
Title

Field of Application for:
Moralt Laminesse FireSound
54mm & 59mm Doorsets and
FireSound 54 Plus - 54mm thick
doorsets
For: 30 or 60 Minutes Fire
Resistance
Proprietary Information redacted.

Report No.:

WF409922 Revision C

Issue Date:

9th May 2025

Valid Until:

9th May 2030

Job Reference:

WF545701

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

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1 Foreword

This Field of Application report has been commissioned by Moralt AG and relates to the fire resistance of 30 or 60 minute fire resisting doorset designs.

The report is for national application and has been written in accordance with the general principles outlined in BS EN 15725.

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 Part22:1987.

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 Laminasse FireSound 54mm & 59mm doorsets for 30 or 60 minutes fire resistance integrity performance (and where appropriate insulation performance), if the doorset designs were to be tested to the requirements of BS 476 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.
- Both leaves of double doorsets and doorsets including an overpanel must be manufactured using the same leaf option. It is not permitted to utilise a mixture of Leaf Options 1, 2 or 3 detailed in section 4.3 within an individual doorset.

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

Note:

- Dimensions are in mm unless otherwise stated.
- Abbreviations: (h) = height; (w) = width; (t) = thickness; (d) = deep; (l) = long.
- 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.

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 Part 22: 1987 test, which has the potential to increase hot gases and flaming on the unexposed side. These factors result in more onerous test conditions for doorsets tested to the BS EN 1634-1 test standard compared with the BS 476 Part 22: 1987 test standard, which has been demonstrated by testing the same products to both standards.

It is therefore the opinion of Warringtonfire that the evidence cited in the following section, tested to both named standards referenced above can be utilised in this assessment which will conclude in terms of the fire resistance performance of the Moralt AG Laminesse FireSound 54mm & 59mm doorset designs if tested in accordance with BS 476 Part 22: 1987.

3.1 Primary Test Evidence FireSound 54mm

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.

3.1.1 Test report RF10007

Date of test	1 st April 2010
Identification of test body	Chiltern International Fire Ltd., now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762
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	Integrity: Cotton Pad: 60 Continuous Flaming: 56 Gap Gauges: *
	Insulation: Discrete Area 1 (timber): * Discrete Area2 (glass): * Radiation (minutes to 15 kW/m ²): *
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	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. 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. The doorset was oriented to open in towards the furnace of the test.

3.1.2 Test report P1009/14-530-1 – Specimen B

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	<p>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/m³. The leaf was 2135mm (h) x 915mm (w) x 54mm (t) and hung in a sapele hardwood frame.</p>
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	<p>The tested specimen included 3No. Leaderflush Shapland bearing butt steel hinges, an overhead face fixed closer, a mortice lock with a 110mm high forend.</p> <p>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.</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>

3.1.3 Test report PF15041

Date of test	17 th March 2015		
Identification of test body	BM TRADA. now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762		
Sponsor	Moralt AG		
Tested Product	<p>A & B:</p> <p>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>		

3.1.4 Test report PF15288 Revision A

Date of test	9 th November 2015		
Identification of test body	Exova Warringtonfire. now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762		
Sponsor	Information held in confidence at Warringtonfire		
Tested Products	<p>A: Unlatched, single acting, single leaf specimen comprised of Moralt FireSound 59 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 59mm (t) and hung in sapele hardwood frames.</p>		
Test Standard	BS 476: Part 22: 1987		
Test Results (minutes)	Integrity:	Specimen A 44*	Specimen B 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 designs for 60 minutes performance, see section 6.4.</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>		

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

Date of test	23 rd June 2016
Identification of test body	Exova Warringtonfire now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762
Sponsor	James Latham, Unit 2, Swallow Park, Fenway Road, Hemel Hempstead, Hertfordshire, HP2 7QU
Tested Product	<p>Specimen B:</p> <p>Unlatched, single acting, double leaf specimen with flush overpanel comprised of Moralt FireSound 54 core leaf with all edges lipped with 8-15mm thick Mahogany of nominal density 640kg/m³.</p> <p>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.</p>
Test Standard	BS 476: Part 22: 1987
Test Results (minutes)	<p>Integrity: 74</p> <p>Insulation: 74</p>
Summary of test specimen	<p>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.</p> <p>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.</p> <p>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.</p> <p>A timber astragal was fitted to the unexposed face of the overpanel.</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>

3.2 Primary Test Evidence FireSound 59mm

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.

3.2.1 Test report RF13181

Date of test	9 th July 2013
Identification of test body	BMTRADA, now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762
Sponsor	Moralt AG
Tested Product	Specimen A: Latched, single acting, double leaf specimen comprised of Moralt FireSound 59 core leaves with all edges lipped with 25mm thick Meranti of nominal density 660kg/m ³ . The leaves measured 2135mm (h) x 915/490mm (w) x 58mm (t) and were hung in a Sapele hardwood frame.
Test Standard	BS 476: Part 22: 1987
Test Results (minutes)	Integrity: 58*
	Insulation: 58
<p>* Failure in RF13181 was attributed to burn-through at the central core area of the leaf at 58 minutes. By utilising the specific Polyurethane adhesive used in the core in fire test Chilt/RF13225 (details held in confidence at Warringtonfire), the leaf construction has demonstrated greater resistance to burn through and has been deemed acceptable for 30 or 60 minutes fire resistance performance.</p> <p>The tested specimen contained a glazed aperture and glazing system, it is the opinion of Warringtonfire the system is suitable for use with this door design since no failures were attributable to the glass or glazing system prior to the test termination at 60 minutes.</p>	

Summary of test specimen:

The tested specimen included 3No. H101 lift off butt steel hinges, an overhead face fixed closer, an Arrone mortice lock with a 155mm high forend, and engaged flush bolts.

2No. 15 x 4 Pyroplex Rigid Box Seal perimeter intumescent seals ref: 8700 were fitted in the frame reveal of the head and jambs with 1No. 15 x 4 Pyroplex Seal ref: 8700 and 1No. 15 x 4 Pyroplex Seal ref: TF8723 in one leaf meeting edge. The hinge blades, latch body, forend and keep and the flush bolts were protected with 1mm thick Interdens intumescent gaskets. The installed 15mm thick Pilkington Pyrostop 30-10 glass was protected with ISL Therm-A-Bead gaskets fitted between the glass and sapele glazing beads on both faces; 8mm thick Sapele was installed to all edges of the glazed aperture and an ISL Therm-A-Line glazing liner.

The doorset was oriented to open in towards the furnace of the test.

3.2.2 Test report RF13225

Date of test	8 th October 2013
Identification of test body	Chiltern International Fire now trading as Warringtonfire Testing and Certification Ltd, UKAS 0249
Sponsor	Moralt AG
Tested Product	<p>Specimen B: Latched, single acting, single leaf specimen comprised of Moralt FireSound 59 core leaf with all edges lipped with 20mm thick Meranti of nominal density 660kg/m³.</p> <p>The leaf measured 2135mm (h) x 915mm (w) x 59mm (t) and were hung in a Sapele hardwood frame.</p>
Test Standard	BS 476: Part 22: 1987
Test Results (minutes) No failures were recorded prior to termination of the test at 69 minutes	Integrity: 69
	Insulation: 69
Summary of test specimen	<p>The tested specimen included 3No. H101 lift off butt steel hinges, an overhead face fixed closer, an Arrone mortice lock with a 155mm high forend and surface mounted Ironmongery Direct stainless steel shoot bolts Ref. 6399674.</p> <p>2No. 15 x 4 Pyroplex Rigid Box Seal perimeter intumescent seals ref: FO8700 were fitted in the frame reveal of the head and jambs The hinge blades, latch body, forend and keep were protected with 1mm thick Interdens intumescent gaskets.</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>

3.2.3 Test report P1009/14-530-1 – Specimen A

Date of test	16 ^h October 2014
Identification of test body	Slovenian National Building and Civil Engineering Institute, Ljubljana
Sponsor	Information held in confidence at Warringtonfire
	<p>Specimen A: Latched, single acting, double leaf specimen comprised of Moralt FireSound 59 core leaf with the vertical edges lipped with 15mm thick Mahogany of nominal density 640kg/m³. The leaves measured 2135mm (h) x 915/490mm (w) x 58mm (t) and hung in a Mahogany hardwood frame.</p>
Test Standard	EN 1634-1: 2014 and EN 1363-1: 2012
Test Results (minutes)	<p>Integrity: Cotton Pad: 82 Continuous Flaming: 82 Gap Gauges: 83</p>
	<p>Insulation: I₁: 78 I₂: 83</p>
Summary of test specimen:	<p>The tested specimen included 3No. H101 bearing butt steel hinges, an overhead face fixed closer, a mortice lock with a 110mm high forend and an edge mounted flush bolt in the edge of the secondary leaf.</p> <p>2No. 15 x 1.8mm ODICE Flexilodice graphite perimeter intumescent seals were fitted in the frame reveal of the head and jambs and in one leaf meeting edge. The hinge blades and latch body were protected with 1mm thick Interdens intumescent gaskets.</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>

3.2.4 Test report BMT/FP/F15073 Specimen A

Date of test	20 th April 2015	
Identification of test body	BM TRADA now trading as Warringtonfire Testing and Certification Ltd, UKAS 1762	
Sponsor	Moralt AG	
Tested Product	<p>Specimen A: Unlatched, single acting, single leaf, glazed specimen comprised of Moralt FireSound 59 core leaf with all edges lipped with 8-15mm thick Mahogany of nominal density 640kg/m³.</p> <p>The leaves measured 2250mm (h) x 915mm (w) x 56mm (t) and hung in an Oak hardwood frame.</p>	
Test Standard	BS EN 1634-1: 2014 and BS EN 1363-1: 2012	
Test Results (minutes)	Integrity:	Specimen A
	Cotton Pad	93
	Continuous Flaming	92
	Gap Gauges	93
	Insulation:	
	I ₁	92
	I ₂	92
	Glazing	76
	Radiation (minutes to 15kW/m ²)	93
The results of specimen A are utilised herein to support assessment of FireSound 59mm doorsets for 30 and 60 minutes integrity performance.		
Summary of test specimen	<p>Specimen A included 3No. Tectus concealed steel hinges, an ITS96 concealed closer and a Glutz mortice lock with a 230mm high forend. The installed 25mm thick Polflam EI60 glass was protected with Odice Superwool paper between the glass and beads on both faces and an Odice Therma aperture liner.</p> <p>2No. 15 x 1.8mm ODICE Flexilodice graphite perimeter intumescent seals were fitted in the frame reveal of the head and jambs with a Planet HS+RD threshold seal. The hinge blades and latch body and keep were protected with 1mm thick Interdens intumescent gaskets the latch forend was protected with 2mm thick Interdens. The concealed closer was protected with 2mm thick Odice SAS graphite gaskets.</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>	

3.2.5 Test report WF 382394 AR1 Doorset A

The referenced test report, the essential details of which are summarised below, is supplementary data for the Moralt FireSound 59 in a single leaf, double swing configuration with the Dorma BTS 80 floor spring and associated pivots.

Date of Test	17 th May 2027
Identification of Test Body	Warringtonfire Testing and Certification UKAS 1762
Sponsor	Moralt AG
Tested Product	Unlatched, single leaf double action timber based doorsets in timber door frames.
Tested Orientation	Specimen A tested opening out, away from the furnace Specimen B tested opening in towards heating conditions
Summary of Test Specimen	<p><u>Leaf:</u> Moralt FireSound 59 Dimensions: 2250 (h) x 1000 (w) x 59 (t) Timber Insert:</p> <ul style="list-style-type: none"> • Top & Bottom: 41(t) x 45(w) • Stiles: 41(t) x 8(w) <p>Lipping: Sapele (density 650kg/m³), 5 (t) to top, bottom and closing edges, 13.6 (t) to hanging edge with profile to suit pivot action of the door leaf. Inserts and lippings adhered using PUR adhesive.</p> <p><u>Door Frame:</u> Sapele head and Jambs, 100 (w) x 45(d), hinge jamb scalloped to match door edge profile. Architrave: MDF (density 750kg/m³) - 45 (w) x 18 (t) fitted to exposed face only.</p> <p><u>Hardware:</u> Floor Spring: Dorma BTS80 F EN6 Double action Bottom Strap: Dorma 7421 Door & Frame Top Pivot: Dorma 8066 Kick / cover plates – Stainless steel – 46 (h) x 2(t) fitted at the base of the leaf running full width of the door leaf.</p> <p><u>Intumescent Materials:</u> Dorma Top Pivot 2066</p> <ul style="list-style-type: none"> • Frame Component: No Intumescent noted. • Door Component: 2 (t) Interdens to all mortice faces. <p>Dorma Bottom Strap 7421</p> <ul style="list-style-type: none"> • 2 (t) Interdens to all mortice faces. <p>Floor Spring:</p> <ul style="list-style-type: none"> • 2 (t) Odice Flexilodice graphite based intumescent encasing the floor spring closer.
Test Standard	BS476: Part 22
Performance	Integrity 75 Insulation: 75

3.3 Primary Test Evidence FireSound Plus 54 - 54mm

3.3.1 Test report DMT-DO-50-1367

Date of test	8 th February 2024		
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 SC23359T for the doorset assembly and SC22134 for the door leaf construction.		
Tested Product	<p>Specimen:</p> <p>ULSADD+OP - Unlatched, single acting, double leaf with flush over panel. Specimens comprised of Moralt FireSound Plus 54 core leaves with the vertical edges and top edges lipped with 20mm thick sapele of nominal density 640kg/m³. The bottom edges of the door leaves were lipped with 5mm thick sapele of nominal density 640kg/m³.</p> <p>The leaves for both specimens were 2440mm (h) x 1220/595mm (w) x 54mm (t) and hung in sapele hardwood frames 100(w) x 38(t) with 40(w) x 15(t) sapele hardwood stops. The overpanel had dimensions of 1824 (w) x 316 (h) and was fitted with a 60(w) x 18(t) stop to act on the active and inactive leaves.</p> <p>Architraves were manufactured from MDF (Density 747 kg/m³) and of dimensions 60(w) x 22(t) positioned to the opening face.</p> <p>The doorsets was oriented to open in towards the furnace of the test.</p>		
Test Standard	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020		
Test Results (minutes)	Integrity	Specimen A 63	Specimen B 63
	Insulation:	63	63
DMT-DO-50-1367 has been incorporated to permit consideration of the Moralt FireSound Plus 54 core hung within a hardwood frame with transomed over panel, with concealed hinges, flush bolts, closers and a glazed aperture.			
Summary of test specimen	<p>The tested specimens included 3No. Consort CCH340.SSS concealed stainless steel hinges to the active leaf and 2 No. Consort CCH340.SSS concealed stainless steel hinges to the inactive leaf, a Doorfit Products Ltd. ICK1955V surface mounted overhead closer, a Glutz 24100.7/60 mortice lock with Glutz 83704-E cylinder and Glutz 48050 Lugano lever handles.</p> <p>2No. 15 x 4 Pyroplex 8700 perimeter intumescent seals fitted in the frame reveal of the head and jambs. At the meeting</p>		

	<p>edges of the inactive leaf 1No. 15 x 4 Pyroplex 8700 and 1 No. 15 x 4 Pyroplex 30141 triple flipper seals were installed. A Norseal NOR710 finned seal was fitted to the upstand of the frame stop. A Norseal NOR720 finned seal was fitted to the lock, top and hinge edge of the active doorleaf.</p> <p>Athmer flushbolts were positioned at top (Ref. TK-15/T, 1653) and bottom (Ref. TK15/B, 1792) of the inactive leaf, the bottom flush bolt was fitted to coincide with the drop seal.</p> <p>The hinges were encased with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t)</p> <p>The dropseals were protected to all three sides of the recess with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t)</p> <p>The lockcase was fully encased, the keep was encased and the forend protected with a Glutz 24000IK.FUL kit – 1 (t) Interdens 15</p> <p>The flushbolt sides were protected with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t), with the rear of the flushbolt protected with Mann McGowan Pyrostrip graphite 10(w) x 2(t).</p> <p>Athmer Schall-EX L-15/30 WS drop seals body dimensions of 30(h) x 15(w) and faceplate dimensions of 19(h) x 15(w) x 1(t).</p> <p>The inactive leaf was glazed with one aperture using Schott 23mm thick Pyronova 60 S3 glass. Hardwood bolelection beads and 5(t) timber liner around the aperture.</p>
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3.4 Supplementary Test Data

3.4.1 Test report DMT-DO-50-994

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

3.4.2 Test report DMT-DO-50-1009

The referenced test report, the essential details of which are summarised below, is supplementary data for the Bartels 'Pivota' concealed hinges being considered for assessment in this report.

Date of Test	31 st August 2021
Identification of Test Body	DMT Gmbh & Co. KG
Sponsor	Moralt AG
Tested Product	A single leaved timber based doorset with thickness of 54mm in a wooden door frame.
Tested Orientation	All opening in towards heating condition
Summary of Test Specimen	<p><u>All Specimens:</u></p> <p><u>LEAF:</u> LAMINESSE FireSmoke 54mm Dimensions: 2440 (h) x 1000 (w) x 54 (t), Lipping: 5 (t) Sapele to vertical edges and 8 (t) to top edge.</p> <p><u>Door Frame:</u> Sapele head and Jambs, 100 (w) x 38(t), 18 (h) stop.</p> <p><u>Hardware:</u> Hinges: 2No Bartels 'Pivota' DXS 100 3-D design Closer: GEZE Boxer Size 2-4 concealed overhead closer Lock/Latch: Doorfit Mortice lock – CH7260FR with 235 (h) forend, disengaged for test. Cylinder: Doorfit ref: EP70CTSKD. Lever handles – Doorfit CH100/G3SS Smoke Seal Lorient Batwing LAS1212 Drop Seal: Lorient Poly Products LAS8001Si</p> <p><u>Intumescent Materials:</u> 2No Lorient Polyproducts Ltd LP2004 seals 2mm either side of the centreline in frame reveals - head and jambs. Hinge protection: Hinge encased with Mann McGowan Intumescent Kit MMG567. Drop Seal Protection: 1 (t) Interdens to top and long sides of seal. Lock Body Mortice – 1 (t) Exitex graphite to all sides</p>
Test Standard	BS 476-22:1987
Performance (minutes)	Integrity: 67 Insulation: 67

3.4.3 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:</p> <p>Unlatched, single acting, single leaf specimens comprised of Moralt FireSound Plus 54 core leaves with the vertical edges lipped with 4 - 8mm 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
<p>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. Failures were recorded at the apertures glazed with the 13mm thick Pyroguard EW60 glass, which is not permitted for use within this report. The fire test was ended at 69 minutes with no further failures recorded.</p>			
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>		

3.4.4 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:</p> <p>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>		

3.4.5 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 10.4.1.3.	
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 gaskets.</p>

3.4.6 Test report DMT-DO-50-1216

Date of test	1 st December 2022	
Identification of test body	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany	
Sponsor	Moralt AG	
Sampling	No sampling undertaken	
Tested Product	<p>Specimen: ULSASD - Unlatched, single acting, single leaf. Specimen comprised of Moralt FireSound 54 core leaf. Sapele inserts of nominal density 638kg/m³ and with dimensions of 27mm(w) x 8mm (t) are recessed into vertical edges and head the blank prior to the lippings being applied. The leaf was lipped to all edges with 5mm thick sapele of nominal density 676kg/m³. The inserts were adhered using PUR type adhesive.</p> <p>The leaf dimensions were 2443mm (h) x 1000 (w) x 55 (t) and hung in sapele hardwood frames(Density 640 kg/m³), 100(w) x 38(t) with 40(w) x 18(t) sapele hardwood stops.</p> <p>Architraves were manufactured from Sapele hardwood (Density 640 kg/m³) and of dimensions 60(w) x 20(t) positioned to the opening face.</p> <p>The doorsets was oriented to open away from the furnace of the test.</p>	
Test Standard	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020	
Test Results (minutes)	Integrity	60
	Insulation:	60
DMT-DO-50-1216 has been incorporated to permit consideration of the Moralt FireSound 54 core hung within a hardwood frame with Salto hardware.		

Summary of test specimen

The tested specimen included 3No. Bartels 'Pivota' DXS 100 3-D design steel hinges. A GEZE Boxer Size 2-4 concealed overhead closer, 2 No. Salto Systems mortice locks LE7S1770R03IMS with AFB0IBA8 control unit with reader. Each lockcase was offset within the leaf thickness by 10mm, one from the exposed face the other from the unexposed face. Spindle centres for the lockcases were 1047 and 1497mm from the bottom of the door leaf.

Salto Systems R1SJRIM480 lever handles and RSPZRIM5 escutcheon.

2No. 15 x 4 Mann McGowan Pyrostrip PSA, PVC encased graphite intumescent seals fitted in the frame reveal of the head and jambs.

A Mann McGowan ACS1 seal finned seal was fitted to the upstand of the frame stop. A Mann McGowan Enviroseal Triblade finned seal was fitted to the lock, top and hinge edge of the doorleaf.

Mann McGowan DD-1703ACU drop seal was positioned 15mm in the bottom of the leaf, 15mm from the exposed face. Body dimensions of 28(h) x 13 (w) and faceplate dimensions of 51 (h) x 21(w) x 1(t).

The hinges were encased with 1mm (t) Interdens 15 SA (Mann McGowan Kit MMG567).

The GEZE boxer closer was protected using Mann McGowan 1mm Interdens SA kits:

- MMG107 Boxer Fire Pack
- MMG109 Rail Pack
- MMG579 (longer forend cover) at top of the closer body

The dropseals were protected to all three sides of the recess with Interdens S/A 1mm (t)

The Salto lockcase was encased and rear of the forend fitted with Mann McGowan 1mm Interdens SA kit MMG652

The Salto control unit was encased and rear of the forend fitted with Mann McGowan 1mm Interdens SA kit MMG651

The Salto keep was fitted with Mann McGowan 1mm Interdens SA kit MMG652, with an additional section of Mann McGowan Pyrostrip 500FSA in the groove of the mortice

3.4.7 Test report DMT-DO-50-1288

Date of test	8 th February 2024	
Identification of test body	DMT GmbH & CO KG, Tremoniastrasse 13, 44137 Dortmund, Germany	
Sponsor	Moralt AG	
Sampling	No sampling undertaken	
Tested Product	<p>Specimen:</p> <p>LSASD - Latched, single acting, single leaf. Specimen comprised of Moralt Smart Core 55 FireSound Plus 54 Sapele inserts of nominal density 641kg/m³ and with dimensions of 27mm(w) x 8mm (t) are recessed into vertical edges and head the blank prior to the lippings being applied. The leaf was lipped to the vertical and top edges with 5mm thick sapele of nominal density 595kg/m³. The bottom edge of the door leaf was unlipped. The inserts were adhered using PUR type adhesive.</p> <p>The leaf dimensions were 2440mm (h) x 1030 (w) x 55 (t) and hung in sapele hardwood frames 100(w) x 38(t) with 40(w) x 18(t) sapele hardwood stops.</p> <p>Architraves were manufactured from Sapele hardwood (Density 647 kg/m³) and of dimensions 60(w) x 20(t) positioned to the opening face.</p> <p>The doorsets was oriented to open in towards the furnace of the test.</p>	
Test Standard	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020	
Test Results (minutes)	Integrity	60
	Insulation:	58
DMT-DO-50-1288 has been incorporated to permit consideration of the Moralt FireSound Plus 54 core when installed with Consort Concealed hinges, closer, security chain and CHL89 RFID lock.		

Summary of test specimen

The tested specimen included 3No. Consort CCH340.SSS concealed stainless steel hinges, Consort CDCC3 Size 2-4 concealed door closer, 2No. Consort CHL89 – RFID locks – installed to provide opposite handing's – at spindle heights of 1047mm and 1447mm from the bottom of the door leaf, Consort CHL89 lever handle and Consort CDC22.SMP concealed security chain positioned 1747mm from the bottom of the door leaf.

2No. 15 x 4 Pyroplex 8700 perimeter intumescent seals fitted in the frame reveal of the head and jambs. A Norseal NOR710 finned seal was fitted to the upstand of the frame stop. A Norseal NOR720 finned seal was fitted to the lock, top and hinge edge of the doorleaf.

Raven Products RP8si drop seal of body dimensions of 34(h) x 14(w) and faceplate dimensions of 57(h) x 22(w) x 1.2(t).

The hinges were encased with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t)

The concealed closer and channel were protected with Consort Architectural Hardware self-adhesive graphite sheet, 0.8mm to all sides of the closer body mortice and the guide rail was encased with 2mm graphite to all sides of the mortice.

The dropseals were protected to all three sides of the recess with Consort Architectural Hardware self-adhesive graphite sheet, 0.8mm (t)

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

The Consort CDC22.SMP concealed security chain was fully encased and the forend of the leaf element was fitted with intumescent to the rear with Consort Architectural Hardware self-adhesive graphite sheet, 0.8mm (t).

3.4.8 Test report DMT-DO-50-1446

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

3.4.9 Test report DMT-DO-50-1447

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

Note:

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

3.4.10 Test report DMT-DO-50-1366

Date of test	8 th February 2024		
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 SC23360T for the doorset assembly and SC22214 for the door leaf construction.		
Tested Product	<p>Specimen: ULSASD - Unlatched, single acting, single leaf. Specimens comprised of Moralt SmartCore 55 FireSound Plus 54 core leaf with the vertical edges and top edges lipped with 20mm thick sapele of nominal density 640kg/m³. The bottom edge of the door leaf was unlipped. The leaf dimensions were 2440mm (h) x 1030 (w) x 55.8 (t) and hung in sapele hardwood frames 100(w) x 38(t) with 40(w) x 15(t) sapele hardwood stops. Architraves were manufactured from Sapele hardwood (Density 647 kg/m³) and of dimensions 60(w) x 20(t) positioned to the opening face. The doorsets was oriented to open in towards the furnace of the test.</p>		
Test Standard	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020		
Test Results (minutes)	Integrity	Specimen A 64	Specimen B 64
	Insulation:	64	64
DMT-DO-50-1366 has been incorporated to permit consideration of Salto hardware.			
Summary of test specimen	<p>The tested specimens included 3No. PIVOTA DXS 100 3-D concealed steel hinges, a Dormakabba IT96 EN 2-4 concealed overhead closer, 2No. Salto LE7S1570R01IMB – XS4 Original EM4 (RFID Locks) offset within the leaf construction – oriented towards the exposed face of the fire test. With Salto keeps ref. LE7S1570R01IM8, Salto cylinder Ref. NME3140N50CSBD and Salto lever handles XS4 ref. EM452U72IMB48.</p> <p>Door viewer – Startec 959.01.011 – Ø14 body with a Ø22 footprint to the exposed face and a Ø27 footprint to the unexposed face</p> <p>2No. 15 x 4 Pyroplex 8700 perimeter intumescent seals fitted in the frame reveal of the head and jambs. A Norseal NOR710 finned seal was fitted to the upstand of the frame stop. A Norseal NOR720 finned seal was fitted to the lock, top and hinge edge of the doorleaf.</p>		

	<p>Athmer Schall-EX L-15/30 WS drop seals body dimensions of 30(h) x 15(w) and faceplate dimensions of 19(h) x 15(w) x 1(t). The hinges were encased with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t) The concealed closer was protected with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t) – “Dorma ITS 96 2-4 Intumescent Kit – 1mm” The dropseals were protected to all three sides of the recess with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t) The Salto lockcase was fully encased, the keep was encased with 15 SA (Mann McGowan Pyrostrip) 1mm (t) the strike plate and keep were bedded on and wrapped in 15 SA (Mann McGowan Pyrostrip) 1mm (t) The door viewer body was fully wrapped with 15 SA (Mann McGowan Pyrostrip) 1mm (t)</p>
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3.4.12 Test Report WF429105

The referenced test report, the essential details of which are summarised below, is supplementary data for the Rutland ITS11204 concealed closers being considered for assessment in this report.

Date of Test	24 th June 2020	
Identification of Test Body	Warringtonfire Testing and Certification UKAS 1762	
Sponsor	Rutland UK, Whittington Way, Chesterfield, S41 9AG	
Tested Product	Two unlatched, single leaved timber based doorsets in timber door frames.	
Tested Orientation	Specimen A tested opening out, away from the furnace Specimen B tested opening in towards heating conditions	
Summary of Test Specimen	<p><u>Both specimens</u> <u>Leaf:</u> 54mm thick particleboard; Dimensions: 2040 (h) x 926 (w) x 54 (t), Lipping: 8 (t) to vertical edges, none on horizontal edges. <u>Door Frame:</u> Sapele head and Jambs, 90 (w) x 44(t) with integral 12 high stop. <u>Hardware:</u> Hinges: 3No bearing butt ref: Rutland RH.BB. 43R.SS Closer: Rutland ITS1204 concealed head mounted Lock/Latch: Rutland RDL.ESL.60.SSR mortice lock – forend 235 (h) Cylinder: Eurospec – CYP71282SC. <u>Intumescent Materials:</u> 2No Lorient LP1504 in frame jambs Hinge protection: 1mm thick graphite pads. Closer Protection: Rutland 'IP.114 2mm intumescent kit for ITS11204' Lock Body Mortice – Rutland 1mm thick graphite jacket and pads</p>	
Test Standard	BSEN1634-1:2014+A1:2018	
Performance	A:	B:
	Integrity 73	Integrity 54 – top closing corner

3.4.13 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 (t) planted stops, butt jointed. Frame Fixing: 4No. 6 x 100mm long steel screws per jamb. Frame Firestopping: Sealed Tight Solutions Ltd (STS) ST99 foam with capped with a bead of acrylic sealant. Threshold: non-combustible board Architraves: Sapele (640kg/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.</p> <p>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.	

