
Title

Field of Application for:
The Strebord© 54 Panelled Range
of Doorsets Using Strebord© 54
Panelled Door Blanks in Timber
Based Door Frames

For 60 minutes Fire Resistance

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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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This document remains the property of Falcon Panel Products Ltd.
It is the responsibility of the reader to ensure that any product manufactured using the evidence within is fit for purpose.
This document details a subset of evidence from an extensive testing regime covering a wide range of products.
Further documentation can be found on our website at <http://www.falconpp.co.uk/doorinfo>

1 Foreword

This Field of Application report has been commissioned by Falcon Panel Products Limited 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 Strebord 54®, 60 minute panelled 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:

- 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 for one doorset configuration, specifically a single leaf, latched doorset.

All 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.

3.1 Primary Test Evidence

3.1.1 Test Report Chilt/RF09140 (Doorset A)

This test is the Primary test for demonstrating the performance of the doorsets.

Date of Test:	26.AUG.2009
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762 (Chiltern International Fire)
Sponsor:	Falcon Panel Products Ltd.
Tested Product:	Latched, Single Acting, Single Leaf, Particleboard Doorset with mock, routed, panels - LSASD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Chiltern International Fire were not involved with any product sampling/selection of the components comprising the specimen.

<p>Summary of Test Specimen:</p>	<p>LEAF: Overall Size: 2100 (h) x 927 (w) x 54mm (t) Core: Falcon Panel Products Ltd Strebord particleboard with routed mock panels (630kg/m³ – stated density), 54mm thick reducing to 30mm thick at mock panel areas. Lipping: Sapele (640kg/m³), 8mm thick to vertical edges only, PU adhesive Mock panel Size(top): 1040 (h) x 700mm (w) Mock panel Size (bottom): 660 (h) x 700mm (w) Mock panel positioning: The mock panels are positioned to create the appearance of a joinery door with the following sizes: Mock head rail size: 100mm (h) Mock mid rail size: 120mm (h) Mock bottom rail size: 180mm (h) Mock closing stile size: 100mm (w) Mock hanging stile size: 127mm (w) Panel facing: Hardboard (900kg/m³), 3mm thick Adhesive – panel facings: PU</p> <p>FRAME: Head & Jamb: Sapele (640kg/m³), 70 x 32mm thick, with 15 x 12mm thick planted stop. Frame Fixing: 3No 100mm long steel screws per jamb Architrave: Sapele (640kg/m³), 18mm thick Threshold: Non-combustible</p> <p>INTUMESCENT: Frame Reveal: 2No 15x4 Pyroplex Rigid Box FO 8700. Fitted 8mm apart and centrally. Door Edges: None fitted</p> <p>HARDWARE: Hinges: 3No Royde & Tucker H105 per jamb Closer: 1No Dorma TS68 Latch: 1No standard tubular mortice latch per leaf Lock/Latch Size: Forend: 57 x 26mm. Latch Status: engaged for test Handle: Aluminium lever type handle, 100 x 38mm</p> <p>HARDWARE PROTECTION: Under Hinges: 1mm thick interdens Under Forend & Keep: 1mm thick interdens Around Lockcase: 1mm thick interdens</p>
<p>Test Standard:</p>	<p>BS 476-22: 1987</p>
<p>Performance:</p>	<p>Integrity: 58 minutes Insulation: 58 minutes</p>
<p>Reason for Use (if test failed)</p>	<p>As evidence for leaf deflection/overall stability of leaf seen when core routed for provision of mock panels.</p>
<p>Failure Mode: (if test failed)</p>	<p>Initial Failure: Continuous Flaming at head of the bottom panel at 58 minutes. The doorset achieved 60 minutes without a perimeter edge failure as seen by the photograph at 60mins in the test report.</p>

3.1.2 Test Report Chilt/RF09140 (Doorset B)

This tests demonstrates the performance of the Strebord 54mm door blank.

