
Title

Field of Application for:
The Panel Technologies 51 Range of
Steel Doorset designs

For up to 120 minutes Fire Resistance
(integrity only) if they were to be tested
in accordance with BS EN 1634-
1:2014 +A1: 2018

Assessment Report No.:

BMT/CNA/F14125 Revision I

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Prepared for:

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The issue/revision number stated on the front of this report supersedes all previous issues/revisions, if applicable. Previous issues/revisions of the report, if applicable, cannot be used once an updated report has been issued/revised under a new revision.

Signatories and Revision History

Rev. No.	Date	FM No.	Report scope
A	21.08.2020	429889	5 year revalidation including BS EN 15725: 2010 and Warringtonfire format updates and amendment to test RF13137 detailed in section 3.
B	18.11.2022	518410	Added leaf option 2 (with new test evidence), alternative 3WLC lock, KRL lock. Add recessed magnetic fire door signage. Updated formatting. 5 year validity.
C	17.02.2023	529046	Introduce the option for 4 number leaves as a doorset and beaded frames.
D	26.07.2023	532471	Introduce option for 3 No leaves in a 'doorset'.
E	26.06.2024	543993	Revision including additional test evidence to update the following sections: a) Installation i) Installation, sealing to wall, structural openings and leaf gaps. ii) Wall types (including partition requirements for 60 and 90 minute doorset designs) (inclusion of tests WF503796, WF525369/R, WF514070/R) b) Signage c) Escutcheons and cylinder pulls with 3WCL d) Frame infill materials clarified e) Perimeter seals clarified Update to latest versions of test reports
F	26.07.2024	545965	Revision and revalidation and including an update to the assessed minimum thickness of rigid walls.
G	10.10.2024	546935	Revision to the following sections: a) Wall types (including fitting of boards to face of masonry and concrete walls and options for lining of structural openings) Fixing positions through the stop
H	02/09/2025	552233	Revision and Revalidation, including: Incorporate Leaf design (WF544493/R and WF527422) (Leaf 3) Variation to Leaf 1 design (WF547575/R and WF548600/R) Modify installation requirements Include the tested Shaftwall design (WF547575/R and WF548600/R)

Rev. No.	Date	FM No.	Report scope and Signatures
I	08/01/2026	556664	Revision to section 9.2
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*For and on behalf of Warringtonfire

Executive summary

This field of application report presents an assessment of the fire resistance performance of the specified proprietary Panel Technologies 51 Range of Steel doorset designs, as fire tested and described in the reports detailed within Appendix A when modified as detailed herein.

The proposed modifications include leaf and frame design options, doorset configurations and sizes, various hardware and installation parameters as discussed in the relevant sections below.

This assessment report is subject to the requirements and limitations described in Sections 2 and 14.

The findings of this report are that if Panel Technologies 51 Range of Steel doorsets constructed in accordance with the specification documented in this field of application were to be tested in accordance with BSEN 1634: 2014 +A1: 2018, it is expected that they would be capable of providing a minimum of 120 minutes integrity fire resistance performance.

This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with the test standard specified above, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.

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1. Introduction

This field of application report presents an assessment of the fire resistance performance of the specified proprietary Panel Technologies 51 Range of Steel doorset designs, as fire tested and described in the reports detailed within Appendix A when modified as detailed herein.

Analysis of specific construction details that require assessment are given within this report against the relevant element of construction, as appropriate.

2. Assessment framework

An assessment is an opinion of the likely performance of a component or element of structure if it was subjected to a standard fire test.

This assessment report has been carried out in accordance with the Passive Fire Protection Forum (PFPF) 'Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence - 2021' and has been written in accordance with the general principles outlined in BS EN 15725: 2023; *Extended application reports on the fire performance of construction products and building elements, as applicable.*

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

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

This report has been prepared and checked by product assessors with the necessary competence, who subscribe to the principles outlined in the Passive Fire Protection Forum (PFPF) 'Guide to Undertaking Technical Assessments of the Fire Performance of Construction Products Based on Fire Test Evidence - 2021'. The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used for building control and other purposes.

This report uses established empirical methods of extrapolation and experience of fire testing similar elements, in order to extend the scope of application by determining the limits for the designs based on the tested constructions and performances obtained. The scope is an evaluation of the potential fire resistance performance, if the variations specified herein were to be tested in accordance with the test standard specified.

This report has been written using appropriate test evidence generated at UKAS accredited laboratories, to the relevant test standard. The supporting test evidence has been deemed appropriate to support the stated design and is summarised in Appendix A.

3. General requirements and assumptions

The specified proprietary Panel Technologies 51 Range of Steel doorset designs shall be constructed in a similar manner from materials and components of the same manufacturer and equivalent quality as those tested or otherwise assessed by Warringtonfire.

The following assumptions have been made in the preparation of this report:

- All densities referred to in this document are based upon an assumed moisture content of 12%.
- It is assumed that unless otherwise documented in the field of application sections of this report, the doorset subject to this report will be constructed in accordance with the test evidence referred to herein.
- All dimensions detailed herein may be varied by $\pm 2\%$ except where minimum, maximum or a range of dimensions are given.
- Where steel is referred to within this document it is assumed that the steel element is made from a continuous solid piece, unless specifically detailed otherwise.

It is assumed that the end user will have an understanding of the tested specification as defined in the relevant test report(s) summarised in Appendix A.

Whilst specific items are included within this Field of Application report that may be used to provide additional performance characteristics (such as acoustic or smoke control for example), it is beyond the remit of this Field of Application report to provide scope for performance characteristics other than fire resistance integrity performance. Any other performance requirement for the door designs contained herein is to be subject to a separate analysis.

If a design variation or extension to scope is not explicitly detailed within the assessment it should not be assumed to be acceptable by omission.

4. Technical Specification

4.1 General

The technical specification for the proposed door assemblies is given in the following sections and is based on the test evidence for the door designs, summarised in Appendix A.

4.2 Intended Use

The intended use of the proposed door assembly is summarised below:

A pedestrian doorset including any frame, door leaf or leaves which is provided to give a fire resisting capability when used for the closing of permanent openings in fire resisting separating elements, which together with the building hardware and any seals (whether provided for the purpose of fire resistance or smoke control or for other purposes such as draught or acoustics) form the assembly.

4.3 Door Leaf

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

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

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

The same leaf option must be used for door leaf components of any individual doorset.

4.3.1 Leaf 1

The door designs can include:

1. Empty core or plasterboard core.
2. Specific hardware options
3. Decorative finishes
4. Alternative galvanisation processes.

4.3.2 Leaf 2

The door designs can include:

1. Plasterboard and IsoBase core only
2. Specific hardware options
3. Decorative finishes
4. Alternative galvanisation processes.

4.3.3 Leaf 3

The door designs can include:

1. Plasterboard facing to one side, with Rockwool RW3 and IsoBase core only
2. Specific hardware options
3. Decorative finishes
4. Alternative galvanisation processes.

4.4 Door Frames

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

Section 6 gives the description of the frame including composition and dimensions.

4.4.1 Frame 1

The construction of the door frames is mild steel.

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

The evaluation of the leaf size for each door leaf option and doorset configuration is based on the tests listed in Appendix A and takes into account:

- Achieving a Category B overrun as stated in BS EN 1634-1: 2014 + A1: 2018.
- The margin of over performance above the integrity performance for the specific design
- The characteristics exhibited during test
- 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, the harder it becomes to pass a test.

This approach leads to the following statements:

- A test on a double doorset is more onerous than a test on a single doorset.
- A test on a multiple leaf doorset is more onerous than a test on a double 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.

For steel doorsets dimension modifications can result in different performance, including both increases and reductions in leaf height and width dimensions from those tested. This has been taken into consideration and therefore steel doorsets of the assessed design, with dimensions as shown in section 4.5.4, are covered and may be manufactured.

4.5.2 Configuration

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

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

Depiction	Abbreviation	Description
	LSASD	(3 point) Locked Single Acting Single Doorset
	LSADD ²	(3 point) Locked Single Acting Double Doorset
-	LSAMD ¹	(3 point) Locked Single Acting Multiple Leaf Doorset Using Leaf option 2 only

Note:

- 1) Leaf option 2 only. Multiple leaf doorsets may be constructed in runs of 4 leaves comprised of 2 No double doorsets separated as described in section 5.1.2.1, or a run of 3 leaves as discussed in section 5.1.2.2. As detailed in section 4.5.3, leaf option 2 may only be installed opening towards the fire attack side.
- 2) Leaf option 3, for configuration LSADD, as detailed in section 4.5.3 may only be installed opening towards the fire attack side.

4.5.3 Orientation

The majority of primary fire resistance tests for these designs were conducted as follows:

The Leaf 1 design with optional Soundbloc plasterboard panels was tested (Chilt/RF13137 Revision C), opening away from the furnace test conditions.

The Leaf 1 design without optional Soundbloc plasterboard panels was tested (BMT/FEP/F14038), opening away from the furnace test conditions.

Leaf 2 designs (WF434360 Specimen B, WF432243, WF513907) were tested opening in towards the furnace test conditions.

The Leaf 3 design (WF544493/R, WF527422) was tested as a single leaf doorset opening both towards and away from the furnace test conditions and as a double leaf doorset opening towards the furnace test conditions.

Consideration has been made of guidance within Annex C of BS EN 1634-1:2014 +A1:2018.

Based on the test evidence, it is assessed that the following orientations are permitted herein:

- Leaf option 1 doorset must only be installed opening away from the fire attack side when Soundbloc plasterboard panels are included in the construction.
- Leaf option 1 doorset may be installed opening in either direction with respect to the fire attack side when not fitted with Soundbloc plasterboard.
- Leaf option 2 doorset must only be installed opening towards the fire attack side.
- Leaf option 3 doorset designs that are double leaf must only be installed opening towards the fire attack side.
- Leaf option 3 doorset designs that are single leaf may be installed opening in either direction with respect to the fire attack side

4.5.4 Leaf sizes

The following sections detail the permitted leaf sizes.

A table of essential hardware is given in section 8.3, as a minimum requirement for the doorset described.

The permitted leaf sizes (for Leaf 1 and Leaf 2) are based on the demonstrated performance in test reference Chilt/RF13137 Revision C and BMT/FEP/F14038 tested opening away from the furnace test conditions and supported by other test evidence cited in Appendix A. Both tests achieved a Category B overrun at 120 minutes integrity performance for gap gauge and continuous flaming criteria and did not achieve an insulation performance.

The permitted leaf sizes (for Leaf 3) are based on the demonstrated performance in test reference WF527422 and WF544493/R. Both tests achieved a Category B overrun at 120 minutes integrity performance for gap gauge and continuous flaming criteria. Some insulation performance was observed in these tests.

It is assessed, that on the basis of the methodology adopted within BS EN 15269-2: 2024 (Annex A clause A.2.1 to A.2.4), leaf size reduction and increase from that tested, for single and double leaf doorsets, are permitted as follows:

Unlimited leaf size reduction (height and width) has been assessed as permitted (using the direct field principles of Annex B, Table B.1 of BS EN 1634-1: 2014+A1: 2018), for Leaf 1 and Leaf 2.

Due to some insulation performance being observed, the leaf size reduction (height and width) has been assessed as a reduction to 50% width and 75% height of the tested specimen (using the direct field principles of Annex B, Table B.1 of BS EN 1634-1: 2014+A1: 2018), for Leaf 3.

Based on the tested specimens achieving Category B overrun leaf size increase is assessed as permitted (using the direct field principles of Annex B, Table B.1 of BS EN 1634-1: 2014+A1: 2018) to apply up to 15% height, 15% width and up to 20% area increase.

BS EN 15269-2: 2024 does not cover multiple leaf doorsets, however Warringtonfire have taken into consideration the test evidence cited within Appendix A. It is the opinion of Warringtonfire that for multiple leaf doorsets, modification of the leaf sizes from those tested to the range as detailed below would not be expected to be detrimental to the fire resistance performance of the doorset.

4.5.4.1 Leaf sizes – Leaf 1 and Leaf 2

For single, double and multiple leaf doorsets required to provide up to 120 minutes integrity performance, leaf size may be varied within the following range as specified in the tables below, for square or rectangular leaves (leaf options 1 and 2).

Single acting double doorsets and single acting multiple leaf doorsets are only considered acceptable when the leaves are hung to open in the same direction.

Single leaf doorsets:

Leaf Dimensions	Height (mm) (length of hinged and lock edge)	Width (mm) (length of other edge)
Minimum	No Limit ³	No Limit ³
Maximum	2757 ⁴	1032 ⁴

Double leaf doorset or any leaf within a multiple leaf doorset:

Leaf Dimensions	Height (mm) (length of hinged and lock edge)	Width (mm) (length of other edge)
Minimum	No Limit ³	No Limit ³
Maximum	2755 ⁵	1032 ⁵

Note:

- 1) In all cases the maximum permitted area of the leaf is **2.58m²**.
- 2) It is required that for rectangular doorsets the longer leaf edges are fitted with the hinge and lock. Which when in a vertical arrangement must be fitted in the vertical orientation.
- 3) The fitting of hardware with required positioning stated in section 8 of this report and complying with leaf and frame designs will result in a practical minimum leaf dimension.
- 4) Based on Test reference Chilt/RF13137 Revision C.
- 5) Based on Test reference BMT/FEP/F14038.
- 6) Double and multiple leaf doorsets incorporating unequal width leaves are covered by this assessment; the width of the smallest leaf must be no more than 50% narrower than the largest leaf, and the largest leaf must remain within the permitted size limits above.

4.5.4.2 Leaf sizes – Leaf 3

For single and double leaf doorsets required to provide up to 120 minutes integrity performance, leaf size may be varied within the following range as specified in the tables below, for square or rectangular leaves (leaf option 3).

Single acting double doorsets are only considered acceptable when the leaves are hung to open in the same direction.

Single or Double leaf doorsets:

Leaf Dimensions	Height (mm) (length of hinged and lock edge)	Width (mm) (length of other edge)
Minimum	1797 ³	448 ³
Maximum	2755 ³	1030 ³

Note:

- 1) In all cases the maximum permitted area of the leaf is **2.57m²**.
- 2) It is required that for rectangular doorsets the longer leaf edges are fitted with the hinge and lock. Which when in a vertical arrangement must be fitted in the vertical orientation.
- 3) Based on Test references WF527422 and WF544493/R.
- 4) Double leaf doorsets incorporating unequal width leaves are covered by this assessment; the width of the smallest leaf must be no more than 50% narrower than the largest leaf. All leaves must remain within the permitted size limits above.

5. General Description of Construction

5.1 Leaf Core Construction

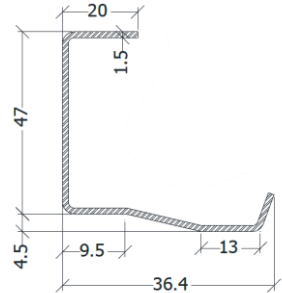
The three door leaf options detailed below are approved by this assessment.

Fabrication of the leaf must be as tested in Chilt/RF13137 Revision C and BMT/FEP/F14038 and WF547575/R and WF548600/R for Leaf 1 designs; WF434360 Specimen B, WF432243 and WF513907 for Leaf 2 designs; and WF544493/R and WF527422 for Leaf 3 designs unless otherwise stated. The tables in the following sections summarise the main components of the tested leaf design. For full construction details, reference should be made to the full test report which is summarised in Appendix A.

See section 5.2 for assessed variations to the tested leaf constructions.

