Kg (58428) – DMT-DO-50-1433 • Glutz – 83704 E Doppelzylinder (DMT-DO-50-1447) • Glutz Euro cylinder, Ref. GC9991, (DMT-DO-50-1443)

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 800^0C.
- 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

These items are suitable in the following applications only:

Leaf options: Laminesse FireSmoke 44/54mm

Frame options: 1 and 2

Configurations: all permitted in section 4.4.2

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference
Handles	• Aluminium lever type handles • Steel lever type handles
Escutcheons	• Glutz AG – 48200 – Ø53 x 8mm projection (DMT-DO-50-1447) • Glutz AG – 48283 – Ø53 x 8mm projection (DMT-DO-50-1447)

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 lever on rose or lever on back plate up to the following maximum sizes:

- Lever on rose with a rose diameter up to 54mm.
- Lever 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

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

Element	Manufacturer & Product Reference
Hinges	• Assa Abloy JH603BU – DMT-DO-50-1433

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:	If 3 hinges are required:	Top	100 –180mm from the head to top of hinge
		2nd	Minimum 200mm from top hinge or centrally fitted between top and bottom hinge
		Bottom	150 – 250mm from the foot of leaf to bottom of hinge
	If 4 hinges are required:	Top	100-180mm from the head to top of hinge
		2nd & 3rd	Equispaced between top and bottom or 2nd hinge 200mm from top hinge and 3rd hinge equally spaced between 2nd and bottom hinge
		Bottom	150 – 250mm from the foot of leaf to bottom of hinge
Intumescent protection:		See section 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 FireSmoke 54mm door design for 30 minute applications in test DMT-DO-50-1447 and WF382394 Rev A AR1.

10.6.2.1 Simonswerk Tectus Concealed Hinges

These items are suitable in the following applications only:

Leaf options: Laminesse FireSmoke 44 and 54

Frame options: 1 and 2

Configurations: All Configurations permitted

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

Manufacturer & Product Reference
• Simonswerk Tectus TE5273.SSE (WF382394 Rev A AR1) • 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 must be hardwood of minimum thickness of 38mm and minimum density 640kg/m^3.

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
		2nd	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
		2nd	Min - 200mm from top hinge Max - centrally between top and 3rd hinge
		3rd	Min – 200mm from bottom hinge Max – centrally between 2nd and bottom hinge
		Bottom	150 – 300mm from foot of leaf to bottom of hinge

10.6.2.2 Bartels Pivota Concealed Hinges

These items are suitable in the following applications only:

Leaf options: Laminesse FireSmoke 44 and 54

Frame options: 1 and 2

Configurations: All Configurations permitted

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

Element	Manufacturer & Product Reference
Hinges	• Bartels GmbH - Pivota DXS 100 3-D design

- The single action hinges must be fitted with the tested Mann McGowan kit ref: MMG567 (Moralt reference M-MVPM-DB-T-627 or 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 hinges must be used in conjunction with a twin strip perimeter intumescent arrangement where one of the seals remains continuous past the hinge blade in the frame reveal or leaf edge.
- The door frame must be hardwood (frame type 1) of minimum thickness 38mm and minimum density 640kg/m^3.
- 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
		2nd	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: MMG567 (Moralt reference M-MVPM-DB-T-627)	

10.6.2.3 CEAM 1131S Concealed Hinges

These items are suitable in the following applications only:

Leaf options: Laminesse FireSmoke 54

Frame options: 1 and 2

Configurations: All Configurations permitted

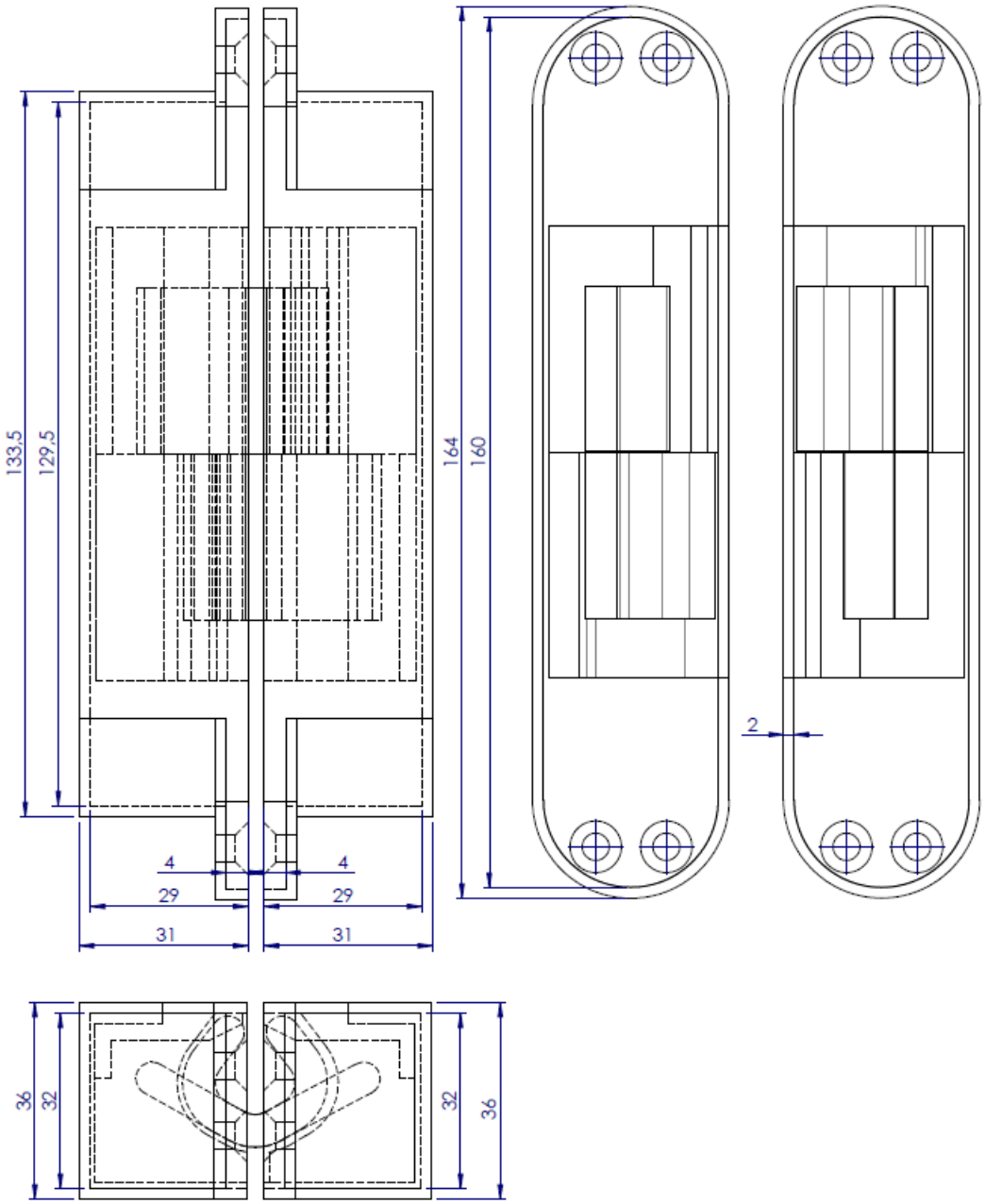
The table below details the tested concealed hinges that are approved.

Element	Manufacturer & Product Reference
Hinges	• CEAM AMADEO SPA 1131S (DMT-DO-50-1446)

- The single action hinges must be fitted with the tested Lorient 2mm Mono Ammonium Phosphate (MAP) intumescent encasing all sides / faces of the hinge body in the door frame and door leaf.
- 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 hinges must be used in conjunction with a twin strip perimeter intumescent arrangement where one of the seals remains continuous past the hinge blade in the frame reveal or leaf edge.
- The door frame must be hardwood (frame type 1) of minimum thickness 38mm and minimum density 640kg/m^3.
- CEAM AMADEO SPA 1131S 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	Top	190 – 210mm from head of leaf to top of hinge
		2nd	Max - centrally between top and bottom hinge
		Bottom	190 – 210mm from foot of leaf to bottom of hinge
Intumescent protection:		Hinges encased with Lorient Mono Ammonium Phosphate (MAP) 2mm thick.	

CEAM AMADEO SPA 1131S – General Dimensions (including intumescent wrapping)



10.7 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers
- Concealed overhead closers

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

10.7.1 Overhead Face Fixed Closer

These items are suitable in the following applications only:

Leaf options: Laminesse FireSmoke 44/54

Frame options: 1 and 2

Configurations: All configurations permitted

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

Element	Manufacturer & Product Reference
Overhead face-fixed closers	• Dorma Door Controls & TS71 – (WF172705 Issue 2) • ASSA Abloy DC700G-CM (DMT-DO-50-1446)

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 leaf/leaves fully engage into the frame reveal.

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:

Leaf options: Laminesse FireSmoke 54 Only

Frame options: 1

Configurations: All configurations permitted

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.

Element	Manufacturer & Product Reference	Minimum Frame Stop Thickness	Intumescent Protection
Concealed overhead closer	Geze Boxer EN 2-4 (DMT-DO-50-1010)	18mm	Closer Protection: Mann McGowan kit ref MMG107, MMG109 and MMG579
	DormaKaba ITS96 Size 2-4 (Technalia 088745-002-1-a, DMT-DO-50-1148 & WF 382394 Rev A AR1)	18mm	ITS 96 – MMG Interdens Moralt intumescent pack ref. MVPM-DB-T-015-01, or MVPM-DB-T-003-01
	Rutland ITS11204	12mm	Closer Protection: Rutland set ref: IP.114 2mm intumescent kit for ITS11204

Note:

Based on the test evidence the above tested and assessed concealed closers are permitted for use with the doorset design subject to the following parameters:

- Minimum frame head dimensions (additional to section 7):
  - Frame head: 38mm thick.
- The details identified in the table above for the following items must be followed for the selected concealed overhead closer, and is based on the tested arrangements:
  - Frame option(s).
  - Permitted configuration(s).
  - The frame must be fitted with a head stop of the minimum size, where required.
  - Intumescent protection to the concealed closer.
  - Leaf perimeter intumescent details.
  - Maximum leaf size if applicable.
- 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 tables above.
- The use of shadow gap installations is not permitted in conjunction with concealed overhead closers.