Date of Test:	26.AUG.2009
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762 (Chiltern International Fire)
Sponsor:	Falcon Panel Products Ltd.
Tested Product:	Latched, Single Acting, Single Leaf, Particleboard Doorset - LSASD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Chiltern International Fire were not involved with any product sampling/selection of the components comprising the specimen.
Summary of Test Specimen:	<p>LEAF: Overall Size: 2742 (h) x 928 (w) x 54mm (t) Core: Falcon Panel Products Ltd Strebord particleboard (630kg/m³ – stated density), 54mm thick. Lipping: Sapele (640kg/m³), 6mm thick to vertical edges only, PU adhesive</p> <p>FRAME: Head & Jambs: Sapele (640kg/m³), 70 x 32mm thick, with 15 x 12mm thick planted stop. Frame Fixing: 3No 100mm long steel screws per jamb Architrave: Sapele (640kg/m³), 18mm thick Threshold: Non-combustible</p> <p>INTUMESCENT: Frame Reveal: 2No 15x4 Pyroplex Rigid Box FO 8700. Fitted 8mm apart and centrally. Door Edges: None fitted</p> <p>HARDWARE: Hinges: 4No Royde & Tucker H105 Closer: 1No Dorma TS83V Latch: 1No standard tubular mortice latch per leaf Lock/Latch Size: Forend: 57 x 26mm. Latch Status: engaged for test Handle: Aluminium lever type handle, 100 x 38mm</p> <p>HARDWARE PROTECTION: Under Hinges: 1mm thick interdens Under Forend & Keep: 1mm thick interdens Around Lockcase: 1mm thick interdens</p>
Test Standard:	BS 476-22: 1987
Performance:	Integrity: 72 minutes Insulation: 72 minutes

3.1.3 Test Report IF10035

This test has been used to prove the panel design.

Date of Test:	23.JUL.2010
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. (Chiltern International Fire)
Sponsor:	Falcon Panel Products Ltd.
Tested Product:	Indicative door blank with routed mock panel.
Tested Orientation:	Not applicable - Symmetrical
Sampling information:	Chiltern International Fire were not involved with any product sampling/selection of the components comprising the specimen.
Summary of Test Specimen:	DOORBLANK: Overall Size: 1000 (h) x 915 (w) x 54mm (t) Core: Falcon Panel Products Ltd Strebord particleboard with routed mock panels (530kg/m ³ – stated density), 54mm thick reducing to 30mm thick at mock panel areas. Mock panel Size: 750 (h) x 715mm (w) Panel facing: Hardboard (900kg/m ³), 3mm thick Adhesive – panel facings: PVA
Test Standard:	Temperature and pressure conditions outlined in BS 476-20:1987 and the principles of BS 476-22: 1987
Performance:	Integrity: 70 minutes

4 Technical Specification

4.1 General

The technical specification for the proposed door assembly 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

The Strebord© 54 panelled door design can include various design features:

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

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

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

4.4 Door Frames – Hardwood Timber

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

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

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

The evaluation of the leaf size 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 tested. The principle is that the more components included in testing, for example, double door leaves and an overpanel – the harder it becomes to pass a test. In this specific example it is because the junction between two door leaves or door leaf and overpanel introduces a discontinuity into the doorset which can be a means of failure. This approach leads to the following statements:

1. A test on a double doorset is more onerous than a test on a single doorset
2. A test on a doorset with a flush overpanel is more onerous than a test on a doorset without an overpanel. A flush overpanel has the same thickness as the door leaf and is flush with the leaf/leaves.
3. A test on an unlatched doorset is more onerous than a test on a latched doorset as the leading edge is unrestrained and will deflect more in fire test conditions
4. A test on an unlatched single acting doorset is considered to be equivalent to a double acting doorset, due to the known deflection of an unlatched single acting doorset towards the furnace conditions i.e. away from the door stop. However, this does not cover doorsets with flush overpanels
5. A doorset with transomed overpanel is considered to perform comparably to a similar doorset without an overpanel. This is because the transom structurally separates the overpanel from the doorset.