5.1.1 Leaf 1 – 51 Range

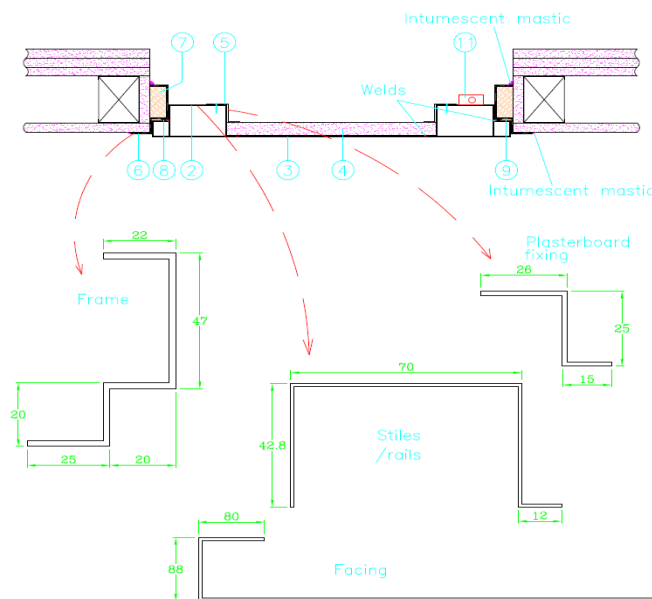
The basic tested construction of this door leaf design comprises the following:

Element	Material	Dimensions (mm)
Stiles	Profiled Zintec steel welded to the steel 'tray' section facing	1.2-1.5 thick x 68 - 70 wide x 43 thick
Rails	Profiled Zintec steel welded to the steel 'tray' section facing, butted up to the stiles	1.2-1.5 thick x 68 - 70 wide x 43 thick
Leaf	Profiled Zintec steel 'tray' or stainless steel*	1.2 thick with 22.5 high returns to all edges (return width 30 at hanging edge, 20 at closing or meeting edge, 25 at top and bottom edge)
	Optional Siniat Soundbloc plasterboard fitted to the fire attack (exposed) face, within the rails and stiles	15 thick
Leaf finish	Polyester powder coating	Nominally 75 microns thick
Welds	Spot welds	12.5 long at nominal 450 centres
Leaf stiffeners	None fitted	-
Meeting edge stop/ astragal (double leaves only)	Profiled Zintec steel	1.2-1.5 thick x 20 wide x 41-47 deep welded along the closing edge return of the passive leaf tray 36-39 wide overall 

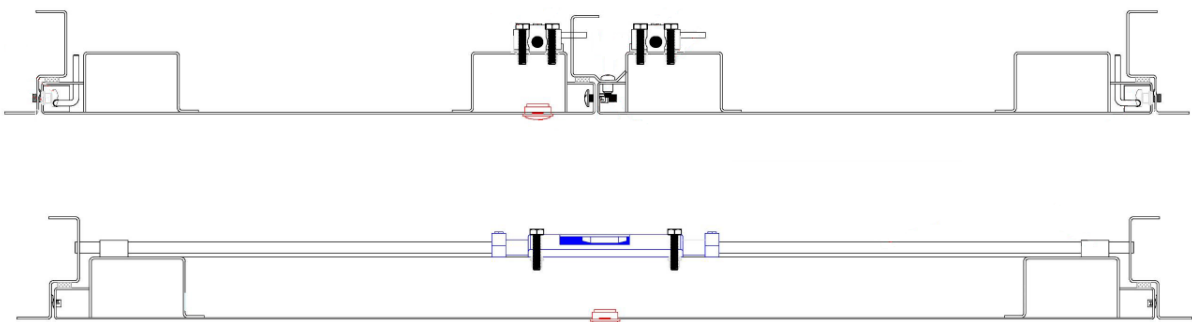
* It is the opinion of Warringtonfire that for this doorset design, with the essential hardware fitted and engaged and taking into account the distortion during the tests, that changing the steel from mild to stainless can be permitted (except for with shaftwall supporting construction), and that the fire resistance integrity performance would be expected to be maintained.

The exchange to stainless steel is not permitted when the doorset is to be fitted within the shaftwall design (section 9.4.1.2) due to the distortion of the supporting construction observed in test reference WF547575/R.

All construction details are to remain as tested in Chilt/RF13137 Revision C and BMT/FEP/F14038 unless stated otherwise in this document. Illustrations of the tested design shown below is taken from Chilt/RF13137 Revision C.

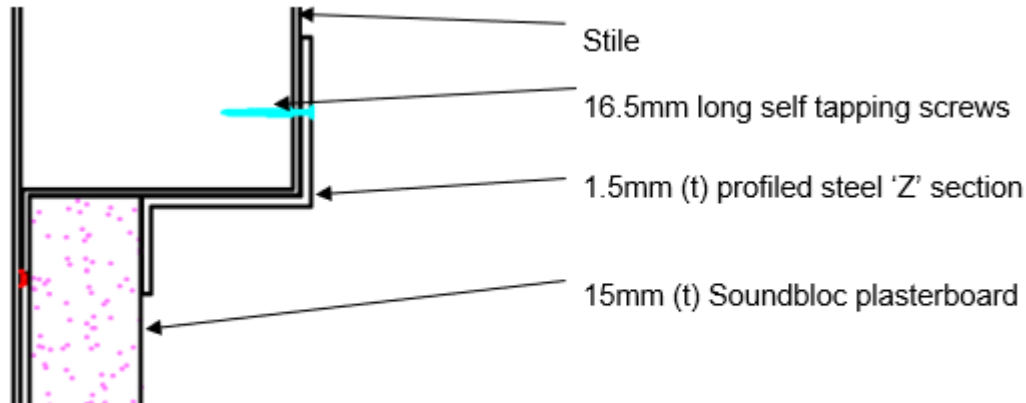


Illustrations of the tested design shown below is taken from WF547575/R.



5.1.1.1 Optional 15mm Thick Soundbloc Plasterboard (Leaf Option 1)

It is permitted to fit a 15mm thick piece of Soundbloc plasterboard (manufactured by Siniat) to the fire attack side (exposed face) of single and double leaf doorsets, constructed from leaf option 1 as successfully tested in Chilt/RF13137 Revision C. The plasterboard is retained using a profiled 1.5mm thick steel 'Z' section fixed to stiles with 16.5mm long self-tapping screws installed 75mm from the corners and at 300mm centres.



5.1.2 Leaf 2 – 51 Range

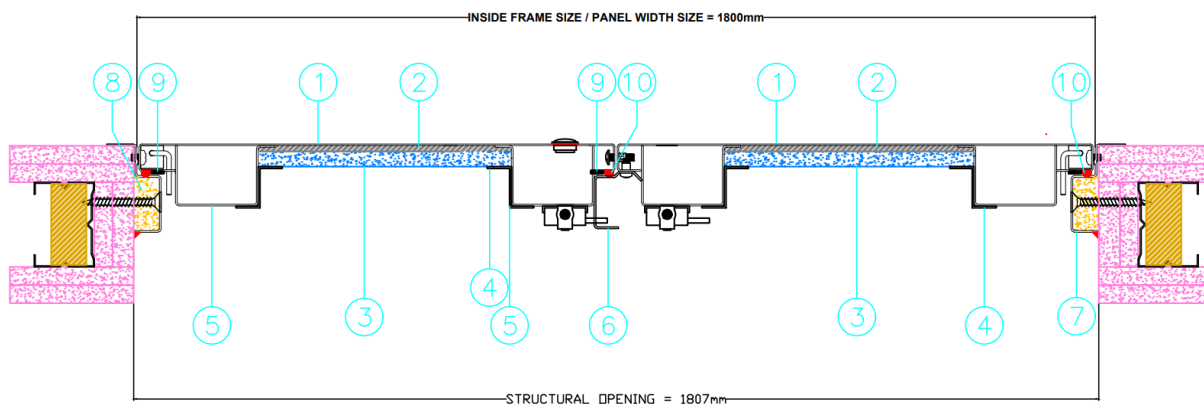
The basic tested construction of this door leaf design comprises the following:

Element	Material	Dimensions (mm)
Stiles	Profiled Zintec steel welded to the steel 'tray' section facing	1.5 thick x 65-82 wide x 43 thick
Rails	Profiled Zintec steel welded to the steel 'tray' section facing, butted up to the stiles	1.5 thick x 65-82 wide x 43 thick
Leaf	Zintec or stainless* coated profiled steel tray section on the exposed face	1.2-1.5 thick
	Custom Audio Designs product ref A325, IsoBase R50, fitted inside the steel tray section	5mm thick
	Siniat Soundbloc or GTEC dB plasterboard fitted to the side away from the fire attack (unexposed) face within the rails and stiles	12.5mm thick
Leaf finish	Polyester powder coating	Nominally 75 microns thick
Welds	Spot welds	12.5 long at nominal 450 centres
Core Clamps	'Z' profile steel welded to the stiles and rails	27-43 high x 38.5-43 wide x 1.2-1.5 thick
Meeting edge stop/ astragal (double leaves only)	Profiled Zintec steel	1.5 thick x 20 wide x 46 deep welded along the closing edge return of the passive leaf tray.

* It is the opinion of Warringtonfire that for this doorset design, with the essential hardware fitted and engaged and taking into account the distortion during the tests, that changing the steel from mild to stainless can be permitted (except for with shaftwall supporting construction), and that the fire resistance integrity performance would be expected to be maintained.

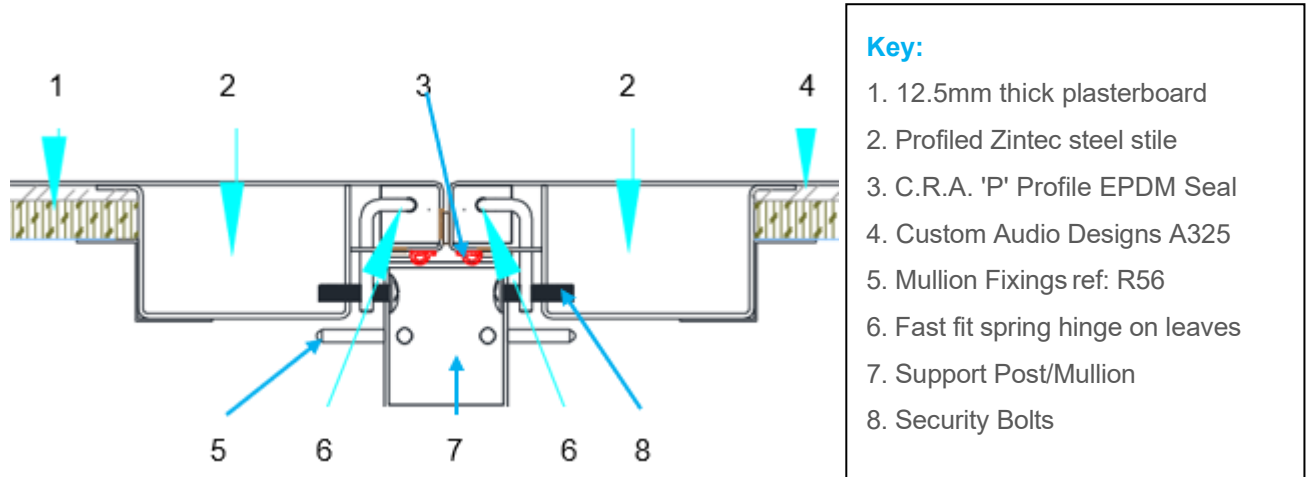
The exchange to stainless steel is not permitted when the doorset is to be fitted within the shaftwall design (section 9.4.1.2) due to the distortion of the supporting construction observed in test reference WF547575/R.

All construction details are to remain as tested in WF434360 Specimen B, WF432243 and WF513907 unless stated otherwise in this document. Illustration of the tested design below taken from WF434360 Specimen B.

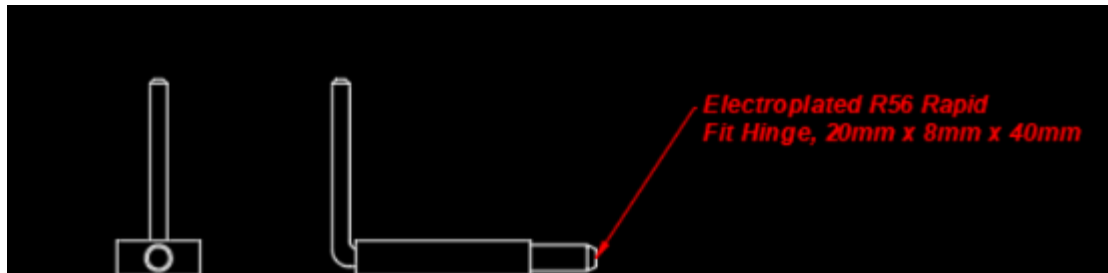


5.1.2.1 Multiple Leaf Configuration – Leaf Option 2 Only – 4No Leaves

As tested in WF513907, leaf option 2 may be installed in runs of 4 leaves. All construction and installation details must remain as detailed in section 5.1.2 with the addition of the supporting post/mullion detailed below at the hanging edge of leaves. Runs of 4 leaves must be installed as tested with outer leaves hinged from the frame jambs abutting the supporting construction and the support post/mullion between the two double door assemblies.



The support post/mullion must be composed of 2No mild steel 'U-sections' at 1.5mm thick welded together to finish as a 49.5mm deep x 55.5 mm wide box section, retained in position in the frame head and threshold by spring hinges welded to the mullion, 2 No at the head and 2No at the threshold such the fixings can be withdrawn allowing the mullion to be temporarily removed.

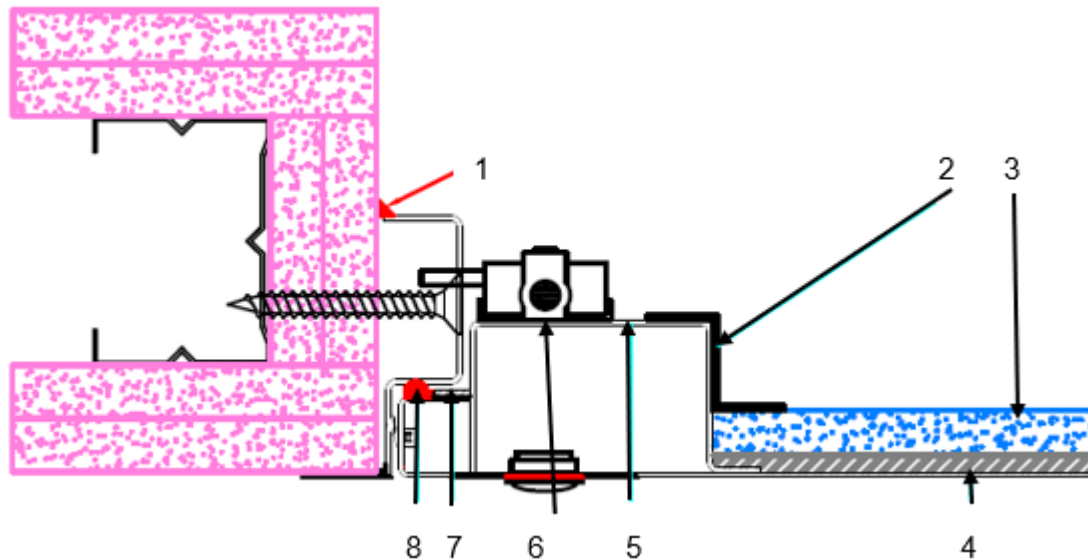


Steel security bolts 30mm long x 5mm diameter must be installed through both faces of the mullion as shown above, locating into holes in the leaf stiles at maximum 405mm centres, with one bolt a maximum of 340mm from the head and threshold in the leaf height.