3.4.14 Test Report FEP/F14102

Date of test	8 th July 2014
Identification of test body	Chiltern International Fire Ltd now trading as Warringtonfire Testing and Certification Ltd, UKAS No. 1762
Sponsor	James Latham
Tested Product	2No. latched, leaf and a half, single acting, timber doorsets. Doorset orientated to open toward heating conditions.
Summary of test specimens	<p>Specimen A: Dimensions: 2040mm (h) x 826/303mm (w) x 54mm (t) Door leaf: Core: graduated density particleboard core 54 (t) density 620kg/m³. Lipping: Beech 8 (t) all edges.</p> <p>Intumescent: 1No. Lorient LP20004SS Type 617 20(w) x 4(t) fitted centrally in each leaf meeting edge. 2No. Norseal Ltd 154FOW seals 15(w) x 4(t) fitted 10 apart in frame reveal of the head and jambs.</p> <p>Frame: Lathams WoodEx European Ash 125(d) x 30(t) with planted MDF stop 15(t) x 32(w), density 640 kg/m³.</p> <p>Hardware: Hinges: 3 No Royde and Tucker high load H101 lift off hinges 100(h) x 35(w) blade size. Closer: Geze UK TS2000V overhead closer 225(w) x 59(w) footprint size. Latch: Standard tubular mortice latch 62(h) x 25(w) forend size, disengaged. Lever: Aluminium type handle 103 (h) x 41 (w) footprint size. Flush Bolts: 200(w) x 25(w) forend size, fitted at head and threshold, bolts engaged. Hardware protection: 1mm thick Interdens fitted underneath both hinge blades. None fitted encasing latch body. 1mm thick Interdens fitted under latch forend. 1mm thick Interdens fitted under keep. 1mm thick Interdens fitted lining flush bolt cut-outs. Frame fixing with 4 masonry fixings 100 mm long on each jamb.</p>

	<p>Specimen B: Dimensions: 2040mm (h) x 826/303mm (w) x 44mm (t) Door leaf: Core: graduated density particleboard core 44 (t) density 620kg/m³. Lipping: Beech 8 (t) all edges. Intumescent: 1No. Lorient LP20004SS Type 617 20(w) x 4(t) fitted centrally in inactive leaf meeting edge only. 1No. Norseal Ltd 154FOW seals 15(w) x 4(t) fitted 14mm from exposed face in the frame reveal of the head and jambs. Frame: Lathams WoodEx European Redwood FSC 125(d) x 30(t) with planted MDF stop 15(t) x 32(w), density 510 kg/m³ Hardware: Hinges: 3 No Royde and Tucker high load H101 lift off hinges 100(h) x 35(w) blade size. Closer: Geze UK TS2000V overhead closer 225(w) x 59(w) footprint size. Latch: Standard tubular mortice latch 62(h) x 25(w) forend size, disengaged. Lever: Aluminium type handle 103 (h) x 41 (w) footprint size. Flush Bolts: 200(w) x 25(w) forend size, fitted at head and threshold, bolts engaged. Hardware protection: 1mm thick Interdens fitted underneath both hinge blades. None fitted encasing latch body. 1mm thick Interdens fitted under latch forend. 1mm thick Interdens fitted under keep. 1mm thick Interdens fitted lining flush bolt cut-outs. Frame fixing with 4 masonry fixings 100 mm long on each jamb. Doorset orientated to open toward heating conditions.</p>
Test Standard	BS 476: Part 22: 1987
Performance	<p>Specimen A: Integrity: 42 minutes* (failure recorded at the latch. No further integrity failures recorded until 64 minutes) Insulation: 42 minutes</p>
	<p>Specimen B: Integrity: 30 minutes (failure recorded at the latch. No further integrity failures recorded until 48 minutes) Insulation: 30 minutes</p>

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

3.4.15 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 Oiartzun- Gipuzkoa, Spain		
Sampling	A representative of Warrington Certification sample selected the hardware on 23 rd February 2017		
Tested Product	<p>Specimens A & B:</p> <p>Latched, single acting, single leaf specimens comprised of a graduated chipboard core with the vertical edges lipped with 8mm thick sapele of nominal density 640kg/m³.</p> <p>The leaves for both specimens were 2040mm (h) x 932mm (w) x 44mm (t) and hung in softwood frames.</p> <p>The doorsets were oriented to open in towards the furnace of the test.</p>		
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 10.4.1.3.			
Summary of test specimen	<p>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.</p> <p>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.</p>		

3.4.16 Test report WF364240

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

3.4.17 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	<p>Specimens A & B:</p> <p>Single leaf specimens comprised of a graduated chipboard core with the vertical edges lipped with 8mm thick sapele of nominal density 640kg/m³.</p> <p>The leaves for both specimens were 1490mm (h) x 584mm (w) x 54mm (t) and mounted in hardwood jambs.</p> <p>The specimens were screwed in position to the jambs.</p>
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 10.4.1.3.	
Summary of test specimen	<p>Other than the latches no other hardware was installed.</p> <p>Specimen A incorporated a Salto LE7 lockset with electric escutcheon ref: E96P0U001M48K and also an LE8 lockset with electronic escutcheon ref: E9150RUIMB49.</p> <p>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.</p>

3.4.18 Test Report Chilt/RF07140 Revision B

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

3.4.19 Test Report Chilt/RF07141 Revision B

Date of Test	27 th November 2007
Identification of Test Body	Warringtonfire Testing and Certification Ltd. previously known as Chiltern International Fire UKAS No. 1762
Sponsor	Harison Thompson & Co Ltd & Lorient Polyproducts Ltd
Tested Product	Unlatched (bolts latched), Single Acting, Double Leaf, Timber Doorset installed with edge protectors – ULSADD. Doorset A 2045 (h) x 850/323 (w) x 54 (t). Halspan Prima 60 doorset installed with Yeoman Shield/Lorient Polyproducts Ltd PVC edge protectors to the vertical edges. Doorset B 2045 (h) x 850/323 (w) x 54 (t). Blankfort 60 doorset installed with Yeoman Shield/Lorient Polyproducts Ltd PVC edge protectors to the vertical edges.
Tested Orientation	Opening in towards heating conditions
Test Standard	BS 476-22: 1987
Performance	Doorset A Integrity: 62 minutes Doorset B Integrity: 67 minutes Doorset A Insulation: 62 minutes Doorset B Insulation: 67 minutes
Reason for Use	Supporting evidence to support the use of the Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors to the vertical edges of proven timber based doorset designs for 60 minutes fire resistance

3.4.20 Test Report LOR1524

Date of Test	26 th March 2014
Identification of Test Body	Lorient Ltd.
Sponsor	Lorient Ltd.
Tested Product	Unlatched (bolts engaged), Single Acting, Double Leaf, Timber Doorset installed with edge protectors – ULSADD. 54mm thick particleboard core doorset installed with a flush bolt and Yeoman Shield/Lorient Polyproducts Ltd PVC edge protectors to the meeting edges.
Tested Orientation	Opening in towards heating condition
Test Standard:	BS 476 Part22: 1987
Performance	Doorset Integrity: 68 minutes
Reason for Use	Supporting evidence for the use of the Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors to the vertical edges of proven timber based doorset designs for 60 minutes fire resistance, where flush bolts have been fitted to one of the meeting edges of the double door design

A representative from BM Trada witnessed the above test.

3.4.21 Test Report Chilt/RF11059

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

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

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

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

3.4.22 Test Report Chilt/RF11061

Supporting evidence to support the use of the Construction Specialities – Acrovyn edge protectors for 60 minutes integrity performance.

The left doorset was designated doorset A and the right doorset was designated doorset B. The left leaf of each doorset measured 2100mm high x 900mm wide x 54mm thick and the right leaf of each doorset measured 2100mm high x 300mm wide x 54mm thick. Vertical leaf edges were protected with the CS Group Acrovyn. Both doorsets were orientated with leaves opening towards the furnace, considered to be the most onerous direction based on experience of testing similar door constructions. It is therefore the opinion of Warringtonfire that the test results can be applied to doors opening in either direction. Both doorsets were fitted with latches disengaged for the test.

When tested in accordance with the requirements of BS476 Part 22: 1987, the specimens achieved the following performance:

Criteria	Doorset A – Particleboard Core	Doorset B – Lamel Core
Integrity:	66 minutes	68 minutes
Insulation:	66 minutes	68 minutes

3.4.23 Test Report Chilt/ IF13095 Revision A

Supporting evidence to support the use of the Construction Specialities – Acrovyn edge protectors for 60 minutes integrity performance.

The leaves measured 1400mm high x 900mm and 300mm wide x 57mm thick. Top and bottom edges were lipped with 2.5mm thick Acrovyn and the leaves faced with 2.5mm thick Acrovyn. Vertical edges were protected with 2mm thick Acrovyn. The doorset was orientated opening towards the furnace, which is considered to be the most onerous direction based on experience of testing doors of similar construction. It is therefore the opinion of Warringtonfire that the test results can be applied to doors opening in either direction. The doorset was fitted with a latch disengaged for the test.

When tested utilizing the temperature and pressure conditions of BS476 Part 20: 1987 and in accordance with the principles of BS 76 Part 22: 1987, the specimen achieved the following performance:

Criteria	Lamel Core based door leaves
Integrity:	60 minutes
Insulation:	60 minutes

3.4.24 Fire Resistance Test Chilt/IF11010B

Supporting evidence to support the use of the Construction Specialities – Acrovyn edge protectors with flush bolts for 60 minutes integrity performance.

The left doorset was designated doorset A and the right doorset was designated doorset B. The leaves of each doorset measured 980mm high x 226mm wide x 54mm thick. Vertical leaf meeting edges were protected with 8mm thick profiled recycled PVC covered by 2mm thick CS Group Acrovyn extending 50mm across the leaf faces. Both doorsets were orientated with leaves simulated as opening towards the furnace, considered to be the most onerous direction based on experience of testing similar door constructions. It is therefore the opinion of Warringtonfire that the test results can be applied to doors opening in either direction. The left leaf of each doorset was fitted with a flush bolt, disengaged for the duration of the test.

When tested in accordance with the principles of BS476 Part 22:1987, the specimens achieved the following performance:

Criteria	Doorset A – Particleboard core	Doorset B - Particleboard core
Integrity:	64 minutes	64 minutes
Insulation:	64 minutes	64 minutes

3.4.25 Test Report WF 382394 AR1

Test WF382394 AR1 was conducted on 2No. unlatched, single leaf doorsets, only specimen B is relevant to this report. The test has been deemed acceptable for use as secondary data to support specific items of hardware with the LAMINESSE FireSmoke 54mm, 60 minute fire resisting doorset design with head rail insert and 6mm particleboard facings:

Test Date	8 th July 2014
Identification of test body	Exova Warringtonfire, now trading as Warringtonfire Testing and Certification. UKAS 1762
Test Sponsor	Details of the test sponsor are held on file, in confidence, at Warringtonfire
Tested Product	Unlatched, single acting, single Leaf
Tested Orientation	Leaf oriented to open towards test conditions
Summary of test construction (mm)	<p>Specimen B: LAMINESSE FireSmoke 54 thick blank with 8mm thick hardwood lippings on all edges and with 6mm thick MDF facings.</p> <p>Leaf Size: 2250 (h) x 1000 (w) x 54 (t).</p> <p>Hardware:</p> <p>3No Simonswerk Tectus concealed hinges ref: TE5273.SSE FD60 and a Dorma ITS96 concealed closer with ITS slide arm and channel guide, with a Glutz multipoint latch with a 1788 high forend and aluminium handleset and security Euro cylinder.</p> <p>Door frame: Hardwood 38 thick of nominal density 650kg/m³.with MDF architraves.</p> <p>Leaf Edge Intumescent Seals: Pyroplex Ltd Rigid Box Seals ref: 6700 and 30141 were fitted in the frame jambs.</p>
Test Standard	BS 476 Part 22: 1987
Test Results (minutes)	<p>Integrity: 69; Insulation: 69</p> <p>Tested opening in toward the furnace</p>

3.4.26 Test report 21-004285-PR02

Date of test	10 th February 2022	
Identification of test body	IFT Rosenheim GmbH, Technologiezentrum, Am Oberfeld 21, 83026 Rosenheim, Germany	
Sponsor	Moralt AG	
Sampling	Specimen was sampled by a representative of BMTRADA under contract SC21184 for the doorset assembly.	
Tested Product	<p>Specimen:</p> <p>LSASD - Latched, single acting, single leaf. Specimens comprised of Moralt FireSound 54 core leaf.</p> <p>Sapele inserts of nominal density 677kg/m³ and with dimensions of 27mm(w) x 8mm (t) are recessed into vertical edges and head the blank prior to the lippings being applied.</p> <p>The inserts were adhered using PUR type adhesive.</p> <p>The top edge lipped with 8mm thick sapele of nominal density 677kg/m³ Complete with a 4.5x12mm groove for interfacing with the Mann McGowan ACS1 seal in the frame stop. The vertical and bottom edges of the door leaves were lipped with 5mm thick sapele of nominal density 677kg/m³. The lippings were adhered using PUR type adhesive.</p> <p>The leaves were 2440mm (h) x 1077mm (w) x 54mm (t) and hung in sapele hardwood frames 100(w) x 38(t) with 40(w) x 18(t) sapele hardwood stops. The stops were rebated to allow the inclusion of the Mann McGowan ACS1 seal.</p> <p>Architraves were manufactured from Sapele and of dimensions 70(w) x 20(t) positioned to the opening face, mitred, glued and connected together using Hoffmann clips .</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>	
Test Standard	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020	
Test Results (minutes)	Integrity	61
	Insulation:	61
<p>21-004285-PR02 has been incorporated to permit consideration of the Moralt FireSound 54 core hung within a hardwood frame, with concealed hinges, concealed closers, cable ways and cableloops.</p> <p>The test is also used as a comparative test with the Moralt FireSound Plus 54 tested in 21-004285-PR03</p> <p>Fire test 21-004285-PR02 was terminated at 61 minutes to permit further testing that is unrelated to this assessment.</p>		
Summary of test specimen	The tested specimen included 2No. Bartels 'Pivota' DXS 100 3-D design steel hinges. A GEZE Boxer Size 2-4 concealed overhead closer, a Dorma Kabba M76-A1DR1-626RWY	

	<p>Mortice Lock positioned with the spindle 146mm above the bottom of the door leaf, DormaKabba Saflock RT Plus lever handles M131B1.702243 and Assa Abloy EA281_100000 cable loop, with cable way running around the bottom of the blank concealed by the lippings and insert piece.</p> <p>A 12mm(d) x 10mm(w) cableway runs from the mortice lock to the leaf threshold, running above the drop seal and returns up the hinge side to the cable loop. On the vertical edge the cableway runs under the Sapele 27mm(w) x 8mm(d) insert pieces</p> <p>2No. 15 x 4 Mann McGowan Pyrostrip 500 PSA, PVC encased graphite intumescent seals fitted in the frame reveal of the head and jambs.</p> <p>A Mann McGowan ACS1 seal finned seal was fitted to the upstand of the frame stop. A Mann McGowan Enviroseal Triblade finned seal was fitted to the lock, top and hinge edge of the doorleaf.</p> <p>The hinges were encased with 1mm (t) Interdens 15 SA (Mann McGowan Kit MMG567).</p> <p>The GEZE boxer closer was protected using Mann McGowan 1mm Interdens SA kits:</p> <ul style="list-style-type: none"> • MMG107 Boxer Fire Pack • MMG109 Rail Pack • MMG579 (longer forend cover) at top of the closer body <p>The dropseals were protected to the two sides the recess with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t)</p> <p>The Assa Abloy EA281 cable loop was installed with the ITD-ABLOY-EA281 intumescent kit to all sides of the mortice – 2mm Interdens SA.</p> <p>The cableway included along its length 10x2mm Mann McGowan Pyrostrip 10x2mm 500FSA.</p> <p>The lockcase was fully encased, the keep was encased and the forend protected with a Glutz 24000IK.FUL kit – 1 (t) Interdens 15</p> <p>PDB Seals PDB411M drop seal of body dimensions of 37(h) x 14.6 (w) and faceplate dimensions of 35 (h) x 16(w) x 0.5(t).</p>
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Note: The

3.4.27 Test report 21-004285-PR03

Date of test	10 th February 2022	
Identification of test body	IFT Rosenheim GmbH, Technologiezentrum, Am Oberfeld 21, 83026 Rosenheim, Germany	
Sponsor	Moralt AG	
Sampling	Specimen was sampled by a representative of BMTRADA under contract SC21185 for the doorset assembly.	
Tested Product	<p>Specimen:</p> <p>LSASD - Latched, single acting, single leaf. Specimens comprised of Moralt FireSound Plus 54 core leaf.</p> <p>Sapele inserts of nominal density 641kg/m³ and with dimensions of 27mm(w) x 8mm (t) are recessed into vertical edges and head the blank prior to the lippings being applied.</p> <p>The inserts were adhered using PUR type adhesive.</p> <p>The top edge lipped with 8mm thick sapele of nominal density 677kg/m³ Complete with a 4.5x12mm groove for interfacing with the Mann McGowan ACS1 seal in the frame stop. The vertical and bottom edges of the door leaves were lipped with 5mm thick sapele of nominal density 677kg/m³. The lippings were adhered using PUR type adhesive.</p> <p>The leaves were 2440mm (h) x 1077mm (w) x 54mm (t) and hung in sapele hardwood frames 100(w) x 38(t) with 40(w) x 18(t) sapele hardwood stops. The stops were rebated to allow the inclusion of the Mann McGowan ACS1 seal.</p> <p>Architraves were manufactured from Sapele and of dimensions 70(w) x 20(t) positioned to the opening face, mitred, glued and connected together using Hoffmann clips .</p> <p>The doorset was oriented to open in towards the furnace of the test.</p>	
Test Standard	EN 1634-1:2014+A1:2018 in conjunction with EN 1363-1:2020	
Test Results (minutes)	Integrity	60
	Insulation:	60
<p>21-004285-PR03 has been incorporated to permit consideration of the Moralt FireSound Plus 54 core hung within a hardwood frame, with concealed hinges, concealed closers, cable ways and cableloops.</p> <p>The test is also used as a comparative test with the Moralt FireSound Plus 54 tested in 21-004285-PR02</p> <p>Fire test 21-004285-PR03 was terminated at 61 minutes to permit further testing that is unrelated to this assessment.</p>		
Summary of test specimen	The tested specimen included 2No. Bartels 'Pivota' DXS 100 3-D design steel hinges. A GEZE Boxer Size 2-4 concealed overhead closer, a Dorma Kabba M76-A1DR1-626RWY	

	<p>Mortice Lock positioned with the spindle 146mm above the bottom of the door leaf, DormaKabba Saflock RT Plus lever handles M131B1.702243 and Assa Abloy EA281_100000 cable loop, with cable way running around the bottom of the blank concealed by the lippings and insert piece.</p> <p>A 12mm(d) x 10mm(w) cableway runs from the mortice lock to the leaf threshold, running above the drop seal and returns up the hinge side to the cable loop. On the vertical edge the cableway runs under the Sapele 27mm(w) x 8mm(d) insert pieces</p> <p>2No. 15 x 4 Mann McGowan Pyrostrip 500 PSA, PVC encased graphite intumescent seals fitted in the frame reveal of the head and jambs.</p> <p>A Mann McGowan ACS1 seal finned seal was fitted to the upstand of the frame stop. A Mann McGowan Enviroseal Triblade finned seal was fitted to the lock, top and hinge edge of the doorleaf.</p> <p>The hinges were encased with 1mm (t) Interdens 15 SA (Mann McGowan Kit MMG567).</p> <p>The GEZE boxer closer was protected using Mann McGowan 1mm Interdens SA kits:</p> <ul style="list-style-type: none"> • MMG107 Boxer Fire Pack • MMG109 Rail Pack • MMG579 (longer forend cover) at top of the closer body <p>The dropseals were protected to the two sides the recess with Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t)</p> <p>The lockcase was fully encased, the keep was encased and the forend protected with a Glutz 24000IK.FUL kit – 1 (t) Interdens 15</p> <p>The Assa Abloy EA281 cable loop was installed with the ITD-ABLOY-EA281 intumescent kit to all sides of the mortice – 2mm Interdens SA.</p> <p>The cableway included along its length 10x2mm Mann McGowan Pyrostrip 10x2mm 500FSA.</p> <p>PDB Seals PDB411M drop seal of body dimensions of 37(h) x 14.6 (w) and faceplate dimensions of 35 (h) x 16(w) x 0.5(t).</p>
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4 Technical Specification

4.1 General

The technical specification for the proposed Moralt AG Laminesse FireSound 54mm & 59mm doorsets 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 59 with 3mm MDF facings – 59mm thick

The door designs can include:

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

4.3.3 Leaf 3 – FireSound Plus54 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.

4.3.4 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.

4.3.5 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.

4.3.6 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.

4.4 Doorset Configurations & Maximum Leaf Sizes

4.4.1 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 takes into account:

1. The margin of over performance above 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.









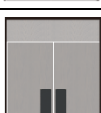
Doorsets with reduced height and width dimensions from those tested are deemed to be less onerous. Therefore, doors with dimensions less than those given in the leaf size envelopes (for the relevant intumescent specification) in the following sections are covered and may be manufactured.

4.4.2 Configuration

The table below shows the permitted configurations for the Moralt AG Laminasse FireSound 54mm & 59mm doorset designs, with the abbreviation and full description of each configuration.

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

4.4.2.1 FireSound – Leaf Types 1, 2 & 3

Doorset Configurations			
Depiction	Abbreviation	Description	Door Leaf
	LSASD	Latched Single Acting Single Doorset	1, 2 & 3
	ULSASD	Unlatched Single Acting Single Doorset	1, 2 & 3
	DASD	Double Acting Single Doorset	2
	LSASD+OP	Latched Single Acting Single Doorset + Flush Overpanel	1, 2 & 3
	ULSASD+OP	Unlatched Single Acting Single Doorset + Flush Overpanel	1, 2 & 3
	LSADD	Latched Single Acting Double Doorset	1, 2 & 3
	ULSADD	Unlatched Single Acting Double Doorset	1, 2 & 3
	LSADD+OP	Latched Single Acting Double Doorset + Flush Overpanel	1, 2 & 3
	ULSADD+OP	Unlatched Single Acting Double Doorset + Flush Overpanel	1, 2 & 3

4.4.3 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.

4.4.4 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.

4.4.4.1 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, PF15041, RF13225, RF13181 and DMT-DO-50-1367 and Odice Flexilodice in P1009/14-530-1), it is the opinion of Warringtonfire that the seal types included within this field of application are suitable for use within the FireSound 54mm, FireSound59mm and FireSound Plus 54 doorset designs for 30 and 60 minutes fire resistance integrity performance, subject to the design parameters contained herein.

Comparative fire tests (21-004285-PR02 & 21-004285-PR03) have been undertaken that included latched single acting doorsets of the same dimensions, with identical frame and hardware details, manufactured using a FireSound 54mm and FireSound Plus 54. The fire integrity achieved for the doorsets was 60 and 61 minutes respectively. The successful fire test has been considered sufficient to demonstrate the comparable performance of the two blanks and therefore allow the substitution of the FireSound 54mm and FireSound Plus 54 with limitations applied at the discretion of Warringtonfire.

Specific door leaf envelopes have been provided where sufficient fire test data is not available to permit an assessed leaf envelope to be created to include all leaf or intumescent options.

Therefore, based on an evaluation and comparison of the cited test evidence in section 3 and the above analysis, the leaf size envelopes and intumescent specifications given in sections 4.4.5 – 4.4.14 below 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 or frame reveals, with tightly formed abutting corner joints, unless stated otherwise.
- Vertical perimeter intumescent seals may include one tight butt joint in their length if needed.
 - Where two seals are fitted, the joints must be offset by a minimum of 100mm and may not be coincident.
 - Where one seal is fitted the joint must be in the lower half of the doorset.

4.4.4.2 Explanation for following sections

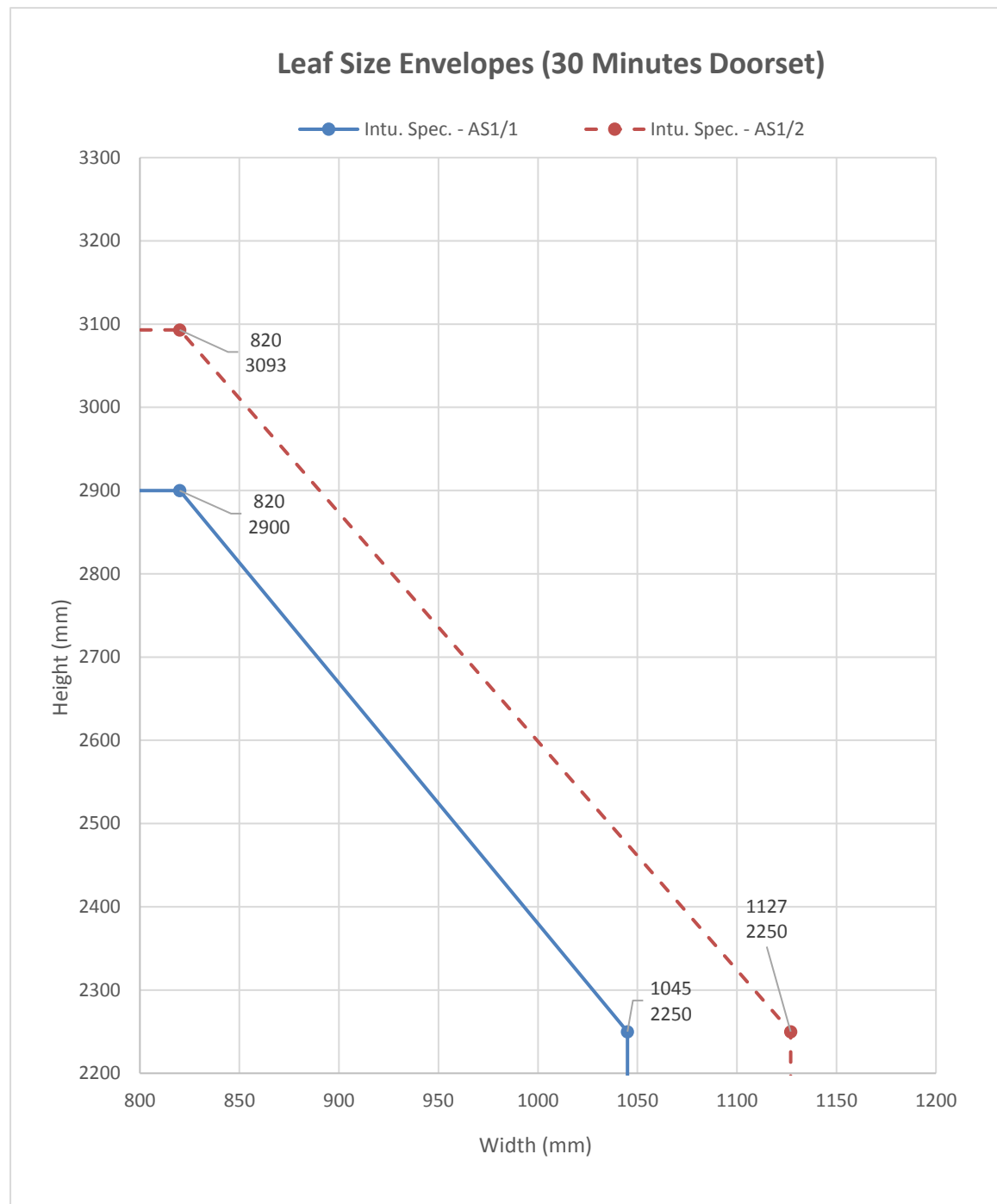
The performance of a doorset in terms of configuration and size is dependent on the leaf type, perimeter intumescent used and frame type. These elements are not automatically interchangeable. The following sections present the envelopes for the 3No leaf types and 3No frame types. Each envelope is linked 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.

