
Title

Field of Application for:
The Wood International Agency Ltd
Range of Doorsets Using
Marksman 44 Door Blanks in
Timber Based Door Frames

For 30 minutes Fire Resistance

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1 Foreword

This Field of application report has been commissioned by Wood International Agency Ltd and relates to the fire resistance of 30 minute fire resisting Marksman doorset designs.

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

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

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

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

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

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

2 Proposal

It is proposed to consider the fire resistance performance of the specified proprietary Marksman 44 doorset designs, for 30 minutes fire resistance integrity performance (and where appropriate insulation performance), if the doorset designs were to be tested to the requirements of BS 476-22: 1987, *Methods for determination of the fire resistance of non-loadbearing elements of construction*.

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

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

2.1 Assumptions

- All densities referred to in this document are based upon an assumed moisture content of 12%.
- It is assumed that unless otherwise documented in the field of application sections of this report, the doorset subject to this report will be constructed in accordance with the test evidence referred to herein.
- For components created using solid timber sections referred to in this assessment, it is assumed that, for all timbers, they will be of a quality deemed to meet or exceed class J30 as specified in BS EN 942: 2007, subject to adequate repairs, other than glazing beads which must meet a minimum class J10. Note that areas under intumescent seals/gaskets are not considered to be concealed faces and defects must be repaired.
- Where timber is referred to within this document it is assumed that the timber element is made from a continuous solid piece, unless specifically detailed otherwise.
- All dimensions detailed herein may be varied by $\pm 2\%$ except where minimum, maximum or a range of dimensions are given.
- Where morticed items of hardware are used (within the leaf or frame) it is assumed that the preparation for such items are tight to the item (and where applicable intumescent protection) as tested with no excessive gaps, unless stated otherwise within a particular section of this report.

3 Test Data

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

Note:

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

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

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

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

It is therefore the opinion of Warringtonfire that the evidence cited in the following section, tested to both named standards referenced above can be utilised in this assessment which will conclude in terms of the fire resistance performance of the Marksman 44 doorset designs if tested in accordance with BS 476: Part 22: 1987.

3.1 Primary Test Evidence

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

3.1.1 Test Report CFR2312191 Revision 1

Date of Test:	19.DEC.2023
Identification of Test Body:	Cambridge Fire Research Ltd UKAS No. 4319
Sponsor:	Wood International Agency Ltd
Tested Product:	Two Unlatched, Single Acting, Single Leaf, Timber Doorset with Glazed Apertures – ULSASD.
Tested Orientation:	Both opening in towards heating condition.
Sampling information:	The doorsets were sampled by a representative of BM Trada under the following contract references: Doorset A: SC23365T Doorset B: SC23364T
Test Standard:	Doorset A: BS 476 - 22 :1987, Method 8 Doorset B: BS 476 - 22 :1987, Method 7
Performance:	Doorset A Integrity: 32 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22: 1987 Doorset B Integrity: 35 minutes Insulation: 35 minutes
Reason for Use	As primary evidence for <ul style="list-style-type: none"> • Leaf size envelopes • Multiple glazed apertures • Glass and Glazing systems • Hardware • Doorset Configurations
Failure Mode:	Doorset A: Failure: Sustained flaming at the top right corner of the glazing 32 minutes Doorset B: Failure: Cotton Pad Test at handle position at 35 minutes

3.1.2 Test Report CFR2405291

Date of Test:	29.MAY.2024
Identification of Test Body:	Cambridge Fire Research Ltd UKAS No. 4319
Sponsor:	Wood International Agency Ltd
Tested Product:	Two Latched, Single Acting, Single Leaf, Timber Doorset with a Glazed Aperture – LSASD.
Tested Orientation:	Both opening in towards heating condition.
Sampling information:	The doorsets were sampled by a representative of BM Trada under the following contract references: Doorset A: SC24103T Doorset B: SC24104T
Test Standard:	Doorset A: BS 476 - 22 :1987, Method 6 Doorset B: BS 476 - 22 :1987, Method 7
Performance:	Doorset A Integrity: 65 minutes Insulation: 65 minutes Doorset B Integrity: 41 minutes Insulation: 40 minutes
Reason for Use	As primary evidence for <ul style="list-style-type: none"> • Leaf size envelopes • Glazed apertures • Glass and Glazing system • Hardware • Framebreak JA 380 Framing Material • Framebreak EU 550 Framing Material • Doorset Configurations
Failure Mode:	Doorset A: Failure: Sustained flaming at the top hanging corner at 65 minutes Doorset B: Failure: Insulation failure exceeding the maximum temperature rise criteria. No further failure occurred before the test on this doorset was terminated at 41 minutes

3.1.3 Test Report WF540198/R Issue 2

Date of Test:	22.JAN.2024
Identification of Test Body:	Warringtonfire Testing and Certification Limited UKAS No. 0249
Sponsor:	Wood International Agency Ltd
Tested Product:	Unlatched, Single Acting, Double Leaf, Timber Doorset with Glazed Apertures – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	The doorset was sampled by a representative of BM Trada under the following contract reference: Doorset: SC24008T
Test Standard:	BS 476 - 22 :1987, Method 8
Performance:	Integrity: 36 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22: 1987
Reason for Use	As primary evidence for <ul style="list-style-type: none">• Leaf size envelopes• Glass and Glazing system• Hardware• Doorset Configurations
Failure Mode:	Failure: Sustained flaming at the head of the specimen

3.1.4 Test Report WF540199/R Issue 2

Date of Test:	22.JAN.2024
Identification of Test Body:	Warringtonfire Testing and Certification Limited UKAS No. 0249
Sponsor:	Wood International Agency Ltd
Tested Product:	Two Unlatched, Single Acting, single Leaf, Timber Doorset with Decorative Grooves & Inserts, Glazed Apertures – ULSASD.
Tested Orientation:	Both opening in towards heating condition.
Sampling information:	The doorsets were sampled by a representative of BM Trada under the following contract references: Doorset A: SC24010T Doorset B: SC24009T
Test Standard:	Both Doorsets: BS 476 - 22 :1987, Method 8
Performance:	Doorset A Integrity: 30 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22: 1987 Doorset B Integrity: 33 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22: 1987
Reason for Use	As primary evidence for <ul style="list-style-type: none"> • Leaf size envelopes • Multiple Glazed apertures • Glass and Glazing system • Hardware • Doorset Configurations • Decorative grooving
Failure Mode:	Doorset A: Failure: Sustained flaming at the head of the glazing Doorset B: Failure: sustained flaming at the glazing

3.1.5 Test Report WF541872/R

Date of Test:	08.APR.2024
Identification of Test Body:	Warringtonfire Testing and Certification Limited UKAS No. 0249
Sponsor:	Pyroguard UK Ltd
Tested Product:	Latched, Single Acting, Single Leaf, Timber Doorset with Glazed Apertures, Side Screens & Fanlight – LSASD
Tested Orientation:	Opening away from heating condition
Sampling information:	The doorset was sampled by a representative of BM Trada under the following contract reference: Doorset: SC24054T
Test Standard:	BS EN 1634-1:2014+A1:2018
Performance:	Integrity: 25 minutes Insulation: 7 minutes
Reason for Use	As primary evidence for <ul style="list-style-type: none"> • Single glazed aperture • Glass and Glazing system • Hardware • Side Screens • Fanlights
Failure Mode:	<p>Initial Failure: Cotton Pad Test applied to the centre of the glazing at 25 minutes Further Failure: Sustained flaming on the glazing at 36 minutes</p> <p>BS EN 1634-1:2014+A1:2018 requires the application of a cotton pad test irrespective of if the product is being evaluated for insulation performance. If the test specimen was evaluated against BS 476-22: 1987 the specimen would be determined as “non-insulating”. In accordance with Clause 8.5.2 of BS 476-22: 1987 the application of a cotton pad would not be considered a failure criteria for integrity.</p> <p>As no other integrity failure was deemed to have occurred until 36 minutes it is the opinion of Warringtonfire that this evidence supports the integrity performance of the doorset design when evaluated against BS 476-22: 1987.</p>

3.1.6 Test Report WF544267/R

Date of Test:	22.MAY.2024
Identification of Test Body:	Warringtonfire Testing and Certification Limited UKAS No. 0249
Sponsor:	Wood International Agency Ltd
Tested Product:	Unlatched, Single Acting, Double Leaf, Timber Doorset with Glazed Apertures – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	The doorset was sampled by a representative of BM Trada under the following contract reference: Doorset: SC24097T
Test Standard:	BS 476 - 22 :1987, Method 8
Performance:	Integrity: 35 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22: 1987
Reason for Use	As primary evidence for <ul style="list-style-type: none">• Leaf size envelopes• Multiple glazed apertures• Glass and Glazing system• Hardware• Doorset Configuration
Failure Mode:	Initial Failure: Sustained flaming at the top of the meeting edge

3.1.7 Test Report WF544268/R Issue 2

Date of Test:	31.MAY.2024
Identification of Test Body:	Warringtonfire Testing and Certification Limited UKAS No. 0249
Sponsor:	Wood International Agency Ltd
Tested Product:	Unlatched, Single Acting, Double Leaf, Timber Doorset– ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	The doorset was sampled by a representative of BM Trada under the following contract reference: Doorset: SC24109T
Test Standard:	BS 476-22:1987, Method 6
Performance:	Integrity: 42 minutes Insulation: 42 minutes
Reason for Use	As primary evidence for <ul style="list-style-type: none">• Leaf size envelopes• Hardware• Doorset Configuration
Failure Mode:	Initial Failure: Sustained flaming at the top of the meeting edge at 42 minutes

3.1.8 Test Report CFR2312141 Revision 1

Date of Test:	14.DEC.2023
Identification of Test Body:	Cambridge Fire Research UKAS No. 4319
Sponsor:	Wood International Agency Ltd
Tested Product:	Unlatched, Single Acting, Double Leaf, Timber Doorset with Glazed Apertures – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	The doorset was sampled by a representative of BM Trada under the following contract reference: Doorset: SC23362T
Test Standard:	BS 476-20:1987, Method 8
Performance:	Integrity: 32 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22:1987
Reason for Use	As primary evidence for <ul style="list-style-type: none">• Leaf size envelopes• Glass and Glazing system• Hardware• Doorset Configuration
Failure Mode:	Initial Failure: Sustained flaming at the top of the meeting edge at 32 minutes

3.1.9 Test Report CFR2312151

Date of Test:	15.DEC.2024
Identification of Test Body:	Cambridge Fire Research UKAS No. 4319
Sponsor:	Wood International Agency Ltd
Tested Product:	Two Unlatched, Single Acting, Single Leaf, Timber Doorset with Glazed Apertures – ULSASD.
Tested Orientation:	Both opening in towards heating condition.
Sampling information:	The doorsets were sampled by a representative of BM Trada under the following contract references: Doorset A: SC23363T Doorset B: SC23366T
Test Standard:	Doorset A: BS 476 - 22 :1987, Method 7 Doorset B: BS 476 - 22 :1987, Method 8
Performance:	Doorset A Integrity: 40 minutes Insulation: 40 minutes Doorset B Integrity: 37 minutes Insulation: Not evaluated in accordance with method 8 of BS 476-22: 1987
Reason for Use	As primary evidence for <ul style="list-style-type: none"> • Leaf size envelopes • Glass and Glazing system • Minimum density of Edgeman EV Engineered Lipping • Hardware • Doorset Configuration
Failure Mode:	Doorset A: Failure: Sustained flaming at the glazing 40 minutes Doorset B: No failure observed at the termination of the test for this doorset design at 37 minutes.

3.1.10 Test Report No 13409A

Date of Test:	18.AUG.2008
Identification of Test Body:	Warringtonfiregent BELAC No. 196-TEST
Sponsor:	AGC Flat Glass Europe
Tested Product:	An unloaded glass wall within timber framing including Pyrobelite 7 glass.
Sampling information:	The glazing elements were identified as being sampled by Warringtonfire Certification which was undertaken on 23 rd June 2008.
Test Standard:	EN 1364-1: 1999
Performance:	Integrity: 44 minutes Insulation: 10 minutes
Reason for Use	As primary evidence for: <ul style="list-style-type: none"> • Pyrobelite 7 glass
Failure Mode:	Initial Failure: Insulation failure on the glass at 10 minutes As the failure observed was only related to insulation performance and no further failure was deemed to have occurred until 44 minutes, it is the opinion of Warringtonfire that this evidence supports the use of the tested glass type for 30 minutes fire resistance integrity performance.

3.1.11 Test Report No 12277A

Date of Test:	31.MAY.2006
Identification of Test Body:	Warringtonfiregent BELAC No. 196-TEST
Sponsor:	Glaverbel Seneffe
Tested Product:	An unloaded glass wall within timber framing including Pyrobel 16 glass.
Sampling information:	None detailed in test report
Test Standard:	EN 1364-1: 1999
Performance:	Integrity: 48 minutes Insulation: 36 minutes
Reason for Use	As primary evidence for: <ul style="list-style-type: none"> • Pyrobel 16 glass
Failure Mode:	Initial Failure: Insulation failure due to the average temperature rise across thermocouples 1-5 reaches 140 ^o c Further Failure: Cotton pad ignites at 48 minutes.

3.1.12 Test Report WF147219

Date of Test:	15.JUL.2005
Identification of Test Body:	Warringtonfire global safety (Now Trading as Warringtonfire Testing and Certification Limited) UKAS No. 0249
Sponsor:	Glaverbel S. A.
Tested Product:	An unloaded glass wall within timber framing including Pyrobelite 12 glass.
Sampling information:	None detailed in test report
Test Standard:	EN 1364-1: 1999
Performance:	Integrity: 58 minutes Insulation: 26 minutes
Reason for Use	As primary evidence for: <ul style="list-style-type: none">• Pyrobelite 12 glass
Failure Mode:	Initial Failure: insulation failure at 26 minutes due to thermocouple 7 having a temperature rise in excess of 180 ^o c Further Failure: Application and ignition of a cotton pad integrity test applied at 58 minutes applied to glazing

3.1.13 Test Report WF158419 Issue 2

Date of Test:	18.DEC.2006
Identification of Test Body:	Bodycote Warringtonfire (Now Trading as Warringtonfire Testing and Certification Limited) UKAS No. 0249
Sponsor:	Glaverbel S.A/N.V.
Tested Product:	An unloaded glass wall within timber framing including Pyrobelite 7 glass.
Sampling information:	The glass was sampled by a representative of Bodycote Warringtonfire and detailed fully in the test report.
Test Standard:	EN 1364-1: 1999
Performance:	Integrity: 37 minutes Insulation: 7 minutes
Reason for Use	As primary evidence for: <ul style="list-style-type: none">• Pyrobelite 7 glass
Failure Mode:	Initial Failure: Sustained flaming on the glazing causing an integrity failure at 37 minutes.

