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Title

Field of Application for:

The Falcon Strebord© 35+, Strebord© 35+ Banded Cores & Strebord© Superpan Range of Doorsets Using 44mm thick 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 Falcon Panel Products Limited and relates to the fire resistance of 30 minute fire resisting doorset designs.

The report is for National Application and has been written in accordance with the general principles outlined in BS EN 15725: 2010; *Extended application reports on the fire performance of construction products and building elements*.

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

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

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

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

CERTIFIRE supporting documentation has been used to enhance the scope of application within this evaluation. At the time of issue of this document, the relevant documentation has remaining validity. The referenced supporting documentation must retain validity, with the same conclusions maintained for the aspects considered herein, in order that the relevant scope generated within this field of application report remains valid. This may necessitate a review of more recent iterations of supporting documentation, against those referenced in this assessment report. If the scope of the relevant supporting documentation changes, then Warringtonfire must be consulted to review the changes, and to consider their effect on the outcomes of this assessment report.

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 Falcon Panel Products door constructions listed below:

1. Strebord© 35+: A fabricator assembled blank of nominal thickness 43mm thick comprising a 35mm thick three layer chipboard core and a final facing of 4mm MDF.
2. Strebord© 35+ Banded Core: A fabricator assembled blank of nominal thickness 43mm thick comprising a 35mm thick three layer chipboard core, bounded by perimeter stiles and rails, with a final facing of 4mm MDF.
3. Strebord© Superpan: A factory pressed blank with MDF faces nominally 44mm thick,

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.

2.1 Assumptions

- All densities referred to in this document are based upon an assumed moisture content of 10-12%.
- It is assumed that unless otherwise documented in the field of application sections of this report, the doorset subject to this report will be constructed in accordance with the test evidence referred to herein.
- For components created using solid timber sections referred to in this assessment, it is assumed that, for all timbers, they will be of a quality deemed to meet or exceed class J30 as specified in BS EN 942: 2007, subject to adequate repairs, other than glazing beads which must meet a minimum class J10. Note that areas under intumescent seals/gaskets are not considered to be concealed faces and defects must be repaired.
- Where timber is referred to within this document it is assumed that the timber element is made from a continuous solid piece, unless specifically detailed otherwise.
- All dimensions detailed herein may be varied by ±2% except where minimum, maximum or a range of dimensions are given.
- All edge morticed hardware (except hinges) are to be positioned centrally within the leaf thickness unless expressed otherwise in the Section 11.

3 Test Data

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

Note:

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

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

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

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

The same time temperature curve is used to control the temperature within the furnace for both test methods (the heating curve given within ISO 834-1). However, the plate thermocouple used to record the temperature within the furnace for the EN test method, requires a longer thermal exposure to read the same temperature as the probe thermocouple that is used for the BS 476: Part 22: 1987 test, particularly during the early stages of the test. Furthermore, the neutral pressure regime is positioned lower relative to the specimen height in a European fire door test, therefore resulting in greater relative positive pressure conditions than those expected in a BS 476-22: 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 citied 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 Falcon Strebord© 35+, Strebord© 35+ Banded Cores & Strebord© Superpan range of doorset designs if tested in accordance with BS 476: Part 22: 1987.

3.1 Primary Test Evidence

3.1.1 Test Report – RF11172

The referenced test report which comprised a Strebord 35+ door leaf in an unlatched pair configuration, the essential details of which are summarised below.

Date of Test:	28/11/2011
Identification of Test Body:	Warringtonfire Testing and Certification Ltd (Formerly CIFL). UKAS No. 1762
Sponsor:	Falcon Panel Products
Tested Product:	Unlatched, Single Acting, Double Leaf, Flush Timber Doorset with a Glazed Aperture to slave leaf – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was not sampled.
Summary of Test Specimen:	Leaf: Overall Size: 2135 (h) x 915/915 (w) x 43mm (t) Core: Falcon Strebord© 35 (580kg/m3), 35mm thick Main Leaf Lipping: Sapele (640kg/m3),35x8mm thick to vertical edges only Slave Leaf Lipping: Sapele (640kg/m3), 43x8mm thick to vertical edges only Lipping Adhesive: Polyurethane Facing: MDF (750kg/m3), 4mm Thick - Facing oversails lippings on Main Leaf Facing Adhesive: PVA Frame: Head & Jambs: MDF (750kg/m3), 70 x 25mm thick, with 20 x 12mm thick pinned planted stop. Frame Fixing: 4 No, 100mm long steel screws per jamb. Threshold: Non-Combustible Intumescent: Frame Reveal: 1 No. 15x4 Pyroplex Rigid Box Seal FO8700. Fitted centrally. Meeting Stiles: 1 No. 15x4 Pyroplex Rigid Box Seal FO8700. Fitted centrally on one meeting edge only. Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. Royde & Tucker H105 per door leaf. Closer: 1 No. Rutland TS3204 per leaf Latch: Eurospec Tubular Steel Mortise Latch Latch Size: Forend: 57x26mm, Keep: 57x26mm. Lock/Latch Status: Disengaged for test. Flush Bolt: None Fitted Handle: Aluminium lever type handle – 101x38mm (footprint)

	Hardware Protection: Under Hinges: None Fitted Under Forend & Keep: None Fitted Around Lockcase: None Fitted Glazing (Slave Leaf Only): Glass: Pilkington Pyroshield 2 – 7mm thick Aperture Size: 685 x 685mm wide Beading: Sapele (640kg/m3), 20 x 20mm high, 19 degree chamfer & 5x5mm bolection. Bead Fixing: 40mm long steel pins, at 45 degrees, 150mm centres & 50mm from corners. Glazing System: Glazing Perimeter: 10x2mm thick ISL Therm-A-Glaze 45 Strip, between glass & bead. Glazing Aperture Liner: None Fitted
Test Standard:	BS 476 Part 22: 1987
Performance:	**Integrity:** 39 minutes **Insulation:** 39 minutes (glazing not evaluated)

3.1.2 Test Report – WF418407 – (Doorset B)

The referenced test report which comprised a Strebord 35+ door leaf in a latched single leaf configuration, the essential details of which are summarised below:

Date of Test:	03/09/2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products
Tested Product:	Unlatched, Single Acting, Single Leaf, Flush Timber Doorset with a glazed Aperture – LSASD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was not sampled
Summary of Test Specimen:	Leaf: Overall Size: 2041 (h) x 926 (w) x 44mm (t) Core: Falcon Strebord© 35 (512kg/m3), 35mm thick Lipping: Sapele (640kg/m3), 44x8mm thick to all four edges Lipping Adhesive: Caberfix Norbond D4 PUR Facing: MDF (757kg/m3), 4mm Thick Frame: Head & Jambs: Falcon Panel Products Streframe E (510kg/m3), 105 x 32mm thick, with 30 x 15mm thick planted stop. Frame Fixing: 4 No. 6 x 100mm long steel screws per jamb. Threshold: Non-Combustible Intumescent: Frame Reveal 1 No. 15x4 Lorient 617 LP1504DS. Fitted centrally. Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. Enduro Butt Hinges (101x31x3mm blade size). Closer: 1 No. Briton 1120 Overhead Closer Lock/Latch:1 No CISA ego ANZ mortice latch Lock/Latch Size:, Forend: 203 x 26mm, Keep: 70 x 28mm. Lock/Latch Status: Engaged for test. Handle: CISA ego ANZ integral handle – 265x68mm footprint. Hardware Protection: Under Hinges: None Fitted Under Forend & Keep: 1mm thick Interdens. Around Latch Rebate (frame): 1mm thick Interdens Around Lockcase: 1mm thick Interdens Glazing (Main Leaf): Glass: Fireglass UK – Pyroguard, 7.2mm thick. Aperture Size: 1200x200mm

	Beading: Sapele (640kg/m3), 22 x 22mm high, 15 degree chamfer & 6x6mm bolection. Bead Fixing: 1.8 x 60mm long steel pins, at 30 degrees, 100mm centres & 50mm from corners. Glazing System: Glazing Perimeter: 23x3mm thick Lorient Flexible Figure 1, between glass & bead. Glazing Aperture Liner: None Fitted
Test Standard:	BS 476 Part 22: 1987
Performance:	**Integrity:** 8 minutes **Insulation:** 8 minutes
Reason for Use (if test failed)	Frame material, lock type. Perimeter failure exceeded 30 minute test requirement.
Failure Mode: (if test failed)	Initial Failure: Continuous Flaming at glazing - 8 minutes *Glazing boarded over at 20 minutes.* Further Failure: Cotton pad at middle hinge position – 34 minutes

Note: The test evidence can be used to support the Strebord 35+ and Superpan with projecting frames as the glazing failure can be considered in isolation from the door frame. The failure of the glazing in the above test has been addressed by not permitting the Pyroguard glass with the tested system, which has been addressed in section 6 of this report.

3.1.3 Test Report - RF12061

The referenced test report which comprised Strebord 35+ Banded Core door leaves in an unlatched pair configuration the essential details of which are summarised below.

