
Title

Field of Application for:
The Sainty-Fire / Sentry Pro60
Range of Doorsets Using Pro 60
Ply Faced & Pro 60 MDF Faced
Door Blanks in Timber Based Door
Frames

For 60 minutes Fire Resistance

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Prepared for:

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1 Foreword

This Field of Application report has been commissioned by Jiangsu Sainty Bancom Wood Co. Ltd. and relates to the fire resistance of 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: 2010; *Extended application reports on the fire performance of construction products and building elements*.

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

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

2 Proposal

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

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

3 Test Data

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

Note:

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

The test evidence has been generated across a number of different doorset configurations, including single and double leaf, single acting, latched 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 higher thermal inertia to read the same temperature as the probe thermocouple that is used for the BS 476: Part 22: 1987 test, particularly during the early stages of the test. Furthermore, the neutral pressure regime is positioned lower relative to the specimen height in a European fire door test, therefore resulting in greater relative positive pressure conditions than those expected in a BS 476-22: 1987 test, which has the potential to increase hot gases and flaming on the unexposed side. These factors result in more onerous test conditions for doorsets tested to the BS EN 1634-1 test standard compared with the BS 476: Part 22: 1987 test standard, which has been demonstrated by testing the same products to both standards.

It is therefore the opinion of Warringtonfire that the evidence 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 Sainty-Fire / Sentry Pro60 doorset designs if tested in accordance with BS 476: Part 22: 1987.

3.1 Primary Test Evidence

3.1.1 Test Report BMT/FEP/F15167 Revision A

The referenced test report, the essential details of which are summarised below, is the primary data for a latched, single acting, single and double, Sainty-Fire ProTech doorsets with Plywood facings fitted with 23mm thick Pyroguard and 7mm thick Pyrodur glazing, being considered for assessment in this report.

Date of Test:	27.Nov. 2015
Identification of Test Body:	Warringtonfire Testing and Certification Ltd previously known as Exova Warringtonfire. UKAS No. 1762
Sponsor:	Jiangsu Sainty Bancom Wood Co. Ltd
Tested Product:	Latched, Single Acting, Leaf & A Half Timber Doorset with Glazing – LSADD & Latched, Single Acting, Single Timber Doorset with glazing – LSASD
Tested Orientation:	Opening in towards heating condition
Sampling information:	N/A
Summary of Test Specimen:	<p>LEAF (Doorset A & B): Doorset A Overall Size: 2135 (h) x 915/300 (w) x 54 (t). Doorset B Overall Size: 2440 (h) x 915 (w) x 54 (t). Core: 3no layers of 12 (t) x 38 (w) Spruce/Pine mix lamels (450kg/m3), inner layer fitted horizontally and outer layers fitted vertically. Lipping: Sapele (640kg/m3), 6 (t) to all four edges. Facing: 9 (t) Poplar core Plywood. Top Rail: Pine (450kg/m3), 36 (t) x 25 (w). FRAME (Doorset A & B): Head & Jambs: Sapele (640kg/m3), 70 (w) x 32 (t), with 15 (w) x 12 (t) planted stop. Frame Fixing: 4No 6Dia x 80 (l) steel screws per jamb. Firestopping: Tightly packed mineral fibre capped with intumescent acrylic mastic nominally 15 (w) x full depth of the frame. Architrave: MDF, 45 (w) x 18 (t). INTUMESCENT (Doorset A): Frame Head & Jambs Reveal: 2No 15x4 Pyroplex 8700, fitted 10 apart with the first seal 8 from the flush face. Meeting Stiles: 2No 15x4 Pyroplex 8700, fitted 7 from the flush face in left leaf and 7 from stop side face in right leaf. INTUMESCENT (Doorset B): Frame Head & Jambs Reveal: 2No 15x4 Pyroplex 8700, fitted 10 apart with the first seal 8 from the flush face. HARDWARE (Doorset A & B): Hinges Doorset A: 3no Royde and Tucker H101 lift off type hinges, 100 (h) x 35 (w) blade size. Hinges Doorset B: 4no Royde and Tucker H101 lift off type hinges, 100 (h) x 35 (w) blade size. Closer: Rutland TS3204 overhead type closer, 220 (w) x 59 (h) footprint size. Lock/Latch: Easi-T mortice latch, 155 (h) x 22 (w) forend & 120 (h) x 25 (w) keep. Handle: Zoo Hardware lever handle, 100 x 38 footprint. HARDWARE PROTECTION (Doorset A & B): Under Hinges: 2 (t) Interdens. Encasing Latch Body & Under Latch & Keep Forend: 2 (t) Interdens GLAZING (Doorset A Main Leaf):</p>

	<p>Glass: Pyroguard, 23 (t) Location: 100 from leaf head and 100 from closing edge. Aperture Size: 810 (h) x 560 (w). Beading: Sapele (640kg/m³), 30 (h) x 16.5 (d), 24° chamfer & 5 x 5 bolection. Bead Fixing: 60 (l) steel screws, at 35°, 135 centres & 50 from corners. <u>GLAZING (Doorset B):</u> Glass: Pilkington Pyrodur, 7 (t). Location: 300 from leaf head and 195 from closing edge. Aperture Size: 645 (h) x 505 (w). Beading: Sapele (640kg/m³), 29 (h) x 25 (d), 20° chamfer & 5 x 5 bolection. Bead Fixing: 60 (l) steel screws, at 35°, 135 centres & 45 from corners. <u>GLAZING SYSTEM (Doorset A & B):</u> Glazing Perimeter: 25 (w) x 4 (t) Intumescent Seals Ltd Therm-A-Bead. Glazing Aperture Liner: 54 (w) x 2 (t) Intumescent Seals Ltd Therm-A-Glaze 60.</p>
Test Standard:	BS EN 1634-1:2014 & EN 1363-1: 2012
Performance:	<p>Doorset A Integrity: 67 minutes. Doorset A Insulation: 64 minutes. Doorset B Integrity: 63 minutes. Doorset B Insulation (Door Leaf & Frame): 63 minutes. Doorset B Insulation (Glass): 3 minutes.</p>

3.1.2 Test Report WF430472

The referenced test report, the essential details of which are summarised below, is the primary data for the inclusion of Sainty-Fire ProTech doorset with MDF facings, Mann McGowan and Lorient perimeter seals, EV lippings, Rutland concealed closer and Raven Seals drop seal, being considered for assessment in this report.

Date of Test:	4.Nov. 2021
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Jiangsu Sainty Bancom Wood Co. Ltd
Tested Product:	2no. Latched, Single Acting, Single Timber Doorsets one flush door leaf and one with glazing – LSASD
Tested Orientation:	Opening in towards heating condition
Sampling information:	N/A
Summary of Test Specimen:	<p>LEAF (Doorset A & B): Doorset A & B Overall Size: 2153 (h) x 933 (w) x 54 (t). Core: 3no layers of 12 (t) x 38 (w) Spruce/Pine mix lamels (450kg/m3), inner layer fitted horizontally and outer layers fitted vertically. Lipping: EV lipping Poplar (700kg/m3), 8 (t) to all four edges. Facing Doorset A: 9 (t) Poplar core Plywood. Facing Doorset B: 9 (t) MDF (600kg/m3). Veneer: 0.6 Engineered Veneer EV Poplar (540kg/m3). Top Rail: Spruce/Pine (450kg/m3), 36 (t) x 25 (w). Drop Down Seal: Raven Seals RP8Si Aluminium drop seal, 34 (h) x 14 (w). FRAME (Doorset A & B): Head & Jambs: Sapele (640kg/m3), 75 (w) x 35 (t), with 20 (w) x 12 (t) planted stop. Frame Fixing: 4No 5Dia x 80 (l) steel screws per jamb. Firestopping: Tightly packed mineral wool capped with 10 (d) Mann McGowan Pyromas A intumescent mastic, 7-14 (w) x full depth of the frame. INTUMESCENT Doorset A: Frame Head & Jambs Reveal: 2No 15x4 Mann McGowan 500P, fitted 8 apart with the first seal 9 from the flush face. INTUMESCENT Doorset B: Frame Head & Jambs Reveal: 2No 15x4 Lorient Type 617, fitted 8 apart with the first seal 9 from the flush face. HARDWARE: Hinges: 3no Royde and Tucker H101 lift off type hinges, 100 (h) x 34 (w) blade size. Closer Doorset A: Rutland ETS.18314.SE overhead type closer, 249 (w) x 98 (h) x 48 (d). Closer Doorset B: Rutland ITS11205 concealed closer, 243 (w) x 58 (h) x 40 (d). Lock/Latch: E*S TL2 Steel tubular mortice latch, 57 (h) x 26 (w) forend, 22 (h) x 63 (w) x 15 (d) latch body & 57 (h) x 26 (w) keep. Handle: Consort Architectural Hardware CH499.01.SSS Stainless Steel lever handle, 55Ø. HARDWARE PROTECTION: Under Hinges: 1 (t) Mann McGowan Interdens. Concealed Closer: 2 (t) Rutland IP115 intumescent kit, Interdens jacket fitted around body and graphite strip fitted to forend face in the top of the leaf. Graphite jacket fitted behind rebate slide rail body in the frame head.</p>

	<p>Encasing Latch Body & Under Latch & Keep Forend: 1 (t) Mann McGowan Interdens. Drop Down Seal: 1mm Interdens fitted around body. <u>GLAZING Doorset A:</u> Glass: Pyrobelite 12, 12 (t). Location: 120 from leaf head and 109 from closing edge. Aperture Size: 875 (h) x 715 (w). Beading: Sapele (640kg/m³), 23.5 (h) x 32 (w), 15° chamfer & 5 x 7 bolection. Bead Fixing: 4.5∅ x 50 (l) steel screws, at 20°, 150 centres & 50 from corners. <u>GLAZING SYSTEM:</u> Glazing Perimeter: 10 (w) x 3 (t) Sealed Tight Solutions Ltd STS 105 GT-3 Closed cell tape. Glazing Aperture Liner: 30 (w) x 2 (t) Sealed Tight Solutions Ltd STS 302 Closed cell tape.</p>
Test Standard:	BS 476: Parts 20/22: 1987 Method 6 and 8.
Performance:	<p>Doorset A Integrity: 62 minutes.* Doorset A Insulation: N/A Doorset B Integrity: 73 minutes. Doorset B Insulation: 73 minutes.</p>

*There was continuous flaming at the glazing position at 62:47. No other failures occurred with the test terminating at 74:00 minutes.