3.1.14 Test Report WF164311

Date of Test:	25.JUL.2007
Identification of Test Body:	Bodycote Warringtonfire (Now Trading as Warringtonfire Testing and Certification Limited) UKAS No. 0249
Sponsor:	AGC Flat Glass Europe.
Tested Product:	An unloaded glass wall within timber framing including Pyrobel 16 glass.
Sampling information:	The glass was sampled by a representative of Bodycote Warringtonfire and detailed fully in the test report.
Test Standard:	EN 1364-1: 1999
Performance:	Integrity: 50 minutes Insulation: 44 minutes
Reason for Use	As primary evidence for: <ul style="list-style-type: none">• Pyrobel 16 glass
Failure Mode:	Initial Failure: Insulation failure at 44 minutes due to an average temperature rise of the unexposed face greater than 180°C Further Failure: Cotton pad failure at 50 minutes when applied to the unexposed face of the glazing Gap gauge failure at 52 minutes at the same location as the cotton pad failure

3.1.15 Test Report WF331776

Date of Test:	08.OCT.2013
Identification of Test Body:	Exova Warringtonfire (Now Trading as Warringtonfire Testing and Certification Limited) UKAS No. 0249
Sponsor:	AGC Glass UK Ltd
Tested Product:	Two unloaded glass walls within timber framing including Pyrobelite 7 and Pyrobel 16 glass.
Sampling information:	None detailed in test report
Test Standard:	EN 1364-1: 1999
Performance:	Specimen A Integrity: 31 minutes Insulation: 12 minutes Specimen B Integrity: 61 minutes Insulation: 39 minutes
Reason for Use	As primary evidence for: <ul style="list-style-type: none"> • Pyrobel 16 glass • Pyrobelite 7
Failure Mode:	Specimen A Test terminated on this specimen at 31 minutes with no failure having occurred Specimen B Failure: Continuous Flaming across the head and right vertical edge of pane G3 at 61 minutes leading to a cotton pad failure as well as sustained flaming.

4 Technical Specification

4.1 General

The technical specification for the proposed door assembly is given in the following sections and is based on the test evidence for the door designs, summarised in section 3.

4.2 Intended Use

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

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

4.3 Door Leaf

The Markman 44 doorset design can include various design features:

1. Glazing
2. Various hardware options
3. Decorative facings
4. Decorative planted on timber mouldings
5. Decorative grooving
6. Glazed side screens
7. Fanlights
8. Solid Side and Overpanels

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

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

4.4 Door Frames

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

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

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

The evaluation of the leaf size for each doorset configuration is based on the tests listed in Section 3 and takes into account:

1. The margin of over performance above 30 minutes integrity for the design,
2. The characteristics exhibited during test and
3. The doorset configuration tested.

The evaluation of the permitted configurations included in this field of application is based on the configurations 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:

1. A test on a double doorset is more onerous than a test on a single doorset.
2. A test on an unlatched doorset is more onerous than a test on a latched doorset as the leading edge is unrestrained and will deflect more in fire test conditions.
3. A doorset with transomed overpanel is considered to perform comparably to a similar doorset without an overpanel. This is because the transom structurally separates the overpanel from the doorset.





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

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

4.5.2 Configuration

The table below shows the permitted configurations for the Marksman 44 doorset design, with the abbreviation and full description of each configuration.

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

Doorset Configurations		
Depiction	Abbreviation	Description
	LSASD	Latched Single Acting Single Doorset
	ULSASD	Unlatched Single Acting Single Doorset
	LSADD	Latched Single Acting Double Doorset
	ULSADD	Unlatched Single Acting Double Doorset

4.5.3 Orientation

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

4.5.4 Envelopes for each Configuration

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

Unequal leaf double doorsets are covered by this assessment provided that all the following criteria are met:

- The relevant door leaf envelopes are not exceeded.
- Door leaf widths are no smaller than 300mm.

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

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

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

4.5.4.1 General Note on Intumescent Seals

- Intumescent seals are to be fitted centrally to the thickness of the leaf unless stated otherwise.
- Intumescent seals are fully interrupted at hardware locations unless stated otherwise.
- Intumescent seals must run the full length of the leaf edge or frame reveals, with tightly formed abutting corner joints, unless stated otherwise.
- Vertical perimeter intumescent seals may include one tight butt joint in their length if needed.
 - Where two seals are fitted, the joints must be offset by a minimum of 100mm and may not be coincident.
 - Where one seal is fitted the joint must be in the lower half of the doorset.
- Intumescent seals are not to be concealed below lippings.
- While intumescent seals are not specified to be applied at the bottom edge of the leaf, their application may be a requirement for certain elements of building hardware. It is the opinion of Warringtonfire that the application of intumescent seals across the bottom edge of the leaf will not detract from the fire resistance performance under test conditions, when applied the intumescent may consist of either:
 - 1No. Intumescent seal no greater than 20mm wide centrally fitted or
 - 2No. Intumescent seals, each no greater than 10mm wide no greater than 10mm apart.
- Inclusion of specific design details (e.g. face grooves) and/or hardware may require a different intumescent seal specification compared to that stated for the leaf configurations in sections 4.5. Where this is the case, it is important that the following conditions are met:
 - The intumescent type given for the specific design detail must match that given for the required leaf configuration and leaf size (e.g. if graphite is given as the required seal type for a concealed closer, only leaf configurations and sizes approved for graphite type seals can be used).
 - The largest of the intumescent specifications given for the different design details must take precedence, which is to be determined by the total amount of intumescent required for that design detail (e.g. if the total amount of perimeter intumescent for a particular concealed closer is greater than that required for the associated leaf configuration and size, the intumescent detail stated for the concealed closer would take precedence).

4.5.4.2 Explanation for following sections

The performance of a doorset in terms of configuration and size is dependent on the leaf type, perimeter intumescent used and frame type. These elements are not automatically interchangeable. The following sections present the envelopes for the Marksman 44 leaf types and Timber frame types. Each envelope is linked to a specific perimeter intumescent which is given a unique reference and is based directly on test evidence.

The envelopes are presented as follows:-

- for LSASD increasing in configuration complexity up to ULSADD
- for each configuration, leaf type, frame type and intumescent specification is considered separately and a unique envelope of permitted leaf sizes is presented based on the configuration, leaf type, frame type and intumescent and the envelope is directly linked to a unique test.

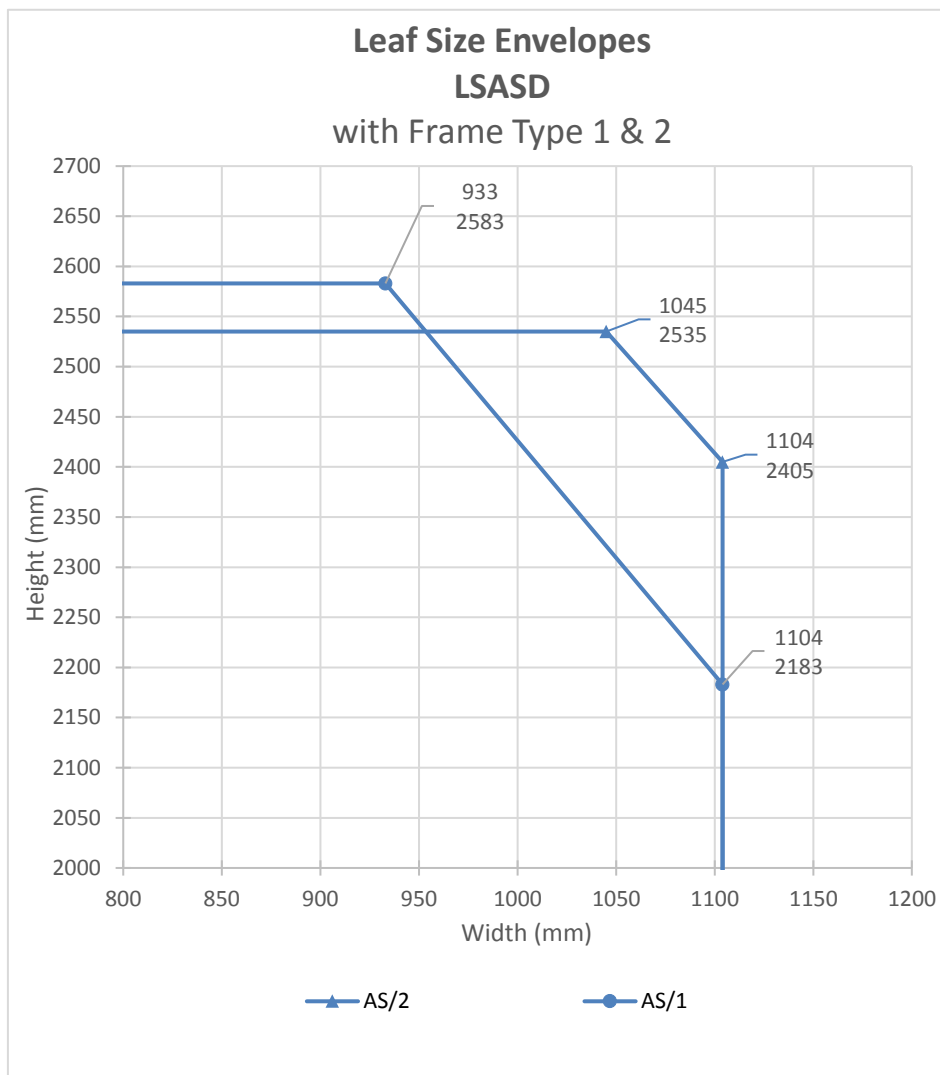
The Marksman 44 doorset design has been tested with a variety of intumescent seals, the testing included seals with and without the presence of inert fins and brushes. Based on the positive performances observed, it is the opinion of Warringtonfire that intumescent seals of the same manufacturer, size and material may be considered comparable whether fins or brushes are present.

Based on the above rationale, the below table displays the permitted intumescent seals that are considered suitable for use with the Marksman 44 doorset design, subject to permitted leaf configurations within the following sections:

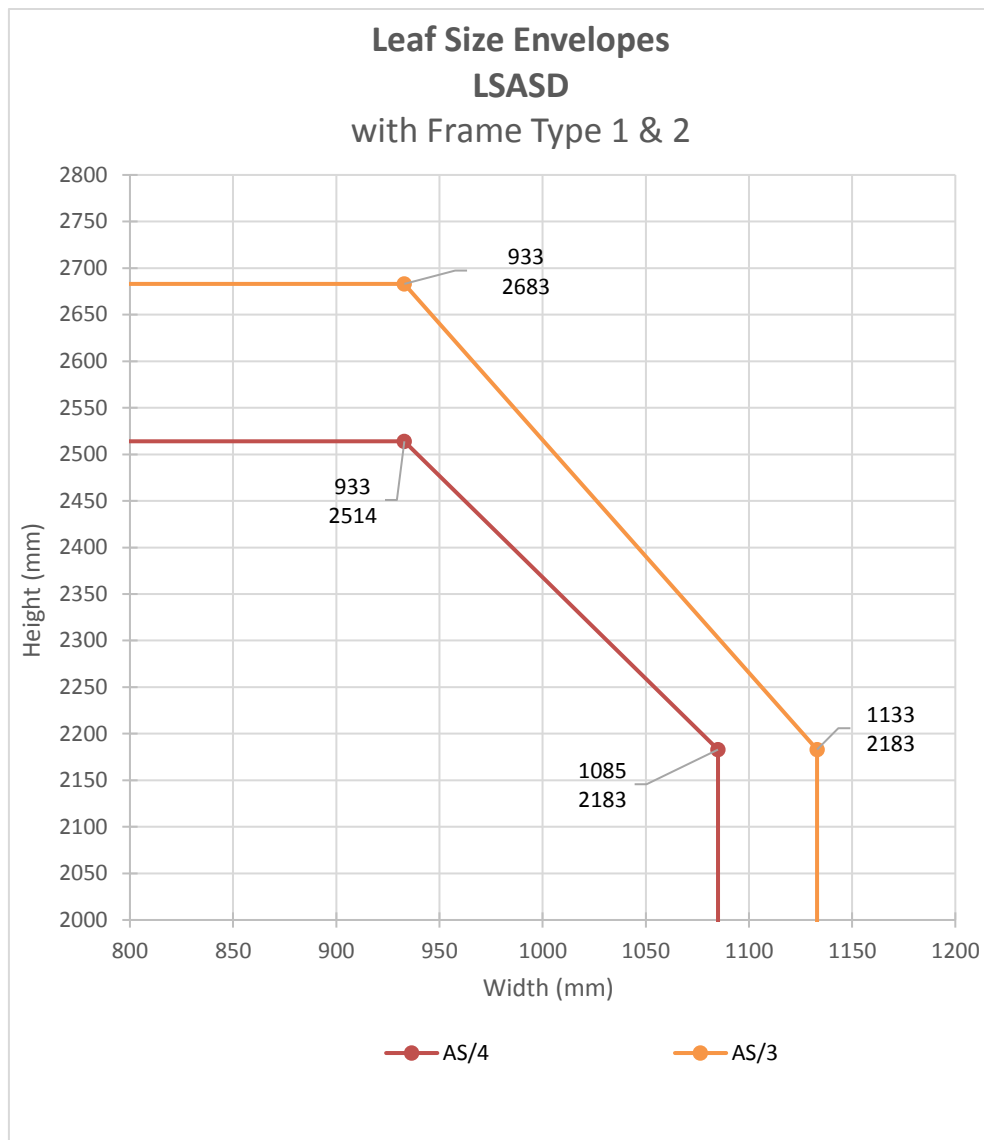
Permitted Intumescent Seals				
Manufacturer	Product Ref	Product Sub Ref	Size (mm)	Specification
Intumescent Seals Limited	Therm-A-Seal	SL1540N	15x4	AS/1
	Therm-A-Stop	ST1540N	15x4	AS/2
	Therm-A-Blade	BL1540N	15x4	BS/2
Lorient	Type 617	LP1504	15x4	AS/7 BS/7 CS/7 DS/7
	Type 617 Finesse	LP1504 Finesse	15x4	
	Type 617 DS	LP1504DS	15x4	
	Type 617 AS	LP1504AS	15x4	
	Type 617 TS	LP1504TS	15x4	
	Type 617 SS	LP1504SS	15x4	
	Type 617	LP1004	10x4	CS/7 DS/7
	Type 617 DS	LP1004DS	10x4	
	Type 617 AS	LP1004AS	10x4	
	Type 617 TS	LP1004TS	10x4	
	Type 617 SS	LP1004SS	10x4	

Permitted Intumescent Seals				
Manufacturer	Product Ref	Product Sub Ref	Size (mm)	Specification
Mann McGowan	Pyrostrip 500P	15 x 4 500PSA	15x4	AS/5 BS/5 CS/8 DS/8
	Pyrostrip 500P	15 x 4 500PSSSA/BB6	15x4	
	Pyrostrip 500P	15 x 4 500PSSSA/SF5	15x4	
	Pyrostrip 500P	15 x 4 500PSSSA/SFO5	15x4	
	Pyrostrip 500P	15 x 4 500PSSSA/TF5	15x4	
	Pyrostrip 500P	15 x 4 500PSSSA/TFO5	15x4	
	Pyrostrip 500P	10 x 4 500PSA	10x4	CS/8 DS/8
	Pyrostrip 500P	10 x 4 500PSSSA/BB6	10x4	
	Pyrostrip 500P	10 x 4 500PSSSA/SF5	10x4	
	Pyrostrip 500P	10 x 4 500PSSSA/SFO5	10x4	
Pyrostrip 500P	10 x 4 500PSSSA/TF5	10x4		
Pyroplex	8700		15x4	AS/3 BS/3 CS/3 DS/3
	8712		15x4	
	8710		15x4	
	30165		15x4	
	30175		15x4	
	30141		15x4	
	30155		15x4	CS/3 DS/3
	8500		10x4	
	8512		10x4	
	8510		10x4	
	30160		10x4	
	30170		10x4	
	30150		10x4	
Sealed Tight Solutions	ST 154FO		15x4	AS/4 AS/6 BS/4 BS/6 CS/4 DS/4
	ST 154FS		15x4	
	ST 154SBS		15x4	
	ST 104FO		10x4	CS/4 DS/4
	ST 104FS		10x4	
	ST 104SBS		10x4	