Date of Test:	23/05/2012
Identification of Test Body:	Warringtonfire Testing and Certification Ltd (formally CIFL). UKAS No. 1762
Sponsor:	Falcon Panel Products
Tested Product:	Unlatched, Single Acting, Double Leaf, Flush Timber Doorset – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was not sampled
Summary of Test Specimen:	Leaf: Overall Size: 2138 (h) x 916/916 (w) x 43mm (t) Core: Falcon Strebord© 35 (512kg/m3), 35mm thick Lipping: Beech (730kg/m3), 35x8mm thick to vertical edges only Lipping Adhesive: Polyurethane Facing: MDF (757kg/m3), 4mm Thick - Facing oversails lippings Facing Adhesive: PVA Top Rail: European Redwood (430 to 508kg/m3), 40 x 35mm thick Bottom Rail: European Redwood (430 to 508kg/m3), 40 x 35mm thick Lock Rail: European Redwood (430 to 508kg/m3), 40 x 35mm thick Stiles: European Redwood (430 to 508kg/m3), 40 x 35mm thick Frame: Head & Jambs: European Redwood (510kg/m3), 70 x 32mm thick, with 20 x 12mm thick planted stop. Frame Fixing: 4 No. 100mm long steel screws per jamb. Threshold: Non-Combustible Intumescent: Frame Reveal: 1 No. 10x4 Mann McGowan Pyrostrip 100P. Fitted centrally in the frame reveal. Meeting Stiles: 2No 10x4 Mann McGowan Pyrostrip 100P. Spaced 10mm apart Fitted centrally on the primary leaf (lock fitted) meeting edge only. Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. Royde & Tucker H101 per jamb Closer: 1 No. Rutland TS3204 per leaf (exposed face) Lock/Latch: 1 No. Arrone 3 lever mortice latch Lock/Latch Size: Forend: 155 x 22mm, Keep: 155 x 24mm. Lock/Latch Status: Disengaged for test. Flush Bolt: None Fitted Handle: Aluminium Lever Type Handle – 100x3

	Hardware Protection: Under Hinges: None Fitted Under Forend & Keep: None Fitted Around Lockcase: None Fitted
Test Standard:	BS 476 Part 22: 1987
Performance:	**Integrity:** 34 minutes **Insulation:** 34 minutes

3.1.4 Test Report – WF514734

The referenced test report which comprised an unlipped Strebord 35 + Banded Core door leaves in an unlatched pair configuration with projecting frames, the essential details of which are summarised below.

Date of Test:	15/02/2022
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1314
Sponsor:	Falcon Panel Products
Tested Product:	Unlatched, Single Acting, Double Leaf, Flush Timber Doorset with multiple glazed apertures – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was sampled – Contract Ref. SC22005
Summary of Test Specimen:	Leaf: Overall Size: 2189 (h) x 969/969 (w) x 44mm (t) Core: Falcon Strebord© 35 (664kg/m^3), 35mm thick Lipping: No lippings fitted Facing: Finsa Fibranor MDF (790kg/m^3), 4mm Thick Facing Adhesive: Easybond D3 Cross linking PVA Top Rail: European Redwood 647kg/m^3, 32 x 35mm thick Bottom Rail: European Redwood 647kg/m^3, 32 x 35mm thick Lock Stile: European Redwood 647kg/m^3, 32 x 35mm thick Hinge Stile: European Redwood 647kg/m^3, 32 x 35mm thick Stiles and rails glued (PVA D3 Crosslinking) to core face and stapled in place (arrow T50 staples 14mm – positioned in corners and at nominally 180mm centres to one face of the blank), to hold in position during pressing. Frame: Head & Jambs: Redwood (428kg/m^3), 107 x 32mm thick, with 32 x 12mm thick planted stop. Frames projected from the partition by 18mm. Frame Fixing: 4 No. 7.5 x 100mm long steel concrete screws per jamb. Threshold: Non-Combustible Intumescent: Frame Reveal: 1 No. 15x4 Lorient 617 LP1504. Fitted centrally. Meeting Stile: 2 No. 10x4 Lorient 617 LP1004. Fitted centrally, 10mm spaced. Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. ZOO Hardware ZHSSW243RP – Ball Bearing Butt hinges (102x30x2mm blade size). Closer: 1 No. Rutland TS11205.SR.SESE Overhead Closer per leaf Lock/Latch:1 No Legge (Allegion) – G2 Series – G50PD C6 NEP SCP Lock/Latch Size: Lockcase: Dia 52mm x26mm deep, Forend: 57 x 25.6mm, Keep: 70 x 30x2mm.

	Lock/Latch Status: Disengaged for test. Handle: Legge – G2 Series – 127x27x9 to 5mm thick, 55mm projection. Rose: Dia 75x18mm. Dropseal: Lorient LAS8001Si – 35x14mm – c/w metal faceplates <u>Hardware Protection:</u> Under Hinges: None Fitted Under Forend & Keep: 1mm thick Lorient Sodium Silicate Around Latch Rebate (frame): 1mm thick Interdens Around Lockcase: 1mm thick Lorient Sodium Silicate to lock cheeks. 1mm Lorient Interdens wrapped around circumference of lock body. <u>Glazing (Main Leaf):</u> Glass: Pyroguard, 7mm thick Pyroguard 2. Aperture Sizes: 989x669mm & 640x240mm in each leaf Beading: Sapele 20 x 20mm high, 15 degree chamfer & 5x5mm bolection. Bead Fixing: 1.6 x 50mm long steel pins, at 30-35 degrees, 150mm centres & 50mm from corners. <u>Glazing System:</u> Glazing Perimeter: 13x3.5mm thick Lorient Flexible Figure 1, between glass & bead. Glazing Aperture Liner: None Fitted
Test Standard:	BS EN 1634-1:2014+A1:2018
Performance:	**Integrity:** Sustained flaming: 32 minutes Cotton pad test: 32 minutes Gap gauge: 4 minutes (Glazing failure) **Insulation:** Maximum set: 4 minutes Average set: 4 minutes
Reason for Use (if test failed)	All components except glazing exceeded 30 minute test requirement.
Failure Mode: (if test failed)	Initial Failure: 25mm gap gauge at glazing - 4 minutes *Glazing boarded over at 5 minutes.* Further Failure: Cotton pad at right leaf top hinge position – 32 minutes

3.1.5 Test Report – WF426842 Doorset A

The referenced test report which comprised Strebord 35+ door leaf in a latched single leaf configuration with telescopic architraves, concealed overhead closer and Sealed Tight Solutions fire seals, the essential details of which are summarised below.

Date of Test:	26/03/2020
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 0249
Sponsor:	Falcon Panel Products
Tested Product:	Unlatched, Single Acting, Double Leaf, Flush Timber Doorset – ULSASD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was not sampled
Summary of Test Specimen:	Leaf: Overall Size: 2202 (h) x 950 (w) x 43mm (t) Core: Falcon Strebord© 35 (572kg/m^3), 35mm thick Lipping: Sapele (730kg/m3), 35x8mm thick to all edges Lipping Adhesive: Polyurethane (Kaberfix D4 PU) Facing: Medite MDF (735kg/m^3), 4mm Thick Facing Adhesive: PVA – D3 (Eurostick) Frame: Head & Jambs: European Redwood (480kg/m^3), 95 x 32mm thick, with 32 x 12mm rebated stop. Frames have 5.5x25mm (deep) grooves infilled with plywood to simulate telescopic architraves. Frame Fixing: 4 No. Dia 5.4x100mm long steel screws per jamb with plastic packers at each location. Threshold: Non-Combustible Intumescent: Frame Reveal: 1 No. 15x4 Sealed Tight Solutions ST1504. Fitted centrally in the frame reveal. Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. Hoppe AR8182 Steel Ball Bearing Butt Closer: 1 No. Arrone AR6383 Concealed Overhead Body Dims: 254 (l) x32 (w) x55 (d)mm Slide Rail Dims: 464 (l) x23 (w) x15 (d)mm. Lock/Latch: 1 No. Arrone AR8100 Lock/Latch Size: Lockcase: 165 x 88 x 16mm, Forend: 235 x 24mm, Keep: 233 x 24mm. Lock/Latch Status: Engaged for test Flush Bolt: None Fitted Handle: Hoppe Paris - Steel - 141mm long x 20mm diameter x 68mm projection on a 55mm diameter x 3mm deep rose.