4.4.5 LSASD Configuration: 30 Minutes Integrity Performance

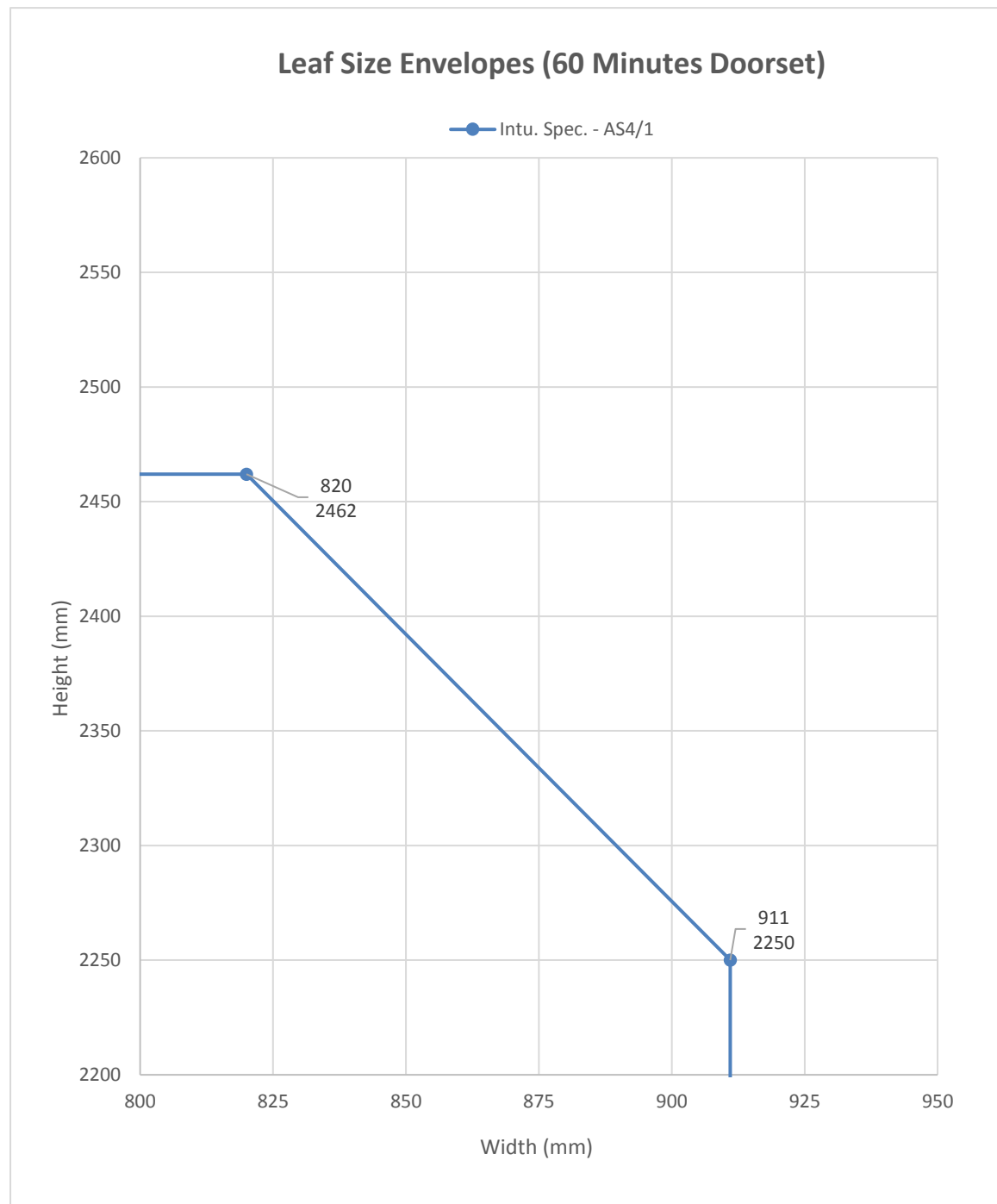
4.4.5.1 Doorset created from Leaf options 1, 2 & 3 with frame options 1, 2 or 3



Intumescent Specification for LSASD Leaf options 1,2 & 3 with frame options 1, 2 or 3			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS1/1 (PF15041, RF15073 Specimen B & DMT-DO-50-1367 & DMT-DO-50-1010))	STS FO Rigid Box Seals	Sealed Tight Solutions Ltd Pyroplex 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.
AS1/2 (PF15041, RF15073 Specimen B & DMT-DO-50-1367 & DMT-DO-50-1010)	Type 617 or Palusol Flexilodice (1.8mm thick) Pyrostrip 500 PSA	Lorient Polyproducts Ltd Odice S.A.S. Mann McGowan	Head & Jambs: 2No. 20mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.

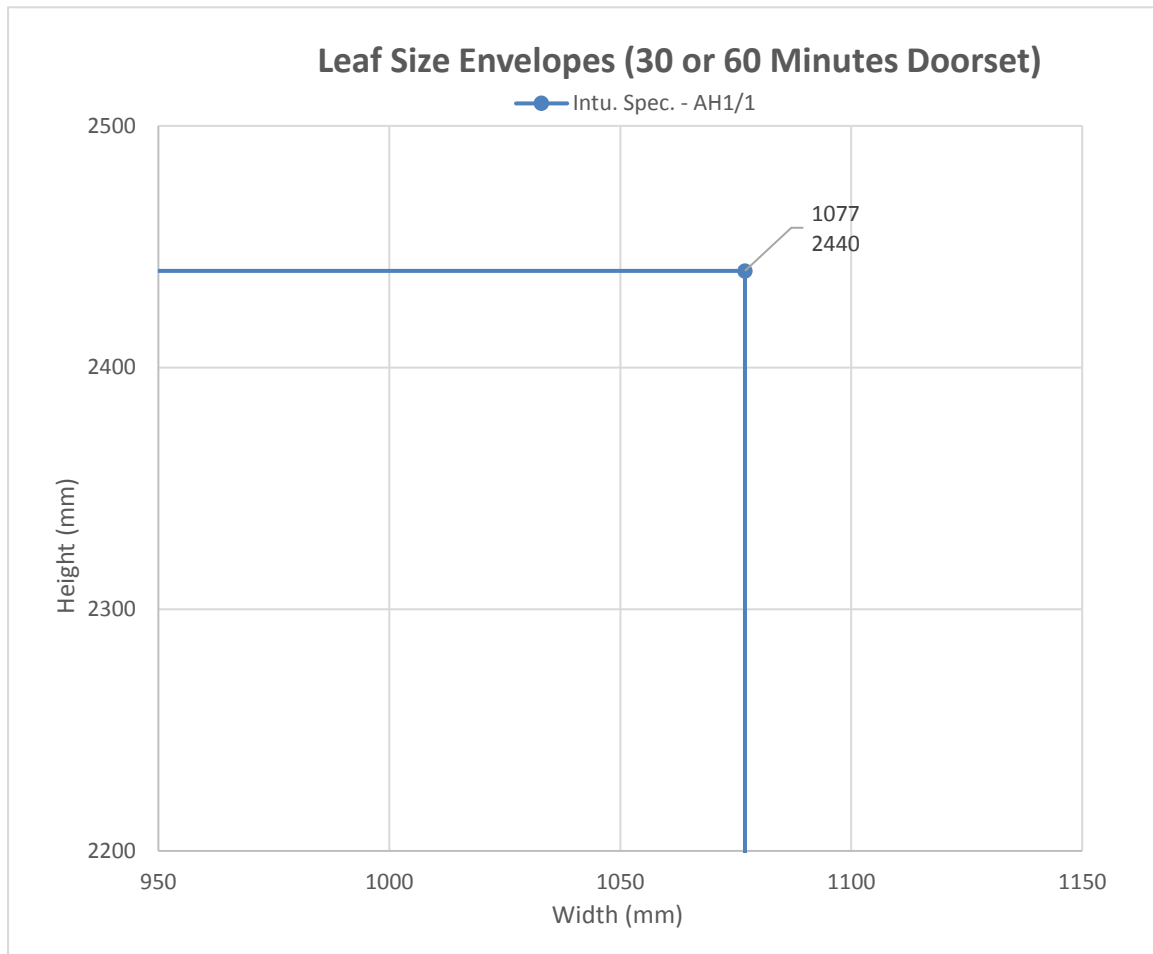
4.4.6 LSASD Configuration: 60 Minutes Integrity Performance

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



Intumescent Specification for LSASD Leaf options 1, 2 & 3 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS4/1 (PF15041, RF15073 Specimen B & DMT-DO-50- 1367)	STS FO Rigid Box Seals Type 617 or Palusol Flexilodice (1.8mm thick)	Sealed Tight Solutions Ltd Pyroplex Ltd Lorient Polyproducts Ltd Odice S.A.S.	Head & Jambs: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.

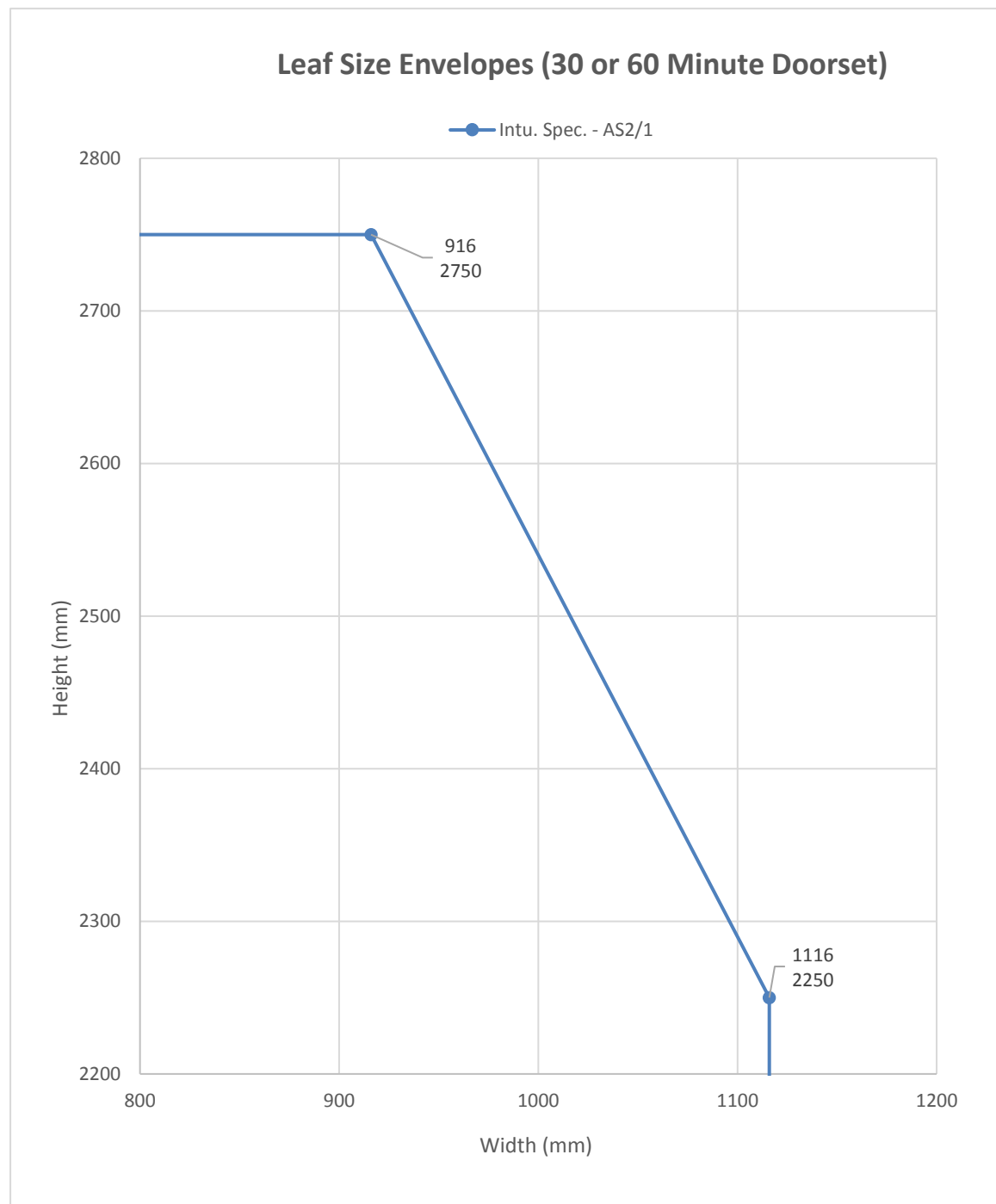
4.4.6.2 Doorset created from Leaf options 1, 2 or 3 with frame options 1 & 2



Intumescent Specification for LSASD Leaf options 1, 2 or 3 with frame options 1 & 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AH1/1 (21-004285-PR02)	Pyrostrip 500 PSA	Mann McGowan	Head & Jambs: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.

4.4.7 LSASD & ULSASD Configurations: 30 or 60 Minutes Integrity Performance

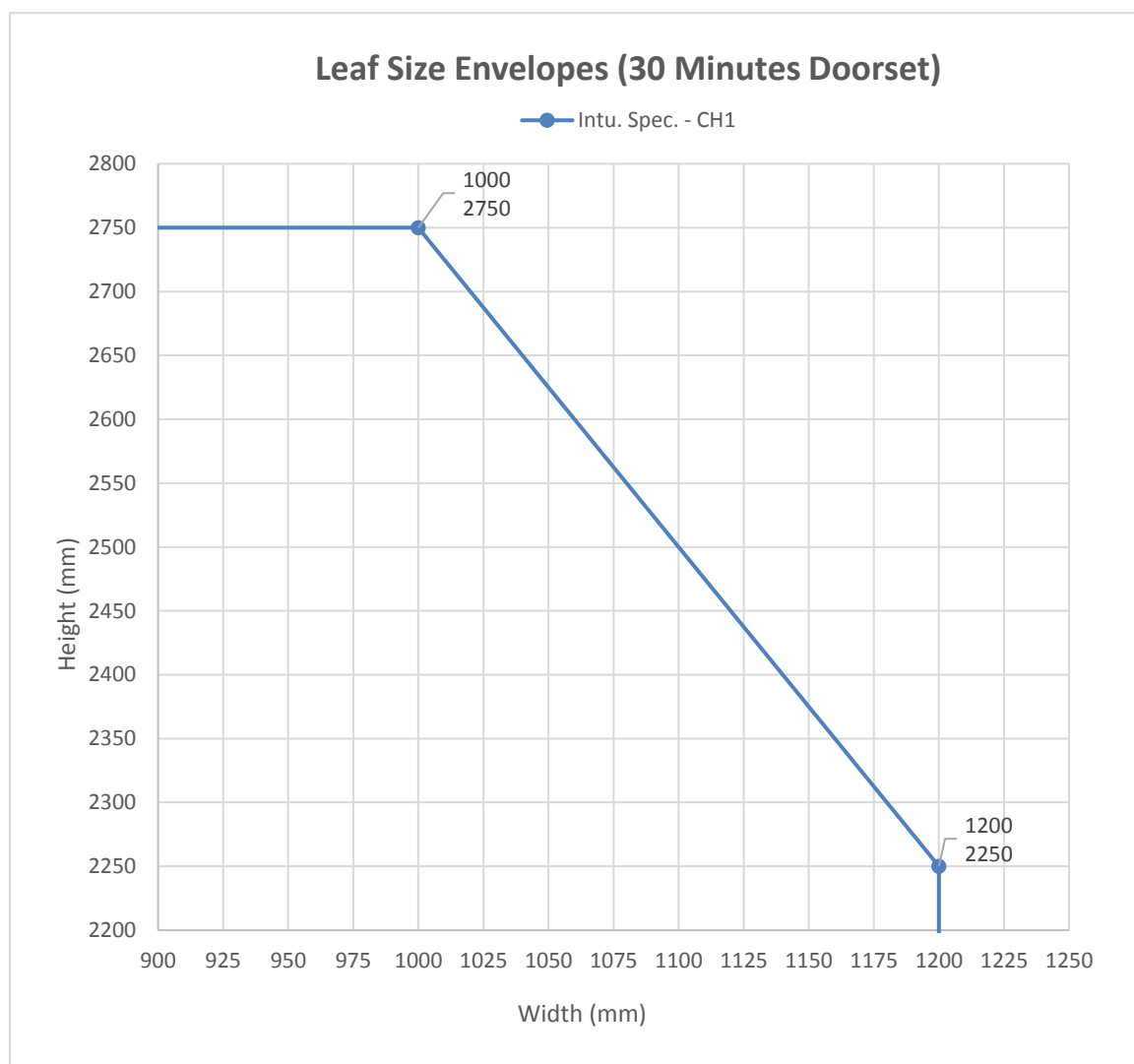
4.4.7.1 Doorset created from Leaf options 1,2 & 3 with frame options 1 or 2



Intumescent Specification for LSASD & ULSASD Leaf options 1, 2 & 3 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS2/1 (F16156 Revision A, DMT-DO-50-1367 & DMT-DO-50-1447)	Type 617 Pyroplex 8700 Rigid Box Seal FP1504 (Ref. F160057)	Lorient Polyproducts Ltd Pyroplex Ltd Athmer oHG	Head & Jambs: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal.

4.4.8 DASD: 30 Minutes Integrity Performance

4.4.8.1 Doorset created from Leaf option 2 with frame option 1



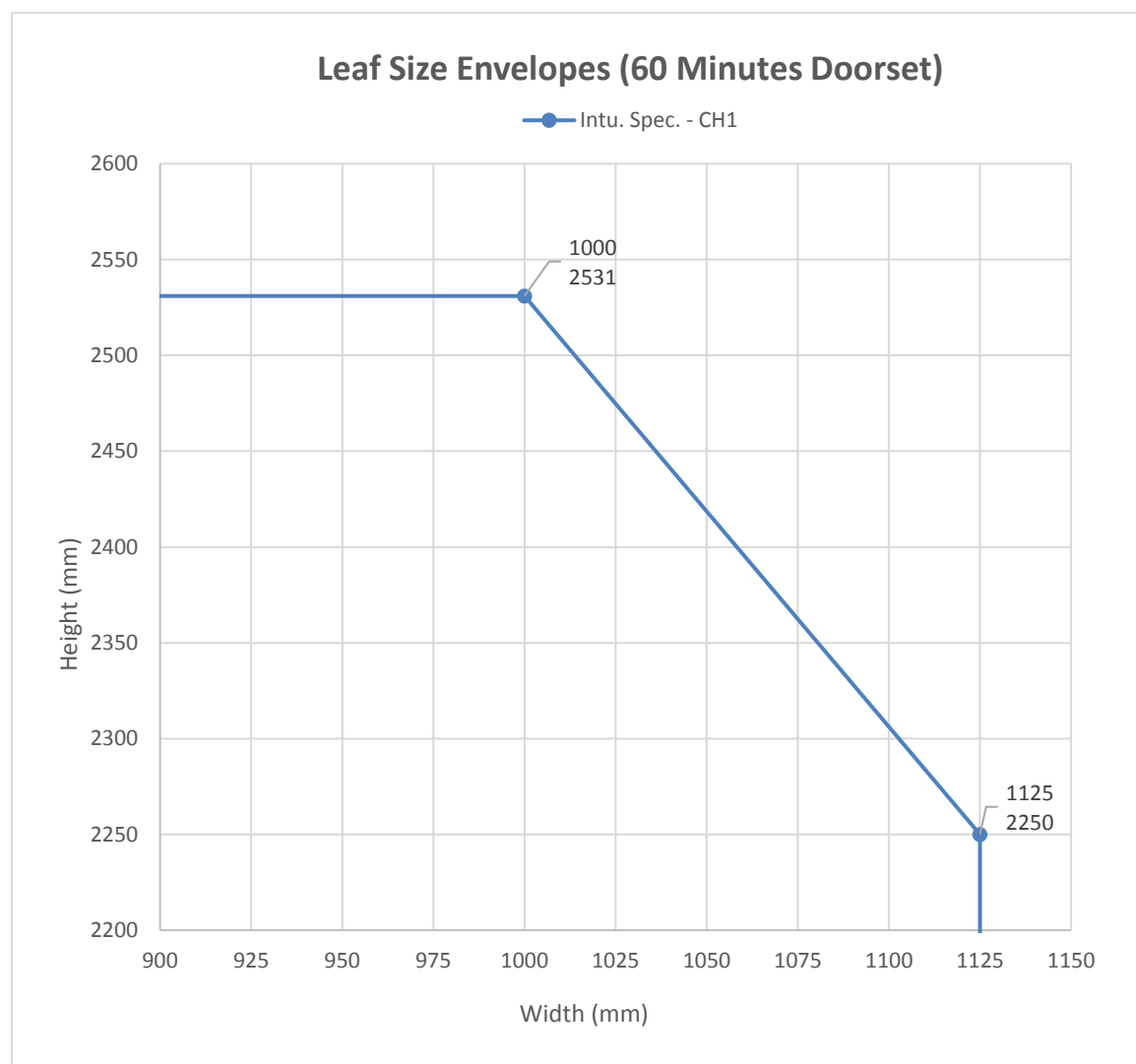
Intumescent Specification for DASD Leaf option 2 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CH1 (WF382394 Revision A AR1)	Pyroplex Rigid Box – Triple Fin (30141)	Reddiplex Ltd	Head: 2No. 15mm wide seals exposed and fitted 15mm apart – 7.5mm either side of the centreline door leaf

Note:

Refer to Section 10.7.3 for details leaf construction and pivot details and Section 7 for frame details.

4.4.9 DASD: 60 Minutes Integrity Performance

4.4.9.1 Doorset created from Leaf option 2 with frame option 1



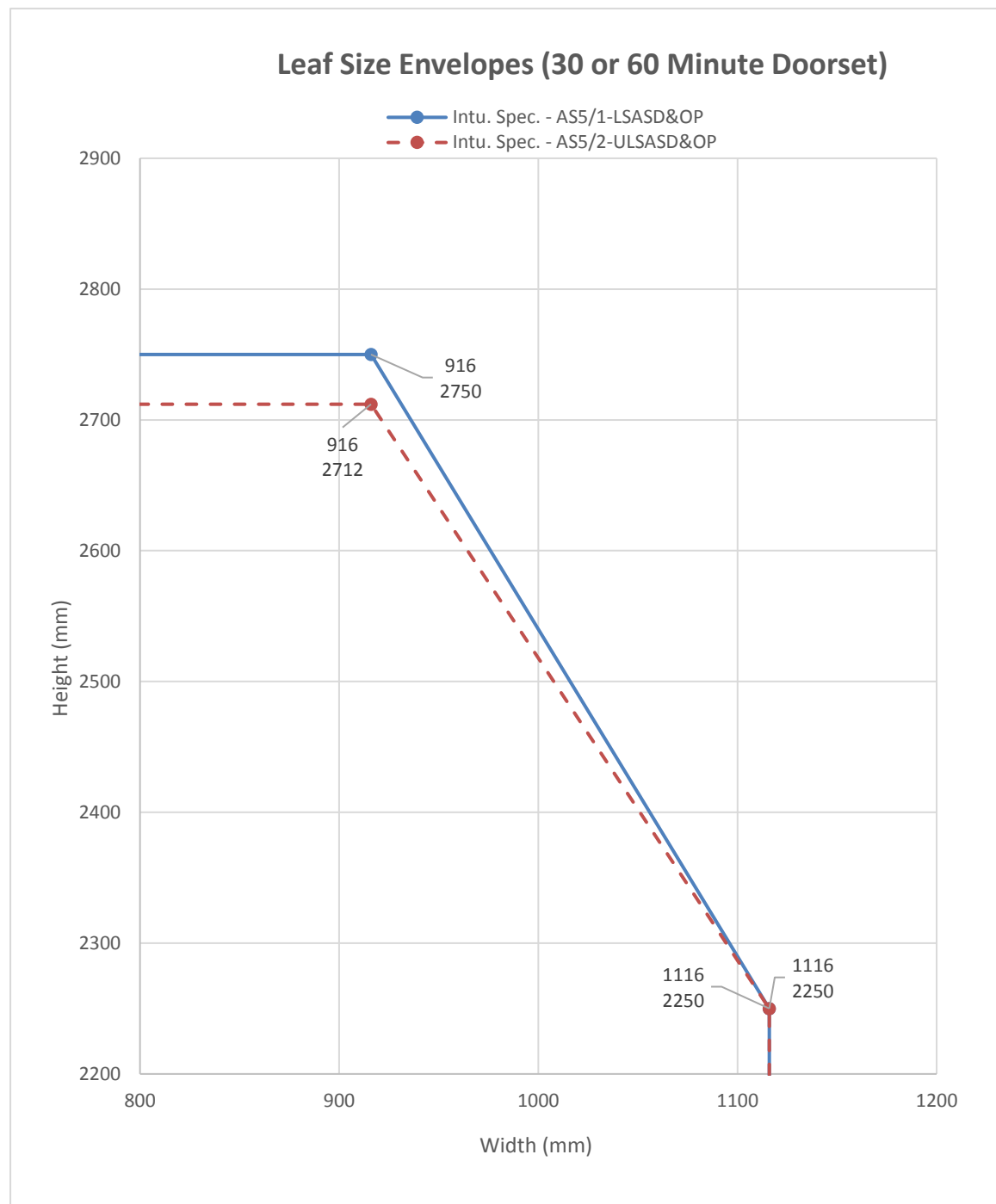
Intumescent Specification for DASD Leaf option 2 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CH1 (WF382394 Revision A AR1)	Pyroplex Rigid Box – Triple Fin (30141)	Reddiplex Ltd	Head: 2No. 15mm wide seals exposed and fitted 15mm apart – 7.5mm either side of the centreline door leaf

Note:

Refer to Section 10.7.3 for details leaf construction and pivot details and Section 7 for frame details.

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

4.4.10.1 Doorset created from Leaf options 1, 2 & 3 with frame option 1



Intumescent Specification for LSASD+OP & ULSASD+OP Leaf options 1, 2 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS5/1 (F16156 Revision A & DMT-DO-50-1367)	Type 617	Lorient Polyproducts Ltd	Head: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the bottom edge of the overpanel.
AS5/2 (F16156 Revision A & DMT-DO-50-1367)	Pyroplex 8700 Rigid Box Seal	Pyroplex Ltd	Jambs & 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.

4.4.11 LSADD Configuration: 30 Minutes Integrity Performance

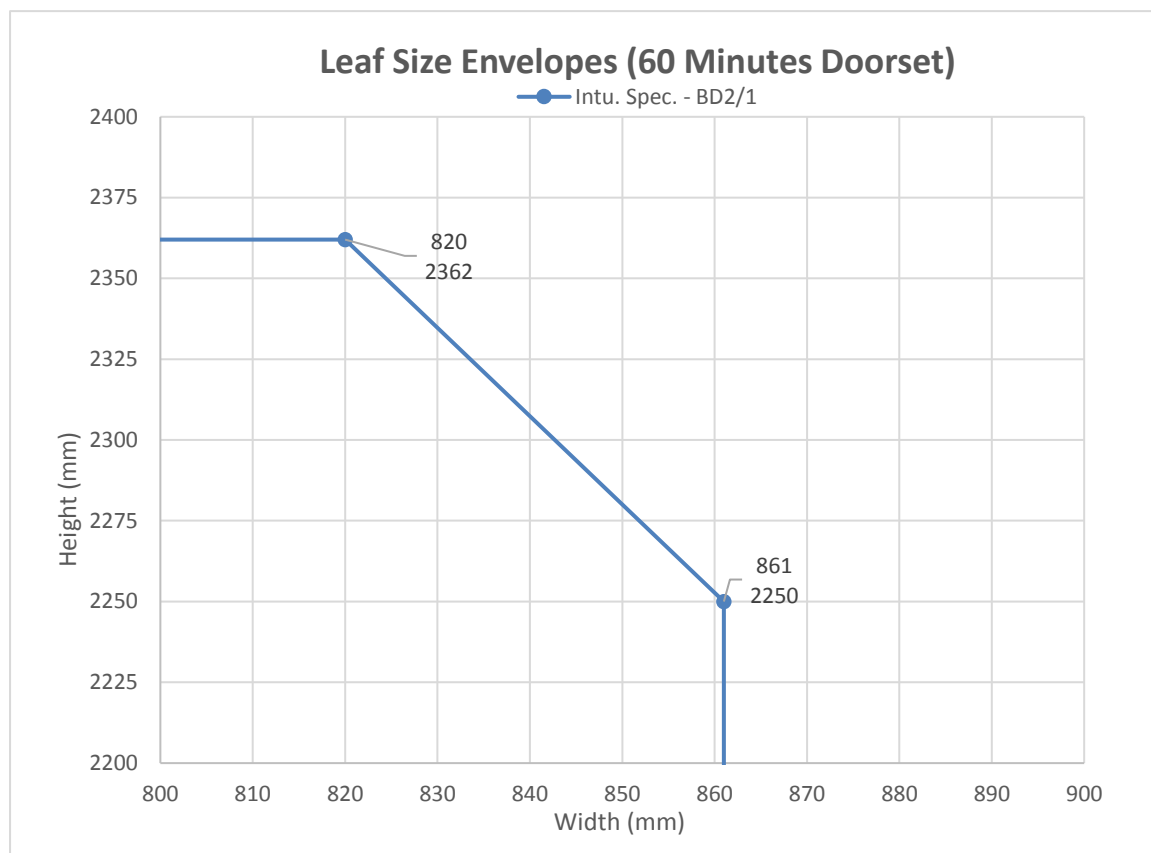
4.4.11.1 Doorset created from Leaf options 1, 2 & 3 with frame options 1, 2 or 3



Intumescent Specification for LSADD Leaf options 1, 2 & 3 with frame options 1, 2 or 3			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BD1/1 (PF15041, RF15073 Specimen B & DMT-DO-50- 1367)	STS FO Rigid Box Seals	Sealed Tight Solutions Ltd Pyroplex 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. Meeting Edges: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only
BD1/2 (PF15041, RF15073 Specimen B & DMT-DO-50- 1367)	Type 617 or Palusol Flexilodice (1.8mm thick)	Lorient Polyproducts Ltd Odice S.A.S.	Head & Jambs: 2No. 20mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf edge or frame reveal. Meeting Edges: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only

4.4.12 LSADD Configuration: 30 & 60 Minutes Integrity Performance

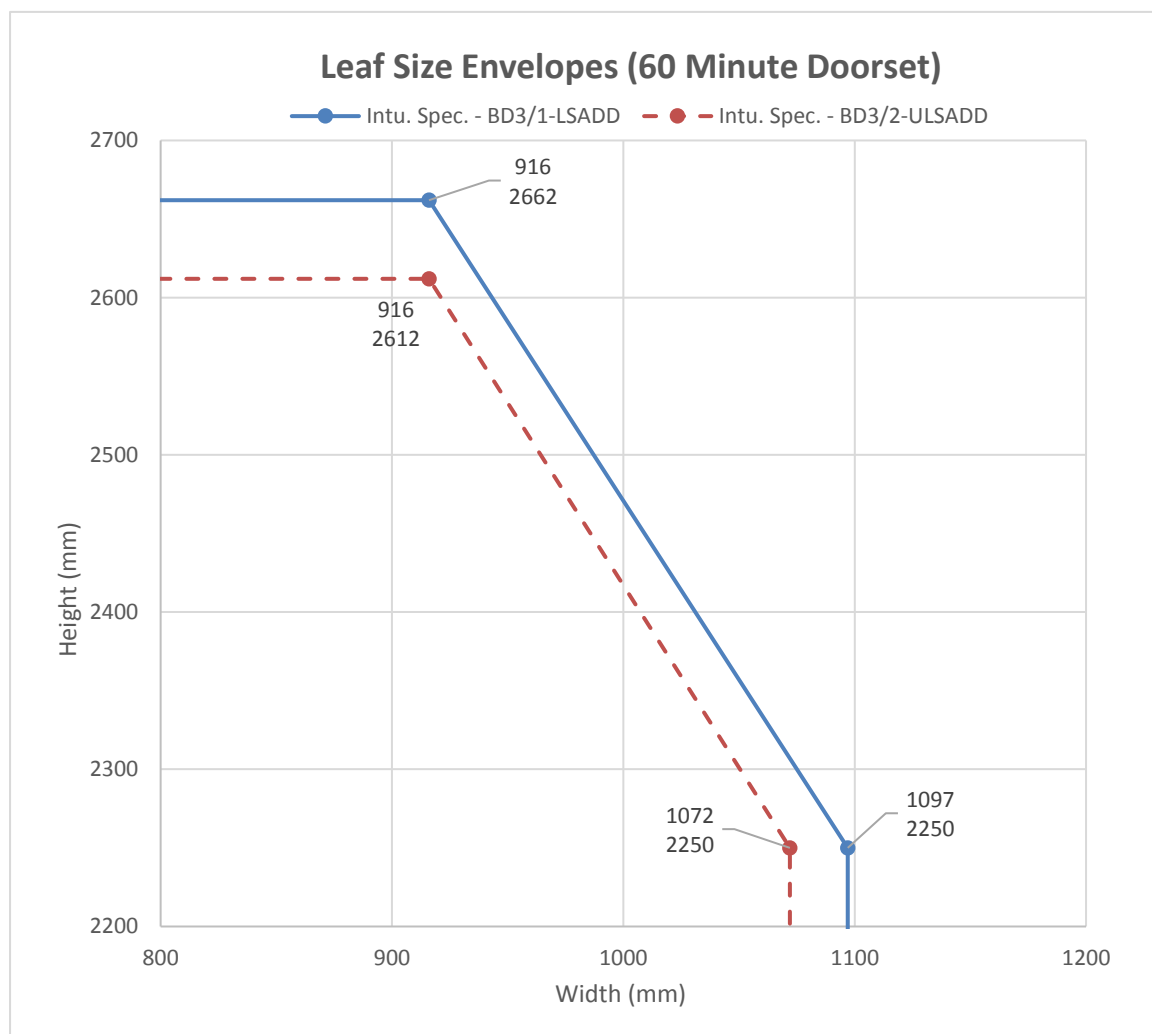
4.4.12.1 Doorset created from Leaf options 1, 2 & 3 with frame options 1 or 2



Intumescent Specification for LSADD			
Leaf options 1,2 & 3 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BD2/1 (PF15041, RF15073 Specimen B & (DMT-DO-50- 1367))	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. Meeting Edges: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only
	Rigid Box Seals	Pyroplex Ltd	
	Type 617 or Palusol	Lorient Polyproducts Ltd	
	Flexilodice (1.8mm thick)	Odice S.A.S.	