4 Technical Specification

4.1 General

The technical specification for the proposed door assemblies are 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 types 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 – Pro 60 Ply Faced – 54mm thick

The door designs can include:

1. Glazing
2. Various hardware options
3. Decorative facings

4.3.2 Leaf 2 – Pro 60 MDF Faced – 54mm thick

The door designs can include:

1. Various hardware options
2. Decorative facings

4.4 Door Frames

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

4.4.1 Frame 1 – Hardwood Timber – for use with Leaf Type 1 & 2

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

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

The evaluation of the leaf size for each door leaf type and frame type 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 leaf doors compared with single leaf doors, the harder it becomes to pass a test. 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 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
3. 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.
4. 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 type and configuration is linked to the perimeter intumescent specification and frame type. The following section details the maximum leaf size for each door leaf type and configuration based on the intumescent specification and frame details tested.

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

4.5.2 Configuration

The table below shows the permitted configurations for the (Sainity-Fire / Sentry Pro60) doorset design, with the abbreviation and full description of each configuration.

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

Doorset Configurations			
Specification	Depiction	Abbreviation	Description
A		LSASD	Latched Single Acting Single Doorset
B		LSADD	Latched Single Acting Double Doorset

4.5.3 Orientation

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

4.5.4 Envelopes for each Configurations

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

Unequal leaf double doorsets are covered by this assessment with no restriction on the smaller leaf dimensions providing it does not exceed the relevant leaf size envelope and is not smaller in width than 300mm.

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

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

4.5.4.1 General Note on Intumescent Seals

1. Intumescent seals are to be fitted centrally unless stated otherwise.
2. Intumescent seals are fully interrupted at hardware locations unless stated otherwise.

4.5.4.2 Explanation for following sections

The performance of a doorset in terms of configuration and size is dependent on the leaf type, perimeter intumescent used and frame type. These elements are not automatically interchangeable. The following sections present the envelopes for the Pro 60 Ply Faced and Pro 60 MDF Faced leaf types and the hardwood 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:-

1. for LSASD increasing in configuration complexity up to LSADD
2. for each configuration, each leaf type is considered separately
3. for each configuration and leaf type, each frame type is considered separately
4. 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.

The intumescent specification reference as illustrated in the tables and graphs in the following sections is broken down into configurations, frame type and intumescent specification. The configuration hierarchy is categorised alphabetically and assigned a letter (A - B), which are fully described in the configuration section 4.5.2 of this assessment. The next component will be marked H for hardwood frame and assigned a number correlating to the frame type specified in frame section 7 of this assessment. The perimeter intumescent type and

arrangement will be distinguished numerically. This will start from 1 and increase until all perimeter intumescent types and variations have been allocated a number. The full description of the perimeter intumescent type and variation is given in the tables below each graph. This combined unique reference will be used to indicate on each graph the maximum leaf size increase that is permitted with each configuration, frame type and perimeter intumescent type and variation. An example of this referencing system and the information it conveys is described below;

Intumescent Specification reference: AH1/1 – indicates the following:

1. (A): Latched, Single Acting, Single Door configuration as stated in section 4.5.2,
2. (H1): Hardwood frame type 1 as stated in section 7,
3. (/1): intumescent type 1 as show in the table below the graph.

4.5.4.3 Summary of Permitted Configuration for (Sainty-Fire / Sentry Pro60) Leaf Type 1 & Frame Type 1

Permitted Configurations with frame type 1 with leaf type 1 (Pro 60 Ply Faced)			
Frame		Configuration	
		LSASD	LSADD
1	Hardwood frame*	Yes	Yes

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

4.5.4.4 Summary of Permitted Configuration for (Sainty-Fire / Sentry Pro60) Leaf Type 2 & Frame Type 1

Permitted Configurations with frame type 1 with leaf type 2 (Pro 60 MDF Faced)			
Frame		Configuration	
		LSASD	LSADD
2	Hardwood frame*	Yes	No

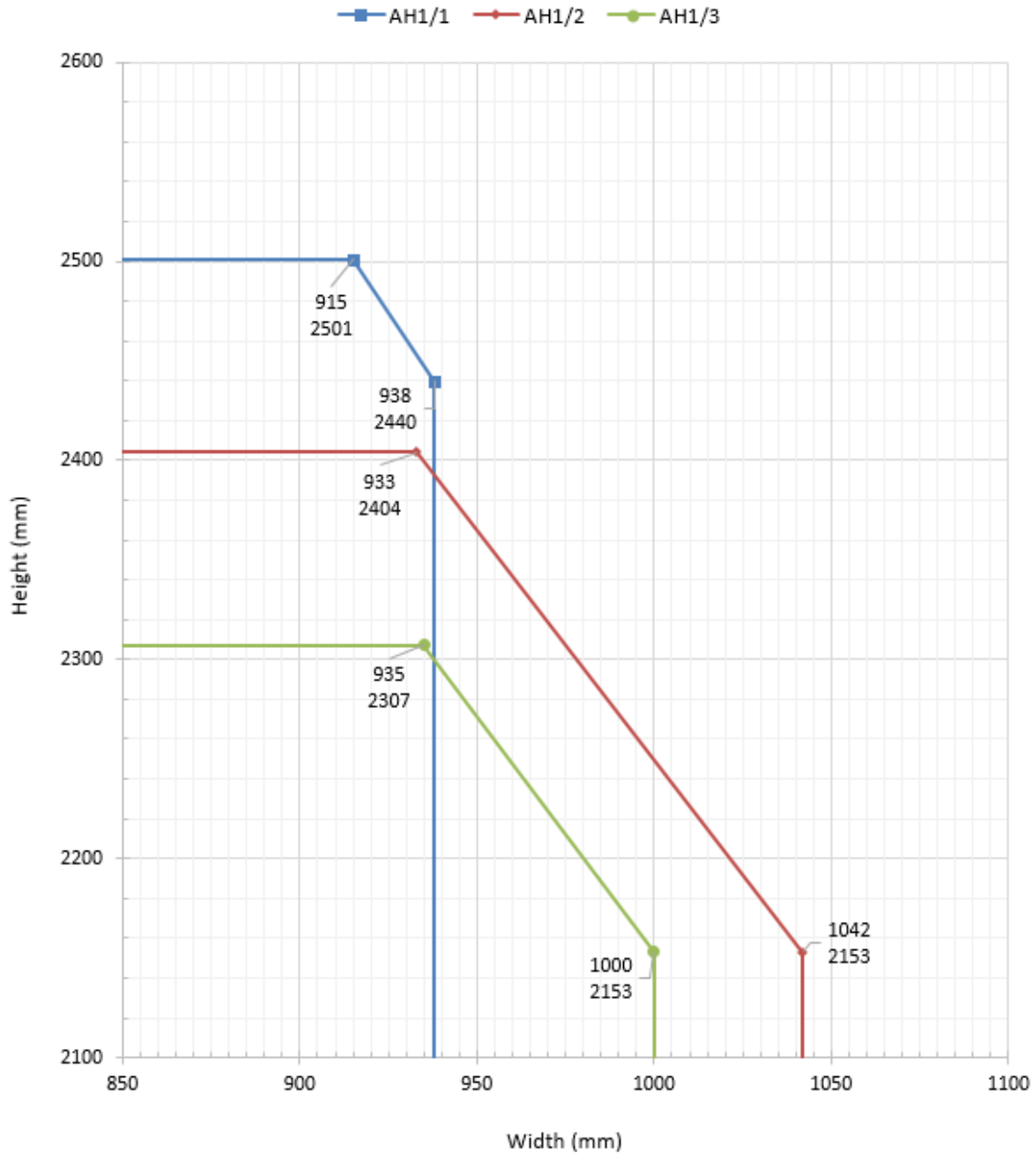
* See Section 7 for specific limitations with respect to the framing types