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

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

4.5.2 Configuration

The table below shows the permitted configuration for the (Strebord© 54 panelled door) doorset design, with the abbreviation and full description of the 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		
Depiction	Abbreviation	Description
	LSASD	Latched Single Acting Single Doorset

4.5.3 Orientation

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

4.5.4 Envelope for the Configuration

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

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

4.5.4.1 General Note on Intumescent Seals

- Intumescent seals are to be fitted centrally unless stated otherwise.
- 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 Strebord© 54 Panelled Door leaf types and 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:-

- for LSASD
- 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.

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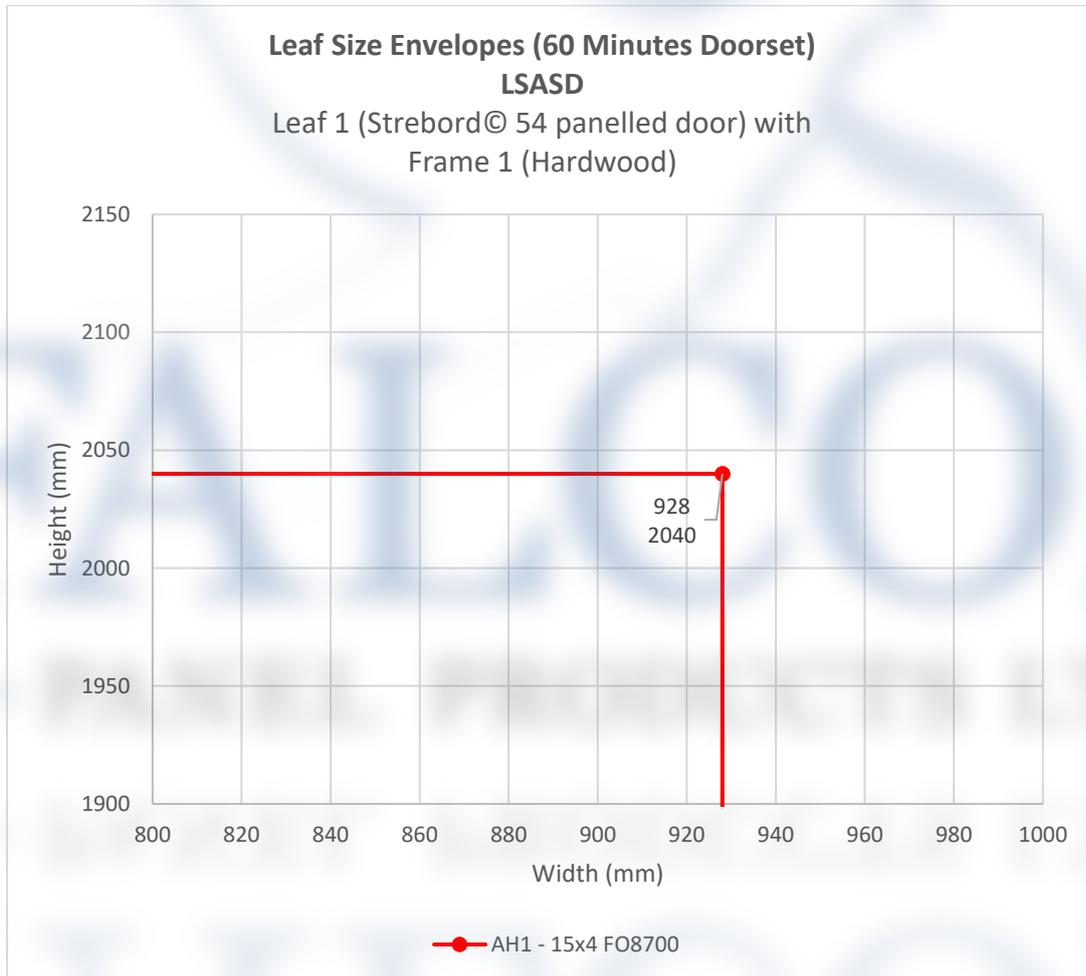
4.5.4.3 Summary of Permitted Configuration for (Strebord© 54 panelled door) blank & Frame 1

Permitted Configurations with frame type 1 with leaf type 1 (Strebord© 54 panelled door)		
Frame		Configuration
		LSASD
1	Hardwood frame*	Yes

* 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 option 1 with frame option 1



Intumescent Specification for LSASD			
Leaf 1 (Strebord© 54 panelled door) with Frame 1 (Hardwood timber)			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AH1 (RF09140 doorset A)	FO 8700 15 x 4	Pyroplex	Head & Jamb: 2no fitted centrally in frame reveal and 8mm apart

5 General Description of Leaf Construction

5.1 Leaf Core Construction

The door leaf option detailed below is approved by this assessment.