	Dropseal: STS ST422 – 20x12mm fitted centrally within the doorleaf thickness. <u>Hardware Protection:</u> Under Hinges: 1mm STS Raw Graphite (102x30x1mm) under all hinge blades Under Forend & Keep: 1mm STS Raw Graphite Around Lockcase: 1mm STS Raw Graphite Concealed Closer: 1mm STS Raw Graphite (on all surfaces contacting the closer / channel mortices) Dropseal: 20x2mm STS Raw Graphite to the vertical sides of the dropseal. <u>Glazing:</u> Glass: CGI – Pyroguard 2 , 7mm thick. Aperture Size: 1394x194mm Beading: Sapele (684kg/m^3), 24 x 23mm high. Bead Fixing: Ø1.6 x 60mm long steel pins, 150mm centres & 50mm from corners. <u>Glazing System:</u> Glazing Perimeter: 10x5mm thick STS ST105 closed cell foam tape, between glass & bead. Glazing Aperture Liner: None Fitted
Test Standard:	BS 476 Part 22: 1987
Performance:	**Integrity:** 29 minutes **Insulation:** 9 minutes
Reason for Use (if test failed)	All components except glazing exceeded 30 minute test requirement.
Failure Mode: (if test failed)	Initial Failure: Sustained flaming on the glazing adjacent to the lever handle – 29 Minutes Further Failure: continuous Flaming at 35 mins – glazing & closer positions - 35 minutes

3.1.6 Test Report – WF433833 – Strebord© Superpan

The referenced test report, the essential details of which are summarised below

Date of Test:	15/10/2020
Identification of Test Body:	Warringtonfire Testing and Certification Ltd (Formerly CIFL). UKAS No. 1762
Sponsor:	Falcon Panel Products
Tested Product:	Unlatched, Single Acting, Double Leaf, Flush Timber Doorset – ULSADD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was sampled – Contract Ref. SC20181
Summary of Test Specimen:	Leaf: Overall Size: 2100 (h) x 903/903 (w) x 44mm (t) Core: Falcon Superpan (density range 595.44 to 600.68 kg/m^3), 44mm thick Lippings: Sapele (640kg/m^3), 44x8mm thick to vertical edges only Lipping Adhesive: Polyurethane Adhesive – Hand Applied – Air Cured. Facing: MDF 3mm (Nominal) integral with core material Frame: Head & Jambs: European Redwood (510kg/m3), 69 x 33mm thick, with 18x12.5mm thick pinned planted stop. Frame Joint: 12 mm trench screwed and glued (PVA adhesive) Frame Fixing: 4 No, 80mm long steel screws per jamb Threshold: Non-Combustible Fire Stopping: Rockwool - full depth of frame (allowing for 10 mm mastic capping either side after installation) Intumescent: Frame Reveal: 1 No. 10x4 Mann McGowan Pyrostrip 100PSA. Fitted 17mm from opening face. Meeting Stiles: 2 No. 10x4 Mann McGowan Pyrostrip 100PSA. Spaced 10mm apart. Fitted centrally on one meeting edge only Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. Royde & Tucker H101 per door leaf. Closer: 1 No. Rutland TS3204 per leaf Latch: Sparka Tubular Steel Mortise Latch Latch Size: Lockcase: Forend: 58x27mm, Keep: 57x24x1mm. Lock/Latch Status: Disengaged for test Flush Bolt: None Fitted Handle: Aluminium lever type handle on dia 52mm rose. Hardware Protection: Under Hinges: 1mm Mono Ammonium Phosphate (MAP) under each blade.

	Under Forend & Keep: 1mm Mono Ammonium Phosphate (MAP) Around Lockcase: 1mm Mono Ammonium Phosphate (MAP)
Test Standard:	BS 476 Part 22: 1987
Performance:	**Integrity:** 31 minutes **Insulation:** 31 minutes

3.2 Secondary Test Data

3.2.1 Test Report – RF11161 – Strebord© 35

The referenced test report, the essential details of which are summarised below, is supporting evidence for the inclusion of grooved facings in the door leaf face based upon the 35mm thick core component being tested without any additional facings.

Date of Test:	21/11/2011
Identification of Test Body:	Chiltern International Fire (now trading as Warringtonfire Testing) UKAS ref: 1762
Sponsor:	Falcon Panel Products Ltd.
Tested Product:	Unlatched, single acting, double leaf, timber based doorset with glazing.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimens were not sampled.
Summary of Test Specimen:	Leaf dimensions: 2135 (h) x 915/915 (w) x 35 (t). Both leaves comprised a Falcon Strebord© 35 core, vertical edges of the leaves were lipped with 8 (t) Sapele of nominal density 770kg/m^3. Door frame: 70 (w) x 25 (t) European Redwood, density 465 kg/m^3 with 12 (t) planted stop. 1No. 15 x 4 Pyroplex PVC encased intumescent seal ref: FO8700 was fitted centrally into the frame head and jambs and in one leaf meeting edge. No intumescent protection was installed to protect hardware. The specimen was hung in a European Redwood frame on 3No. steel bearing lift off type hinges per leaf, together with a lever operated mortice latch, disengaged for the test. A surface mounted overhead door closer, was fitted to the exposed face of the leaves. A pane of 7mm thick Pilkington Pyroshield glass of size 690 x 690mm was protected with Sapele beads and ISL Therm-A-Strip seals. The doorset was oriented to open in towards the furnace.
Test Standard:	BS 476 Part 22:1987
Performance:	Integrity: 32 Insulation: 32* *In accordance with the note to clause 7.6.1.1 of BS 476 Part 22:1987, the glazing was not evaluated for insulation.

3.2.2 Test Report – WF423917 Doorset B (DRAFT)

The referenced test report which comprised Strebord 35+ door leaf in a latched single leaf configuration which included a concealed overhead door closer, the essential details of which are summarised below.

Date of Test:	21/01/2020
Identification of Test Body:	Warringtonfire Testing and Certification Ltd UKAS No. 1314
Sponsor:	Falcon Panel Products
Tested Product:	Latched, Single Acting, Single Leaf, Flush Timber Doorset – LSASD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimen was not sampled
Summary of Test Specimen:	Leaf: Overall Size: 2200 (h) x 950 (w) x 43mm (t) Core: Falcon Strebord© 35 (512kg/m3), 35mm thick Lipping: Sapele (640kg/m3), 43x8mm thick to vertical edges only Lipping Adhesive: Polyurethane (Henkel Technomelt 270/7) Facing: MDF (734kg/m^3), 4mm Thick Facing Adhesive: Eurostick D3 PVA Frame: Head & Jambs: European Redwood (510kg/m3), 100 x 32mm thick, with 54 x 12mm integral stop. Frame Fixing: 6 No. steel screws per jamb Threshold: Non-Combustible Architrave: None fitted. Fire Stopping: Rockwool - full depth of frame (allowing for 10 mm mastic capping either side after installation) Intumescent: Frame Reveal: 1 No. 15x4 Pyroplex Rigid Box with Twin Smoke Seals Ref 30175. Fitted centrally in the frame reveal. Bottom Leaf Edge: None Fitted Hardware: Hinges: 3 No. Eurospec Stainless Steel Butt Hinges Ref. HIN1433 Closer: 1 No. Arrone AR7383 Concealed Overhead Closer Body Dims: 242 (l) x49 (w) x 32 (d)mm Slide Rail Dims: 464 (l) x23 (w) x15 (d)mm Lock/Latch: 1 No. Allgood 7204 (Din std) mortice Latch Lock/Latch Status: Engaged for test Handle: Arrone AR200S/10-UN-SAA - Lever Type Handle, Rose: Ø 52mm, Lever: 65 deep x 143 long x Ø19mm GLAZING:

	• Glass: Pyrobelite 7mm thick a. Aperture Size: 1402mm(h) x 202mm(w) b. Sight Size: 1370mm(h) x 170mm(w) • Beading: Sapele (640kg/m³) 23 high x 24 deep including a 8 high x 9 deep bolection return and an 15° chamfer • Bead Fixing: Ø1.6x50mm steel pins, 30 - 50mm from the corners and at 150mm intervals. <u>GLAZING SYSTEM:</u> Glazing Perimeter: Sealed Tight Solutions Ltd ST105 5mm glazing tape fitted between the glass and the glazing bead. Hardware Protection: Under Hinges: 1mm thick STS graphite fitted under each hinge blade Under Forend & Keep: 1mm thick STS graphite Around Lockcase: 1mm thick STS graphite Concealed Closer – Arrone AR7383 MAP Intumescent Kit.
Test Standard:	BS EN 1634-1:2014+A1:2018
Performance:	**Integrity:** Sustained flaming: 36 minutes Cotton pad test: 13 & 25 minutes Gap gauge: 37 minutes **Insulation:** Maximum set: 13 minutes Average set: 13 minutes
Failure Mode: (if test failed)	Initial Failure: Cotton pad at threshold – 13 Minutes Further Failure: Cotton pad at latch position 25 minutes Continuous flaming at latch position 36 minutes

3.2.3 Test Report WF505552

The referenced test report, the essential details of which are summarised below is included to support the inclusion of the Sealed Tight Solutions ST104 and to provide additional supporting data for inclusion of large bodied lockcases, particularly when used with single leaf doorsets utilising a single strip intumescent sealing system. The glazing area in this test has not been considered.