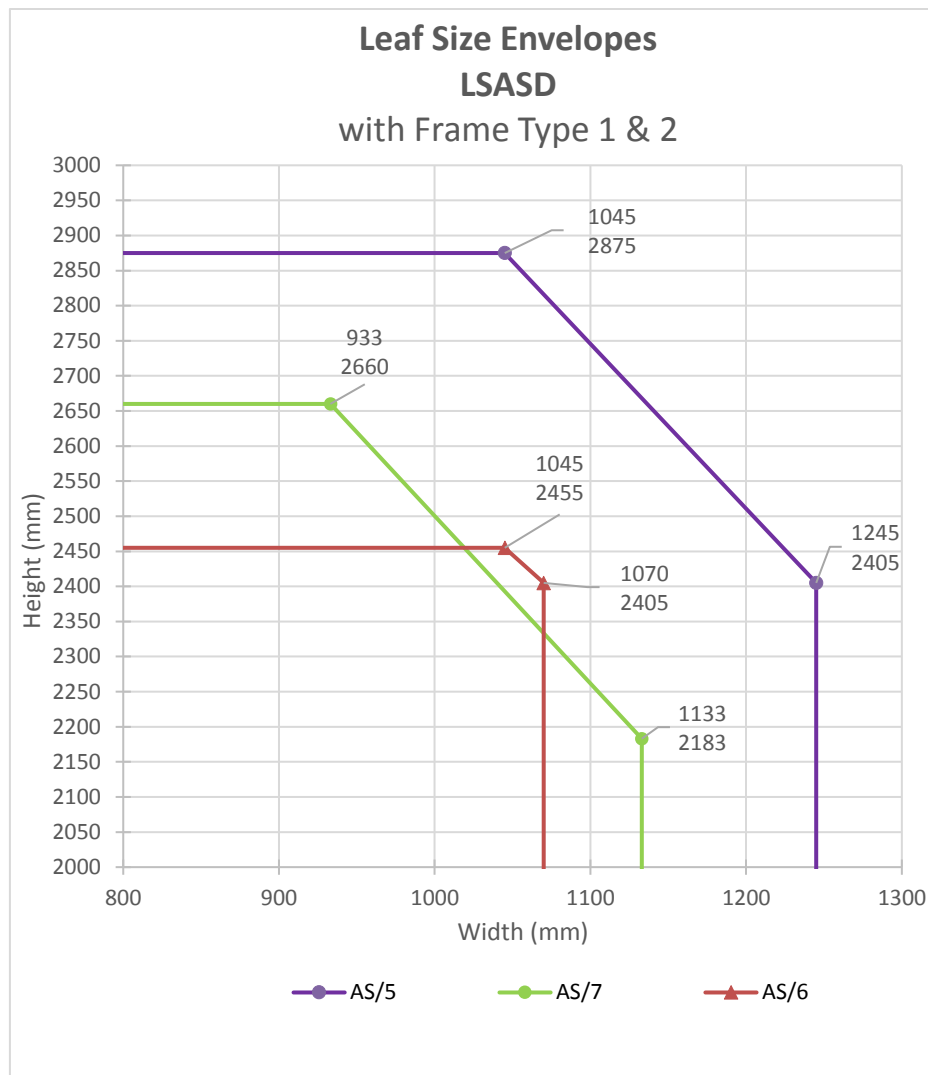
4.5.5 LSASD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size (mm)
AS/1 (CFR2405291 B)	Therm-A-Seal	Intumescent Seals Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal
AS/2 (CFR2312191 Revision 1 A)	Therm-A-Seal	Intumescent Seals Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal

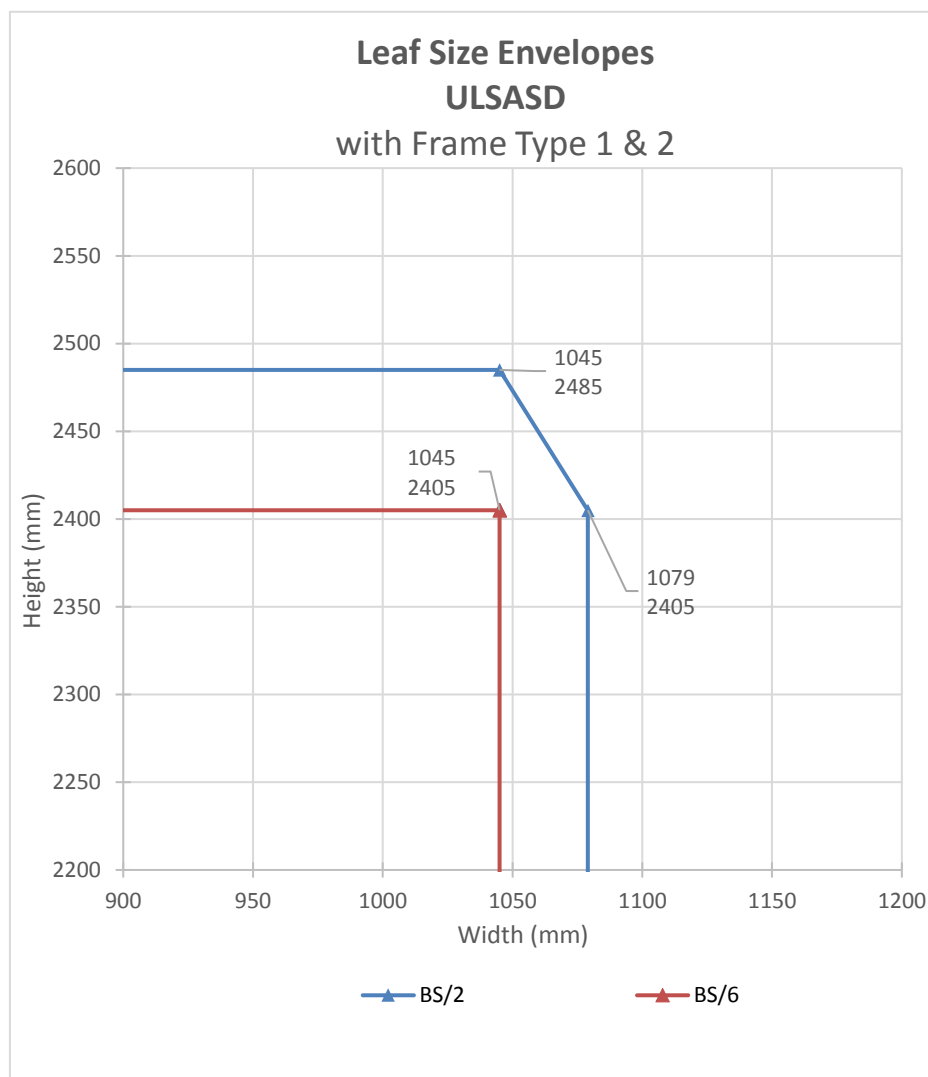


Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS/3 (WF544268/R Issue 2)	8700	Pyroplex	Frame reveal: 1No. 15x4 Centrally in the frame reveal
AS/4 (WF544267/R)	ST154FO	Sealed Tight Solutions	Frame reveal: 1No. 15x4 Centrally in the frame reveal

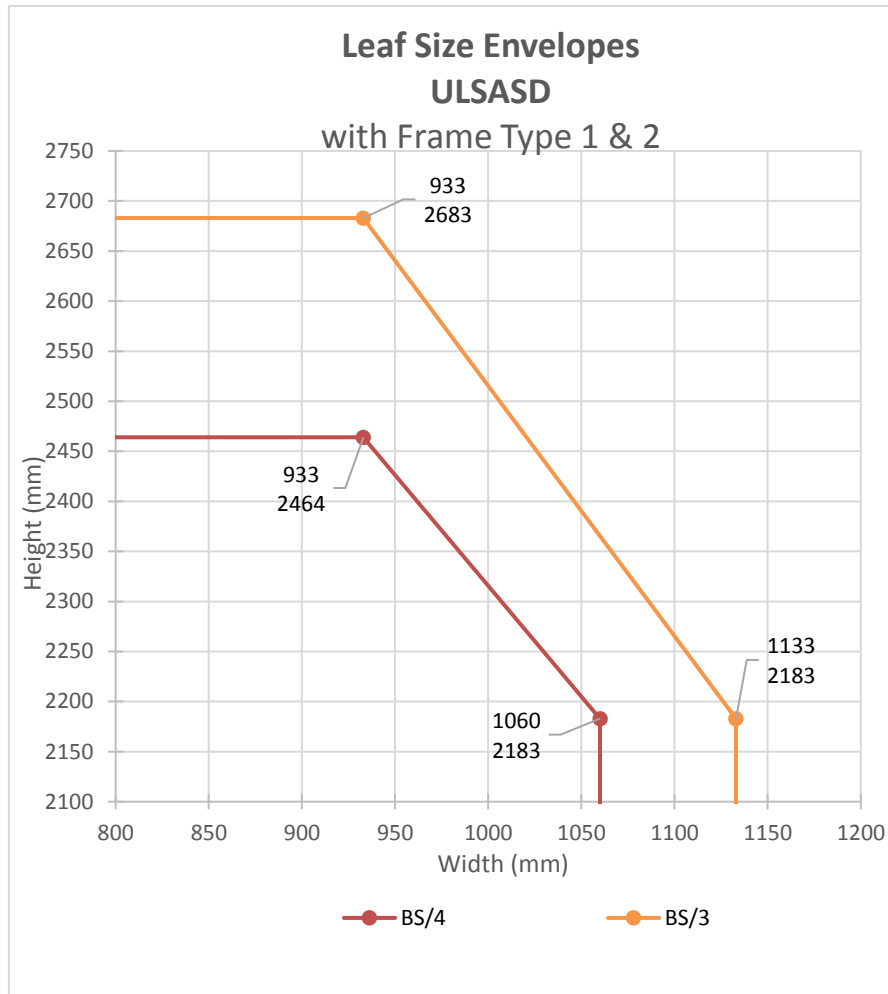


Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS/5 (CFR2312151 B)	Pyrostrip 500P/PSS	Mann McGowan	Frame reveal: 1No. 15x4 Centrally in the frame reveal
AS/6 (WF540199/R Issue 2 A)	ST154FO	Sealed Tight Solutions	Frame reveal: 1No. 15x4 Centrally in the frame reveal
AS/7 (WF540198/R Issue 2)	Type 617 - LP1504	Lorient Polyproducts Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal

4.5.6 ULSASD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS/2 (CFR2312191 Revision 1 A)	Therm-A-Seal	Intumescent Seals Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal
BS/6 (WF540199/R Issue 2 A)	ST154FO	Sealed Tight Solutions	Frame reveal: 1No. 15x4 Centrally in the frame reveal

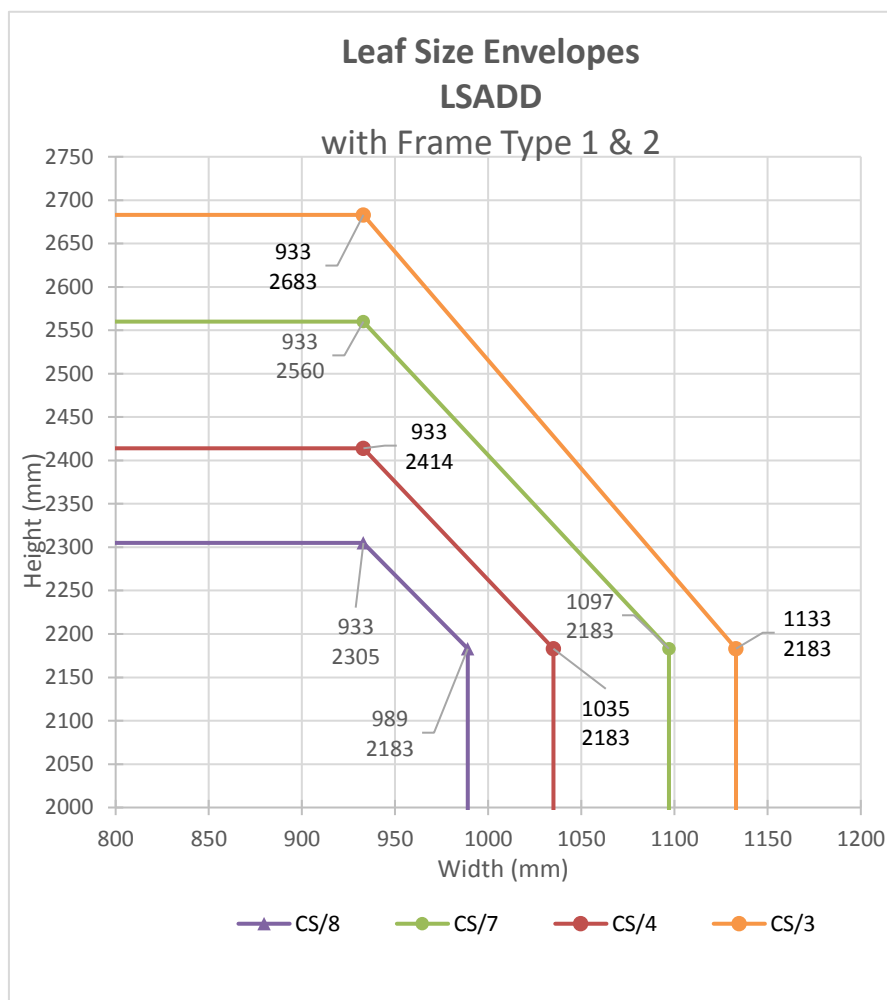


Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS/3 (WF544268/R Issue 2)	8700	Pyroplex	Frame reveal: 1No. 15x4 Centrally in the frame reveal
BS/4 (WF544267/R)	ST154FO	Sealed Tight Solutions	Frame reveal: 1No. 15x4 Centrally in the frame reveal



Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS/5 (CFR2312151 B)	Pyrostrip 500P/PSS	Mann McGowan	Frame reveal: 1No. 15x4 Centrally in the frame reveal
BS/7 (WF540198/R Issue 2)	Type 617 - LP1504	Lorient Polyproducts Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal

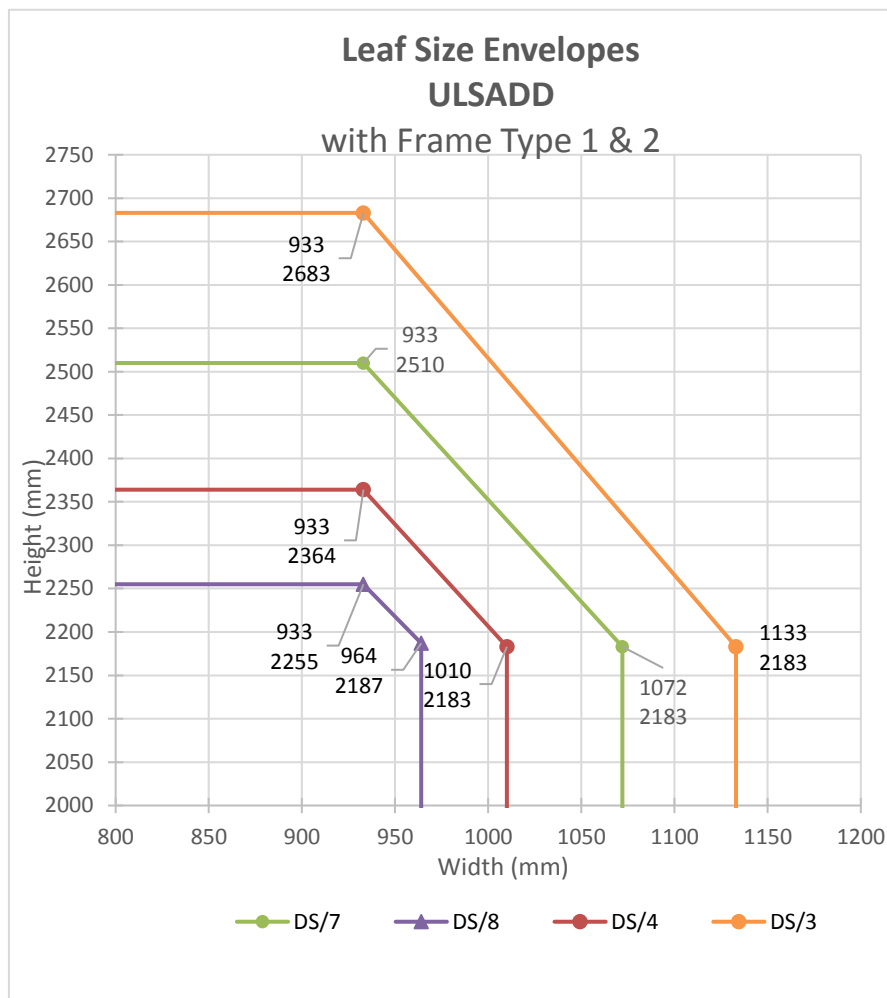
4.5.7 LSADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for LSADD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS/3 (WF544268/R Issue 2)	8700 8500	Pyroplex	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart
CS/4 (WF544267/R)	ST154FO ST104FO	Sealed Tight Solutions	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart

Intumescent Specification for LSADD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS/7 (WF540198/R Issue 2)	Type 617 - LP1504 Type 617 - LP1004	Lorient Polyproducts Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart
CS/8 (CFR2312141 Revision 1)	Pyrostrip 500P/PSS	Mann McGowan	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart

4.5.8 ULSADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for ULSADD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
DS/3 (WF544268/R Issue 2)	8700 8500	Pyroplex	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart
DS/4 (WF544267/R)	ST154FO ST104FO	Sealed Tight Solutions	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4's fitted centrally in the primary leaf 10mm apart

Intumescent Specification for ULSADD			
Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
DS/7 (WF540198/R Issue 2)	Type 617 - LP1504 Type 617 - LP1004DS	Lorient Polyproducts Ltd	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart
DS/8 (CFR2312141 Revision 1)	Pyrostrip 500P/PSS	Mann McGowan	Frame reveal: 1No. 15x4 Centrally in the frame reveal Meeting Edge: 2No. 10x4 fitted centrally in the primary leaf 10mm apart

5 General Description of Leaf Construction

5.1 Leaf Core Construction

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

5.1.1 Marksman 44 – 44mm thick

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

Element	Material	Dimensions (mm)	Density (kg/m ³)
Core	Marksman 44 Graduated Density Chipboard	44 (t)	520 - 590

The leaf must be lipped as specified in section 5.3.

The minimum leaf thickness after calibration is 43mm (i.e. a maximum of 0.5mm from both sides).

The minimum leaf thickness after finishes applied is 44mm.

5.2 Leaf Size Adjustment During Manufacturing

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

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

5.3 Timber Lipping

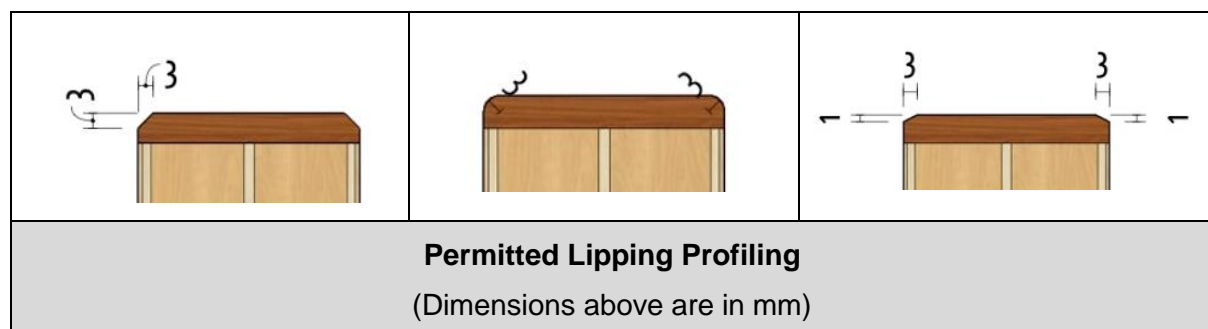
The testing documented in section 3 has generally been undertaken using 6-8mm thick lippings applied to all edges and vertical edges only using hardwood species at varying densities. A number of different adhesives have been used to seal the lippings.

On the above basis, Marksman 44 door blanks must be lipped with the following specification:

Timber Lipping Specification		
Material (Test Reference)	Size (mm)	Min Density (kg/m ³)
Hardwood	Flat = 6 – 12 thick	640
Edgeman EV Engineered Lipping (CFR2312151)	Flat = 6 – 12 thick	665

Notes:

1. Rounded and /or rebated lippings are not permitted.
2. All lippings are to be the same thickness as the door leaf.
3. Solid panels housed within modular framing or separated by the leaf head by a transom do not require lipping but may be lipped if required.
4. Single and double doorsets with or without transomed overpanels only require lipping on the vertical edges but may be additionally lipped on the top and bottom edges if required. (Supported by WF544268/R Issue 2 which included lippings to the vertical edges only)
5. Lippings can be bonded with the adhesives as detailed in Section 9. These may be hand applied or may be applied using an edgebander. With either method it must be ensured that sufficient glue is applied to across the entire surface area between the 2No substrates being adhered to guarantee a robust bond. Other manufacturers guidance should be followed, for either installation application.
6. It is not permitted to construct a finished lipping size given above from multiple layers of material; the applied lipping must be made from one continuous piece of material.
7. The Marksman 44 doorset design has been tested with a 3mm x 3mm chamfer to all leaf edges and adjacent frame edges. It is therefore the opinion of Warringtonfire that edge profiling can be any size or shape up to a maximum of 3mm x 3mm chamfer for all lippings. Examples depicted below:



5.4 Decorative & Protective Facings

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

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

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint ⁵	0.2
Timber veneers ³	2
Plastic laminates ³	2
PVC ³	2
Cellulosic and non-metallic foils ³	0.4

Notes:

1. Metallic facings are not permitted except for push plates and kick plates
2. The door leaf thickness may be reduced on both sides by a maximum of 0.5mm for calibration purposes in order to accommodate the chosen finish. The minimum overall leaf thickness must remain at 44mm after finishing has been applied.
3. Materials may over sail lippings but must not return around leaf edges, except for paint which is permitted to be applied to the leaf edges, subject to meeting other requirements detailed herein.
4. For all options, materials must not conceal intumescent strips.
5. Intumescent paints are not permitted.

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

5.5 Decorative Planted on Timber Mouldings

Decorative mouldings can be applied to the face of the leaf providing the following criteria is adhered to:-

The mouldings:

1. Are surface applied to the door
2. Are no higher than 30mm i.e. proud of the door
3. Are no wider than 50mm
4. Cover no more than 20% of the door leaf area
5. Are no closer than 80mm to the door leaf edge or glazed aperture
6. Are bonded into position, small pins may be additionally used with no greater penetration than 12mm into the door core.
7. Are bonded using any glue which is suitable for bonding the lipping of the door.

It has been possible to include the proposed decorative mouldings as they would be expected to char and fall away from the surface of the leaf under test conditions. In fact, they are likely to provide a protective barrier to the area of the leaf to which they are applied until such time as they fall away.

5.6 Feature Grooves

Decorative feature grooves were included within test reference WF540199/R Issue 2 without being of detriment to the overall performance of the doorset design. The doorset they were included within achieved 33 minutes under test conditions and included glazed apertures.

Based on this testing both sides of the door leaves may be grooved to the following specification.

Feature grooves cannot be located within 20mm of any mortice for hardware (i.e. any item which requires material to be removed from the door)

As tested within WF540199/R Issue 2 the grooves may coincide with glazed apertures, with bolected glazing beads without the requirement to modify the glazing bead. The below detailed groove option may be utilised within glazed doorset designs providing if the groove coincides with the edge of an aperture, a bolection bead is used. When a bolection bead is used, grooves which are parallel to a glazed aperture must be a minimum of 15mm from the glazing aperture and may not run under the bead bolection.

Grooves must be a minimum 60mm from any glazed apertures when flush beads are utilized. Grooves must not in this instance coincide with aperture edges when using flush beads.

The following section details the tested grooving arrangement, and the limitations associated with its application.

5.6.1 Groove detail

Groove		
Element	Details	
Maximum Groove Dimensions (mm)	18 wide x 10 deep	
Inserts	Grooves must be infilled with a hardwood insert (minimum density 640kg/m ³). The insert may be subsequently grooved by a maximum of 10 wide x 7 deep, the shape of the groove applied is unrestricted.	
Adhesive	See section 9 for permitted adhesives.	
Proximity to leaf edges (mm)	Horizontal Grooves	90
	Vertical Grooves	70
Groove spacing (mm)	Grooves may be no closer than 60 apart (in parallel). Grooves may however intersect as tested.	
Groove Orientation	Vertical and / or Horizontal	
Permitted configurations	LSASD and ULSASD	
Permitted leaf size (mm) must not exceed the sizes given and also must comply with the leaf sizes for the chosen perimeter intumescent and configuration as given in Section 4.5.	2310mm high x 933mm wide (Based on the performance demonstrated within WF540199/R Issue 2 Doorset B)	
Required perimeter intumescent seal specification:	Any of the intumescent specifications permitted within Section 4.5 which include: a single 15 wide x 4 thick intumescent seal positioned centrally within the frame reveal.	

5.7 Astragal

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

- The astragal shall consist of the same material as the door frame with at least the same or greater density.
- The astragal shall be mechanically fixed using steel screws at no greater than 250mm centres, the screws shall penetrate into the substrate by at least 15mm and no greater than $\frac{1}{2}$ the thickness of the substrate.
- The astragal shall measure 50mm wide x 18mm thick and shall be positioned centrally over the junction.

Other materials or dimensions of astragals are not permitted.

It has been considered possible to include the above specified astragal based on the fact that the effective rebate of the doorset design will remain unchanged. The addition of the astragal element will provide further protection at the perimeter gaps increasing the time in which failure modes may develop.

Astragals are permitted in the following designs:

- Optionally permitted at meeting edges of double doors.

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

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

6 Glazing within the Leaf

6.1 General

The testing conducted on doorset design has demonstrated that they are capable of tolerating glazed apertures, whilst providing a margin of over performance, this is supported by the summarised test evidence within section 3.

Glazing is therefore acceptable within the following parameters.

Apertures must not be less than 100mm from top and side edges and 100mm from the bottom edge. (Supported by CFR2312191 Revision 1).

Aperture shapes considered herein are rectilinear and as such are permitted unless alternative shapes are detailed within this document for specific glass or glazing systems.

Apertures cannot be rotated (e.g. a square to be rotated to create a diamond effect) unless explicitly stated within this document for specific glass or glazing systems.

6.1.1 Maximum Permitted Glazed Aperture Dimensions

The maximum total assessed aperture area for any individual door leaf based on the test evidence detailed within section 3 is as follows:

Maximum total permitted aperture within the Marksman 44 door leaf (CFR2312191 Revision 1)		
Maximum Height (mm)	Maximum Width (mm)	Maximum Area (m²)
2646	1014	2.329

Multiple apertures are acceptable within the permitted total assessed aperture area, with a minimum dimension of 100mm of core between apertures. (As demonstrated in WF544267/R).

Maximum glass thickness permitted is 16mm for single pane glazing.

Minimum glass thickness permitted is 7mm, as tested and may not be reduced.

The subsequent sections within this report detail the permitted glass and glazing systems with their associated size ranges permitted within the Marksman 44 doorset design.

The maximum glazed areas given in each subsection supersede those given above and must be adhered to. However, the dimensional restrictions given above shall not be exceeded under any circumstance.

It is possible to include glass within the door leaf at smaller dimensions than given for any particular glass type or glazing system.

6.2 Certifire Single Pane Glass and Glazing System Options

Alternative glass and glazing systems with a Certifire certificate – valid at the date of manufacture of the doorset which has been written in accordance with Warringtonfire Testing & Certification Ltd, Technical Schedule TS25 - may be used to glaze the Marksman 44 door design, subject to the following.

- The minimum thickness of glass permitted for alternative glass types is 7mm.
- The maximum thickness of glass permitted for alternative glass types is 16mm.
- The glass type used must include an intumescent interlayer within the construction of the glass.
- Where a Certifire certificate is utilised to justify glazing the doorset, the full requirements given within that certificate for the glass and glazing system specified must be complied with.
- All parameters in section 6.1 above must take precedence over those in the supporting Certifire certificate, e.g. the glazed area, maximum height and width permitted in section 6.1 above may not be increased on the basis of the area, height and width permitted within the Certifire certificate. If the area, height and width in the proposed Certifire certificate is smaller than that in section 6.1, the smaller dimension will take precedence for the proposed glass or glazing system.
- The general requirements within the proposed Certifire certificate are still applicable, the Certifire certificate must include the option for the certificated glass and / or glazing system to be fitted within a timber / cellulosic based door leaf within a timber / cellulosic frame with a leaf thickness of 44mm.
- Where the Certifire certificate requires a timber aperture liner, these must always be fitted.
- Bead fixings – The required pin or screw specification as given in the supporting Certifire certificate must be used, alternatives fixing details are not permitted.

6.3 Single Pane Glass and Glazing Systems (Timber Beading)

The tested and assessed glass and glazing system(s) combinations, detailed within the table below may be used, subject to the limitations and scope detailed in section 6.1 above.

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

The numerical figures in the main body of the table are the maximum height, width (m) & area of glazed aperture size (in m²) that is considered acceptable for an individual glazed aperture, based upon the specific system. Where a '-' is applied the glass type and glazing system has not been considered compatible.