5.1.2.2 Multiple Leaf Configuration – Leaf Option 2 Only – 3 No Leaves

Leaf option 2 may also be installed in runs of 3 leaves, comprised of a double leaf and a single leaf configuration. The double leaf must be installed as detailed in section 5.1.2.1 whilst the single leaf must be hung on the mullion detailed in section 5.1.2.1, it is not permitted to have the single leaf installed with its' closing edge against the mullion.

The closing edge details must be as tested in WF434360 (Specimen B).

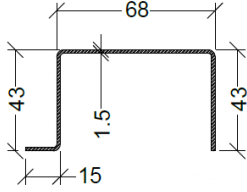
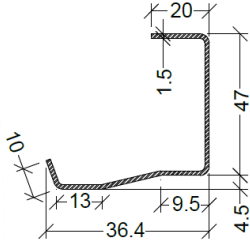


Key:

1. Mastic
2. Z-profile plasterboard retainer
3. Plasterboard Core
4. IsoBase Core
5. Stile
6. Lock, and keyhole
7. Envirograph G10/10 seal
8. CRA P-Profile compression seal

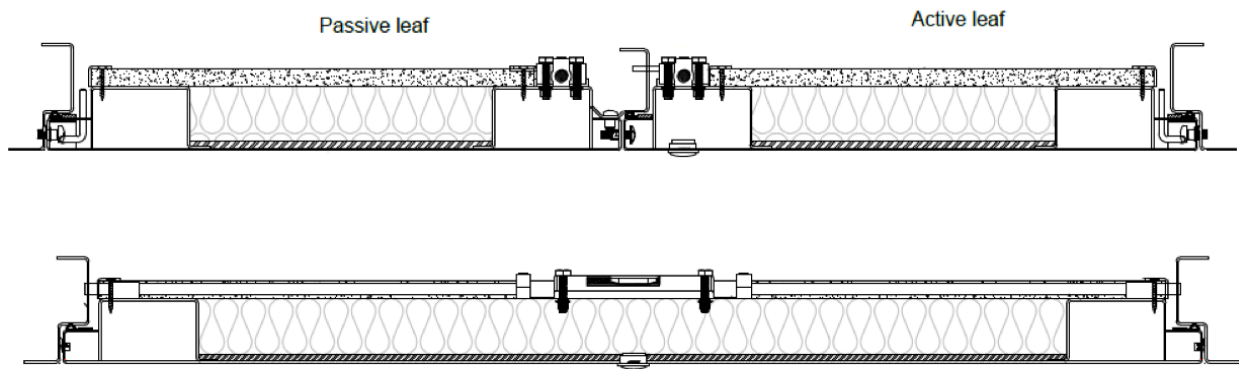
5.1.3 Leaf 3 – 51 Range

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

Element	Material	Dimensions (mm)
Stiles	Profiled Zintec steel welded to the steel 'tray section facing	1.5 thick x 68 plus 15 wide x 43 thick
Rails	Profiled Zintec steel welded to the steel 'tray section facing, butted up to the stiles	
Leaf	Zintec* coated profiled steel tray section	1.2 thick with 22.5 high returns to all edges (return width 30 at hanging edge, 20 at closing or meeting edge, 25 at top and bottom edge)
	Custom Audio Design, IsoBase R50, fitted inside the steel tray section between the rails and stiles	5mm thick
	Rockwool RW3 Semi Rigid Slabs adjacent to the IsoBase R50 between the rails and stiles	40mm thick
	Siniat dB board fitted over the RW3, rails and stiles	12.5mm thick
Leaf finish	Polyester powder coating	Nominally 75 microns thick
Welds	Spot welds	12.5 long at nominal 450 centres
Core Clamps	'L' profile screwed to the stiles and rails, clamping the Siniat dB board.	12.5 high x 16 wide x 1.5 thick
	Core Clamp screws at 200 to 300 centres to rails and stiles	3.5 x 25 long screws
Meeting edge stop/ astragal (double leaves only)	Profiled Zintec steel	1.5 thick x 20 wide x 47 deep welded along the closing edge return of the passive leaf tray 

* It is the opinion of Warringtonfire that for this doorset design, with the essential hardware fitted and engaged and taking into account the distortion during the tests, that changing the steel from mild to stainless can be permitted (except for with shaftwall supporting construction), and that the fire resistance integrity performance would be expected to be maintained.

The exchange to stainless steel is not permitted when the doorset is to be fitted within the shaftwall design (section 9.4.1.2) due to the distortion of the supporting construction observed in test reference WF547575/R.



5.2 Variations to Tested Leaf Construction

Variations to size or materials of leaf construction are not permitted unless specifically detailed in either section 5.1 or the following sections.

5.2.1 Decorative and Protective Finishes

The following additional finishes for the leaf 'tray' are permitted for these doorset designs since they would either degrade rapidly or remain inert under test conditions without significant effect to the fire resistance performance of the doorset.

Facing Material	Maximum Permitted Thickness (mm)
Paint	0.2
Vitreous Enamel	1.0
Stove Enamelling	0.1
Epoxy Powder Coating	0.4
Polyester Powder Coating	approx 0.075 (75 microns)

5.2.2 Galvanisation Process

It is the opinion of Warringtonfire, that the effect the use of a particular galvanisation process will have on the doorset design tested, will be insignificant. Therefore, any of the galvanisation processes listed below are acceptable for the leaf:

- Hot dip
- Electro-galvanisation
- Aluzinc.

6. Door Frame Construction

6.1 Details for Frame 1 – Up to 120 Minute Fire Resistance Performance

The frame design detailed below is approved by this assessment.

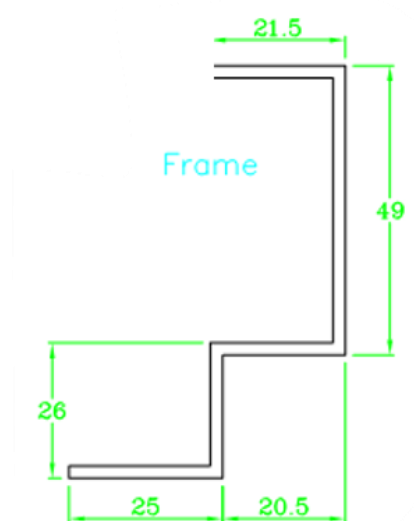
Fabrication of the frame must be as tested in BMT/FEP/F14038. The following table summarises the main components of the tested frame design. For full construction details, reference should be made to the full test report which is summarised in Appendix A.

The tested construction is detailed in section 6.1. See section 6.2 for assessed variations to the tested frame construction.

This is a four-sided single rebate frame construction based on the referenced test evidence cited in Appendix A.

Element	Material or Product	Dimensions (mm)
Head, Jambs & Threshold	Profiled mild steel section, featuring an integral stop and architrave.	75 deep (total) x 45 wide x 1.5 thick overall.
Stop	Integral	20-20.5 deep x 49 wide
Architrave	Integral	25 wide x 1.5 thick section oversailing the supporting construction (see below).

The figure below shows example detail of the tested frame profile.



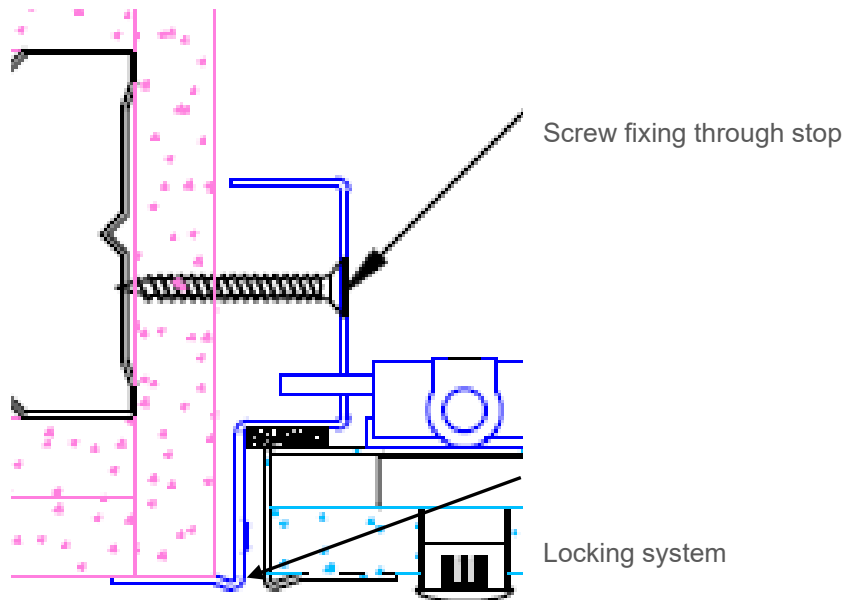
Example of tested frame (Frame 1) profile

6.2 Variations to Tested Frame

The frame must remain as tested in BMT/FEP/F14038 except for the variations which follow.

6.2.1 Beaded Frame

Specimen B tested in WF429750 Version 2 Specimen B incorporated a frame of the same profile as illustrated in section 6.1 with minor variations to the dimensions and including a 2mm high 'plaster stop bead' as shown below, no frame infill was included behind the stop section. The specimen did not exhibit failure criteria prior to termination of the test at 144 minutes.



On the basis of the similar integrity performances obtained and in the frame profiles, it is the opinion of Warringtonfire that the inclusion of the plaster stop bead (as tested in WF429750 Version 2 Specimen B) may therefore be positively appraised for use in combination with Leaf 1, 2 and 3 doorset designs for all configurations permitted in section 4.5.

6.2.2 Frame Infill material

Test references BMT/FEP/F14038, WF434360 specimen B, WF429750 Version 2 specimen B, WF513907, WF544493/R, WF527422, WF547575/R and WF548600/R did not include infill to the frame.

Therefore, unfilled (hollow) frames are permitted for Leaf 1, Leaf 2 and Leaf 3 doorset designs.

Test reference Chilt/RF13137 Revision C included 33 kg/m³ Rockwool rock mineral fibre, and test reference WF432243 included Rockwool RW3 mineral wool, to fit within the integral stop.

It is assessed, that on the basis of the methodology adopted within BS EN 15269-2: 2024 (Annex A clause B.2.6), the following tested or assessed frame infill materials are optionally permitted for Leaf 1, Leaf 2 and Leaf 3 doorset designs:

Element	Product Information	Size (mm) and positioning
Frame Infill	Mineral Wool (glass, ceramic or stone wool) of Euroclass A1 and minimum density 33 kg/m ³	Cut to fill the integral stop
	Gypsum Board of Euroclass A1 or A2-s1, d0	
	Gypsum Plaster	Filling the integral stop
	Mortar	
	Concrete	

All other materials not stated in the table above including timber and PU foam infills are not permitted.

6.2.3 Galvanisation Process

It is the opinion of Warringtonfire, that the effect the use of a particular galvanisation process will have on the design tested, will be insignificant. Therefore, any of the galvanisation processes listed below are acceptable for the frame:

- Hot dip
- Electro-galvanisation
- Aluzinc.

6.3 Frame Joint

The head to jambs and threshold to jambs jointing must be mitred and welded as tested. Joints must be tight and secure with no gaps. For further details reference should be made to the full test reports.

7. Leaf Perimeter Seals

7.1 General

Doorset design leaf option 1 has been tested in the following arrangements:

- with intumescent seals in conjunction with acoustic environmental seals
- with foam environmental seals and without intumescent seals.

Doorset design leaf option 2 has been tested with intumescent seals in conjunction with acoustic environmental seals.

Doorset design leaf option 3 has been tested with intumescent seals in conjunction with acoustic environmental seals.

The intumescent and environmental seals that have been tested and assessed for these doorset designs are detailed below. When fitted, seals must be fitted as tested or assessed and must not interfere with the ability of the leaves to be closed into the frame meeting the requirements of section 9.6.

Seals must run the full length of the required location, with tightly formed abutting corner joints, and fitted as tested. Apart from at corners, joints are not permitted.

7.2 Leaf perimeter seals - Leaf 1

Leaf 1 is assessed as permitted to be fitted with any one of the following combinations of seal types:

- without any seals (BMT/FEP/F14038)
- with intumescent seals only (see below in this section) (Chilt/RF13137 Revision C, WF547575/R, WF548600/R)
- with foam environmental seals only (see below in this section) (BMT/FEP/F14038)
- with intumescent seals (see below in this section) in conjunction with one of three options (see section 7.5) of environmental seals

Intumescent Seals		
Application	Location	Product & Manufacturer
Single leaf doorsets	Fitted to the upstand of the doorstop in the frame or to the leaf face to contact with the stop, on all edges.	10 x 2mm G10-10 Envirograf (Chilt/RF13137 Revision C)
Double leaf doorsets	Fitted to the upstand of the doorstop in the frame or to the leaf face to contact with the stop on all edges. May be optionally fitted to the astragal at the meeting edge to contact with the face of the other leaf. (WF547575/R, WF548600/R and further supported ¹ by test WF432243 with Leaf 2 designs)	<u>OR</u> 10 x 4.5mm Norseal FS1000 (WF547575/R, WF548600/R)

Note:

The optional fitting of the intumescent seal to the astragal is supported by the successful test WF432243 with a Leaf 2 design. This demonstrated the performance of the intumescent seal with a similar profile astragal. The doorset designs assessed herein are fitted with locked 3-point locks and therefore it would not be expected that the intumescent at the meeting edge would be likely to result in the doorset opening due to the intumescent activity during a fire resistance test. It is therefore the opinion of Warringtonfire that this would not result in a detriment to the fire resistance performance.

Foam Environmental Seals – when fitted without intumescent seals		
Application	Location	Product & Manufacturer
Single doorsets	Fitted to the leaf closing face perimeter to contact with the stop, on all edges.	8mm x 4mm Foam Sponge Strip CB Frost (BMT/FEP/F14038)
Double leaf doorsets	Fitted to the leaf closing face perimeter at the leaf head, threshold and hanging edges to contact with the stop. Fitted to the leaf closing face of the door leaf at the meeting edge of one of the door leaves to contact with the astragal.	

7.3 Leaf perimeter seals - Leaf 2

Leaf 2 must be fitted with the following combination of seal types:

- with intumescent seals (see below in this section) in conjunction with one of three options (see section 7.5) of environmental seals

Intumescent Seals		
Application	Location	Product & Manufacturer
Single leaf doorsets	Fitted to the upstand of the doorstop in the frame or to the leaf face to contact with the stop, on all edges.	10 x 2mm G10/10 Envirograf (WF434360 Specimen B, WF432243, WF513907)
Double leaf doorsets	Fitted to the upstand of the doorstop in the frame or to the leaf face to contact with the stop on all edges. Fitted to the astragal at the meeting edge to contact with the face of the other leaf.	
Multiple Leaf doorsets (3 or 4 leaves)	Fitted to leaf vertical edges facing the frame reveal. Fitted to the hanging edge of one leaf at the support post/mullion. Fitted around the leaf closing face perimeter to contact with the frame stop or support post/mullion. Fitted to the astragal at the meeting edge of double doors to contact with the face of the other leaf.	

7.4 Leaf perimeter seals - Leaf 3

Leaf 3 is assessed as permitted to be fitted with the following combination of seal types:

- with intumescent seals only (see below in this section) (WF544493/R and WF527422)
- with intumescent seals (see below in this section) in conjunction with one of three options (see section 7.5) of environmental seals

Intumescent Seals		
Application	Location	Product & Manufacturer
Single leaf doorsets	Fitted to the leaf face to contact with the stop, on all edges.	10 x 2mm G10/10 Envirograf (WF544493/R, WF527422)
Double leaf doorsets	Fitted to the leaf face to contact with the stop or astragal on all edges.	