Date of Test:	24.JUN.2021
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	A glazed unlatched, single acting, single doorset – ULSASD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	LEAF: Overall Size: 2744mm(h) x 918mm(w) x 44mm(t) Core: Falcon Panel Products Strebord® 44 Lipping: Sapele (640kg/m³), 8mm thick applied to all edges. FRAME: Head & Jambs: Caberwood Trade MDF (593kg/m³), 70mm(d) x 25mm(w), with a 12mm(d) x 20mm(w) planted (screwed) stop. Fire stopping: Rockwool mineral fibre capped with Mann McGowan Pyromas A, ~4.6-15mm wide. Threshold: Non-combustible INTUMESCENT: Frame Reveal: 1no 15x4 Sealed Tight Solutions STS154FO fitted 14.5mm from the opening face of the frame reveal. HARDWARE: Hinges: 4no Rutland RH.BB.43R.SS stainless steel bearing butt type hinge fitted 150mm, 450mm, 1456mm and 2461mm from the head of the leaf. Closer: Rutland ITS.11204 concealed overhead type closer rebated within the head of each leaf and within the frame as per manufacturer's instructions. 1. Body size: 256mm(l) x 55mm(h) x 32)mm(w) 2. Arm size: 461mm(l) x 30mm(w) 3. Slide Rail:464mm(l) x 33mm(w) x 20mm(d) Latch: Rutland RDL.L.55 DIN Latch 1. Forend size: 234mm(h) x 22mm(w) x 3mm(t) 2. Body size: 166mm(h) x 14mm(w) x 81mm(d) 3. Keep size: 180mm(h) x 24/41mm(w) x 1mm(t) Cylinder: UAP Kinetica 3* KIN30T/30CAS-HELIX-K4 Escutcheon: Altro E-1 steel escutcheon Ø52mm x 8mm Lock/Latch Status: Disengaged for test

	Drop seal: 20mm(h) x 12mm(t) Sealed Tight Solutions Ltd STS422 fitted centrally within the bottom edge of the leaf. HARDWARE PROTECTION: Under hinge blades: 1mm Sealed Tight Solutions Ltd raw graphite Under latch forend: 1mm Sealed Tight Solutions Ltd raw graphite Under keeps: 1mm Sealed Tight Solutions Ltd raw graphite Around latch body: 1mm Sealed Tight Solutions Ltd raw graphite Closer: Graphite intumescent to the top of the closer body and to the sides and ends of the guide rail in the frame head (as supplied). GLAZING: • Glass: Pyrobelite 7mm thick a. Aperture Size: 2546mm(h) x 720mm(w) b. Glass Size: 2538mm(h) x 712mm(w) x 7mm(t) c. Sight Size: 2500mm(h) x 685mm(w) • Beading: Sapele (640kg/m³) 15mm(h) x 13.5mm(d) • Bead Fixing: 16g steel pins, 50mm from the corners and at 150mm intervals. GLAZING SYSTEM: Glazing Perimeter: Sealed Tight Solutions Ltd ST104 2x13.5mm PVC-encased graphite based intumescent strip fitted between the glass and the glazing bead. Setting blocks: Calcium silicate 7mm(w) x 25mm(d) x 3mm(t) set 80 mm from corners on the horizontal edges, 80 mm from corners on vertical edges – with 4 blocks on each vertical edge and 2 blocks on bottom edge, none on head.
Test Standard:	BS EN 1634-1
Performance:	**Integrity:** 30 minutes

3.2.4 Test Report WF380214 (Doorset A)

The referenced test report, the essential details of which are summarised below, is supporting evidence for the inclusion of Lorient LVV40 air transfer grilles.

Date of Test:	24/02/2017
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1314
Sponsor:	Falcon Panel Products Ltd.
Tested Product:	Unlatched, Single Acting, Single Leaf, Flush Timber Doorset with Air Transfer Grille – ULSASD.
Tested Orientation:	Opening in towards heating condition
Sampling information:	Test specimens were not sampled.
Summary of Test Specimen:	Leaf: Overall Size: 2052 (h) x 952 (w) x 44mm (t) ***N.B.*** *Leaf dimensions are to the extremity of the leaf – not the rebated size.* Core: Falcon Strebord© 35 (560kg/m3), 35mm thick Lipping: Sapele (640kg/m3), 35x20mm thick to head and vertical edges, including a 12x31mm rebate Lipping Adhesive: Polyurethane Facing: MDF- Sapele Veneered - 4mm Thick - Facing oversails lippings Facing Adhesive: PVA Top Rail: None Fitted Bottom Rail: None Fitted Lock Rail: None Fitted Stiles: None Fitted Frame: Head & Jambs: European Redwood 610kg/m3), 70 x 44mm thick, with a 37 x 12mm thick integral stop. Frame Fixing: 4 No. 5.5 x 100mm long steel screws per jamb Threshold: Non-Combustible Intumescent: Leaf Edges: 2 No 10x4 Lorient 617 LP1004. Fitted 3.6mm apart and 15.6mm from the exposed face. Bottom Leaf Edge: Norsound NOR810s drop seal – fitted centrally within the leaf thickness. Hardware: Hinges: 3 No. AGB 3D Adjustable Steel Hinges Closer: 1 No. Arrone AR1500 Lock/Latch: Eurospec Din Std Latch Lock/Latch Size: Forend: 235 x 25mm, Keep: 175 x 22mm. Lock/Latch Status: Disengaged for test Handle: Carlisle Steelwork Scimitar Lever Handle Dia 52mm rose.

	Hardware Protection: Under Hinges: 1mm thick Interdens Under Forend & Keep: 1mm thick Interdens Around Lockcase: 1mm thick Interdens Air Transfer Grille (ATG): Model: Lorient LVV40 – 40mm thick Grille Size: 600 x 300mm wide Aperture Lining: Sapele (640kg/m3), 6mm thick. Sealing System: 8mm thick Lorient sealant with a fillet applied to each side of the ATG around its perimeter. Steel Trim: 650x345mm fitted over the ATG on both faces.
Test Standard:	BS EN 1634-1:2014
Performance:	**Integrity:** Sustained flaming: 52 minutes Cotton pad test: 52 minutes Gap gauge: 54 minutes **Insulation:** Maximum set: 52 minutes Average set: 52 minutes

3.2.5 Test Report WF414781

The referenced test report, the essential details of which are summarised below, is being used as supplementary data for the Strebord 35+, Strebord 35+ Banded Core and Strebord Superpan design in order to include the option for using the Falcon Strelip product, larger lockcases and cylinders. The Strelip product has been considered as being an acceptable alternative material for lipping the Strebord 35+, Strebord 35+ Banded Core and Strebord Superpan based on comparing the performance of the Stredor design summarised below with the performance of the Strebord 35+, Strebord 35+ Banded Core and Strebord Superpan product fitted with hardwood lippings. The larger lock case has been deemed acceptable on the basis of including intumescent protection around the lockcase for all configurations of Duocore, as detailed in this assessment. In addition, the testing on the Stredor design was to the EN 1634-1 standard which is known to be more onerous than the BS 476: Part: 1987 standard that the Strebord 35+, Strebord 35+ Banded Core and Strebord Superpan has been tested to. No other elements within this test are considered for Falcon Strebord 35+, Strebord 35+ Banded Core and Strebord Superpan.

Date of Test:	7th June 2019
Identification of Test Body:	BM TRADA UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched single acting double leaf doorset (ULSADD)
Sampling:	Sampled by a representative from BM TRADA on 30th May 2019 under FM414654
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Summary of Test Specimen:	LEAF: Overall Size (each leaf): 2040mm(h) x 935(w) x 44mm(t) Door Core: • Falcon Panel Products Stredor 44mm (F14 mill) ○ (Inner Core Layer) – 2.1mm poplar ply (594-613kg/m³) ○ (Outer Core Layers) – 13mm pine lamels (594-613kg/m³) ○ (Surface Core Layer) – 8mm MDF (594-613kg/m³) Lipping (both leaves): Strelip 30 (686-698kg/m³), 8mm thick to all four edges FRAME: Head & Jambs: European Redwood (510kg/m³), 90mm(d) x 32mm(w), with 32mm(w) x 12mm(d) planted stop. Frame Fixing: 4No. Ø5 x 100 steel woodscrews Threshold: Non combustible INTUMESCENT: Frame Reveal: 1No. 15 x 4 Lorient LP1504 Type 617 fitted 15mm from the opening face in the frame reveal Leaf Edge: 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face

	SMOKE/ACOUSTIC Lorient Polyproducts LAS8001si drop seal 35 (h) x 14 (w) GLAZING: Glass: Fireglass UK AGC Pyrobelite 7 Aperture Size: 250 (w) x 1200 (h) (upper) 250 (w) x 440 (h) (lower) Apertures spaced 100mm apart Beading: Sapele (640kg/m³), 21mm(w) x 19mm(h) with 15°chamfer and a 6x6mm bolection Bead Fixing: 50mm long x 1.6 Ø steel pins at 30°, 200mm centres & 50mm from corners. GLAZING SYSTEM: Glazing Perimeter: 15 x 3.5 Lorient Polyproducts Ltd Flexible Figure 1 (FF1) fitted between the glass and bead on both faces HARDWARE: Hinges: 3no Carlisle brass (Eurospec) stainless steel bearing butt type hinge ref HIN 1433/113SSS/R Closer: Rutland Door Controls concealed overhead closer ref: ITS11204 Lock/Latch: Assa Abloy Union steel latch re: JHD72Esl-R-SS60 with Assa Abloy cylinder ref J-228AA-SC • Forend: 235x24mm • Keep: 185x43mm Altro Stainless steel lever type handle RE: 908356 TH 105 Zoo stainless steel flush bolts ref: ZAS03RSS fitted in top and bottom of leaf HARDWARE PROTECTION: Under Hinge: 1mm Lorient Polyproducts MAP fitted under hinge blade on frame and leaf Concealed closer: Lining concealed closer rebates 2(t) manufacturers supplied graphite kit Lock/Latch: • Encasing latch body: 1 (t) Lorient MAP • Under forend plate: 1 (t) Lorient MAP • Under keep: 1 (t) Lorient MAP • Lining drop seal rebate: 1 (t) Lorient MAP • Lining flush bolt rebates: 1 (t) Lorient MAP
Test Standard:	BS EN 1634-1: 2014 + A1: 2018
Performance:	Integrity: 33 minutes Insulation: 10 minutes

