
Title

Field of Application for:
Moralt Laminasse FireSound
54mm Doorsets
For: 30 & 60 Minutes Fire
Resistance

Report No.:

WF409922 Revision A

Issue Date:

13th April 2023

Valid Until:

13th April 2028

Job Reference:

WF530852

Prepared for:

Moralt AG
Obere Tiefenbachstr.1,
83734 Hausham,
Germany

Contents

Contents	2
1 Foreword	4
2 Proposal	5
2.1 Assumptions	5
3 Test Data.....	6
3.1 Primary Test Evidence	7
3.2 Test report RF10007	7
3.3 Test report P1009/14-530-1	8
3.4 Test report PF15041	9
3.5 Test report PF15288 Revision A	10
3.6 Test report BMT/FEP/F16156 Revision A Specimen B.....	11
3.7 Test report DMT-DO-50-1010	12
3.8 Test report DMT-DO-50-1012	13
3.9 Test Report Technalia 088745-002-1-a.....	14
3.10 Test report WF383782	15
3.11 Test report WF383783	16
3.12 Test report DMT-DO-50-1148	17
4 Technical Specification.....	18
4.1 General	18
4.2 Intended Use.....	18
4.3 Door Leaf	18
4.4 Door Frames	18
4.5 Doorset Configurations & Maximum Leaf Sizes.....	19
5 General Description of Construction	40
5.1 Leaf Core Construction	40
5.2 Leaf Size Adjustment During Manufacture	40
5.3 Timber Lipping – Leaf type 1 & 2.....	41
5.4 CS Group PVC Edge Protectors& Post-Formed Acrovyn Facings.....	42
5.5 Decorative & Protective Facings – all Leaf Options	43
5.6 Acoustic Panels.....	44
6 Glazing within the Leaf	45
6.1 General	45
7 Door Frame Construction	55
7.1 Details for Frame 1.....	55
7.2 Standard frame detail.....	56

7.3	CS Group Acrovyn	56
7.4	Door Frame Joints.....	57
7.5	Decorative Facings – All Frame Options	58
8	Solid Overpanels	58
8.1	General	58
9	Adhesives.....	60
10	Hardware.....	61
10.1	General	61
10.2	Intumescent to Hardware	62
10.3	Essential Hardware	63
10.4	Handles.....	63
10.5	Latches & Locks.....	64
10.6	Hinges.....	68
10.7	Doorset Self Closing	70
10.8	Flush Bolts	71
10.9	Non-Essential Hardware	72
11	Installation	76
11.1	General	76
11.2	Door Frame Installation	76
11.3	Firestopping	77
11.4	Packers.....	78
11.5	Wall Types, Structural Opening & Fixity	79
11.6	Post Production (Onsite) Leaf Size Adjustment.....	80
11.7	Door Gaps.....	80
12	Insulation Performance.....	80
12.1	30 Minutes Performance	80
12.2	60 Minutes Performance	80
13	Conclusion	81
14	Declaration by the Applicant	82
15	Limitations	83
16	Validity.....	84
	Appendix A Summary of Supporting Test Data.....	85
	Appendix B Revisions.....	86

1 Foreword

This Field of application report has been commissioned by Moralt AG and relates to Laminesse FireSound 54mm doorsets, for both 30 and 60 minute fire resisting performance doorset installations.

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

This Field of Application (scope) uses established empirical methods of extrapolation and experience of fire testing similar doorsets, in order to extend the scope of application by determining the limits for the designs based on the tested constructions and performances obtained. The scope is an evaluation of the potential fire resistance performance if the variations specified herein were to be tested in accordance with BS 476 Part 22: 1987.

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

This Field of Application has been written using appropriate test evidence generated at UKAS accredited laboratories¹, to the relevant test standard. The supporting test evidence has been deemed appropriate to support the manufacturers stated door design and is summarised in section 3.

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

This Field of Application has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the Passive Fire Protection Forum (PFPF) 'Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence'. The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used for building control and other purposes.

The drawings provided in this report are for guidance and illustrative purposes only. Please note that the written scope of application takes precedence.

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

2 Proposal

It is proposed to consider the fire resistance performance of the specified proprietary Moralt AG Laminesse FireSound 54mm doorsets for 30 & 60 minutes fire resistance (and where appropriate insulation performance), if the doorset designs were to be tested to the requirements of BS 476 Part22: 1987, *Methods for determination of the fire resistance of non-loadbearing elements of construction*.

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

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.

2.1 Assumptions

- All densities referred to in this document are based upon an assumed moisture content of 10-12%.
- It is assumed that unless otherwise documented in the field of application sections of this report, the doorset subject to this report will be constructed in accordance with the test evidence referred to herein.
- For components created using solid timber sections referred to in this assessment, it is assumed that, for all timbers, they will be of a quality deemed to meet or exceed class J30 as specified in BS EN 942: 2007, subject to adequate repairs, other than glazing beads which must meet a minimum class J10. Note that areas under intumescent seals/gaskets are not considered to be concealed faces and defects must be repaired.
- Where timber is referred to within this document it is assumed that the timber element is made from a continuous solid piece, unless specifically detailed otherwise.
- All dimensions detailed herein may be varied by $\pm 2\%$ except where minimum, maximum or a range of dimensions are given.

3 Test Data

The test evidence summarised below has been generated to support the fire resistance performance of the door designs that are the subject of this field of application. The summary details are considered to be the key aspects of the design tested.

Note:

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

The test evidence has been generated across a number of different doorset configurations, including single leaf, double leaf, latched and unlatched doorsets as well as doorsets with flush overpanels.

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

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

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

It is therefore the opinion of Warringtonfire that the evidence cited in the following section, tested to both named standards referenced above can be utilised in this assessment which will conclude in terms of the fire resistance performance of the Laminesse FireSound 54mm doorset designs if tested in accordance with BS 476: Part 22: 1987.

3.1 Primary Test Evidence

The following summaries are provided to give the key details relevant to the test report. Throughout this assessment report, relevant sections will reference the tests where they have been used to provide the scope of application.

3.2 Test report RF10007

Date of test	1 st April 2010
Identification of test body	Chiltern International Fire Ltd. (Now Warringtonfire Testing and Certification Ltd)
Sponsor	Moralt AG
Tested Product	Latched, single acting, double leaf specimen comprised of Moralt FireSound 54 core leaves with the vertical edges lipped with 8mm thick sapele of nominal density 640kg/m ³ The leaves were both 2145mm (h) x 933mm (w) x 55mm (t) and hung in a sapele hardwood frame.
Test Standard	BSEN 1634-1: 2000 and BSEN 1363-1: 1999
Test Results (minutes) * Failure criteria was not achieved prior to termination of test at 64 minutes	<p>Integrity: Cotton Pad: 60 Continuous Flaming: 56 Gap Gauges: *</p> <p>Insulation: Discrete Area 1 (timber): * Discrete Area2 (glass): * Radiation (minutes to 15 kW/m²): *</p>
Failure was attributed to undermining of the beads at the glazing perimeter. Based on the performance of the remainder of the doorset, which did not achieve failure criteria until 60 minutes, it is our assessment that the FireSound 54mm may be assessed for 60 minutes performance. Test data is used in support of assessment for double doorsets, the tested glazing system is not assessed for use at 60 minutes performance.	
Summary of test specimen	<p>The tested specimen included 3No. H207 concealed bearing butt steel hinges, an overhead face fixed closer, an Ingersoll Rand mortice lock with a 235mm high forend and engaged flush bolts.</p> <p>2No. 15 x 4 Lorient Polyproducts Ltd Type 617 perimeter intumescent seals were fitted in the frame reveal of the head and jambs and also in one leaf meeting edge. The hinge blades, latch forend and keep and the flush bolts were protected with 1mm thick MAP intumescent gaskets. The installed 23mm thick Pilkington Pyrostop glass was protected with System36 gaskets fitted between the glass and sapele glazing beads on both faces; and an LX5402 Palusol glazing liner.</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>

3.3 Test report P1009/14-530-1

Date of test	16 ^h April 2014
Identification of test body	Slovenian National Building and Civil Engineering Institute, Ljubljana
Sponsor	Information held in confidence at Warringtonfire
Tested Product	Specimen B: Latched, single acting, single leaf specimen comprised of Moralt FireSound 54 core leaf with the vertical edges lipped with 8mm thick Mahogany of nominal density 640kg/m ³ The leaf was 2135mm (h) x 915mm (w) x 54mm (t) and hung in a sapele hardwood frame.
Test Standard	BS EN 1634-1: 2014 and BS EN 1363-1: 2012
Test Results (minutes) * Failure criteria was not achieved prior to termination of test at 84 minutes.	Integrity: Cotton Pad: 65 (bottom hinge position) Continuous Flaming: * Gap Gauges: * Insulation: 65 – due to integrity failure. Insulation measurements continued after 65 minutes, and failure criteria were not achieved (in isolation to the integrity failure) prior to termination of test at 84 minutes
Specimen B contained a glazed aperture. Assessment for the installation of glazed apertures into FireSound 54 is based on the performance and installation details tested in P1009/14-530.	
Summary of test specimen	The tested specimen included 3No. Leaderflush Shapland bearing butt steel hinges, an overhead face fixed closer, a mortice lock with a 110mm high forend. 2No. 15 x 4 Pyroplex Ltd Rigid Box perimeter intumescent seals were fitted in the frame reveal of the head and jambs. The hinge blades and latch body were protected with 1mm thick Interdens intumescent gaskets. The installed 23mm thick Pilkington Pyrostop 60-101 glass was protected with ISL Therm-A-Bead gaskets fitted between the glass and sapele glazing beads on both faces and an ISL Therm-A-Line glazing liner. The doorset was oriented to open in towards the furnace of the test.

3.4 Test report PF15041

Date of test	17 th March 2015		
Identification of test body	BM TRADA. (Now Warringtonfire Testing and Certification Ltd)		
Sponsor	Moralt AG		
Tested Product	<p>A & B: Latched, single acting, double leaf specimens comprised of Moralt FireSound 54 core leaves with the vertical edges lipped with 8-14mm thick sapele of nominal density 640kg/m³</p> <p>The leaves for both specimens were 2250mm (h) x 820/260mm (w) x 54mm (t) and hung in sapele hardwood frames.</p>		
Test Standard	BSEN 1634-1: 2014 and BSEN 1363-1: 2012		
Test Results (minutes)	Integrity:	Specimen A	Specimen B
	Cotton Pad	81	81
	Continuous Flaming	77	66
	Gap Gauges	81	81
	Insulation:		
	Discrete Area 1 (timber)	77	66
	Radiation (minutes to 15 kW/m ²)	81	81
<p>Test PF15041 was designed to compare the performance of the two core types discussed in section 5.1; assessment of parity between the two core types is based on using distortion data and reference to the observations recorded up to the time of failure of doorset B.</p>			
Summary of test specimen	<p>The tested specimen included 3No. Cooke Bros 7700CB bearing butt steel hinges, an overhead face fixed closer, a Glutz mortice lock with a 235mm high forend and disengaged flush bolts.</p> <p>For both specimens: 2No. 15 x 4 Pyroplex Ltd 8700 perimeter intumescent seals were fitted in the frame reveal of the head and jambs and 2No. 15 x 4 Pyroplex Ltd 30141 perimeter intumescent seals in one leaf meeting edge. A Norsound 810 dropseal was fitted in the threshold of the leaf.</p> <p>The hinge blades, latch forend and body, drop seal and the flush bolts were protected with 1mm thick Interdens intumescent gaskets. The doorsets were oriented to open in towards the furnace of the test.</p>		

3.5 Test report PF15288 Revision A

Date of test	9 th November 2015		
Identification of test body	Exova Warringtonfire. (Now Warringtonfire Testing and Certification Ltd)		
Sponsor	Information held in confidence at Warringtonfire		
Tested Products	<p>A: Unlatched, single acting, single leaf specimen comprised of Moralt FireSound core leaves with the vertical edges lipped with 6-18mm thick sapele of nominal density 640kg/m³</p> <p>Leaf size: 2244mm (h) x 905mm (w) x 59mm (t) and hung in sapele hardwood frames.</p> <p>B: Unlatched, single acting, double leaf specimen comprised of Moralt FireSound core leaves with the vertical edges lipped with 6-18mm thick sapele of nominal density 640kg/m³</p> <p>Leaf sizes: 2250mm (h) x 905/478mm (w) x 56mm (t) and hung in sapele hardwood frames.</p>		
Test Standard	BS 476: Part 22: 1987		
Test Results (minutes)		Specimen A	Specimen B
	Integrity:	44*	83
	Insulation:	0**	83
<p>* Integrity failure was recorded behind the architrave between the door frame and supporting construction, no further failures were recorded prior to 77 minutes. The installed glazing system in specimen A is therefore assessed for use in the FireSound 54 design for 60 minutes performance, see section 6.1.2.</p> <p>** In accordance with section 8.6.1 of BS 476: Part22: 1987, specimen A has not been evaluated for insulation performance</p>			
Summary of test specimen	<p>The tested specimens included 3No. Zoo Architectural bearing butt steel hinges, an overhead face fixed closer, a Zoo Architectural mortice lock with a 235mm high forend and, for specimen B, disengaged flush bolts.</p> <p>For both specimens: 2No. 15 x 4 Sealed Tight Solutions Ltd (STS) ST1504 perimeter intumescent seals were fitted in the frame reveal of the head and jambs and, for specimen B, 2No. Sealed Tight Solutions ST1504 perimeter intumescent seals in one leaf meeting edge.</p> <p>12mm thick Pyrobelite glass was installed in specimen A, protected with the STS ST105GT(3) and ST302 glazing system.</p> <p>The hinge blades, latch forend and keep and the flush bolts were protected with 1mm thick STS graphite intumescent gaskets.</p> <p>The doorsets were oriented to open in towards the furnace of the test.</p>		

3.6 Test report BMT/FEP/F16156 Revision A Specimen B

Date of test	23 rd June 2016
Identification of test body	Exova Warringtonfire (Now Warringtonfire Testing and Certification Ltd)
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 59 core leaf with all edges lipped with 8-15mm thick Mahogany of nominal density 640kg/m ³ 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.