5.1.1 Leaf Type 1 – (Strebord© 54 panelled door) – 54mm thick

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

Element	Material	Dimensions (mm)	Minimum Density (kg/m ³)
Core	Falcon Strebord© particleboard with 2No. routed mock panels	54 thick reduced to 30 thick at mock panel areas	530* - 630*
Panel facings	Hardboard	3 thick	900**
Adhesive, panel facings	PU or PVA	-	-
Panel beading (Note 1)	European Redwood	12 high x 9 deep	510**
Bead fixings (Note 1)	Steel pins	30 long x 1.2 diameter fitted 50 from corners at 150 centres	-

Note 1: In the opinion of Warringtonfire it is a requirement of this assessment that panel beads around the perimeter are fixed both sides to further reduce the likelihood of failure at the panel/ stile and rail interface.

Note 2: * Stated density; not checked by laboratory. ** Nominal density.

The leaf must be lipped as specified in section 5.3.

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

The minimum leaf thickness after finishes applied is 54mm.

5.2 Leaf Size Adjustment During Manufacturing – all Leaf Options

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

Pre-Machining Leaf Size Adjustment Specification	
Element	Reduction
Leaf	The manufactured size of the leaf may be reduced in height or width without restriction, subject to maintaining the minimum leaf framing dimensions stated in section 5.5 and providing the finished leaf is lipped in accordance with section 5.3
Timber Lipping	The timber lipping thickness can be reduced after it has been glued in place, providing it is not reduced below the minimum stated in section 5.3

5.3 Timber Lipping – Leaf type 1

The testing documented in section 3 has generally been undertaken using 6-8mm thick lippings applied to the vertical edges using sapele of nominal density 640kg/m³. PU adhesive was used to seal the lippings.

On the above basis, **Strebord© 54 panelled** door blanks (leaf type 1) must be lipped with the following specification.

Timber Lipping Specification for Strebord© 54 Panelled door blanks		
Material	Size (mm)	Min Density (kg/m ³)
Hardwood which must be straight grained joinery quality, free from knots, splits and checks	Flat = 8-13 thick	640

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. Single doorsets only require lipping on the vertical edges but may be additionally lipped on the top and bottom edges if required.
3. 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.
4. Lippings must be bonded with PU. This may be hand applied or may be applied using an edgebander. With either method it must be ensured that sufficient glue is applied to across the entire surface area between the 2No substrates being adhered to guarantee a robust bond. Other manufacturers' guidance should be followed, for either installation application.

5.4 Panel Construction

Mock panel construction was included within tests RF09140 (doorset A). The integrity failure observed for the panelled doorset tested in RF09140 (doorset A) was due to burn-through of the panel core at 58 minutes. The panel design was re-tested at small-scale (IF10035) to investigate a remedial solution for the failure, which achieved 70 minutes integrity. The testing of the 60 minute panel design at both full-scale and small-scale demonstrated that the fire integrity performance of the panel design depends on the fixity of the 3mm thick hardboard facing to the panel core.

Therefore, it has been assessed that the panel facing must be suitably bonded to the panel core, using PVA or PU adhesive as tested, but also retained using timber beading at the perimeter of the panel. The beading must be fixed using steel pins.