7.5 Environmental seals fitted adjacent to intumescent

The two acoustic environmental seals have been tested in conjunction with the permitted intumescent seal, with one type tested with Leaf 1 (Chilt/RF13137 Revision C) and one type tested with Leaf 2 (WF432243). The foam environmental seal has been tested without other seals with Leaf 1 (BMT/FEP/F14038).

It is the opinion of Warringtonfire that this is sufficient test evidence to support the use of any one of the following environmental seals fitted adjacent to the intumescent seal for Leaf 1, Leaf 2 and Leaf 3.

When fitting one of these three options of environmental seal in conjunction with intumescent seals it must be adjacent to the intumescent seal as tested and none of the intumescent seal may be removed to facilitate fitting.

Only one environmental seal option may be fitted to any individual doorset.

Environmental Seal Options		
Application	Location	Product & Manufacturer
Single leaf doorsets	Fitted as follows adjacent to Intumescent seal: Fitted around leaf closing face perimeter to contact with the stop or at corner of the upstand of the door stop on all edges.	IS1020 'P' seal 8mm x 4mm, Lorient Polyproducts (Chilt/RF13137 Revision C)
Double leaf doorsets	Fitted as follows adjacent to Intumescent seal: • Fitted around leaf closing face perimeter at the leaf head, threshold and hanging edges to contact with the stop or at corner of the upstand of the door stop on all edges. Fitted to astragal at meeting edge of double doors to contact with face of the other leaf.	OR C.R.A. International 9mm x 5.5mm, White 'P' Profile Compression Self Adhesive EPDM Seal (WF434360 Specimen B, WF432243, WF513907, WF544493/R, WF527422)
Multiple Leaf doorsets (Leaf 2 only) (3 or 4 leaves)	Fitted as follows adjacent to Intumescent seal (if appropriate): • Fitted to the hanging edge of one leaf at the support post/mullion. • Fitted around the leaf closing face perimeter to contact with the frame stop or support post/mullion. Fitted to astragal at meeting edge of double doors to contact with face of the other leaf.	OR 8mm x 4mm Foam Sponge Strip CB Frost (BMT/FEP/F14038)

8. Hardware

8.1 General

The following sections detail the permitted scope and constraints for fitting hardware to the doorset design and consider what tested or assessed items of essential hardware can be used on Leaf types 1, 2 and 3 unless restricted below.

Each section will consider the named item of hardware and detail if there are any limitations.

Hardware items should generally be fitted in accordance with the manufacturer's instructions. However, the parameters and requirements of this assessment always take precedence.

8.2 Intumescent to Hardware

Intumescent materials were not used to protect hardware during the tests and are not required or permitted.

8.3 Essential Hardware

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

Configuration	Hardware
LSASD	• 3-point Lock • Pivot • Door security bolts • Fire Door Keep Locked Shut sign
LSADD	• 3-point Locks • Pivot • Door security bolts • Fire Door Keep Locked Shut sign
LSAMD	• 3-point Locks • Pivot • Door security bolts • Fire Door Keep Locked Shut sign

Note:

1. Closer – the doorsets do not require self-closing devices since they must be kept locked shut. A metal 'Fire Door Keep Locked Shut' sign must therefore be fixed to the leaf face.
2. Lock – all leaves must be fitted with a 3-point locking system including a top and bottom shoot bolt as tested or assessed, which must be engaged as follows when the doorset is in the closed position:
 - a. For single leaves and active leaf (including those within a Multiple leaf doorset) – engagement at 3 points
 - b. For passive leaves of double leaf doorsets (including those within a Multiple leaf doorset) – engagement at 2 points, as tested.
3. Only the hardware detailed herein is approved for use with this steel doorset design.

8.4 Locks – 3-Point Engagement

The permitted options for a latch/lock are as detailed below in the following sections. No other options for a latch/lock are permitted.

All locks must be engaged as follows when the doorset is in the closed position:

- For single leaves and active leaf (including those within a Multiple leaf doorset) – engagement at 3 points
- For passive leaves of double leaf doorsets (including those within a Multiple leaf doorset) – engagement at 2 points, as tested.

1No. lock or latch shall be applied to each leaf, as tested.

When fitted the lock or latch body shall be installed within the closing edge of the leaf. For rectangular leaves this must be the longer edge of the leaf and when the doorset is fitted in the vertical orientation this must also be a vertical edge of the door leaf, at a height as detailed within the relevant section below. Refer to specific notes contained within each section for further considerations on lock or latch type.

8.4.1 3-point locking system (3WL)

The table below details the tested lock that is approved as tested.

Element	Make/Type	Size (mm)	Location
Lock – engaged Leaf option 1, 2 & 3	3-point locking system, with lock operating 2No. Ø8 diameter rods, acting at top and bottom of both leaves	110 high x 36 wide x 16 thick (lock body size)	Fitted at mid height of each leaf.
	3 Point Locking System. Manufactured from Bright Zinc Plated Mild Steel, with 18mm stroke. Product ref. 3WL. Operating 2No. Ø8 diameter rods, acting at top and bottom of both leaves	110 x 33 x 16mm (centre latch size)	
Locking rod guide blocks Leaf option 1, 2 & 3	8No. steel rod blocks stitch welded on exposed face of stile	20 x 20 x12 with an 8mmØ hole to accept the rod	Fitted at maximum 10mm and 100 from leaf head and threshold and at 400mm centres to the lock

The below illustration, supplied by Panel Technologies Limited details the components of the 3WL lock:



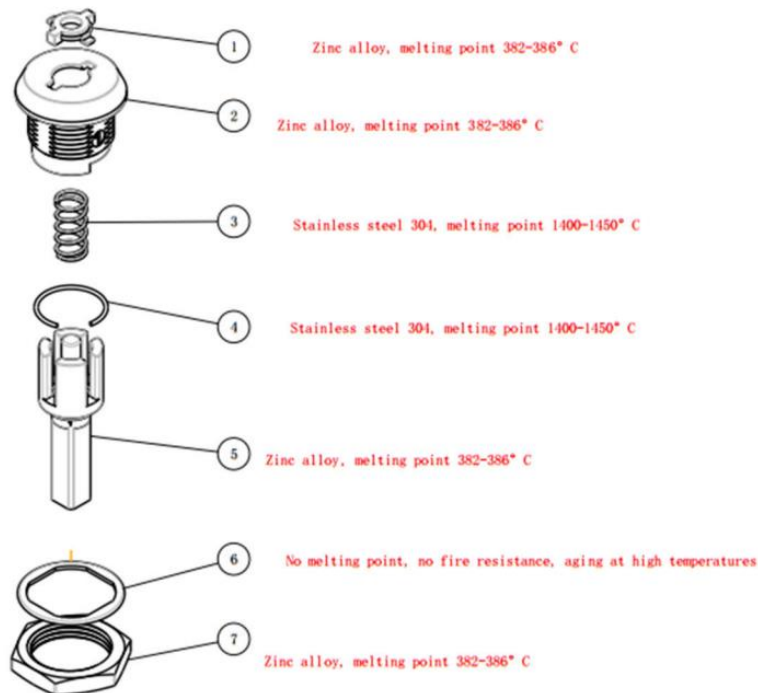
8.4.2 3WL inserts

The 3WL lock tested included a zinc “shaft keyhole” (item 6 in the illustration in section 8.4.1).

The following alternate lock insert for use with the 3WL lock has been assessed.

8.4.2.1 Key Retaining Lock (KRL) insert with 3WL Lock

The below illustration, supplied by Panel Technologies Limited, details the components of the KRL lock insert.

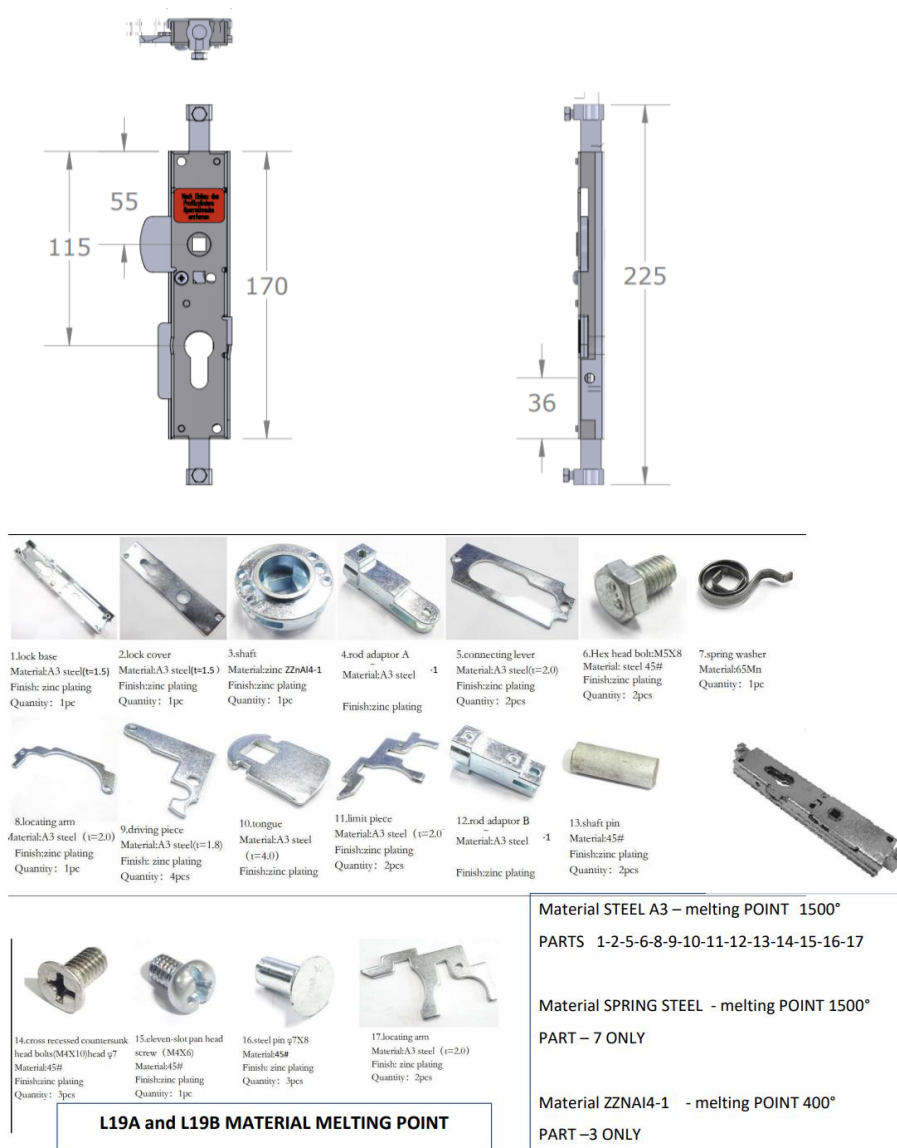


Key Retaining Lock (KRL)

The originally tested ‘shaft keyhole’ has been declared to be constructed from Zinc die cast with a melting point of 400°C. The Key Retaining Lock has been declared to be constructed from Zinc alloy with a melting point of 382-386°C. As the melting point of the two locks is similar and the alternative Key Retaining Lock shall be fitted in the same position, it is the opinion of Warringtonfire that this modification is acceptable.

8.4.3 3WLC Lock with Single Eurocylinder

The '3WL' lock has previously been proven with the assessed doorset design as detailed in section 8.4.1, in test reports WF434360 Specimen B and WF432243. The '3WLC' is the same as the '3WL' lock, except that it has an increased height to accommodate a eurocylinder and is slightly wider (case size 170mm x 37mm x 16mm). The 3WLC lock is detailed in the below illustrations:



The increased height and width to accommodate the cylinder would not be of detriment to performance over the 3WL lock tested as the lock is surface mounted and constructed from the same materials with the same melting point. The only modification required to the door leaf to accommodate the 3WLC lock is a hole through the leaf to accommodate the cylinder. As this hole will then be filled with a cylinder, it is the opinion of Warringtonfire that this will not be of detriment to performance, however the opening for the cylinder must be flush without any gaps.

The following cylinders are permitted for use with the 3WLC lock:

Zoo Hardware Ltd – V5 Range

- 70mm long (60/10 fixing Centre)
- 50mm long (40/10 fixing Centre)
- 45mm long (35/10 fixing Centre)

Steel or Stainless Steel escutcheons (up to 53mm diameter and 7mm projection) or cylinder pulls (up to 92mm high x 45mm wide) may be fitted in conjunction with a eurocylinder. The escutcheon or cylinder pull may not include other materials (such as plastic components).

- Permitted fixing methods for escutcheons or cylinder pulls are as follows:
 - Welded to the face of the leaf.
 - Screwed to the face of the leaf using machine screw(s), with the holes for the bolts kept to a minimum and backed with a steel or stainless steel flanged rivet nut.

8.5 Pivots

The table below details the tested pivots that are approved when fitted as tested BMT/FEP/F14038, WF434360 specimen B and WF544493/R.

Element		Make/Type	Size (mm)	Location
Hinges	Leaf option 1	Steel pin 'pivots'	6Ø (pin size)	Fitted at head and threshold of leaf
	Leaf option 1, 2 & 3	Fast fit spring hinges. Product reference - HINGE-RF-R51	8Ø (pin size)	Fitted at head and threshold of leaf

8.6 Signage

A 'Fire Door Keep Locked Shut' sign is required to be fixed to the leaf face. The following options are permitted.

8.6.1 Fixed Signage

Surface mounted components with the following specification are deemed acceptable as in the opinion of Warringtonfire they will not significantly affect the fire resistance performance of the design being considered. This is on the basis of the items being surface mounted away from the edge of the leaf, therefore unlikely to influence the junction between leaf and frame. Furthermore, they are generally of lightweight construction, meaning that they are unlikely to destabilise the steel doorset assembly and therefore cause adverse deflection under test conditions.

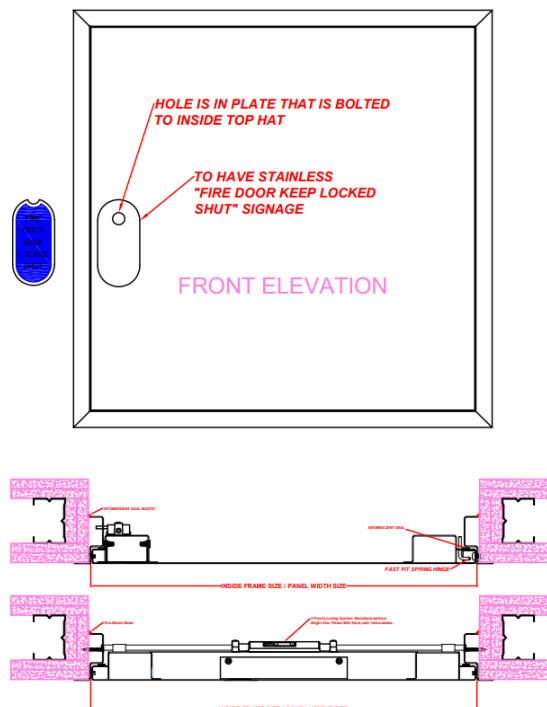
Approved specification:

- Steel, stainless steel, aluminium or bronze signage may be fitted to the steel face of the leaf providing they are fitted no closer than 75mm from the leaf edge and are no greater than 80mm in diameter. A maximum of 2No. signs may be fitted and must be positioned at least 100mm apart.
- Permitted fixing methods are as follows:
 - Surface-fixed with adhesive.
 - Steel signage of the above specification may be welded to the face of the leaf.
 - Signage may be bolted to the face of the leaf, with the holes for the bolts kept to a minimum and backed with steel or stainless steel washer and nut or flanged rivet nut.