10.8 Bolts

10.8.1 Flush Bolts

These items are suitable in the following applications only:

Frame options: 1 and 2

Configurations: LSADD, ULSADD, LSADD+OP & ULLSADD+OP

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

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

Flush bolts must be steel, 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.

Flush bolt installation and intumescent protection

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 and 2

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

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

Frame options: 1 and 2

Configurations: All configurations

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

Frame options: 1 and 2

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 Air Transfer Grilles

Air transfer grilles must be Certifire approved for 30 minutes in doorsets with solid timber door leaves. Restriction relating to size, location and intumescent protection around the air transfer grille must be complied with.

The area occupied by the air transfer grille must not exceed 0.2m^2 and must be deducted from the area of glazing, if both elements are fitted.

10.9.6 Environmental Seals

Frame options: 1 and 2

Configurations: All configurations

A number of different environmental seals have been successfully tested as part of the Moralt Laminesse Firesmoke 44/54mm doorset design. For example, the Mann McGowan ACS1 & 'Enviroseal Tri-blade' seals were successfully tested in reports DMT-DO-50-1433.

Based on this testing the table below details the approved Deventer environmental seals included within the summarised evidence within appendix A:

Product Reference & Manufacturer
Mann McGowan Enviroseal Triblade (21-004285-PR02 & 21-004285-PR03)
Mann McGowan ACS1 PVC finned Smoke Seal (DMT-DO-50-1010)
Sealed Tight Solutions ST1009 (Technalia 088745-002-1-a)
Norseal NOR720 (DMT-DO-50-1367)

Alternatively, on the basis of the testing undertaken, silicon or PVC based flame retardant acoustic, weather and dust seals (e.g. Norsound 710, Norsound 720, Lorient IS1212, IS1511, IS7025, IS7060) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

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

10.9.7 Threshold drop Seals

These items are suitable in the following applications only:

Frame options: 1 and 2

Configurations: All configurations

Drop seals have been successfully tested within the into Moralt LAMINESSE FireSmoke 44/54mm thick 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
Lorient Polyproducts Ltd.	IS8010si
	LAS8005si
Athmer	Schall-Ex Duo L-15
Norsound Ltd.	810 range
STS Ltd	ST422
Planet	HS, RH and US
Raven	RP8Si
Ellenmatic Soundproof dropseal (DMT-DO-50-994)	Not required

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 44/54mm thick timber / cellulosic doors in timber / cellulosic frames.
- The threshold drop seal must not exceed:
    - Body dimensions of 35mm (h) x 14mm (t) and
    - Face plate dimensions of 57mm (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.

10.9.8 Knockers, Numerals & Signage

Frame options: 1 and 2

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.

10.9.9 Security Chains

Components with the following specification are also 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.

10.9.10 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.

10.9.11 Panic Hardware

Configurations: All configurations

Certifire approved panic hardware 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 panic hardware 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.

10.9.12 Mag Lock

These items are suitable in the following applications only:

Frame options: 1 and 2

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 BS 476: 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 further mechanical latch is fitted.

10.9.13 Cableway

Cableways may be included subject to the following specification. The use of cable loops which require rebating into the leaf hanging edge is not permitted by this report. Face fixed cable loops may be used, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and does not interfere with the self-closing action of the door leaf.

Leaf: Leaf 1 & 2 –lipping must be hardwood with minimum density of 640kg/m3
Frame: Frame 1 only

The frames must have a minimum density of 510kg/m^3 and minimum size of 32mm (w) x 70mm (d) (excluding stop).

Configurations: LSASD ULSASD, LSADD, ULSADD.

Cableway must be installed at no higher than 1500mm from the bottom of the leaf to the highest point of the cableway.

Cableway must be spaced a minimum of 90mm from any apertures within the leaf e.g. glazing, air transfer grilles or letter plates etc.

Installation comprises a 10mm high x 10mm wide channel central to the leaf edge, running down from the hanging edge to the bottom edge of leaf, along the bottom edge to the closing edge/meeting edge, and up along the closing edge/ meeting edge to the latch/lock location, and must be concealed in the following way:

- Groove the edge of the door core with a 10mm wide channel located centrally in the leaf thickness, to a depth of 39mm. This groove should run from the lock/keep location in the closing/meeting edge, down the edge, along the bottom of the door then back up the hanging edge.
- Install the cable, protected with 1mm STS CablePro intumescent wrap, into the groove.
- Infill the groove with 29mm x 10mm hardwood (minimum density 640 kg/m^3), bonded in place with PU adhesive.
- The door core can then be lipped and calibrated in the usual manner.