4.5.5 LSASD Configuration: Leaf Sizes & Intumescent Specification

Doorset created from Leaf type 1 with frame type 1

LSASD

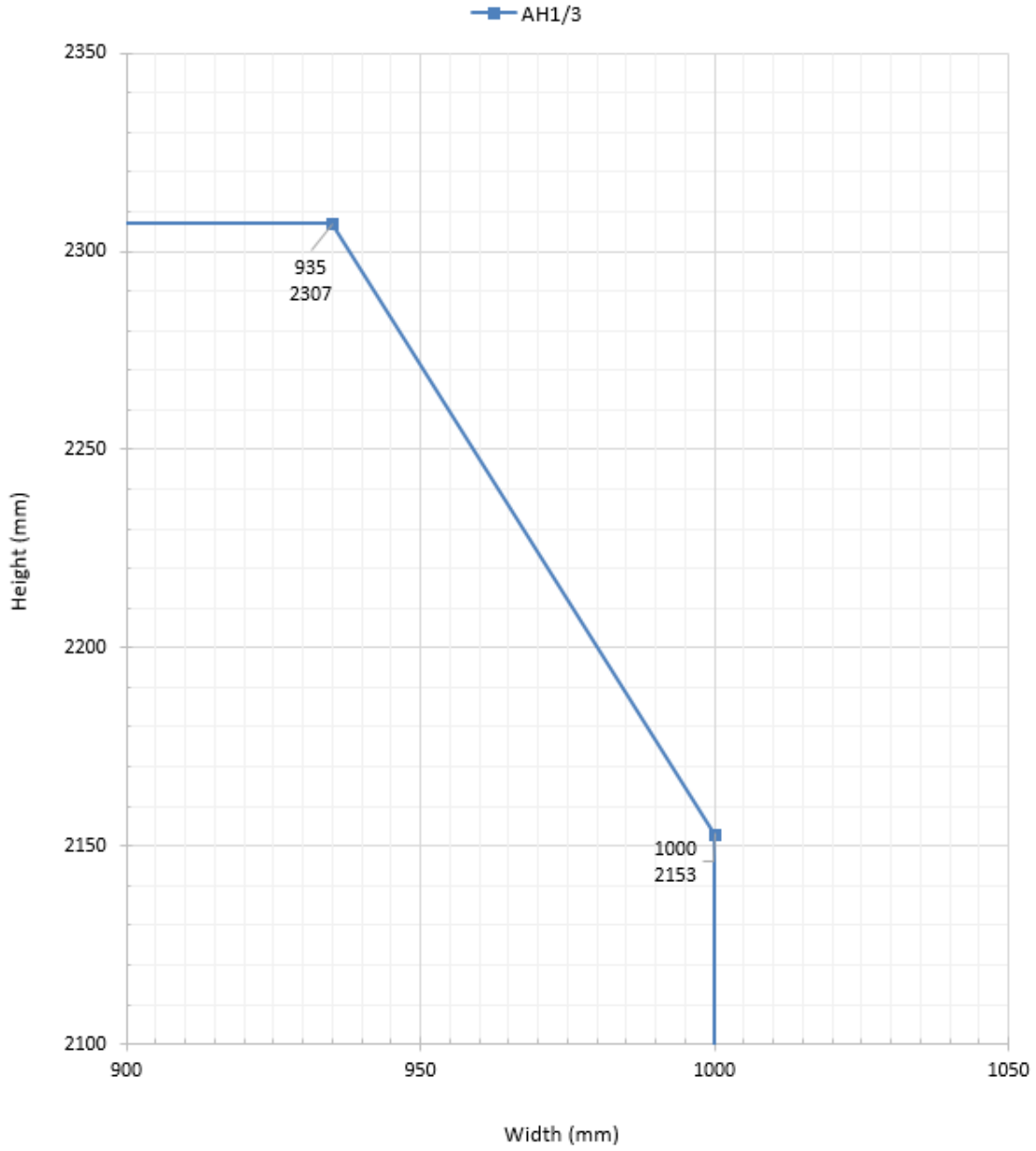
Door type 1 - Sainty-Fire / Sentry Pro60 (54mm thick Pro 60
 Ply Faced Blank) with Frame type 1



Intumescent Specification for LSASD Leaf 1 (Pro 60 Ply Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AH1/1 Blue Line (BMT/FEP/F15167 Rev A Doorset B)	8700	Pyroplex Ltd	Frame Head & Jambs or Door Leaf Top & Vertical Edges: 2no fitted 10mm apart and 8mm from the flush face in the frame reveal or door leaf edges.
AH1/2 Red Line (WF430472 Doorset A)	500P	Mann McGowan Ltd	Frame Head & Jambs or Door Leaf Top & Vertical Edges: 2no fitted 8mm apart and 9mm from the flush face in the frame reveal or door leaf edges.
AH1/3 ¹ Green Line (WF430472 Doorset B)	Type 617	Lorient Polyproducts Ltd	Frame Head & Jambs or Door Leaf Top & Vertical Edges: 2no fitted 8mm apart and 9mm from the flush face in the frame reveal or leaf edges.

¹The intumescent specification AH1/3 listed above was successfully tested with door leaf type 2. Door type 1 is of the same core construction as door type 2 but incorporates Plywood faces of the same thickness as the MDF. MDF is prone to delaminate and fall away when used as a facing material on timber door leaves in a fire situation more readily than Plywood facings. Considering the above and the added assurance of the considerable overrun achieved, Warringtonfire has permitted the use of the Lorient Polyproducts Ltd. Type 617 perimeter seals with door type 1. The maximum leaf sizes for this option is restricted to those calculated from the successfully tested door type 2, as illustrated in the graph above.

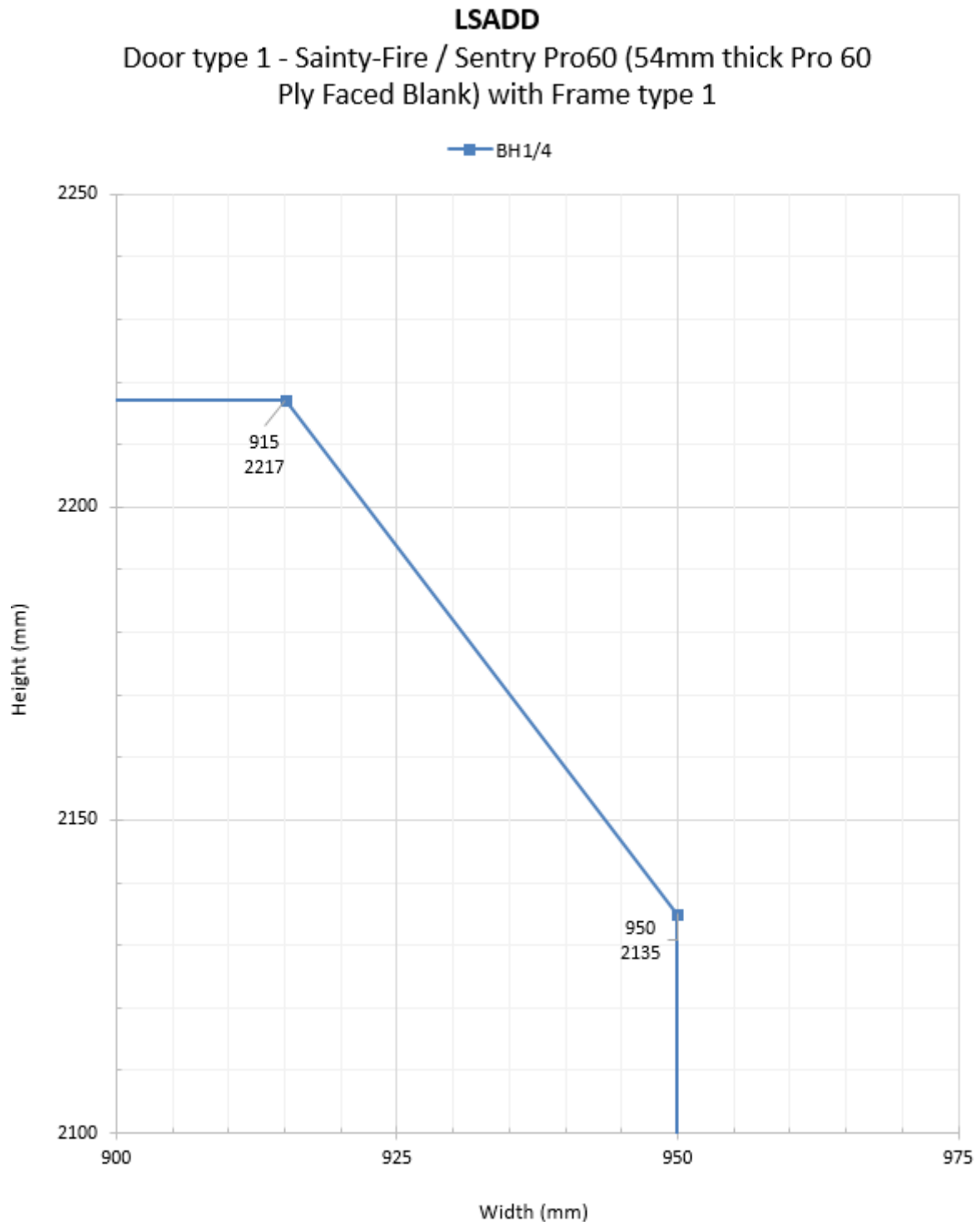
LSASD
**Door Type 2 - Sainty-Fire / Sentry Pro60 (54mm thick Pro 60
MDF Faced Blank) with Frame type 1**



Intumescent Specification for LSASD Leaf 2 (Pro 60 MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AH1/3 Blue Line (WF430472 Doorset B)	Type 617	Lorient Polyproducts Ltd	Frame Head & Jambs or Door Leaf Top & Vertical Edges: 2no fitted 8mm apart and 9mm from the flush face in the frame reveal or door leaf edges.

4.5.6 LSADD Configuration: Leaf Sizes & Intumescent Specification

Doorset created from Leaf types 1 with frame types 1



Intumescent Specification for LSADD Leaf 1 (Pro 60 Ply Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BH1/4 Blue Line (BMT/FEP/F15167 Rev A Doorset A)	8700	Pyroplex Ltd	<p>Frame Head & Jambs or Door Leaf Top & Vertical Edges: 2no fitted 10mm apart and 8mm from the flush face in the frame reveal or door leaf edges.</p> <p>Meeting Edge: 1no fitted 7mm from the flush face in the left leaf and 1no fitted 7mm from the stop side in the right leaf.</p>

5 General Description of Leaf Construction

5.1 Leaf Core Construction

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

5.1.1 Leaf Type 1 – (Pro 60 Ply Faced) – 54mm thick

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

Element		Material	Dimensions (mm)	Minimum Density (kg/m ³)*
Core	Inner	Spruce & Pine – horizontally orientated lamels	12 (t) x 38 (w)	450
	Outer	Spruce & Pine – vertically orientated lamels	12 (t) x 38 (w)	450
Stiles		None fitted	-	-
Rails		Pine	36 (t) x 25 (w)	450
Facing		Poplar core Plywood	9 (t)	450

*Client stated minimum density.