3.2.6 Test Report BMT/FEP/F14029 (Doorset A)

The referenced test report, the essential details of which are summarised below, is the primary data for the Streframe® timber door frames:

Date of Test:	24.JUN.2021
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	A glazed unlatched, single acting, single doorset – ULSASD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	LEAF: Overall Size: 2040mm(h) x 926mm(w) x 56mm(t) Core: Falcon Panel Products Strebord® 44 with 40mm(w) x 44mm(t) Streframe® stiles and rails. Facings: MDF (700kg/m³), 6mm thick applied to both faces. Lipping: Streframe® (500kg/m³), 10mm thick applied to all edges. FRAME: Head & Jambs: Streframe® (500kg/m³), 100mm(d) x 32mm(w), with a 12mm(d) x 32mm(w) planted (pinned) stop. Fire stopping: Rockwool mineral fibre capped with intumescent mastic, ~10-15mm wide. Threshold: Non-combustible INTUMESCENT: Frame Reveal: 1no 15x4mm Pyroplex Ltd FO8700 seal fitted centrally within the frame reveal. HARDWARE: Hinges: 3no Hanson and Beards bearing butt type hinge fitted 148mm, 966mm and 1740mm from the head of the leaf. Closer: Dormakaba TS 71 surface-mounted overhead closer fitted on the exposed face of each leaf as per manufacturer's instructions. Body size: 232mm(w) x 68mm(h) x 45mm(d) Latch: Assa Abloy steel mortice • Forend size: 230mm(h) x 24mm(w) • Keep size: 180mm(h) x 25mm(w) Handle: Aluminium lever type handle Ø52mm Lock/Latch Status: Disengaged for test Drop seal: 1no 20x12mm NOR810s drop seal, fitted centrally within a rebate at the base of the leaf.

	HARDWARE PROTECTION:
	Under hinge blades: 1mm graphite
	Under latch forend: 1mm graphite
	Under keeps: 1mm graphite
	Around latch body: 1mm graphite
	
	GLAZING:
	• Glass: Pyroguard EW30 7mm thick
	  ○ Aperture Size: 759mm(h) x 164mm(w)
	  ○ Glass Size: 753mm(h) x 158mm(w) x 7mm(t)
	  ○ Sight Size: 735mm(h) x 140mm(w)
	• Beading: Streframe® 37mm(h) x 26mm(d) with a 7x13mm bolection and a 25° chamfer.
	• Bead Fixing: 16g, 60mm steel pins fitted 25-50mm from the corners and at 120mm intervals.
	
	GLAZING SYSTEM:
	Glazing Perimeter: 25x4mm Intumescent Seals Limited Therm-A-Bead monoammonium phosphate based intumescent fitted between the glass and the glazing bead.
	Lining Aperture: 54x2mm Therm-A-Line

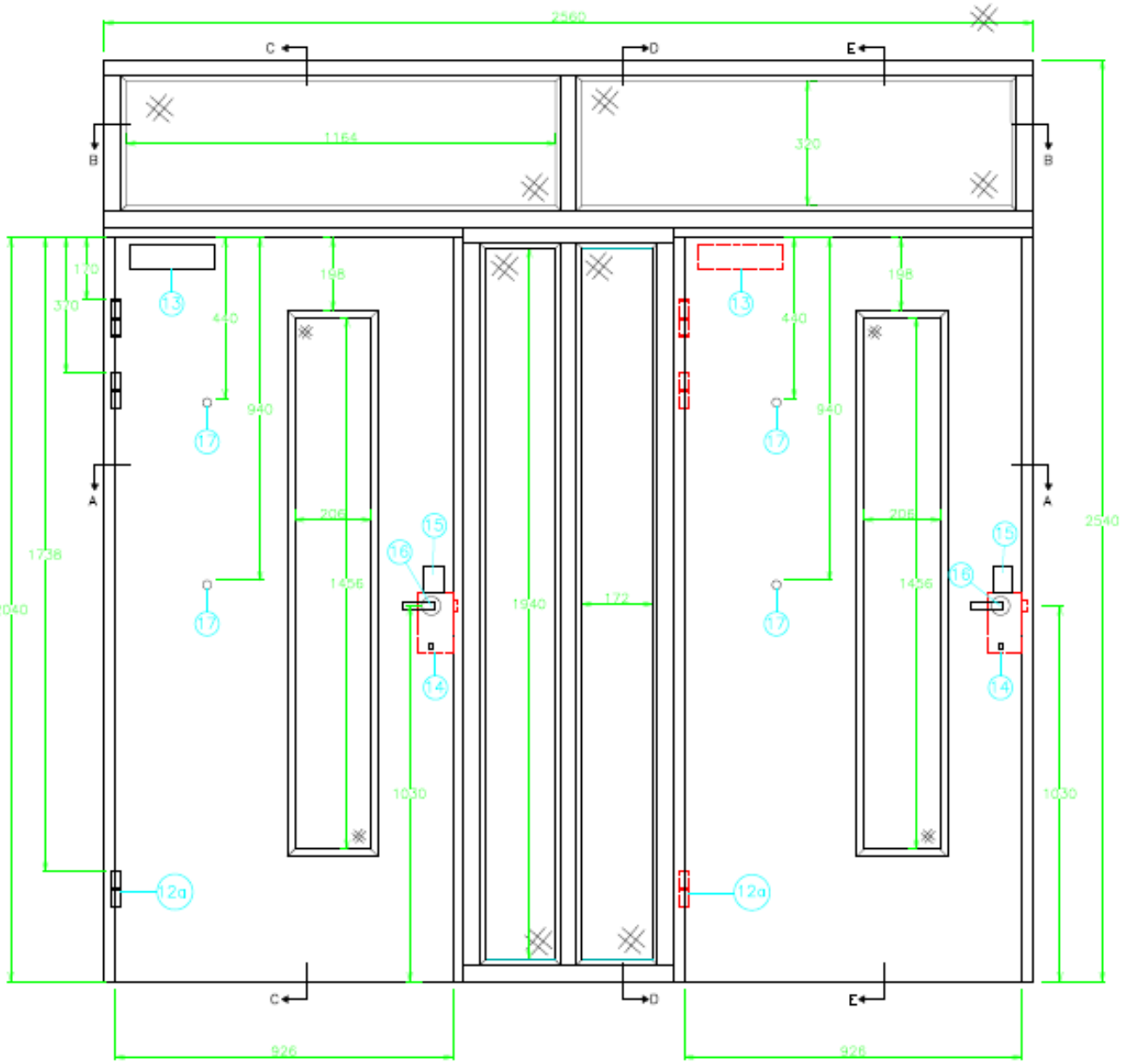
Test Standard:	BS 476: Part 22
Performance:	**Integrity:** 53 minutes
Reason for Use	Demonstration of the integrity of Streframe® beading
Failure Mode:	Initial Failure: Cotton pad at 53:57 – Latch position. Further Failure: Continuous flaming at 55:23 – Latch position.

3.3 Supplementary Evidence for Fanlights and Sidelights

3.3.1 Summary of test report WF 411193 Falcon test evidence

The referenced test report, the essential details of which are summarised below, is used to support sidelights and fanlights with the Strebord© 35+, Strebord© 35+ Banded Core & Strebord© Superpan door designs where a 4 sided frame construction is utilised around the fanlights and sidelights:

The referenced test report, the essential details of which are summarised below, is used to support sidelights and fanlights with the Strebord© 35+, Strebord© 35+ Banded Core & Strebord© Superpan door designs where a 4-sided frame construction is utilised around the fanlights and sidelights:



Date of Test:	28.February.2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	2 latched, single acting, single doorset – LSASD with glazed overpanel and glazed sidelights
Tested Orientation:	A - Hung opening away from heating condition B- Hung opening in towards heating condition
Summary of Test Specimen:	LEAF A and B: Overall Size: 2040mm(h) x 926(w) x 44mm(t) Core: Falcon Panel Products Strebord® 44 Lipping: LVL mixed hardwoods (580kg/m³), 8mm thick to all edges FRAME A and B: Head & Jambs: MDF (700kg/m³), 100mm(d) x 30mm(w) with an 32mm(d) x 12mm(w) planted (pinned) MDF (700kg/m³) stop. Fire stopping: Fire and Acoustic Fire foam with plastic packers visible on fire side – gaps 18 to 23mm Threshold: Non-combustible INTUMESCENT: Frame Reveal: • 1no 15x4mm Pyroplex FO8700 fitted 14.5m from the exposed face. SMOKE/ACOUSTIC SEALS: Frame Reveal: • FAS 35 11.7 x 5 fitted to the upstand of stop. • FAS 45 30 x 12.5 fitted centrally to bottom of leaf GLAZING: Glass (Both leaves): Pyrobelite 7. Left Leaf: • Aperture Size: 1486mm(h) x 236mm(w) • Glass size 1481mm(h) x 231mm(w) • Sight size: 1456mm(h) x 206mm(w) Beading: MDF (Oak foil wrapped) (~750kg/m³) 22mm(h) x21mm(d) including 5x7mm bolection and a 18° chamfer. Bead Fixing: Steel pins 18g, 40mm(l), 125mm-150mm centres.