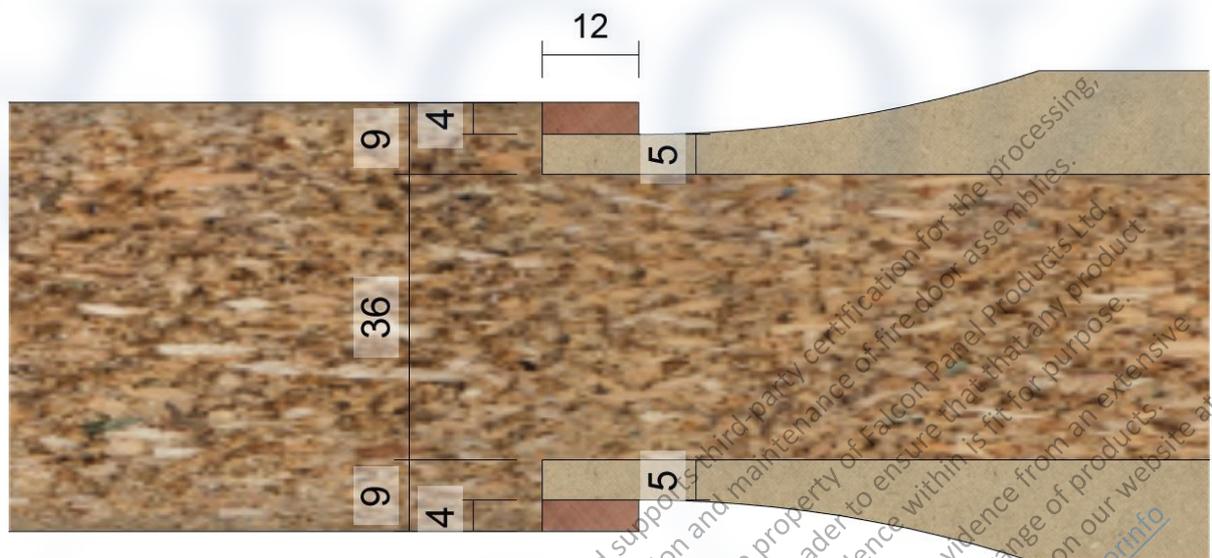
Leaf facing materials at 3mm thickness are not deemed to provide significant contribution to the stiffness/burn through characteristics of the specimen, the consideration is for burn through at the perimeter of the panel. As IF10035 achieved 70 minutes integrity with facings of Hardboard at 900kg/m³ and the assessed design requires additional beading to protect the edges, it has been assessed that facings of MDF 750kg/m³ and Chipboard of 680 kg/m³ may be used as an alternative.

Construction of panels for Strebord© 54 panelled doorsets must be to the following specification:

Element	Dimensions (mm)	Product	Min. Density (kg/m ³)
Panel core	Routed by a maximum of 12mm each side	Strebord© 54	530
Panel facing	Minimum 3mm thick	Chipboard	680
		MDF	750
		Hardboard	900
Panel edge beading	Minimum 12 (h) x an appropriate depth to finish projecting from or flush with the leaf face (d)	Softwood or Hardwood Timber	510
Panel fixings	30 (l) x 1.2 (Ø)	Steel pins	-

Notes:

1. Facing materials must be bonded to the core with PU, PVA.
2. Additional planted beads/mouldings must be fitted at the edges of the panelled areas and retained using minimum 30mm long x 1.2mm diameter pins inserted at 35-40° to the vertical, 50mm from each corner and at 150mm centres. The beading must be a minimum of 12mm high and an appropriate depth to finish projecting from or flush with the leaf face.
3. Additional decorative/protective facing options are detailed in section 5.7.
4. Examples of compliant panel constructions are shown below.





5.5 Leaf framing

2 mock panels were included in test RF09140 Doorset A, which incorporated full thickness door core being retained to provide leaf framing.

When incorporating mock panels, the minimum leaf framing specification for Strebord© 54 panelled doorsets (where applicable) must be as follows:

Element	Dimensions (mm)
Head rail & stiles	100
Mid-rails	170
Bottom rails	200
Intermediate framing	80

5.6 Number of mock panels

2 mock panels were included in test RF09140 Doorset A. This showed similar distortion at the perimeter of the leaf to the distortion seen in test RF09140 Doorset B, which was a larger door leaf and did not incorporate mock panels.