The leaf must be lipped as specified in section 5.3.

For adhesives used to fix the core, lipping and facings see section 9.

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

The minimum leaf thickness after finishes applied is 54mm.

5.1.2 Leaf Type 2 – (Pro 60 MDF Faced) – 54mm thick

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

Element		Material	Dimensions (mm)	Minimum Density (kg/m ³)*
Core	Inner	Spruce & Pine – horizontally orientated lamels	12 (t) x 38 (w)	450
	Outer	Spruce & Pine – vertically orientated lamels	12 (t) x 38 (w)	450
Stiles		None fitted	-	-
Rails		Pine	36 (t) x 25 (w)	450
Facing		MDF	9 (t)	600

*Client stated minimum density.

The leaf must be lipped as specified in section, 5.4.

For adhesives used to fix the core, lipping and facings see section 9.

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

The minimum leaf thickness after finishes applied is 54mm.

5.2 Leaf Size Adjustment During Manufacturing – all Leaf types

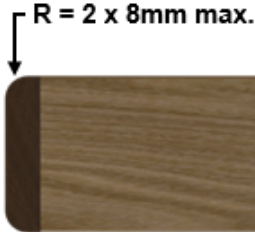
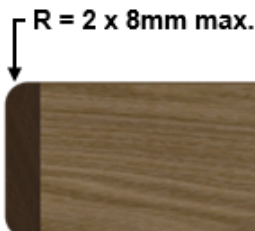
Door leaves may be altered as follows prior to the machining for hardware.

Pre-Machining Leaf Size Adjustment Specification	
Element	Reduction
Leaf	The size of the leaf may be reduced in height or width without restriction providing reduction is made from the vertical or bottom edges of the leaf, i.e. reduction is not permitted from the top rail for manufacturing purposes, and providing the finished leaf is lipped in accordance with section 5.3 or 5.4 respectively.
Timber Lipping	The timber lipping thickness can be reduced after it has been glued in place, providing it is not reduced below the minimum stated in 5.3 or 5.4 respectively.

5.3 Timber Lipping – Leaf type 1

The testing documented in section 3 has generally been undertaken on leaf type 1 using hardwood and Poplar EV lippings at varying thickness and densities applied to all edges. PU adhesive has been used in all cases to seal the lippings.

On the above basis, Pro 60 Ply Faced door blanks (leaf type 1) must be lipped with one of the following specifications.

Timber Lipping Specification for Pro 60 Ply Faced door blanks		
Material	Size (mm)	Min Density (kg/m ³)
Hardwood which must be straight grained joinery quality, free from knots, splits and checks. The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.	Flat = 6 – 11 thick with a maximum of 2mm profiling permitted at corners of lipping see below. 	640
Poplar EV	Flat = 8 – 12 thick with a maximum of 2mm profiling permitted at corners of lipping see below. 	700
-	Rounded = Not permitted	-
-	Rebated = Not permitted	

Notes:

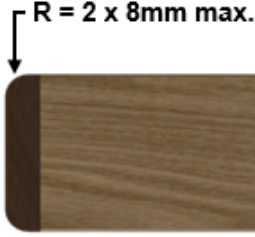
1. All lippings are to be the same thickness as the door core plus the decorative facings. This means the lippings are always exposed.
2. Overpanels separated from the leaf heads with a transom do not need to be lipped.
3. Single and double doorsets with or without transomed overpanels require lipping on all 4 edges.
4. Double doorsets must use square lippings at the meeting edges. Rebated lippings are not permitted.
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.

- Lippings must be bonded using PU adhesive. 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 as per supporting test evidence referenced in section 3.

5.4 Timber Lipping – Leaf type 2

The test documented in section 3 for leaf type 2 was undertaken using 8mm thick Poplar EV lippings applied to all edges. PU adhesive was used to seal the lippings.

On the above basis, Pro 60 MDF Faced door blanks (leaf type 2) must be lipped with the following specification.

Timber Lipping Specification for Pro 60 MDF Faced door blanks		
Material	Size (mm)	Min Density (kg/m ³)
Poplar EV The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.	Flat = 8 – 12 thick with a maximum of 2mm profiling permitted at corners of lipping, see below. 	700
	Rounded = Not permitted	
	Rebated = Not permitted	

Notes:

- All lippings are to be the same thickness as the door core plus the decorative facings. This means the lippings are always exposed.
- Overpanels separated from the leaf heads with a transom do not need to be lipped.
- Single doorsets with or without transomed overpanels require lipping on all 4 edges.
- 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.
- Lippings must be bonded using PU adhesive. 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 as per supporting test evidence referenced in section 3.

5.5 Decorative & Protective Facings – all Leaf types

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 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	0.5
Timber veneers	2
Plastic laminates	2
PVC	2
Cellulosic and non-metallic foils	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates
2. The door leaf thickness may be reduced on both sides by a maximum of 0.5mm for calibration purposes in order to accommodate the chosen finish. The minimum overall leaf thickness must remain at 54mm after finishing has been applied.
3. Materials must not return around leaf edges.
4. Materials must not conceal intumescent strips.

6 Glazing within the Leaf

6.1 General

The Pro 60 MDF Faced door leaf type 2 has not been tested with a glazed aperture installed and is therefore not permitted with glazing.

The testing conducted on the Pro 60 Ply Faced door design has demonstrated that they are capable of tolerating glazed apertures, whilst providing a margin of over performance.

Test reference WF430472 included a type 1 door leaf with a glazed aperture measuring 875mm high x 715mm wide fitted 120mm from the head of the leaf and 109mm from the closing edge of the leaf.

Test BMT/FEP/F15167 Revision A included a type 1 door leaf with a glazed aperture measuring 810mm high x 560mm wide fitted 100mm from the head of the leaf and 100mm from the closing edge of the leaf.

Glazing is therefore acceptable within the following parameters taking the size of the largest tested aperture and performance of the door the tested aperture size has been increased by 60%.

The maximum assessed glazed area for type 1 door leaves.1.0m².

Based on the minimum tested distance between the aperture and the edges of the door, glazed openings must not be less than 100mm from horizontal edges and 100mm from vertical edges.

Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 100mm of core between apertures. This distance is based on the minimum distance tested between the aperture and the edge of the leaf and the stability of the door core in fire test conditions.

Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape, but no aperture angle must be less than 60 degrees.

Timber for glazing beads must be straight grained joinery quality, free from knots, splits and checks.

6.1.1 Single Pane Glass & Glazing Systems – Leaf Type 1

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

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

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

The total area of all glazed apertures must not exceed that state in Section 6.1 above.

6.1.2 Single Pane Glass & Glazing Systems – Leaf Type 1

Glass & Glazing System Specification Maximum Assessed Area (m ²)						
Glass type and manufacturer (Test Reference)		Glazing system and manufacturer (Test reference)				
		1. Therm A Glaze 60 Intumescent Seals Ltd (BMT/FEP/F15167)	2. Fireglaze 60 Sealmaster UK Ltd	3. Pyroglaze 60 Mann McGowan Ltd	4. System 90+ Lorient Polyproducts Ltd (CF185)	5. STS105GT3 /ST302 Sealed Tight Solutions Ltd ² (WF430472)
1.	Pyrodur 60-10 Pilkington UK Ltd (BMT/FEP/F15167 Rev A Doorset B)	0.82	0.82	0.82	0.82	0.82
2.	Pyroguard EW 60 (11mm) Pyroguard UK Ltd ⁴ (CF257)	n/a	0.58	n/a	n/a	n/a
3.	Pyranova 15-S2.0 Schott Glass Ltd	0.82	0.82	0.82	0.82	n/a
4.	Pyrobelite 12 AGC Flat Glass UK (WF430472)	1.0	1.0	1.0	1.0	1.0
5.	Pyrodur 60-20 Pilkington UK Ltd	1.0	1.0	1.0	1.0	1.0
6.	Pyroguard EI30 Pyroguard UK Ltd	1.0	1.0	1.0	1.0	1.0
7.	Pyrostop 30-10 Pilkington UK Ltd	1.0	1.0	1.0	1.0	1.0
8.	Pyrobel 16 AGC Flat Glass UK ³	1.0	1.0	1.0	1.0	1.0
9.	Pyroguard 23 AGC Flat Glass UK ³ (BMT/FEP/F15167 Rev A Doorset A)	1.0	1.0	1.0	1.0	1.0

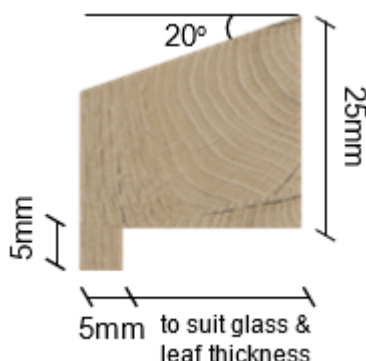
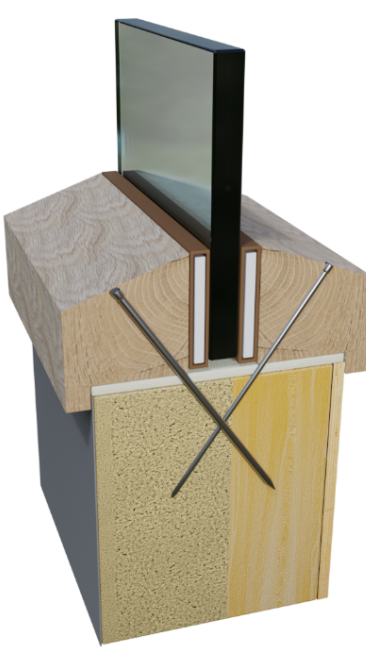
Notes:

1. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.
2. Glazing system 5 may only be used with glass types 1 & 4 - 9.
3. Glass types 8 and 9 are fully insulating for 60 minutes in terms of the criteria set out in BS 476: Part 20: 1987.
4. Pyroguard EW 60 (11mm thick) is restricted to Fireglaze 60 glazing system only.