11. Installation

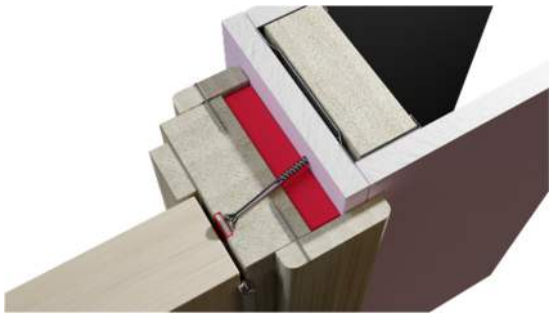
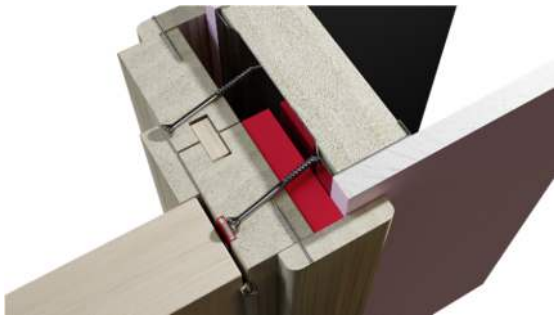
11.1 General

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	
	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.
	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.
	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.

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 BS 476: Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 18mm 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 BS 476: Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 18mm 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	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: 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 BS 476: Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.	 

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 600mm maximum centres and maximum of 150mm from 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 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 Firesmoke 44/54mm 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 limitation in terms of lipping thickness is still maintained. Onsite trimming of PVC facings or edge protectors is not permitted.

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.
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**
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 Firesmoke 44/54mm doorset designs, constructed in accordance with the specification documented in this field of application were to be tested in accordance with BS 476: 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:
Christian Daschner
E178F3EA31B14B0...

Name: Christian Daschner

Position: Director R&D

Date: 07-Oct-2025

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 citied in the following section, tested to both named standards referenced above can be utilised in this assessment which will conclude in terms of the fire resistance performance of the Moralt Laminesse Firesmoke 44/54mm doorset designs if tested in accordance with BS 476: Part 22: 1987.

Notes:

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’.

A.1 Primary Evidence

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 FireSmoke44 for 30 minute fire resisting doorset design. Only the Laminesse FireSmoke44 specimen (referenced as door 2) 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:	LEAF 2: Laminesse FireSmoke44 Leaf sizes (active): 2250(h) x 1000/595(w) x 44(t) Core: Details held on file, in confidence, at Warringtonfire. Facing: 6mm (t) HDF (761 kg/m^3) on both sides of the core element 2. Lipping/Edge banding (active): 990 (h) x 44 (w) x 5 (t) at the lateral and leaf tops. FRAME: Head & Jambs: 100 (w) x 38 (t) Stop: 40 (d) x 15 (w). MDF insert: 10 x 3 (positioning aid). Frame Fixing: glued with 2No 12(Ø) x 73 (l) dowels each. Astragal: 60 (w) x 18 (d) OVERPANEL: 1604 (w) x 506 (h) x 44 (t) Lipping: 1604 (h) x 44 (w) x 5 (t) INTUMESCENT: 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. SMOKE SEAL: Leaf edge: 1No. 5 (w) x 8.6 (h) Mann McGowan Enviroseal Tri-Blade. GLAZING: Glass type: Pyrodur 30-105 (Pilkington) Glass size: 1052/824(h) x 348(w) x 7(t) fitted 120/1279mm from the head of the leaf and 120mm from the closing edge of the inactive leaf. Sight size:1028/800(h) x 323 Beading: Solid timber Spruce (448 Kg/m^3). INTUMESCENT TO GLAZING: 12(h) x 15 (w) x 2.6 (t) Lorient Ltd graphite based intumescent. HARDWARE: Hinges: 5No. 100 (h) x 35 (w) x 3 (t) Assa Abloy JH603BU butt hinge fitted 200mm, 1025mm and 1950mm from the (active) leaf head and 200mm and 1950mm from the (inactive) leaf head. Closer: 236 (h) x 55 (w) x 38 (d) ICK1955V Doorfit Product Ltd. Lockset/Latch: 117(h) x 19(w) x 180(d) fitted 1047 from the base of the leaf. Cylinder: 85(h) x 33(w) x 10/17 (t) Abus August Dummy cylinder. Lever handle: 298(h) x 36(w) x 22.5 (t) x 82.5mm projection with battery and RFID unit. HARDWARE PROTECTION: Under hinge blades: Mann McGowan Interdens 15 SA
Test Standard:	Principles and conditions of EN 1634-1:2014 + A1 2018 in conjunction with EN 1363-1:2020
Performance	Doorset 2 Integrity: 34 minutes Insulation: 12 minutes

Test report DMT-DO-50-1010

Test is presented as primary data for the Laminesse Firesmoke 44mm for 30-minute fire resisting doorset design for the use of Assa Abloy steel handle using Vingcard Signature RFID lockset.