Glass & Glazing System Specification		Maximum Assessed Area (m ²), Height & Width (m)								
Glass Type Manufacturer	Thickness	System & Manufacturer →	1	2	3	4	5	6	7	
			Intumescent Foam Glazing Tape, applied between the bead and the face of the glass 10 x 5	Intumescent Foam Glazing Tape, applied between the bead and the face of the glass 15 x 5	FF1 Graphite, applied between the bead and the face of the glass 13.5 x 3.5 (excluding cap dimensions)	Pyrostrip 500 FSA applied between the bead and the face of the glass 10 x 2	ST105GT(3) adhered to the bead upstand 9 x 3	ST104SG, applied between the bead and the face of the glass 16.5 x 5	Pyroglaze 30, Graphite based strip in PVC carrier, applied between the bead and the face of the glass 10 x 3	
			Sealmaster	Sealmaster	Lorient Polyproducts Ltd	Mann McGowan	Sealed Tight Solutions Ltd	Sealed Tight Solutions Ltd	Mann McGowan	
		Fire Test Reference	CFR2312191 Revision 1 A CFR2405291 B	WF540198/R Issue 2 (Active Leaf) WF540199/R Issue 2 B	WF540198/R Issue 2 (Secondary Leaf)	WF541872/R	WF544267	WF540199/R Issue 2 A WF544267	CFR2312141 Revision 1 (Secondary Leaf) CFR2312151 B	
1	Pyrobelite 7 AGC Flat Glass Europe SA	7	CFR2312191 Revision 1 A WF540198/R Issue 2 (Secondary Leaf) WF540199/R Issue 2 A WF544267/R	Area: 2.329 Height: 2.646 Width: 1.014	Area: 0.7 Height: 1.680 Width: 0.48 Or Area: 0.46 Height: 1.80 Width: 0.30	Area: 0.7 Height: 1.680 Width: 0.480	Area: 1.816 Height: 2.379 Width: 0.879	Area: 0.445 Height: 1.068 Width: 0.48	Area: 2.22 Height: 2.526 Width: 1.014	Area: 2.329 Height: 2.646 Width: 1.014
2	Pyroguard Adv Pyroguard 2 EW30/7-1 Pyroguard	7	WF540198/R Issue 2 (Active Leaf) WF540199/R Issue 2 B WF541872/R CFR2312141 Revision 1 (Secondary Leaf) CFR2312151 B	Area: 2.329 Height: 2.646 Width: 1.014	Area: 0.7 Height: 1.680 Width: 0.48 Or Area: 0.46 Height: 1.80 Width: 0.30	Area: 0.7 Height: 1.680 Width: 0.480	Area: 1.816 Height: 2.379 Width: 0.879	Area: 0.445 Height: 1.068 Width: 0.48	Area: 2.22 Height: 2.526 Width: 1.014	Area: 2.34 Height: 2.652 Width: 1.018
3	Pyrobelite 12 AGC Flat Glass Europe SA	12	WF147219	Area: 2.329 Height: 2.646 Width: 1.014	Area: 0.7 Height: 1.680 Width: 0.48 Or Area: 0.46 Height: 1.80	Area: 0.7 Height: 1.680 Width: 0.480	Area: 1.816 Height: 2.379 Width: 0.879	Area: 0.445 Height: 1.068 Width: 0.48	Area: 2.22 Height: 2.526 Width: 1.014	Area: 2.34 Height: 2.652 Width: 1.018

Glass & Glazing System Specification		Maximum Assessed Area (m ²), Height & Width (m)							
Glass Type Manufacturer	Thickness	System & Manufacturer →	1	2	3	4	5	6	7
			Intumescent Foam Glazing Tape, applied between the bead and the face of the glass 10 x 5	Intumescent Foam Glazing Tape, applied between the bead and the face of the glass 15 x 5	FF1 Graphite, applied between the bead and the face of the glass 13.5 x 3.5 (excluding cap dimensions)	Pyrostrip 500 FSA applied between the bead and the face of the glass 10 x 2	ST105GT(3) adhered to the bead upstand 9 x 3	ST104SG, applied between the bead and the face of the glass 16.5 x 5	Pyroglaze 30, Graphite based strip in PVC carrier, applied between the bead and the face of the glass 10 x 3
		Fire Test Reference	Sealmaster	Sealmaster	Lorient Polyproducts Ltd	Mann McGowan	Sealed Tight Solutions Ltd	Sealed Tight Solutions Ltd	Mann McGowan
		CFR2312191 Revision 1 A CFR2405291 B		WF540198/R Issue 2 (Active Leaf) WF540199/R Issue 2 B	WF540198/R Issue 2 (Secondary Leaf)	WF541872/R	WF544267	WF540199/R Issue 2 A WF544267	CFR2312141 Revision 1 (Secondary Leaf) CFR2312151 B
				Width: 0.30					
4	Pyroguard EI30-Int Pyroguard	15	CFR2405291 B	Area: 0.553 Height: 1.795 Width: 0.355	Area: 0.553 Height: 1.795 Width: 0.355 Or Area: 0.46 Height: 1.795 Width: 0.30	Area: 0.553 Height: 1.680 Width: 0.355	Area: 0.553 Height: 1.795 Width: 0.355	Area: 0.445 Height: 1.068 Width: 0.355	Area: 0.553 Height: 1.795 Width: 0.355
5	Pyrobel 16 AGC Flat Glass Europe SA	17	WF331776	Area: 2.329 Height: 2.646 Width: 1.01	Area: 0.7 Height: 1.680 Width: 0.48 Or Area: 0.46 Height: 1.80 Width: 0.30	Area: 0.7 Height: 1.680 Width: 0.480	Area: 1.816 Height: 2.379 Width: 0.879	Area: 0.445 Height: 1.068 Width: 0.48	Area: 2.22 Height: 2.526 Width: 1.014

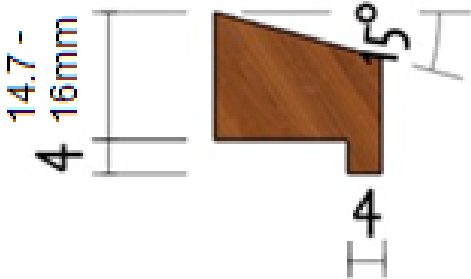
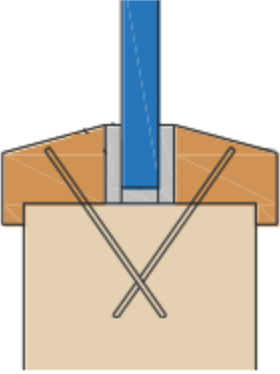
Note:

- All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.
- Glass types 4 & 5 are fully insulating for 30 minutes in terms of the criteria set out BS 476: Part 20: 1987.

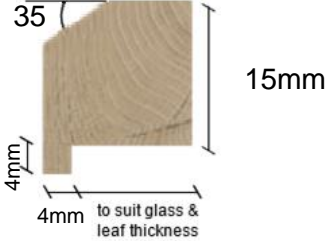
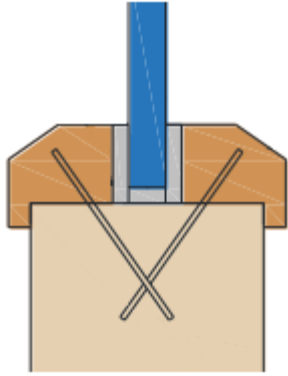
6.3.1 Permitted Glazing Beading and Glass Retention (Timber Beads)

The following sections detail the permitted glazing beading, aperture lining requirements and minimum fixing details for the above detailed glass and glazing systems. Each section deals with a specific type of glazing bead and indicates which glazing system it is applicable to. Glazing beads shall only be used with the permitted glass and glazing system as identified.

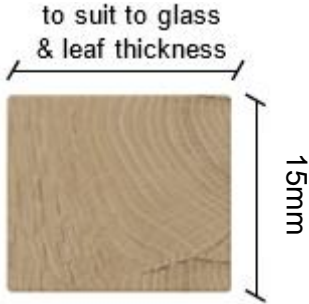
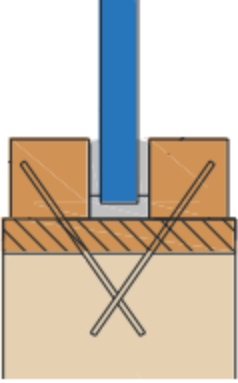
6.3.1.1 Chamfer Bead – Option 1

Permitted Glazing Systems (Defined in Section 6.3)	1, 2, 3, 4, 5, 6 & 7
	
<ul style="list-style-type: none"> • The above detailed bolection may be increased in thickness and height if required, with the bolection dimensions shown being the minimum. • The glazing beads must be created from hardwood of a minimum 640kg/m³ density. • Glazing beads must be retained in position with minimum length of 50mm long steel pins or 50mm long No. 6-8 screws, inserted at 35-40° to the vertical. • Fixings must be at 200mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3.2 below. • A 6 – 10mm thick square aperture liner is optionally permitted for use with the above bead providing it is constructed from hardwood of minimum density 640kg/m³ and glued in position using a UF, PVA or PU type adhesive. • The fitting of the glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. • Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires 	

6.3.1.2 Chamfer Bead – Option 2

Permitted Glazing Systems (Defined in Section 6.3)	1, 2, 3, 4, 5, 6 & 7
	
<ul style="list-style-type: none"> • The above detailed bolection may be increased in thickness and height if required, with the bolection dimensions shown being the minimum. • The glazing beads must be created from hardwood of a minimum 640kg/m³ density. • Glazing beads must be retained in position with minimum length of 50mm long steel pins or 50mm long No. 6-8 screws, inserted at 35-40° to the vertical. • Fixings must be at 200mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3.2 below. • A 6 – 10mm thick square aperture liner is optionally permitted for use with the above bead providing it is constructed from hardwood of minimum density 640kg/m³ and glued in position using a UF, PVA or PU type adhesive. • The fitting of the glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. • Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires 	

6.3.1.3 Flush Bead – Option 1

Permitted Glazing Systems (Defined in Section 6.3)	4 & 6
	
<ul style="list-style-type: none"> • The glazing beads must be created from hardwood of a minimum 640kg/m³ density. • Glazing beads must be retained in position with minimum of 38mm long steel pins or 38mm long No. 6-8 screws, inserted at 35-40° to the vertical. • Fixings must be at 200mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 6.3.2 below. • A 6mm thick square aperture liner is required for use with square beads it must be constructed from hardwood of minimum density 640kg/m³ and glued in position using a UF, PVA or PU type adhesive. When fitted the intumescent liner, if narrower than 44mm, this may be rebated by the thickness of the intumescent liner into the top of the hardwood aperture liner. • The fitting of the glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions. • Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires. • Based on the testing undertaken as summarised within section 3 the bead profiles given overleaf are also permitted as a variation to this bead option as the sizes or size ranges given. The below detailed bolection may be increased in thickness and height if required, with the bolection dimensions shown being the minimum. The quirk displayed is the maximum dimension permitted and must not be exceeded. 	

<p>Bolected Square Bead</p>	<p>Flush Bead with Quirk</p>
<p>Chamfered Flush Bead</p>	<p>Chamfered Flush Bead with Quirk</p>

6.3.2 Pneumatically Fired Pins

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

Option 1 – Round, Oval & Rectangular Pins

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

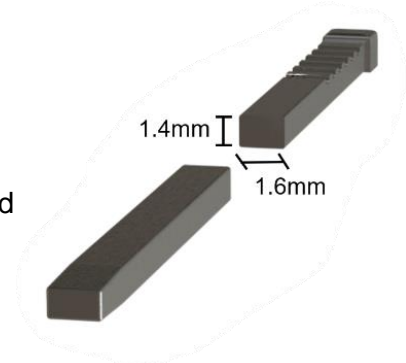
- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.03mm².
- Minimum linear dimension of 1.6mm in any direction, see figure below. The maximum pin diameter or any linear dimensions may be no greater than 2.0mm.



Option 2 – Gun (Pneumatically) Fired Rectangular Pins

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

- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.24mm².
- Minimum linear dimensions as shown in the figure.
- The 1.6mm dimension is predominately oriented perpendicular to the glass, where possible.
- The maximum pin diameter or any linear dimensions may be no greater than 2.0mm.



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

7 Door Frame Construction

7.1 Details for Frame Type 1

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

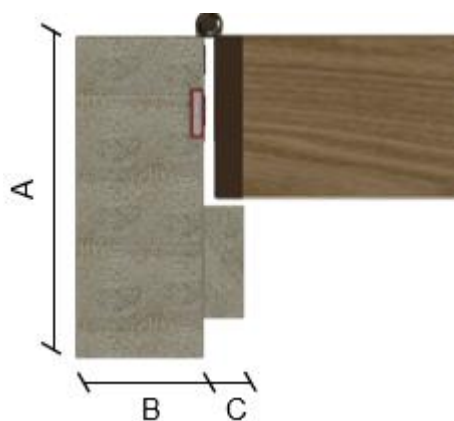
Frame Specification			
Frame Type	Material	Minimum Section Size (mm)	Minimum Density (kg/m ³)
1	Softwood / Hardwood	Frame: 70 (d) x 30 (w) (excluding stop) Stop: 20 x 12 (w) (integral or planted on)	480

Note:

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

7.1.1 Standard detail Frame Type 1

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



- A: Frame depth = 70mm minimum
- B: Frame width = 30mm minimum
- C: Stop width = 12mm minimum

Minimum section size when using a transomed overpanel:

- A: Frame depth = 70mm minimum
- B: Frame width = 44mm minimum
- C: Stop width = 12mm minimum

7.2 Details for Frame Type 2

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

Frame Specification			
Frame Type	Material	Minimum Section Size (mm)	Minimum Density (kg/m ³)
2	Framebreak JA 380 (CFR2405291 B)	Frame: 96 (d) x 31 (w) (excluding stop) Stop: 20 x 12 (w) (integral or planted on)	378
	Framebreak PI 450 (Assessed as below)		450
	Framebreak EU 550 (CFR2405291 A)		470

Note:

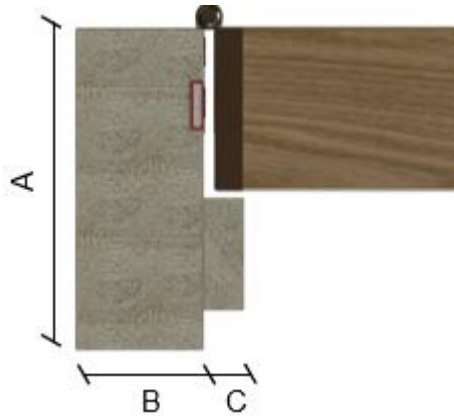
Minimum section size is subject to size of hardware and the use of transomed overpanel (see frame details below).

Test CFR2405291 doorset A and B has demonstrated JA 380 and EU 550 frame materials are capable of achieving 30 minutes fire resistance performance. This testing has determined the minimum densities of each of the tested materials. The PI 450 frame material is constructed in the same manner as the two tested materials and is constructed from timber with a greater density than the tested JA 380 which would be anticipated to enhance the fire resistance performance by means of a reduced char rate.

It is therefore the opinion of Warrington fire that based on the tested materials in CFR2405291, the PI 450 design would achieve a similar fire resistance performance when tested to BS476: Part 22: 1987.