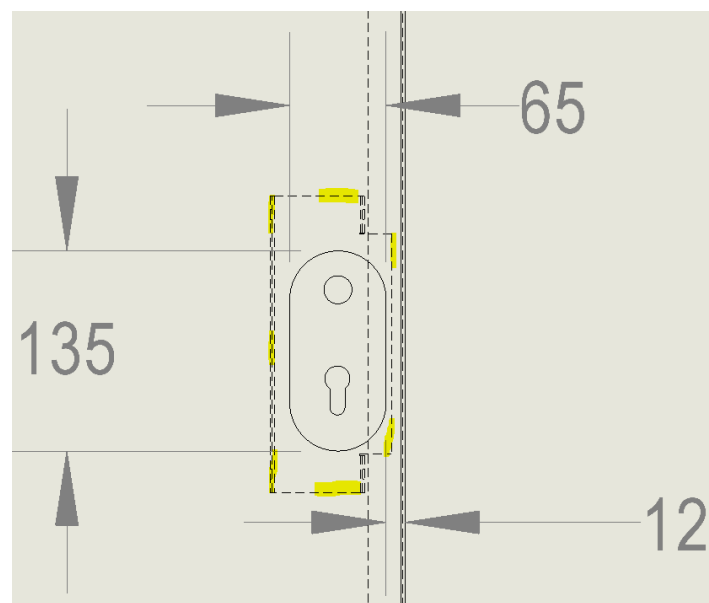
When applied to a door leaf the plate shall be surface mounted to the face without removing material from the leaf.

8.6.2 'Fire Door Keep Locked Shut' Magnetic Sign

A recessed, obround, cut-out 'Fire Door Keep Locked Shut' magnetic sign may be fitted to the steel doorsets as detailed below.



The cut out in the face of the door leaf shall measure 135mm high x 65mm wide. A 1.2mm thick steel plate will then be stitch welded behind the cut out as illustrated below to seal the opening in the face of the door leaf.



For additional protection, this cut out will be positioned in front of the 'top hat' reinforcement sections of the door leaf which will act as an additional layer of protection behind the stitch welded steel panel which seals the cut out. There will then be a removeable 'Fire Door Keep Locked Shut' steel sign (with backing magnets) that can be placed over the obround cut out as and when necessary. The following photos below illustrate the principle involved.



Obround cut out with backing plate



With magnetic fire door sign affixed

The stitch welding technique that will be used to fix the steel backing plate to the face of the door leaf has already been proven in the tested designs to fix the 'top hat' sections into place. The distance between the stitch welds on the backing plate are also small. Therefore, distortion between the backing plate and the leaf would not be expected to open gaps in the face of the leaf which could result in a gap gauge failure. Furthermore, as previously discussed, the top hat sections would remain behind the backing plate, providing a further level of protection and preventing a gap gauge failure of the door leaf at the recessed section. The round hole in the photo above allows access to the lock and has been tested (in WF513907 and WF527422) with the hole to the exposed face without being the cause of integrity failure, the addition of the key cylinder as illustrated above through a rectangular section hole is therefore no more onerous than the open hole above – the hole is to be no larger than the largest dimension for the cylinder. None of these materials for the backing plate or sign are flammable. It is on this basis, that in the opinion of Warringtonfire, this 'Fire Door Keep locked Shut' magnetic sign, recessed into the face of the door leaf as detailed in this section will not be a cause of premature integrity failure.

8.7 Door Security Bolts

Door security bolts must be fitted as tested and engaged when the leaf is closed.

Security Bolt Spacing		
Element	Dimensions (mm)	Location (mm)
Steel security bolts on hanging edges	Ø5 x 12mm protruding from leaf edge	Fitted at maximum 405mm centres, with one bolt a maximum of 340mm from the head and threshold of the leaf
Steel security bolts on meeting edge of active leaf (double doorsets only)	Ø13 bolt head x 8mm protruding from leaf edge	Fitted equispaced along the meeting edge at maximum 405mm centres, with one bolt a maximum of 150mm from the head and one bolt a maximum of 340mm from the threshold of the leaf

9. Installation

9.1 General

The steel doorset must be installed on the face of the supporting construction with the leaf opening towards the same face as the integral architrave is fitted, as tested.

For Leaf 1 doorset designs when Soundbloc plasterboard panels are included in the construction, the integral architrave must be away from the fire attack side and the leaf must open away from the fire attack side.

For Leaf 1 doorset designs with no Soundbloc plasterboard panels in the leaf construction, the integral architrave may be fitted with the exposure direction of the fire attack from either side.

For Leaf 2 doorset designs the integral architrave must be towards the fire attack side and the leaf must open towards from the fire attack side.

For Leaf 3 doorset designs that are double leaf, the integral architrave must be towards the fire attack side and the leaf must open towards from the fire attack side.

For Leaf 3 doorset designs that are single leaf, the integral architrave may be fitted with the exposure direction of the fire attack from either side.

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

- the frame installation
- the requirements for the supporting construction
- the fire stopping between the frame and the supporting construction
- the fixing requirements
- the requirements for door edge gaps

9.2 Door Frame Installation and sealing to structural opening

The frame must be installed as supported by the test evidence cited herein.

The frame incorporates an integral architrave that returns across the face of the supporting construction.

The integral architrave of the frame is bedded on a bead of intumescent mastic and pushed as far as possible flush to the face of the wall. Where the integral architrave is unable to be completely flush to the face of the wall, gaps of up to 3mm are permitted which must be filled with the same intumescent mastic.

Fitting of the frame to the structural opening must be as tested. The permitted gap between the rear of the frame and the final structural opening after any aperture lining is fitted must comply with the following:

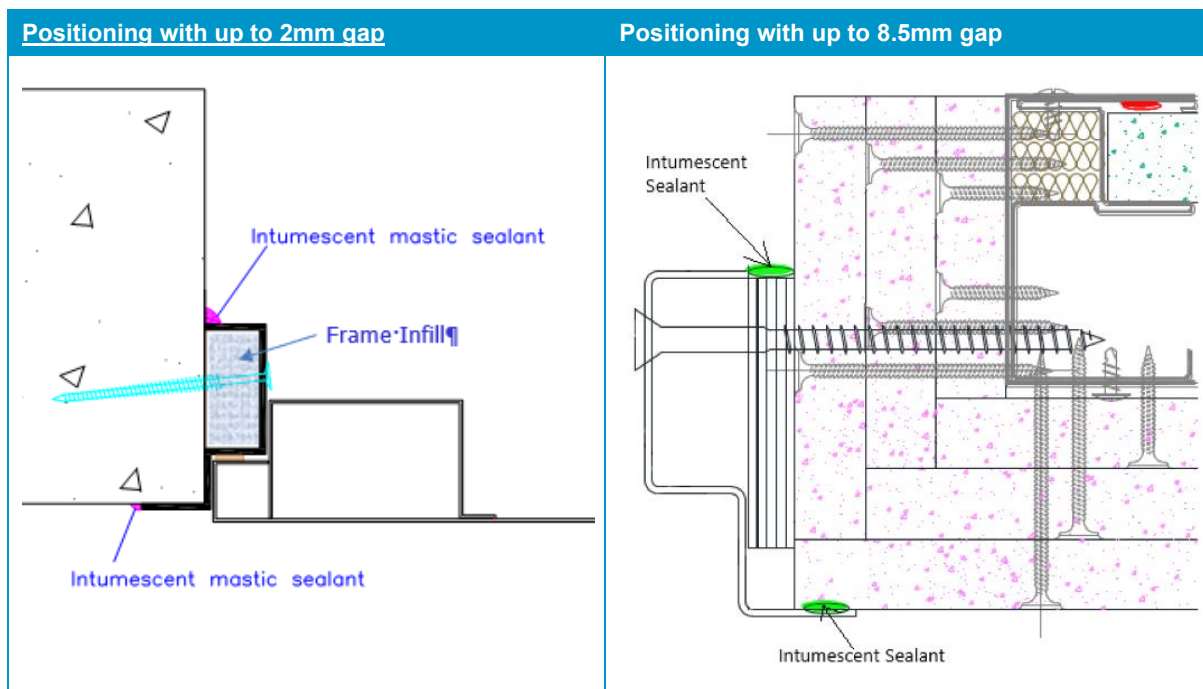
Type of Supporting construction	Maximum Gap
Blockwork, Masonry or Concrete	2mm maximum at all edges (supported by WF432243 and WF434360 specimen B)
Plasterboard clad timber or steel stud partitions or the shaftwall design Note: When fitted with a plinth as detailed in section 9.4.1.3, the maximum gap at the base of the frame shall be as permitted for Blockwork, Masonry or Concrete.	8.5mm maximum at all edges (supported by WF547575/R Version 6 and WF548600/R Version 6).

For an installation with maximum gap size of 2mm at all edges and to ensure a suitable seal between the frame and the supporting construction a continuous 5mm wide bead of the successfully tested Mann McGowan Pyromas A acrylic intumescent mastic is to be applied at the end of the architrave

and next to the frame stop as shown below. Alternative sealants that have been previously fire tested to BS EN 1363-1 or BS EN 1634-1 for the required period of fire resistance and between the required substrates in this application, tested with the required gap size are permitted.

For an installation with maximum gap size of 8.5mm and to ensure a suitable seal between the frame and the supporting construction a continuous bead of the successfully tested FIREPRO® Acoustic Intumescent Sealant (water based acrylic sealant) is to be applied under the architrave and next to the frame stop to cap the gap as shown below. Alternative sealants that have been previously fire tested to BS EN 1363-1 or BS EN 1634-1 for the required period of fire resistance and between the required substrates in this application, tested with the required gap size are permitted.

The figure below shows example details of tested installations using screw fixing. For further detail, reference should be made to the test evidence cited in Appendix A.



Note:

1. The drawings are provided as a generalised illustration of the door frame installation only; actual installation must be as per the text within this document specifies.
2. Information on frame Infill is given in section 6.2.2.

9.3 Packers

110mm x 60mm steel (frame shim) packers were included within tests, WF544493/R and WF527422 Doorset A, fitted at the vertical fixing positions of the frame and within tests WF547575/R, WF548600/R fitted at all edges between the frame and the structural opening, at nominally 500mm centres.. Steel packers are therefore permitted at all edges of the frame, fitted as tested.

When the gap between the rear of the frame and the structural opening is greater than 2mm, steel packers must be fitted at maximum of 500mm centres, otherwise they may be optionally fitted.

9.4 Wall Types, Structural Opening & Fixity

9.4.1 Wall Types

The following wall types are approved for this doorset design:

- a) Plasterboard clad timber stud partitions (exposed studs are not covered by this report)
- b) Plasterboard clad steel stud partitions (exposed studs are not covered by this report)
- c) Blockwork and Masonry constructions (wall thickness and overall density must be equal to or greater than 140mm thick and 850 kg/m³).
- d) Concrete walls (excluding no fines concrete) (wall thickness and overall density must be equal to or greater than 140mm thick and 850 kg/m³).
- e) Shaftwall design as detailed in section 9.4.1.2.

Wall types a & b above must have supporting fire resistance test evidence which demonstrates that it is capable of staying in place and intact for, as a minimum, the required performance period of the doorset (classified to BS EN 13501-2) supporting a doorset design. (See Appendix A for justification)

Wall type c and d above must be determined to be able to provide at least the same level of fire resistance as the required performance period of the doorset design.

Based on the testing cited in Appendix A, the structural opening (for wall types a & b) must be lined (see section 9.4.2) and provide underlying studwork ("framed out") at the perimeter of the aperture to provide adequate fixity.

All wall types detailed above shall provide a suitable medium to permit adequate fixity, it is anticipated that for:

- Wall type a, plasterboard clad timber stud partitions, the timber stud will be of sufficient dimensions such that the fixing for the door frame penetrates into solid timber.
- Wall type b, plasterboard clad steel stud partitions, are not required to include a timber lining for the door frame fixings to penetrate into (as supported by WF514070/R Issue 3 and WF525369/R), unless this is required by the supporting fire resistance test evidence for the wall type.
- Wall type c and d, Blockwork, masonry or homogenous concrete constructions are anticipated to be solid to receive the fixings, with fixing positions away from any reinforcement.

9.4.1.1 Plasterboard facings to blockwork, masonry and concrete walls

If a concrete, blockwork or masonry wall were optionally faced with up to 3No. layers of 12.5mm or 15mm thick Type F plasterboard (EN520) it is the opinion of Warringtonfire that this would not be expected to influence the fire resistance performance of the doorsets considered herein. These facings are therefore permitted as long as the following is complied with:

- Facing boards to the walls must be mechanically fixed with steel fixings at a minimum of 300mm centres, no further than 100mm from the finished structural opening, with a penetration to the underlying masonry or concrete wall of minimum 30mm. Dot and dab (for example) without mechanical fixings is not permitted.
- Voids between board layers and between the first board layer and the masonry or concrete wall are not permitted in the 100 mm zone immediately surrounding the structural opening.

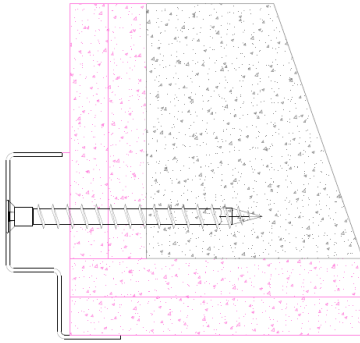


Illustration of Plasterboard facings and lining of structural opening to wall types c & d

This assessment does not consider the influence of facings or linings of structural openings on the anticipated fire resistance performance of the wall.

9.4.1.2 Shaftwall design

The following shaftwall design was tested in WF547575/R and WF548600/R in conjunction with a double leaf doorset. These tests demonstrate that the shaftwall can be fitted in either direction relative to the fire attack direction, when the tested doorset design is fitted with the opening face of the doorset to the face of the shaftwall which includes the three layers of 15mm Fire Panel. On the basis of the tested doorset design and the tested configuration, the doorsets assessed herein may be fitted within the tested shaftwall design in the following applications only:

Leaf options: 1, 2 and 3 (when fitted within the shaftwall design the leaf designs are not permitted to be stainless steel).