Date of test	**17th March 2015**		
Identification of test body	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany		
Sponsor	Moralt AG		
Sampling	Specimens were sampled by a representative of BMTRADA under contracts SC21026, SC210272, SC32206B, SC21105 and SC21104		
Tested Product	Specimen A & B: Latched, single acting, double leaf specimens comprised of Moralt FireSound Plus 54 core leaves with the vertical edges lipped with 8-14mm thick sapele of nominal density 640kg/$m^{3.}$ The leaves for both specimens were 2440mm (h) x 1000mm (w) x 54mm (t) and hung in sapele hardwood frames. The doorsets were oriented to open in towards the furnace of the test.		
Test Standard	BS 476 Part 22:1987		
Test Results (minutes)	**Integrity**	**Specimen A** 42	**Specimen B** 54
	Insulation:	11 Glass	11 Glass
DMT-DO-50-1010 has been incorporated to permit consideration of concealed hinges and closers, alternative glass and glazing options. Failures were recorded at the apertures glazed with the 13mm thick Pyroguard EW60 glass, which is not permitted for use within this report.			
Summary of test specimen	The tested specimens included 3No. PIVOTA DXS 100 3-D concealed steel hinges, a Geze Boxer EN 2-4 concealed overhead closer, an Assa Abloy 'Signature MPA RFID mortice lock with a 235mm high forend and an Assa Abloy EA280 cable loop and associated cableway installation. For both specimens: 2No. 15 x 4 Mann McGowan Pyrostrip 500P perimeter intumescent seals with co-extruded 'Tri-blade' smoke seals were fitted in the frame reveal of the head and jambs. A Mann McGowan ACS1 PVC finned smoke seal was fitted to the upstand of the frame stop. A Mann McGowan DD-1703ACU dropseal was fitted in the threshold of the leaf. The hinges were protected with a MMG567 Mann McGowan gasket set, the concealed closer was protected with Mann McGowan MMG107 Boxer Fire, MMG109 Rail pack and MMG579 longer forend cover gasket sets, latch forend and body protected with Mann McGowan pack ref: MMG568, drop seal included 2mm thick Interdens on the top surface. The leaf was glazed with one aperture using 13mm thick Pyroguard EW60 and one aperture with 25mm thick Pyroguard EI60 from Pyroguard UK.		

Test report DMT-DO-50-1148

Test is presented as primary data for the Laminesse Firesmoke 44mm for 30-minute fire resisting doorset design for the use of Assa Abloy steel handle using Vingcard Signature RFID lockset.

Date of test	**7th July 2022**
Identification of test body	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany
Sponsor	Moralt AG
Sampling	Specimens were sampled during manufacture at Moralt AG by a representative of BMTRADA under contracts SC21024 and SC21026
Tested Product	Eight specimens of Moralt Laminesse FireSound 54mm were installed with various items of hardware. The leaves for all specimens were 508mm (h) x 508mm (w) x 54mm (t) and mounted in hardwood jambs. Each specimen was mounted on 2No hinges and latched by the various tested hardware items. Only specimens 7 & 8 are considered herein, both specimens were mounted opening in towards the heating conditions. Specimen 7 incorporated the DormaKaba RT Plus handleset and specimen 8 incorporated the Assa Abloy EL520 lockset with Inoxi handles.
Test Standard	Principles of EN1634-1:2014+A1 2018 and EN 1363-1:2020
Test Results (minutes)	No integrity or insulation failures were recorded on specimens 7 or 8 prior to termination of the test at 88 minutes.
DMT-DO-50-1148 has been incorporated as supporting data to permit consideration the Assa Abloy EL520 lockset with Inoxi handles and the DormaKaba RT Plus handleset discussed in section 10.4.1.2.	
Summary of test specimen	Specimen 7 incorporated a DormaKaba RT Plus handleset with protective steel plate (ref: PS7901012ER30-626) operating a mortice latch and also an ITS96 concealed closer. Lockcase and keep protected with intumescent pack ref: MMG631 – 2mm thick Interdens SA. Specimen 8 incorporated an Inoxi handleset operating an EL520 mortice latch engaging into a EL520 keep and also a Dorma concealed closer in the head. Lockcase protected with intumescent pack ref: ITL-Abloy-EL560-100 – 2mm thick Phosphate.

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 door leaf was sampled by BM Trada on 10th 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	Door leaf:
	Applied cladding panel (27mm Spruce panel with a 2(t), aluminium facing).
	Hardware:
	• 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:
	  • 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

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 5th 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	Door 1: Hardware: • 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 Glazing: • 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/m^3), 54(w) x 5(t)mm	

	Door 2: Cladding Panel: Applied cladding panel (27mm Spruce panel with a 10(w) x 10(d) grooves. Door 2: Hardware: • 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 23m thick Pyroguard EI60 INT glass.

Test report RF07028

This test was conducted on an unlatched, double leaf, single acting doorset, with glazing. Test is presented as primary data for the Laminesse Firesmoke 44mm for 30 minute fire resisting doorset design.

Test Date	**4th November 2014**
Identification of test body:	Chiltern international Fire, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Moralt AG
Summary of test construction (mm)	**Specimen:** Laminesse FireSmoke 44mm blank, 2mm thick plywood facings, with 9mm thick hardwood lippings on all edges. **Leaf Size:** 2300 (h) x 1050/1050 (w) x 43.5 (t). **Glazing:** Left Leaf: 6mm thick Pyroshield in aperture size 1200(h) x 200(w), protected with Intumescent Seals Ltd Therm-A-Strip glazing system in hardwood beads. Right Leaf: 6mm thick Pyroshield in aperture size 600(h) x 600(w), protected with Intumescent Seals Ltd Therm-A-Strip glazing system in hardwood beads. **Hardware:** 4No Royde & Tucker H101 lift off type hinges and a Dorma TS73V overhead closer were fitted to each leaf, with a Legge 'life' tubular latch with a 58 high forend and aluminium handleset. **Door frame**: European Redwood 32 thick of nominal density 510kg/m^3.with Redwood architraves. **Leaf Edge Intumescent Seals:** Intumescent Seals Ltd Therm-A-Seal were fitted in the frame jambs and leaf edges.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes) Tested opening in toward the furnace	Integrity: 33 Insulation: 33 (In accordance with the note to clause 7.6.1.1. of BS 476: 1987 the glazing was not evaluated for insulation)