	GLAZING SYSTEM (Both Leaves): Glazing perimeter: 15x3mm FAS Close cell foam fitted between glass and bead with FAS filling remaining glazing void. HARDWARE: Hinges: 3no Vier Zoo lift off butt hinges VLHL243RS 102 x 76 x 3 fitted 170mm, 370mm and 1737mm from the head of the leaf. Closer: Rutland TS11205 overhead face fixed closer Latch: Salto Element mortice latch Ref LE7E3765COIMSLH with half cylinder and thumb turn with nib fitted 1030mm from the threshold of the leaf. • Forend size: 235mm(h) x 20mm(w) x 3mm(t) • Keep: 170mm(h) x 25mm(d) Card reader: Salto Element Euro card reader Battery pack 116mm x 65mm and card reader 45mm x 67 mm fitted above door handle Lock/Latch Status: Engaged for test Handle: Salto stainless steel lever Ref R1SURIM080 Eye viewer:2No UAP Nanocoast ref CVPLSSS barrel 12mm dia fitted 440 and 940 down from the head of the leaf. HARDWARE PROTECTION: Under hinge blade: 1mm thick FAS Spartan hardware protection Encasing latch body and under latch forend: 1mm thick FAS Spartan hardware protection Under latch keep: 1mm thick FAS Spartan Hardware protection Surrounding eye viewers 1mm thick FAS Intumescent acrylic mastic Fanlight A 4 sided framed modular fanlight with 2 apertures covering both doorsets and sidelights, with a shared mullion. Overall size 2560mm (w) by 460mm (h) Sidelight A 4 sided framed modular sidelight with 2 apertures between both doorsets, with a shared mullion.

	SIDELIGHTS AND FANLIGHTS
	Framing
	• Timber Pinus Sylvestris 520 kg/m3
	• Dimensions 44mm (w) x 100mm (d)
	Glazing
	Glass Pyrobelite 7
	• Fanlights
	  • Aperture Size: 370mm(h) x 1214mm(w)
	• Sidelights
	  • Aperture Size: 1990mm(h) x 222mm(w)
	Beading: Sapele (640kg/m³) 25mm(h) x 30mm(d) including and a 17° chamfer.
	Bead Fixing: Steel pins 18g, 38mm(l), 100mm from corners and 200 centres.
	Glazing perimeter: 15x3mm FAS Ceramic fibre fitted between glass and bead with FAS filling remaining glazing void.

	BS 476: Part 22: 1987
Performance:	**Integrity:** 37 minutes Insulation 0 minutes in accordance with Section 8.6.1

4 Technical Specification

4.1 General

The technical specification for the proposed door Strebord© 35+, Strebord© 35+ Banded Core & Strebord© Superpan 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 three door leaf options detailed below are approved by this assessment.

4.3.1 Leaf 1 – Strebord© 35+ – 43mm thick

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

Element	Material	Dimensions (mm)	Minimum Density (kg/m^3)
Core	Falcon Strebord© 35	35 (t)	560
Stiles	N/a	N/a	N/a
Rails	N/a	N/a	N/a
Facing	MDF	4 (t)	750

Minimum Door Leaf Thickness:

- With permitted decorative facing/finishes 43.5mm

Minimum Door Blank Thickness:

- Without decorative facings/finishes 43.0mm.

The door designs can include:

- Lippings (minimum vertical edges only – may be exposed or oversailed by the MDF facing).
- Glazing
- Decorative facings
- Grooves

4.3.2 Leaf 2 – Strebord© 35+ Banded Core – 43mm thick

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

Element	Material	Dimensions (mm)	Minimum Density (kg/m^3)
Core	Falcon Strebord© 35	35 (t)	560
Stiles[1]	European Redwood	32 (Min) x 35 40 (Max) x 35	500
Rails[1]	European Redwood		500
Facing	MDF	4 (t)	750

Notes:

1. It is permitted for the stiles and rails to be manufactured from alternative Softwood or Hardwood species of minimum density 500kg/m^3. For each leaf and doorsets, stiles and rails must be manufactured from the same timber type species.

Minimum Door Leaf Thickness:

- With permitted decorative facing/finishes 43.5mm

Minimum Door Blank Thickness:

- Without decorative facings/finishes 43.0mm.

The door designs can include:

- Lippings (none required, various options available – Refer to Section 5.2.2)
- Glazing
- Decorative facings

Notes:

1. The Strebord© 35+ has been tested as a banded design without lipping and Type 617 intumescent (WF514734). It has been requested by Falcon Panel Products to consider the use of Type 617 perimeter intumescent with banded Strebord 35+ where the leaf is additionally lipped. The banded Strebord© 35+ has been tested with lipping in RF12061 albeit with a different type of intumescent. It is Warringtonfire's opinion that based on the performance of the banded design tested with lipping, and the fact the Type 617 seal was tested with exposed softwood, which is known to have a faster char rate than hardwood, Type 617 can be used with banded cores that have been additionally lipped with hardwood meeting the requirements of this assessment.

4.3.3 Leaf 3 – Strebord© Superpan – 44mm thick

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

Element	Material	Dimensions (mm)	Minimum Density (kg/m^3)
Core	Three layer particle board	38 (t) - nominal	560
Facing (Integral with the core construction)	MDF	3 (t) - nominal	750

Minimum Door Leaf Thickness:

- With permitted decorative facing/finishes 44.5mm

Minimum Door Blank Thickness:

- Without decorative facings/finishes 44.0mm.

The door designs can include:

- Lippings (minimum vertical edges only)
- Glazing

- Decorative facings

4.4 Door Frames

The following door frames have been assessed as acceptable for use with the proposed doorset design based on the test evidence cited in section 3 and are detailed in the following sections. The frames are constructed using the following materials:

- Timber based frames

The frames are then grouped according to whether they are suitable for single action (SA) or double action (DA) configurations:

- SA are Single Action frames
- DA are Double Action frames

The following sections detail the minimum frame dimensions and the required materials for each of the frame types.

All dimensions are given in millimetres (mm)

The following table details the wall construction that each frame type can be installed into:

Frame type and material	**Wall construction**
Frames1 & 4 - Timber based frame	Masonry wall Timber stud partition Steel stud partition

Note: Frame Types are numbered following Falcon's convention. Where the numbering is not consecutive this indicates that the frame option has been omitted.

4.4.1 Frame Group 1

The construction of the Frame 1 door frame types includes the following materials and profiles.

4.4.1.1 Frame 1.1 – Standard with a planted stop - SA

Minimum dimensions

Frame 70 x 32

Stop 12 x 20

For door frames constructed using Streframe® E Engineered Softwood the stop dimensions must be a minimum of 30x15mm

Jamb

Head

Permitted Materials for frame type 1.1	Minimum Density (kg/m³)
Softwood/Hardwood (Solid: Not Engineered Timber)	510
MDF[1]	650
Streframe® Lightweight Hardwood[1]	500
Streframe® E Engineered Softwood[1]	510

1 Transoms and mullions are not permitted using these material type

4.4.1.2 Frame 1.2 – Slimline with Planted Stop

Minimum dimensions

Frame 70 x 25

Stop 20 x 12

Jamb

Head

Permitted materials for frame 1.2	Minimum Density (kg/m³)
Softwood/Hardwood (Solid: Not Engineered Timber)	510
MDF	650

Note: Transoms and mullions are not permitted with this frame type

4.4.1.3 Frame 1.3 – Standard with integral stop – SA

Minimum dimensions

Frame 70 x 32

Stop 20 x 12

For door frames constructed using Streframe® E Engineered Softwood the stop dimensions must be a minimum of 30x15mm

Hinge Side Jamb

Head

Permitted materials for frame 1.3	Minimum Density (kg/m³)
Softwood/Hardwood (Solid: Not Engineered Timber)	510
MDF[1]	650
Streframe® Lightweight Hardwood[1]	500
Streframe® E Engineered Softwood[1]	510

1 Transoms and mullions are not permitted using these material types.

4.4.1.4 Frame 1.4 – Slimline with integral stop – SA

Minimum dimensions

Frame 70 x 25

Stop 20 x 12

Hinge Side Jamb

Head

Permitted materials for frame 1.3	Minimum Density (kg/m³)
Softwood/Hardwood (Solid: Not Engineered Timber)	510
MDF	650

Note: Transoms and mullions are not permitted with this frame type

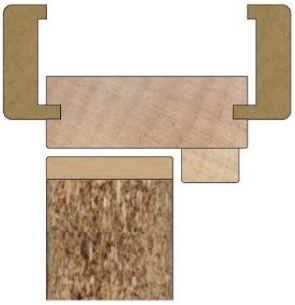
4.4.1.5 Frame 1.5 – Telescopic architrave with planted stop – SA

Minimum dimensions

Frame	70 x 32
Stop	20 x 12
Groove	central in frame 6 x 6 max

Jamb

Head



Permitted materials for frame 1.5	Minimum Density (kg/m³)
Softwood (Solid: Not Engineered Timber)	510
Hardwood (Solid: Not Engineered Timber)	510