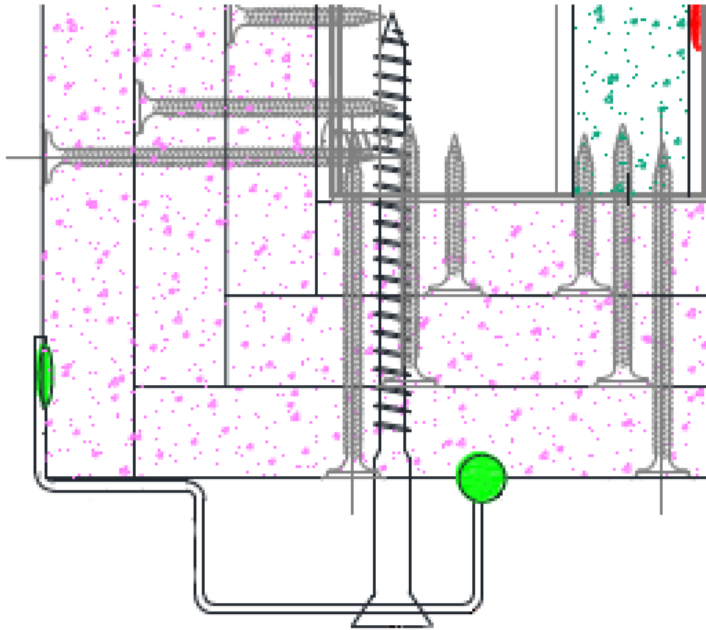
Configurations: LSASD, LSADD only

All details of the shaftwall design must be as tested in WF547575/R and WF548600/R and as an overview comprises:

- Knauf J channel (62mm web x 60/30mm flange, 0.92 gauge) screw fixed to the floor and soffit.
- Knauf deep flange U Channel (62mm web x 70mm flange, 0.70 gauge) screwed to the CT studs to form structural opening framing.
- Knauf CT Stud (60mm web x 38/39 mm flange, 0.92 gauge) screwed to the U channel
- 100mm thick Knauf Rocksilk RS60 filling voids as tested
- Knauf Intumescent and acoustic mastic sealing all coreboard panels and fire panel boards.
- 15mm Knauf Fire Panel – Type A to EN520. 3 layers to one face of the shaftwall and lining the structural opening.
- 19mm Coreboard – Type F to EN520. 1 layer retained by the shaftwall framework
- Knauf tape and fill applied to all plasterboard joints and screw heads.

Relative orientation of the doorset and the shaftwall:

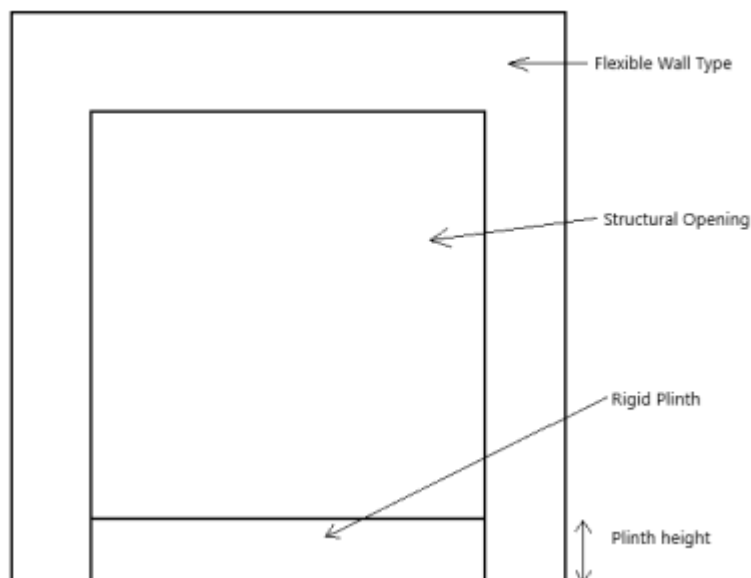
- The opening face of the doorset and the integral architrave of the frame must be to the face of the shaftwall which includes the three layers of 15mm Fire Panel, as tested. See below for example of tested arrangement:



9.4.1.3 Rigid Plinth

On the basis of the test evidence considered it is the opinion of Warringtonfire that a rigid plinth made of the materials specified in section 9.4.1 as type c) or d) may be fitted as a plinth in conjunction with one of the section 9.4.1 flexible wall types (types a), b) or e)). When fitting a rigid plinth the following must be complied with:

- The plinth height range permitted is 75mm to 250mm, above the finished floor level on either side.
- The plinth is located at the bottom of the structural opening as shown in the following elevation sketch.
- The face of the plinth and the face of the flexible wall must be flush with no more than 1mm tolerance to the opening face of the doorset in order for the integral architrave of the frame to form a tight fit against the face of the supporting construction.



9.4.2 Structural Opening and Lining of Structural Openings

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

Additionally, for flexible wall types a & b:

- The aperture must be lined with either 1No, 2No or 3No. layer(s) of 12.5mm or 15mm thick Type F plasterboard (EN520). The lined aperture size shall be sized to ensure the permitted gap between the rear of the frame and the structural opening is not exceeded (see section 9.2).
- The structural opening must be prepared in line with the test evidence provided by the wall manufacturer.

Additionally, for rigid wall types c & d:

- It is optionally permitted for the structural opening for wall types c & d to be lined with up to 3No. layer(s) of 12.5mm or 15mm thick Type F plasterboard (EN520). The boards must be mechanically fixed to the underlying wall, without voids behind them.
- The aperture or lined aperture size shall be sized to ensure the permitted gap between the rear of the frame and the structural opening is not exceeded (see section 9.2).
- The length of frame fixings must be increased directly proportionally to the thickness of the aperture lining, to ensure penetration of fixings as detailed in section 9.4.3.1.

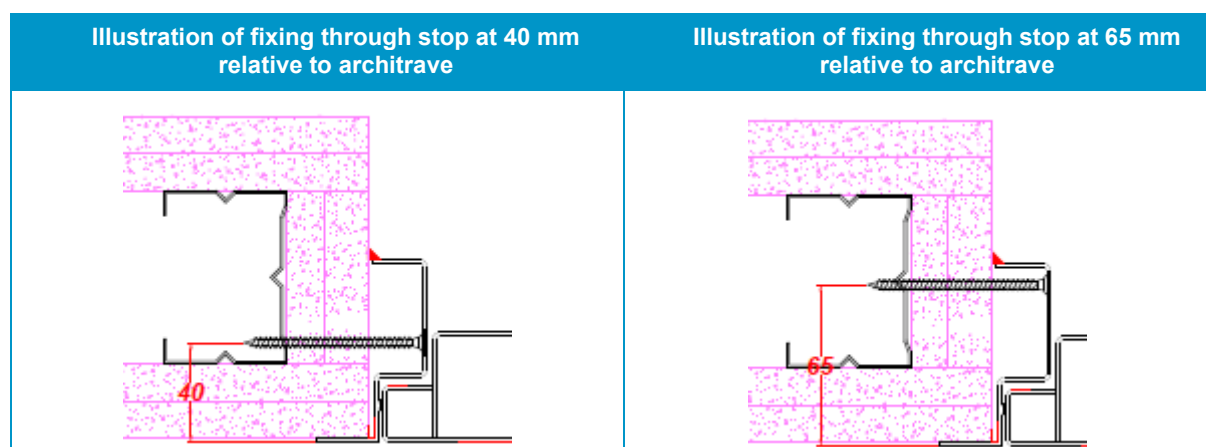
For shaftwall type e:

- Lining of structural opening must be as detailed in section 9.4.1.2. The lined aperture size shall be sized to ensure the permitted gap between the rear of the frame and the structural opening is not exceeded (see section 9.2).

9.4.3 Fixity

In all instances the fixing position must be such that it provides adequate restraint to the element of construction throughout the exposure to fire.

Fixings for all wall types must be through the frame stop. The fixing position tested was 55mm relative to the architrave. With the fixing position further from the architrave than tested there is potential for the frame to distort during fire resistance testing and result in earlier failures due to gaps opening and/or restraining hardware disengaging. This is mitigated by the permitted gap between the rear of the frame and the structural opening for the doorset designs considered herein (see section 9.2). It is assessed therefore, that the position of the fixing through the stop may be varied between 40 and 65 mm as shown in the following illustrations without being expected to adversely affect the doorset performance when tested for fire resistance. This is permitted on the basis of the fixings penetrating into the underlying masonry or concrete or the underlying studs for a partition, with minimum penetration lengths as given in following sections of this report.



9.4.3.1 Masonry and concrete

Fixings must be steel, appropriate to the masonry or concrete construction, and have been successfully tested for doorsets in similar walls. The minimum fixing length is 80mm when fixing to these wall types. The use of 80mm Spax screws is permitted (based on BMT/FEP/F14038).

Where the aperture is optionally lined as detailed in 9.4.1, the length of frame fixings must be increased directly proportionally to the thickness of the aperture lining.

All four frame edges must be fixed as tested in the cited test evidence with the fixing positioned at maximum of 50mm from corners and at maximum 250mm centres along all edges. The fixings must be installed through the frame stop as tested, at the range of positions relative to the architrave as given in section 9.4.3.

If the masonry or concrete wall is faced as detailed in section 9.4.1.1, the frame fixings must be located securely into the underlying masonry or concrete and positioned so as to avoid blowout of the underlying material.

9.4.3.2 Timber or Steel Stud Partitions with a timber lining to the steel studs

Fixings for plasterboard clad partitions with timber studs or steel studs (with a timber infill), must be steel screws of a minimum 4mm diameter.

The minimum penetration of 35mm is required into the underlying timber studs or steel studs (with a timber infill), (based on Chilt/RF13137), with a number of factors affecting the minimum screw length.

All four frame edges must be fixed as tested in the cited test evidence with the fixing positioned at maximum of 50mm from corners and at maximum of 450mm centres along all edges. The fixings must be installed through the frame stop as tested, at the range of positions relative to the architrave as given in section 9.4.3.

When a rigid plinth is fitted the bottom edge of the frame must be fixed as detailed in section 9.4.3.1.

9.4.3.3 Steel Stud Partitions (without a timber lining to the steel studs)

Fixings for plasterboard clad partitions with steel studs (without a timber infill), must be steel screws of a minimum 5mm diameter.

The minimum penetration of 25mm is required into the underlying steel studs (without a timber infill), with a number of factors affecting the minimum screw length (based on WF544493/R).

All four frame edges must be fixed as tested in the cited test evidence with the fixing positioned at maximum of 50mm from corners and at maximum of 300mm centres along all edges. The fixings must be installed through the frame stop as tested, at the range of positions relative to the architrave as given in section 9.4.3.

When a rigid plinth is fitted the bottom edge of the frame must be fixed as detailed in section 9.4.3.1.

9.4.3.4 Shaftwall

Fixings for shaftwalls, must be steel screws of a minimum 6mm diameter x 120mm long.

All four frame edges must be fixed as tested in the cited test evidence with the fixing positioned at maximum of 50mm from corners and at maximum of 300mm centres along all edges. The fixings must be installed through the frame stop as tested, at the range of positions relative to the architrave as given in section 9.4.3.

When a rigid plinth is fitted, the bottom edge of the frame must be fixed as detailed in section 9.4.3.1.

9.5 Post Production (Onsite) Leaf Size Adjustment

Post production adjustment of the steel doorset assemblies is not permitted.

9.6 Leaf Gaps

9.6.1 LSASD and LSADD configurations – Leaf 1

Based on the test evidence (Chilt/RF13137 and BMT/FEP/F14038 and WF547575/R and WF548600/R) for single and double leaf doorsets, the door gap and alignment tolerances must fall within the following range:

Door Gap & Alignment Tolerance Specification	
Location	Dimension
Vertical edge leaf edge gaps:	
Frame Jambs / leaf at hanging edge	A minimum of 0.5mm and a maximum of 3.5mm
Frame Jambs/ leaf at closing edge (LSASD)	A minimum of 0.5mm and a maximum of 2.5mm
Leaf / leaf at meeting edge (LSADD)	A minimum of 0.5mm and a maximum of 3.0mm
Horizontal edge leaf edge gaps:	
Frame Head / top edge of leaf	A minimum of 0.5mm and a maximum of 3.0mm
Frame / bottom edge leaf	A minimum of 0.1mm and a maximum of 2.5mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm.

If substantially different gaps are employed, the fire resistance performance of these doorset designs may change.

Note:

The leaf must be flat (unbowed) and in contact with the frame all around the perimeter.

9.6.2 LSASD and LSADD configurations – Leaf 2

Based on the test evidence (WF434360 Specimen B, WF432243 and WF513907) for single and double leaf doorsets, the door gap and alignment tolerances must fall within the following range:

Door Gap & Alignment Tolerance Specification	
Location	Dimension
Vertical edge leaf edge gaps:	
Frame Jambs / leaf at hanging edge	A minimum of 2.0mm and a maximum of 3.5mm
Frame Jambs/ leaf at closing edge (LSASD)	A minimum of 0.5mm and a maximum of 2.5mm
Leaf / leaf at meeting edge (LSADD)	A minimum of 1.0mm and a maximum of 2.5mm
Horizontal edge leaf edge gaps:	
Frame Head / top edge of leaf	A minimum of 0.5mm and a maximum of 2.5mm
Frame / bottom edge leaf	A minimum of 0.1mm and a maximum of 2.5mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm.

If substantially different gaps are employed, the fire resistance performance of these doorset designs may change.

Note:

The leaf must be flat (unbowed) and in contact with the frame all around the perimeter.

9.6.3 LSASD and LSADD configurations – Leaf 3

Based on the test evidence (WF527422 and WF544493/R) for single and double leaf doorsets, the door gap and alignment tolerances must fall within the following range:

Door Gap & Alignment Tolerance Specification	
Location	Dimension
Vertical edge leaf edge gaps:	
Frame Jambs / leaf at hanging edge	A minimum of 2.5mm and a maximum of 3.5mm
Frame Jambs/ leaf at closing edge (LSASD)	A minimum of 1.0mm and a maximum of 2.5mm
Leaf / leaf at meeting edge (LSADD)	A minimum of 1.0mm and a maximum of 2.5mm
Horizontal edge leaf edge gaps:	
Frame Head / top edge of leaf	A minimum of 1.0mm and a maximum of 3.5mm
Frame / bottom edge leaf	A minimum of 1.0mm and a maximum of 2.0mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm.

If substantially different gaps are employed, the fire resistance performance of these doorset designs may change.

Note:

The leaf must be flat (unbowed) and in contact with the frame all around the perimeter.

9.6.4 LSAMD configurations – Leaf 2

Based on the test evidence WF513907, the door gap and alignment tolerances must fall within the following limits, for 3 or 4 leaf multiple leaf doorsets.

Door Gap & Alignment Tolerance Specification	
Location	Dimension
Vertical edge leaf edge gaps:	
Frame Jambs / leaf	A minimum of 2.5mm and a maximum of 4.5mm
Leaf / leaf hanging edges by support post (mullion)	A minimum of 2.0mm and a maximum of 4.0mm
Leaf / leaf at meeting edge	A minimum of 2.0mm and a maximum of 4.0mm
Horizontal edge leaf edge gaps:	
Frame Head / top edge of leaf	A minimum of 3.0mm and a maximum of 6.0mm
Frame / bottom edge leaf	A minimum of 1.0mm and a maximum of 3.0mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm.

If substantially different gaps are employed, the fire resistance performance of these doorset designs may change.

Note:

- 1) The leaf must be flat (unbowed) and in contact with the frame all around the perimeter.

10. Insulation Performance

Insulation performance may not be claimed for a doorsets to these designs.

11. Conclusions

If the Panel Technologies Limited, 51 Range steel doorset design – Leaf 1 design, constructed in accordance with the specification documented in this field of application were to be fitted vertically within a wall (as given in section 9.4.1) and tested in accordance with BSEN 1634-1: 2014 +A1: 2018, it is expected that they would provide a minimum of 120 minutes integrity¹ performance subject to the doorset being fitted as follows:

- Leaf option 1 doorset must only be installed opening away from the fire attack side when Soundbloc plasterboard panels are included in the construction.
- Leaf option 1 doorset may be installed opening in either direction with respect to the fire attack side when not fitted with Soundbloc plasterboard.