3.7 Test report DMT-DO-50-1010

Date of test	17 th 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	<p>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/m³</p> <p>The leaves for both specimens were 2440mm (h) x 1000mm (w) x 54mm (t) and hung in sapele hardwood frames.</p> <p>The doorsets were oriented to open in towards the furnace of the test.</p>		
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 and a rebated head detail as shown in section 5.3.1. 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	<p>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.</p> <p>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.</p> <p>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.</p> <p>The leaf was glazed with one aperture using 13mm thick Pyroguard EW60 and one aperture with 25mm thick Pyroguard EI60 from Pyroguard UK.</p>		

3.8 Test report DMT-DO-50-1012

Date of test	3 rd September 2021		
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 contract SC21028		
Tested Product	<p>Specimen A & B: Latched, single acting, single leaf specimens comprised of Moralt SmartCore 55 leaves with the vertical edges lipped with 5mm thick sapele of nominal density 640kg/m³</p> <p>The leaf for both specimens were 2440mm (h) x 1000mm (w) x 54mm (t) and hung in sapele hardwood frames.</p> <p>The doorsets were oriented with specimen A opening in towards the furnace of the test and specimen B opening away.</p>		
Test Standard	BS 476 Part 22:1987		
Test Results (minutes)	Integrity	Specimen A 65	Specimen B 62
	Insulation:	65	62
DMT-DO-50-1012 has been incorporated to permit consideration of the Assa Abloy VingCard Signature MPA 4G RFID lockset.			
Summary of test specimen	<p>The tested specimen included 3No. Doorfit CBH102R.SSS steel butt hinges, a Doorfit ICK1955V face fixed closer, an Assa Abloy 'Signature MPA RFID mortice lock with a 235mm high forend and an Assa Abloy 'Hospitality' reader unit.</p> <p>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.</p> <p>The hinges were protected with 1mm thick graphite, latch forend and body protected with Mann McGowan pack ref: MMG568, drop seal included 2mm thick Interdens on the top surface.</p>		

3.9 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	<p>LEAF: Overall Size: 2229 (h) x 958 (w) x 54mm (t) Core: graduated density chipboard (630kg/m³). Lippings: 6mm thick Sapele to all edges.</p> <p>FRAME: Head & Jambs: MDF (700kg/m³), 151 x 48mm thick including 5mm return around wall face, with 100 x 18mm thick 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/m³), integral with frame 12mm projection x 5mm overlap.</p> <p>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.</p> <p>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.</p> <p>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</p>

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.	

3.10 Test report WF383782

Date of test	26 th September 2017		
Identification of test body	Exova Warrington fire now trading as Warringtonfire Testing and Certification UKAS 0249		
Sponsor	Salto Systems, Arkotz 9, Poligono, Lanbarren, 20180 Oiazun- Gipuzkoa, Spain		
Sampling	A representative of Warrington Certification sample selected the hardware on 23 rd February 2017		
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/m ³ The leaves for both specimens were 2040mm (h) x 932mm (w) x 44mm (t) and hung in softwood frames. The doorsets were oriented to open in towards the furnace of the test.		
Test Standard	BS EN 1634-1:2014		
Test Results (minutes)	Integrity	Specimen A 45	Specimen B 37
	Insulation:	45	37
WF383782 has been incorporated as supporting data to permit consideration the Salto entry systems discussed in section 10.5.1.1.			
Summary of test specimen	The tested specimens were mounted on 5No. Royde and Tucker Hi-Load H102 steel butt hinges, other than the latches no other hardware was installed. Specimen A incorporated a Salto LE7 lockset and strike plate with a Salto lever handle on a plastic backplate ref: E915RUIMB39 to the unexposed face and a steel lever handle on a steel rose on the exposed face. Specimen B incorporated a Salto LE8 electric escutcheon ref: E9652U851M3K.		

3.11 Test report WF383783

Date of test	26 th September 2017
Identification of test body	Exova Warrington fire now trading as Warringtonfire Testing and Certification
Sponsor	Salto Systems, Arkotz 9, Poligono, Lanbarren, 20180 Olartzun- Gipuzkoa, Spain
Sampling	A representative of Warrington Certification sample selected the hardware on 23 rd February 2017
Tested Product	Specimens A & B: Single leaf specimens comprised of a graduated chipboard core with the vertical edges lipped with 8mm thick sapele of nominal density 640kg/m ³ The leaves for both specimens were 1490mm (h) x 584mm (w) x 54mm (t) and mounted in hardwood jambs. The specimens were screwed in position to the jambs.
Test Standard	Principles of BS EN 1363-1:2012
Test Results (minutes)	No integrity failures were recorded prior to termination of the test at 68 minutes.
WF383783 has been incorporated as supporting data to permit consideration the Salto entry system discussed in section 10.5.1.1.	
Summary of test specimen	Other than the latches no other hardware was installed. Specimen A incorporated a Salto LE7 lockset with electric escutcheon ref: E96P0U001M48K and also an LE8 lockset with electronic escutcheon ref: E9150RUIMB49. Specimen B incorporated 4,5,6,7,9 a Salto LE7 lockset with electric escutcheon ref: E96P0U001M48K and also an LE8 lockset with electronic escutcheon with reader ref: E9452U72IM49W.

3.12 Test report DMT-DO-50-1148

Date of test	7 th 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	<p>Eight specimens of Moralt Laminesse FireSound 54mm were installed with various items of hardware.</p> <p>The leaves for all specimens were 508mm (h) x 508mm (w) x 54mm (t) and mounted in hardwood jambs.</p> <p>Each specimen was mounted on 2No hinges and latched by the various tested hardware items.</p> <p>Only specimens 7 & 8 are considered herein, both specimens were mounted opening in towards the heating conditions.</p> <p>Specimen 7 incorporated the DormaKaba RT Plus handleset and specimen 8 incorporated the Assa Abloy EL520 lockset with Inoxi handles.</p>
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 10.5.1.1.	
Summary of test specimen	<p>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.</p> <p>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.</p>

4 Technical Specification

4.1 General

The technical specification for the proposed Laminesse FireSound 54mm design is given in the following sections and is based on the test evidence for the door designs, summarised in section 3.

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

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

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

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

4.3.1 Leaf 1 – FireSound 54 with 3mm MDF facings – 54mm thick

The door designs can include:

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

4.3.2 Leaf 2 – FireSound 54 with 3mm Chipboard facings – 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, where applicable.

4.4.1 Frame 1 – Hardwood Timber – for use with all Leaf Options

The construction of the door frames is hardwood with minimum frame dimensions permitted for use at both 30 and 60 minute integrity performance. For further information on the specification and construction of the door frames see section 7.

4.4.2 Frame 2 – WoodEx Hardwood – for use with all Leaf Options

The construction of the door frames is laminated hardwood with minimum frame dimensions permitted for use at both 30 and 60 minute integrity performance. For further information on the specification and construction of the door frames see section 7.

4.4.3 Frame 3 – WoodEx Redwood – for use with all Leaf Options

The construction of the door frames is laminated Redwood with minimum frame dimensions permitted for use at 30 minutes integrity performance only. For further information on the specification and construction of the door frames see section 7.

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 Section 3 and considers:

1. The margin of over performance above 30 and 60 minutes integrity for the design
2. The characteristics exhibited during test and
3. 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:

1. A test on a double doorset is more onerous than a test on a single doorset
2. 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.
3. 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
4. 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
5. 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.







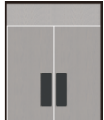
The leaf size for each door leaf option and configuration is linked to the perimeter intumescent specification and frame option. The following section details the maximum leaf size for each door leaf option and configuration based on the intumescent specification and frame details tested.

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.

4.5.2 Configuration

The table below shows the permitted configurations for the Laminesse FireSound 54mm doorset design, with the abbreviation and full description of each configuration.

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

Doorset Configurations		
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
	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 Configurations

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 with no restriction on the smaller leaf dimensions providing it does not exceed the relevant leaf size envelope and is not smaller in width than 300mm.

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

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

Based on the fact the performance of the different seal types has been proven by the test evidence summarised in section 3 (Lorient Polyproducts Type 617 in RF10007 and BMT/FEP/F16156 Revision A Specimen B; STS seals in PF15288 Revision A and Technalia 088745-002-1-a; Pyroplex in P1009/14-530-1 and PF15041), it is the opinion of Warringtonfire that the seal types included within this field of application are suitable for use within the FireSound 54mm Doorset design for 30 and 60 minutes fire resistance integrity performance, subject to the design parameters contained herein.

Therefore, based on an evaluation and comparison of the cited test evidence in section 3 and above, the leaf size envelopes in sections 4.5.8 and 4.5.10 may be achieved with any of the seal types permitted in the relevant sections. Leaf size envelopes and intumescent specifications have been assessed based on the lowest observed performance.

- Intumescent seals are to be fitted centrally 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, with tightly formed abutting corner joints where the leaf edges meet, unless stated otherwise.

4.5.4.2 Explanation for following sections

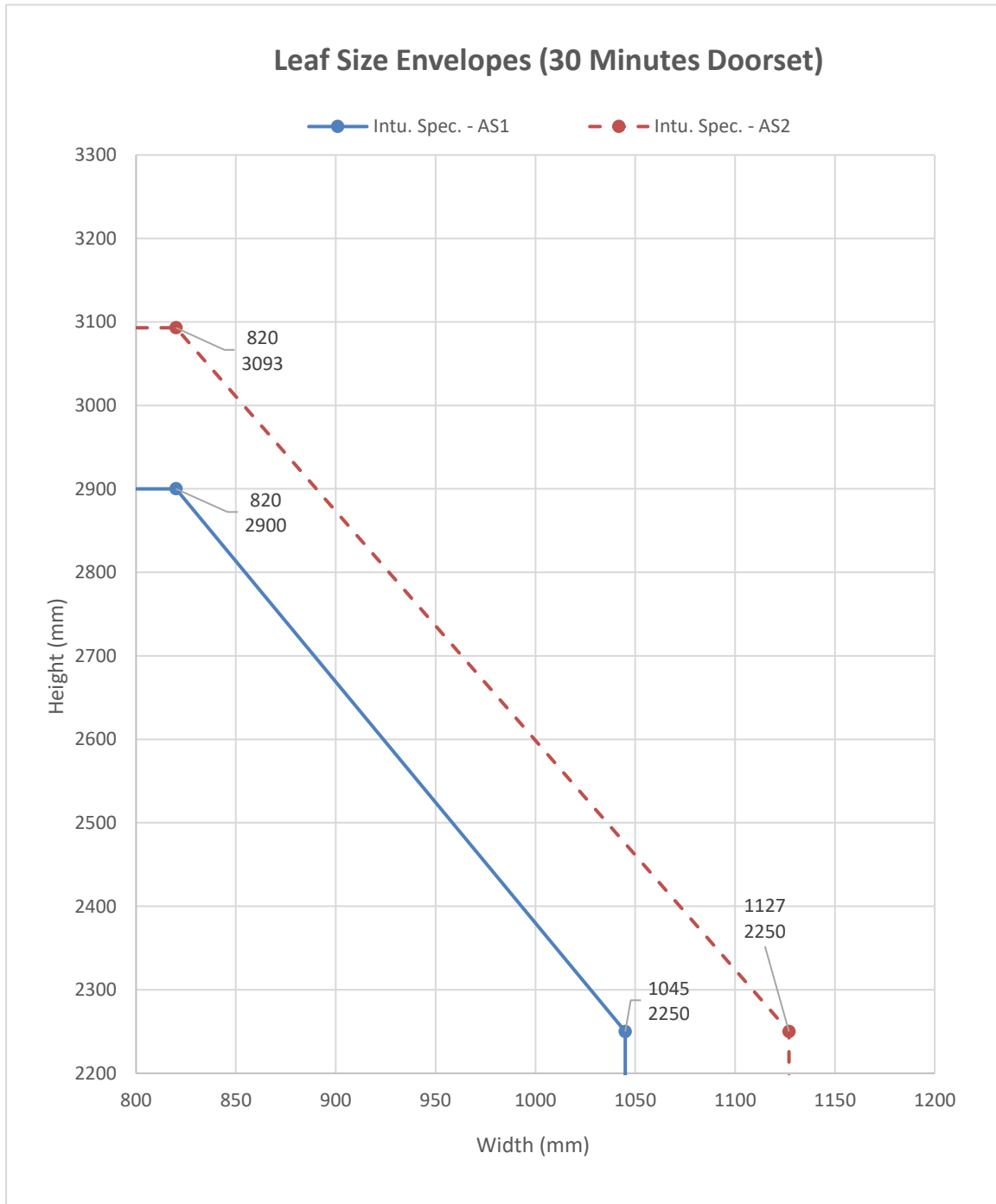
The performance of a doorset in terms of configuration and size is dependent on the leaf type, perimeter intumescent used and frame type. These elements are not automatically interchangeable. The following sections present the envelopes for the Laminesse FireSound 54mm leaf types and assessed frame types. 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.

4.5.5 LSASD Configuration: 30 Minutes Integrity Performance

Doorset created from Leaf options 1 or 2 with frame options 1, 2 or 3



Intumescent Specification for LSASD			
Leaf options 1 or 2 with frame options 1, 2 or 3			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS1 (PF15041)	STS FO	Sealed Tight Solutions Ltd	Head & Jambs: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.
AS2 (PF15041)	Rigid Box Seals Type 617 or Palusol	Pyroplex Ltd Lorient Polyproducts Ltd	

4.5.6 LSASD & ULASD Configurations: 30 or 60 Minutes Integrity Performance Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSASD & ULSASD			
Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
DS4 (F16156 Revision A)	Type 617	Lorient Polyproducts Ltd	Head & Jambs: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.
DS5 (F16156 Revision A)			