7.2.1 Standard detail Frame Type 2

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



A: Frame depth = 96mm minimum

B: Frame width = 31mm minimum

C: Stop width = 12mm minimum

Minimum section size when using a transomed overpanel:

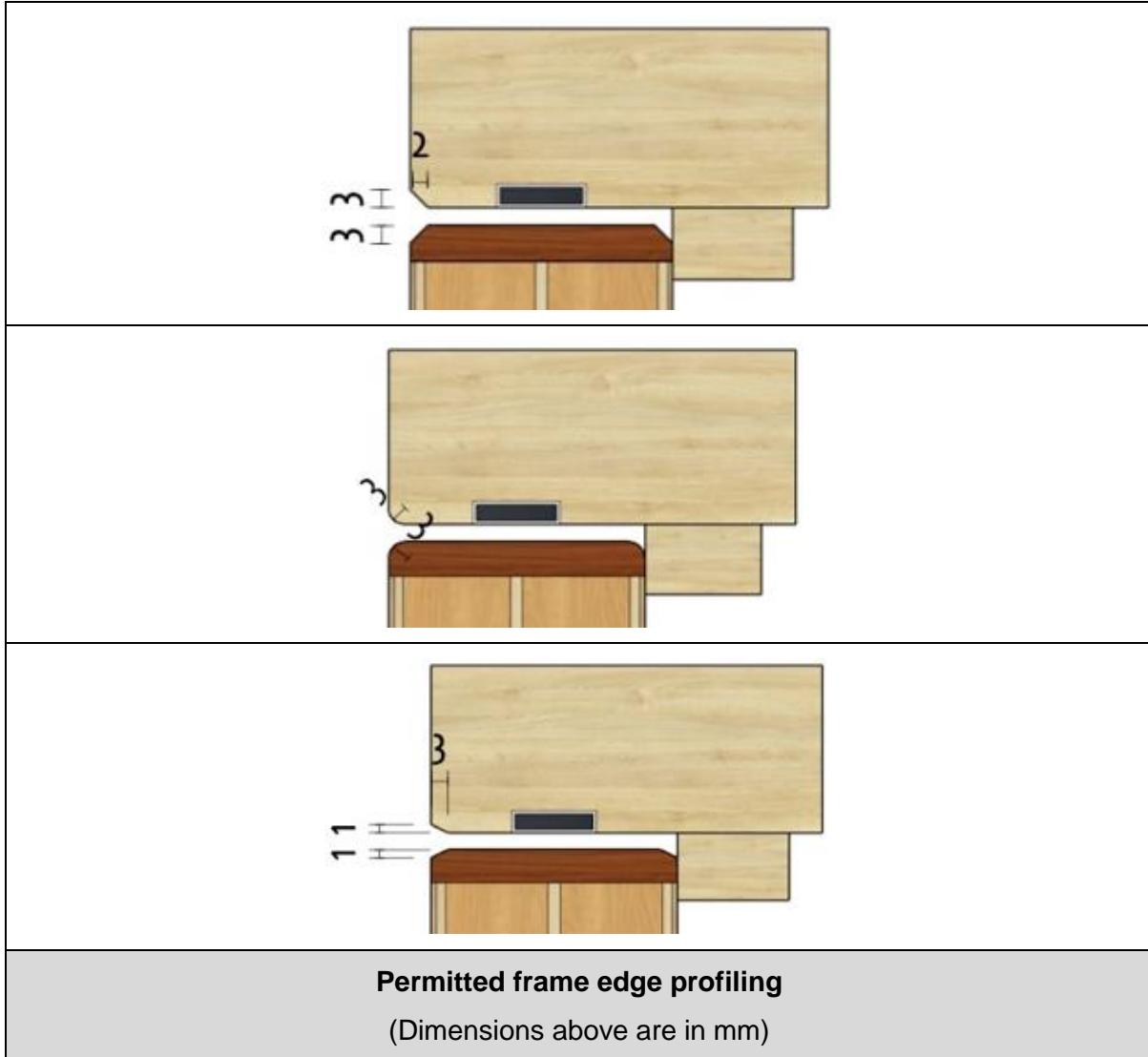
A: Frame depth = 96mm minimum

B: Frame width = 44mm minimum

C: Stop width = 12mm minimum

7.3 Frame Edge Profiling

The Marksman 44 doorset design has been tested with a 3mm x 3mm chamfer to all leaf edges and adjacent frame edges. It is therefore the opinion of Warringtonfire that edge profiling to either of the two frame types detailed above, can be any size or shape up to a maximum of 3mm x 3mm chamfer. Examples depicted below.



7.4 Door Frame Joints

Below are depictions of the door framing joints that are deemed acceptable. Please note that the drawings are provided as general illustrations of each type of door frame joint; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies. The door frame joints are required to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Frame joints may additionally be reinforced with adhesive (see section 9).



Half Lapped Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint



Trenched Joint

Approved door frame jointing options

7.5 Decorative Facings – All Frame Options

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

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

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint ³	0.2
Timber veneers	0.7

Notes:

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

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

8 Overpanels & Fanlights, Sidepanel & Sidelights

Overpanels, fanlights, sidepanels and sidelights are permitted based on the testing as summarised within section 3, the following sections outline the constructional details of each of the permitted elements and limitations associated with each configuration.

8.1 General

The testing undertaken on the doorset design allows for the application of:

Solid overpanels with two framing options (Modular, Transomed).

Solid sidepanels with one framing option (Modular).

Glazed fanlights with one framing option (Modular).

Glazed sidelights with one framing option (Modular).

Framing options are detailed in the following section depending on the panel or glazing utilised.

It is possible to utilise both methods of framing within any single doorset design providing the restrictions given in the following sections are adhered to. i.e. it is possible to provide a doorset with a solid overpanel separated by a shared transom with a modular framed sidelight beside it.

8.2 Framing

The following framing options as detailed below are permitted for the doorset design and are permitted depending on solid panel arrangement or glazed fanlight / sidelight utilised. Information on the frame type permitted for the solid panel or glazed element is detailed in sections 8.2.1 – 8.2.2.

8.2.1 Modular Framing

Modular framing for the purpose of this document is considered to be an element (glazing or panel) which is independently framed and fixed to the frame of a doorset design. An example of a modular framed solution is given below. This is supported for use in this assessment by test WF541872/R.

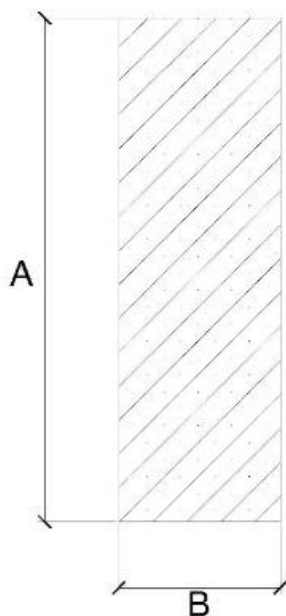


Single leaf doorset with glazed modular sidelight.

8.2.1.1 Standard Frame Detail (Modular Framing)

The frame listed below is the minimum size and density which has been successfully tested and assessed by this report. The frame must be constructed to meet the following specification for modular units containing solid panels or glazing, the frame section shall meet this specification on all four edges.

Modular Frame specification		
Material	Minimum section size (mm)	Minimum density (kg/m ³)
Softwood/Hardwood: (see section 2.1)	Frame: 70 (d) x 30 (w)	510



A: Frame depth = 70mm minimum

B: Frame width = 30mm minimum

Note: Back to back framing sections require additional intumescent grooves as described in Section 8.2.1.5.

Notes:

It is possible to include a 3mm x 3mm quirk detail to the rear edges of the frame where the jointing to the door frame or adjacent modular framing element shall occur.

The depth of the modular frame and the door frame shall be equal, this may result in increasing the depth of the permitted door frame to match the modular frame dimension, or vice versa. In all cases the greater dimension shall be used.

8.2.1.2 Transom or Mullion Detail (Modular Framing)

It is possible to include a single transom within a modular unit applied to the side of a doorset and / or a single mullion within a modular unit applied to the head of a doorset.

When applied the transom or mullion shall meet the following specification:

Modular Frame specification		
Material	Minimum section size (mm)	Minimum density (kg/m ³)
Softwood/Hardwood: (see section 2.1)	Frame: 70 (d) x 44 (w)	510

The transom or mullion when applied shall be mortice and tenon jointed as depicted in section 8.2.1.3. The joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5 x 100mm steel screws.



A: Frame depth = 70mm minimum

B: Frame width = 4mm minimum

Transoms when applied shall not be greater than 1000mm from the centre of the transom to the notional floor level. This may inhibit the use of transoms in some configurations.

Mullions shall not be applied in modular sidepanels or sidelights.

It is possible to include solid panel and glazing arrangements which are permitted as detailed in section 8.3 and 8.4 either side of a transom within a modular unit applied to the side of a doorset subject to the positioning requirement of the transom given above and the maximum permitted glass or panel size given in the following sections.

8.2.1.3 Frame Jointing (Modular Framing)

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



Double Rebated Joint



Mitre Joint



Mortice & Tenon Joint



Butt Joint



Trenched or Half Lapped Joint

The modular frame joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5 x 100mm steel screws. Frame joints shall additionally be reinforced with the adhesives approved for the application frame jointing detailed within section 9.

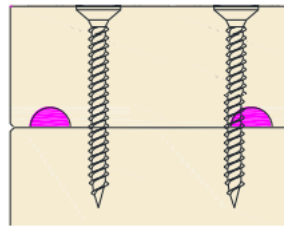
8.2.1.4 Attachment Technique (Modular Framing)

The modular framing shall be affixed to the door frame or adjacent modular framed units utilising steel screws appropriate for use with timber substrates.

Screws must be fixed between 50mm and 100mm from corners at maximum of 200mm centres from each face. Fixings shall penetrate approximately half of the depth of the adjacent timber section.

The joint between the modular elements and the door frame or adjacent modularly framed units may additionally be reinforced with the adhesives approved for the application frame jointing detailed within section 9.

A visual representation of the permitted jointing method is detailed below:



8.2.1.5 Intumescent Sealing Between Frame Elements (Modular Framing)

As tested the modular frame section which abuts adjacent framing elements shall include 2No. grooves 10mm wide x 5mm deep which must be filled with an acrylic intumescent mastic which has been tested in accordance with BS 476-22, BS EN 1634-1 or BS EN 1366-4.

The grooves must be positioned 5mm from either side visible frame face of the modular frame.

8.2.2 Shared framing (Transomed)

Shared framing (Transomed) for the purpose of this document is considered to be when an element (panel) is contained within the frame for the doorset and separated from the door leaf by a shared transom. An example of a transomed solution is given below, though the construction of doorsets shall be as the text in this document specifies.



8.2.2.1 Standard Frame Detail (Transomed)

The permitted frame detail for the doorset shall meet the minimum requirements as outlined in section 7, where applicable. The detail for the permitted transom can be found within section 8.2.2.2 below.

8.2.2.2 Detail for Transom (Transomed)

It is possible to include a transom to separate a panelled overpanel within a door frame from the door leaf. It is not permitted to include a mullion within a doorset which is constructed using the shared framing design. When applied the transom shall meet the following specification:

Modular Frame specification		
Frame Type	Minimum section size (mm)	Minimum density (kg/m ³)
Frame 1	Transom: 70 (d) x 44 (w)	510
Frame 2	Transom: 96 (d) x 44 (w)	(Refer to section 7.2 for minimum densities)

Notes:

When applied the material for the transom shall match the timber species used for the frame surrounding the door frame.

The transom when applied shall be mortice and tenon or butt jointed as depicted in section 8.2.2.3. The joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5 x 100mm steel screws.

Minimum Section Size – Frame Type 1



A: Transom depth = 70mm minimum

B: Transom width = 44mm minimum

Minimum Section Size – Frame Type 2



A: Transom depth = 96mm minimum

B: Transom width = 44mm minimum

8.2.2.3 Frame Jointing (Transomed)

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



Mortice & Tenon Joint



Butt Joint

The transom when applied shall be mortice and tenon or butt jointed as depicted above. The joints are required to be tight, with no gaps, and require mechanical fixing with 2No. Ø5 x 100mm steel screws.

8.3 Solid Panels

Solid side and overpanels are permitted for use with the modular framing option given in section 8.2.1 above (Modular Framing).

Solid overpanels are also permitted for use with the shared framing option given in section 8.2.2 above. (Shared Framing).

8.3.1 Solid Panel Construction (Side or Over Panels)

Based on the testing undertaken on the doorset design, it has been assessed to include the tested core construction as a solid fixed panel. This is because under test conditions the panel will be fixed within the perimeter framing limiting the deflection throughout the test duration and enhancing the expected fire resistance performance which was observed for the door leaf itself. Therefore, the following specification shall be met:

Element	Material	Dimensions (mm)	Minimum Density (kg/m ³)
Core	Marksman 44 Graduated Density Chipboard	44 (t)	520

The panel must be lipped as specified in section 5.3, and the panel shall be constructed of a single board, joints are not permitted within any panels.

The minimum panel thickness after calibration is 43mm (i.e. a maximum of 0.5mm from both sides).

Decorative & protective facings may be applied to the surface of the solid panels in accordance with section 5.4.

The minimum panel thickness after finishes applied is 44mm.

8.3.2 Intumescent Sealing Arrangement (Side or Over Panels)

Solid side and overpanels when included within a doorset design (in either modular or shared framing) shall include the same intumescent specification as utilised within the door leaf or frame reveal. This shall be applied to all four edges.

Permitted intumescent specifications are detailed in section 4.5, while there may be multiple options for manufacturer and seal types only one specification can be utilised with any individual doorset, and the specification used shall match the specification used on the door leaf.

8.3.3 Fixing Arrangement (Side or Over Panels)

Solid panels must be fixed into the framing solution by steel screws appropriate for the timber-based substrates.

Screws shall be applied nominally centrally to the thickness of the solid panel, through the rear of the frame to all edges and transom reveal where applicable and shall penetrate into the solid panel by at least 30mm.

Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.

When fitted the solid panel shall have no greater than 1mm between the panel edge and the adjacent framing element.

Where fitted within shared framing (transomed) the face of the solid overpanel shall be nominally in line with the face of the door leaf.

Where fitted within modular framing the panel may either be nominally in line with the face of the door leaf or centrally within the modular frame depth.

8.3.4 Maximum Dimensions (Side or Over Panels)

Based on the testing undertaken within the doorset design the following maximum dimensions are permitted for any single panel, subject to the doorset not exceeding 2950mm in height and width including outer framing dimensions.

Solid Panel & Frame Type	Height (mm)	Width (mm)
Overpanel (Shared Framing)	Up to maximum dimension given in section 4.5 for leaf size based on intumescent specification used.	Overall doorset width
Overpanel (Modular Framing)		
Sidepanel (Modular Framing)	Up to maximum dimension given in section 4.5 for leaf size based on intumescent specification used.	

The overall assembly shall form a rectilinear shape.

8.4 Glazed Fanlights & Sidelights

Based on the testing detailed within section 3, it has been possible to consider the use of glazed fanlights and sidelights with the modular framing given in section 8.2.1 above.

The glazing system must be one of the following tested or assessed glass types and glazing systems. Alternatively, it is possible to utilise glass and glazing systems with a Certifire certificate – Valid at the date of manufacture of the doorset which has been written in accordance with Warringtonfire Testing and Certification Ltd Technical Schedule 25. More information on the use of Certifire approved glass and glazing systems can be found within section 8.4.2.

8.4.1 Tested and Assessed Glass types & Glazing Systems

The table below specifies the maximum assessed height and width that is deemed acceptable for different aspect ratios ('landscape' or 'portrait' orientation) for an individual glazed aperture, based upon the test evidence contained within section 3.