Test report BTC15415F

This test was conducted on an unlatched, double leaf, single acting doorset with flush overpanel mounted in a Komfire 100 aluminium door frame. Test is presented as primary data for the Laminesse Firesmoke 44mm for 30 minute fire resisting doorset design with 6mm thick facings and Lorient Polyproducts Ltd Type 617 seals.

Test Date	**30th August 2007**
Identification of test body:	Building Test Centre, British Gypsum Ltd, East Leake, Loughborough, LE12 6NP. UKAS 0296
Test Sponsor:	Moralt AG
Summary of test construction (mm)	**Specimen:** Laminesse FireSmoke 44mm blank with 8mm thick hardwood lippings on all edges, 4mm thick chipboard facings. **Leaf Size:** 2398 (h) x 897/900 (w) x 44(t) with 200 (h) over-panel with rebated head detail **Hardware:** 3No Komfire 100mm high lift off type hinges ref: 582 and a Dorma TS68 overhead closer, no latch was installed. **Door frame**: Komfire 100 aluminium door frame. **Leaf Edge Intumescent Seals:** Lorient Polyproducts Ltd Type 617 were fitted in the frame jambs and leaf edges.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 49, Insulation: 49 Tested opening in toward the furnace

Test report FEP/F14256

This test was conducted on an unlatched, single leaf, single acting doorset. Test is presented as primary data for the Laminesse Firesmoke 44mm for 30 minute fire resisting doorset design with 6mm thick facings and Pyroplex Ltd intumescent seals. Specimen B within test RF14256 totalled 44mm thick; therefore, the leaf core may be reduced in thickness from the tested dimension within the primary test data - Chilt/RF07028 to achieve a leaf, a minimum of 44mm thick overall, including these 6mm thick facings.

Test Date	**10th November 2014**
Identification of test body:	BMTRADA, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor:	Moralt AG
Summary of test construction (mm)	**Specimen B:** Laminesse FireSmoke 44mm blank with 8mm thick hardwood lippings on all edges, and 4mm deep grooves in 6mm thick MDF facings. **Leaf Size:** Specimen B: 2135 (h) x 926 (w) x 44(t) **Hardware:** 3No Eclipse bearing butt type hinges and a Rutland TS3204 overhead closer, Euro spec latch with a 235 high forend and steel Glutz handleset. **Door frame**: Tulipwood 32 thick of nominal density 510kg/m^3.with MDF architraves. **Leaf Edge Intumescent Seals:** Pyroplex Ltd Rigid Box Seals ref: FO8700 were fitted in the frame reveals.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes) Tested opening in toward the furnace	Specimen B
	Integrity: 49 Insulation: 49

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

Test report WF172705 Issue 2

This test was conducted on 2No unlatched, single leaf, glazed single acting doorsets. Test is presented as primary data for the Laminesse Firesmoke 44mm for 30 minute fire resisting doorset design with Lorient Polyproducts Ltd intumescent seals.

Test Date	**23rd June 2008**	
Identification of test body:	Bodycote Warringtonfire, now trading as Warringtonfire Testing and Certification. UKAS 0249	
Test Sponsor:	Moralt AG	
Summary of test construction (mm)	**Leaf Sizes:** Specimen A: 2320 (h) x 1020 (w) x 44(t) Specimen B: 2120 (h) x 970 (w) x 44(t). **Both Specimens A&B:** Laminesse FireSmoke 44mm blank with 10mm thick hardwood lippings on all edges, and 4mm deep grooves in 6mm thick plywood facings. **Glazing:** Both Leaves: 6mm thick Schott Pyran S, protected with Lorient Polyproducts Ltd Flexible Figure 1 (FF1) glazing system in hardwood beads 22(h) x 22(w) with a 5 x 5 bolection return. Specimen A aperture size 1800(h) x 800(w), specimen B aperture size 1600(h) x 700(w). Right Leaf: 6mm thick Pyroshield in aperture size 600(h) x 600(w), protected with Intumescent Seals Ltd Therm-A-Strip glazing system in hardwood beads. **Hardware:** 3No Royde & Tucker H102 lift off type hinges and a Dorma TS71 overhead closer. **Door frame**: Generic softwood 32 thick of nominal density 510kg/m^3.with MDF architraves. **Leaf Edge Intumescent Seals:** Pyroplex Ltd Rigid Box Seals ref: FO8700 were fitted in the frame reveals.	
Test Standard:	EN1634-1: 2000 and EN1363-1: 1999	
Test Results (minutes) Tested opening in toward the furnace	Specimen A	Specimen B
	Integrity: Continuous Flaming: 33 Gap Gauges: 37 Cotton Pad: 16 **Insulation:** 2	**Integrity:** Continuous Flaming: 31 Gap Gauges: 37 Cotton Pad: 18 **Insulation:** 2

The fully glazed designs tested herein are not required to provide insulation performance. Therefore, when considering the test results, the integrity value is determined based on the time to failure of the gap gauges or sustained flaming criteria, whichever fails first.