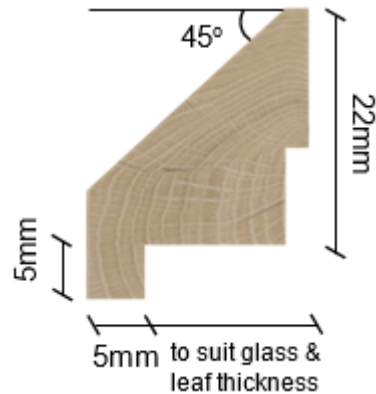
6.2 Glazing Beads & Installation – all Leaf Types

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. In the example shown, Therm-A-Glaze 60 has been depicted with a single glazed unit.

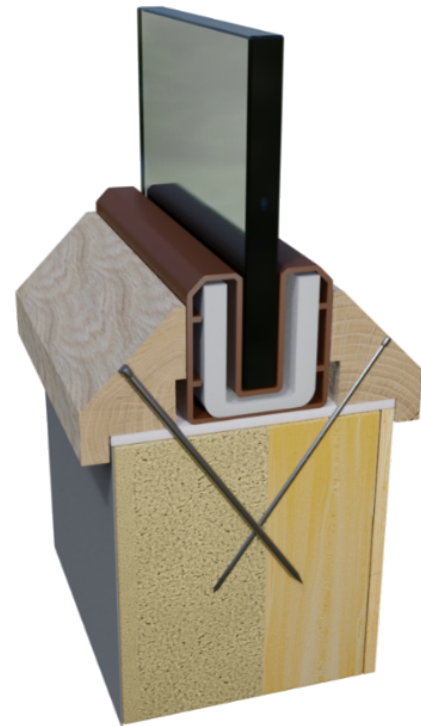
6.2.1 Chamfered Bead

Permitted with glazing system 1, 2 & 3 from the table in Section 6.1.1	
	
<ol style="list-style-type: none"> 1. The glazing beads must be created from straight grained joinery quality hardwood (not beech) of a minimum 640kg/m³ density. 2. Glazing beads must be retained in position with 60mm long steel pins or 60mm long No. 6-8 screws, inserted at 35-40° to the vertical. 3. 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 6.2.3 below. 4. The fitting of the glazing seal between the bead and the glass should generally be in accordance with the manufacturer's instructions with a tight fit present between the substrates. 5. Glass should be aligned within the aperture using hardwood or non-combustible setting block placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires 	

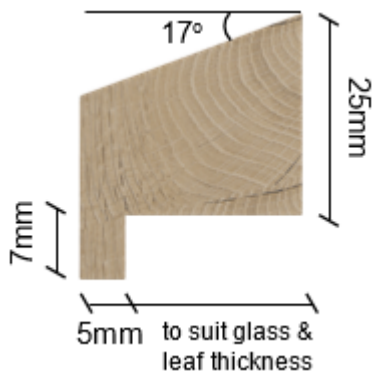
Permitted with glazing system 4 from the table in Section 6.1.1



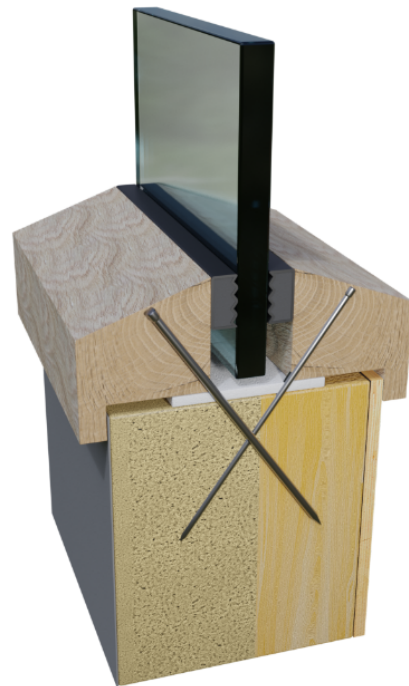
1. The glazing beads must be created from straight grained joinery quality hardwood (not beech) of a minimum 640kg/m³ density.
2. Glazing beads must be retained in position with 60mm long steel pins or 60mm long No. 6-8 screws, inserted at 35-40° to the vertical.
3. Fixings must be at 150mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.2.3 below.
4. The fitting of the glazing seal between the bead and the glass should generally be in accordance with the manufacturer's instructions with a tight fit present between the substrates.
4. Glass should be aligned within the aperture using hardwood or non-combustible setting block placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires



Permitted with glazing system 5 from the table in Section 6.1.1

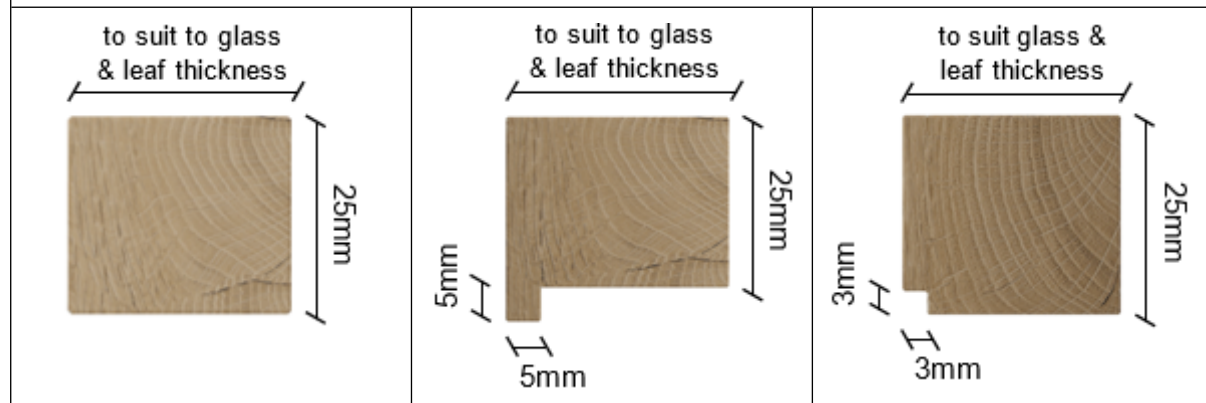


1. The glazing beads must be created from straight grained joinery quality hardwood (not beech) of a minimum 640kg/m^3 density.
2. Glazing beads must be retained in position with 50mm long steel pins or 50mm long No. 6-8 screws, inserted at $35\text{-}40^\circ$ to the vertical.
3. Fixings must be at 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 6.2.3 below.
4. The fitting of the glazing seal between the bead and the glass should generally be in accordance with the manufacturer's instructions with a tight fit present between the substrates.
5. Glass should be aligned within the aperture using hardwood or non-combustible setting block placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires



6.2.2 Square Beads

Permitted with glass types 8-9 from the table in section 6.1.1 only but may be used with glazing systems 1-3 listed in the table



1. The glazing beads must be created from straight grained joinery quality hardwood (not beech) of a minimum 640kg/m³ density.
2. Glazing beads must be retained in position with 40mm long steel pins or 40mm long No. 6-8 screws, inserted at 35-40° to the vertical.
3. 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 6.2.3 below.
4. A 6 – 10mm thick square aperture liner is permitted for use with square beads providing it is constructed from hardwood of minimum density 640kg/m³ and glued in position using a UF, PVA or PU type adhesive.
5. The fitting of the glazing seal between the bead and the glass should generally be in accordance with the manufacturer's instructions with a tight fit present between the substrates.
6. Glass should be aligned within the aperture using hardwood or non-combustible setting block placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires

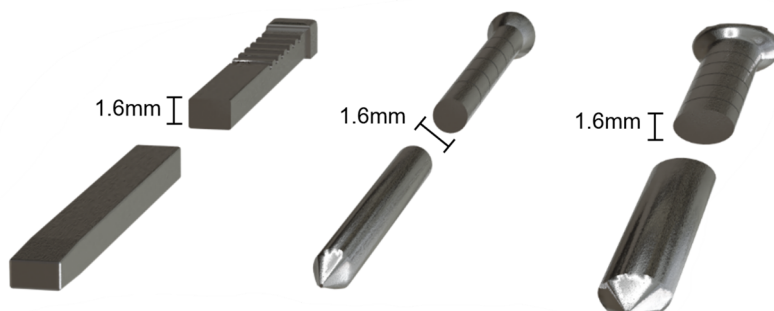
6.2.3 Glazing Pins for Glazing Within Leaf

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

Option 1 – Round, Oval & Rectangular Pins

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

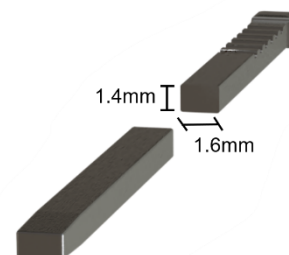
1. Minimum Standard Wire Gauge (SWG) 16.
2. Minimum cross section area of 2.03mm².
3. Minimum linear dimension of 1.6mm in any direction, see figure below.