Assessment of variation to the tested designs is permitted within the following parameters:

1. A minimum of 2 and a maximum of 10 panels may be included, subject to sections 5.4 and 5.5.
2. Panels must be constructed in accordance with specification detailed in section 5.4.
3. Panels may be flat or raised and profiled, subject to the minimum thickness detailed in section 5.4.
4. Where more than 2 panels are included, the use of one mid-rail is always required. The use of intermediate framing is for vertical muntins and intermediate rails.
5. Examples of possible elevation layouts are shown below.



5.7 Decorative & Protective Facings

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

The following additional facing materials are therefore permitted 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	0.2
Timber veneers	2
Cellulosic and non-metallic foils	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates, which must not be attached covering panelled areas,
2. Plastic laminates and PVC facings are not permitted.
3. 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.
4. Materials must not return around leaf edges.
5. Materials must not conceal intumescent strips.

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

6 Glazing within the Leaf

Glazing has not been tested and is not assessed for use with this doorset design.

7 Door Frame Construction

7.1 Details for Frame 1

Tests RF09140 (Doorsets A and B), documented in section 3, were undertaken using a 70 x 32mm sapele frame of nominal density 640kg/m³.

The door frame details 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 frames.

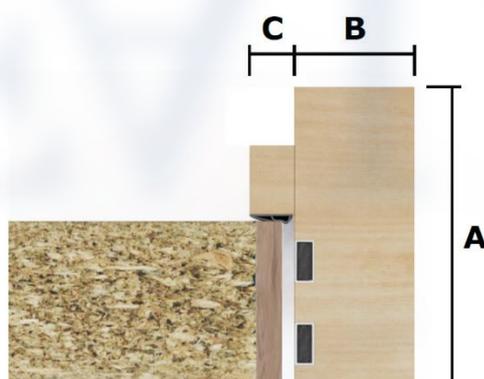
Frame specification				
Frame type	Material	Minimum section size (mm)	Minimum density (kg/m ³)	Acceptable leaf type
1	Hardwood: All door frame timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects). The use of Beech (<i>Fagus sylvatica</i>) is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

Note:

Minimum section size is subject to size of hardware.

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

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.



OMEC Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint – biscuit optional



Housed (Trench) Joint

Approved door frame jointing options

8 Overpanels & Fanlights, Sidepanel & Sidelights

Overpanels & Fanlights, Sidepanels & Sidelights have not been tested and is not assessed for use with this doorset design.

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
Panel Facings (section 5.4)	UF, PRF, PF, PU or PVA
Timber Lippings (section 5.3)	UF, PRF, PF or PU
Decorative facings (section 5.7)	UF, PRF, PF, PU, PVA, EVA or CR

Notes:

1. The acronyms for the adhesive types are provided along with other commonly used names below:-

UF = Urea Formaldehyde (Plastic Resin Glue)

PRF = Phenol Resorcinol Formaldehyde (Resorcinol Formaldehyde)

PF = Phenol Formaldehyde (Phenolic Resin)

PU = Polyurethane (PUR)

PVA = Polyvinyl Acetate (PVAc, Polyethylene Ethanoate)

EVA = Ethylene-vinyl acetate (PEVA)

CR = Polychloroprene Rubber (Contact Adhesive, Neoprene)

10 Hardware

10.1 General

The following section details the permitted scope and constraints for fitting hardware to the Strebord© 54 panelled doorset design. The following items of hardware must bear the CE Mark:

- Latches & locks: Test Standard EN 12209
- Single axis hinges: Test Standard EN 1935
- Controlled door closing devices: Test Standard EN 1154

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 the CERTIFIRE approval of the item of hardware
- Based on generic guidance or CE marking but final approval will be with another approving body.

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 300mm of another item of hardware in the leaf edges unless there is test evidence to demonstrate they can be installed 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.

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	For frame option 1 Fitted under both hinge blade	1mm or 2mm Interdens - Dufaylite Developments Ltd.
Lock/latches	Encasing latch body	1mm or 2mm Interdens - Dufaylite Developments Ltd.
	Around latch keep	1mm or 2mm Interdens - Dufaylite Developments Ltd.
	Under latch forend	1mm or 2mm Interdens - Dufaylite Developments Ltd.
	Under latch keep	1mm or 2mm Interdens – Dufaylite Developments Ltd.