A.2 Secondary Evidence

Test report FEP14102

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 Firesmoke 44/54mm for 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)	**Specimen B:** Graduated Density chipboard 44 thick blank with 8mm thick hardwood lippings on all edges. **Leaf Size:** 2040 (h) x 826/303 (w) x 44 (t). **Hardware:** 3No Royde & Tucker lift off butt type hinges ref: H101 and a Geze UK TS2000V overhead closer were fitted to each leaf, with a Zoo tubular latch with a 62 high forend and aluminium handleset and steel flush bolts fitted in the meeting edge. **Door frame**: Latham WoodEx Engineered European Redwood 30 thick of nominal density 510kg/m^3.with Redwood architraves. **Leaf Edge Intumescent Seals:** Lorient Polyproducts Ltd Type 617 were fitted in the frame jambs and leaf edges, with a Norsound NOR710 environmental seals fitted against the door stop.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 30; Insulation: 30 Tested opening in toward the furnace

Note:

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

Test report DMT-DO-50-994

Test DMT-DO-50-994 was conducted on 1No. latched, single leaf doorsets. Test is presented as supporting data for the Laminesse Firesmoke 54mm for 30 minute fire resisting doorset design installed with Ellenmatic Soundproof dropseal.

Date of test	**13th 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, 54mm 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.

Test report WF382394 Rev A AR1

Test WF382394 was conducted on 2No. unlatched, single leaf doorsets, only specimen B is relevant to this report. Test is presented as supporting data for the Laminesse Firesmoke 44/54mm for 30 minute fire resisting doorset design installed with various items of hardware.

Test Date	**8th July 2014**
Identification of test body:	Exova Warringtonfire, 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)	**Specimen B:** Laminesse Firesmoke 54 thick blank with 8mm thick hardwood lippings on all edges and with 6mm thick MDF facings. **Leaf Size:** 2250 (h) x 1000 (w) x 54 (t). **Hardware:** 3No. Simonswerk Tectus concealed hinges ref: TE5273.SSE FD60 and a Dorma ITS96 concealed closer with ITS slide arm and channel guide, with a Glutz multipoint latch with a 1788 high forend and aluminium handleset and security Euro cylinder. **Door frame**: Hardwood 38 thick of nominal density 650kg/m^3.with MDF architraves. **Leaf Edge Intumescent Seals:** Pyroplex Ltd Rigid Box Seals ref: 6700 and 30141 were fitted in the frame jambs.
Test Standard:	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 69; Insulation: 69 Tested opening in toward the furnace

Test report BMT/FEP/F16156 Revision A Specimen B

Date of test	**23rd June 2016**
Identification of test body	Exova Warringtonfire now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762
Sponsor	James Latham, Unit 2, Swallow Park, Fenway Road, Hemel Hempstead, Hertfordshire, HP2 7QU
Tested Product	Specimen B: Unlatched, single acting, double leaf specimen with flush overpanel comprised of Moralt FireSound 54 core leaf with all edges lipped with 8-15mm thick Mahogany of nominal density 640kg/m3. The leaves measured 2250mm (h) x 916/332mm (w) x 54mm (t) with a 1258mm wide x 305mm high overpanel and hung in a Mahogany hardwood frame.
Test Standard	BS 476: Part 22: 1987
Test Results (minutes)	**Integrity:** 74 **Insulation:** 74
Summary of test specimen	Specimen B included 3No. Royde & Tucker H207 steel bearing butt hinges, a face fixed Arrone AR1500 closer, a Glutz mortice lock with a 235mm high forend and disengaged flush bolts in the smaller leaf. 2No. 15 x 4mm Lorient Polyproducts Ltd, Type 617 perimeter intumescent seals were fitted in the frame reveal of the head and jambs, in the bottom edge of the overpanel and in one meeting edge, with a Lorient LAS8001si threshold seal. The hinge blades, flush bolts and latch body, forend and keep were protected with 1mm thick MAP intumescent gaskets. The leaf (larger) leaf contained a glazed aperture 1106mm high x 406mm wide, glazed with 23mm thick Pilkington Pyrostop utilising ISL Therm-A-Line aperture liner and Therm-A-Glaze 45 seals between the glass and beads. A timber astragal was fitted to the unexposed face of the overpanel. The doorset was oriented to open in towards the furnace of the test.