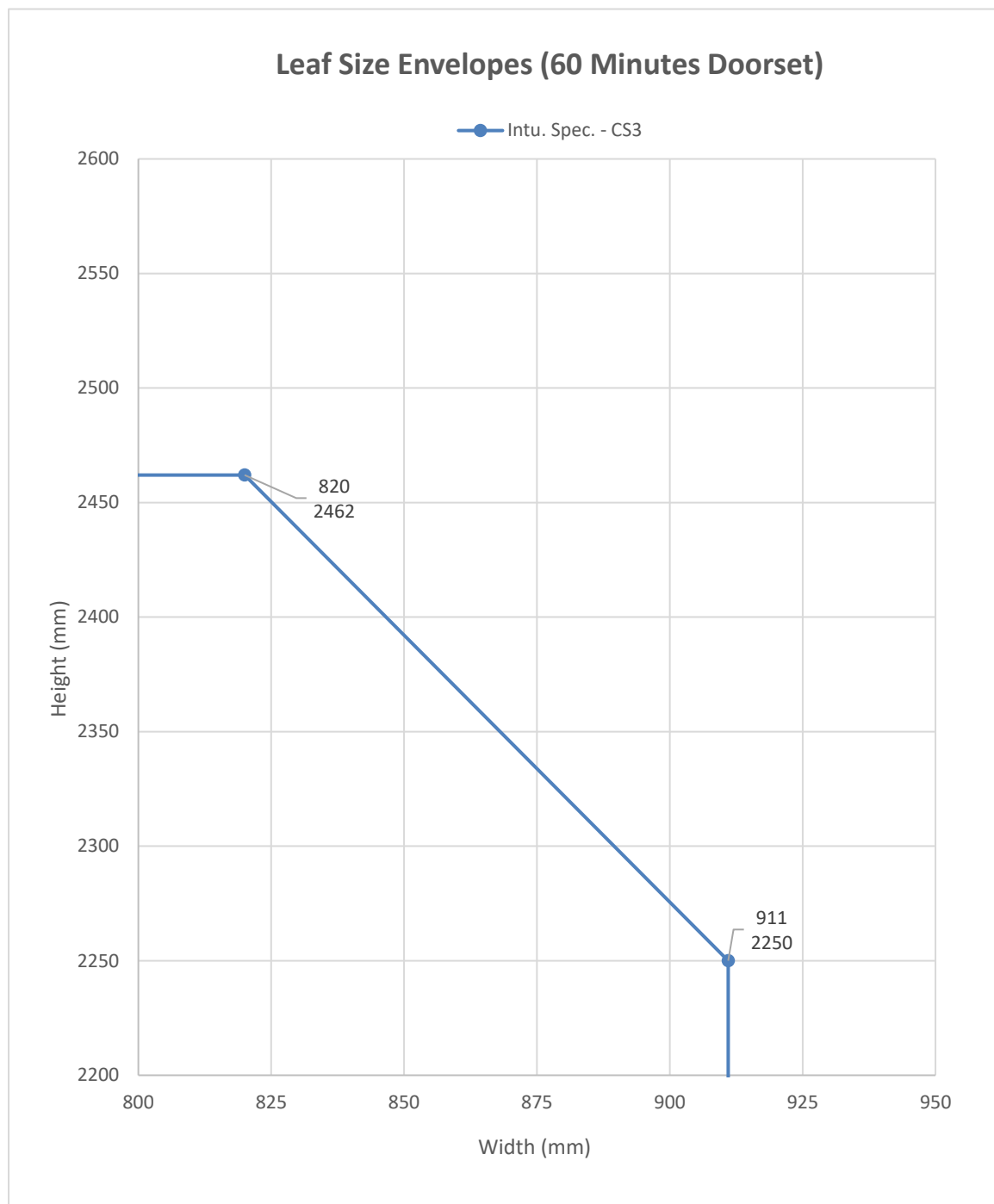
4.5.7 LSADD Configuration: 30 Minutes Integrity Performance Doorset created from Leaf options 1 or 2 with frame options 1, 2 or 3



Intumescent Specification for LSADD			
Leaf options 1 or 2 with frame options 1, 2 or 3			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BD1 (PF15041)	STS FO	Sealed Tight Solutions Ltd	<p>Head & Jamb: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.</p> <p>Meeting Edges: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only</p>
BD2 (PF15041)	Rigid Box Seals Type 617 or Palusol	Pyroplex Ltd Lorient Polyproducts Ltd	<p>Head & Jamb: 2No. 20mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.</p> <p>Meeting Edges: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only</p>

4.5.8 LSASD Configuration: 60 Minutes Integrity Performance

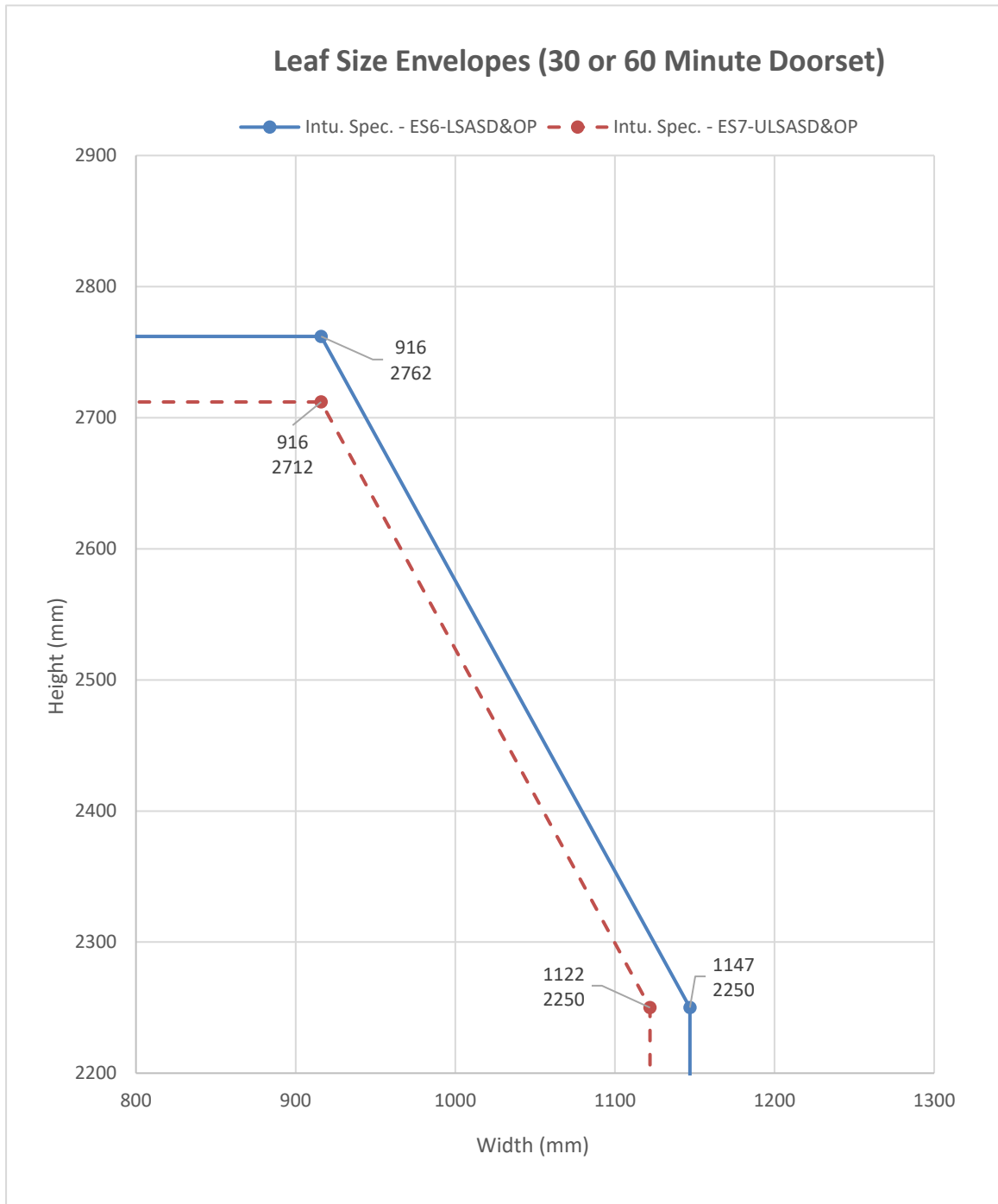
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSASD			
Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS3 (PF15041)	<p>STS FO</p> <p>Rigid Box Seals</p> <p>Type 617 or Palusol</p>	<p>Sealed Tight Solutions Ltd</p> <p>Pyroplex Ltd</p> <p>Lorient Polyproducts Ltd</p>	<p>Head & Jambs:</p> <p>2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.</p>

4.5.9 LSASD+OP & ULASD+OP Configurations: 30 or 60 Minutes Integrity Performance

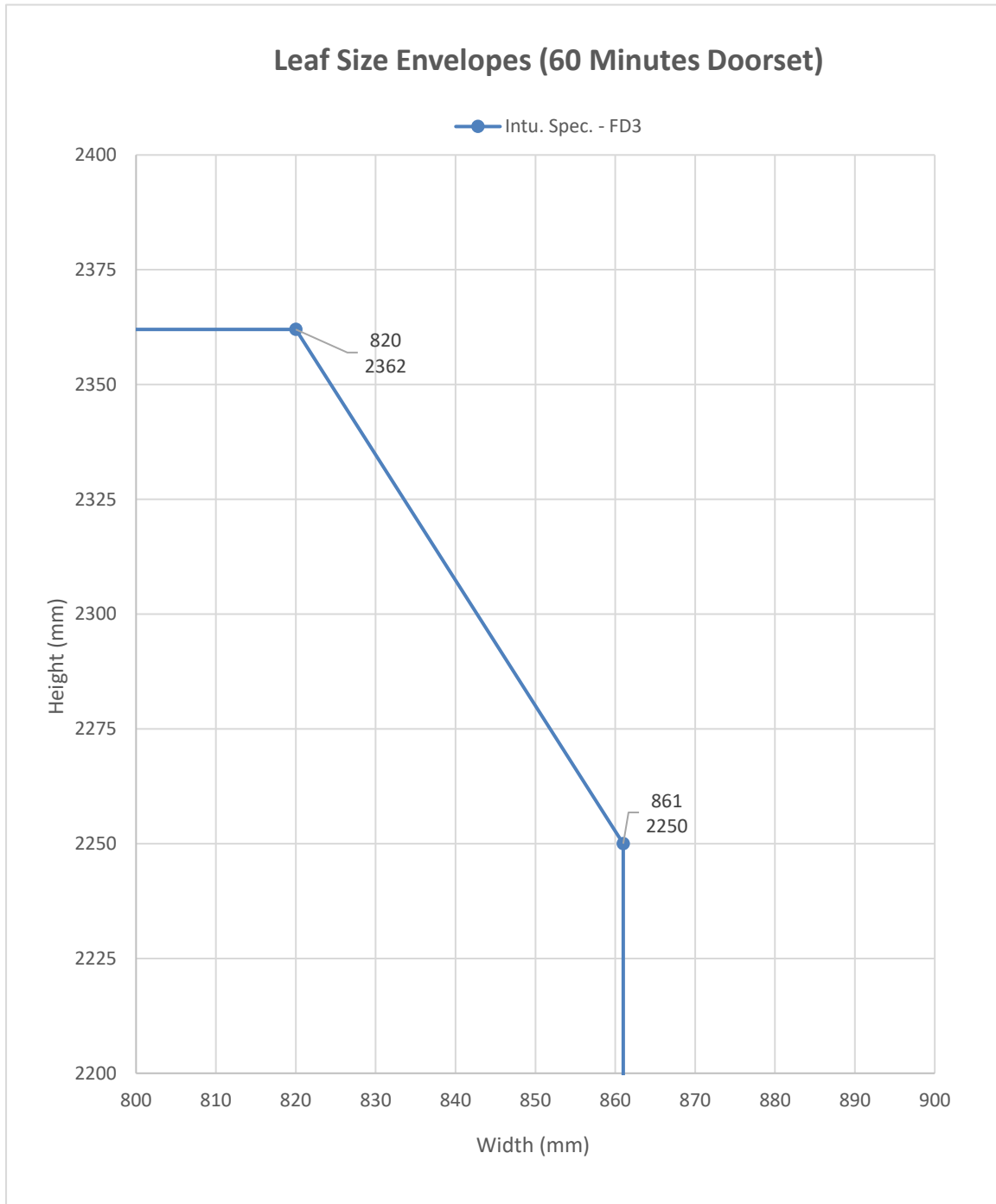
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSASD+OP & ULSASD+OP			
Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
ES6 (F16156 Revision A)	Type 617	Lorient Polyproducts Ltd	<p>Head: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the bottom edge of the overpanel</p> <p>Jams & Overpanel (other than leaf head): 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.</p>
ES7 (F16156 Revision A)			

4.5.10 LSADD Configuration: 60 Minutes Integrity Performance

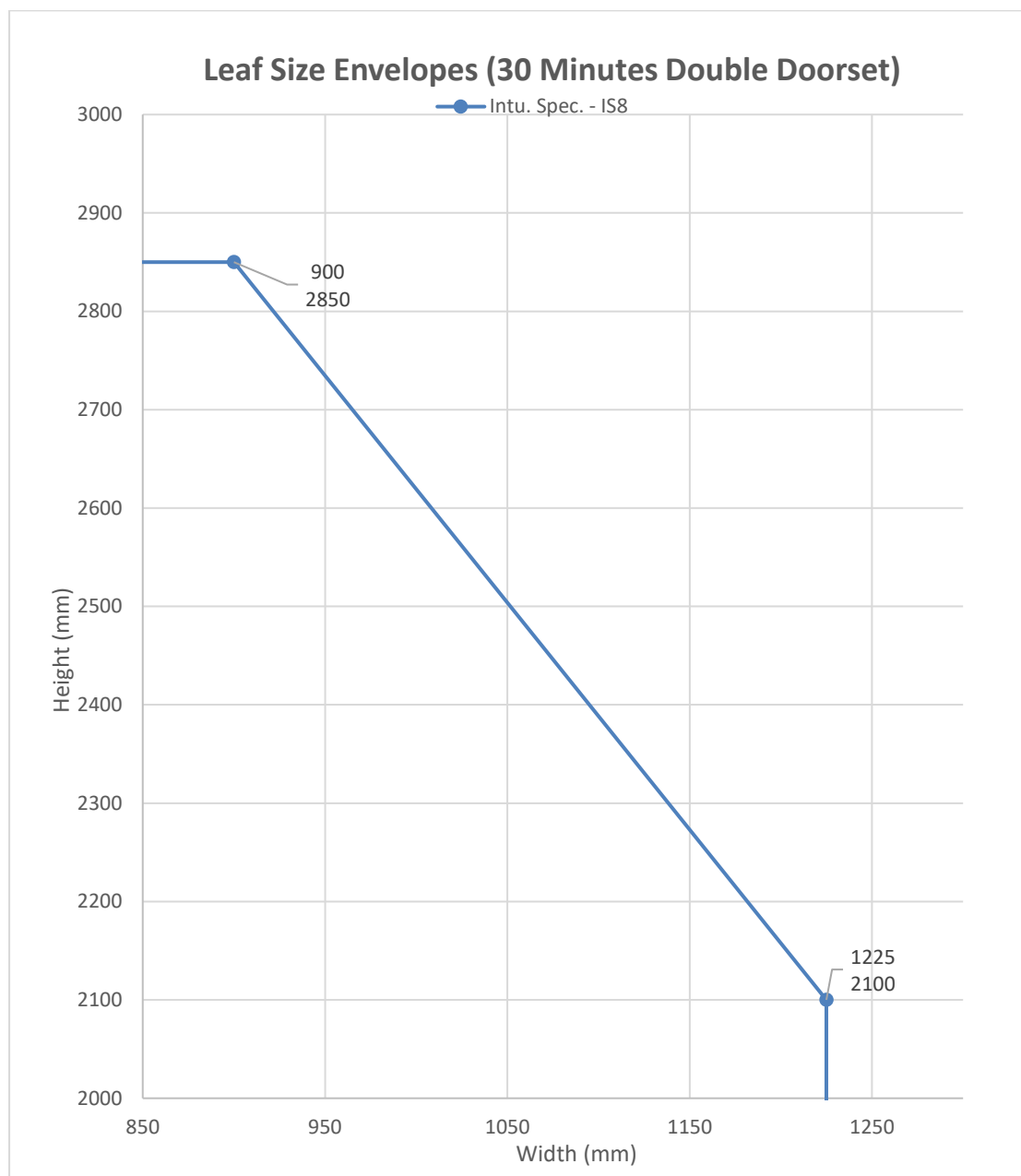
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSADD			
Leaf options 1 or 2 with frame options 1, 2 or 3			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
FD3 (PF15041)	STS FO Rigid Box Seals Type 617 or Palusol	Sealed Tight Solutions Ltd Pyroplex Ltd Lorient Polyproducts Ltd	<p>Head & Jambs: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.</p> <p>Meeting Edges: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only</p>