4.4.13 LSADD & ULSADD Configuration: 30 & 60 Minutes Integrity Performance

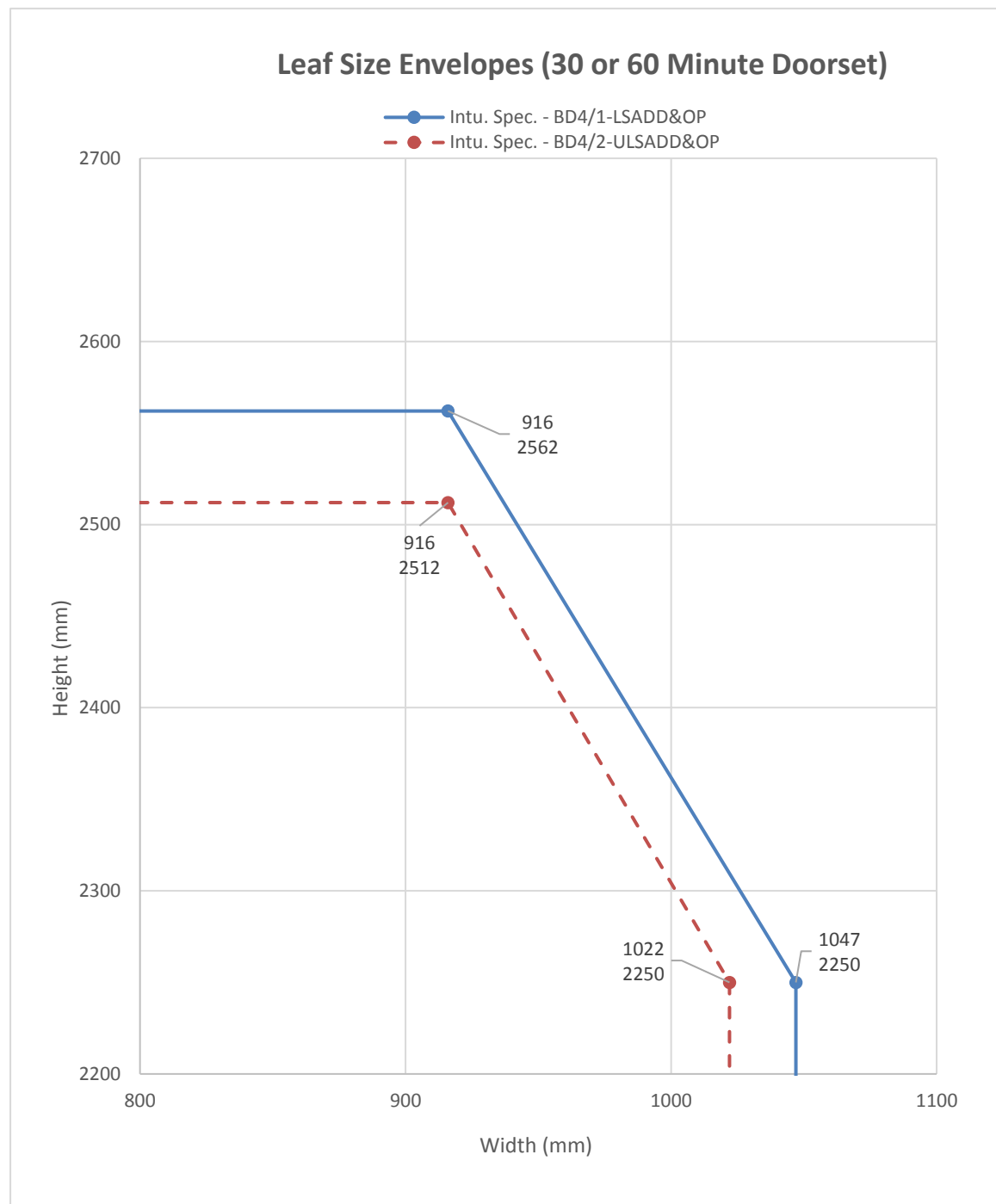
4.4.13.1 Doorset created from Leaf options 1, 2 & 3 with frame options 1 or 2



Intumescent Specification for LSADD & ULSADD			
Leaf options 1, 2 & 3 with frame options 1 or 2			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BD3/1 & BD3/2 (F16156 Revision A & DMT-DO-50-1367)	Type 617 Pyroplex 8700 Rigid Box Seal	Lorient Polyproducts Ltd Pyroplex 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. Meeting Edges: 2No. 15 x 4mm seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only.

4.4.14 LSADD+OP & ULSADD+OP Configurations: 30 or 60 Minutes Integrity Performance

4.4.14.1 Doorset created from Leaf options 1, 2 & 3 with frame option 1

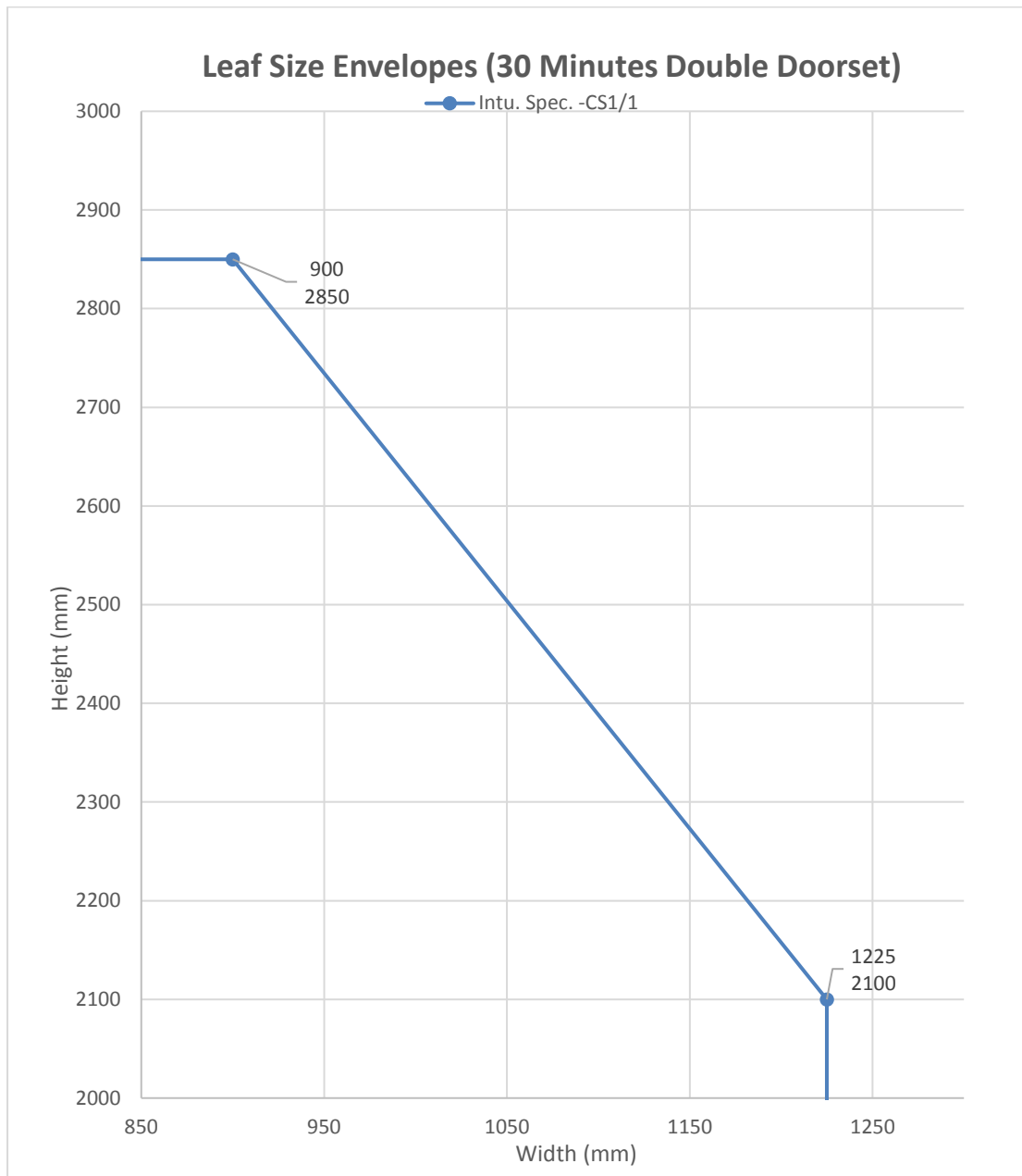


Intumescent Specification for LSADD+OP & ULSADD+OP Leaf options 1, 2 & 3 with frame options 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BD4/1 (F16156 Revision A & DMT-DO-50-1367)	Type 617 Pyroplex 8700 Rigid Box Seal	Lorient Polyproducts Ltd Pyroplex Ltd	Head: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the bottom edge of the overpanel.
BD4/2 (F16156 Revision A & DMT-DO-50-1367)			Jambs & 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. Meeting Edges: 2No. 15 x 4mm seals exposed and fitted 10mm apart - 5mm either side of the centreline in one leaf edge only.

4.4.15 CS Edge Protectors/Acrovyn Wrap

4.4.15.1 LSASD & ULSASD Configuration: 30 Minutes Integrity Performance

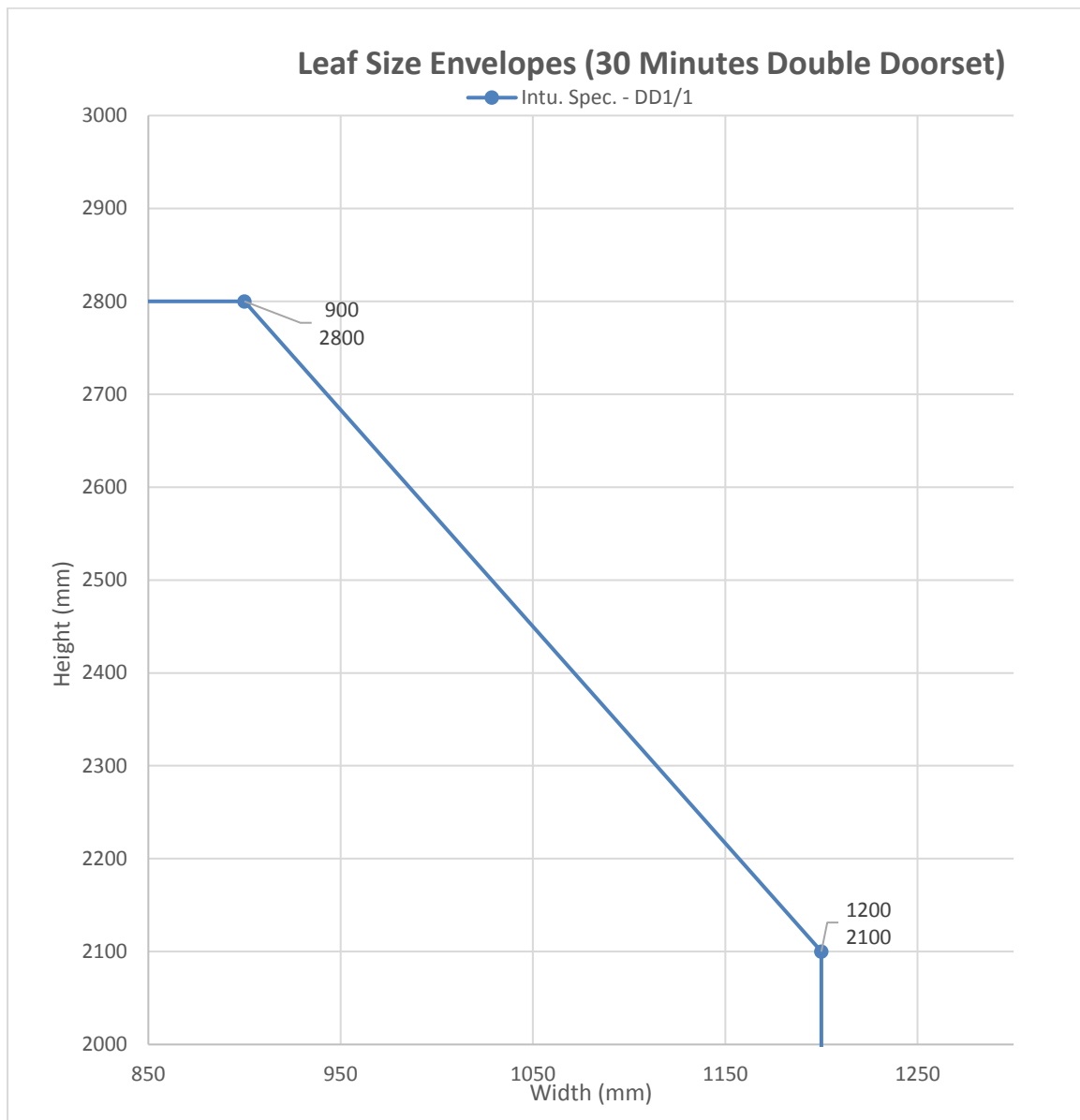
Doorset created from Leaf options 1 & 3 with frame option 1



Intumescent Specification for LSASD & ULSASD			
Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS1/1 (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.

4.4.15.2 LSADD & ULSADD Configuration: 30 Minutes Integrity Performance

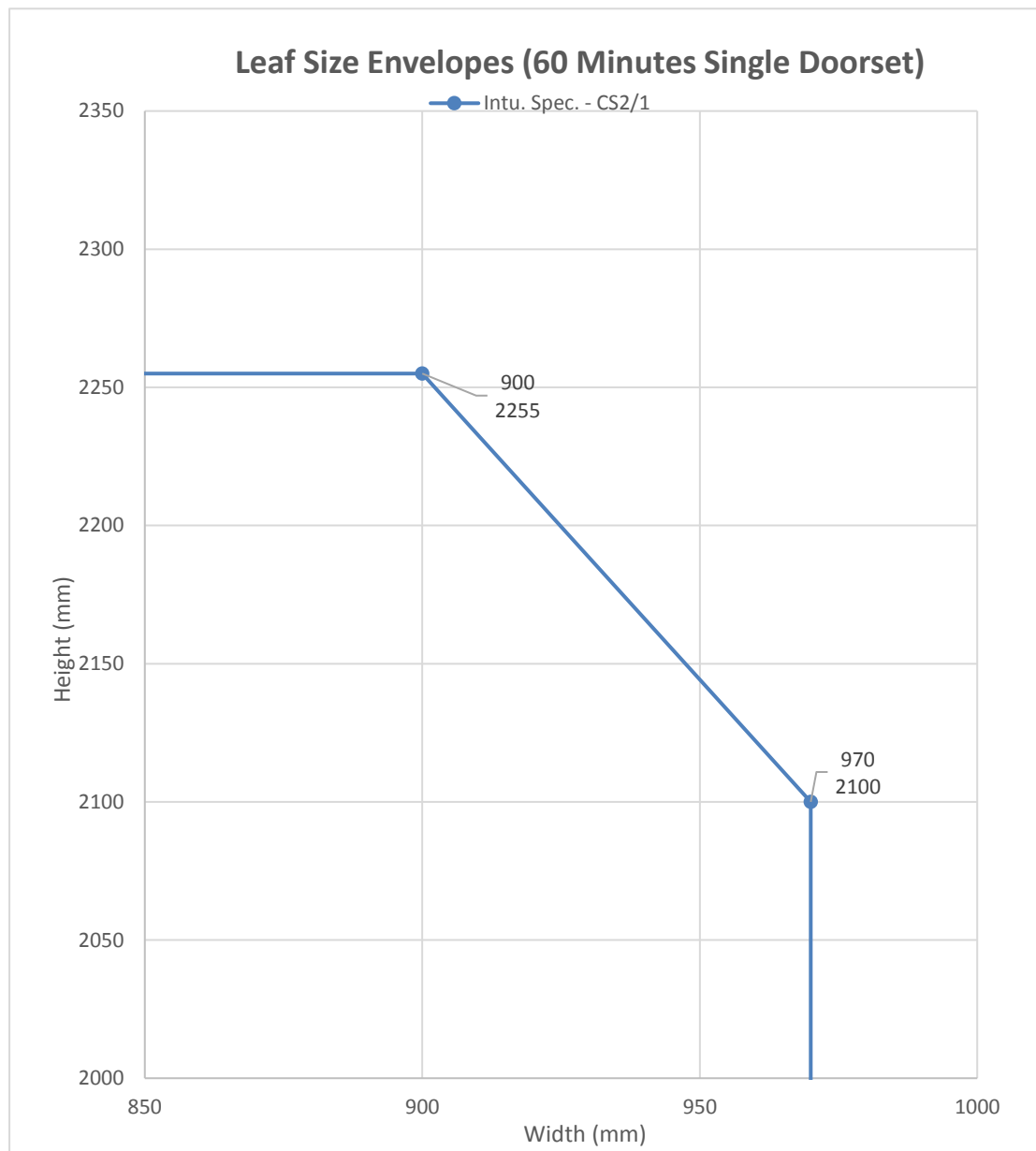
Doorset created from Leaf options 1 & 3 with frame option 1



Intumescent Specification for LSADD & ULSADD			
Leaf option 1 & 3with frame option 1			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
DD1/1 (RF11059)	Type 617	Lorient Polyproducts Ltd	Head & Jamb: 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

4.4.15.3 LSASD & ULSASD Configuration: 60 Minutes Integrity Performance

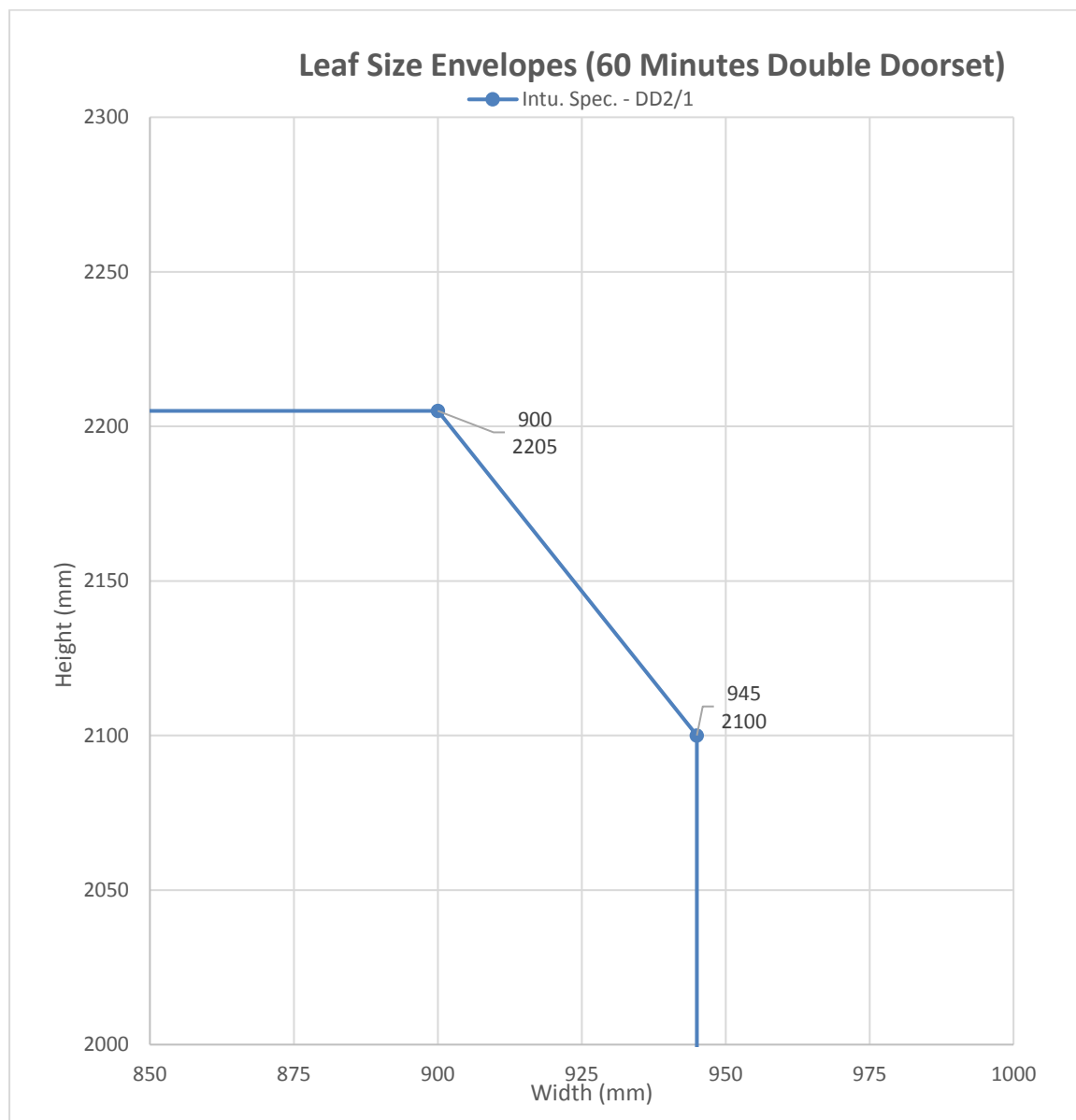
Doorset created from Leaf options 1 & 3 with frame option 1



Intumescent Specification for LSASD & ULSASD			
Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS2/1 (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.

4.4.15.4 LSADD & ULSADD Configuration: 60 Minutes Integrity Performance

Doorset created from Leaf options 1 & 3 with frame option 1

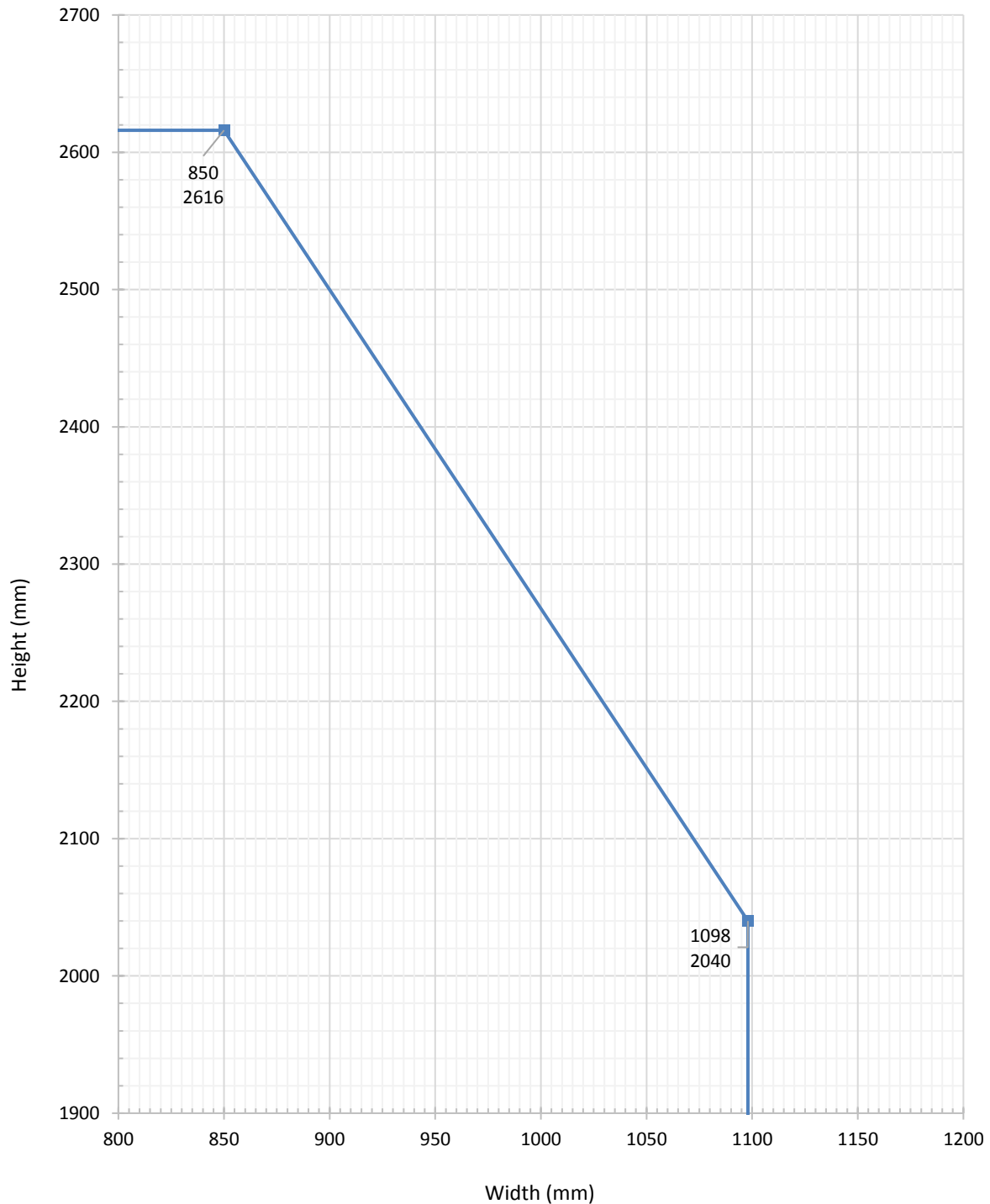


Intumescent Specification for LSADD & ULSADD			
Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
DD2/1 (RF11061)	Type617	Lorient Polyproducts Ltd	Head, Jambs & Overpanel: 1No. 15mm wide seal exposed and fitted on 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

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

4.4.16.1 LSASD & ULSASD Configuration: 30 Minutes Integrity Performance

Doorset created from Leaf options 1 & 3 with frame option 1



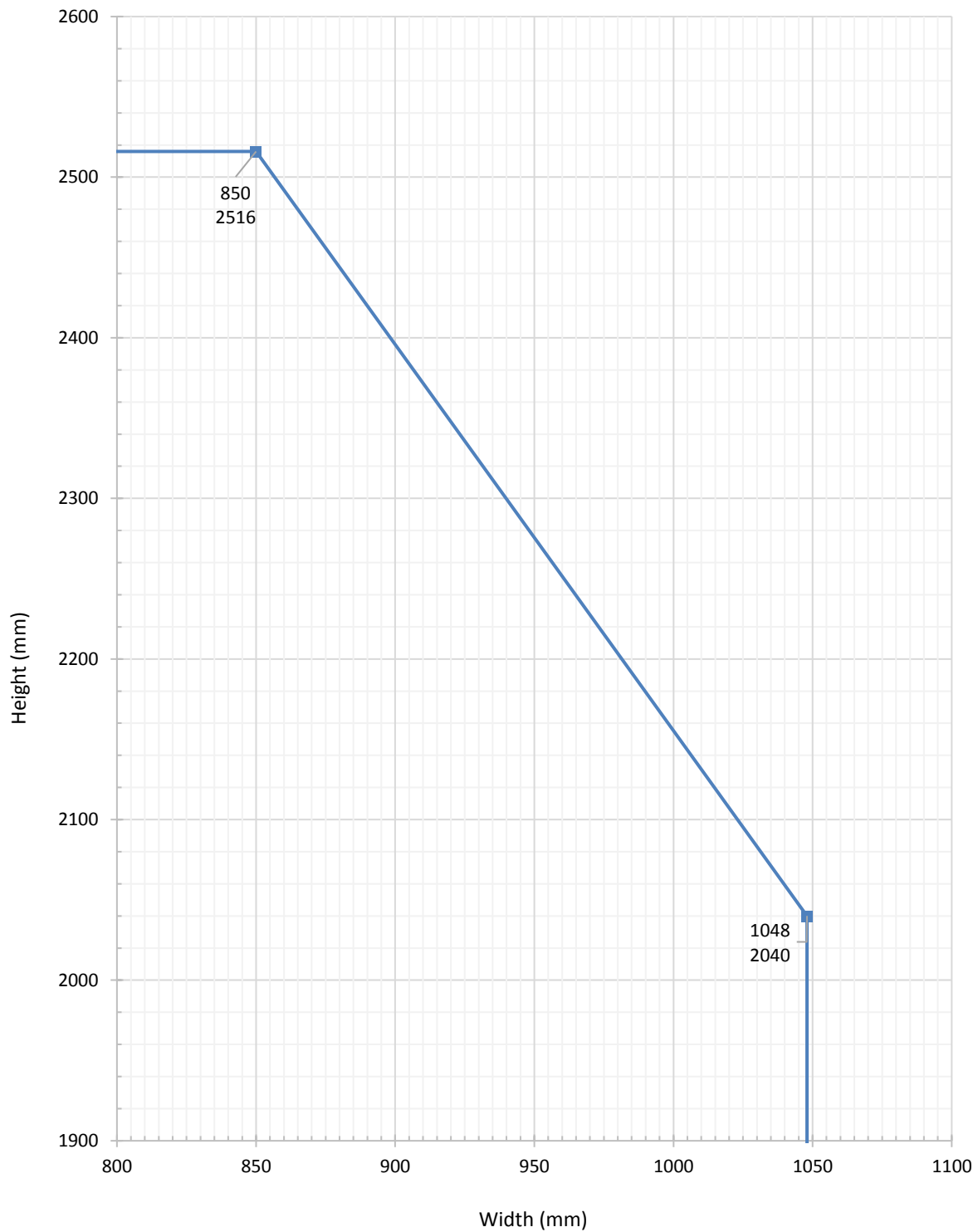
Intumescent Specification for LSASD & ULSASD Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
ES1/1 (Chilt/RF07140 Revision B Specimen A)	LP1504 Type 617	Lorient Polyproducts Ltd.	Frame or Leaf Head: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf head or frame reveal. Vertical Leaf Edges (Edge Protector): 1no. 15x4mm seal installed centrally in the edge protector ¹

Note:

1. If it is only required to fit an edge protector to one edge of the leaf (see section 5.5), the intumescent specification for the edge not fitted with an edge protector must match that given for the leaf head in the table above.