If the Panel Technologies Limited, 51 Range steel doorset design – Leaf 2 design, constructed in accordance with the specification documented in this field of application were to be fitted vertically within a wall (as given in section 9.4.1) and tested in accordance with BSEN 1634-1: 2014 +A1: 2018, it is expected that they would provide a minimum of 120 minutes integrity¹ performance, subject to the doorset being fitted as follows:

- Leaf option 2 doorset must only be installed opening towards the fire attack side.

If the Panel Technologies Limited, 51 Range steel doorset design – Leaf 3 design, constructed in accordance with the specification documented in this field of application were to be fitted vertically within a wall (as given in section 9.4.1) and tested in accordance with BSEN 1634-1: 2014 +A1: 2018, it is expected that they would provide a minimum of 120 minutes integrity¹ performance, subject to the doorset being fitted as follows:

- Leaf option 3 doorset designs that are double leaf must only be installed opening towards the fire attack side.
- Leaf option 3 doorset designs that are single leaf may be installed opening in either direction with respect to the fire attack side.

In all cases the latch/lock must be engaged with the doorset in the closed position.

Note:

1. Although this report does not establish a formal classification against EN13501-2, the guidance within EN13501-2:2023 has been followed as the doorsets considered herein are for integrity only performance (and not insulation performance). Therefore, integrity has been determined on the basis of the two aspects of sustained flaming and gap gauges only.

12. Declaration

We the undersigned confirm that we have read and comply with obligations placed on us by the Passive Fire Protection Forum (PFPF) Guide to undertaking technical assessments and engineering evaluations based on fire test evidence 2021 Industry Standard Procedure

We confirm that any changes to a component or element of structure which are the subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.

We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.

We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.

We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

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

Signed: 
701A0E6005614F7...

Name: Ross Stokes

Position: Technical Manager

Date: 12-Jan-2026

For and on behalf of: **Panel Technologies Limited**

13. Limitations

This assessment report:

- Does not provide an endorsement by Warringtonfire of actual products supplied.
- Has been prepared based on information provided by the Applicant. Warringtonfire has not verified the accuracy or completeness of that information and will not be responsible for any errors or omissions that might be incorporated into this report as a result.
- Any figures included in this report are provided for illustrative purposes only and may not fully reflect the actual scope being assessed. Warringtonfire cannot guarantee the accuracy of the drawings against the scope being assessed. The scope of this report is limited to assessments of the modifications to the tested systems as described herein.
- This report addresses itself solely to the elements and subjects discussed and do not cover any other criteria or modifications. All other details not specifically referred to should remain as tested or assessed.
- This report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to Warringtonfire, the assessment will be unconditionally withdrawn, and the applicant will be notified in writing. Similarly, the assessment should be re-evaluated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.
- This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
- Opinions and interpretation expressed herein are outside the scope of UKAS accreditation.
- This assessment report relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions that are stipulated in the standard this assessment concludes to. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.
- This report represents our opinion as to the performance likely to be demonstrated on a test in accordance with the standard to which this assessment concludes, on the basis of the test evidence referred to in this report. We express no opinion as to whether that evidence, and/or this report would be regarded by any Building Control authorities or any other third parties as sufficient for that or any other purpose.
- This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of Warringtonfire. All work and services carried out by Warringtonfire Testing and Certification Limited are subject to, and conducted in accordance with, the Standard Terms and Conditions of Warringtonfire Testing and Certification Limited, which are available at <https://www.element.com/terms/terms-and-conditions> or upon request.
- Previous versions of the report(s), if applicable, are withdrawn from the date of the up-issued assessment report with immediate effect. That means that they may no longer be relied upon in support of any products being placed on the market (or for the stated project/address where applicable) from the issue date stated on the front cover of this report. The withdrawal of an assessment report does not affect any reliance placed on the report up to the issue date stated on the front cover of this assessment; however, going forward, the up-issued report must be referenced in any literature or product specifications in place of the previous versions of the assessment.

14. Validity

This assessment report is not valid unless signed by all signatories identified within the Signatories and Revision History section of this report.

This assessment report is not valid unless it incorporates the declaration given in Section 12 duly signed by the applicant.

The assessment validity is as stated on the front cover of this report, after which time it is recommended that it be submitted to the assessing authority for re-evaluation.

Appendix A

Summary of supporting data

The test evidence summarised below has been generated to support the fire resistance performance of the door designs that are the subject of this field of application. The summary details are considered to be the key aspects of the design tested. These test summaries are not intended to be a definitive guide to constructing a doorset. The details for the construction of a doorset must be taken from other sections within this Field of Application.

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

Note:

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

A.1 Primary Evidence

Test Report Reference Chilt/RF13137 Revision C			
Report sponsor	Fire Proofing Services Ltd		
Test laboratory	Chiltern International Fire, now trading as Warringtonfire Testing and Certification Limited, UKAS No. 1762		
Test date	23 May 2013		
Test standard	BS EN 1634-1: 2008		
Sampling information	None stated in test report		
Tested Orientation	Opening away from the heating condition.		
Specimen summary & tested configuration	LSASD – Locked, Single Acting Single Doorset Single leaf = Leaf dimensions: 2398(l) x 898(w) x 44(t) The leaf comprised of a 1.2mm thick profiled, mild steel folded tray; with 70(w) x 44(t) stiles and rails welded to the tray. Tray was finished with 75micron thick Polyester powder coating. 15(t) Siniat 'Soundbloc' plasterboard was fitted to the exposed face of the leaf. Leaf was hung in a 4-sided frame consisting of a 1.5(t) mild steel frame fixed within the supporting structure with M4 x 70(l) steel screws. Rockwool was installed behind the frame against the structure. Envirograf Paper ref: G10-10 was fitted to the upstand of the frame stops, with Lorient Polyproducts Ltd IS1020 rubber seal fitted alongside also on the stop. Fast Fit spring hinges were installed at the head and threshold to act as pivots, no closer was fitted. 8No hinge bolts were fitted at approximately 290 centres on the hanging edge. The locking system comprised a 3-point locking system with rods engaging in the frame head and threshold and a centre latch positioned at 1200 above the threshold.		
Test results	Doorset	Integrity – Sustained Flaming:	132 minutes
		Integrity – Gap Gauges:	132 minutes
		Integrity – Cotton Pad:	132 minutes
		Insulation:	8 minutes
Reason for use	Supporting Leaf 1 doorset designs		

Test Report Reference BMT/FEP/F14038			
Report sponsor	Fire Proofing Services Ltd		
Test laboratory	Chiltern International Fire, now trading as Warringtonfire Testing and Certification Limited, UKAS No. 1762		
Test date	10 March 3013		
Test standard	BSEN 1634-1: 2014		
Sampling information	None stated in test report		
Tested Orientation	Opening away from the heating condition.		
Specimen summary & tested configuration	LSADD – Locked, Single Acting Double Doorset Double leaf - Leaf dimensions: 2396(l) x 898/898(w) x 44(t) The leaf comprised of a 1.2mm thick profiled, Zintec steel folded tray; with 68(w) x 43(t) stiles and rails welded to the tray and a 1.2(t) profiled Zintec steel meeting edge astragal. Tray was finished with 75micron thick Polyester powder coating. Leaf was hung in 4-sided frame consisting of a 1.5(t) mild steel frame fixed within the supporting structure with 80(l) steel 'Spax' screws. CB Frost Ltd, foam sponge strip was fitted to the leaf facings to fit against the frame stops and astragal in the closed position. 6mm diameter steel pins were installed at the head and threshold to act as pivots; no closer was fitted. 5No hinge bolts were fitted at 405 centres on each hanging edge with 6No on the meeting edge of the left leaf. The locking system comprised a 3-point locking system with rods engaging in the frame head and threshold and a centre latch positioned at 1200 above the threshold.		
Test results	Doorset	Integrity – Sustained Flaming:	139 minutes
		Integrity – Gap Gauges:	139 minutes
		Integrity – Cotton Pad:	139 minutes
		Insulation:	1 minute
Reason for use	Supporting Leaf 1 doorset designs		

Test Report Reference WF434360 Rev A (Specimen B)			
Report sponsor	Panel Technologies Ltd		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 1762		
Test date	12 November 2020		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset B: Opening in towards heating condition.		
Specimen summary & tested configuration	LSASD – Locked, Single Acting Single Doorset LEAF: Overall Size: 2395mm high x 895mm wide x 45mm thick Profiled steel tray section: Zintec coated profiled steel tray section on the exposed face, 22.5mm deep x 1.2mm thick Stiles and rails: Profiled steel section, welded. 43mm high x 65mm wide x 1.5mm thick. Core: Unexposed - GTEC dB Plasterboard 12.5mm thick. Exposed - Custom Audio Designs Part Number A325, IsoBase R50 5mm thick. Core clamps: 'Z' profile steel welded to the stiles and rails, 27mm high x 38.5mm wide x 1.2mm thick. FRAME: Frame (All four edges): Profiled Zintec steel sections featuring an integral stop and architrave, 73.6mm deep x 45mm wide x 1.5mm thick overall featuring a 47.5mm deep x 20mm wide integral stop and a 25mm wide return oversailing the supporting construction. Stop: Integral to the frame section. Frame jointing detail: Welded. Frame to supporting construction fire stopping detail: Intumescent acrylic sealant Mann McGowan Pyromas A, continuous bead sealing frame to supporting construction. 2No. layers plasterboard Gyproc Tapered Edge Fireline Board 15mm thick fitted with 60mm self-tapping steel screws - fitted lining aperture on the unexposed face. Frame to supporting construction fixing detail: Self tapping steel screws at 300mm centres, 66mm long. INTUMESCENT & SEALING MATERIALS: Frame reveal: Envirograph G10/10 10mm x 2mm, Grey Self-Adhesive Intumescent Strip. Fitted around the leaf face perimeter on the unexposed face. C.R.A. International 9mm x 5.5mm, White 'P' Profile Compression Self Adhesive EPDM Seal, 8 x 5mm. Fitted around the leaf face perimeter on the unexposed face. HARDWARE: Hinges: Fast fit spring hinges. Product reference - HINGE-RF-R51. Electroplated Fast Fit Spring Hinge Ø8mm (pin size) 19.1mm depth x 19.1mm width x 40mm high. Fitted at the top and bottom of the leaf. Latch: 3 Point Lock fitted on stile, with top and bottom acting shoot bolts running through steel blocks. Material number - 3 Point Locking System. Manufactured from Bright Zinc Plated Mild Steel, with 18mm stroke. Product ref. 3WL, 110 x 33 x 16mm (centre latch size). Fitted at mid height of leaf.		
Test results	Doorset B	Integrity – Sustained Flaming:	126 minutes
		Integrity – Gap Gauges:	126 minutes
		Integrity – Cotton Pad:	126 minutes
		Insulation:	11 minutes
Reason for use	Supporting Leaf 2 doorset designs, including runs of 3No Leaves, with the leaf closing edge as tested.		

Test Report Reference WF4322243			
Report sponsor	Panel Technologies Ltd		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 1762		
Test date	18 September 2020		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset: Opening in towards heating condition.		
Specimen summary & tested configuration	LSADD – Locked, Single Acting Double Doorset LEAF: Overall Size: 2397mm high x 897/897mm wide x nominally 44mm thick Profiled steel tray section: Zintec coated profiled steel tray section on the exposed face, 21 deep x 1.5mm thick. Core – fitted inside the steel tray section: Manufacturer Custom Audio Designs product ref A325, IsoBase R50 5mm thick, 33kg/m3. Facing – unexposed face: Siniat Soundbloc plasterboard 12.5mm thick Core clamps: Profiled Zintec fixed to stiles and rails fixed with M5 x 12mm Bright Zinc Plated (BZP) Pan Pozi Head Cross Recess Machine Screw at 15mm from corners and 425mm centres, 1.5 (t) x 48 (w) overall x 25mm (h). Stiles and rails: Profiled Zintec section, 1.5mm thick x 82mm wide x 43mm high. Astragal – right leaf: Profiled Zintec section 1.5 thick x 20 wide x 46mm deep. FRAME: Frame (all four edges): Profiled Zintec steel sections including an integral stop and architrave, 75 deep x 45 wide x 1.5mm thick overall including a 20 deep x 50mm wide integral stop and a 26mm wide architrave oversailing the supporting construction on the exposed face. Frame infill: Rockwool Product ref RW3 mineral wool. Fully filling void behind frame. Stop: Integral to the frame section. Head to jamb jointing detail: Welded. Frame to supporting construction fire stopping detail: Intumescent acrylic sealant Mann McGowan Pyromas A. Continuous bead sealing frame to supporting construction. Frame to supporting construction fixing detail: Self-tapping steel screws fitted 45mm from corners at nominally 285mm centres. 50mm long – 6No. on head and threshold, 9No. on jambs. INTUMESCENT & SEALING MATERIALS: Leaf head, threshold, hanging edges and right leaf closing edge: Envirograf G10/10 intumescent seal, 10 x 2mm. Fitted around the leaf face edge on the unexposed face. C.R.A. International product ref C.R.A 18693 Neoprene buffer seal 9 x 5.5mm. Fitted around the leaf face perimeter on the unexposed face. HARDWARE: Hinges: Fast fit spring hinges. Product reference - HINGE-RF-R51. Electroplated Fast Fit Spring Hinge, Ø8mm (pin size) 19.1mm depth x 19.1mm width x 40mm high. Fitted at the top and bottom of the leaf. Latch: 3 Point Latch fitted on a steel section, with top and bottom acting shoot bolts running through steel blocks Material number - 3 Point Locking System. Manufactured from Bright Zinc Plated Mild Steel, with 18mm stroke. Product ref. 3WL. 110 x 33 x 16mm (centre latch size). Fitted 1145mm from the head of both leaves.		
Test results	Doorset	Integrity – Sustained Flaming:	132 minutes
		Integrity – Gap Gauges:	132 minutes
		Integrity – Cotton Pad:	132 minutes
		Insulation:	10 minutes
Reason for use	Supporting Leaf 2 doorset designs		

Test Report Reference WF429750 Version 2 (Specimen B)			
Report sponsor	Panel Technologies Ltd		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 1762		
Test date	07 July 2020		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset B: Opening in towards heating condition.		
Specimen summary & tested configuration	LSASD – Locked, Single Acting Single Doorset Doorset B: Leaf dimensions: 2397(l) x 895(w) x 69(t - overall) The leaf comprised of a 0.9mm thick profiled, mild steel folded tray. 12.5(t) Siniat Soundbloc dB plasterboard was fitted to the exposed face of the leaf with retained with steel supports. Leaf was hung in a 4-sided frame consisting of a 1.2(t) mild steel frame with a 25(w) integral architrave fixed within the supporting steel stud aperture with M4 x 50(l) steel screws and the frame for specimen B incorporated a 2mm high plaster stop bead. A Norseal FS1000 intumescent foam seal was fitted to the upstand of the frame stops. 6 mm diameter steel Bagshaw spring hinges ref: HINGE-RF-R51 were installed at the head and threshold to act as pivots, no closer was fitted. The locking system comprised a 3-point locking system with rods engaging in the frame head and threshold and a centre latch positioned at 1200 above the threshold		
Test results	Doorset B	Integrity – Sustained Flaming:	144 minutes
		Integrity – Gap Gauges:	144 minutes
		Integrity – Cotton Pad:	144 minutes
		Insulation:	10 minutes
Reason for use	Supporting “beaded” frames.		