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	<ul style="list-style-type: none"> • Latch • Handle • Hinges • Self-closing device (closer)

10.4 Latches & Locks

10.4.1 Single Point Engagement

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration: LSASD

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

Element	Product
Locks & latches	<ul style="list-style-type: none"> • Standard tubular mortice latch

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

Single 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 NOTE THE MORTICE FOR THE LOCK BODY MUST NOT BE ANY CLOSER THAN 60mm TO ANY PANEL RECESS
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 or stainless steel with a melting point $\geq 800^{\circ}\text{C}$

Notes:

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

10.5 Handles

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration: LSASD

The table below details the tested handles that are approved.

Element	Product
Handles	<ul style="list-style-type: none">Aluminium lever type handle, 100 x 38mm

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

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

10.6 Butt Hinges

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration: LSASD

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

Element	Manufacturer & Product Reference
Hinges	<ul style="list-style-type: none"> Royde & Tucker H105 lift-off type hinges

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

Element	Specification
Blade height:	90 - 120mm
Blade width (excluding knuckle):	28 - 35mm
Blade thickness	2.5 - 4mm
Fixings:	Minimum of 4No. 38mm long fully threaded 'twinfast' or chipboard screws per blade Note: It is also permitted to use screw fixings as tested and supplied with the hinges approved for the Strebord© design at 60 minutes fire resistance.
Materials:	Steel or stainless steel
Hinge positions:	Top 120 – 200mm from the head to top of hinge
	2 nd Min – 200mm from top hinge Max – centrally between top and bottom hinge
	Bottom 150 – 300mm from the foot of leaf to bottom of hinge
Intumescent protection:	See section 10.2

Notes:

1 – A minimum of 3 hinges must be used. Additional intermediate hinges may be included within door assemblies in-between the hinges required for the leaf provided there is a minimum 200mm between hinges. Where intermediate hinges are introduced, their positioning may influence 2nd and 3rd hinge parameters.

2 – Minimum blade dimensions are applicable when within the door edge.

3 – Rising butt hinges are not approved for the Strebord® 54 Panelled 60 minute doorset system.

10.7 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers

Automatic doorset self-closing devices such as transom mounted, and offset pivots used with floor springs are not considered acceptable for use with the Strebord© 54 panelled range of doorsets.

10.7.1 Overhead Face Fixed Closer

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration:

Frame option 1 - LSASD

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 TS68 overhead face-fixed type closer• Dorma TS83V overhead face-fixed type closer

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

- CERTIFIRE approved overhead face-fixed closers for 60-minute fire resistance applications on 44mm thick timber door and timber frames

Note:

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

10.7.2 Frame Jamb Mounted Closer

Frame jamb mounted closers have not been tested and is not assessed for use with this doorset design.

10.8 Non-Essential Hardware

10.8.1 Pull Handles

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration: LSASD

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.

10.8.2 Push Plates & Kick Plates

Leaf option: 1

Frame option: 1

Configuration: LSASD

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. Plates are not permitted to cover/obscure the panels.

10.8.3 Environmental Seals

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration: LSASD

Use of environmental seals is permitted, based on reference to the current revision of Field of Application report Chilt/A02067 "Falcon Strebord© 54 doorsets", where these are permitted in conjunction with hardwood frames.

Silicon based flame retardant acoustic, weather and dust seals (for example Norseal 710, Lorient IS1212, IS1511, IS7025, or IS7060) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

10.8.4 Threshold drop Seals

These items are suitable in the following applications only:

Leaf option: 1

Frame option: 1

Configuration: LSASD

When recessed into the bottom of leaves, the use of threshold drop seals is permitted without the requirement for any intumescent protection, unless required by the threshold drop seal manufacturer for 60 minute fire resisting applications in timber based doorsets. The components with the following specification are deemed acceptable, based on reference to the current revision of Field of Application report Chilt/A02067 "Falcon Strebord© 54 doorset".