The dimensions of any single glazed aperture must not exceed that stated below, nor shall the entire assembly exceed 2950mm wide x 2950mm high for any individual doorset including the dimension of the door frame, overpanels, fanlights, sidepanels and sidelights.

Note: sidelights including a horizontal transom separating two glass panes are to be considered as two apertures for the purpose of the maximum pane dimensions given below.

Test Reference	Glass Type (thickness)	Perimeter Frame (w x t) mm	Frame Density (kg/m ³)	Transom / Mullion (w x t) mm	Maximum Individual Aperture Dimensions (mm)	Max Glazed Area (m ²)	Glazing System	Glazing Bead Size		Bead Shape	Bead: Density (kg/m ³)	Bead Fixing
								Height	Width			
WF541872/ R	Pyroguard 2-EW30/7-1 (7mm thick)	70 x 30	510	70 x 44	Landscape: 501 (h) x 1908 (w) Portrait: 2890 (h) x 1008 (w)	Landscape: 0.83 Portrait: 2.77	Mann McGowan Pyrostrip 500 FSA 10mm (w) x 2 (t) fitted between glass and the bead.	15	15	Square	Hardwood 640	Steel pins 38mm long Fitted 50mm long at 200mm centres. 35 degrees to the face of the glass.

Notes:

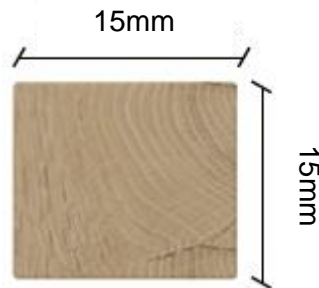
1. Further information on beading is found in section 8.4.1.1 below.

8.4.1.1 Glazing Beads & Installations

The following sections provide visual representation of the permitted glazing beads, these sections are to be read in conjunction with the table in section 8.4.1 which provides the relevant information relative to the tables below.

8.4.1.1.1 Square Bead

Permitted with glass types from the table in Section 8.4.1 as identified and must be used with the specified glazing system in the table



- It is permitted to apply up to a 15° splay to the bead as detailed above.
- The glazing beads must be created from hardwood (not Beech *fagus species*) of a minimum 640kg/m³ density.
- Glazing beads must be retained in position with minimum of 38mm long steel pins or 38mm long No. 6-8 screws, inserted at 35-40° to the vertical.
- Fixings must be at 200mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 8.4.1.1.2 below.
- It is optionally permitted to apply a 3x3 quirk to the bead.
- The fitting of the glazing seal between the bead and the glass should be in accordance with the manufacturer's instructions.
- Glass shall be aligned within the aperture using hardwood or non-combustible setting blocks placed at the bottom horizontal edge only, sized to provide edge cover and expansion allowance as the specific system requires.

8.4.1.1.2 Pin Fixings

Where it is identified within section 8.4.1 that pin fixings are permitted the following pin specification is permitted and has been considered suitable for applications requiring a pin fixing to glazing beads:

Option 1 – Round, Oval & Rectangular Pins

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

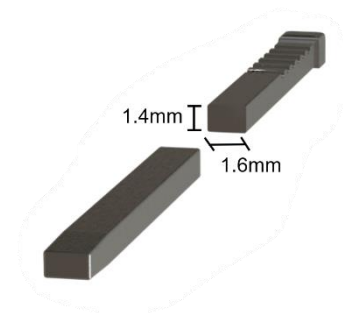
- Minimum Standard Wire Gauge (SWG) 16.
- Minimum cross section area of 2.03mm².
- Minimum linear dimension of 1.6mm in any direction, see figure below.



Option 2 – Gun (Pneumatically) Fired Rectangular Pins

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

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



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

8.4.2 Certifire Approved Glass & Glazing Systems

Alternative glass and glazing systems with a Certifire certificate – valid at the date of manufacture of the doorset which has been written in accordance with Warringtonfire Testing & Certification Ltd Technical Schedule TS25 - may be utilised to glaze fanlights and sidelights for use with the doorset design, subject to the following.

- The chosen Certifire approved glass and glazing system must detail that it is suitable for use for 30 minutes fire resistance performance within a timber screen.
- Certifire approved glass and glazing systems may be utilised with the doorset design providing they are able to be applied in a self-contained modular frame.
- The modular frame must meet or exceed the specification for modular frames given within section 8.2.1 above, however, must be fixed to the doorset or adjacent modules in the manner specified in section 8.2.1.4 and sealed in accordance with 8.2.1.5.
- Where a Certifire certificate is utilised to justify fanlights and / or sidelights, the full requirements given within that certificate for the frame (which may require an increase in dimensional requirements given in section 8.2.1 for example), glass type, glazing system and glass retention method specified must be complied with.
- Parameters in section 8.4.1 above relating to the overall dimension of the doorset design including fanlight and sidelight modules must not be exceeded.
- Bead Fixings - The required pin or screw specification as given in the supporting Certifire certificate must be used, alternatives fixing details are not permitted.
- The doorset assembly must remain rectilinear.

9 Adhesives

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

Element	Product / Material Type
Door Leaf	As per manufacturers tested specification
Decorative Facings	UF, PU or PVA
Timber lipping	UF, PU, PUR or Hotmelt PUR
Decorative Grooves	PVA
Frame Jointing	PU

10 Hardware

10.1 General

The following section details the permitted scope and constraints for fitting hardware to this door design. The following items of hardware must also bear the UKCA or CE Mark in addition to the requirements outlined in the following sections. The UKCA or CE mark must indicate that the hardware is suitable for fire doors in the classification code and declaration of performance issued by the hardware manufacturer:

- Latches & locks: Test Standard EN 12209
- Single axis hinges: Test Standard EN 1935
- Controlled door closing devices: Test Standard EN 1154
- Electrically powered hold-open devices: Test Standard EN 1155
- Door co-ordinators: Test Standard EN 1158
- Emergency exit hardware: Test Standard EN 179
- Panic exit hardware: Test Standard EN 1125.

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

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

- The component has been successfully tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a suitably similar type of doorset e.g. timber leaf in timber frame.
- As a result of an assessment of the appropriateness of the item of hardware, based on test evidence not commissioned by Wood International Agency Limited.
- As a result of the Certifire approval of the item of hardware.

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

- Leaf size
- Configuration
- Intumescent seals
- Intumescent protection
- Frame configuration requirements

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

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

10.2 Intumescent to Hardware

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

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

Hardware Intumescent Specification		
Item	Location	Product/Manufacturer (Test Reference)
Hinges	Under hinge blades	Not Required (WF544268/R Issue 2) 1 (t) Interdens® (WF541872/R) 1 (t) Mann McGowan, Pyrohinge graphite (CFR2312141 Revision 1) 1 (t) Intumescent Seals Ltd, Therm-A-Strip (CFR2312191 Revision 1) 1 (t) Fire and Acoustic Seals, Flexifire, Graphite (WF540199/R Issue 2) 1 (t) Sealed Tight Solutions, Graphite (WF544267/R)
Locks/latches with a forend and keep of less than or equal to 100mm high:	Under forend & keep only	1 (t) Lorient Polyproducts MAP (WF544268/R Issue 2) 1 (t) Sealed Tight Solutions, Graphite (WF544267/R) 1 (t) Interdens® (WF540198/R Issue 2)
Locks/latches with a forend and keep greater than 100mm high	Under forend & keep and encasing lock body	1 (t) Intumescent Seals Ltd, Therm-A-Strip (CFR2312191 Revision 1) 1 (t) Mann McGowan, Pyrolock MAP (CFR2312151)
Concealed overhead closers	Refer to Section 10.7.2 for specific intumescent protection requirements, specific to the closer utilised.	
Flush bolts	Encasing the entire body of the flush bolt including the back surface of the face plate	1 (t) Mann McGowan, Pyrostrip graphite (CFR2312141 Revision 1) 1 (t) Interdens® (WF540198/R Issue 2) 1 (t) Sealed Tight Solutions, Graphite (WF544267/R)

Gaskets must be fitted where required by supporting evidence, for example, test evidence or Certifire certificates. If gaskets are not required by the supporting evidence but are within this Field of Application, the requirements of this Field of Application take precedence.

It is permitted to use up to 2mm thick MAP, Interdens or graphite-based gasket tested for the particular application [as appropriate for the hardware]. It is the opinion of Warringtonfire that the additional protection will not detract from the fire resistance performance under test conditions.

10.3 Essential Hardware

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

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

10.4 Latches & Locks

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

10.4.1 Single Point Engagement

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

Element	Manufacturer & Product Reference (Test Reference)
Locks & latches	<ol style="list-style-type: none"> 1. Arrone AR812 (CFR2312191 Revision 1 A) 2. Arrone AR810 Sashlock (CFR2312191 Revision 1 B) 3. Arrone AR910-R-60-SSS (CFR2405291 B) 4. Hoppe Arrone LAL0075 Tubular Latch (WF540198/R Issue 2) 5. Hoppe Arrone LAL0075 Tubular Latch-Heavy Duty 63mm (WF544268/R Issue 2) 6. Zoo ZDL0060RSS (WF540199/R Issue 2 A) 7. Zoo ZDL7260SSS (WF540199/R Issue 2 B) 8. UAP Firemongery, Intelligent Hardware, LL-11.861.SSS (WF541872/R) 9. Vier Precision Design ZDL00060 Sashlock (CFR2312141 Revision 1)

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

Element	Specification
Maximum forend and strike plate dimensions	235mm high x 25mm wide x 4mm thick
Maximum body dimensions	166mm high x 135mm wide x 16mm thick
Intumescent protection	see section 10.2
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass with a melting point $\geq 800^{\circ}$ C

Notes:

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

10.4.2 Cylinders

The table below details the tested cylinders that are approved.

Element	Manufacturer & Product Reference (Test Reference)
Cylinder	<ul style="list-style-type: none">• Arrone AR-KD-5130BB-NP (CFR2312191 Revision 1)• Assa Abloy Yale KMT4030-NP (WF540199/R Issue 2 A)• Assa Abloy Yale KMT3030-NP (WF540199/R Issue 2 B)• UAP Firemongery KIN30/30NAS-K4 (WF541872/R)• Abloy Novel CY326-VL-SC-DF (CFR2312141 Revision 1)• Yale KMT3030-NP 30:10:30 (CFR2312151)

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

- Where required for use with single point latches, the cylinder must be constructed of either brass or steel with a melting point in excess of 800°C.
- The cylinder must be compatible with the lock/latch.
- Cylinder dimensions may be up to 33mm high x 17mm wide at the maximum dimension and may be of euro profile or oval.
- Single and double cylinders, along with cylinder & turn are permitted.
- Door preparation for single cylinders shall penetrate a maximum of 2/3rds of the door thickness.
- Intumescent protection and tightness of fitting:
 - If the lock body is protected with an intumescent material, maximum clearance between leaf and cylinder is 3mm to each edge.
 - 1mm thick MAP or non-pressure forming graphite intumescent around the cylinder is optionally permitted.

10.4.3 Electro-mechanical locks

The electro-mechanical access control systems detailed in the following sections have been successfully tested and assessed with the Marksman door blanks and are therefore suitable for use within the scope stated herein.

Test Evidence (Tested configuration)	Lock Body & Keep (Dimensions)	Handleset (Dimensions)	Intumescent Protection
WF544267/R (ULSADD)	Lock Body: Abloy EL520- 100MM (Body – 168.5mm long x 133mm wide x 16.5 deep Forend – 235mm long x 24mm wide) Keep: Abloy EA322 (231mm high x 24mm wide with a 175mm high x 17.5 strike)	Abloy INOXI Long Plate 3-19/242/115 PZBL (Lever handle with back plate of 215mm x 56mm wide)	1 (t) Sealed Tight Solutions, Graphite applied under forend & keep and encasing lock body.

Notes:

1. In all instances the location of the handle must be between 800 – 1200mm from the threshold.
2. The lockset may be fitted in conjunction with the permitted cable loop defined within section 10.9.5. to achieve functionality.

10.5 Handles & Escutcheons

The table below details the tested handles that are approved.

Element	Manufacturer & Product Reference (Test Reference)
Handles	<ul style="list-style-type: none"> • Hoppe Paris EX138Z/42 (CFR2405291) • Hoppe 1385/42K (CFR2312191 Revision 1) • UAP Firemongery, Intelligent Hardware, IHC-54.608.19.SSS (WF541872/R) • Arrone AR961/10-4-SP-SSS (CFR2312141 Revision 1) • Arrone AR200S/10-SP-SAA (CFR2312151)
Escutcheons	<ul style="list-style-type: none"> • Hoppe UK Arrone AR961/67 (CFR2312191 Revision 1) • Hoppe NB321/67-SSS (CFR2312191 Revision 1) • Zoo Hardware Ltd, ZPS001SS (CFR2312141 Revision 1) • UAP Firemongery, Intelligent Hardware, IHC-51.608.3.SSS (WF541872/R) • Arrone AR200/27 (CFR2312151) • Hoppe EX425 (CFR2405291)

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

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

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

- Handle on rose with a rose diameter up to 53mm
- Handle on back plate with a back plate size up to 215mm high x 56mm wide
- Lever handle length 250mm

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

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

- Steel, stainless steel, brass, aluminium or bronze are permitted
- Surface fixings or through fixings are permitted. If through fixed there must be no more than 0.5mm clearance between the hole and the fixing.
- The escutcheon may be up to Ø53mm overall and up to 8mm thick.

10.6 Butt Hinges

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

Element	Manufacturer & Product Reference (Test Reference)
Hinges	<ul style="list-style-type: none"> Arrone AR8180-SSS (CFR2312191 Revision 1) Arrone AR8380 (WF540198/R Issue 2) Assa Abloy - Union JH603BUFR-M-BZP (WF540199/R Issue 2) UAP Firemongery, HINGE-SS201-FIRE-SQUARE-SSS (WF541872/R) Union Powerload JH603BUFS-U-BZP (WF544267/R) Hoppe AR8182-SSS (WF544268/R Issue 2)

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

Element	Specification
Blade height:	90 – 120mm
Blade width (excluding knuckle):	30 – 37mm
Blade thickness	2.5 – 4mm
Fixings:	Minimum of 4 No. 30mm long No. 8 or No.10 steel wood screws per blade
Materials:	Steel or stainless steel

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

Element	Specification		
Hinge positions:	Top	100-150mm from the head to top of hinge	
	If 3 hinges are required:	2 nd	Minimum 100mm from top hinge or centrally fitted between top and bottom hinges
		Bottom	150 – 250mm from the foot of leaf to bottom of hinge
		Top	100-150mm from the head to top of hinge
	If 4 hinges are required:	2 nd & 3 rd	Equispaced between top and bottom or 2 nd hinge 100mm from top hinge and 3 rd hinge equally spaced between 2 nd and bottom hinge
		Bottom	150 – 250mm from the foot of leaf to bottom of hinge
Intumescent protection:	See section 10.2		

Note:

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

10.7 Doorset Self Closing

Doorset automatic self-closing can be provided by:

- Overhead face fixed closers
- Concealed overhead closers

Automatic doorset self-closing devices such as transom mounted, and offset pivots used with floor springs are not considered acceptable for use with the Marksman 44 doorset range.