Test Report Chilt/RF07140 Revision B

Date of Test	26th November 2007
Identification of Test Body	Warringtonfire Testing and Certification Ltd. Previously known as Chiltern International Fire UKAS No. 1762
Sponsor	Harison Thompson & Co Ltd & Lorient Polyproducts Ltd
Tested Product	Unlatched (bolts latched), Single Acting, Double Leaf, Timber Doorset installed with edge protectors – ULSADD. Doorset A 2040 (h) x 850/323 (w) x 44 (t). Particleboard core doorset installed with Yeoman Shield/Lorient Polyproducts Ltd PVC edge protectors to the vertical edges. Doorset B 2040 (h) x 850/323 (w) x 43 (t). Lamella core doorset installed with Yeoman Shield/Lorient Polyproducts Ltd PVC edge protectors to the vertical edges.
Tested Orientation	Opening in towards heating conditions
Test Standard	BS 476-22: 1987
Performance	**Doorset A Integrity:** 44 minutes **Doorset B Integrity:** 51 minutes **Doorset A Insulation:** 44 minutes **Doorset B Insulation:** 51 minutes
Reason for Use	Supporting evidence to support the use of the Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors to the vertical edges of proven timber based doorset designs for 30 minutes fire resistance

Test report WF364240

Date of test	**11th May 2016**		
Identification of test body	Warringtonfire now trading as Warringtonfire Testing and Certification UKAS 0249		
Sponsor	Abloy Oy		
Sampling	A representative of Warrington Certification sample selected the hardware on 26th April 2016		
Tested Product	Specimens A & B: Latched, single acting, single leaf specimens comprised of a graduated chipboard core with the vertical edges lipped with 8mm thick sapele of nominal density 640kg/m3. The leaves for both specimens were graduated chipboard cores 2040mm (h) x 931mm (w) x 54mm (t) and hung in hardwood frames. Specimen A was oriented to open in towards the furnace and specimen B to open away from the heating conditions for the test.		
Test Standard	BS EN 1634-1:2014		
Test Results (minutes)	**Integrity**	**Specimen A** 68	**Specimen B** 68
	Insulation:	68	68
WF364240 has been incorporated as supporting data to permit consideration of the Abloy Oy EL520 lockset range.			
Summary of test specimen	The tested specimens were mounted on 4No. Royde and Tucker Hi-Load H102 steel butt hinges, with a Abloy Oy EA281 cable loop and Inoxi lever handles. Both specimens incorporated an EL520/100 lockset and EA329 strike plate.		

Test Report Technalia 088745-002-1-a

Test 088745-002-1-a is presented as suitable supporting data for the use of the Onity card reader and handle ref: Advance Trillium RFID. Locksets installed with the increased intumescent specification 'option 2' had not been recorded as the cause of integrity failure prior to termination of the test at 60 minutes on either of the specimens.

Date of Test	22 July 2020
Identification of Test Body	Technalia Research and Innovation, Area Anardi, 5, E-20730 Azpeitia (Gipuzkoa).
Sponsor	Onity, Poligono Industrial Lanbarren, C/Aranaburu 4D, 20180 Oiartzun, Spain
Tested Product	2 No identical - Latched, Single Acting, Single Leaf, Timber Doorsets - LSASD.
Tested Orientation	Door 1 tested Opening out, away from heating conditions Door 2 tested Opening in towards heating conditions
Sampling information	The test specimens were checked against the client specification prior to testing by staff at the test facility.
Summary of Test Specimen	**LEAF:** Overall Size: 2229 (h) x 958 (w) x 54mm (t) Core: graduated density chipboard (630kg/m^3). Lippings: 6mm thick Sapele to all edges. **FRAME:** Head & Jambs: MDF (700kg/m^3), 151 x 48mm thick including 5mm return around wall face, with 100 x 18mm (t) planted stops, butt jointed. Frame Fixing: 4No. 6 x 100mm long steel screws per jamb. Frame Firestopping: Sealed Tight Solutions Ltd (STS) ST99 foam with capped with a bead of acrylic sealant. Threshold: non-combustible board Architraves: Sapele (640kg/m^3), integral with frame 12mm projection x 5mm overlap. **INTUMESCENT Materials:** Frame Reveals: 2No 15x4 STS STS154FO. Fitted 10mm apart with 1st seal fitted 5.5mm from opening face. Bottom Leaf Edge. Drop Seal – STS ST422. **Smoke Seals:** STS ST1009. **HARDWARE:** Hinges: 4No Zoo Hardware ref: ZCHSS243S Closer: Dorma ITS96, concealed overhead Lock/Latch – installed as 'option2': Onity card reader and handle ref: Advance Trillium RFID + Onity mortice latch ref: Euro 5470H. Lock/Latch Size: Central Lockcase: 174 high x 14 wide x 105 deep (mm), spindle at 1675mm above threshold. RFID reader backing plate 90 x 60 mounted to face of leaf above main latch body. Forend: 240 x 23 x 3mm, keep: 200 x 40 (O/all) x 3mm. Lock/Latch Status: engaged for test.

	HARDWARE PROTECTION: Under Hinges: 1mm thick Norseal Interdens hinge pad behind all hinge blades. Latch/Lock: 1mm thick 'Interdens 15' Encasing Lockcase, under forend & keep, inside card reader mounting plate, handle rosette and under reader mounting plate. Dropseal – 2mm thick Interdens on top face of dropseal	
Test Standard	EN1634-1:2014+A1:2018	
Performance (minutes)	**Doorset 1**	**Doorset 2**
	Integrity: 42* **Insulation:** 42	**Integrity:** 42* **Insulation**: 42
Failure Mode	Failure was recorded on doorset 1 at the card reader installed as 'option 1' (with reduced intumescent protection) and at the top hinge position on doorset 2. No further integrity failures were recorded prior to termination of the test at 60 minutes.	