4.5.11 LSASD Configuration: CS Edge Protectors/Acrovyn Wrap 30 Minutes Integrity Performance

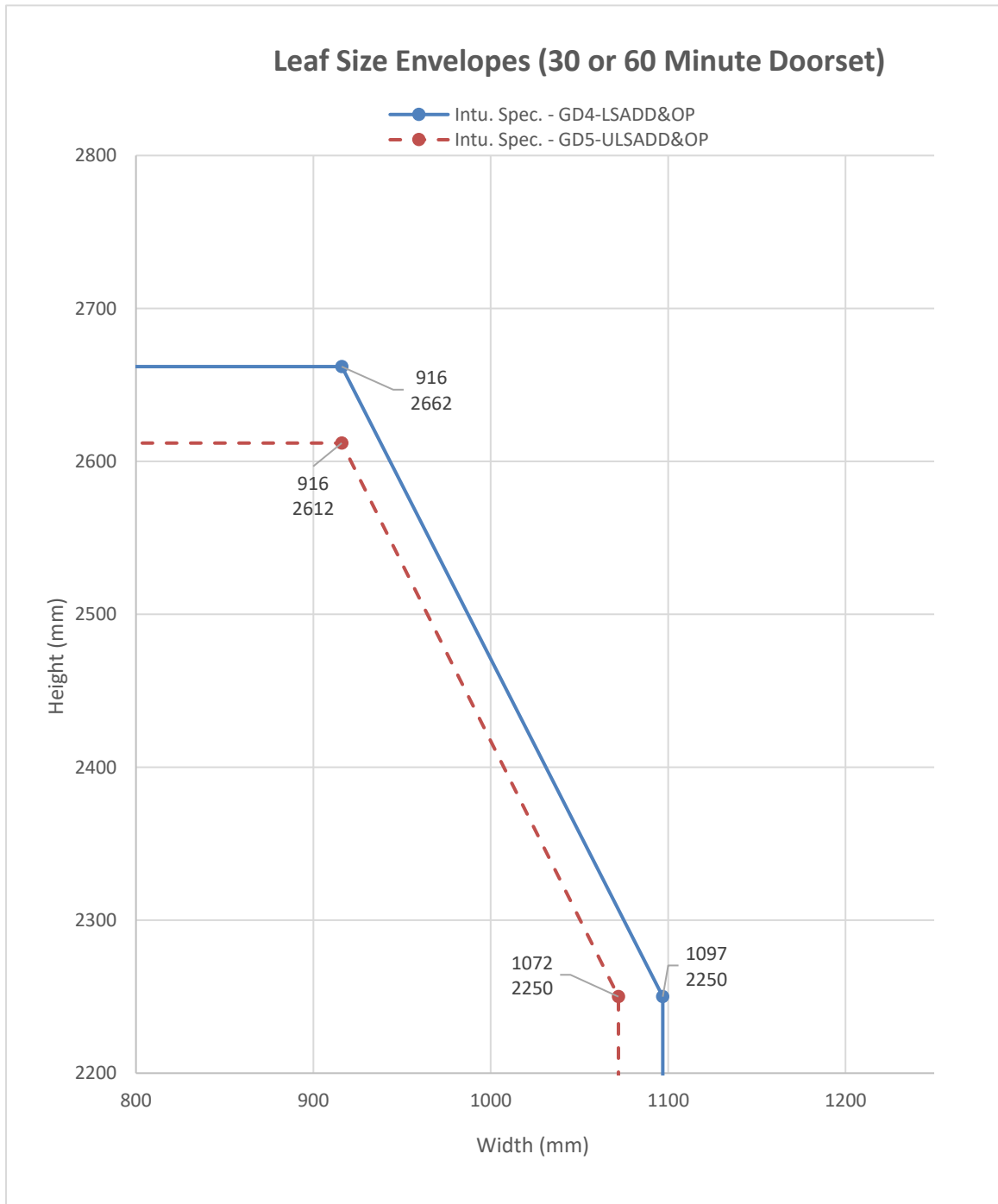
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSASD Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS8 (RF11059)	Type 617	Lorient Polyproducts Ltd	Head & Jambs: 1No. 15mm wide seal exposed and fitted on the centreline in the leaf edge or frame reveal.

4.5.12 LSADD+OP & ULADD+OP Configurations: 30 or 60 Minutes Integrity Performance

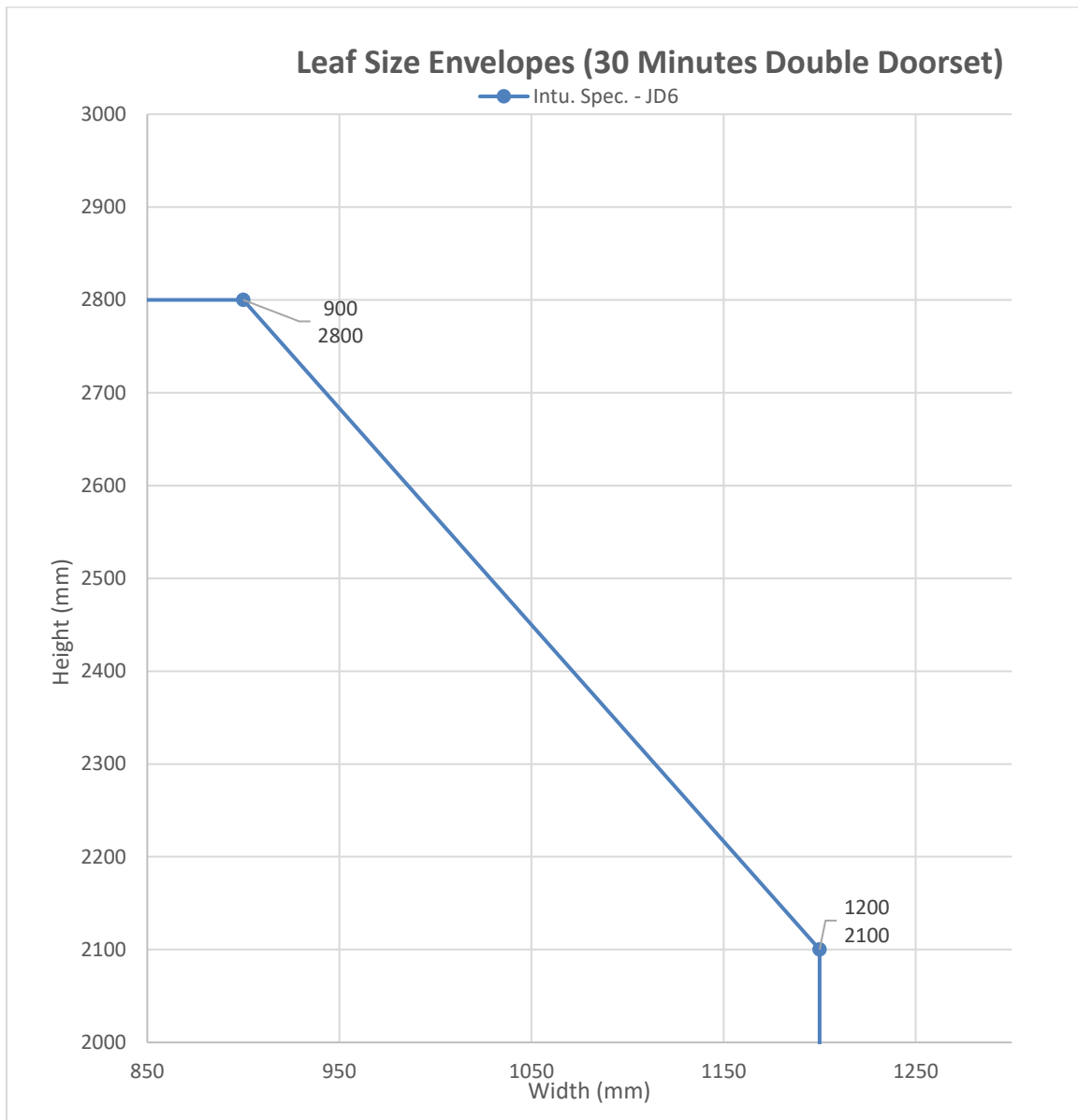
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSADD+OP & ULSADD+OP			
Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GD4 (F16156 Revision A)	Type 617	Lorient Polyproducts Ltd	<p>Head: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the bottom edge of the overpanel</p> <p>Jams & Overpanel (other than leaf head): 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.</p> <p>Meeting Edges: 2No. 15 x 4mm seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only.</p>
GD5 (F16156 Revision A)			

4.5.13 LSADD Configuration: CS Edge Protectors/Acrovyn Wrap 30 Minutes Integrity Performance

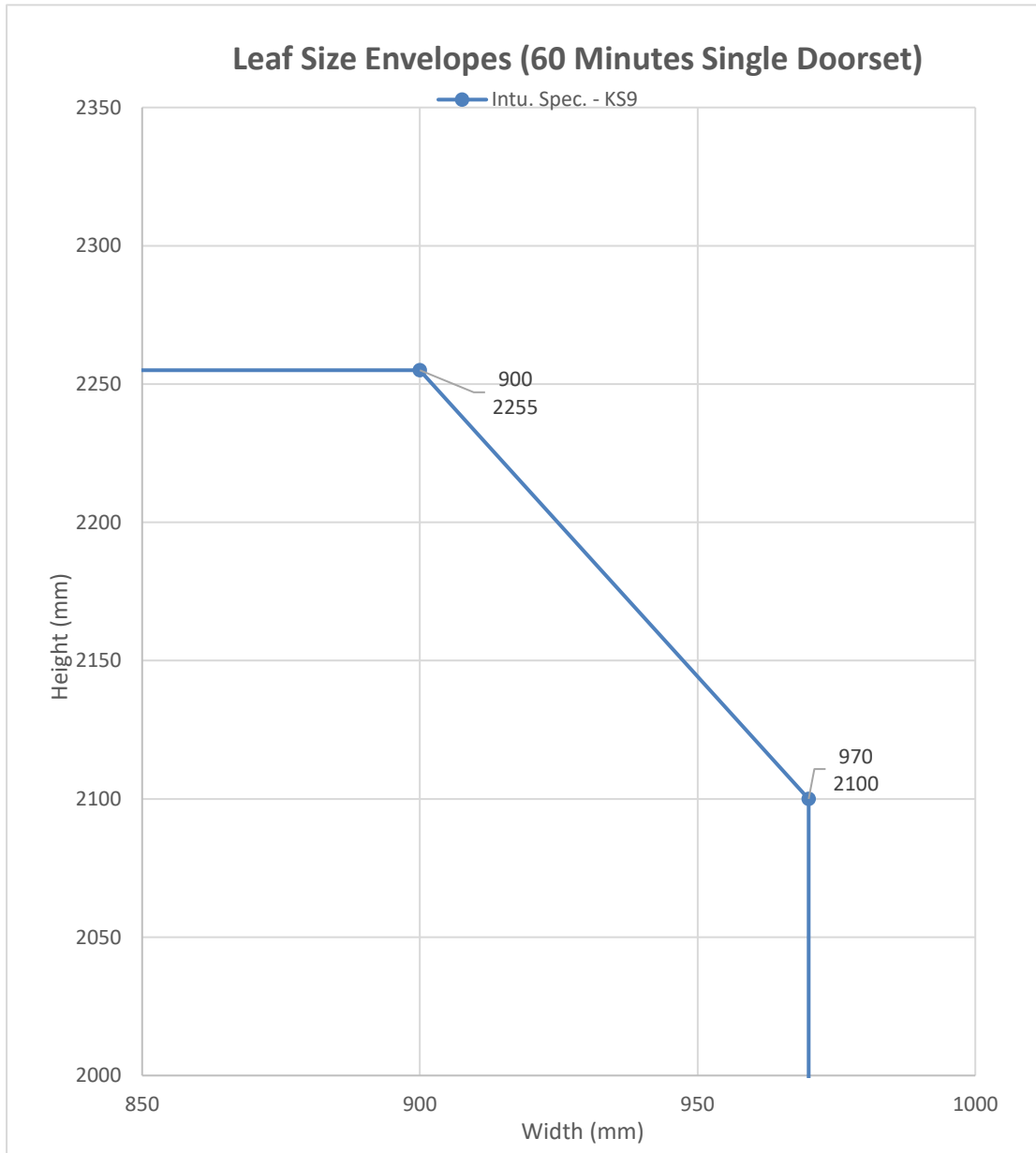
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSADD Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
JD6 (RF11061)	Type 617	Lorient Polyproducts Ltd	<p>Head & Jamb: 1No. 15mm wide seal exposed and fitted on the centreline in the leaf edge or frame reveal.</p> <p>Meeting Edges: 1No. 15 x 4mm strip centrally fitted in the meeting edge of both leaves</p>