10.7.1 Overhead Face Fixed Closer

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

Element	Manufacturer & Product Reference (Test Reference)
Overhead face-fixed closers	<ul style="list-style-type: none">• Arrone AR1500-SE-SE (CFR2312191 Revision 1 B)• Rutland TS11205 (CFR2405291)• Arrone AR5500SD-SE (WF540198/R Issue 2)• Zoo ZDC0024A-PN (WF540199/R Issue 2 A)• Rutland TS.9205BC.SRFB.SESE (WF544267/R)

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

- Certifire approved overhead face-fixed closers for 30-minute fire resistance applications on 44mm thick timber door and timber frames

Note:

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

10.7.2 Concealed Overhead Self Closing Device

These items are suitable in the following applications only, subject to the details in the table below:

Frame options: 1 and 2

Configurations: LSASD, ULSASD, LSADD, ULSADD

The table below details the tested concealed overhead closers that are approved when fitted as tested with the body of the concealed closer morticed into the top of the door leaf and the track morticed into the frame head.

Manufacturer & Product Reference (Test Reference)	Intumescent Protection	Closer Body Dimensions	Closer Slide Arm Dimensions	Permitted Configuration and maximum leaf size if applicable	Perimeter Intumescent Specification (see section 4.5)	Minimum Head Stop Height (mm)
Arrone AR7383-SE (CFR2312191 Revision 1 A, CFR2312151 A)	Intumescent Seals Ltd, Therm-A-Flex, 2 (t) on top of the closer body and encasing the closer slide arm track. 1 (t) under the forends and lining the vertical edge of the body rebate local to the gearing. OR Mann McGowan, Pyrostrip 400CGSA, 2 (t) on top of the closer body and encasing the closer slide arm track.	Body 50 (h) x 340 (l) x 33 (w)	Track: 440 (l) x 15 (h) x 23 (w)	LSASD ULSASD LSADD ULSADD	AS/1 AS/2 AS/3 AS/5 BS/2 BS/3 BS/5 CS/3 CS/8 DS/3 DS/8	12
Rutland ITS.11204 (WF540199/R Issue 2 B)	Rutland IP.144, 2 (t) Graphite self-adhered pre-cut to shape on top of the door closer and around the sides of slide channel in the frame	Body 57 (h) x 243 (l) x 32 (w)	Track: 460 (l) x 19 (h) x 29 (w)			

Note:

Based on the test evidence the above tested and assessed concealed closers are permitted for use with the doorset design subject to the following parameters:

- Minimum frame head dimensions must be as defined within section 7 for each frame type.
- The details identified in the table above for the following items must be followed for the selected concealed overhead closer, and is based on the tested arrangements:
 - Permitted configuration(s).
 - The frame must be fitted with a head stop of the minimum size.
 - Intumescent protection to the concealed closer as identified above must be applied.
 - Leaf perimeter intumescent details.
- It must be ensured that the concealed overhead closer is of sufficient strength and power to ensure the door leaf/leaves fully engage into the frame reveal.
- The dimensions of the concealed overhead door closer must not exceed the dimensions given within the tables above.

10.8 Bolts

10.8.1 Flush Bolts

Flush bolts may be incorporated centrally into the top and bottom of one meeting edge, providing the following maximum dimensions are not exceeded and the components are fitted opposite the edge fitted with intumescent strips:

- 204mm long x 36mm deep x 20mm wide. (WF540198/R Issue 2)

Flush bolts must be steel, and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice of the keep and body must be protected with intumescent gaskets as specified in section 10.2. Alternatively, the hardware manufacturers tested gaskets may be used providing the quantity of intumescent is equal to or greater than required in section 10.2.



Example of Flush bolt installation and intumescent protection

10.8.2 Surface Mounted Face Fixed Bolts

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

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

Intumescent protection is not required.

10.9 Non-Essential Hardware

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

10.9.1 Pull Handles

Steel, stainless steel or bronze handles may be surface-fixed or bolted through the door leaf, providing the length is limited to 1200mm between the fixing points. If through fixed, there must be no more than 1mm clearance between the hole and stud.

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

10.9.2 Push Plates & Kick Plates

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

Approved specification:

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

10.9.3 Security Viewers

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

Components with the following specification are also deemed acceptable.

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

10.9.4 Door Selectors

These items are suitable in the following applications:

Configurations: All double leaf door configurations

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

10.9.5 Cable Loops & Cable Ways

Where cable ways are required within the doorset design no recessing of frame or leaf is permitted except the item of hardware and the inclusion of a single hole to facilitate cabling which is no greater than Ø12mm. The hole must be abutting the element of hardware which it is required to facilitate and is only permitted when the frame to which the leaf is hung is adjacent to the supporting structure.

10.9.5.1 Cable Loops

The table below details the tested and assessed cable loops that are approved.

Test Evidence (Tested configuration)	Item & dimensions (mm)	Hardware Intumescent Protection (mm)	Minimum Perimeter Intumescent (Specified in Section 4.5)
WF544267/R (ULSADD)	Abloy, EA280 Concealed Loop, 323 high x 17 deep x 24 wide	1 (t) Sealed Tight Solutions Ltd, Graphite must be applied encasing the body and under the forend of the cable loop & 2 (t) Sealed Tight Solutions Ltd, Graphite must be applied lining the inside of the cable loop under the spring.	Intumescent seal specification must meet the criteria given in the text below this table and correspond to the intumescent permitted in section 4.5.

Based on the test evidence, which was conducted with Marksman 44, the above tested and assessed cable loop is permitted for use with the doorset design subject to the following parameters:

Configurations: LSASD, ULSASD, LSADD, ULSADD

- When a cable loop is fitted, the leaf perimeter edge intumescent must be located into the frame reveal along the hanging edge.
- In all instances the location of the bottom of the cable loop body forend must be between 595–995mm from the floor level.
- Intumescent protection to the cable loop used must be as tested and identified within the table above.
- The cable loop body may be rebated into the leaf edge or alternatively the frame reveal, in both instances the positioning shall remain central to the thickness of the leaf.
- When the cable loop body is rebated into the frame reveal, the frame intumescent must be one of the following tested intumescent seals when using one of the identified cable loops:
 - Sealed Tight Solutions Ltd

10.9.5.2 Cableways

Cableways through the leaf have been tested and are therefore permitted in the following method detailed in the following sections in conjunction with the cable loops in section 10.9.5.

Cableways are not permitted at the perimeter of a glazed apertures in a leaf

Cableways must be a minimum of 44mm from any apertures within the leaf e.g. glazing, air transfer grilles or letter plates etc.

Grooves cannot be located within 44mm of any cableway.

10.9.5.2.1 Cableway Method 1

This method has been successfully tested in test reference WF544267/R with associated hardware. Cableway method 1 is therefore suitable for use within the following scope:

Configurations: LSASD, ULSASD, LSADD, ULSADD

- A hole drilled horizontally, centrally through the leaf of maximum 12mm diameter.
- The cable must be PVC encased.
- A minimum of 50% of the diameter of the 12mm hole drilled must be lined with Sealed Tight Solutions Ltd, STS Cable Pro Graphite based intumescent to the entire length of the hole through the leaf.
- The hole must be located no higher than 1300mm from the threshold.

10.9.6 Environmental Seals

A number of different environmental seals have been successfully tested as part of the Marksman 44 doorset design. Based on this testing the table below details the approved environmental seals included within the summarised evidence within section 3:

Product Reference & Manufacturer (Test Reference)
Mann McGowan, ACS 1 (CFR2312141 Revision 1)
Sealmaster, Delta (CFR2405291)
Norseal, NOR710 (WF544268/R Issue 2)
Fire & Acoustic Seals Ltd, FAS39 (WF540198/R Issue 2)
Sealed Tight Solutions Ltd, ST1009 (WF544267/R)

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

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

10.9.7 Threshold Drop Seals

A number of drop seals have been successfully tested and detailed in the table below. It is permitted for use without the requirement for any intumescent protection.

Note, if a rebated drop seal is fitted to the doorset then flush bolts, if approved, may not be fitted to the bottom of the doorset.

Product Reference & Manufacturer (Test Reference)	Intumescent Protection (mm)
Sealmaster, Dropseal DRP2712E (CFR2405291 B)	None Required. 1 (t) Intumescent Seals Ltd, Therm-A-Strip may be optionally applied encasing the drop down seal body.
Fire & Acoustic Seals Limited, FAS45 (WF540198/R Issue 2)	None Required.
Mann McGowann, Enviroseal 420-S (WF541872/R)	None Required.
Sealed Tight Solutions ST 422 (WF544267/R)	None Required.
Norseal, NOR 810S (WF544268/R Issue 2)	None Required.
Mann McGowan 1703 ACU (CFR2312141 Revision 1)	1 (t) Mann McGowan Pyrostrip applied encasing the drop down seal in the bottom of the leaf edge.

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

- Certifire approved threshold drop seals for 30-minute fire resistance applications on 44mm thick timber / cellulosic doors in timber / cellulosic frames or timber / cellulosic doors in metal frames as appropriate for the frame utilised with the doorset design.
- The threshold drop seal must not exceed:
 - Body dimensions of 31mm (h) x 14mm (t)
- The Certifire certificate shall be adhered to for intumescent protection and fitting requirements.

10.9.8 Knockers, Numerals & Signage

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

Approved specifications:

Knockers:

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

Numerals & Signage:

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

10.9.9 Security Chains

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

Approved specification:

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

10.9.10 Fire Door Identification Plates

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

These may be required to identify the following:

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

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

10.9.11 Panic Hardware

Certifire approved panic hardware may be fitted, providing the installation does not require the removal of any timber from the leaf, stop or frame reveal and it does not interfere with the self-closing action of the door leaf, except to facilitate screw fixings.

The fitting of panic hardware is not considered to change the latching arrangement of the doorset and therefore the permitted leaf size shall be established using unlatched doorset configurations as detailed within section 4.5.

11 Installation




11.1 General

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

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

11.2 Door Frame Installation

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



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


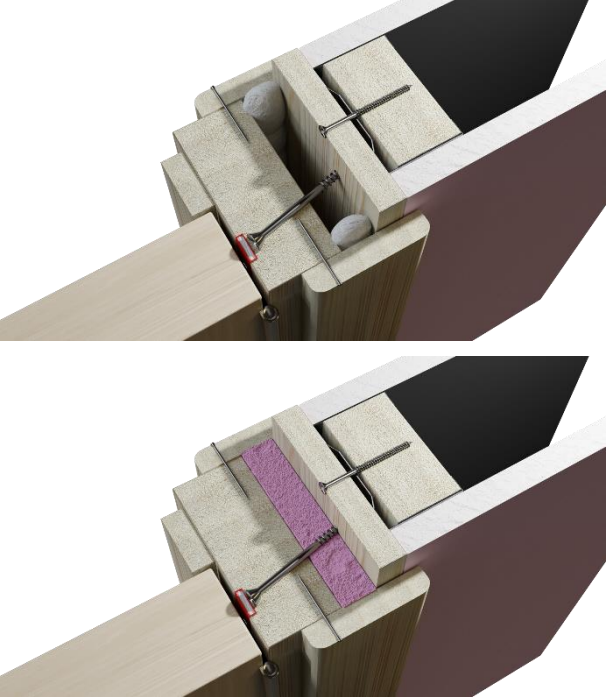
Note:

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. When fitted within a masonry construction as detailed in section 11.5 the entire thickness of the leaf shall be within the thickness of the masonry element.

11.3 Firestopping

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

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

Gap (mm)	Requirement	3D model depiction
Up to 20	<p>Gap must be filled to the full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1.</p> <p>Timber architraves of a minimum 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.</p>	
Over 20	<p>A timber based or non-combustible subframe up to 50mm thick can be inserted and fixed to the wall bedded on intumescent mastic, the gap between door frame and subframe filled as follows:</p> <p>Gaps 5 to 10mm filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1.</p> <p>Timber architraves of a minimum 18mm thick must be fitted to both faces, fitted with a minimum 15mm overlap to the door gap.</p>	

11.4 Packers

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

Packers must be present local to each fixing position.

11.5 Wall Types, Structural Opening & Fixity

11.5.1 Wall Types

The following wall types are approved for this doorset design:

- a) Plasterboard clad timber stud partitions
- b) Plasterboard clad steel stud partitions including timber lining
- c) Masonry constructions

Wall types a & b above must have supporting fire resistance test evidence which demonstrates that it is capable of staying in place and intact for a minimum of 30 minutes supporting a doorset design.

Wall type c above must be determined to be able to provide at least the same level of fire resistance of the doorset design.

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

- Plasterboard clad timber stud partitions, the timber stud will be of sufficient dimensions such that the fixing for the door frame penetrates into solid timber.
- Plasterboard clad steel stud partitions will include a timber lining of sufficient dimensions such that the fixing for the door frame penetrates into solid timber.
- Masonry constructions are anticipated to be constructed of a solid block or brickwork to receive the fixings.

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

11.5.2 Structural Opening

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

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

11.5.3 Fixity

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

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

For all other configurations of doorset, the upper horizontal framing section abutting the structural opening must also be secured to the wall using steel fixings at 600mm maximum centres and maximum of 200mm from corner. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 50mm.

11.6 Post Production (Onsite) Leaf Size Adjustment

The Marksman 44 range of doorsets may be altered as follows:

Leaf Size Adjustment Specification	
Element	Reduction
Lipping	The post-production lipping thickness may be reduced by 1mm for fitting purposes, providing that the door gaps and intumescent conditions remain as required by this assessment and the minimum limitation in terms of lipping thickness is still maintained.

11.7 Door Gaps

Door gaps and alignment tolerances must fall within the following range:

Door Gap & Alignment Tolerance Specification	
Location	Dimension
Door edge gaps	A minimum of 2mm and a maximum of 4mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm but may be fitted to sit back from the opening face by up to 2mm.
Bottom edge of the leaf This is the maximum tolerance for fire resistance only.	8mm between bottom of leaf and top of floor covering.

12 Insulation Performance

Insulation performance may be claimed for a doorset to this design in line with the following table:

Insulation Performance Criteria	
Type	Details
Non-insulating	Doorsets incorporating greater than 20% of non-insulating glazing
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Unglazed doorsets or doorsets including 30-minute insulating glazing (as defined within section 6)


13 Conclusion

If Marksman 44 doorsets constructed in accordance with the specification documented in this field of application were to be tested in accordance with BS 476: Part 22: 1987, it is our opinion that they would provide a minimum of 30 minutes integrity and insulation (subject to section 12).

14 Declaration by the Applicant

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

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

Signed:  Signed by:
9A3864775705477...

Name: Neil Harrison

Position: Director

Date: 24-Sep-2024

For and on behalf of: Wood International Agency Ltd

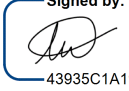
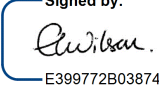
15 Limitations

The following limitations apply to this assessment:

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

16 Validity

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

Position:	Assessor	Reviewer
Signature:	Signed by:  43935C1A192A419...	Signed by:  E399772B03874B1...
Name:	N Whitelock*	E L Wilson*
Title:	Technical Manager, Doors & Smoke Leakage	Senior Product Assessor

* For and on behalf of Warringtonfire

Appendix A: Revisions

Rev.	WF Ref.	Date	Description