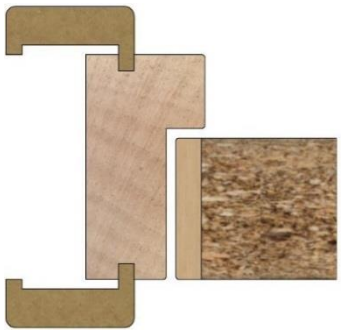
. **Note:** Transoms and mullions are not permitted with this frame type

4.4.1.6 Frame 1.6 – Telescopic architrave with integral stop – SA

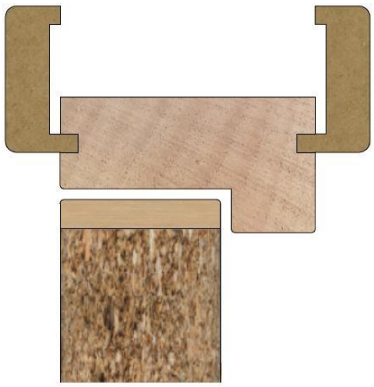
Minimum dimensions

Frame	70 x 32
Stop	20 x 12
Groove	central in frame 6 x 6 max

Jamb



Head



Permitted materials for frame 1.6	Minimum Density (kg/m³)
Softwood (Solid: Not Engineered Timber)	510
Hardwood (Solid: Not Engineered Timber)	510

Note: Transoms and mullions are not permitted with this frame type

4.4.1.7 Frame 1.7 – Integral architrave with planted stop – SA

Minimum dimensions

Frame 70 x 32

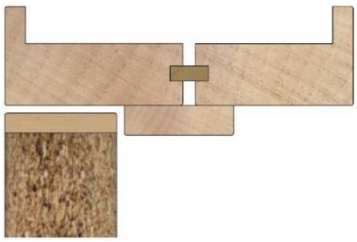
Stop 20 x 12

Integral architrave around wall 25 x 18

Note – if the gap between frame and wall is between 5 and 10 and the fire stopping complies with section 12.1 then the Integral architrave can be reduced to 15 x 18.

Jamb

Head



Permitted materials for frame 1.7	Minimum Density (kg/m³)
Softwood (Solid: Not Engineered Timber)	510
Hardwood (Solid: Not Engineered Timber)	510

Note: Transoms and mullions are not permitted with this frame type

4.4.1.8 Frame 1.8 – Integral Architrave with integral stop – SA

Minimum dimensions

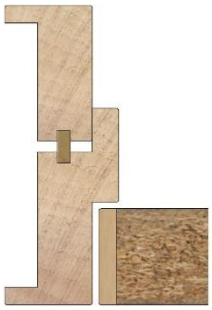
Frame 70 x 32

Stop 20 x 12

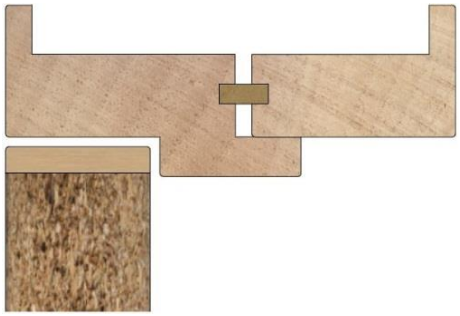
Integral architrave around wall 25 x 18

Note – if the gap between frame and wall is between 5 and 10 and the fire stopping complies with section 12.1 then the Integral architrave can be reduced to 15 x 18.

Jamb



Head



Permitted frame materials for frame 1.8	Minimum Density (kg/m^3)
Softwood (Solid: Not Engineered Timber)	510
Hardwood (Solid: Not Engineered Timber)	510

Note: Transoms and mullions are not permitted with this frame type

4.4.1.9 Frame 1.9 – Projecting Frame with planted stop – SA

Details are based on test - WF 514734 where a 107mm frame with and 18mm projection was installed into a 75mm flexible partition.

Minimum dimensions

Frame 75 x 32 (with no (i.e. 0mm) projection from partition)

Stop 20 x 12

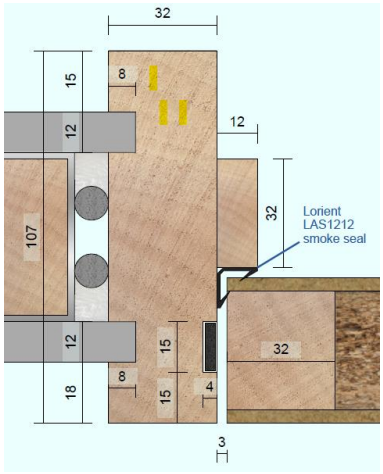
Maximum Projection of frame from partition face: 18mm

Note – It is the opinion of this report that the fire tested detail may be replaced without compromise to the fire performance by the following firestopping methods:

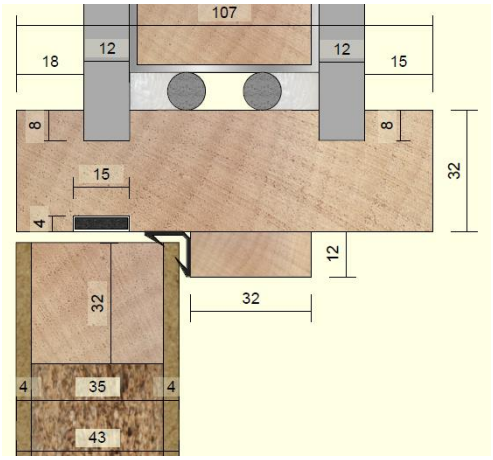
- **Mineral rock fibre and mastic** – up to 15mm maximum frame to supporting construction gap.
- **Fire & Acoustic Seals Ltd** - Expanding foam and mastics – Wall depth 100mm min – up to 25mm maximum frame to supporting construction gap.

The systems noted above are detailed in section 12.1.

Jamb



Head



Permitted frame materials for frame 1.8	Minimum Density (kg/m³)
Softwood (Solid: Not Engineered Timber)	510
Hardwood (Solid: Not Engineered Timber)	510

Note: Transoms and mullions are not permitted with this frame type

4.4.1.10 Frame 1.10-Projecting Frame with integral stop - SA

Details are based on test - WF 514734 where a 107mm frame with and 18mm projection was installed into a 75mm flexible partition.

Minimum dimensions

Frame 75 x 32 (with no (i.e. 0mm) projection from partition)

Stop 20 x 12

Maximum Projection of frame from partition face: 18mm

Note – It is the opinion of this report that the fire tested detail may be replaced without compromise to the fire performance by the following firestopping methods:

- **Mineral rock fibre and mastic** – up to 15mm maximum frame to supporting construction gap.
- **Fire & Acoustic Seals Ltd** - Expanding foam and mastics – Wall depth 100mm min – up to 25mm maximum frame to supporting construction gap.

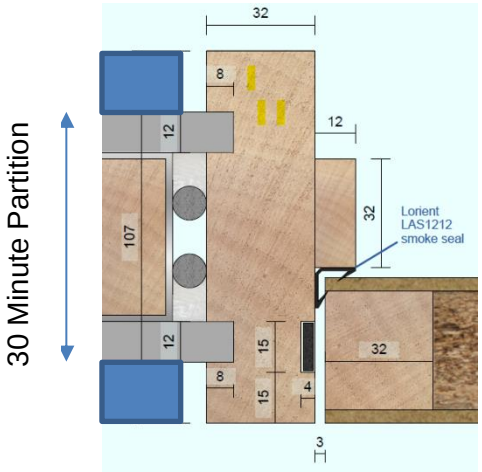
The systems noted above are detailed in section 12.1.

Permitted frame materials for frame 1.8	Minimum Density (kg/m³)
Softwood (Solid: Not Engineered Timber)	510
Hardwood (Solid: Not Engineered Timber)	510

Note: Transoms and mullions are not permitted with this frame type

4.4.1.11 Frame 1.9 & 1.10-with Shadow Gaps

The projecting frame details tested in WF514734 provide data to permit shadow gaps to the rear of the frame. The partition to the rear of the frame must be a recognised 30 minute design. The additional plasterboard facing required to form the shadow gap is shown in the image below in blue.



4.4.2 Frame Group 4

The construction of the Frame 4 door frame types includes the following materials and profiles.

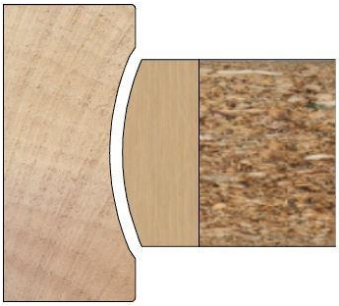
4.4.2.1 Frame 4.1 – Standard Double Action

Minimum dimensions

Scalloped Frame	70 x 32 at thinnest part of scalloped section
Square Frame (closing jamb)	70 x 32
Head	70 x 44 (to accommodate head pivot)

Radius in scalloped frame: Dependent upon the location of pivot point plus 3mm for door gap

Scalloped Hinge Side Jamb or closing Jamb



Square Closing Side Jamb ONLY

Head

Permitted materials for frame 4.1	Minimum Density (kg/m³)
Softwood/Hardwood (Solid: Not Engineered Timber)	510
Streframe® Lightweight Hardwood[1]	500
Streframe® E Engineered Softwood[1]	510
MDF[1]	650

1 Transoms and mullions are not permitted using these material types.

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

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

- The margin of over performance above 30 minutes integrity for the design
- The characteristics exhibited during test and
- 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, for example, double door leaves and an overpanel – the harder it becomes to pass a test. In this specific example it is because the junction between two door leaves or door leaf and overpanel introduces a discontinuity into the doorset which can be a means of failure. This approach leads to the following statements:

- A test on a double doorset is more onerous than a test on a single doorset
- A test on a doorset with a flush overpanel is more onerous than a test on a doorset without an overpanel. A flush overpanel has the same thickness as the door leaf and is flush with the leaf/leaves.
- 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
- A test on an unlatched single acting doorset is considered to be equivalent to a double acting doorset, due to the known deflection of an unlatched single acting doorset towards the furnace conditions i.e. away from the door stop. However, this does not cover doorsets with flush overpanels
- 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 Orientation

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.