4.5.14 LSASD Configuration: CS Edge Protectors/Acrovyn Wrap 60 Minutes Integrity Performance

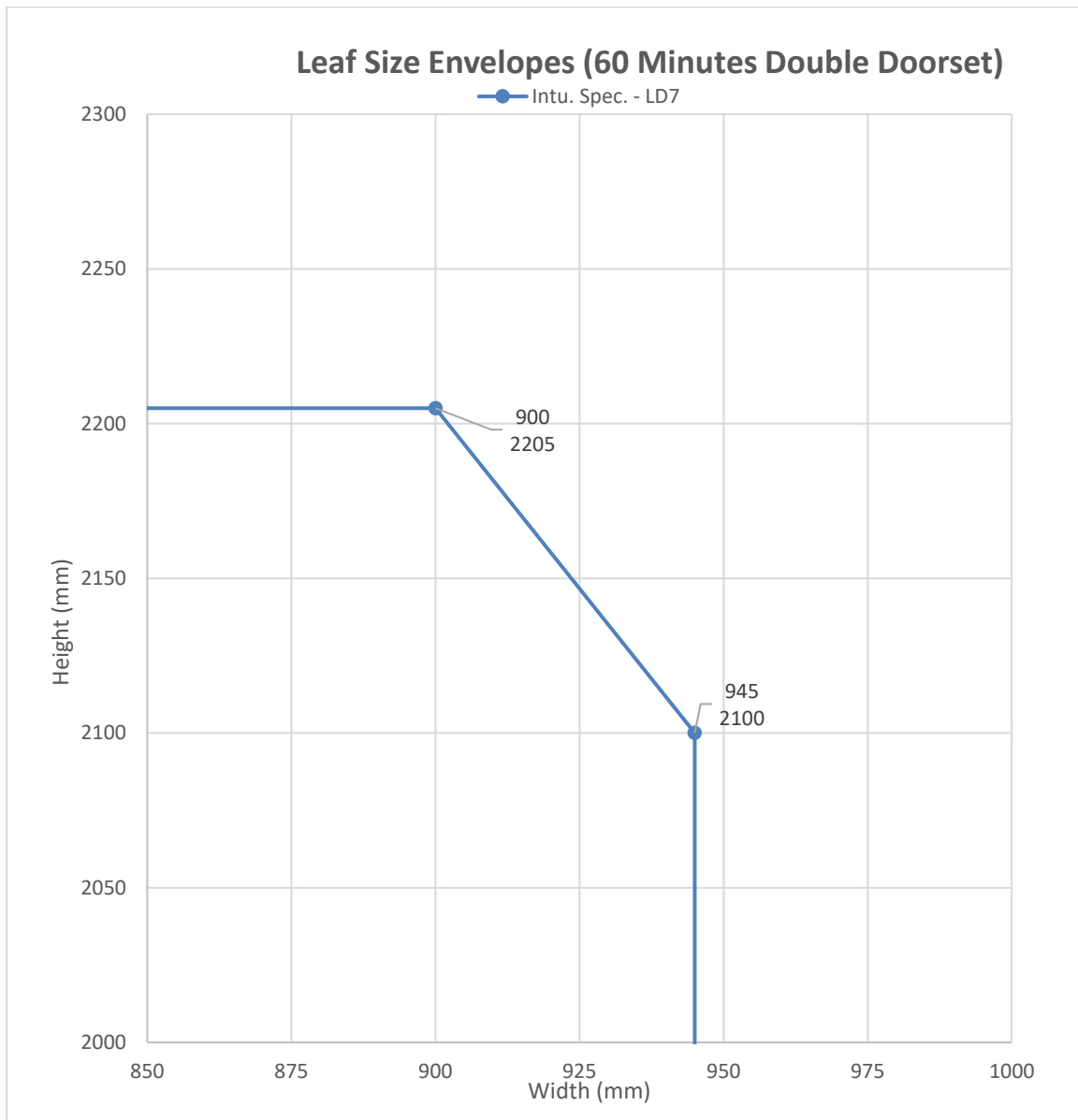
Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSASD Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
KS9 (RF11059)	Type 617	Lorient Polyproducts Ltd	Head & Jambs: 2No. 15mm wide seals exposed and fitted 5mm either side of the centreline in the leaf edges or frame reveal.

4.5.15 LSADD Configuration: CS Edge Protectors/Acrovyn Wrap 30 Minutes Integrity Performance

Doorset created from Leaf options 1 or 2 with frame options 1 or 2



Intumescent Specification for LSADD Leaf options 1 or 2 with frame options 1 or 2			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
LD7 (RF11061)	Type617	Lorient Polyproducts Ltd	Head, Jambs & Overpanel: 1No. 15mm wide seal exposed and fitted on the centreline in the leaf edge or frame reveal. Meeting Edges: 1No. 15 x 4mm strip centrally fitted in the meeting edge of both leaves

5 General Description of Construction

5.1 Leaf Core Construction

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

Tests PF15041 and RF10007 detailed in section 3 have successfully demonstrated that the core boards required for the Laminesse FireSound 54mm doorset design may be supplied by either of two manufacturers (details of the suppliers and core make-ups are held, in confidence, at Warringtonfire).

Either core type may be used in the Laminesse FireSound 54 leaf options without restriction, unless specifically excepted in the following sections.

Where items of hardware are rebated into the leaf edges, hardwood inserts must be inserted as detailed in section 10.

5.1.1 Leaf Types

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

This assessment considers the following design variations:

1. FireSound 54mm - 3mm MDF facings
2. FireSound 54mm - 3mm Chipboard facings.

5.2 Leaf Size Adjustment During Manufacture

Laminesse FireSound 54mm door leaves may be altered as follows.

Element	Reduction
Leaf	The manufactured size of the leaf may be reduced in height or width without restriction, subject to the lipping requirements in section 5.3.
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

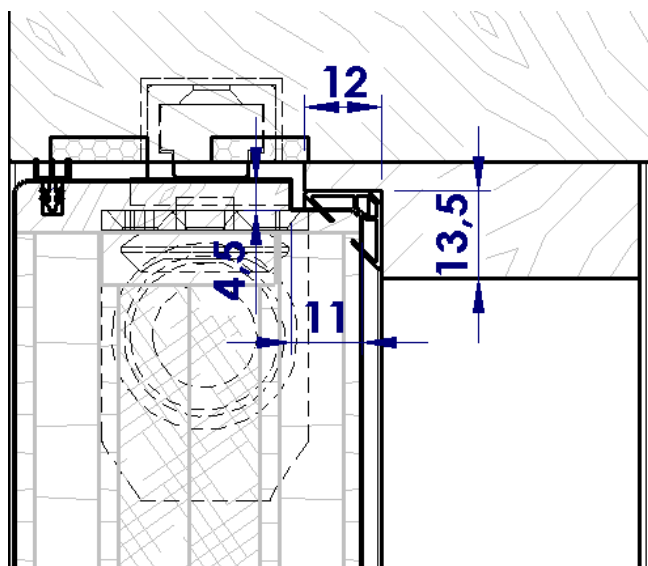
5.3 Timber Lipping – Leaf type 1 & 2

The lipping specifications for this design of door leaf are as follows, the use of Beech (*Fagus sylvatica*) is not permitted for 60 minute applications.

Material	Dimensions (mm)	Min. Density	
Hardwood	1. Square (T-shape): 13 - 25 thick T-shape section with 5 -10mm deep x 26mm wide tongue into the core leaving 8 - 15mm exposed at the edges (see section 5.3.3) 2. Square = 8- 13 thick with a maximum of 2mm profiling permitted at corners of lipping (see section 7.2)	640 kg/m ³	
	2. Rounded		Not Permitted
	3. Rebated		See note 4

Notes:

1. Timber for lippings must be joinery quality, straight grained hardwood, free from knots, splits and checks
2. Single and double doorsets without overpanels only require lipping on the vertical edges but may be additionally lipped on the top and bottom edges if required
3. Leaves to doorsets with flush overpanels must be lipped on the vertical edges and top edge of the doors
4. Based on the results of DMT-DO-50-1010, and for the top edge of leaves only – after lippings are applied a 13.5mm deep x 12mm wide rebate may be cut into the closing face of leaf provided an additional stop of the same dimensions is applied to the frame to form a double rebated frame against a rebated leaf head detail as shown below. **Note:** Not permitted with flush overpanels.

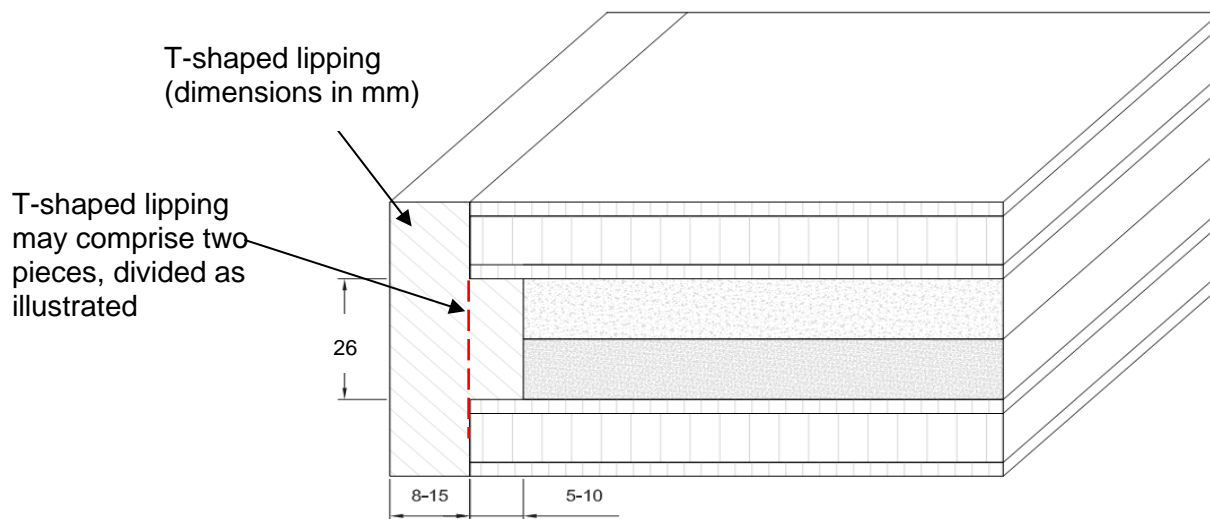


5. Overpanels flush with the leaf heads must be lipped all edges.
6. A 2.5° chamfer is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 11.7.

5.3.1 'T'-shaped Lipping Options

In certain circumstances, a 'T' section lipping may be required which will be bonded into a groove machined in the edge of the leaf. This option is acceptable providing the tongue is a maximum of 26mm wide and otherwise meets the specification given in sections 5.3. The 'T' section lipping may be in two sections with the exposed lipping being within the range of 6 – 10mm thick. All glue lines must be as stated in section 9.

Where glazed apertures require timber liners as detailed in section 6, the liner may also be 'T' shaped as detailed herein (the use of Beech (*Fagus sylvatica*) is not permitted for 60 minute applications).



5.4 CS Group PVC Edge Protectors & Post-Formed Acrovyn Facings

5.4.1 CS Group Edge Protectors

The Moralt FireSound 54mm design has 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 4.5.12 - 4.5.15. CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

5.4.2 Post-Formed CS Group Acrovyn

It is possible to encapsulate the Moralt FireSound 54mm design by post-forming the leaf in CS Group Acrovyn, based on the supporting test evidence in Chilt/RF11059 for 30 minute applications and Chilt/RF11061 and IF13095 Revision A for 60 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 4.5.12 – 4.5.15 must be replicated
6. CS Group Acrovyn must be bonded to the leaf using 3M Scotch-Grip cement 10 contact adhesive
7. See datasheets in sections 4.5.12 – 4.5.15 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 only meeting the specification given in section 7.

5.5 Decorative & Protective Facings – all Leaf Options

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. No decorative or protective facings may be applied to Acrovyn facings as detailed in section 5.4.

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint ⁵	0.2
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 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.

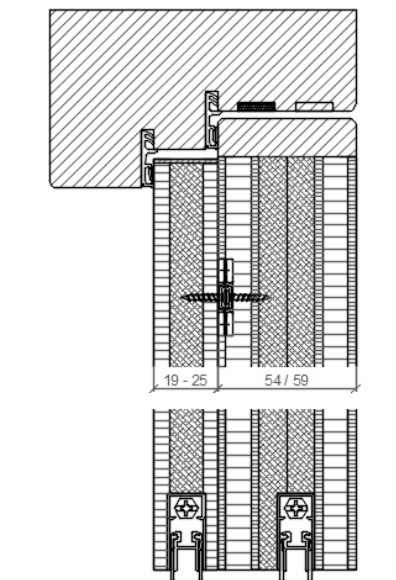
Decorative finishes listed above may be painted within the limits for paint finish, above.

5.6 Acoustic Panels

For performance characteristics other than resistance to fire, it is proposed to add 'acoustic clad on' panels to the closing face of the FireSound 54 design.

This detail is assessed as acceptable subject to the following requirements.

1. Maximum thickness of the panels must be 40mm
2. 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
3. The panels must be of cellulosic or non-combustible materials, i.e. cores with MDF facings. The use of metallic materials at this thickness is not permitted
4. It is not permitted to use clad on panels in combination with PVC edge protectors or PVC leaf encapsulation (i.e. CS Group Acrovyn)
5. Since the clad on panels are not considered essential to the fire resistance performance of the leaf, it is our opinion they may be grooved to any design. The depth and/or width of any grooves is not restricted provided the grooves do not cut into the facings described in section 5.1.
6. Threshold seals meeting the requirements of section 10.9.6 may be recessed into the bottom edge of clad on panels 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
7. The fitting of environmental seals as discussed in section 10.9.5 is permitted as illustrated below.



6 Glazing within the Leaf

6.1 General

The testing conducted on Laminesse FireSound 54mm door designs has demonstrated that they are capable of tolerating glazed apertures, whilst providing a margin of over performance.

Glazing is therefore acceptable within the following parameters.

All glazed apertures must be framed with hardwood timber a minimum of 6mm thick and with a minimum density of 640kg/m³. The use of Beech (*Fagus sylvatica*) is not permitted for 60 minute applications.

6.1.1 30 Minute Applications

Test reference Chilt/RF10007 included a glazed aperture 1235mm high x 230mm wide.

The maximum total assessed aperture area for any individual door leaf is 0.34m².

Any single aperture may not be greater than 0.34m².

Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 135mm of core between apertures.

Apertures must not be less than 160mm from top and bottom edges and 210mm from the vertical edges based on the results of P1009/14-530-1.

Aperture shape must be rectilinear unless alternative shape has been proven by test.

Apertures cannot be rotated (e.g. a square to be rotated to create a diamond effect).

6.1.1.1 Single Pane Glass & Glazing Systems – Leaf type 1 & 2 for 30 Minute Applications

The glazing system must be one of the following proprietary tested systems.

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

The numerical figures in the main body of the table are the maximum area of glass (in m²) that is considered acceptable for an individual glazed aperture, based upon the specific system.

The total area of all glazed apertures must not exceed that state in Section 6.1.1 above.