Test Report Reference WF513907 Version 3			
Report sponsor	Panel Technologies Ltd		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 1762		
Test date	06 June 2022		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset: Opening in towards heating condition.		
Specimen summary & tested configuration	LSAMD – Locked, Single Acting Multiple Doorset (4 leaves) Leaf: Overall Size: 2396mm high x 646/626/646/626mm wide x nominally 43mm thick Profiled steel tray section: Zintec coated profiled steel tray section on the exposed face, 21 deep x 1.2mm thick. Core – fitted inside the steel tray section: Manufacturer Custom Audio Designs product ref A325, IsoBase R50 5mm thick, 33kg/m3. Facing – unexposed face: Siniat Soundbloc plasterboard @12.5mm thick, 848kg/m3 Core clamps: Profiled Zintec fixed to stiles and rails fixed with M5 x 16mm Bright Zinc Plated (BZP) Pan Pozi Head Cross Recess Machine Screw at 15mm from corners and 300 - 425mm centres, 1.5 thick x 48 wide overall x 25mm high. Stiles and rails: Profiled Zintec section, 1.5mm thick x 82mm wide x 43mm high. Astragal – leaves 2 & 4: Profiled Zintec section 1.5 thick x 20 wide x 46mm deep. Frame: Frame (all four edges): Profiled Zintec steel sections including an integral stop and architrave, 75 deep x 44 wide x 1.5mm thick overall including a 20 deep x 26mm wide integral stop and a 26mm wide architrave oversailing the supporting construction on the exposed face. Frame infill: None. Stop: Integral to the frame sections. Head to jamb jointing detail: Welded. Frame to supporting construction fire stopping detail: Intumescent acrylic sealant Mann McGowan Pyromas A: A continuous, nominally 10mm thick, bead sealing frame to supporting construction. Frame to supporting construction fixing detail: Self-tapping steel screws fitted 50 - 60mm from corners at nominally 600mm centres. 120mm long – 6No. on head, jambs and threshold. Intumescent & Sealing Materials: Leaf head, threshold, hanging edges and right leaf closing edge: Envirograf G10/10 intumescent seal, 10 x 2mm. Fitted around the leaf face edge on the unexposed face. C.R.A. International product ref C.R.A 18693 Neoprene buffer seal 9 x 5.5mm. Fitted around the leaf face perimeter on the unexposed face. Hardware: Hinges: Fast fit spring hinges. Product reference - HINGE-RF-R51. Electroplated Fast Fit Spring Hinge, Ø8mm (pin size) 19.1mm depth x 19.1mm width x 40mm high. Fitted at the top and bottom of the leaf. Latch: 3 Point Latch fitted on a steel section, with top and bottom acting shoot bolts running through steel blocks Material number - 3 Point Locking System. Manufactured from Bright Zinc Plated Mild Steel, with 18mm stroke/projection. Product ref. 18732LH: 137 x 34 x 16mm (centre latch size). Fitted 1198mm (central on leaf height) from the head of both leaves.		
Test results	Doorset	Integrity – Sustained Flaming:	144 minutes

Test Report Reference WF513907 Version 3			
		Integrity – Gap Gauges:	144 minutes
		Integrity – Cotton Pad:	144 minutes
		Insulation:	8 minutes
Reason for use	Supporting Leaf 2 doorset designs		

Test Report Reference WF544493/R			
Report sponsor	Panel Technologies Limited		
Test laboratory	Warringtonfire Testing and Certification Limited. UKAS No. 0249		
Test date	03 June 2024		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset: Opening in towards heating condition.		
Specimen summary & tested configuration	LSADD – Locked, Single Acting Double Doorset Leaf dimensions: 2396(l) x 897/897(w) x 58(t) The leaf comprised of a 1.2mm thick profiled, Zintec steel folded tray; with 68(w) x 43(t) stiles and rails (1.5mm thick) welded to the tray and a 1.5(t) profiled Zintec steel meeting edge astragal. Leaf Core – fitted inside the steel tray section, IsoBase 5mm thick, plus Rockwool RW3 Facing – over rails and stiles: Siniat dB board, 12.5mm thick fixed with core clamps and screws. Astragal – Profiled Zintec section 1.5 thick x 20 wide x 47mm deep. Leaves were hung in 4-sided frame consisting of a 1.5(t) mild steel frame with 25(t) integral architrave. Envirograph G10/10 adjacent to CRA 18693 While P profile neoprene was fitted to the leaf facings to fit against the frame stops and astragal in the closed position. Pivots (HINGE-RF-R51) with 8mm diameter steel pins; no closer was fitted. hinge bolts were fitted at each hanging edge and at the meeting edge. The locking system comprised a 3-point locking system with rods engaging in the frame head and threshold to both leaves and a centre latch positioned at mid height of the leaf engaging only for the active leaf.		
Test results	Doorset	Integrity – Sustained Flaming:	132 minutes
		Integrity – Gap Gauges:	132 minutes
		Integrity – Cotton Pad:	82 minutes
		Insulation Normal Procedure:	19 minutes
Reason for use	Supporting Leaf 3 doorset designs		
Failure Mode	Initial Failure: Cotton Pad Test at 82 minutes with no further failures at test termination of 132 minutes. Although this report does not establish a formal classification against EN13501-2, the guidance within EN13501-2:2023 has been followed as the doorsets considered herein are for integrity only performance (and not insulation performance). Therefore, integrity has been determined on the basis of the two aspects of sustained flaming and gap gauges only.		

Test Report Reference WF527422			
Report sponsor	Panel Technologies Limited		
Test laboratory	Warringtonfire Testing and Certification Limited. UKAS No. 0249		
Test date	25 August 2023		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset A: Opening in towards heating condition. Doorset B: Opening away from the heating condition.		
Specimen summary & tested configuration	Doorset A and B: LSASD – Locked, Single Acting Single Doorset Single leaf - Leaf dimensions: 2396(l) x 896(w) x 56.5(t) The leaf comprised of a profiled, Zintec steel folded tray; with stiles and rails welded to the tray. Leaf Core – fitted inside the steel tray section, IsoBase R50 5mm thick, plus Rockwool RW3 Facing – over rails and stiles: Siniat dB board, 12.5mm thick fixed with screws. Leaves were hung in 4 sided frame consisting of a 1.5(t) mild steel frame with 25(t) integral architrave. Envirograph G10/10 adjacent to CRA 18693 While P profile neoprene was fitted to the leaf facings to fit against the frame stops in the closed position. Pivots (Spring hinge) with 8mm diameter steel pins; no closer was fitted. Hinge bolts were fitted at each hanging edge. The locking system comprised a 3 point locking system with rods engaging in the frame head and threshold and a centre latch positioned at mid-height of the leaf.		
Test results		Doorset A	Doorset B
	Integrity – Sustained Flaming:	132 minutes	132 minutes
	Integrity – Gap Gauges:	132 minutes	132 minutes
	Integrity – Cotton Pad:	52 minutes	55 minutes
	Insulation Normal Procedure:	24 minutes	7 minutes
Reason for use	Supporting Leaf 3 doorset designs		
Failure Mode	Initial Failure: Cotton Pad Test at 52 minutes for Doorset A and 55 minutes for Doorset B with no further failures at test termination of 132 minutes. Although this report does not establish a formal classification against EN13501-2, the guidance within EN13501-2:2023 has been followed as the doorsets considered herein are for integrity only performance (and not insulation performance). Therefore, integrity has been determined on the basis of the two aspects of sustained flaming and gap gauges only.		

Test Report Reference WF547575/R Version 6			
Report sponsor	Panel Technologies Limited		
Test laboratory	Warringtonfire Testing and Certification Limited. UKAS No. 0249		
Test date	13 November 2024		
Test standard	BS EN1634-1:2014 + A1:2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset: Opening away from the heating condition. Shaftwall: Orientation with the Coreboard towards the heating condition.		
Specimen summary & tested configuration	Doorset: LSADD – Locked, Single Acting Double Doorset Double leaf - Leaf dimensions: 2397(l) x 895.5/895.5(w) The leaf comprised of a profiled, Zintec steel folded tray (1.2mm thick); with stiles and rails (1.5mm thick) welded to the tray and a 1.5(t) profiled Zintec steel meeting edge astragal. Leaves were hung in 4 sided frame consisting of a 1.5(t) mild steel frame with 25(t) integral architrave. Norseal FS1000 was fitted to the frame stops and astragal to fit against the leaf face in the closed position. Pivots (HINGE-RF-R51) with 8mm diameter steel pins; no closer was fitted. Hinge bolts were fitted at each hanging edge and at the meeting edge at 150mm from the top of the door leaf and at 525mm centres. The locking system (18732) comprised a 3 point locking system with rods engaging in the frame head and threshold to both leaves and a centre latch positioned at mid height of the leaf engaging only for the active leaf.		
Associated supporting Construction	A Knauf Shaftwall design including 1x19mm coreboard to one face and 3x15mm Knauf Fire Panel to the other face with a lined structural opening of 1820mm wide x 2420mm high.		
Test results	Doorset	Integrity – Sustained Flaming:	180 minutes
		Integrity – Gap Gauges:	180 minutes
		Integrity – Cotton Pad:	20 minutes
		Insulation:	<1 minute
Reason for use	Supporting tested Shaftwall design Supporting Leaf 1 doorset designs		
Failure Mode	Initial Failure: Cotton Pad Test at 20 minutes with no further failures at test termination of 180 minutes. Although this report does not establish a formal classification against EN13501-2, the guidance within EN13501-2:2023 has been followed as the doorsets considered herein are for integrity only performance (and not insulation performance). Therefore, integrity has been determined on the basis of the two aspects of sustained flaming and gap gauges only.		

Test Report Reference WF548600/R Version 6			
Report sponsor	Panel Technologies Limited		
Test laboratory	Warringtonfire Testing and Certification Limited. UKAS No. 0249		
Test date	13 December 2024		
Test standard	BS EN 1634-1: 2014 + A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset: Opening in towards the heating condition. Shaftwall: Orientation with the Coreboard away from the heating condition.		
Specimen summary & tested configuration	Doorset: LSADD – Locked, Single Acting Double Doorset Double leaf - Leaf dimensions: 2397(l) x 895.5/895.5(w) The leaf comprised of a profiled, Zintec steel folded tray (1.2mm thick); with stiles and rails (1.5mm thick) welded to the tray and a 1.5(t) profiled Zintec steel meeting edge astragal. Leaves were hung in 4 sided frame consisting of a 1.5(t) mild steel frame with 25(t) integral architrave. Norseal FS1000 was fitted to the frame stops and astragal to fit against the leaf face in the closed position. Pivots (HINGE-RF-R51) with 8mm diameter steel pins; no closer was fitted. Hinge bolts were fitted at each hanging edge and at the meeting edge at 150mm from the top of the door leaf and at 525mm centres. The locking system (18732) comprised a 3 point locking system with rods engaging in the frame head and threshold to both leaves and a centre latch positioned at mid height of the leaf engaging only for the active leaf.		
Associated supporting Construction	A Knauf Shaftwall design including 1x19mm coreboard to one face and 3x15mm Knauf Fire Panel to the other face with a lined structural opening of 1820mm wide x 2420mm high.		
Test results	Doorset	Integrity – Sustained Flaming:	153 minutes
		Integrity – Gap Gauges:	153 minutes
		Integrity – Cotton Pad:	16 minutes
		Insulation:	<1 minute
Reason for use	Supporting tested Shaftwall design Supporting Leaf 1 doorset designs		
Failure Mode	Initial Failure: Cotton Pad Test at 16 minutes with no further failures at test termination of 180 minutes. Although this report does not establish a formal classification against EN13501-2, the guidance within EN13501-2:2023 has been followed as the doorsets considered herein are for integrity only performance (and not insulation performance). Therefore, integrity has been determined on the basis of the two aspects of sustained flaming and gap gauges only.		

A.2 Secondary Evidence

Test Report Reference WF503796 Version 2			
Report sponsor	Panel Technologies Ltd		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 1762		
Test date	19 May 2021		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset A: Opening in towards heating condition. Doorset B: Opening away from the heating condition.		
Specimen summary & tested configuration	Steel stud partition with structural openings fitted with 2 doorsets, of comparable height and width to the single doorsets assessed herein. Frame profile for both doorsets being single rebate frame constructions of the same dimensions as the Frame 1 design assessed herein. Leaf design for a similar design to the steel only Leaf 1 assessed herein, including rails and stiles (with different thickness steel used for the rails and stiles), with different leaf perimeter seals to those considered herein.		
Test results	Doorset A	Integrity:	132 minutes
	Doorset B	Integrity:	132 minutes
Reason for use	Test Evidence referenced to support the use of lower performance partitions with lower performance doorsets, with the testing having demonstrated that for similar doorsets of similar size, that the lower performance partition has not contributed to a failure at the leaf edge or at the frame to supporting construction junction prior to the lower performance period required, for the doorsets assessed herein		

Test Report Reference WF514070/R Issue 3			
Report sponsor	Panel Technologies Limited		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 0249		
Test date	15 July 2022		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset A: Opening away from the heating condition. Doorset B: Opening away from the heating condition.		
Specimen summary & tested configuration	Doorset A: 3 point locked, single acting, single doorset consisting of steel frame, 1.5 (t) steel tray leaf with 2No. 12.5 (t) Siniat Gtech dB board core. Leaf dimensions of 650 (w) x 1900 (h). Doorset B: 3 point locked, single acting, single doorset consisting of steel frame, 1.5 (t) steel tray leaf with 12.5 (t) Siniat Gtech dB board core. Leaf dimensions of 900 (w) x 2400 (h).		
Test results	Doorset A	Integrity – Sustained Flaming:	183 minutes
		Integrity – Gap Gauges:	183 minutes
		Integrity – Cotton Pad:	91 minutes
		Insulation Normal Procedure:	16 minutes

Test Report Reference WF514070/R Issue 3

	Doorset B	Integrity – Sustained Flaming:	183 minutes
		Integrity – Gap Gauges:	183 minutes
		Integrity – Cotton Pad:	116 minutes
		Insulation Normal Procedure:	24 minutes
Reason for use	This test was undertaken with Panel Technologies Limited steel doorset designs of different designs to those assessed herein, within a flexible supporting construction. The test did not include timber infills within the steel sections forming the aperture used to facilitate the doorsets' installation. On the basis of the similar integrity performances obtained with this test and those conducted with timber infills in the steel sections, it is the opinion of Warringtonfire that the removal of the timber infill from steel stud flexible partitions for the doorsets assessed herein, would not result in any anticipated reduction in integrity performance.		

Test Report Reference WF525369/R

Report sponsor	Panel Technologies Limited		
Test laboratory	Warringtonfire Testing and Certification Ltd. UKAS No. 0249		
Test date	30 November 2022		
Test standard	BS EN 1634-1: 2014 +A1: 2018		
Sampling information	None stated in test report		
Tested Orientation	Doorset: Opening in towards heating condition.		
Specimen summary & tested configuration	Doorset: 3 point locked, single acting, double leaf doorset consisting of steel frame, 1.5 (t) steel tray leaf. Leaf dimensions of 902 (w) x 2400 (h) (each leaf).		
Test results	Doorset	Integrity – Sustained Flaming:	132 minutes
		Integrity – Gap Gauges:	132 minutes
		Integrity – Cotton Pad:	19 minutes
		Insulation Normal Procedure:	0 minutes
Reason for use	This test was undertaken with a Panel Technologies Limited steel doorset design of a different design to those assessed herein, within a flexible supporting construction. The test did not include timber infills within the steel sections forming the aperture used to facilitate the doorsets' installation. On the basis of the similar integrity performances obtained with this test and those conducted with timber infills in the steel sections, it is the opinion of Warringtonfire that the removal of the timber infill from steel stud flexible partitions for the doorsets assessed herein, would not result in any anticipated reduction in integrity performance.		