4.4.16.2 LSADD & ULSADD Configuration: 30 Minutes Integrity Performance

Doorset created from Leaf options 1 & 3 with frame option 1



Intumescent Specification for LSADD & ULSADD Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
FD1/1 (Chilt/RF07140 Revision B Specimen A)	LP1504 Type 617	Lorient Polyproducts Ltd.	Frame or Leaf Head Reveal: 2No. 15mm wide seals exposed and fitted 10mm apart - 5mm either side of the centreline in the leaf head or frame reveal. Vertical Leaf Edges (Edge Protector): 1no. 15x4mm seal installed centrally in the edge protector**

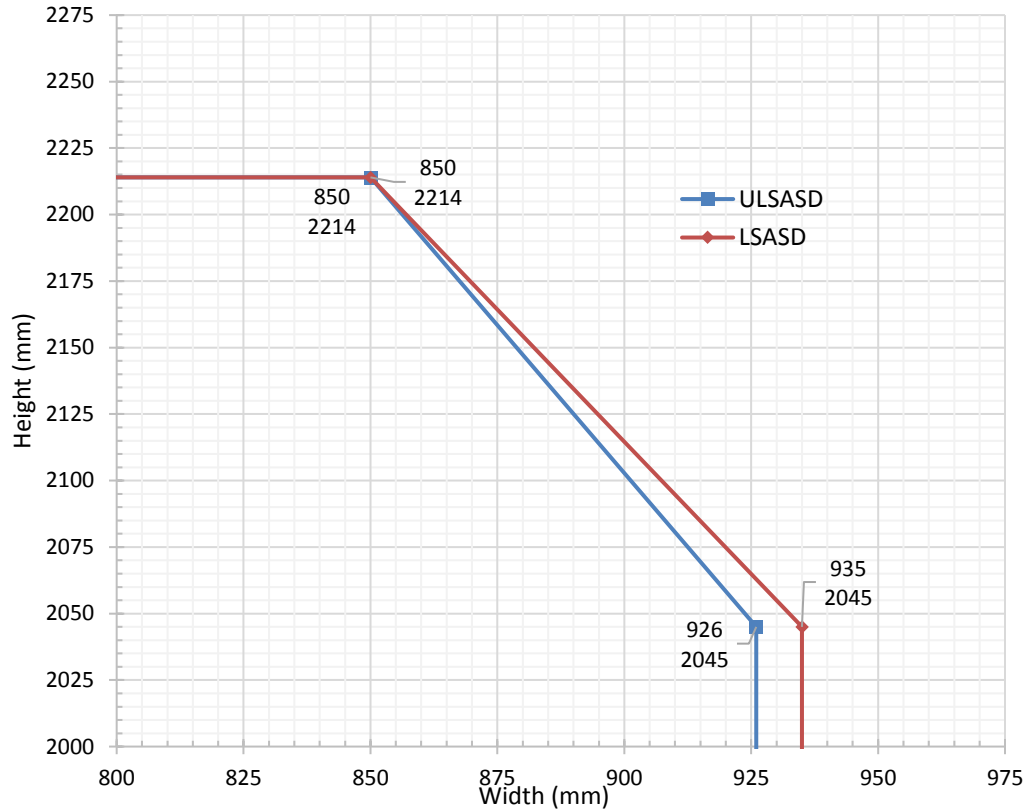
Note:

1. If it is only required to fit edge protectors to the meeting edges of the leaves (see section 5.5), the intumescent specification for the edges not fitted with an edge protector must match that given for the leaf head in the table above.

4.4.16.3 LSASD & ULSASD Configuration: 60 Minutes Integrity Performance

Doorset created from Leaf options 1 & 3 with frame option 1

Intumescent Specification ES2/1 is identical for each configuration



Intumescent Specification for LSASD & ULSASD			
Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
ES2/1 (Chilt/RF07141 Revision B Specimen A)	LP1504 & LP2004 Type 617	Lorient Polyproducts Ltd.	Frame or Leaf Head: 2no 15x4mm LP1504 seals installed centrally spaced 10mm apart. Vertical Leaf Edges (Edge Protector): 1no. 20x4mm LP2004 seal installed centrally in the edge protector ¹

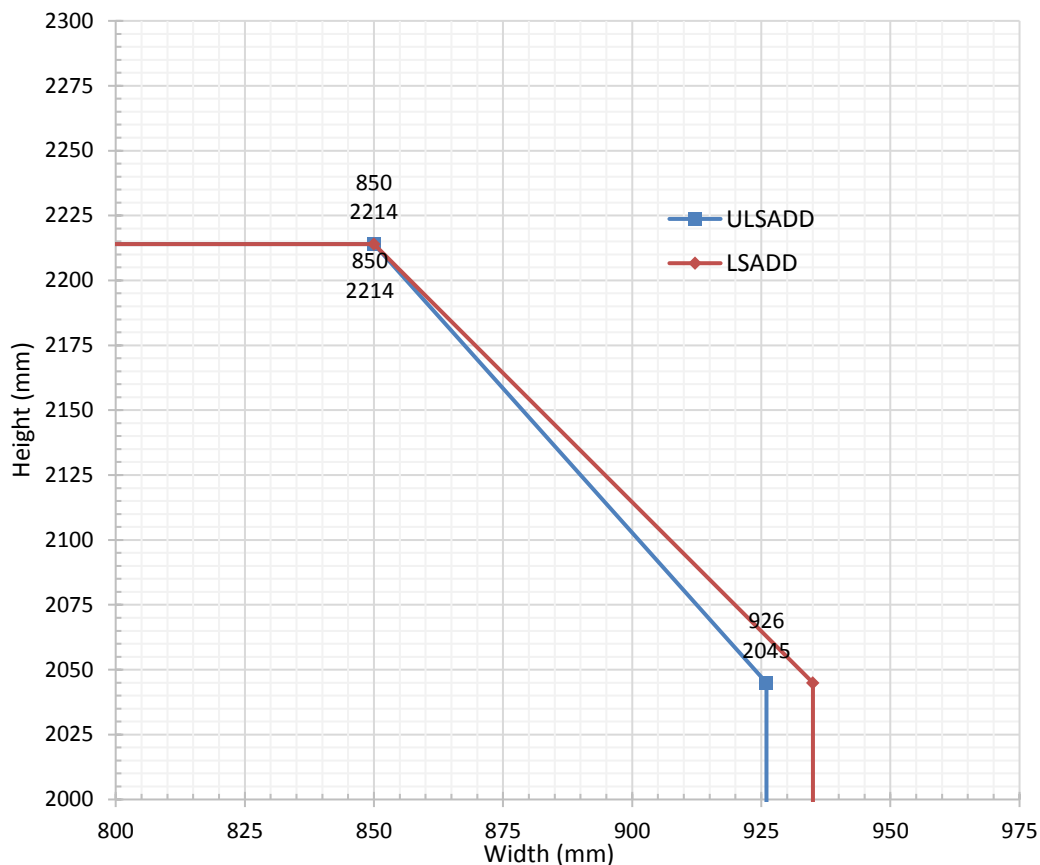
Note:

- If it is only required to fit an edge protector to one edge of the leaf (see section 5.5), the intumescent specification for the edge not fitted with an edge protector must match that given for the leaf head in the table above.

4.4.16.4 LSADD & ULSADD Configuration: 60 Minutes Integrity Performance

Doorset created from Leaf options 1 & 3 with frame option 1

Intumescent Specification FD2/1 is identical for each configuration



Intumescent Specification for LSADD & ULSADD			
Leaf option 1 & 3 with frame option 1			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
FD2/1 (Chilt/RF07141 Revision B Specimen A)	LP1504 & LP2004 Type 617	Lorient Polyproducts Ltd.	Frame or Leaf Head: 2no 15x4mm LP1504 seals installed centrally spaced 10mm apart* Vertical Leaf Edges (Edge Protector): 1no. 20x4mm LP2004 seal installed centrally in the edge protector**

Note:

1. If it is only required to fit edge protectors to the meeting edges of the leaves (see section 5.5), the intumescent specification for the edges not fitted with an edge protector must match that given for the leaf head in the table above.

5 General Description of Leaf Construction

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

This assessment considers the following design variations:

1. FireSound 54mm - 3mm MDF facings
2. FireSound 59mm - 3mm MDF facings
3. FireSound Plus54 - 3mm MDF facings

Note: MDF facings may be from either standard MDF or High Density MDF (HD-MDF) with the minimum density for both MDF types being 780kg/m³.

The leaves must be lipped as specified in section 5.4.

The minimum leaf thickness after calibration is 53 or 58mm, as appropriate (i.e. a maximum of 0.5mm from both sides).

The minimum leaf thickness after finishes applied is 54 or 59mm, as appropriate.

5.1.1 Details for leaf Makeups

At the request of Moralt AG this information has been redacted, and is held on file in confidence at Warringtonfire.

5.1.1.1 Leaf Type 1: FireSound 54mm

Notes:

1. Leaf edge inserts must always be inserted to both vertical edges and also at the head when concealed closers are specified.
2. At the request of Moralt AG further information on the core construction has been redacted, and is held on file in confidence at Warringtonfire.

5.1.1.2 Leaf Type 2: FireSound 59mm

Notes:

1. Leaf edge inserts must always be inserted to both vertical edges and also at the head when concealed closers are specified.
2. At the request of Moralt AG further information on the core construction has been redacted, and is held on file in confidence at Warringtonfire.

5.1.1.3 Leaf Type 3: FireSound Plus54

Notes:

1. Leaf edge inserts must always be inserted to both vertical edges and also at the head when concealed closers are specified.
2. At the request of Moralt AG further information on the core construction has been redacted, and is held on file in confidence at Warringtonfire.

5.2 Comparison of Door Core Designs

The testing cited in section 3 has successfully demonstrated that the core board required for the Laminesse FireSound 54mm, Laminesse FireSound 59mm Laminesse FireSound Plus 54 doorset designs may be supplied by either of two manufacturers (details of the suppliers and core make-ups are held, in confidence, at Exova Warringtonfire). Tests P1009/14-530, RF13181 and RF13225 compare the performances in the Laminesse FireSound 59mm design, tests PF15041 and RF10007 in the Laminesse FireSound 54mm and test DMT-DO-50-1010 in the Laminesse FireSound Plus 54.

Either core type may be used in the relevant Laminesse FireSound design without restriction, unless specifically excepted in the following sections.

5.3 Leaf Size Adjustment During Manufacture – all Leaf Options

Laminesse FireSound 54mm, Laminesse FireSound 59mm Laminesse FireSound Plus 54 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 in section 5.4 and requirements for blocking or inserts in section 5.4.1.
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 5.4

5.4 Timber Lippings and Inserts

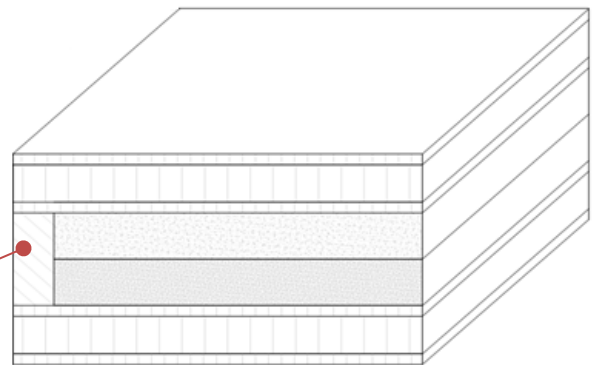
5.4.1 Timber Inserts

Door blanks are supplied by Moralt AG without inserts installed. It is the responsibility of the final doorset converter to ensure these inserts are installed where required by this report. Installation of the inserts requires trimming of the facings with the required lippings fixed concealing the inserts.

Inserts must be a 8mm thick and between 22 – 30mm wide to fit between the facings, inserts must be fitted prior to lippings and be adhered in position with PUR adhesive.

- Based on fire test DMT-DO-50-1367 which successfully demonstrated lipped edges without timber inserts, it is permitted for the inserts not to be installed where square lipping thicknesses are 20mm or greater, except where specific sections of this report (for example hardware and cableways) express that timber inserts are required.
- Inserts must be installed full height to the vertical leaf edges as illustrated below
- Inserts must also be installed in to the leaf head where recessed hardware (such as a concealed closer) is installed.
- Where Cableways are required refer to section 10.9.11 for insert details
- For double swing doorsets refer to section 10.7.3.1 for the additional top and bottom inserts.

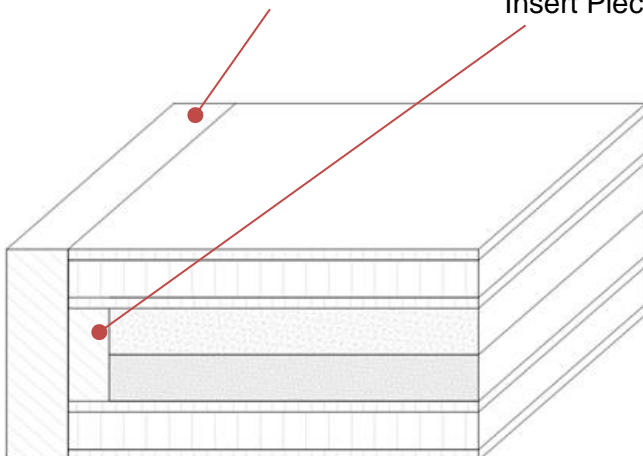
Hardwood Insert Piece
8(t) x 22 to 30(w) mm
Inserted into the leaf edge
prior to lipping and adhered
with PUR adhesive



Detail of Insert Piece in Leaf Edge

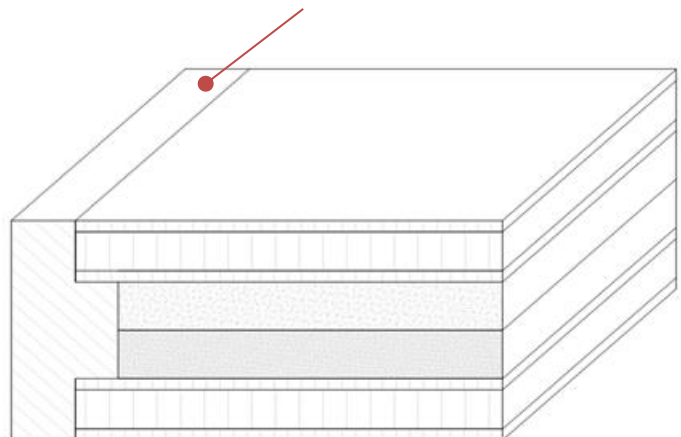
Hardwood Lipping applied
over the hardwood insert.
Refer to section 5.4

Hardwood
Insert Piece



**Detail of Separate Lipping
applied over the Hardwood
Insert Piece in Leaf Edge**

Hardwood Single Piece 'T' Shap
Lippings may be used in lieu of the
square lipping and insert piece -
Refer to section 5.4



**Detail of Single Piece T-
Shape Lipping**

5.4.2 Timber Lippings

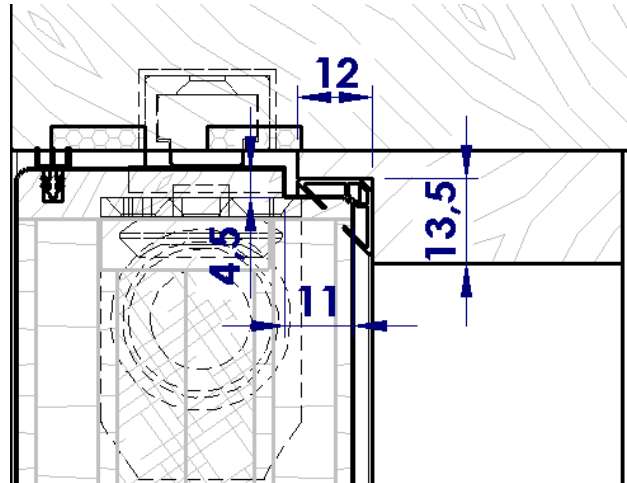
The lipping specifications for these designs of door leaf are as follows, the use of Beech (*Fagus sylvatica*) is not permitted for 60 minute applications.

Material	Leaf Type	Dimensions (mm)		Min. Density
Hardwood	1, 2 & 3	1. Square (T-shape): 13 - 25 thick T-shape section with 8 -10mm deep x 26mm wide tongue into the core leaving 8 - 15mm exposed at the edges (see section 5.4) 2. Square = 6- 25 thick. For lippings of 8mm thick or greater a maximum of 2mm profiling is permitted at the corners of lipping. (Refer also to section 7.1) 3. Overpanel Bottom Edge: 8- 25 thick with a maximum of 2mm profiling permitted at corners of lipping (Refer also to section 7.1)		640 kg/m³
	2	1. Rounded: Rounded = 13 – 18 thick with a radius matching the distance between leaf edge and floor pivot (see section 7.1.2)		
	N/a	1. Rebated	See note 6	

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. For leaf types 1 & 2 overpanels flush with the leaf heads must be lipped all edges. For leaf type 3 the bottom edge of the over panel must be lipped, the other edges may be lipped if required.
5. 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 and the diminished thickness of the lipping due to the applied chamfer is equal to or greater than the minimum lipping thickness in the table above.
6. 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 section 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.
7. 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)..

8. Based on the results of DMT-DO-50-1010, and for the top edge of leaves only – after lippings are applied an 11mm deep x 4.5mm wide rebate may be cut into the closing face of leaf provided the door stop is a minimum of 18mm thick with a coordinating rebate of 13.5mm deep x 12mm wide is applied to the frame to form a double rebated frame against a rebated leaf head detail as shown below.
 - a. *Not permitted* with flush overpanels.
 - b. Refer to Section 5.4.1 for insert requirements / lipping requirements.



5.5 PVC Edge Protectors & Post-Formed Facings

5.5.1 CS Group Edge Protectors

The Moralt FireSound 54mm and Moralt FireSound Plus 54 designs have been assessed for use with CS Group edge protectors as detailed below. CS Group edge protectors are supplied pre-formed with the approved intumescent material. The CS Group edge protectors must be used as part of a complete intumescent system and the required intumescent specification and leaf sizes are given in the relevant data sheets in section 4.4.15. CS Group must be contacted for precise installation and fixing details (www.c-sgroup.co.uk).

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

5.5.2 Post-Formed CS Group Acrovyn

It is possible to encapsulate the Moralt FireSound 54mm and Moralt FireSound Plus 54 designs by post-forming the leaf in CS Group Acrovyn, based on the supporting test evidence in Chilt/RF11059 for 30 minute applications and 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 5.4). 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 5.4). 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 4.4.15 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 4.4.15 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 (i.e. frame type 1) only, meeting the specification given in section 7.
11. Not permitted with the use of flush bolts located at the meeting edge.
12. Applied acoustic panels described in section 5.7 may abut the edge protector, but must not oversail onto the leg of the edge protector.

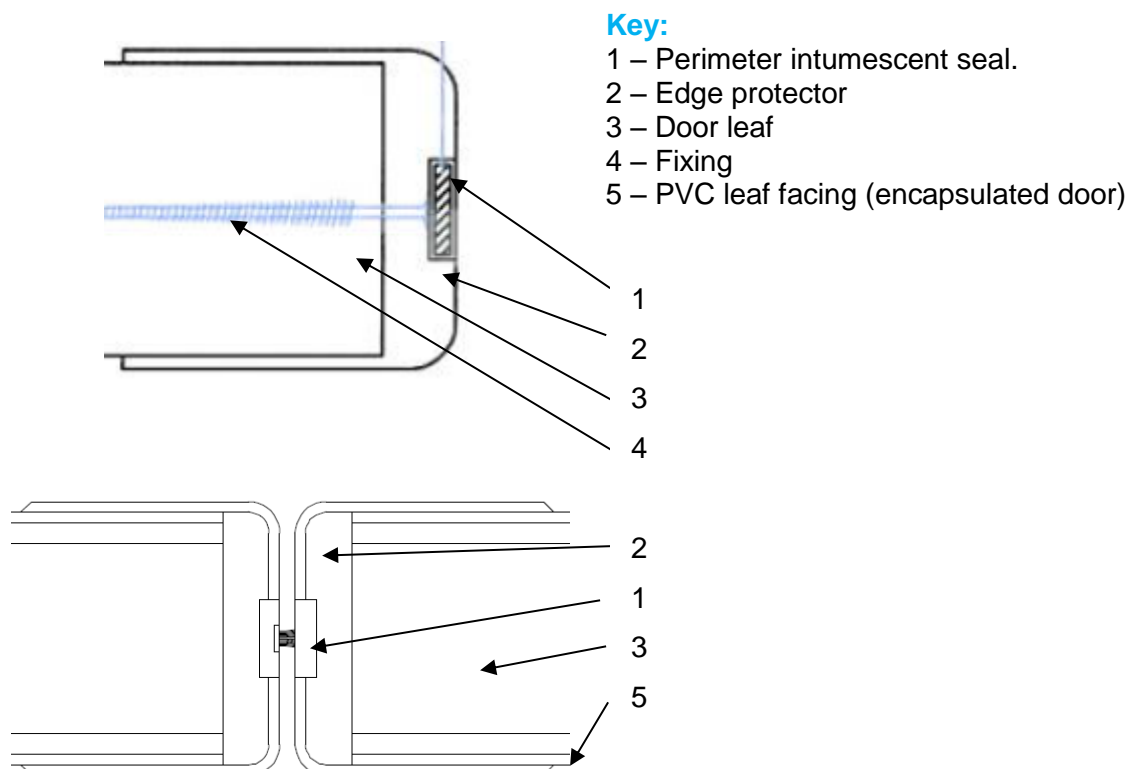
5.5.3 Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors

The Moralt FireSound 54mm and Moralt FireSound Plus 54 designs have been assessed for use with Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors as detailed below. Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors are supplied pre-formed with the approved intumescent material. The Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors must be used as part of a complete intumescent system and the required intumescent specification and leaf sizes are given in the relevant data sheets in section 4.4.16. Yeoman Shield/Lorient Polyproducts Ltd. must be contacted for precise installation and fixing details.

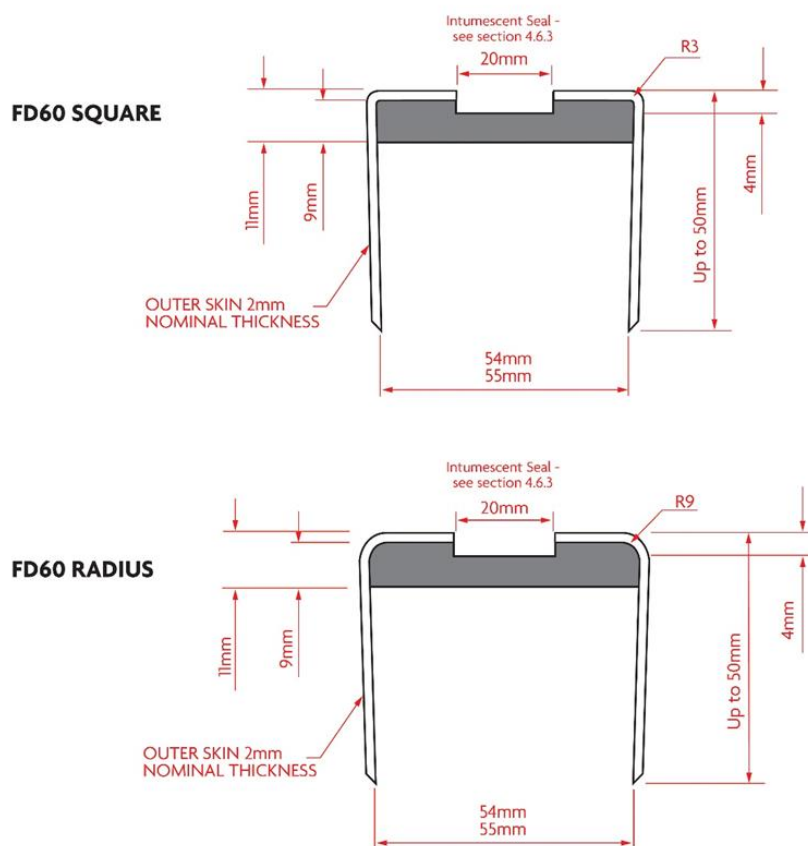
5.5.3.1 Installation Requirements

The Yeoman Shield/Lorient PVCu door edge protectors must be constructed and installed to the specification tested, as depicted below. The test evidence summarised in section 3 justifies the use of Yeoman Shield/Lorient Polyproducts Ltd. PVC edge protectors when fitted to single and double doorsets. The following requirements must also be adhered to when installing the edge protectors.

- Yeoman Shield/Lorient PVCu door edge protectors may only be fitted to the vertical edges of doorsets. It is permitted to fit the edge protectors to the closing edge and/or hanging edge of single leaf doorsets. It is permitted to fit the edge protectors to one or both hanging edges of double leaf doorsets.
- Where edge protectors are fitted to the meeting edges of a double doorset, they must be fitted to both meeting edges.
- The intumescent specification permitted for the maximum leaf size for each fire resistance performance, frame option and configuration are given in section 4.4.16.
- The PVC protectors may be used on latched or unlatched, single acting, double and single leaf doorsets.
- The edge protector must be constructed from 2mm thick PVC outer shell formed around a 9mm thick toughened PVC insert, which is wrapped around the door leaf edge via 50mm long legs. If the door leaf is encapsulated, the edge protector must travel over the PVC leaf facings as depicted in the drawing below.
- Based on the testing conducted in LOR1254 flushbolts of maximum dimensions 250(h) x 20 (w) mm
- The edge protectors must be glued into position using PVA or PU adhesive for 30 minutes and PU adhesive for 60 minutes integrity fire resistance performance. All edge protectors must be additionally fixed using 50mm long screws at a maximum 200mm centres. Double doorset configurations incorporating flush bolts must include a screw installed a maximum 50mm from the flush bolt and at the maximum centres given above. See drawing below for fixing location.