Glass & Glazing System Specification Maximum Assessed Area (m ²)				
Glass Type & Manufacturer (Test reference)		Glazing System & Manufacturer (Test reference)		
		1	2	3
		Therm A Strip Intumescent Seals Ltd Note 1	System 36 Plus Lorient Polyproducts Ltd	STS105GT Sealed Tight Solutions
1	Pyrobelite 12 AGC Flat Glass UK	0.34	0.34	0.34
2	Pyrodur 60-20 Pilkington UK Ltd	0.34	0.34	0.34
3	Pyranova 15-S3.0 Schott UK Ltd.	0.34	0.34	0.34
4	Pyrostop 30-10 Pilkington UK Ltd	0.34	0.34	0.34
5	Pyrobel 16 AGC Flat Glass UK	0.34	0.34	0.34
6	Pyrostop 60-101 Pilkington UK Ltd (P1009/14-530-1)	0.34	0.34 (RF1007)	0.34

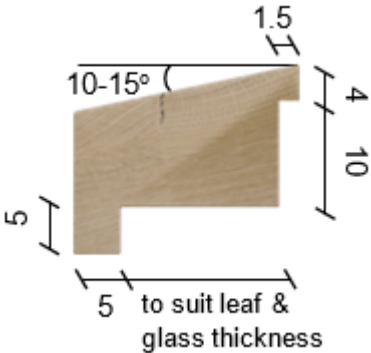

Note:

- For all glazing systems, an intumescent aperture liner must be fitted to all 4 sides of the glazing aperture in addition to the timber liner required in section 6.1:
 - For Therm-A-Strip, 2mm thick Intumescent Seals Therm-A-Line
 - For System 36 Plus, 2mm thick Lorient LX5402 Palusol
 - For STS105GT, 2mm thick ST302.
- Seals referenced ST105GT may be supplied as either 10 x 5mm or 9 x 3mm strips which must be fitted between both faces of the installed glass and the beads. The two seal sizes may be freely interchanged. It is not required to fit an additional intumescent aperture liner.
- 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.
- Glass types 3 - 6 are fully insulating for 30 minutes in terms of the criteria set out BS 476: Part 20: 1987.

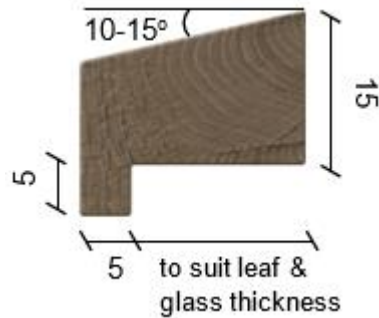
6.1.1.2 Glazing Beads & Installation – all Leaf Options

The 3D models in the following sections are provided as a generalised illustration of the glazing installation only; actual installation must be as per the specific details noted within this document.

6.1.1.3 Chamfered Bead

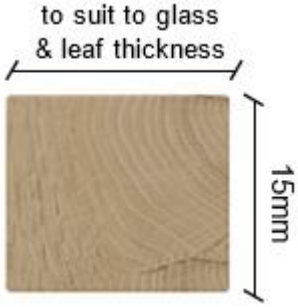
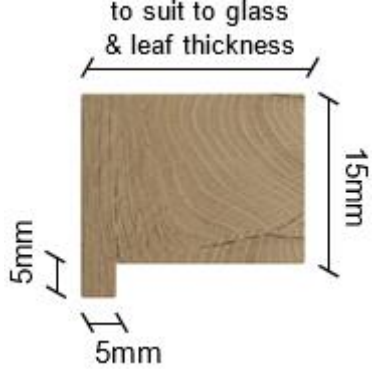
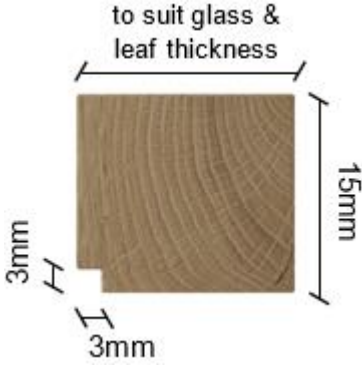
Permitted with glazing systems 1 & 2 from the table in Section 6.1.1.1	
	
<ul style="list-style-type: none">• The glazing beads must be created from hardwood of a minimum 640kg/m³ density.• Glazing beads must be retained in position with 60mm long steel pins or 60mm long No. 6-8 screws, inserted at 20 - 40° 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 6.1.3.• The fitting of the glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. See note one under the table in 5.1.1.1 for details of intumescent liner (not shown in illustration)• 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	

Permitted with glazing systems 3 - STS105GT from the table in Section 6.1.1.1



- The glazing beads must be created from hardwood of a minimum 640kg/m^3 density.
- Glazing beads must be retained in position with 60mm long steel pins or 40mm long No. 6-8 screws, inserted at $20 - 40^\circ$ 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 6.1.3 below.
- 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

6.1.1.4 Square Beads

Permitted with glazing system 3 only and all glass types in section 6.1.1.1		
		
<ul style="list-style-type: none"> • The glazing beads must be created from hardwood of a minimum 640kg/m³ density. • Glazing beads must be retained in position with 60mm long steel pins or 40mm long No. 6-8 screws, inserted at 20 - 40° 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 6.1.3 below. • An aperture liner is always required for use with square beads meeting the specification in section 6.1.1.1. • 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 		

6.1.2 60 Minute Applications

Test reference P1009/14-530-1 included a glazed aperture 1235mm high x 496mm wide.

Test reference PF15288 Revision A included a glazed aperture 1600mm high x 480mm wide.

Test reference DMT-DO-50-1010 included 2No glazed apertures, with the largest aperture 1255mm high x 255mm wide.

The maximum total assessed aperture area for any individual door leaf is 0.92m².

Any single aperture may not be greater than 0.92m².

Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 100mm of core between apertures.

Apertures must not be less than 600mm from top and bottom edges and 210mm from the vertical edges.

Aperture shape must be rectilinear unless alternative shape has been proven by test.

Apertures cannot be rotated (e.g. a square to be rotated to create a diamond effect).

6.1.2.1 Single Pane Glass & Glazing Systems – Leaf type 1 & 2 for 60 Minute Applications

The glazing system must be one of the following proprietary tested systems.

The table below specifies the maximum assessed area of glazing for each permitted glass type and glazing system, all glazing systems require the use of an intumescent aperture liner.

The numerical figures in the main body of the table are the maximum area of glass (in m²) that is considered acceptable for an individual glazed aperture, based upon the specific system.

The total area of all glazed apertures must not exceed that state in Section 6.1.2 above.

Glass & Glazing System Specification				
Maximum Assessed Area (m ²)				
Glass Type & Manufacturer (Test reference)		Glazing System & Manufacturer (Test reference)		
		1	2	3
		Therm A Glaze Intumescent Seals Ltd (P1009/14-530-1)	STS105GT Sealed Tight Solutions (PF15288 Revision A)	Pyroglaze 60 Mann McGowan Ltd (DMT-DO-50-1010)
1	Pyrobelite 12 AGC Flat Glass UK	NA	0.92	NA
2	Pyrodur 60-20 Pilkington UK Ltd	NA	0.92	NA
3	Pyroguard EI 30 Pyroguard UK Ltd	NA	0.92	NA
4	Pyrostop 30-10 Pilkington UK Ltd	NA	0.92	NA
5	Contraflam EW60	NA	0.92	NA
6	Pyrobel 16 AGC Flat Glass UK	NA	0.92	NA
7	Pyrostop 60-101 Pilkington UK Lt	0.74	NA	NA
8	T-EI60/25-3 VI Pyroguard UK Ltd	NA	NA	0.38

Note:

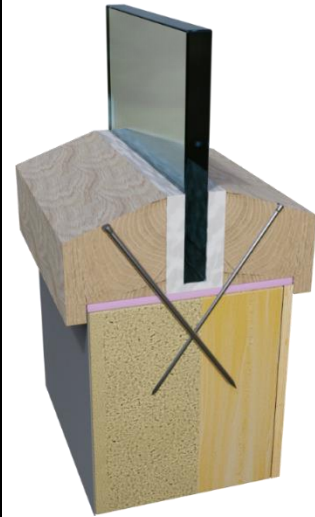
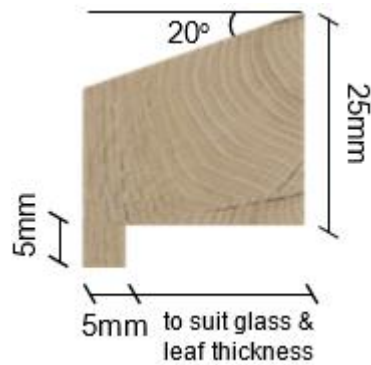
1. Seals referenced ST105GT may be supplied as either 10 x 5mm or 9 x 3mm strips which must be fitted between both faces of the installed glass and the beads. The two seal sizes may be freely interchanged.
2. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.
3. Glass types 3 - 6 are fully insulating for 30 minutes in terms of the criteria set out BS 476: Part 20: 1987
4. Glass types 7 & 8 are fully insulating for 60 minutes in terms of the criteria set out BS 476: Part 20: 1987.

6.1.2.2 Glazing Beads & Installation – all Leaf Options

The 3D models in the following sections are provided as a generalised illustration of the glazing installation only; actual installation must be as per the specific details noted within this document.

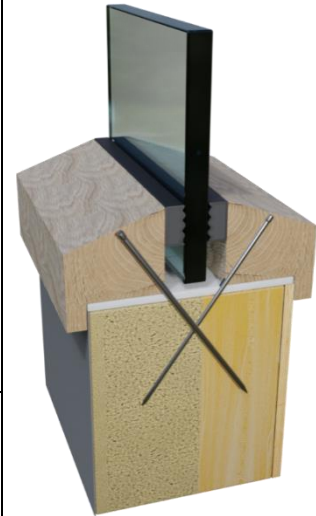
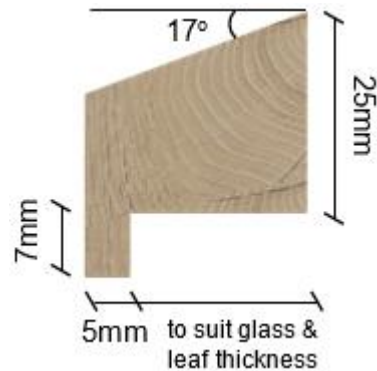
6.1.2.3 Chamfered Bead

Permitted with Therm-A-Glaze and Pyroglaze 60 glazing systems and glass type 7 in 6.1.2.1



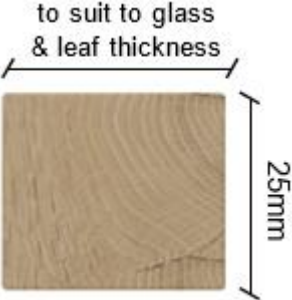
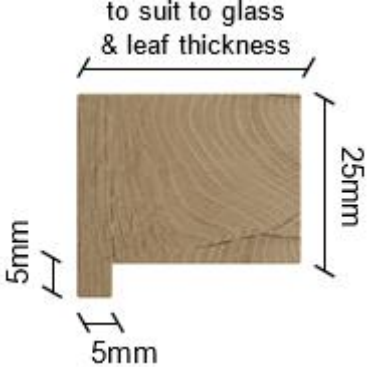
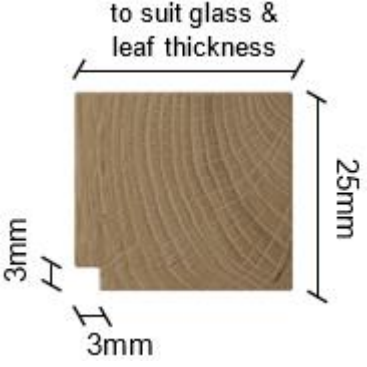
- The glazing beads must be created from hardwood (not Beech *fagus species*) of a minimum 640kg/m³ density.
- Glazing beads must be retained in position with 60mm long steel pins or 60mm long No. 6-8 screws, inserted at 20 - 40° to the vertical.
- Fixings must be at 150mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.1.3.
- 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

**Permitted with STS (ST105GT/ST30*2 liner) glazing system and glass types 1 – 6 in
6.1.2.1**



- The glazing beads must be created from hardwood (not Beech *fagus species*) of a minimum 640kg/m³ density.
- Glazing beads must be retained in position with 50mm long steel pins or 50mm long No. 6-8 screws, inserted at 20 - 40° 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 6.1.3.
- 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

6.1.2.4 Square Beads

Permitted with glazing systems 1 and 2 and all glass types in section 6.1.2.1		
		
<ul style="list-style-type: none"> • The glazing beads must be created from hardwood of a minimum 640kg/m³ density. • Glazing beads must be retained in position with 60mm long steel pins or 50mm long No. 6-8 screws, inserted at 20 - 40° 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 6.1.3. • An aperture liner is always required for use with square beads meeting the specification in section 6.1.2.2. • 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 		

6.1.3 Glazing Pins for Glazing Within Leaf

The following pin specification is permitted and has been considered suitable for applications requiring a pin fixing to glazing beads:

Option 1 – Round, Oval & Rectangular Pins

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

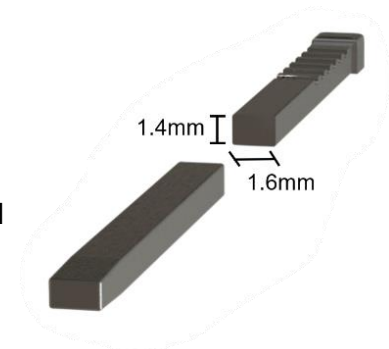
- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.03mm².
- Minimum linear dimension of 1.6mm in any direction, see figure below. The maximum pin diameter or any linear dimension may be no greater than 2.0mm.



Option 2 – Gun (Pneumatically) Fired Rectangular Pins

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

- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.24mm².
- Minimum linear dimensions as shown in the figure.
- The 1.6mm dimension is predominately oriented perpendicular to the glass, where possible.
- The maximum pin diameter or any linear dimension 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 1

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.

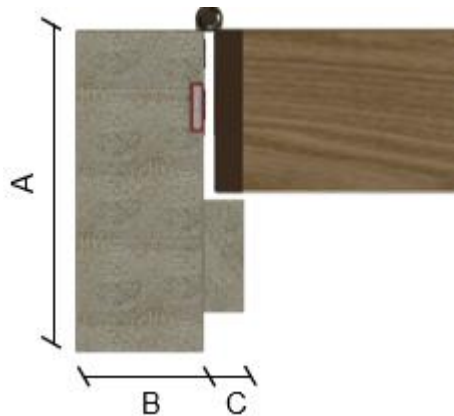
Frame Type	Material	Minimum Section Size (mm)	Minimum Density (kg/m ³)	Acceptable Leaf Type
1	Hardwood	Frame: 70 (d) x 32 (w) (excluding stop) Stop: 12 (h) (integral or planted on)	640	1 & 2
2	WoodEx Hardwood ³	Frame: 70 (d) x 32 (w) (excluding stop) Stop: 15 (h) (integral or planted on)	640	
3	WoodEx Softwood ³		510	

Notes:

1. Minimum section size is subject to size of hardware and the use of transomed overpanel (see sections below)
2. The use of Beech (*Fagus sylvatica*) is not permitted for 60 minute applications
3. The use of WoodEx Hardwood and softwood frame types is based on the results of test FEP/F14102, see justification in appendix A, WoodEx Redwood may only be used for 30 minute applications
4. The various hardwood WoodEx products may be used for 30 and 60 minute applications
5. Timber for door frames must be of a quality deemed to meet or exceed class J30 as specified in BS EN 942: 2007, subject to adequate repairs
6. If the doorset features a transomed overpanel, the door frame must be hardwood (not WoodEx frames) with a minimum section of 70mm x 32mm and of the minimum density stated above
7. If the doorset features a flush overpanel, the door frame must be hardwood (not WoodEx frames) with a minimum section of 70mm x 32mm and of the minimum density stated above
8. It is not permitted to round off the edges of the door frame at the junction with the leaf edge
9. Door frame joints must utilise one of the 4 methods depicted in section 7.4. All methods require mechanical fixing with the appropriate length steel screws or ring shank nails.