Option 2 – Gun (Pneumatically) Fired Rectangular Pins

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

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



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

7 Door Frame Construction

7.1 Details for Frame 1

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

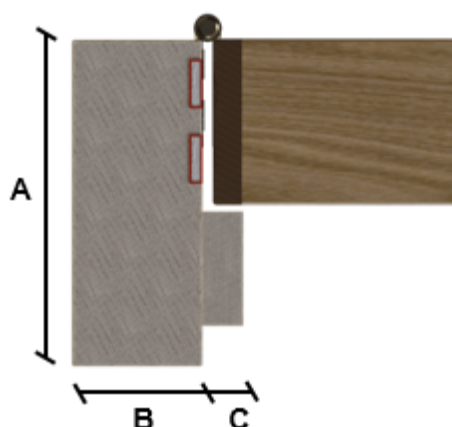
Frame specification				
Frame type	Material	Minimum section size (mm)	Minimum density (kg/m ³)	Acceptable leaf type
1	<p>Hardwood:</p> <p>All door frame timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects).</p> <p>The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.</p>	<p>Frame: 70 (d) x 32 (w) (excluding stop)</p> <p>Stop: 12 (w) (integral or planted on)</p>	640	Leaf 1 & 2

Note:

Minimum section size is subject to size of hardware and the use of transomed overpanel (see frame details below).

7.1.1 Standard frame detail

The diagram below shows detail of the standard frame construction.



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

NB; the minimum dimensions of the door frame must be increase to 75mm deep x 35mm wide when fitting a concealed closer, see section 10.7.2 for details.

See section 7.1.2 for minimum door frame dimensions and profile when fitted with stress grooves in the rear

7.1.2 7.1.2 Door frame profile with stress groove

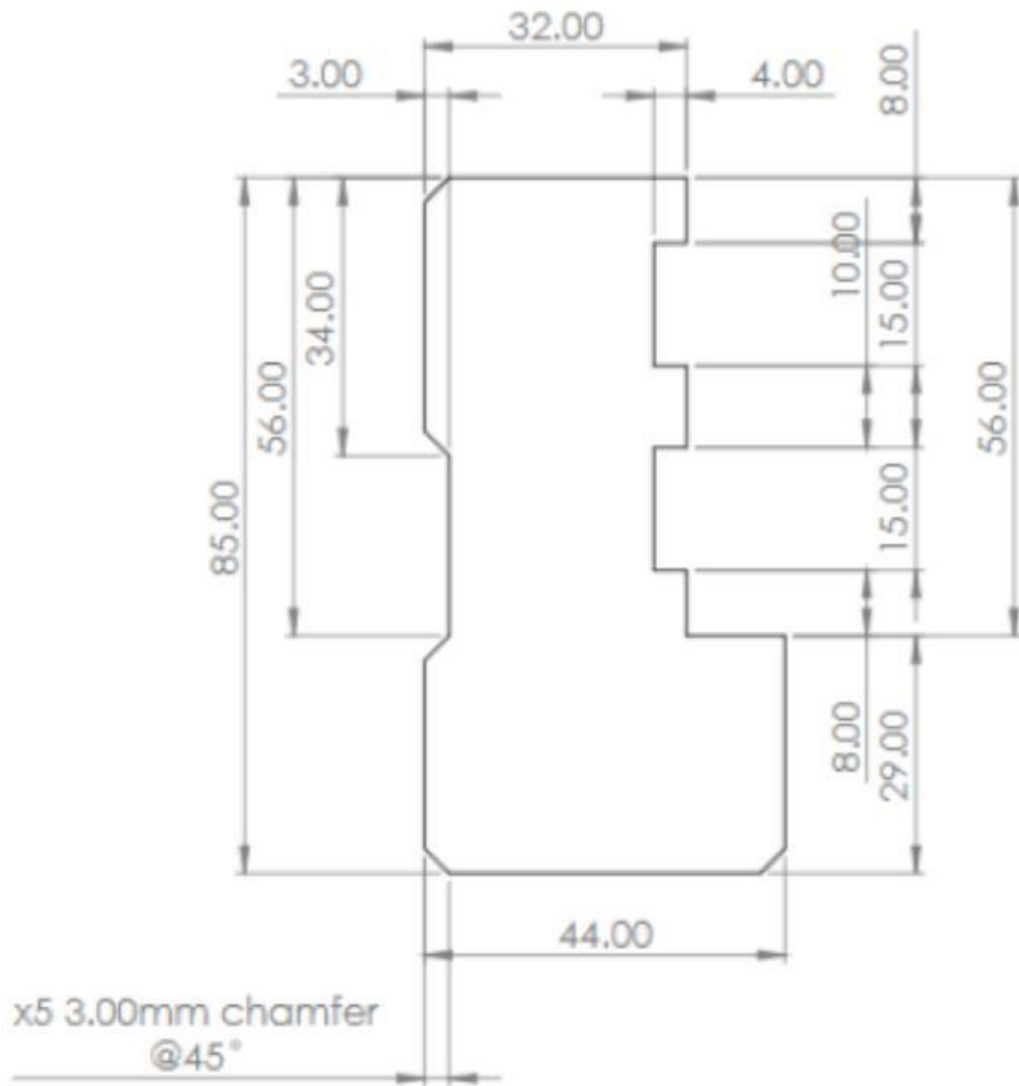
It is proposed to assess the inclusion of a 22mm wide x 3mm deep stress groove recessed centrally to the rear of the frame profile as depicted in the drawing below. This door frame profile is the minimum section that is to be used when using stress grooves. The inclusion of the stress groove reduces the thickness of the door frame local to that area, which could potentially reduce the stability of the frame, as the timber begins to char in fire test conditions.

However, in all cases the back of the frame must be suitably fire stopped in accordance with section 11.3 of this assessment. The fire stopping methods are designed and tested to prevent fire from tracking around the rear of the frame in test conditions, which if left unprotected, can lead to premature integrity failure. The fire stopping methods will therefore provide a suitable barrier to prevent flames attacking the rear of the frame where the stress groove is located, for the duration of test.

Furthermore, given the location of the stress groove in the frame, it is possible to use the char rates given within EN 1995-1-2:2004, for hardwood timber of that matching the frame density within this field of application report, to calculate whether the door frame would char back in fire test conditions to the depth at which the groove is located.

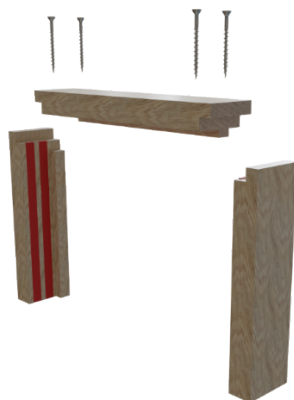
Using the char rates within EN 1995-1-2:2004, the timber would likely experience 0.50mm char rate per minute and therefore the door frame would be expected to char to a depth of 30mm within the required 60minutes fire resistance period of this assessment. Considering the minimum frame depth permitted for the door frame profile below is 85mm deep, and given the location of the stress groove within the approved profile the char depth would have only just reached the location of the stress groove after 60minutes.

For the above reasons, Warringtonfire has permitted the use of a stress groove centrally fitted to the rear of the frame in this assessment matching the specification in the drawing below. If the stress groove is used the doorset must be fitted with a face fixed closer. Concealed closers are not permitted with this frame design. Stress grooves cannot be used within transoms where solid over panels are used.



7.2 Door Frame Joints

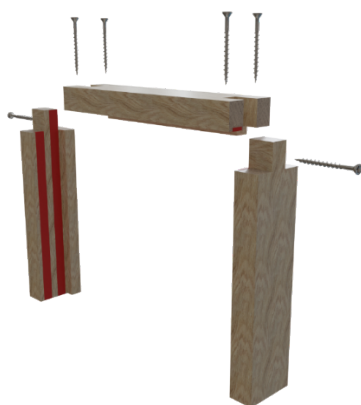
Below are depictions of the door framing joints that are deemed acceptable. Please note that the drawings are representative of each type of door frame joint; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies.



Double Rebated Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint



Trenched or Half Lapped Joint

Approved door frame jointing options

8 Overpanels

8.1 Solid overpanels framed on all edges (transomed)

Overpanels of the same construction as the door leaf/leaves may be used when separated by a transom. In this application they are not required to be lipped on any specified edges. The overpanel must be fully contained within the door frame (see following diagram).

1. A transom is required to separate the leaf head(s) from the overpanel and must be to the same specification as frame type 1, as described in the table in section 7.1.
2. Transom joints must utilise one of the following methods: mortice and tenon joints or butt joints (see section 7.2). 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.
3. Joints are required to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws.
4. Solid overpanels must be fixed screwing through the rear of the frame with steel screws passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between



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

The intumescent seals specified for the jambs in section 4 must also be fitted to all four edges of the panel. The seals may be fitted either in the panel edges or alternatively in the frame reveal.

Maximum panel dimensions are given as below:

Assembly Element		Height (mm)	Width (mm)
Overpanel	Single Doorsets	2000	Overall doorset width
	Double Doorsets	1500	Overall doorset width

9 Adhesives

The following adhesives must be used in the construction of the doorsets. 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, as supported by successful test evidence referenced in section 3.

Element	Product/Material Type
Door blank core	WBP melamine
Top Rail	WBP melamine or MUF
Door blank facings	WBP melamine
Timber lipping & decorative facings	PU

10 Hardware

10.1 General

The following section details the permitted scope and constraints for fitting hardware to the Sainty-Fire / Sentry Pro60 doorset design. The following items of hardware must bear the CE Mark:

1. Latches & locks: Test Standard EN 12209
2. Single axis hinges: Test Standard EN 1935
3. Controlled door closing devices: Test Standard EN 1154
4. Electrically powered hold-open devices: Test Standard EN 1155
5. Emergency exit hardware: Test Standard EN 179
6. Panic exit hardware: Test Standard EN 1125.