5.5.3.2 Detail Drawings – Typical 60 minute sections



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

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

These items are suitable in the following applications only:

Frame options: 1,2 & 3 (see table in section 7)

Configurations: LSASD & LSADD

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

Element	Manufacturer & Product Reference
Locks & latches	1. E *s Easi-T latch 2. Laidlaw Orbis 6105 3. Noberne Group mortice cylinder latch

Alternatively, components with the following specification, are also deemed acceptable. Note: If the supporting primary doorset assessment stipulates reduced overall dimensions for the latch/lock, then these may be used, but these smaller sizes must take precedence over the below permitted maximum sizes.

Element		Specification
Maximum forend and strike plate dimensions	30 mins	235mm high x 25mm wide x 4mm thick
	60 mins	125mm high x 25mm wide x 4mm thick
Maximum body dimensions	30 mins	165mm high x 100mm wide x 20mm thick
	60 mins	100mm high x 100mm wide x 20mm thick
Intumescent protection - Under latch forend and keep and fully encasing the entire latch body		1. 1mm thick MAP Lorient Polyproducts Ltd. 2. 2mm thick Therm-A-Line Intumescent Seals Ltd. 3. 2mm thick Therm-A-Flex Intumescent Seals Ltd. 4. 2mm thick Therm-A-Line Intumescent Seals Ltd. - additional 2 no. layers (6mm thick in total) to rear face of latch body
Materials		All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point $\geq 800^{\circ}\text{C}$

5.6 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.

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint ⁶	0.5
Timber veneers ⁴	2
Plastic or resin laminates (HPL) ⁴	2
PVC ⁵	2
Cellulosic and non-metallic foils ⁴	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 or 59mm after finishes have been applied.
3. For all options, materials must not conceal intumescent strips.
4. Materials may over sail lippings but must not return around leaf edges.
5. Materials may over sail lippings but must not return around leaf edges, except where detailed within this report using specific products.
6. Intumescent paints are not permitted.

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

5.7 Acoustic / Cladding Panels

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

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

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

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

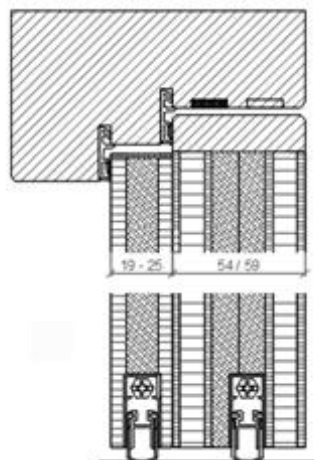
 - Applied panels up to 27mm thick

Based on the successful testing of the applied panel in fire tests DMT-DO-50-1446 & DMT-DO-50-1447 the maximum permitted weight and dimensions for applied panels up to 29mm thick must not exceed:

 - Maximum Height 2345mm
 - Maximum Width: 940mm
 - At a maximum area of: 1.92m²
 - Maximum Weight of Applied Panel: 39kg.

Note: The above permitted weight and dimensions are based on the size and recorded density of the panels within DMT-DO-50-1446 & DMT-DO-50-1447.
4. Cladding panels are permitted to be fitted only to the stop (closing) side of the door leaves only.
5. Cladding panels may be lipped if required as per the leaf lipping details in Section 5.4.2.
6. Decorative or protective facings may be applied as outlined in Section 5.6.
7. It is not permitted to use cladding panels in combination with PVC edge protectors or PVC leaf encapsulation.
8. Cladding panels are not permitted to be used with glazed doorsets
9. The panels must not be fitted under the frame stop, i.e. the panels may not be full width of the leaf on the closing face. However, where clad on panels are used, it is permitted to extend the door frame to be double rebated where the panel would be under the second stop area as below.
10. Hardware that requires either a mortice into, or a bore hole through the cladding panel and doorleaf (e.g. through fixings, door viewers, letterplates etc.) must be lined with either 1mm Interdens or graphite based intumescent material. The hardware must be approved for use within a door leaf range of 81 – 99mm and be physically able to be installed within the increased total leaf thickness.

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



5.8 Decorative Planted on Timber Mouldings – all Leaf Options

Decorative mouldings can be applied to all door leaf types providing the following criteria are adhered to:

The mouldings:

1. Are surface applied to the door.
2. Are no higher than 30mm i.e. proud of the door.
3. Are no wider than 50mm.
4. Cover no more than 20% of the door leaf area.
5. Are no closer than 80mm to the door leaf edge.
6. Are bonded into position with no mechanical fixings.
7. Are bonded using any glue which is suitable for bonding the lipping of the door.
8. May not be applied to acoustic panels as detailed in section 5.7.

5.9 Feature Grooves

Feature grooves may not be applied to the FireSound 54, FireSound Plus54 or FireSound 59 designs.

5.10 Astragal

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

- The astragal shall consist of the same material as the door frame used in doors assembly construction with at least the same or greater density.
- The astragal shall be mechanically fixed using steel screws at no greater than 250mm centres, the screws shall penetrate into the substrate by at least 15mm and no greater than $\frac{1}{2}$ the thickness of the substrate.
- The astragal shall be positioned centrally over the junction and be of minimum dimensions 50mm wide x 20mm thick.
- Astragals may be fitted concurrently with edge protectors.
- See section 8.1.2 for details when fitting an astragal to flush overpanels, which details take precedence over those above.

Other materials or dimensions of astragals are not permitted, the astragal may be encapsulated to the same specification as the leaf, detailed in section 5.5.

It has been considered possible to include the above specified astragal based on the fact that the effective rebate of the doorset design will remain unchanged and the performance reported in BMT/FEP/F16156 Revision A Specimen B. The addition of the astragal element will provide further protection at the perimeter gaps increasing the time in which failure modes may develop.

Astragals are permitted in the following designs:

- Optionally permitted at meeting edges of double doors.
- Required to be fitted at the junction between flush overpanel(s) and the top of the door leaf, see section 8.1.2.

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

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

6 Glazing within the Leaf

6.1 General

The testing conducted on Laminesse FireSound 54mm, FireSound 59mm and FireSound Plus 54 door designs has demonstrated that they are capable of tolerating glazed apertures, whilst providing a margin of over performance.

Moralt FireSound 54 (Leaf Type 1)

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

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

Moralt FireSound 59 (Leaf Type 2)

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

DMT-DO-50-1447 has been permitted to allow an increase in aperture size for the Moralt FireSound 59 (Leaf Type 2) based on the core construction similarity and fire integrity performance achieved with the tested core FireSound Plus 54 (Leaf Type 3).

FireSound Plus 54 (Leaf Type 3)

Test reference DMT-DO-50-1447 included a glazed aperture 2160mm high x 970mm wide. The doorset tested incorporated a Pattern 10 glazed aperture (single aperture with a minimal and equal stile and rail dimensions).

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

Glazing is therefore acceptable within the following parameters:

Maximum total permitted aperture – By Leaf Type				
Leaf Type	Test Report	Maximum Aperture Height (mm)	Maximum Aperture Width (mm)	Maximum Area (m ²)
1	P1009/14-530-	1.482	0.59	0.96
2	PF15288 Revision A & DMT-DO-50-1447	2160	970	2.0
3	DMT-DO-50-1010 & DMT-DO-50-1447	2160	970	2.0

Notes:

- Maximum single aperture length and width dimensions are given in the glazing tables in Sections 6.3 and 6.4.
- 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).
- 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 Aperture Location Within the Leaf

30 Minute Applications

Apertures must not be less than 120mm from top and bottom edges and 120mm from the vertical edges based on the results of DMT-DO-50-1447.

Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 80mm of core between apertures based on the results of DMT-DO-50-1010.

60 Minute Applications

Apertures must not be less than 120mm from top and bottom edges and 120mm from the vertical edges based on the results of DMT-DO-50-1447.

Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 120mm of core between apertures.

6.2 Certifire Single Pane Glass and Glazing System Options

Alternative glass and glazing systems with a Certifire certificate – valid at the date of manufacture of the doorset which has been written in accordance with Warringtonfire Testing & Certification Ltd, Technical Schedule TS25 - may be used to glaze the Laminasse FireSound 54mm, FireSound 59mm and FireSound Plus 54 door designs, subject to the following.

- The minimum thickness of glass permitted for alternative glass types is 12mm.
- The maximum thickness of glass permitted for alternative glass types is 23mm.
- Where a Certifire certificate is utilised to justify glazing the doorset, the full requirements given within that certificate for the glass and glazing system specified must be complied with.
- All parameters in section 6.1 above must take precedence over those in the supporting Certifire certificate, e.g. the glazed area, maximum height and width permitted in section 6.1 above may not be increased on the basis of the area, height and width permitted within the Certifire certificate. If the area, height and width in the proposed Certifire certificate is smaller than that in section 6.1, the smaller dimension will take precedence for the proposed glass or glazing system.
- The general requirements within the proposed Certifire certificate are still applicable, the Certifire certificate must include the option for the certificated glass and / or glazing system to be fitted within a timber / cellulosic based door leaf within a timber / cellulosic frame with a minimum leaf thickness of 54mm and a maximum leaf thickness or 59mm
- Timber aperture liners are an expressed requirement of this field of application report. It should therefore be ensured that the selected Certifire certificate permits the installation of a timber aperture liner which must be compliant with the specifications given in Section 6.1.
- Bead fixings – The required pin or screw specification as given in the supporting Certifire certificate must be used, alternatives fixing details are not permitted.

6.3 30 Minute Applications Single Pane Glass & Glazing Systems – Leaf types 1 2 & 3

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

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

The numerical figures in the main body of the table are the maximum assessed length, width and area of glass 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 above.

Glass & Glazing System Specification		30 Minute Applications Maximum Assessed Area (m ²), Height & Width (m)			
Glass Type Manufacturer	Thickness	System & Manufacturer →	1	2	3
			Therm A Glaze 60 Comprising Therm-A-Bead & ISL Therm-A-Line (54x2mm) Intumescent Seals Ltd	System 36 Plus with Lorient LX5402 (54x2mm) Palusol Liner Lorient Polyproducts Ltd	STS105GT with ST302 (30x2mm) Liner Sealed Tight Solutions
		Fire Test Reference	RF13181 & P1009/14-530-1	RF10007	PF15288 Revision A
1	Pyrobelite 12 AGC Flat Glass UK	12	PF15288 Revision A	N/a	Area: 0.92 Height: 1.92 Width: 0.576
2	Pyrostop 30-10 Pilkington UK Ltd	15	RF13181	N/a	Area: 0.31 Length: 1.33 Width: 0.34
3	Pyrostop 60-101 Pilkington UK Ltd	23	(RF10007 & P1009/14-530-1)	Area: 0.34 Height: 1.482 Width: 0.276	N/a

Note:

- For all glazing systems, an intumescent aperture liner (as detailed within the table above) must be fitted to all 4 sides of the glazing aperture in addition to the timber liner required in section 6.1:
- 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
- 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 2 - 3 are fully insulating for 30 minutes in terms of the criteria set out BS 476 Part 20: 1987.

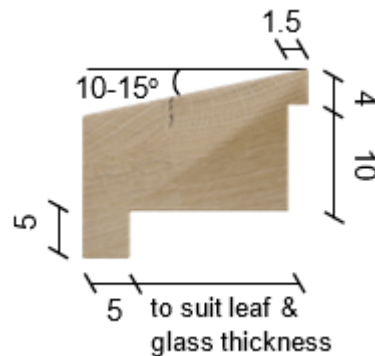
6.3.1 Glazing Beads & Installation – all Leaf Options

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.

6.3.1.1 Chamfered Bead

Permitted with the following glazing systems and glass types from the table in Section 6.3:

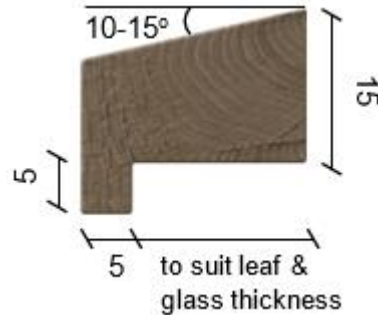
- **Glazing System 1 and Glass Types 2 & 3**



- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum.
- The glazing beads must be created from hardwood of a minimum 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 6.5.
- 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 6.3 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
- An aperture liner is always required and must meet the specification in section 6.1.

Permitted with the following glazing systems and glass types from the table in Section 6.3:

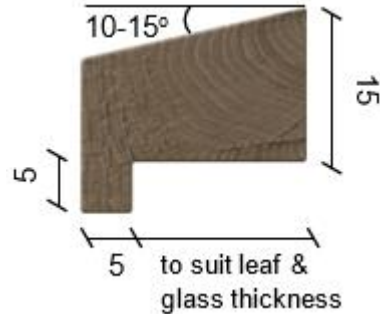
- **Glazing System 2 and Glass Type 3**



- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum.
- The glazing beads must be created from hardwood of a minimum 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 6.5.
- 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 6.3 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
- An aperture liner is always required and must meet the specification in section 6.1.

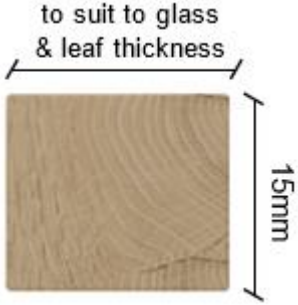
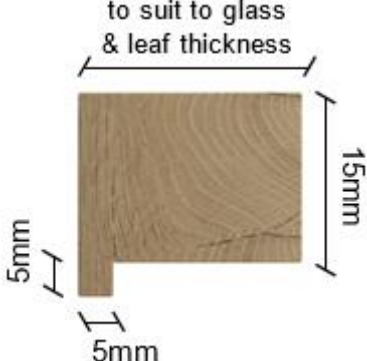
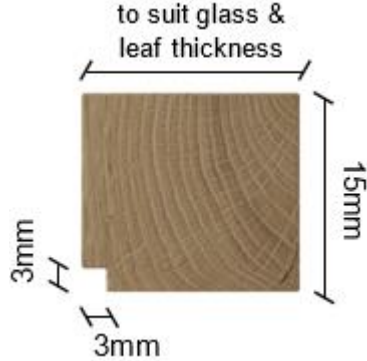
Permitted with the following glazing systems and glass types from the table in Section 6.3:

- **Glazing System 1 and Glass Types 1 & 2**



- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum.
- The glazing beads must be created from hardwood of a minimum 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 6.5 below.
- 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 6.3 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
- An aperture liner is always required and must meet the specification in section 6.1.

6.3.1.2 Square Beads

Permitted with glazing system 3 only from the table in section 6.3		
		
<ul style="list-style-type: none"> The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum. The glazing beads must be created from hardwood of a minimum 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 6.5 below. An aperture liner is always required for use with square beads meeting the specification in section 6.1. 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 6.2 for details of intumescent liner. 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 		

6.4 30 & 60 Minute Applications Single Pane Glass & Glazing Systems – Leaf types 1, 2 & 3

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

The table below specifies the maximum assessed area of glazing for each specified 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 above.

Glass & Glazing System Specification		30 & 60 Minute Applications Maximum Assessed Area (m ²), Height & Width (m)					
Glass Type Manufacturer		Thickness	System & Manufacturer →	1	2	3	4
				Therm A Glaze 60 Comprising Therm-A-Bead & ISL Therm-A-Line (54x2mm)	STS105GT with ST302 (30x2mm) Liner	Pyroglaze 60	PFG1HR 28x1.5 seals with a 53x1.25mm graphite liner.
				Intumescent Seals Ltd	Sealed Tight Solutions	Mann McGowan Ltd	Pyroplex
			Fire Test Reference	P1009/14-530-1	PF15288 Revision A	DMT-DO-50-1010 & DMT-DO-50-1447	DMT-DO-50-1367
1	Pyrobelite 12 AGC Flat Glass UK	12	PF15288 Revision A	N/a	Area: 0.92 Height: 1.92 Width: 0.576	N/a	N/a
2	Pyrostop 60-101 Pilkington UK Ltd	23	P1009/14-530-1	Area: 0.75 Height: 1.5 Width: 0.59	N/a	N/a	N/a
3	Pyranova 60 S3.0 Schott Glass	23	DMT-DO-50-1367	N/a	N/a	N/a	Area: 0.41 Height: 1.51 Width: 0.31
4	Fireswiss Foam Glas Trösch 60 -23	23	DMT-DO-50-1447	N/a	N/a	Area: 2.0 Height: 2.16 Width: 0.970	N/a
5	Pyroguard EI60 INT Pyroguard UK Ltd	23		N/a	N/a	Area: 2.0 Height: 2.16 Width: 0.970	N/a
6	T-EI60/25-3 VI Pyroguard UK Ltd	25	DMT-DO-50-1010	N/a	N/a	Area: 0.38 Height: 1.49 Width: 0.29	N/a

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 2 - 6 are fully insulating for 30 minutes in terms of the criteria set out BS 476: Part 20: 1987
4. Glass types 2 - 6 are fully insulating for 60 minutes in terms of the criteria set out BS 476: Part 20: 1987

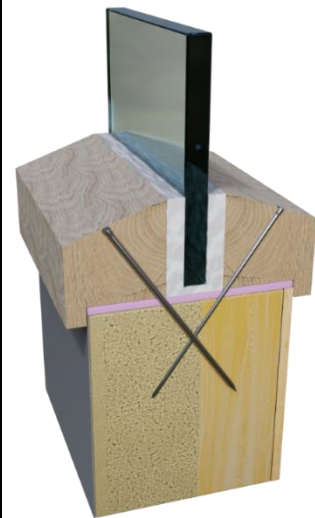
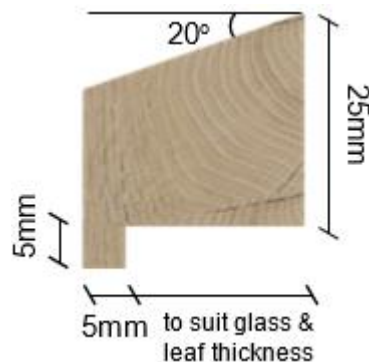
6.4.1.1 Glazing Beads & Installation – all Leaf Options

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.

6.4.1.2 Chamfered Bead

Permitted with the following glazing systems and glass types from the table in Section 6.4:

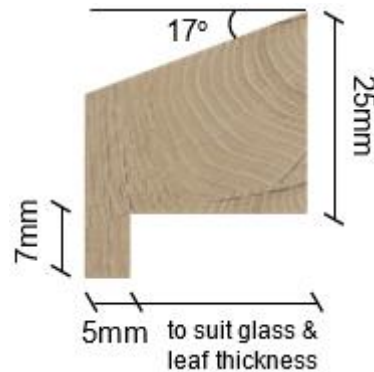
- **Glazing System 1 and Glass Type 2**
- **Glazing System 3 and Glass Types 4, 5 & 6**



- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum.
- The glazing beads must be created from hardwood (not Beech *fagus species*) of a minimum 640kg/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 6.5.
- 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.
- An aperture liner is always required and must meet the specification in section 6.1.

Permitted with the following glazing systems and glass types from the table in Section 6.4:

- **Glazing System 2 and Glass Type 1**


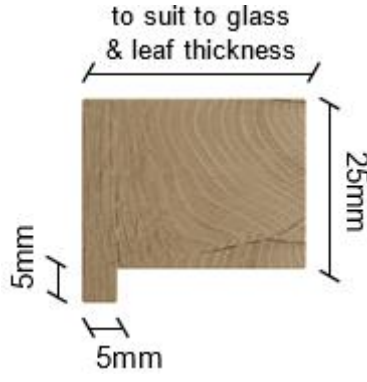
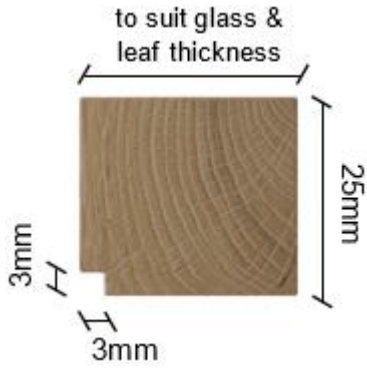


- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum.
- The glazing beads must be created from hardwood (not Beech *fagus species*) of a minimum 640kg/m³ density.
- Glazing beads must be retained in position with 50mm long steel 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 6.5.
- 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
- An aperture liner is always required and must meet the specification in section 6.1.

6.4.1.3 Square Beads

Permitted with the following glazing systems and glass types from the table in Section 6.4:

- **Glazing system 1 with Glass Type 2**
- **Glazing system 2 with Glass Type 1**
- **Glazing system 3 with Glass Types 4, 5 & 6**

		
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- The above detailed bolection may be increased in thickness and height if required, with the dimensions shown being the minimum.
- The glazing beads must be created from hardwood of a minimum 640kg/m³ density.
- Fixings for Glazing Systems 1 and 2:
 - 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.
 - 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 6.5.
- Fixings for Glazing System 3:
 - Glazing beads must be retained in position with 60mm long steel pins or 50mm long No. 6-8 screws, inserted at 15° to the vertical.
 - Must be at 150mm maximum centres and no more than 50mm from each corner.
- An aperture liner is always required for use with square beads.
- 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

6.5 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:

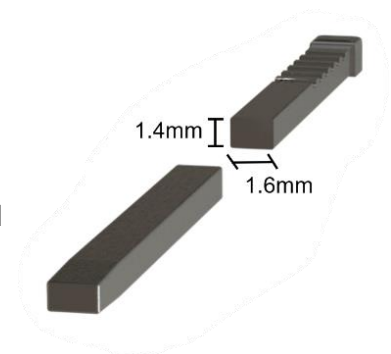
- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.03mm^2 .
- Minimum linear dimension of 1.6mm in any direction, see figure below. The maximum pin diameter or any linear dimension may be no greater than 2.0mm.



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 2.24mm^2 .
- Minimum linear dimensions as shown in the figure.
- The 1.6mm dimension is predominately oriented perpendicular to the glass, where possible.
- The maximum pin diameter or any linear 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 Frame Material Details

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

Frame Type	Material	Minimum Section Size (mm)	Minimum Density (kg/m ³)	Operation (Action)	Acceptable Leaf Type
1	Hardwood	Frame: 70 (d) x 32 (w) (excluding stop) Stop: 12 (h) (integral or planted on) ⁶	640	Single Action	1, 2 & 3
		Frame: 100 (d) x 32 (w) (rear of frame to bottom of scallop) Frame Head: 100 (d) x 44 (w)	640	Double Action	2
2	WoodEx Hardwood ³	Frame: 70 (d) x 32 (w) (excluding stop)	640	Single Action	1, 2 & 3
3	WoodEx Softwood ³	Stop: 15 (h) (integral or planted on)	510	Single Action	1, 2 & 3

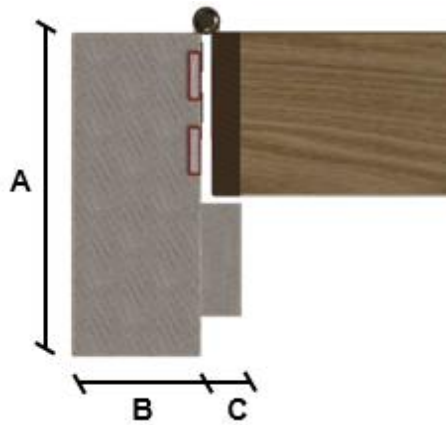
Notes:

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 section 3, WoodEx Redwood (frame type 3) may only be used for 30 minute applications.
4. 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.
5. If the doorset features a transomed overpanel, the door frame must be hardwood (not WoodEx frames – frame types 2 or 3) with a minimum section of 70mm x 32mm and of the minimum density stated above.
6. Where concealed closers are installed, the door frame stop must be increased in thickness to the dimensions given in Section 10.7.2.
7. If the doorset features a flush overpanel, the door frame must be hardwood (not WoodEx frames – frame types 2 or 3) 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.

Door frame joints must utilise one of the 4 methods depicted in section 7.2. All methods require mechanical fixing with the appropriate length steel screws or ring shank nails.

7.1.1 Standard frame detail – Frame Type 1, 2 & 3

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 5.4.



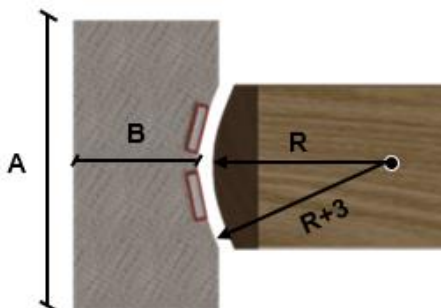
- A: Frame depth = 70mm minimum
- B: Frame thickness = 32mm minimum
- C: Stop height = 12 (Hardwood) or 15mm (WoodEx) minimum

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

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

7.1.2 Scalloped frame detail – Frame Type 1 Only

The diagram below shows detail of the scalloped frame construction hanging edge only. When using scalloped frames for double acting doorsets, the groove(s) for the specified intumescent strip(s) must be as defined within section 4.5. Lipping dimensions must comply with section 5.4.

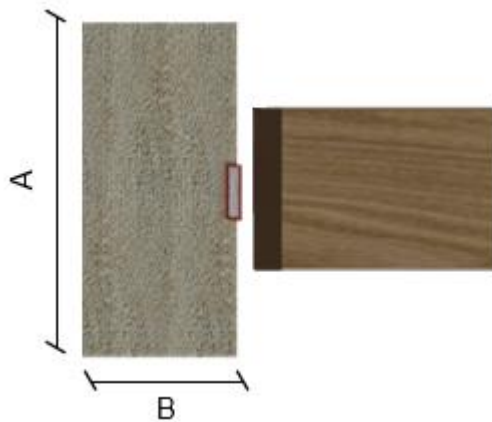


- A: Frame depth = 100mm minimum
- B: Frame width = 32mm minimum
- R: Radius from floor spring or pivot

The face of the leaf must be a minimum of 20mm from either face of the frame, essentially the door leaf is to be centralised within the minimum frame section depth.

7.1.3 Square frame detail for double acting doorsets – Frame Type 1 Only

The diagram below shows detail of the square frame construction for the closing edge of a double acting doorset and frame head.



Closing (Lock Jamb)

A: Frame depth = 100mm minimum

B: Frame width = 32mm minimum

Frame Head (to accommodate pivots)

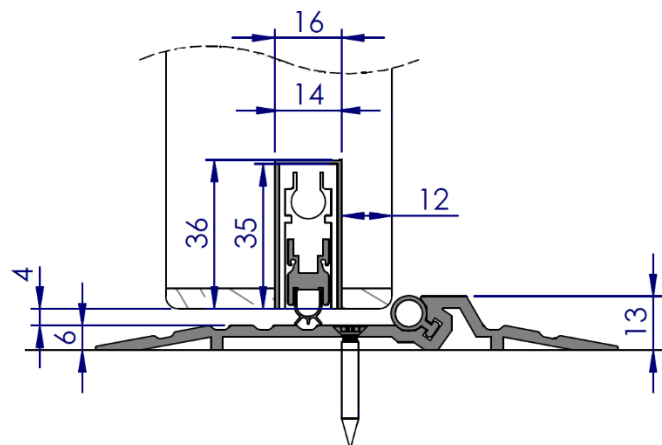
A: Frame depth = 100mm minimum

B: Frame width = 44mm minimum

7.2 Aluminium Threshold Strips

The ASSA Abloy LAS4014Si has been successfully tested within fire test DMT-DO-50-1446 and is permitted to for use with the following limitations:

1. Suitable for single leaf doorsets only.
2. The threshold plate must be used in conjunction with the ASSA Abloy / Lorient LAS8001 drop seal as tested within DMT-DO-50-1446
3. The aluminium threshold must be cut between the frame jambs. It is not permitted for the threshold to be fixed to, or run under the frame jambs.
4. The aluminium threshold must be fixed to the floor with a minimum of 3 No.Ø3.5x30mm screws, set 50 to 75mm away from the frame jambs and spaced a maximum of 225mm apart.
5. A bead of intumescent mastic must be run underneath the threshold prior to fixing in position.
6. The maximum threshold gap between the finished floor and bottom of the door leaf is 10mm (as tested). This provides a 4mm gap between the bottom of the doorleaf and the threshold plate.



7.3 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.



Double Rebated Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint



Trenched or Half Lapped Joint

Approved door frame jointing options

7.4 Decorative Facings – All Frame Options 1, 2 and 3

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

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

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint ³	0.5
Timber veneers	0.7

Notes:

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

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

7.4.1 CS Group Acrovyn

Based on the evidence generated in IF13094 and IF13095 Revision A as cited in section 3, 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 4.4.15 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 4.4.15 for maximum permitted leaf sizes.
4. The maximum thickness of CS Group Acrovyn used must be 2mm, as per the test evidence.

8 Overpanels

8.1 General

Based upon the available test evidence, referenced BMT/FEP/F16156 Revision A Specimen B, 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).
- Maximum overall height of the doorsets assembly must not exceed 2950mm

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 7.3). 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 4.4 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 reveals.

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 (leaf type 1 & 3) have been successfully tested in report reference BMT/FEP/F16156 Revision A Specimen B and DMT-DO-50-1367.

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 (leaf type 1, 2) may be used and must be lipped on all edges.
- Solid flush overpanels of the same construction as the door leaf / leaves (leaf type 3) require lipping to the bottom edge of the door leaf only , all edge may be lipped if required.
- 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
Hardwood Inserts	

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.