7.2 Standard frame detail

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



- A: Frame depth = 70mm minimum
- B: Frame width = 32mm minimum
- C: Stop width = 12 (Hardwood) or 15mm (WoodEx) minimum

Minimum section size when using a transomed overpanel, permitted with frame type 1 only:

- A: Frame depth = 70mm minimum
- B: Frame width = 32mm minimum
- C: Stop width = 12mm minimum

7.3 CS Group Acrovyn

Based on the evidence generated in IF13094 and IF13095 Revision A 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 4.5.12 – 4.5.15 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 4.5.12 – 4.5.15 for maximum permitted leaf sizes
4. The maximum thickness of CS Group Acrovyn used must be 2mm, as per the test evidence.

7.4 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

Figure 4 – Approved door frame jointing options

7.5 Decorative Facings – All Frame Options

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

The following additional facing materials are therefore permitted to the frame for this door design, including frame reveal, since they would have limited influence under fire resistance test conditions. These materials may not be applied on top of CS Group Acrovyn as described in section 7.3.

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.

8 Solid Overpanels

8.1 General

Based upon the available test evidence, referenced BMT/FEP/F16156 Revision A Specimen B framing for door assemblies incorporating solid overpanels may be employed, subject to the following limitations:

- Door frame sections must be frame type 1 (minimum density 640kg/m³).

8.1.1 Framed on all edges (transomed)

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

- A transom is required to separate the leaf head(s) from the overpanel and must be to the same specification as frame option 1, as described in the table in section 7.1
- Overpanels must be lipped on the vertical edges, and may also be lipped on the horizontal edges if required
- Transom joints must utilise one of the following methods: mortice and tenon joints or butt joints (see section 7.4). Either method requires joints to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Butt joints must be additionally bonded with urea formaldehyde.
- Joints are required to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws.
- Solid overpanels must be fixed screwing through the rear of the frame with steel screws passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.



8.1.1.1 Fitted in square edge frame sections (i.e. no rebate)

The intumescent seals specified for the jambs in section 4 must also be fitted to all four edges of the panel based on the doorset configuration and required integrity period. The seals may be fitted either in the panel edges or alternatively in the frame reveal.

Maximum panel dimensions are given as below, for both 30 and 60 minute applications:

Configuration	Max. Overpanel Height (mm)
Single doorsets	2000
Double doorsets	1500

8.1.2 Solid Flush Overpanels

Doorsets with flush overpanels (incorporating an astragal) of the same construction as the door leaves have been successfully tested in report reference BMT/FEP/F16156 Revision A Specimen B.

The solid flush panel design given in the following section is therefore permitted based upon the successful testing undertaken.

- Solid flush overpanels of the same construction as the door leaf/leaves may be used and must be lipped on all edges. The overpanel must be fully contained within the door frame with respect to frame thickness
- Solid flush overpanels must be fixed screwing through the rear of the frame with steel screws passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between
- 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 hardwood of minimum density 640kg/m³ and be of minimum dimensions 45mm 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.

Table below specifies the maximum assessed solid flush/rebated overpanel dimensions.

Assembly Element		Height (mm)	Width (mm)
Flush overpanel	Single or Double Doorsets	360	Overall doorset width

9 Adhesives

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

Element	Product/Material Type
Door blank core	Manufacturers specification held on file
Door blank facings	
Timber lipping & decorative facings	PVAc, Polyurethane
Hardwood Glazing Aperture Liner	Polyurethane

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.

No item of hardware should be within 200mm of another item of hardware in the leaf edges unless there is test evidence to demonstrated 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.

10.1.1 Hardwood Blocking or Inserts

Where items of hardware are rebated into the leaf edges, hardwood blocking or inserts of minimum density 640 kg/m³ must be inserted. Inserts must be 8mm thick and between 22 – 28mm wide to fit between the facings, inserts must be fitted prior to lippings and be adhered in position with PUR adhesive. Blocking must be a minimum of 50mm longer than the hardware (i.e. project 25mm at both ends).

Blocking must be installed behind concealed hinges, concealed closers and lock/latch bodies.

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/mmanufacturer options listed in the table may be used in the specific application noted. However, only 1 No 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. Intumescent specifications apply equally to 30 and 60 minute applications unless otherwise stated.

Item	Location	Product/Manufacturer
Hinges	Under all hinge blades	<ol style="list-style-type: none"> 1. 1mm Interdens – Dufaylite Developments Ltd. 2. 1mm MAP paper – Lorient Polyproducts Ltd. 3. 1mm Pyrostrip 300 – Mann McGowan Ltd. 4. 1mm Therm-A-Strip – Intumescent Seals Ltd. 5. 1mm ST60 Graphite gasket material - Sealed Tight Solutions Ltd
Lock/latches	Under forend & keep and encasing latch body for all configurations	
Concealed overhead closers	Encasing the entire body of the concealed closer and slide arm including the back surface of the face plate	See section 10.7.2
Concealed Hinges	Lining rebates in leaf and frame for hinge bodies	1mm thick gasket set - Mann McGowan Kit ref: MMG567
Cableways and cable loop	See section 10.9.8 for details	
Flush bolts	Encasing the entire body of the flush bolt including the back surface of the face plate	<ol style="list-style-type: none"> 1. 2mm Interdens – Dufaylite Developments Ltd. 2. 2mm MAP paper – Lorient Polyproducts Ltd. 3. 2mm Pyrostrip 300 – Mann McGowan Ltd. 4. 2mm Therm-A-Strip – Intumescent Seals Ltd. 5. 2mm ST60 Graphite gasket material - Sealed Tight Solutions Ltd
Dropseals	Fitted to the top face of the drop seal	

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.

Within the following hardware sections references are given to Mann McGowan and/or Moralt intumescent packs for specific hardware items which may be used in preference to the details above.

10.3 Essential Hardware

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

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

See section 10.9.4 for details of door selectors, required where astragals are specified.

10.4 Handles

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference
Handles	<ul style="list-style-type: none"> • Aluminium lever type handles • Steel lever type handles

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

- The handle may be any size up to 240mm high x 35mm wide. The handle must be compatible with the lock/latch and cylinder (if required), such that the closing action of the doorset is not impeded.

10.5 Latches & Locks

10.5.1 Single Point Engagement

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

Element	Manufacturer & Product Reference
Locks & latches	1. Ingersoll Rand mortice latch
	2. Arrone 3 lever mortice latch
	3. Glutz mortice deadlock Ref:1052.7
	4. Glutz mortice deadlock Ref:4525
	5. Glutz mortice deadlock Ref:4621, 7/60
	Entry System Locksets (see section 10.5.1.1 below):
	1. Assa Abloy 'Vingcard Signature MPA 4G RFID'
	2. Salto LE7 lockset with electric escutcheon
	3. Salto LE7 lockset and strike plate
	4. Salto LE8
5. Advance Trillium RFID	
6. Assa Abloy Inoxi handleset operating a EL520 mortice latch and EL520 keep	
7. Häfele Dialock handleset	
8. DormaKaba RT Plus handleset	

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

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

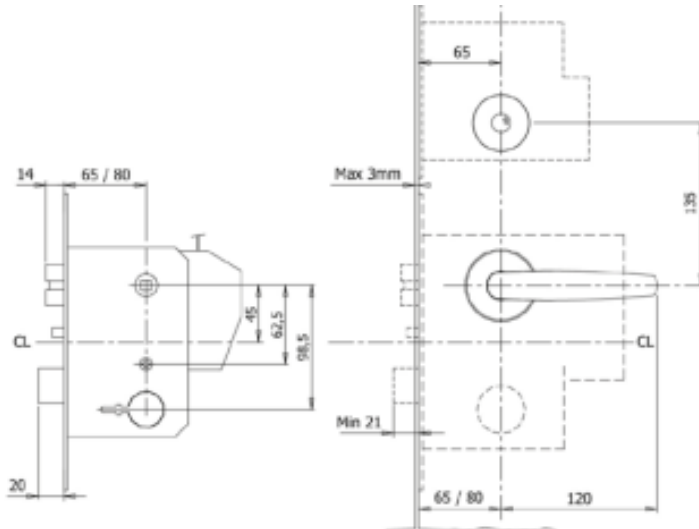
Note: In all instances the location of the handle must be between 850 – 1200mm from the threshold.

10.5.1.1 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 section 3. 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'

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.



Onity Advance Trillium

Based on the results of Tecnalía test 088745-002-1-a, cited in section 3.9 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.

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

Salto locksets ref LE7 and LE8

Based on the results of tests WF383782 and WF383783, cited in section 3.10 & 3.11 the Salto LE7 and LE8 locksets may be installed, subject to the following intumescent protection being installed.

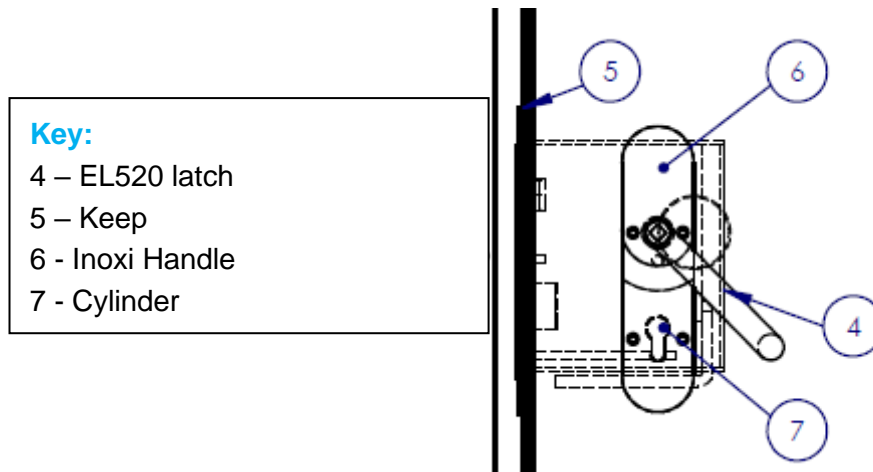
The Mann McGown MMG651 & MMG652 intumescent packs (Moralt references M-MVPM_DB_T-020-08 & M-MVPM_DB_T-020-05) comprised of 1mm thick Interdens 15 must be installed as tested - encasing all faces of lockcase and under the forend & keep.

	<p>LE7 Lock case and keep showing tested keep box</p>
	<p>E96P0U001M48K Handleset and electronic escutcheon</p>
	<p>E9150RUIMB49 Handleset and electronic escutcheon</p>

Assa Abloy Inoxi handleset and EL520 mortice latch

Based on the results of DMT-DO-50-1148, cited in section 3.12, 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 Phosphate.

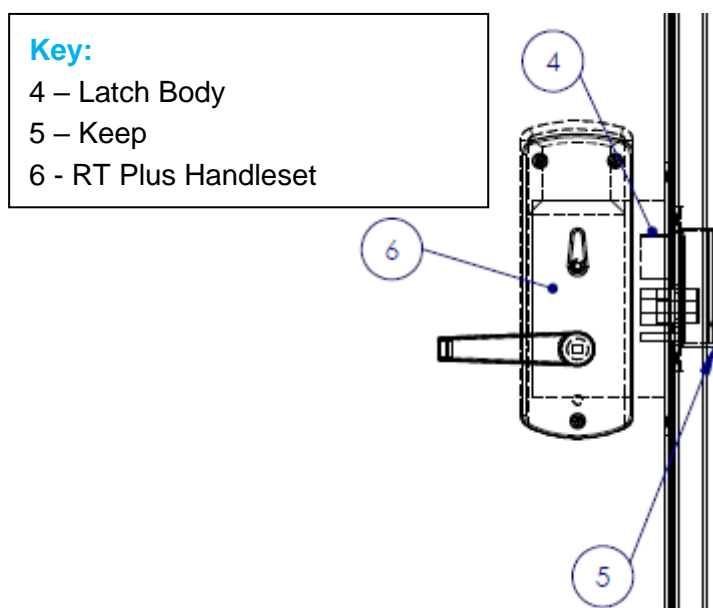


Hafele Diallock DT600/DT700/DT710 Handles

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 10.5.1 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 McGowan 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 10.5.1.



10.5.2 Cylinders

The table below details the tested cylinders that are approved.

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> Assa Abloy CY326U HCr

Alternatively, components with the following specification are deemed acceptable.

- Where required, the cylinder must be constructed of either brass or steel with a melting point in excess of 800°C.
- 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 only half the door thickness.
- Intumescent protection and tightness of fitting:
 - Where 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.

10.6 Hinges

10.6.1 Butt Hinges

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

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> Royde & Tucker H207 concealed steel butt hinges Royde & Tucker H101 lift-off type hinges TDSL bearing butt type hinges

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
		2 nd	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
		2 nd & 3 rd	Equispaced between top and bottom or 2 nd hinge 200mm from top hinge and 3 rd hinge equally spaced between 2 nd 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 ≥2400mm (h) must be hung on 4 hinges.

10.6.2 Concealed Hinges

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

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> Bartels GmbH – PIVOTA DXS 100 3-D ‘Design’

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

Element		Specification	
Hinge positions:	Top	180 –220mm from the head to top of hinge	
	2 nd	Centrally fitted between top and bottom hinge	
	Bottom	210 - 270mm from the foot of leaf to bottom of hinge	
Intumescent protection:		Mann McGowan Kit ref: MMG567	

Note:

Leaves must be hung on a minimum of 3 hinges.

10.7 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers
- Concealed overhead closers.

Automatic doorset self-closing devices such as transom mounted closers, and pivots/floor springs are not considered acceptable for use with the Laminesse FireSound 54 doorset range.