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

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

1. 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
2. As a result of an assessment of the appropriateness of the item of hardware, based on test evidence not commissioned by Jiangsu Sainty Bancom Wood Co. Ltd.
3. 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:

1. Leaf size
2. Configuration
3. Intumescent seals
4. Intumescent protection
5. Frame configuration requirements

No item of hardware should be within 200mm of another item of hardware unless there is test evidence to demonstrate they can be in closer proximity.

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

10.2 Intumescent to Hardware

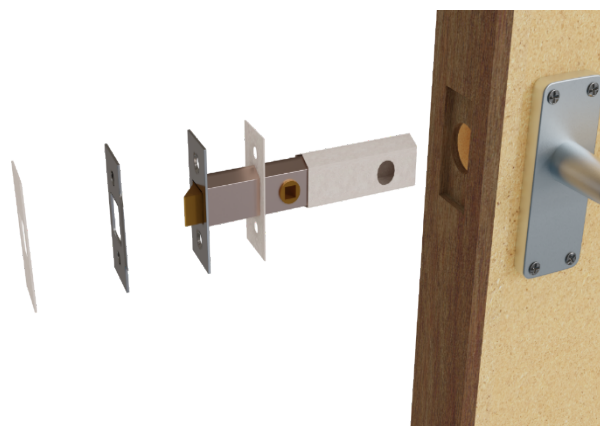
The intumescent materials used to protect hardware that have been tested and assessed for this doorset design are detailed below. Note that any one of the product/maker options listed in the table may be used in the specific application noted. However, only 1 No manufacturer should be considered per doorset application.

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

Hardware Intumescent Specification		
Item	Location	Product/Manufacturer
Hinges	Under both hinge blades	1mm thick Interdens - Mann McGowan Ltd
Lock/latches	Under latch & keep forend (Double doorset with locksets with a forend 65mm high or greater.)	2mm thick Interdens.
	Under latch & keep forend (Single doorset with locksets with a forend of maximum 65mm high)	1mm thick Interdens - Mann McGowan Ltd
Concealed overhead closers	Encasing the entire body of the concealed closer, behind forend face of mechanism in top of leaf and behind rebated slide rail body located in the frame.	2mm thick IP115 intumescent kit – Rutland Ltd
Drop Seal	Encasing drop seal body	1mm thick Interdens



Example of hinge protection detail



Example of lock & latch protection detail

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	<ol style="list-style-type: none">1. Latch2. Handle3. Hinges4. Self-closing device (closer)
LSADD	<ol style="list-style-type: none">1. Latch2. Handle3. Hinges4. Self-closing device (closer)

10.4 Latches & Locks

10.4.1 Single Point Engagement

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

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

Element	Manufacturer & Product Reference
Locks & latches	1. Easi-T mortice latch. 2. TL2 Steel tubular mortice latch – E*S Eurospec.

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

Leaf Type 1 doorsets

Element	Specification
Maximum forend and strike plate dimensions	165mm high x 25mm wide x 4mm thick
Maximum body dimensions	130mm high x 70mm 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 $\geq 800^{\circ}\text{C}$

Leaf Type 2 doorsets

Element	Specification
Maximum forend and strike plate dimensions	65mm high by 25mm wide by 4mm thick
Maximum body dimensions	45mm high by 70mm wide by 18mm thick
Intumescent protection	see section 10.2
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point $\geq 800^{\circ}\text{C}$

Notes:

1. In all instances the location of the handle must be between 1000 – 1200mm from the threshold.

10.4.2 Cylinders

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

The components with the following specification are deemed acceptable.

1. Where required for use with single point latches, all parts essential to the locking/latching action to be steel, stainless steel or brass with a melting point $\geq 800^{\circ}\text{C}$.
2. Cylinders may include a thumbturn to one face if required.

10.5 Handles

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference
Handles	<ol style="list-style-type: none">1. Lever type handle – Zoo Hardware.2. CH499.01.SSS Stainless steel lever type handle – Consort Architectural Hardware.

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

1. The handle may be any size up to 55 \emptyset mm rose size. The handle must be compatible with the lock/latch and cylinder (if required), such that the closing action of the doorset is not impeded.

10.6 Butt Hinges

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

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

Element	Manufacturer & Product Reference
Hinges	1. H101 Steel lift off type bearing hinges – Royde and Tucker

Alternatively, the 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:	Top	150 – 200mm from the head to top of hinge	
	If 3 hinges are required:	2 nd	Minimum 200mm from top hinge or centrally fitted between top and bottom hinge
		Bottom	180 - 250mm from the foot of leaf to bottom of hinge
	If 4 hinges are required:	Top	150 - 200mm 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	180 - 250mm from the foot of leaf to bottom of hinge
Intumescent protection:	See section 10.2		

Note:

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

10.7 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 jamb mounted, transom mounted and offset pivots used with floor springs are not considered acceptable for use with the Sainty-Fire / Sentry Pro 60 doorset range.

10.7.1 Overhead Face Fixed Closer

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

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

Element	Manufacturer & Product Reference
Overhead face-fixed closers	1. TS3204 overhead surface mounted type closer – Rutland. 2. ETS.18314.SE overhead surface mounted closer – Rutland.

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

1. CERTIFIRE approved overhead face-fixed closers for 60-minute fire resistance applications on 54mm thick timber door and timber frames

Note:

It must be ensured that the closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal

10.7.2 Concealed Overhead Self Closing Device

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame type: 1

Configurations: LSASD & LSADD

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

Element	Manufacturer & Product Reference
Concealed overhead closer	1. ITS 11205 concealed type closer – Rutland.

Alternatively, the components with the following specification are also deemed acceptable to use with door type 2 only.

1. CERTIFIRE approved concealed overhead closers for 60-minute fire resistance applications for use on 54mm thick timber door and frames

Note:

1. 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
2. For intumescent protection requirements, see section 10.2.

The ITS 11205 concealed closer was successfully tested in report WF430472 Doorset B. The concealed closer was installed into the frame head and the head of door type 2 which incorporated 9mm thick MDF facings with a density of 600kg/m³. Specimen A consisted of door type 1 with 9mm Plywood facings which was installed with a face fixed overhead type closer. The 2 specimens tested were latched, single acting, single doorsets measuring 2153mm high x 933mm wide x 54mm thick and incorporating the same frame design. The main differences between the tests were the perimeter seals, glazing, closer design and the facing material used. Disregarding the failure associated with the glazing at 62 minutes on doorset A, no other failures occurred to the doorset with the test terminating at 74 minutes. Doorset B failed at 73 minutes via a cotton pad located at the centre of the head on the door leaf. This demonstrates the door leafs ability to prevent burn through well exceeding 60 minutes fire resistance.

MDF is prone to delaminate and fall away when used as a facing material on timber door leaves in a fire situation more readily than Plywood facings. Considering Doorset A is of the same core construction but incorporated Plywood faces of the same thickness as Doorset B, and that a considerable overrun was achieved, Warringtonfire has permitted the use of the ITS 11205 concealed close in door type 1. Additionally, the following requirements and installation instructions must be comply with;

- Permitted with Latched, Single Acting, Single Doorsets only.
- Permitted with door type 1 and door type 2.
- The door frame must be type 1 however the dimension must be increased to measure a minimum of 75mm deep x 35mm thick incorporating a minimum stop width of 12mm with a minimum density of 640kg/m³.
- Must be used in combination with Lorient Type 617 perimeter intumescent seals fitted in the frame head and jambs for both door types as per the specification given in section 4.5.5 referenced as AH1/3 and restricted to the maximum leaf sizes associated

with that specification. Perimeter seals fitted in the door edges are not permitted with a concealed closer.

- For intumescent protection requirements, see section 10.2.
- The concealed closer must be installed into the leaf head and frame head tightly with no significant gaps also factoring in for the intumescent protection.
- The closer must be fitted a minimum 100mm from the hanging edge and a minimum of 200mm of core material must remain between the body of the closer and any glazed aperture or other item of hardware.
- The closer must be installed complying fully with the manufacturing instructions.

10.8 Flush Bolts

Flush bolts have not been tested and are not permitted in this assessment.

Surface mounted bolts may be fitted without restriction providing they do not remove material from the frame or leaf.

10.9 Non-Essential Hardware

10.9.1 Push Plates & Kick Plates

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

The components with the following specification are deemed acceptable.

1. Steel or stainless-steel face-fixed hardware such as push plates and kick plates may be surface fitted to the doorset. These items of hardware are permitted up to a maximum of 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a contact or other thermally softening adhesive. Plates must not return around the door edges or 'notch out'/interrupt the door stop.

10.9.2 Panic Hardware

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

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.

10.9.3 Environmental Seals

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

Silicon 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.

10.9.4 Threshold drop Seals

These items are suitable in the following applications only:

Leaf types: 1 & 2

Frame types: 1

Configurations: LSASD & LSADD

An RP8Si aluminum Raven Seals drop seal was successfully tested in report WF430472 and is acceptable for use in all door designs. It is permitted for use but must be fitted centrally in the base of the leaf and include the intumescent protection specified in section 10.2.