Where an item of hardware is not covered by the scope of a relevant harmonised or designated standard, and cannot therefore be UKCA or CE Marked, inclusion of the hardware is only permitted with this doorset design if it meets the specific requirements of the appropriate section within this Field of Application (i.e. supporting test evidence and specification). All items of hardware must be fitted in accordance with requirements of this assessment.

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 Timber Inserts for Hardware

Where items of hardware are rebated into the leaf edges, hardwood inserts (or where permitted thicker lipings) must be installed as detailed in Section 5.4.1.

10.2 Intumescent to Hardware

The intumescent materials used to protect hardware that have been tested and assessed for this doorset design are detailed below. Note that any one of the product/manufacturer options listed in the table may be used in the specific application noted. However, only 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 4.4. Intumescent specifications apply equally to 30 and 60 minute applications unless otherwise stated.

Item	Location	Product/Manufacturer
Hinges	Under all hinge blades	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 the 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
Floor Spring and Pivots	See section 10.7.3	
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 10.9.11 for details	
Flush bolts	Encasing the entire body of the flush bolt including the back surface of the face plate	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. 1mm ST60 Graphite gasket material - Sealed Tight Solutions Ltd
Drop Seals	Refer to Section 10.9.6	



Example of hinge protection detail



Example of lock & latch protection detail

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)
DASD	<ul style="list-style-type: none"> • Top pivot & bottom strap • 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)

Notes:

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

10.4 Latches & Locks

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

Note: Refer to section 5.5 for restrictions when using the Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors. Details in section 5.5 for locksets must take precedence over those in the sections below.

10.4.1 Single Point Engagement

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

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

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

Element	Manufacturer & Product Reference (Test Reference)
Locks & latches	<ol style="list-style-type: none"> Ingersoll Rand mortice latch Arrone 3 lever mortice latch Glutz mortice deadlock Ref:1052.7 Glutz mortice deadlock Ref:4525 Glutz mortice deadlock Ref:4621, 7/60 Glutz mortice deadlock Ref:24100, 7/60 (DMT-DO-50-1447 Door 1) <p>Abloy Oy Mortice Latches (see section 10.4.1.1 below):</p> <ol style="list-style-type: none"> Assa Abloy EL520 mortice latch (WF364240) <p>Entry System Locksets (see section 10.4.1.2 below):</p> <ol style="list-style-type: none"> Assa Abloy 'Vingcard Essence' (DMT-DO-50-1446) Assa Abloy 'Vingcard Signature MPA 4G RFID' (DMT-DO-50-1012) Salto LE7 lockset with electric escutcheon (WF383782 & WF383783) Salto LE7 lockset and strike plate (WF383783) Salto LE8 (WF383783) Salto LE7S1570R01IMB XS4 Original RFID lock (DMT-DO-50-1366 & DMT-DO-50-1447 Door 2) Salto LE7S1770R03IMS & AFB0IBA8 (DMT-DO-1216) Advance Trillium RFID (Technalia 088745-002-1-a) Assa Abloy Inoxi handleset operating a EL520 mortice latch and EL520 keep. (DMT-DO-50-1148) Häfele Dialock handleset DormaKaba RT Plus handleset (DMT-DO-50-1148)

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

Single and double leaf doorsets

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

Notes:

- In all instances the location of the handle must be between 850 – 1200mm from the threshold.
- Where a cableway and cableloop are required refer to section 10.9.11.

10.4.1.1 Abloy Oy Mortice Latches

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

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

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

Based on the above and provided that the lock and forend dimensions are not increased over those tested, it is reasonable to assume the following range of Abloy Oy latches and strike plates may be incorporated in the FireSound 54mm, FireSound 59mm and FireSound Plus 54 designs for both 30 and 60 minutes integrity performance.

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

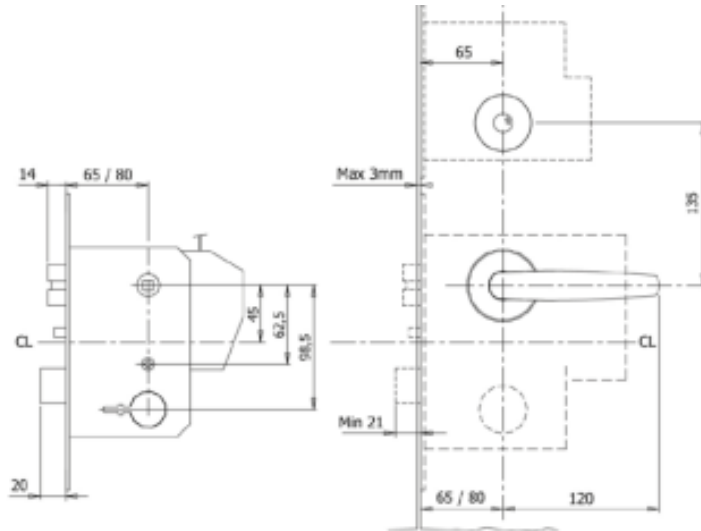
Motor Locks	Solenoid Locks	Mechanical Locks	Strike Plates	
EL520	EL560	EL160	EA321	EA327
EL532	EL561	EL162	EA322	EA328
EL522	EL562	EL163	EA323	EA329
EL524	EL563	EL165	EA324	EA330
EL534	EL564	EL360	EA325	EA331
EL535	EL565	EL362	EA326	EA332

10.4.1.2 Entry System Locksets

A number of different entry system locksets have been proven to not be a cause of premature failure in the tests cited in 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.

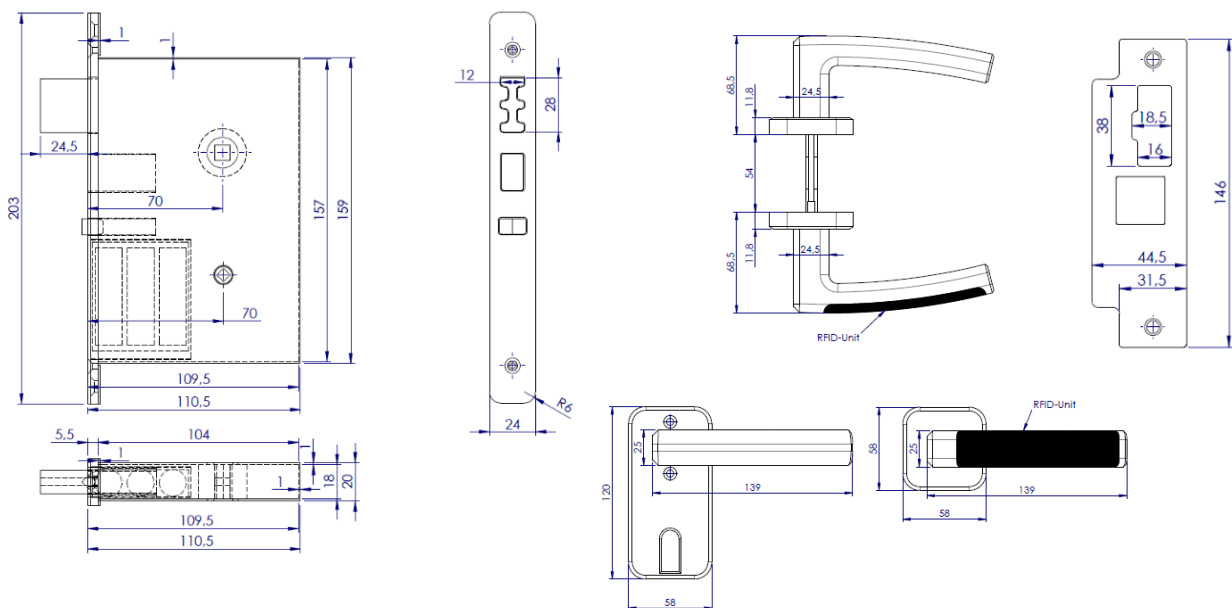
Assa Abloy 'Vingcard' Signature

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



ASSA Abloy Vingcard Novel lockcase and lever handles

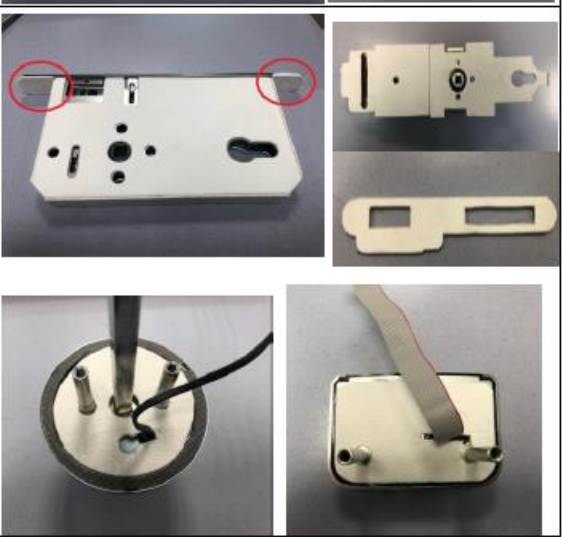
The Assa Abloy 'Vingcard Novel' RFID lock (Item Ref. P001170024-100-301) with Assa Abloy Novel handles was successfully tested in DMT-50-1446, the lock, lever handle and keep dimensions are shown below. DMT-50-1446 included two Assa Abloy 'Vingcard Novel' RFID locks in opposed orientations and therefore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



Onity Advance Trillium

Based on the results of Tecnia test 088745-002-1-a, cited in section 3 the Onity card reader and handle ref: Advance Trillium RFID may be installed, subject to the following intumescent protection being installed.

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

Option 2:	<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>	
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Salto locksets ref LE7 and LE8

Based on the results of tests WF383782, WF383783, DMT-DO-50-1216 and DMT-DO-50-1366 cited in section 3 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>

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

Consort CHL89 RFID lockset

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

Consort CHL89 – RFID lock set Dimensions

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

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

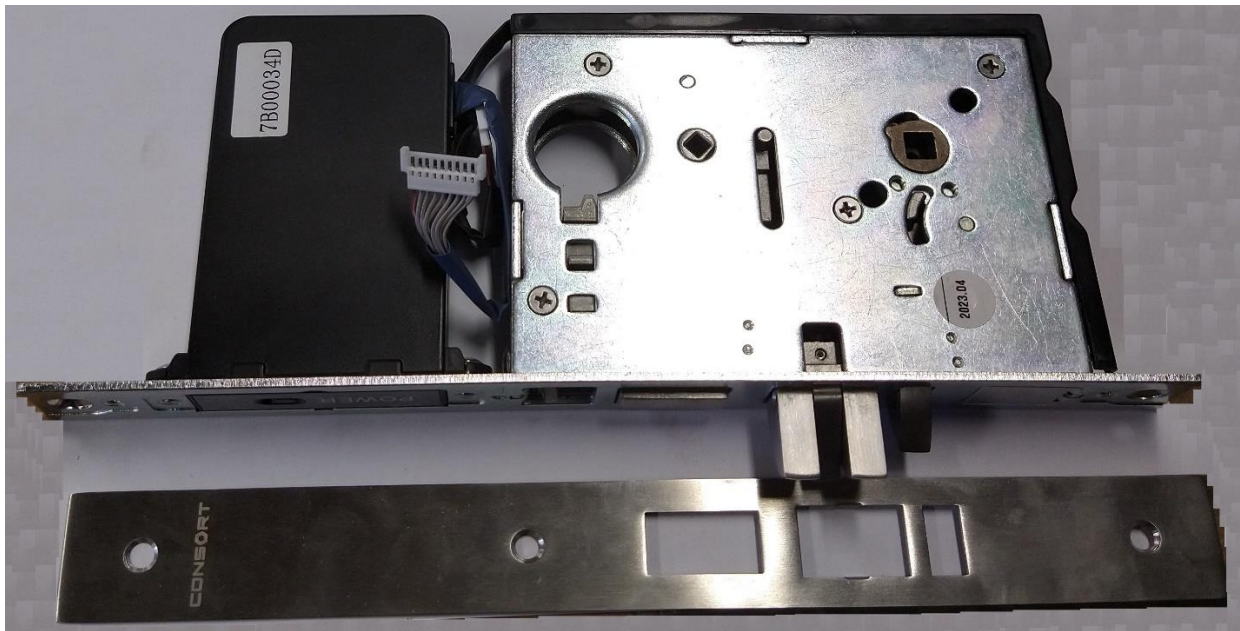
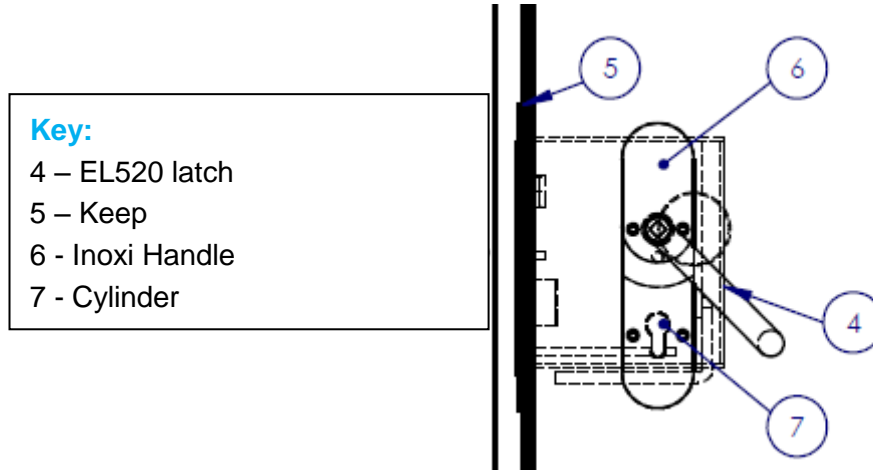


Image of the lockcase prior to application of intumescent material

Assa Abloy Innox handleset and EL520 mortice latch

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

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

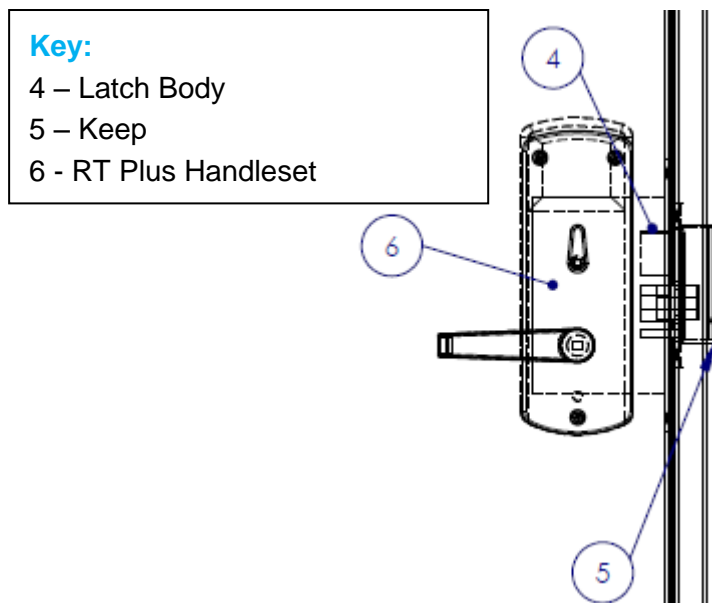


Hafele Dialock DT600/DT700/DT710 Handles

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

DormaKaba RT Plus handleset

Specimen 7 within test DMT-DO-50-1148 incorporated a DormaKaba RT Plus handleset with protective steel plate (ref: PS7901012ER30-626) operating a rebated mortice latch protected with the Mann McGown MMG631 intumescent pack. This surface product may be used as lever handles to operate rebated locks/latches. This product and accessories may not replace any part of the latch(es) as assessed in section 10.4.1.



10.4.2 Cylinders

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1 and 2 (and 3 for 30 minute applications)

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

The table below details the tested cylinders that are approved.

Element	Manufacturer & Product Reference
Cylinders	<ul style="list-style-type: none">Assa Abloy CY326U HCrGlutz – 83704 E Doppelzylinder (DMT-DO-50-1447)Salto Neo - NME3140N50CSBD ((DMT-DO-1366 & DMT-DO-50-1447 Door 2))

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

- Where required for use, 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:
 - If the lock body is not protected with an intumescent material, the maximum clearance between leaf and cylinder is 1mm to each edge.
 - If the lock body is protected with an intumescent material, maximum clearance between leaf and cylinder is 3mm to each edge.
 - 1mm thick MAP or non-pressure forming graphite intumescent around the cylinder is optionally permitted.

10.5 Handles

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: all permitted in section 4.4.2

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference
Handles	<ul style="list-style-type: none">Aluminium lever type handlesSteel lever type handles
Escutcheons	<ul style="list-style-type: none">Glutz AG – 48200 – Ø53 x 8mm projection (DMT-DO-50-1447)Glutz AG – 48283 – Ø53 x 8mm projection (DMT-DO-50-1447)

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

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

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

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

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

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

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

10.6 Hinges

10.6.1 Butt hinges

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

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

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

Concealed hinges have been successfully tested in the LAMINESSE FireSound 54mm door design for 60 minute applications in test WF382394.

10.6.2.1 Simonswerk Tectus Concealed Hinges

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1 only

Configurations: LSASD, ULSASD, LSADD & ULSADD

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

Manufacturer & Product Reference	
<ul style="list-style-type: none"> • Simonswerk Tectus TE5273.SSE (WF382394) • Simonswerk Tectus TE527 3D (BMT/FEP/PF15073 & DMT-DO-50-1447) 	
	<ul style="list-style-type: none"> • The single action hinges must be fitted with the tested 1mm thick BASF exterdens Graphite 'TE 527 - 3D' intumescent pack or .encased in 1mm thick Interdens to the leaf and frame bodies (Moralt reference M-MVPM-DB-T-634-2). • The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above. • The mortice for concealed hinges must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf. • The hinges must be used in conjunction with a twin strip perimeter intumescent arrangement where one of the seals remains continuous past the hinge blade in the frame reveal or leaf edge. • The door frame must be hardwood (frame type1) of minimum thickness 38mm and minimum density 640kg/m³.

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

Element		Specification	
Hinge positions:	3 Hinges: Leaf height: 1201- 2400mm	Top	150 – 200mm from head of leaf to top of hinge
		2 nd	Min - 200mm from top hinge Max - centrally between top and bottom hinge
		Bottom	150 – 300mm from foot of leaf to bottom of hinge
	4 Hinges Leaf height: >2401mm	Top	150 – 200mm from head of leaf to top of hinge
		2 nd	Min - 200mm from top hinge Max - centrally between top and 3 rd hinge
		3 rd	Min – 200mm from bottom hinge Max – centrally between 2 nd and bottom hinge
		Bottom	150 – 300mm from foot of leaf to bottom of hinge
	Intumescent protection:		
		The tested 1mm thick BASF exterdens Graphite 'TE 527 - 3D' intumescent pack or .encased in 1mm thick Interdens to the leaf and frame bodies, (Moralt reference M-MVPM-DB-T-634-2)	

10.6.2.2 Bartels Pivota Concealed Hinges

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1 only

Configurations: LSASD, ULSASD, LSADD & ULSADD

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

- The single action hinges must be fitted with the tested Mann McGowan kit ref: MMG567 (Moralt reference M-MVPM-DB-T-627).
- The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.
- The mortice for concealed hinges must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf.
- The hinges must be used in conjunction with a twin strip perimeter intumescent arrangement where one of the seals remains continuous past the hinge blade in the frame reveal or leaf edge.
- The door frame must be hardwood (frame type1) of minimum thickness 38mm and minimum density 640kg/m³.
- Pivota concealed hinges are to be positioned as follows. It is not permitted to fit any more hinges than that stated in the table below, as appropriate for the required leaf height.

Element		Specification	
Hinge positions:	2 Hinges: Leaf height: ≤2440mm	Top	180 – 210mm from head of leaf to top of hinge
		Bottom	140 – 180mm from foot of leaf to bottom of hinge
	3 Hinges:	Top	180 – 210mm from head of leaf to top of hinge
		2 nd	Max - centrally between top and bottom hinge
		Bottom	180 – 210mm from foot of leaf to bottom of hinge
Intumescent protection:		The tested Mann McGowan kit ref: MMG567 (Moralt reference M-MVPM-DB-T-627)	

10.6.2.3 Consort CCH340.SSS Concealed Hinges

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1 only

Configurations: LSASD, ULSASD, LSADD & ULSADD

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

Manufacturer & Product Reference	
<ul style="list-style-type: none"> Consort concealed hinges CCH340.SSS (DMT-DO-50-1367 & DMT-DO-50-1447 Door 1) 	
<ul style="list-style-type: none"> The single action hinges must be fitted with the tested Mann McGowan Pyrostrip 1mm thick intumescent. The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above. The mortice for concealed hinges must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf. The hinges must be used in conjunction with a twin strip perimeter intumescent arrangement where one of the seals remains continuous past the hinge blade in the frame reveal or leaf edge. The door frame must be hardwood (frame type1) of minimum thickness 38mm and minimum density 640kg/m³. Consort CCH340.SSS concealed hinges are to be positioned as follows. It is not permitted to fit any more hinges than that stated in the table below, as appropriate for the required leaf height. 	

Element		Specification	
Hinge positions:	2 Hinges: Leaf Dims: ≤2440(h) x ≤595(w)mm	Top	180 – 210mm from head of leaf to top of hinge
		Bottom	140 – 180mm from foot of leaf to bottom of hinge
	3 Hinges:	Top	180 – 210mm from head of leaf to top of hinge
		2 nd	Max - centrally between top and bottom hinge
		Bottom	180 – 210mm from foot of leaf to bottom of hinge
Intumescent protection:		Hinges encased with Mann McGowan Pyrostrip 1mm thick.	

10.6.2.4 CEAM 1131S Concealed Hinges

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1 only

Configurations: LSASD, ULSASD, LSADD & ULSADD

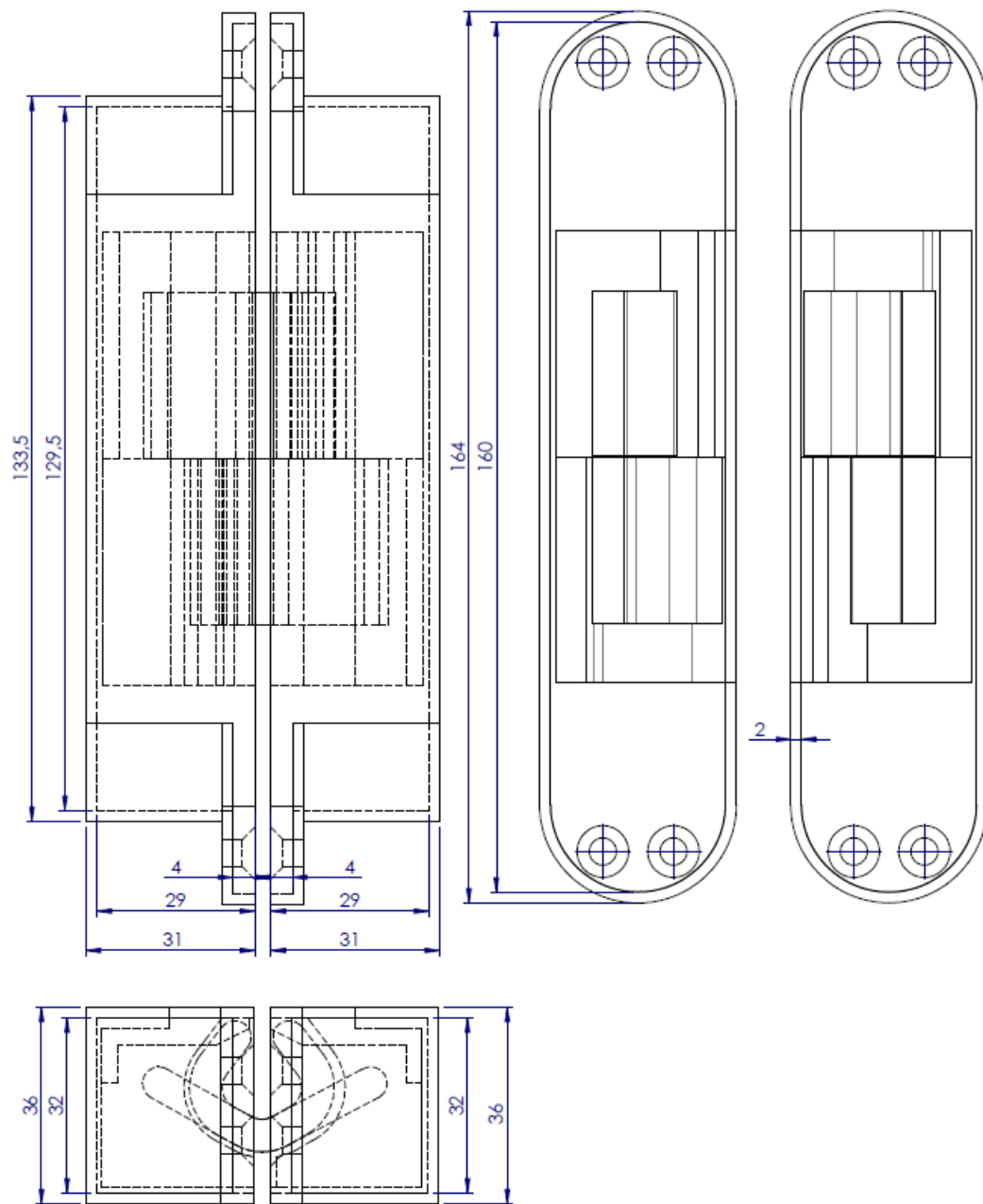
The table below details the tested concealed hinges that are approved.

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> CEAM AMADEO SPA 1131S (DMT-DO-50-1446)

- The single action hinges must be fitted with the tested Lorient 2mm Mono Ammonium Phosphate (MAP) intumescent encasing all sides / faces of the hinge body in the door frame and door leaf.
- The hinges must be fixed in accordance with manufacturer's instructions including using the supplied hinge fixings and instructions for morticing and taking into account the necessary details for fire resistance as stated above.
- The mortice for concealed hinges must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf.
- The hinges must be used in conjunction with a twin strip perimeter intumescent arrangement where one of the seals remains continuous past the hinge blade in the frame reveal or leaf edge.
- The door frame must be hardwood (frame type1) of minimum thickness 38mm and minimum density 640kg/m³.
- CEAM AMADEO SPA 1131S concealed hinges are to be positioned as follows. It is not permitted to fit any more hinges than that stated in the table below, as appropriate for the required leaf height.

Element		Specification	
Hinge positions:	3 Hinges	Top	190 – 210mm from head of leaf to top of hinge
		2 nd	Max - centrally between top and bottom hinge
		Bottom	190 – 210mm from foot of leaf to bottom of hinge
Intumescent protection:		Hinges encased with Lorient Mono Ammonium Phosphate (MAP) 2mm thick.	

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



10.7 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers
- Concealed overhead closers.

Automatic doorset self-closing devices such as transom mounted, and offset pivots used with floor springs and jamb mounted concealed closers are not considered acceptable for use with the FireSound 54mm, FireSound Plus54 or FireSound 59mm doorset range.

10.7.1 Overhead Face Fixed Closer

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

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• ASSA Abloy DC700G-CM (DMT-DO-50-1446)

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

For 30 minute doorsets:

- Certifire approved overhead face-fixed closers for 30-minute fire resistance applications on timber doors of a minimum 44mm thickness and timber frames.

For 60 minute doorsets

- Certifire approved overhead face-fixed closers for 60-minute fire resistance applications on timber doors of a minimum 54mm thickness 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, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: LSASD, ULSASD, LSADD & ULSADD

The table below details the tested concealed overhead closers that are approved.

Manufacturer & Product Reference	Frame - Minimum Stop Size	Maximum Closer Body Dimensions	Maximum Closer Slide Channel Dimensions
Geze GmbH – Boxer EN2-4 (DMT-DO-50-1010)	18(h)	240(l) x 32(w) x 45(h)	440(l) x 22(w) x 12(h)
DormaKaba ITS96 Size 2-4 Technalia 088745-002-1-a, DMT-DO-50-1148 & WF 382394)	18(h)	242(l) x 32(w) x 42(h)	440(l) x 20(w) x 12(h)
Rutland ITS11204 (WF429105)	15(h)	243(l) x 32(w) x 67(h)	550(l) x 31(w) x 19(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.
- Where concealed closers are installed, the door frame stop at the head must be a minimum of 15mm high.
- Intumescent protection shall be as tested using the relevant intumescent protection given below:
 - GEZE Boxer EN2-4 - MMG629 Pack
 - MMG107 Boxer Fire for body
 - MMG109 for slide arm
 - MMG579 Forend Top Cover
 - Dorma ITS96:
(Moralt reference M-MVPM-DB-T-015-01)
 - MMG107 for body
 - MMG109 for slide arm
 - MMG579 Forend Top Cover
 - Rutland ITS11204 - Rutland set ref: IP.114 2mm intumescent kit for ITS11204.
- The dimensions of the concealed overhead door closer or slide channel must not exceed the dimensions given within the table above.

10.7.3 Floor Springs

These items are suitable in the following applications only:

Leaf options: 2

Frame options: 1

Configurations: DASD

The table below details the tested floor springs that are approved:

Element	Manufacturer & Product Reference
Floor Springs & Top Pivots	<ul style="list-style-type: none">Floor Spring: Dorma BTS80 F EN6 Double action (WF382394 Rev A AR1)Bottom Strap: Dorma 7421 (WF382394 Rev A AR1)Door & Frame Top Pivot: Dorma 8066 (WF382394 Rev A AR1)

10.7.3.1 Leaf 2 - Modified Construction for Double Swing

Double action doorsets must maintain the leaf construction as tested within fire test WF382394 Rev A AR1.