10.7.1 Overhead Face Fixed Closer

These items are suitable in the following applications only:

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

Element	Manufacturer & Product Reference
Overhead face-fixed closers	<ul style="list-style-type: none">• Dorma TS83V overhead-type• Rutland TS3204 overhead-type• Dorma TS71 overhead-type• Arrone AR1500

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

- Certifire approved overhead face-fixed closers for 30 or 60-minute fire resistance applications, as appropriate, on 54mm 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:

Leaf options: 1 and 2

Frame options: 1 Only

Configurations: LSASD, ULSASD, LSADD, ULSADD

The table below details the tested concealed overhead closer that is approved. The closer body must be mounted in the leaf heads.

Element	Manufacturer & Product Reference	Closer Body Dimensions	Closer Slide Arm Dimensions
Concealed overhead closer	<ul style="list-style-type: none"> Geze GmbH – Boxer EN2-4 DormaKaba ITS96 	240(l) x 32(w) x 45(h)	440(l) x 22(w) x 12(h)

Note:

- It must be ensured that the concealed overhead closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal
- Intumescent protection shall be as tested using the Mann McGowan Kit ref:
 - Boxer EN2-4
 - MMG629 Pack
 - ITS96
 - MMG107 for body
 - MMG109 for slide arm
 - MMG579 Forend Top Cover
- The dimensions of the concealed overhead door closer must not exceed the dimensions given within the table above.

10.8 Flush Bolts

The table below details the tested flush bolts that are approved.

Element	Manufacturer & Product Reference
Flush Bolts	<ul style="list-style-type: none"> Ironmongery Direct stainless steel shoot bolts Ref. 6399674 Zoo Hardware Ref: ZA S03RSS

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:

- 250mm 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 Mann McGowan MMG439 intumescent pack may be used.



Figure 9 – Flush bolt installation and indicative 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

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.

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, 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 or 'notch out'/interrupt the door stop.

10.9.3 Security Viewers

Components with the following specification are deemed acceptable on the basis the hole required through the leaf is significantly smaller than that permitted for glazed apertures and that the hole will be infilled with a viewer meeting the specification below.

- 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.
- Must be fitted no closer than 100mm to door edge, glazing or any other hardware component.

10.9.4 Door Selectors

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

10.9.5 Environmental Seals

A number of different environmental seals have been successfully tested as part of the FireSound 54 doorset design. For example, the Mann McGowan ACS1 weather seal was successfully tested in report DMT-DO-50-1010.

On this basis, silicon-based flame retardant acoustic, weather and dust seals (for example those referenced above or Lorient IS1212, IS1511, IS7025, IS7060, Deventer DS155a or Sealed Tight Solutions Ltd. ST1009) 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 adhered within the frame reveal.

10.9.6 Threshold drop Seals

A Mann McGowan DD-1703ACU drop seal was successfully tested in report DMT-DO-50-1010 and is acceptable for use in all door designs. **Note:** if a rebated drop seal is fitted to the doorset then flush bolts may not be fitted to the bottom of the doorset.

Alternatively, components with the following specification are also deemed acceptable, recessed into the bottom of leaves.

Product	Manufacturer
LAS8007/0935A00	Lorient Polyproducts Ltd.
IS8010si	Lorient Polyproducts Ltd.
RP8Si	Raven Products Ltd.
NOR810, NOR810S, NOR810dB+	Norsound Ltd.
Schall-Ex Duo L-15	Athmer
STS 422	Sealed Tight Solutions Ltd
HS range	Planet

The drop down seal must be installed with the intumescent protection specified in section 10.2.

10.9.7 Knockers, Numerals & Signage

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

Approved specifications:

Knockers:

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

Numerals & Signage:

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

10.9.8 Cableway

10.9.8.1 Cable Loop

These items are suitable in the following applications only:

Leaf options: 1 and 2

Frame options: 1 Only

Configurations: LSASD, ULSASD

The table below details the tested cable loop that is approved.

Element	Manufacturer & Product Reference	Body Dimensions
Cable Loop	<ul style="list-style-type: none">• Abloy EA280	324mm (h) x 24mm (w) x 17(d) with a \varnothing 12 spring assembly

The top of the loop should be below 1200mm from the threshold and no closer than 200mm from another item of hardware in the leaf edges (e.g. hinges).

The body of the cable loop is to be located centrally in the door frame.

For 60 minute applications, 2mm thick Interdens must be fitted to all faces of the rebates required for installation.

10.9.8.2 Cableways

Cableways were also successfully tested in DMT-D0-50-1010, cableways are to be used to route cables around the door leaf to operate electronic hardware. The cableway will be routed from a cable loop fitted at the jambs of a doorset to the relevant item of hardware (e.g. a lockset or electronic strike).

The cableway must be installed as detailed below.

- Groove the edge of the door core with a 10mm wide channel located centrally, to a depth of 12mm prior to installation of lippings. This groove should run from the lock/keep location in the closing/meeting stile, down the stile, along the bottom of the door then back up the hanging stile to the cable loop location. The groove may be machined above the location for a dropseal if one is to be fitted, as tested
- Install the cable, protected with Mann McGowan Pyrostrip 500FSA-10x 2mm, into the groove
- Infill the groove with hardwood, bonded in place with PU adhesive
- The bottom of the groove must be no closer than 100mm from glazed apertures
- The door core can then be lipped and calibrated in the usual manner.

11 Installation




11.1 General

This section further 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 red coloured seal. For further clarification of the approved firestopping systems see section 11.3.

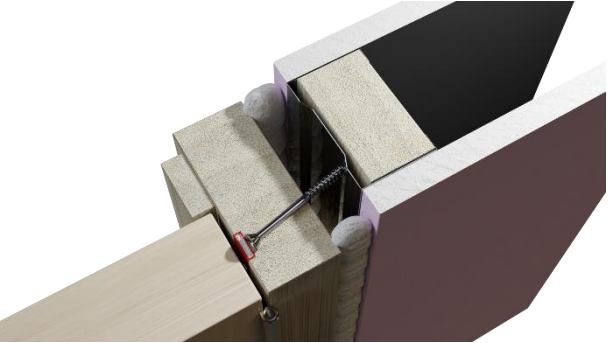
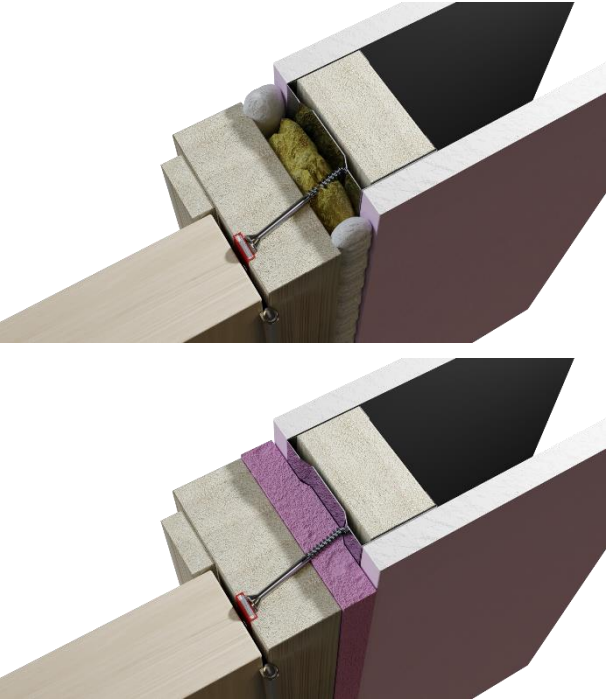
Permitted Installations	
	<p>Instances where the door frame and the wall of the same depth such that architraves are fitted flush to both faces. Note that the minimum door frame section size (width and depth) must be as per the requirements noted in this report – see door frame section.</p> <p>Architraves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

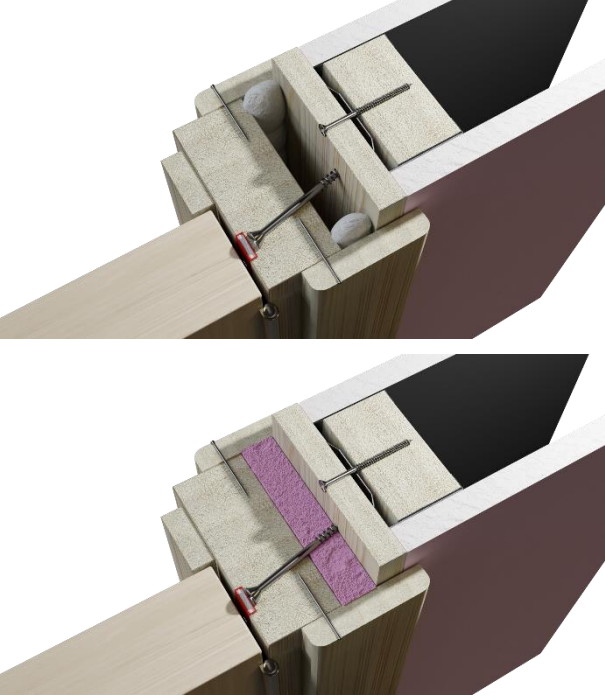
Note:

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.

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 15mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.	
10 – 20	Gap must be tightly packed with mineral fibre capped on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1 or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional.	

Gap (mm)	Requirement	3D model depiction
Over 20	<p>This would be considered a poor preparation of the structural opening. A timber based or non-combustible subframe up to 50mm thick can be inserted and fixed to the wall bedded on intumescent mastic, the gap between door frame and subframe filled as follows:</p> <p>Gaps 5 to 10mm filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1.</p> <p>Timber architraves of a minimum 15mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.</p>	

Note:

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

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.

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) Masonry 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 60 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.
- Masonry constructions are anticipated to be constructed of a solid block or brickwork 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 doorsets, 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 40mm. 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 40mm.

11.6 Post Production (Onsite) Leaf Size Adjustment

The Laminesse FireSound 54 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

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	10mm 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 meeting the following:

12.1 30 Minutes Performance

Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating or partially insulating glazing
Fully insulating	Unglazed doorsets or doors fitted with 30 minute fully insulating glass (see note in section 6.1.1.1)

12.2 60 Minutes Performance

Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating or partially insulating glazing
Fully insulating	Unglazed doorsets or doors fitted with 60 minute fully insulating glass (see note in section 6.1.2.1)

13 Conclusion


If Laminesse FireSound 54 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 our opinion that they would provide a minimum of 30 or 60 minutes integrity and insulation (subject to section 12), as appropriate.

14 Declaration by the Applicant

- 1) 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
- 2) 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.
- 3) 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.
- 4) 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.
- 5) 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:



Name:

STEVEN DENNARD

Position:

SALES.

Date:

13-4-2023

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

15 Limitations

The following limitations apply to this assessment:

- 1) This field of application addresses itself solely to the elements and subjects discussed and do not cover any other criteria or modifications. All other details not specifically referred to should remain as tested or assessed.
- 2) This field of application report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to Warringtonfire, the assessment will be unconditionally withdrawn, and the applicant will be notified in writing. Similarly, the assessment evaluation is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.
- 3) This field of application has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
- 4) Opinions and interpretation expressed herein are outside the scope of UKAS accreditation.
- 5) This field of application relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions against the ISO 834 time/temperature curve that is 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 field of application, the element is suitable for its intended purpose.
- 6) This field of application report represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476 Part 22:1987, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this field of application would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.
- 7) This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Warringtonfire. All work and services carried out by Warringtonfire Testing and Certification Limited are subject to, and conducted in accordance with, the Standard Terms and Conditions of Warringtonfire Testing and Certification Limited, which are available at <https://www.element.com/terms/terms-and-conditions> or upon request.
- 8) The version/revision stated on the front of this field of application supersedes all previous versions/revisions and must be used to manufacture doorsets from the stated validity date on this front cover. Previous revisions of the Field of Application cannot be used once an updated Field of Application has been issued under a new revision.

16 Validity

- 1) The assessment is initially valid for five years after which time it is recommended to be submitted to Warringtonfire for re-appraisal.
- 2) This assessment report is not valid unless it incorporates the declaration given in Section 14 duly signed by the applicant.

Position:	Assessor	Reviewer
Signature:		
Name:	*A M Winning	*L Dunk
Title:	Senior Product Assessor	Senior Product Assessor

* For and on behalf of Warringtonfire

Appendix A: Summary of Supporting Test Evidence

Test Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
BMT/FEP/F14102 ¹ (WoodEx Ash 60)	A - ULSADD	2040 826/303 54	BS 476: Pt 22: 1987	Integrity: 42 Insulation: 42
BMT/FEP/F14102 ¹ (WoodEx Redwood)	B - ULSADD	2040 826/303 54	BS 476: Pt 22: 1987	Integrity: 30 Insulation: 30
271 38944 R1 (cableway)	LSADD	2384 104 54	BSEN 1634-1: 2008 and BSEN 1363-1: 1999	Integrity: 36 Insulation: 36

Construction Specialities – Acrovyn facings & edge protectors supporting data

RF11059 (Construction Specialities – Acrovyn edge protectors)	A: ULSADD	2100 x 900/300 x 44	BS 476: Pt 20/22: 1987	Integrity: 43
				Insulation: 43
B: ULSADD	2100 x 900/300 x 44	Integrity: 39		
		Insulation: 39		
RF11061 (Construction Specialities – Acrovyn edge protectors)	A: ULSADD	2100 x 900/300 x 54		Integrity: 66
				Insulation: 66
B: ULSADD	2100 x 900/300 x 54	Integrity: 68		
		Insulation: 68		
IF13094	ULSADD	1400 x 900/300 x 48 ²	Integrity: 45	
IF13095 Revision A	ULSADD	1400 x 900/300 x 48 ³	Integrity: 60	

Notes:

1. Test BMT/FEP/F14102 was devised to investigate the influence of the WoodEx engineered timber as a door frame material for use with previously tested and approved door designs. The failure of doorset A was attributable to the latch and has been deemed a result of inadequate intumescent protection. Had the doorset been tested with the approved intumescent specification it would have achieved a minimum of 60 minutes integrity, when tested to BS 476 Part 22:1987. The failure is therefore completely remote from the door frame and was not influenced by the type of door frame material used. The test is therefore suitable as supporting data for the hardwood WoodEx products with the Laminesse FireSound doorset designs
2. Door leaf thickness includes thickness of the Acrovyn facings
3. Door leaf thickness includes thickness of the Acrovyn facings.

Appendix B: Revisions

Revision	Warringtonfire Reference	Date	Description
A	WF530852 & WF524570	13.04.23	Update to latest Warringtonfire format, revision based on addition of test DMT-D0-50-1010 for glazing details under contract WF524570, rebated heads and hardware items and test DMT-D0-50-1018 for additional handle sets under contract WF530852.