Product	Manufacturer
IS8010si	Lorient Polyproducts Ltd.
NOR810, NOR810S, NOR810dB+	Norsound Ltd.
RP8Si	Raven
Schall Ex-Duo L-15	Athmer
DropSeal 2712s	Sealmaster Ltd.

11 Installation

11.1 General

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

- the door frame and architrave installation position relative to the wall
- the fire stopping between the frame and the wall and the use of shadow gaps
- 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 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>



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.

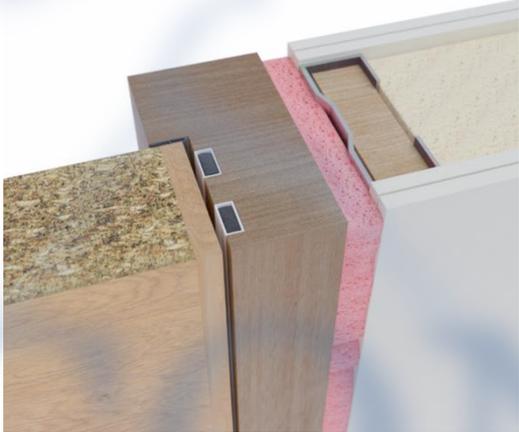
Note:

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

11.3 Firestopping

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

Gap (mm)	Requirement	3D model depiction
0 – 2	In practice, unlikely to occur, but if present, must be sealed with architraves, as below, fitted over a bead of acrylic intumescent sealant, tested as below.	N/A
3 – 10	<p>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.</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>	
10 – 20	<p>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.</p> <p>Architraves are optional.</p>	

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

Note:

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

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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 without sidepanels, the frame jambs only are to be fixed to the supporting construction using steel fixings at 500mm maximum centres and maximum of 150mm from 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.

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 Strebord© 54 panelled 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 the door frame by more than 1mm.
Threshold	10mm between bottom of leaf and top of floor covering. This is the maximum tolerance for fire resistance only. Where smoke control is required refer to section 13.

12 Insulation Performance

Insulation performance may be claimed for a doorset to this design.

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.

Note: For doorsets tested to BS EN 1634-3: 2004, the leakage rate is measured at positive and negative pressure differences of 10Pa, 25Pa, and 50Pa. The same 25Pa positive and negative pressure difference is used for the BS 476-31.1:1983 test method. Therefore, if tested to BS 476-31.1:1983, the designs summarised below would be expected to provide the same leakage rate as the results when they were tested to BS EN 1634-3: 2004, at 25Pa.

14 Conclusion

If the Strebord© 54 panelled doorset design, 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.

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: Neil Harrison

Position: Door Technical Manager

Date: 11/08/21

For and on behalf of:

Falcon Panel Products 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 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.

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:	*Dr K D S Towler	*A M Winning
Title:	Senior Product Assessor	Senior Product Assessor

* For and on behalf of Warringtonfire

Appendix A: Summary of Supporting Test Evidence

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)	
RF09140 (Doorset A)	LSASD	2100 (h) 927 (w) 54 (t)	BS 476: Part 22: 1987	Integrity	58
				Insulation	58
RF09140 (Doorset B)	LSASD	2742 (h) 928 (w) 54 (t)	BS 476: Part 22: 1987	Integrity	72
				Insulation	72
IF10035	Indicative doorblank	1000 (h) 915 (w) 54 (t)	BS 476: Part 22: 1987	Integrity	70

Appendix B: Revisions

Rev.	WF Ref.	Date	Description
A	Chilt/A10152	07.07.11	Inclusion of doorset B tested under RF09140 to support a positive result for the panelled design at full-scale in conjunction with indicative test IF10035.
B	CNA/F15172	24.07.15	Technical review, update & revalidation for a further 5 years.
C	WF436809	23.12.2020	The assessment has been written into the latest Warringtonfire format and revalidated for a further 6 months based on a review of the evidence contained in Appendix A. The use of beech (Fagus species) has been removed as a hardwood option. The maximum assessed lockset dimensions have been reduced to account for the width of the closing stile
D	WF505066	15.07.2021	Technical review, update & revalidation for a further 5 years. Decorative facings, hardware, installation sections have been updated.

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