The required stile, rail and lipping elements are as per the table below:

Component	Position	Dimensions (mm)	Material
Timber Insert	Stiles	41(t) x 8(w)	Hardwood Min Density 650kg/m³
	Top & Bottom Rail	41(t) x 45(w)	
Lippings	Refer to Section 5.4		

Note:

- For adhesive details for each of the above components refer to Section 9.
- It must be ensured that the floor spring 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, the relevant intumescent protection given below:
 - Dorma Top Pivot 2066
 - Frame Component: 2 (t) Interdens to all mortice faces.
 - Door Component: 2 (t) Interdens to all mortice faces.
 - Dorma Bottom Strap 7421
 - 2 (t) Interdens to all mortice faces.
 - Floor Spring: 2 (t) Odice Flexilodice graphite based intumescent encasing the floor spring closer.

10.8 Bolts

10.8.1 Surface Mounted Face Fixed Bolts

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: all in section 4.4.2

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

Element	Manufacturer & Product Reference (Test Reference)
Surface Mounted Bolts	<ul style="list-style-type: none">Ironmongery Direct stainless steel shoot bolts: 6399674

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

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

Intumescent protection is not required.

10.8.2 Flush Bolts

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: LSADD, ULSADD & LSADD+OP

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

Element	Manufacturer & Product Reference (Test Reference)
Flush Bolts	<ul style="list-style-type: none"> Athmer: TK-15/T 1653 (DMT-DO-50-1367) Athmer: TK-15/B 1792 (DMT-DO-50-1367) Ironmongery Direct stainless steel shoot bolts: 6399674 Zoo Hardware: ZAS03RSS (BMT/FEP/F16156 Revision A Specimen B & PF15288 Revision A)

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:

- Maximum Dimensions:
 - 250mm long x 20mm deep x 20mm wide
 - 278mm long x 17mm deep x 15mm wide
- Where Yeoman Shield/Lorient Polyproducts Ltd. PVC door edge protectors are installed, flush bolts are limited to 250mm long x 20mm deep x 20mm wide as tested in LOR1524.
- Where CS Edge Protectors/Acrovyn Wrap are installed, flush bolts are limited to ≤210mm long x 20mm deep x 20mm wide as tested in IF11010B.

Flush bolts must be steel, and the mortice must be as tight to the mechanism as is compatible with its operation.

Intumescent Protection

Based on fire test (DMT-DO-50-1367) the intumescent protection required for the Athmer TK-15/T 1653 and Athmer TK-15/B 1792 is as follows:

(Moralt data sheet M-MVPM-DB-T-023-04)

- Interdens 15 SA (Mann McGowan Pyrostrip) 1mm (t) to the flushbolt sides.
- Mann McGowan Pyrostrip graphite 10(w) x 2(t) to the rear of the flushbolt.

For all suitable flush bolts all edges of the mortice of the keep and body must be protected with intumescent gaskets as specified in section 10.2. As an alternative, the hardware manufacturers tested gaskets may be used.

The image below depicts a typical flushbolt and intumescent liner arrangement.



10.9 Non-Essential Hardware

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

10.9.1 Pull Handles

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

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

Leaf options: 1 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

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

Approved specification:

- Polymeric or metal face-fixed hardware such as push plates and kick plates up to 2mm thick may be surface fitted to the doorset. These items of hardware are permitted up to a maximum of 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a contact or other thermally softening adhesive.
- Plates must not return around the door edges.
- In all cases plates meeting the above specification shall not be applied under glazing beads or door stops.

10.9.3 Security Viewers

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

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

Components with the following specification are deemed acceptable.

- Door security viewers with brass or steel bodies of a diameter less than or equal to 15mm may be used provided that the through-hole is bored tight to the case of the viewer (maximum tolerance +1 mm). Lenses must be glass and the item must be protected with a tested acrylic intumescent mastic and / or a 0.5 – 1.0mm thick graphite based intumescent wrap.

10.9.4 Door Selectors

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All double leaf door configurations

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

10.9.5 Environmental Seals

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations:

A number of different environmental seals have been successfully tested as part of the Moralt FireSound 54 and 59 doorset design. Based on this testing the table below details the approved environmental seals included within the summarised evidence within section 3:

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

Alternatively, on the basis of the testing undertaken, silicon or PVC based flame retardant acoustic, weather and dust seals may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

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

10.9.6 Threshold Drop Seals

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

Drop seals have been successfully tested within the doorset design and are therefore, acceptable for use in the door designs considered herein.

Test report DMT-DO-50-1216 included a Mann McGowan DD-1703ACU installed offset from the door leaf centreline, with 15mm of door core material between the exposed leaf face and the drop seal rebate. The dropseal was installed with all 3 sides of the mortice lined with intumescent.

Testing summarised within Section 3 of this assessment also successfully demonstrates that when positioned offset towards the unexposed face that the door constructions when installed with a drop seal are capable of achieving up to 60 minutes fire integrity.

Therefore it is permitted by this report to locate the drop seal centrally or offset to within 15mm of either face of the door leaf, provided that the drop seal intumescent protection tested in each location (where the drop seal is positioned centrally or offset within the doorleaf) is maintained.

The table below details the permitted threshold Drop Seals and the required intumescent specification as tested and summarised within section 3:

Manufacturer	Product Reference (Test Reference)	Tested Intumescent Protection
Norseal	NOR810 (PF15041)	1mm Interdens to all sides of the drop seal
Lorient Polyproducts	LAS8001si (BMT/FEP/F16156 Revision A Specimen B & DMT-DO-50-1288)	1mm Lorient MAP Interdens to both sides of the drop seal or 1mm Interdens to all sides of the drop seal
Mann McGowan	DD-1703ACU (DMT-DO-50-1010 & DMT-DO-50-1216)	2mm Interdens to top surface of drop seal or 1mm Interdens to all three sides
Elton B.V	'Ellenmatic Soundproof' (DMT-DO-50-994)	Refer to Section 10.9.6.1 (tested on non-Moralt FireSound leaf)
Sealed Tight Solutions	ST422GT (BMT/FEP/F15288 Rev A & Technalia 088745-002-1-a)	No intumescent required or 2mm Interdens to top surface of drop seal
Athmer	SchallEx L15/30 WS (WF 382394 AR1 & DMT-DO-50-1367) (See Note 1)	1mm Odice Flexilodice Graphite based intumescent to all sides of the drop seal casing or 1mm Interdens 15 to all sides of the drop seal
	SchallEx L14/35 EK	1mm Interdens to all sides of the drop seal
Planet	HS, RH (BMT/FP/F15073 Specimen A)	1mm Interdens to all sides of the drop seal
Raven Products Ltd.	RP8Si (DMT-DO-50-1288)	Consort Architectural Hardware self-adhesive graphite sheet, 0.8mm (t) to all three sides.
PDB Seals	PDB411M (21-004285-PR02 & 21-004285-PR03)	1mm Mann McGowan Pyrostrip to the two sides of the dropseal recess.

Note:

1. The Athmer SchallEx L15/30 WS was successfully tested in conjunction with the Athmer TK-15/B 1792 flushbolt in fire test DMT-DO-50-1367 and are therefore approved for use concurrently. 1mm Odice Flexilodice Graphite intumescent protection must be used
2. With the exception of Point 1 above, where a rebated drop seal is fitted to the doorset, flush bolts may not be fitted to the bottom of the doorset.
3. The fire tested drop seals in the table above may alternatively be installed with the intumescent protection as detailed in section 10.9.6.1

Based on the constructional and dimensional similarity to the tested drop seals the following alternative drop seals have been assessed for use with the Moralt FireSound 54mm, Moralt FireSound 59mm and Moralt FireSound Plus 54:

Manufacturer	Product	Intumescent Protection
Sealed Tight Solutions Ltd	ST422 (Technalia 088745-002-1-a)	Refer to Section 10.9.6.1
	ST422FF (Face Fixed)	Face Fixed – No Intumescent Requirement

Note:

1. Flush bolts may not be fitted to the bottom of the doorset where assessed drop seals in the table above are specified.

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

- Certifire approved threshold drop seals for 60-minute fire resistance applications on 54mm thick timber / cellulosic doors in timber / cellulosic frames.
- The threshold drop seal must not exceed:
 - Body dimensions of 35mm (h) x 14mm (t) and
 - Face plate dimensions of 57mm (h) x 21mm (w) x 1.5mm (t).
- The Certifire certificate shall be adhered to for intumescent protection, position within the doorleaf thickness and fitting requirements.
- Intumescent protection shall be fitted as required by the Certifire document.
- Where a rebated drop seal is fitted to the doorset then flush bolts may not be fitted to the bottom of the doorset.

10.9.6.1 Dropseals – Alternative Permitted Intumescent Protection

Further to the tested intumescent protection detailed within the table in section 10.9.6, the following intumescent materials are permitted, where all 3 sides of the drop seal recess are protected.

Item	Location	Product/Manufacturer
Drop Seals	To all sides of the drop seal recess	<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

10.9.7 Knockers, Numerals & Signage

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

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

Approved specifications:

Knockers:

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

Numerals & Signage:

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

10.9.8 Security Chains

10.9.8.1 Security chain Consort CDC22.SMP

These items are suitable in the following applications only:

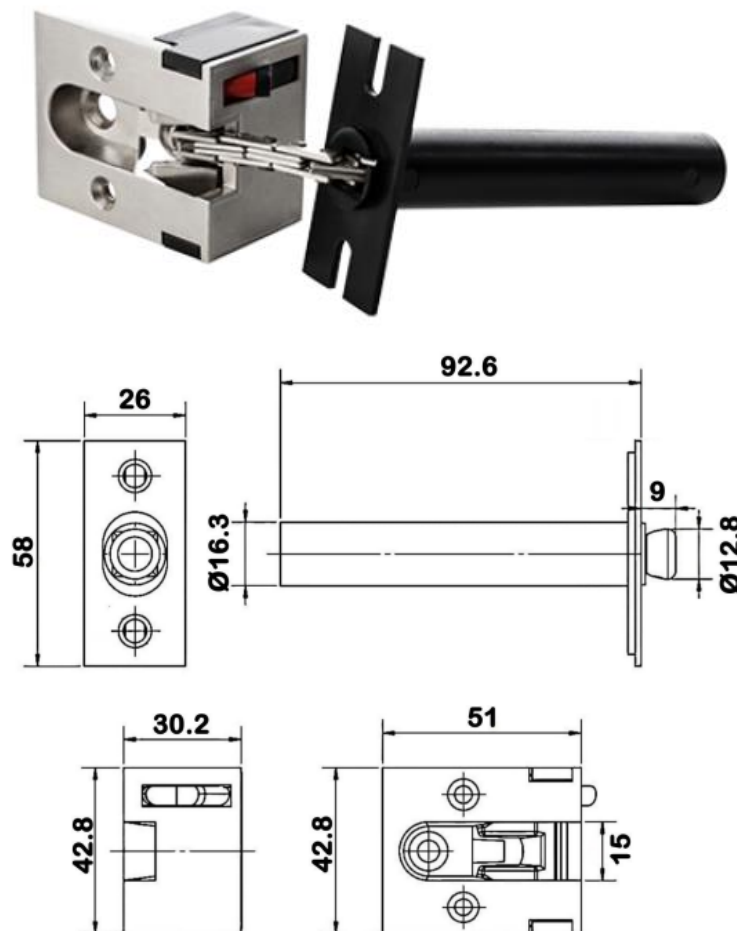
Leaf options: 1, 2 & 3

Frame options: 1 only

Configurations: LSASD & ULSASD

Fire test DMT-D0-50-1288 successfully included a Consort CDC22.SMP security chain and are therefore approved with the following restrictions:

- The door frame must be hardwood (frame type1) of minimum thickness 38mm and minimum density 640kg/m³.
- The mortice for the Consort CDC22.SMP security chain must be no closer than 50mm to any aperture or other mortice or recessed area within the door leaf.
- The maximum permitted height from the bottom of the door leaf to centreline of the door component is 1750mm.
- The tested detail included architraves which must be retained. These may be notched (as tested) around the Consort CDC22.SMP security chain.
- Intumescent protection
 - Frame component: Fully encased with 0.8mm self-adhesive graphite sheet
 - Door Component: Body fully wrapped and rear of forend protected with 0.8mm self-adhesive graphite sheet



10.9.8.2 Face fixed Security Chains

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

Approved specification:

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

10.9.9 Fire Door Identification Plates

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

These may be required to identify the following:

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

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

10.9.10 Panic Hardware

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1, 2 (and 3 for 30 minute applications)

Configurations: All in section 4.4.2

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

The fitting of panic hardware is not considered to change the latching arrangement of the doorset and therefore the permitted leaf size shall be established using unlatched doorset configurations as detailed within the relevant data sheet in section 4.4.

10.9.11 Cableloop and Cableway

10.9.11.1 Cable Loop

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1 only

Configurations: See table below.

The table below details the tested cables loop that are approved.

Element	Manufacturer & Product Reference	Body Dimensions	Configurations
Cable Loop	Abloy EA280 (DMT-DO-50-1010)	324mm (h) x 24mm (w) x 17(d) with a Ø12 spring assembly	LSASD & ULSASD
	Abloy EA281 (lft-21-004285-PR02 and lft-21-004285-PR03)	544mm (h) x 24mm (w) x 17(d) with a Ø12 spring assembly	LSASD

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 to with its centreline in alignment with the centreline of the cableway in the door leaf.

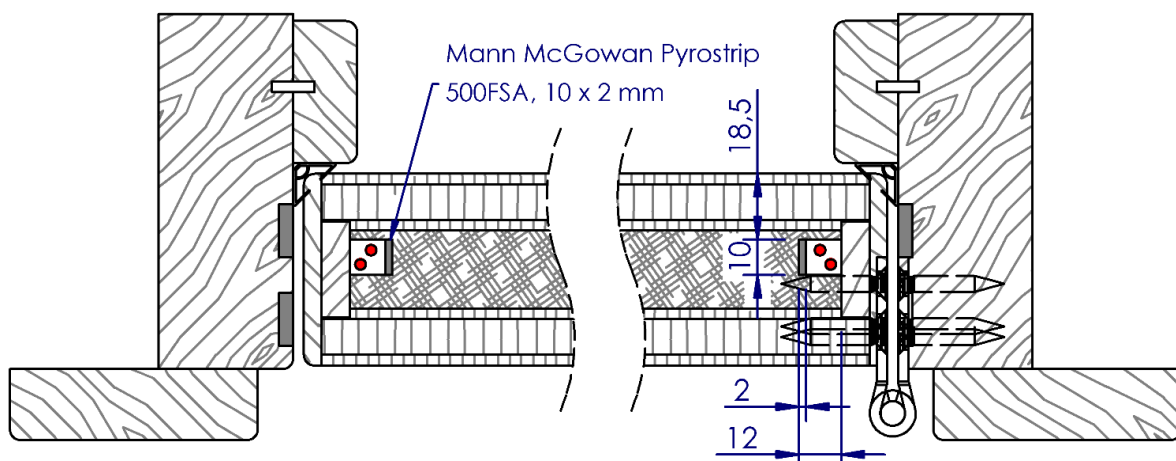
For 30 & 60 minute applications, 2mm thick Interdens must be fitted to all faces of the rebates required for installation.

10.9.11.2 Cableways

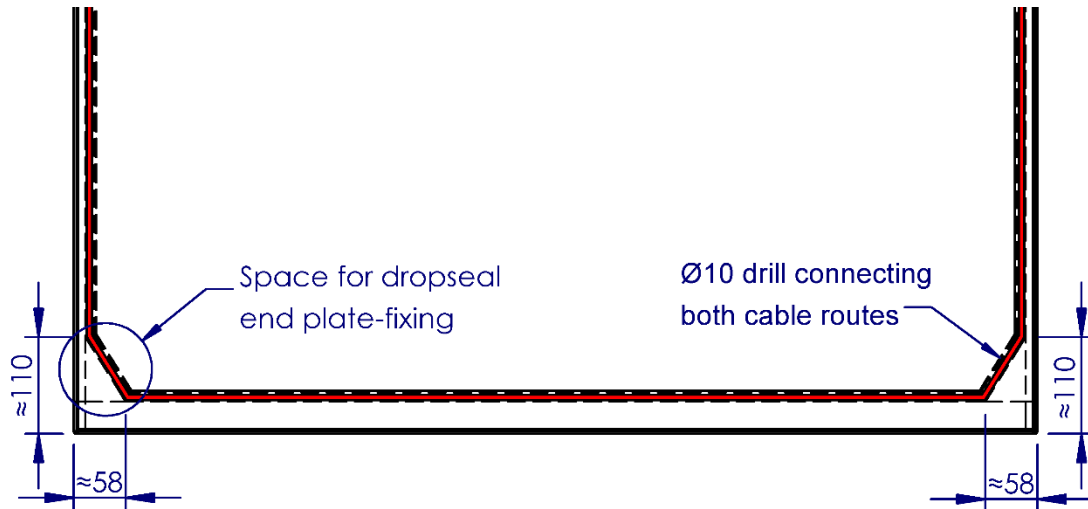
Cableways were successfully tested in DMT-D0-50-1010, lft-21-004285-PR02 and lft-21-004285-PR03, cableways are to be used to route cables around the door leaf to operate electronic hardware. The cableway will be routed from a cable loop fitted at the jambs of a doorset to the relevant item of hardware (e.g. a lockset or electronic strike).

The cableway must be installed as detailed below.

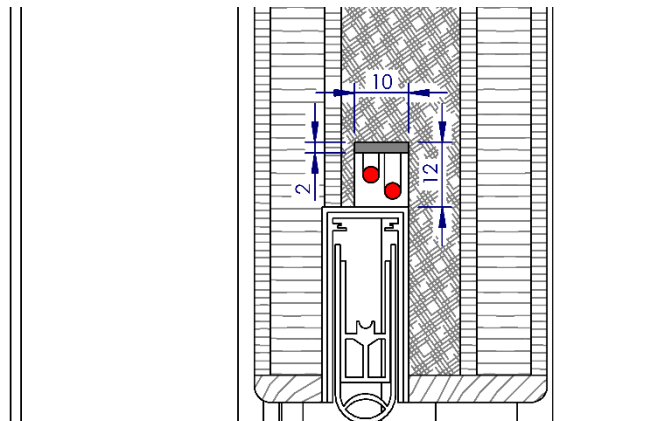
- Groove the edge of the door core with a 10mm wide channel located centrally or at a minimum of 18.5mm from the closing (stop face) of the door leaf, to a depth of 20mm prior to the installation of the 8mm thick hardwood insert and prior to installation of lippings.



- The 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 for the hardwood insert is to run the full height of the door leaf. The vertical and horizontal grooves are stopped short – as shown in the diagram below and an interconnecting Ø10mm hole is required between the horizontal and vertical grooves

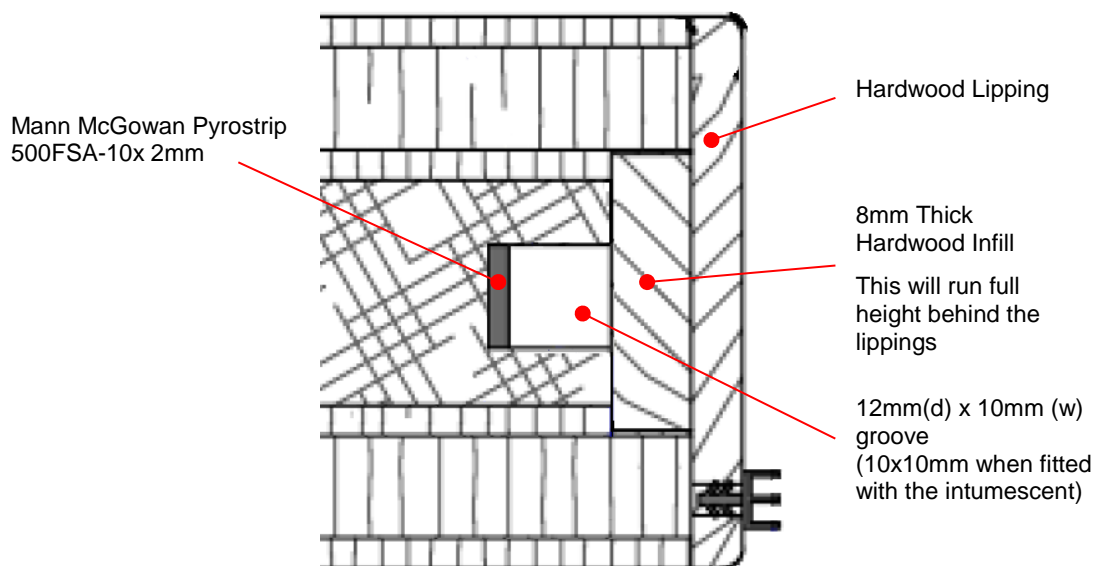


- The threshold dropseal must be fitted to allow the 12mm (d) x 10mm (w) groove to may be located above the dropseal location. The drop seal must be positioned as detailed in section 10.9.6.



- Install the cable, protected with Mann McGowan Pyrostrip 500FSA-10x 2mm, into the groove.
 - Infill the groove with 27(w) x 8mm(t) hardwood insert, bonded in place with PU adhesive.
- Note:** The insert pieces are to run the full height of the door leaf behind the lipping.
- 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.

The image below shows the completed detail with the cableway in the optional central position:



Vertical Edge shown – Thresholds without dropseals will be similar, minus the acoustic seal.

10.9.12 Mag Lock

These items are suitable in the following applications only:

Leaf options: 1, 2 & 3

Frame options: 1

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

Manufacturer & Product Reference	Body Dimensions	Armature Dimensions	Fixing Method
<ul style="list-style-type: none"> ASSA ABLOY /Adams Rite) ARMLOCK 280 Series (DMT-DO-50-1446 & DMT-DO-50-1447 Door 2) 	266mm (l) x 67mm (w) x 40(d) mm	160mm (l) x 61mm (w) x 16(t) mm	Surface mounted to the face of the doorleaf & frame using L & Z brackets (Ref 280-800)

Based on the successful fire testing cited above, maglocks which have supporting fire resistance test evidence when applied to a timber-based door leaf in a timber frame which has achieved greater than the required integrity (either 30 or 60) minutes integrity performance when tested to BS 476: Part 22: 1987 or EN 1634-1, may be fitted, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and it does not interfere with the self-closing action of the door leaf.

The fitting of mag locks is not considered to change the latching arrangement of the doorset and therefore the permitted leaf size shall be established using unlatched doorset configurations as detailed within section 4.4 where no further mechanical latch is fitted.

11 Installation




11.1 General

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

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

11.2 Door Frame Installation

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


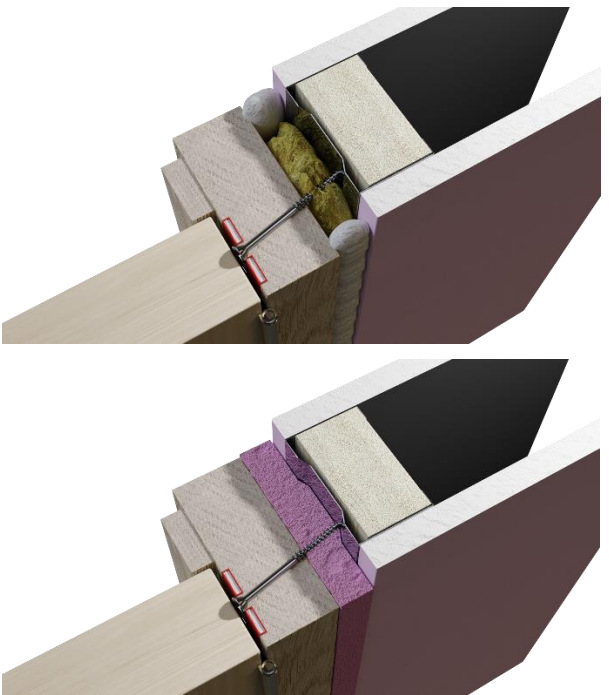
Permitted Installations	
	<p>Instances where the door frame and the wall of the same depth such that architraves are fitted flush to both faces. Note that the minimum door frame section size (width and depth) must be as per the requirements noted in this report – see door frame section.</p> <p>Architraves 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>

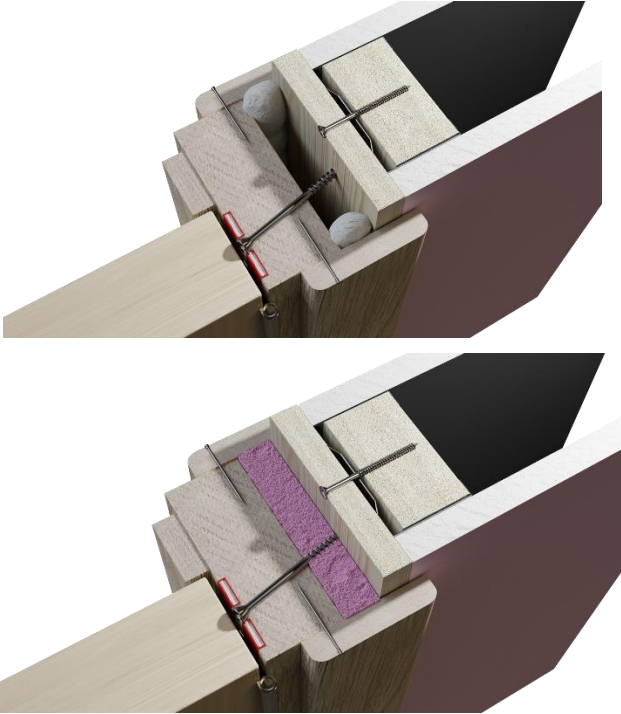
Note:

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.	
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>	

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. Blockwork, Masonry or homogenous concrete constructions.

Wall types a & b above must have supporting fire resistance test evidence which demonstrates that it is capable of staying in place and intact for a minimum of 30 or 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.
- Blockwork, Masonry or homogenous concrete constructions are anticipated to be constructed in accordance with section 7.2.2 of BS EN 1363-1:2020.

11.5.2 Structural Opening

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

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

11.5.3 Fixity

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

For single leaf doorset without side panels, the frame jambs only are to be fixed to the supporting construction using steel fixings at 600mm maximum centres and maximum of 150mm from corner. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 50mm. It is not necessary to fix the frame head, although packers must be inserted.

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

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

11.6 Post Production (Onsite) Leaf Size Adjustment

The Laminasse FireSound 54mm and 59mm 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 / Bottom edge of the leaf This is the maximum tolerance for fire resistance only.	8mm between the bottom of leaf and top of floor covering. Doorsets with an aluminium threshold strip as defined within section 7.2 may be installed with a maximum gap of 10mm between the bottom of leaf and top of floor covering.

12 Insulation Performance

Insulation performance may be claimed for a doorset to these designs 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 6.3)

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 6.4)

13 Conclusion

If Laminesse FireSound 54mm or 59mm 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:

Signiert von:

E178E3EA31B14B0...

Name: Christian Daschner

Position: Director R&D

Date: 13-May-2025

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:	<div>Signed by:  3A9C822F3E7F487...</div>	<div>Signed by:  DE15B987D373423...</div>
Name:	C Newton*	A M Winning*
Title:	Senior Product Assessor	Senior Product Assessor

* For and on behalf of Warringtonfire

Appendix A Revisions

Rev	Warringtonfire Reference	Date	Description
A	WF530852 & WF524570	17.03.23	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.
B	WF534962	28.05.24	<p>Permit Yeoman shield encapsulation of the leaf(s) and Edge Protectors (RF07140 Revision B and RF07141 Revision B)</p> <p>Mann McGowan environmental seals (DMT-DO-50-1216)</p> <p>Add additional lockset types.</p> <p>Add Bartels Pivota concealed hinges (DMT-DO-50-1009)</p> <p>Amend current Abloy lock references.</p> <p>Add dropseal scope from new supplier - Elton (DMT-DO-50-992/993/994)</p> <p>Remove all references to smoke control performance</p>
C	WF545701	09.05.25	<p>5 year revalidation and review, including additional test data</p> <p>The following reports have been referenced in the revised document to extend the scope of the field of application, refer to section 3 for summarised details.</p> <p>DMT-DO-50-1367, If21 - 004285 - PR02, If21 - 004285 - PR03, DMT-DO-50-1216, DMT-DO-50-1366, DMT-DO-50-1288, WF382394 AR1, DMT-DO-50-1446 & DMT-DO-50-1447</p> <p>Additional Details / Items:</p> <ul style="list-style-type: none"> • FireSound Plus 54 (Leaf Type 3) • DASD options added for Leaf Type 2 with Dorma hardware • Consort concealed hinges CCH340.SSS • Assa Abloy Vingcard Novel Aperio L100 / E100 • Assa Abloy overhead closer face fixed ref: DC700 CM LH • Assa Abloy maglock & Maglock section. • Assa Abloy EA281 cable loop • RFID lock Consort CHL89 lockset • Additional Salto hardware • Athmer SchallEx L15/30 WS drop seal • PDB Seals PDB411M drop seal • Mann McGowan Environmental seals • Glutz Mortice lock 24100.7/60 • 23mm Schott Pyranova glass • Pyroplex Glazing system • Mann McGowan 500P edge seals (LSASD only) • Lorient Aluminium Threshold <p>Glazing section updated to current templating.</p>