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

Product	Manufacturer
LAS8007/0935A00	Lorient Polyproducts Ltd.
IS8010si	Lorient Polyproducts Ltd.
RP8Si	Raven Products Ltd.
NOR810, NOR810S, NOR810dB+	Norsound Ltd.
SLS-DRP-100	Halspan Ltd.
STS 422	Sealed Tight Solutions Ltd

11 Installation




11.1 General

This section considers the installation of direct types of frames and doorset. This section considers:

1. the door frame and architrave installation position relative to the wall
2. the fire stopping between the frame and the wall and the use of shadow gap
3. the fixing requirement including packers
4. the requirements for door edge gaps
5. 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 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap, other than when the architrave abuts the wall.</p>
	<p>Split frames are permitted providing that both frame sections are secured to the wall in accordance with section 11.5. Furthermore, the main frame section (from which the door is hung) must be constructed to at least the minimum door frame section size (width and depth) as per the requirements noted in this report – see door frame section. The extension piece must be constructed using the same timber species as the main frame section.</p>

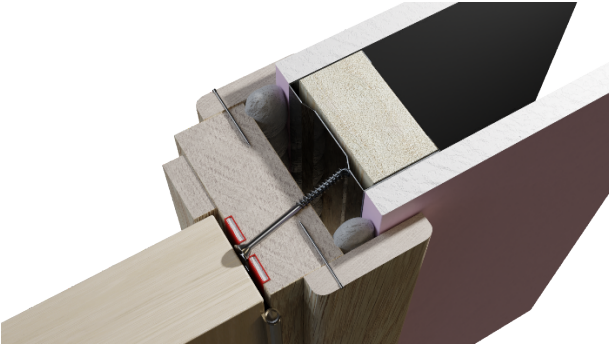

Note:


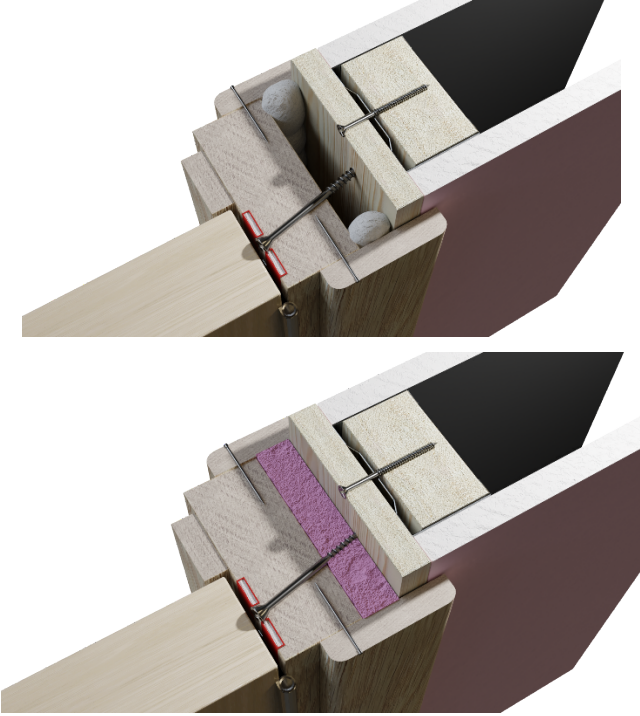
The drawings are provided as a generalised illustration of the door frame installation only; actual installation must be as per the text within this document specifies.

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.

All specimens successfully tested in reports BMT/FEP/F15167 Rev A and WF430472 where installed using tightly packed mineral fibre full depth of the frame and capped with 10mm deep intumescent acrylic mastic with gaps ranging from 7-15mm wide. This firestopping technique is illustrated in the table below to cover gap sizes of 10 – 20mm.

Gap (mm)	Requirement	3D model depiction
0 – 2	In practice, unlikely to occur, but if present, must be sealed with architraves, as below, fitted over a bead of acrylic intumescent sealant, tested as below.	N/A
3 – 10	Gap must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.	
10 – 20	Gap must be tightly packed with mineral fibre capped on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1 or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Timber architraves of a minimum 18mm thick must be fitted to both faces, fitted	

Gap (mm)	Requirement	3D model depiction
	with a minimum 15mm overlap to the door gap.	
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 and the gap between subframe and wall 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 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.</p>	

Note:

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

11.4 Packers

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

11.5 Wall types, Structural Opening & Fixity

For walls that remain rigid during fire exposure (brickwork or blockwork, for example) the opening should 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.

The supporting construction must provide at least the required level of fire resistance designated for the doorset design and be a suitable medium to permit adequate fixity.

It must therefore be capable of staying in place and intact for a minimum of 60 minutes. For single leaf doorset, 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.

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.

11.6 Post Production (Onsite) Leaf Size Adjustment

The Saintry-Fire / Sentry Pro60 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	8mm between bottom of leaf and top of floor covering. This is the maximum tolerance for fire resistance only. Where smoke control is required refer to section 13.

12 Insulation Performance

Insulation performance may be claimed for a doorset to this design meeting the following:

Insulation Performance Criteria		
Type		Details
Partially insulating		Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Timber frames	Unglazed doorsets or doorsets including 60-minute insulating glazing (if approved)

13 Smoke Control Guidance

Fire doorsets required to provide an ambient temperature smoke control function will need to fit smoke seals, or combined intumescent/smoke seals, which have been tested in accordance with one of the following test methods:

- BS 476-31.1: 1983; *Fire tests on building materials and structures, Section 31.1 Method of measurement under ambient temperature conditions*
- BS EN 1634-3: 2004; *Fire resistance tests for door and shutter assemblies — Part 3: Smoke control doors and shutters*

In order for the doorset to provide the smoke leakage performance demonstrated by the smoke leakage test evidence, the orientation and position of the smoke seals, any interruptions, door edge gaps, and the type and configuration of the doorset must be consistent with the details tested. Additionally, any other components installed where smoke leakage may occur, such as glazing, hardware, or sealing between the frame and structural surround, must also be taken into account.

The tested leakage rate will be expressed in the test reports as the volume of air leakage through the complete specimen, per linear metre of door gap, per hour (m³/m/hr), which is measured at the pressure differences stated in the relevant standard e.g. 10Pa, 25Pa and 50Pa. The test reports will also state the tested threshold arrangement (i.e. taped or fitted with a threshold seal).

The fitting of smoke seals must not compromise the fire resistance performance of the doorset designs assessed within this field of application. Smoke seals that are fitted to fire resisting doorsets must therefore have suitable fire resistance test evidence that demonstrates the performance of the seal in fire test conditions, when tested as part of a complete doorset, to the relevant test standard (e.g. BS 476: Part 22: 1987 or BS EN 1634-1). The configuration and location of the seal in the fire test evidence must align with that tested for smoke leakage.

Smoke seals can compromise the fire resistance performance of door designs by, for example, preventing the door leaf from closing fully within the frame reveal or igniting if the seal is fitted to a door design without insulation performance. It is therefore recommended that fire test evidence is sought that directly supports the use of the smoke seal with the door design assessed herein, or, where cascaded evidence is being relied upon, the smoke seal manufacturer is contacted to verify that the fire test evidence for the seal is applicable to the door design assessed herein.

14 Conclusion

If Sainty-Fire / Sentry Pro60 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 60 minutes integrity and insulation (subject to section 12).

15 Declaration by the Applicant

- 1) We the undersigned confirm that we have read and comply with obligations placed on us by the Passive Fire Protection Forum (PFPF) Guide to undertaking technical assessments and engineering evaluations based on fire test evidence 2021 Industry Standard Procedure
- 2) We confirm that any changes to a component or element of structure which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.
- 3) We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.
- 4) We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.
- 5) We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

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

Signed:

Name:

Position:

Date:

For and on behalf of: **Jiangsu Sainty Bancom Wood Co. Ltd.**

16 Limitations

The following limitations apply to this assessment:

- 1) This field of application addresses itself solely to the elements and subjects discussed and do not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
- 2) This field of application report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available 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. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this field of application, the element is suitable for its intended purpose.
- 6) This field of application report represents our opinion as to the performance likely to be demonstrated on a test in accordance with BS 476: Part 22: 1987, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this field of application would be regarded by any Building Control authority as sufficient for that or any other purpose. This field of application report is provided to the client for its own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any purpose.
- 7) This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Warringtonfire. All work and services carried out by Warringtonfire Testing and Certification Limited are subject to, and conducted in accordance with, the Standard Terms and Conditions of Warringtonfire Testing and Certification Limited, which are available at <https://www.element.com/terms/terms-and-conditions> or upon request.
- 8) The version/revision stated on the front of this Field of Application supersedes all previous versions/revisions and must be used to manufacture doorsets from the stated validity date on this front cover. Previous revisions of the Field of Application cannot be used once an updated Field of Application has been issued under a new revision.

17 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 15 duly signed by the applicant.

Signature:		
Name:	*Liam Dunk	*Peter Barker
Title:	Product Assessor	Technical Manger

* For and on behalf of Warringtonfire

Appendix A: Summary of Supporting Test Evidence

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)	
BMT/FEP/F15167 Rev A	A - LSADD	2135 (h)	BS EN 1634-1: 2014	Integrity	67
		915/300 (w)		Insulation	64
	B - LSASD	2440 (h)		Integrity	63
		915 (w)		Insulation	3
WF430472	A - LSASD	2153 (h)	BS 476: Part 22: 1987	Integrity	62
		933 (w)		Insulation	n/a
	B - LSASD	2153 (h)		Integrity	73
		933 (w)		Insulation	73
		54 (t)			

Appendix B: Revisions

Rev.	WF Ref.	Date	Description
A	WF437415	7/04/2021	Technically review and revalidate assessment for further 5 year period, including update to Warringtonfire format and to the general principles of BS EN 15725. Added test report WF430472 to support inclusion of door leaves with MDF facings (Min density 600kg/m ³), Mann McGowan and Lorient perimeter seals, concealed closer, Raven Seals drop seal, EV lippings and larger frame option. Update doorset reference to Sainty-Fire / Sentry Pro60.
B	WF503634	17/05/2021	Update to assessment to include stress groove detail to the rear of the frame and allowing perimeter seals fitted in the door leaf edges with a restriction on this when a concealed closer is fitted.