This is supported in table 2 of clause 13.4.1 BS EN 1634-1:2014 +A1:2018

4.5.3 Configuration

The table below shows the permitted configurations for the Falcon Strebord© 35+ & Strebord© Superpan 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.

Doorset Configurations			
Reference	Depiction	Abbreviation	Description
A		LSASD	Latched Single Acting Single Doorset
B		ULSASD	Unlatched Single Acting Single Doorset
C		DASD	Double Acting Single Doorset
G		LSADD	Latched Single Acting Double Doorset
H		ULSADD	Unlatched Single Acting Double Doorset
I		DADD	Double Acting Double Doorset

Notes:

- Unequal leaf double doorsets are covered by this Field of Application. The smaller door leaf must be no less than 300mm.
- For double doorsets both leaves must comply with the door leaf envelope size limitations
- For double doorsets and doorsets with overpanels the construction of each leaf and/or overpanel must be from the same leaf reference – for example, using Leaf 1 & Leaf 3 as primary and secondary leaves in a double doorset is not permitted.
- A table of essential hardware is given for each doorset configuration, as a baseline for the doorset described. Changes to hardware can affect the intumescent specification and frame details which are subsequently considered in section 9 and 11
- Flush overpanels are not permitted.

4.5.4 General Notes on Leaf Sizes & Intumescent

The following sections detail the door leaf size envelopes which indicates the permitted leaf sizes for the listed configurations based on the intumescents, door leaf and frame options.

For Double Doors:

- When using these envelopes for double doorsets, the meeting stile intumescent detail must be adequate to contribute to the protection of any hardware present.
- The requirements for intumescent strips when a lock is fitted are given in section 9.2 and 11.3.
- Unequal leaf double doorsets are covered by this Field of Application. The smaller door leaf must be no less than 300mm.
- Both leaves of double doorsets must comply with the door leaf envelope size limitations.

For Intumescent Seals:

- Intumescent seals are considered to be fitted centrally (within the frame reveal or leaf edge) unless stated otherwise.
- Intumescent seals are fully interrupted at hardware locations unless stated otherwise.

4.5.5 Feature Grooves in the faces of Leaf 1 & 2

There are associated limitations with size and configurations for Leaf 1 & 2 with grooves and recesses, refer to section 5.6 for further details.

4.5.6 Explanation for following sections

The performance of a doorset in terms of configuration and size is dependent on the leaf type, intumescent and frame type and are not automatically interchangeable. The following sections present the envelopes for the three leaf refs and two frame groups. Each envelope is linked to a frame and specific 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, each leaf ref. is considered separately.
- for each configuration and leaf ref, each frame group is considered separately.
- for each configuration, leaf ref, frame group and intumescent specification is considered separately.
- and a unique envelope of permitted leaf sizes is presented based on the configuration, leaf reference, frame group and intumescent and the envelope is directly linked to a unique test.

More envelopes are presented for single doorsets for two reasons:

- more single doorsets have been tested.
- the performance from a more complicated configuration can be cascaded down to less onerous configurations.

The intumescent may be fitted in the frame reveal or leaf edge. On double doors the intumescent must be installed in the leaf housing the latch at the meeting edge, irrespective of the specific frame type primary evidence.

The following tables refer to the opening face of the door in the table cells relating to intumescent location.

- The opening face is the pull face.
- The closing face is the push face i.e. the stop side.

The table below shows which leaf and frame combination is permitted.

Note: Frames are numbered following Falcon's convention. Where the numbering is not consecutive this indicates that the frame option has been omitted.

Frame Group.	Material	Leaf 1	Leaf 2	Leaf 3
		Falcon Strebord 35+ MDF Faced	**Falcon Strebord 35+ MDF Faced with Banded Core**	**Falcon Superpan**
1	SA – Softwood, ,Hardwood & MDF	Yes	Yes	Yes
4	DA – Softwood, Hardwood & MDF	Yes	Yes[1]	Yes

Notes:

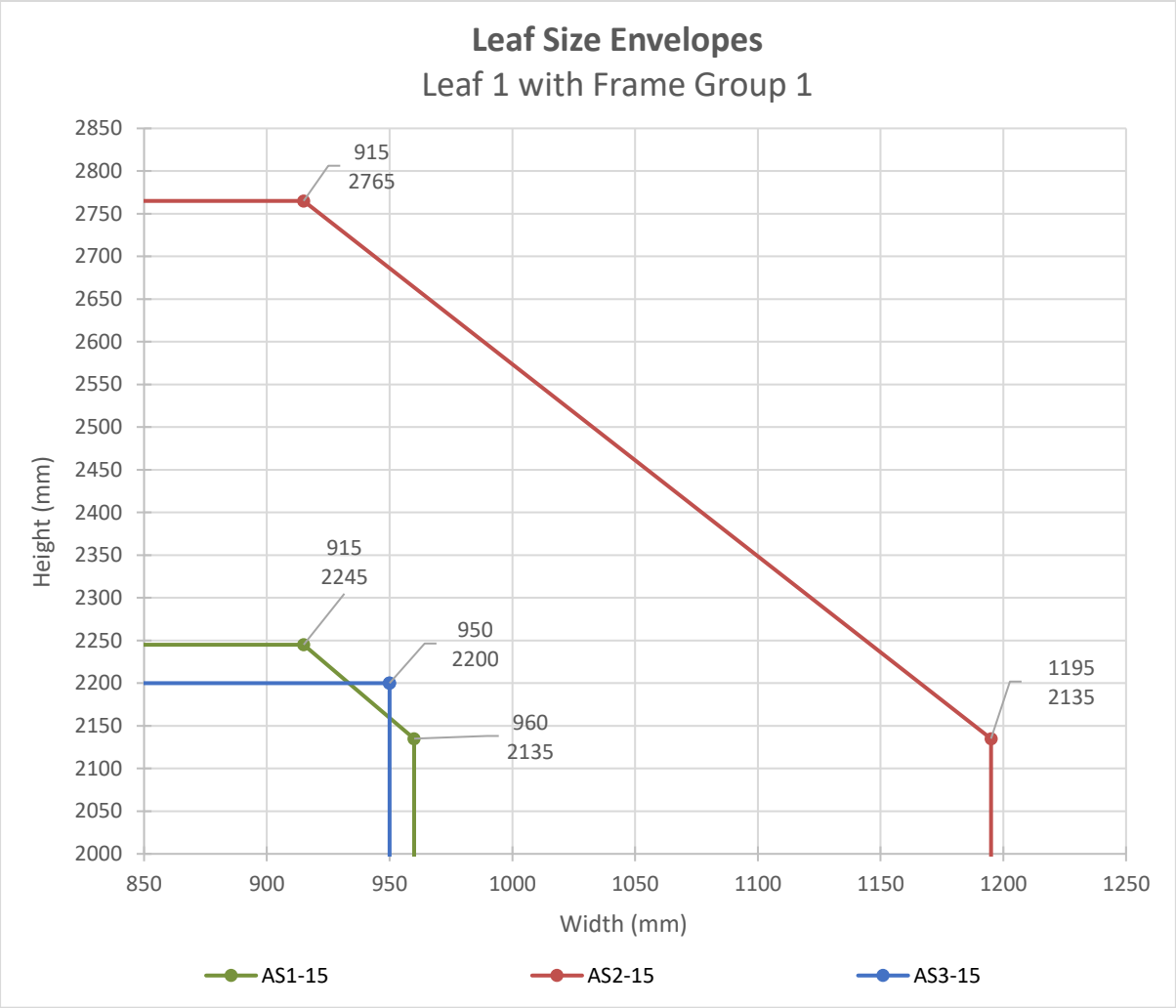
1. Leaf 2 is to be lipped (as a minimum) to vertical edges for double action (DA) applications

The following table shows the permitted doorset configurations with the leaf frame combinations

Permitted Configurations for Leaf Refs 1, 2 & 3 & Frame Groups 1 & 4.												
Frame		Configuration										
		LSASD	ULSASD	DASD	LSASDOP	ULSASDOP	DASDOP	LSADD	ULSADD	DADD	LSADDOP	ULSADDOP	DADDOP
1	SA - Softwood, MDF and Hardwood	Y	Y	N	N	N	N	Y	Y	N	N	N	N
4	DA - Softwood and Hardwood	N	N	Y	N	N	N	N	N	Y	N	N	N

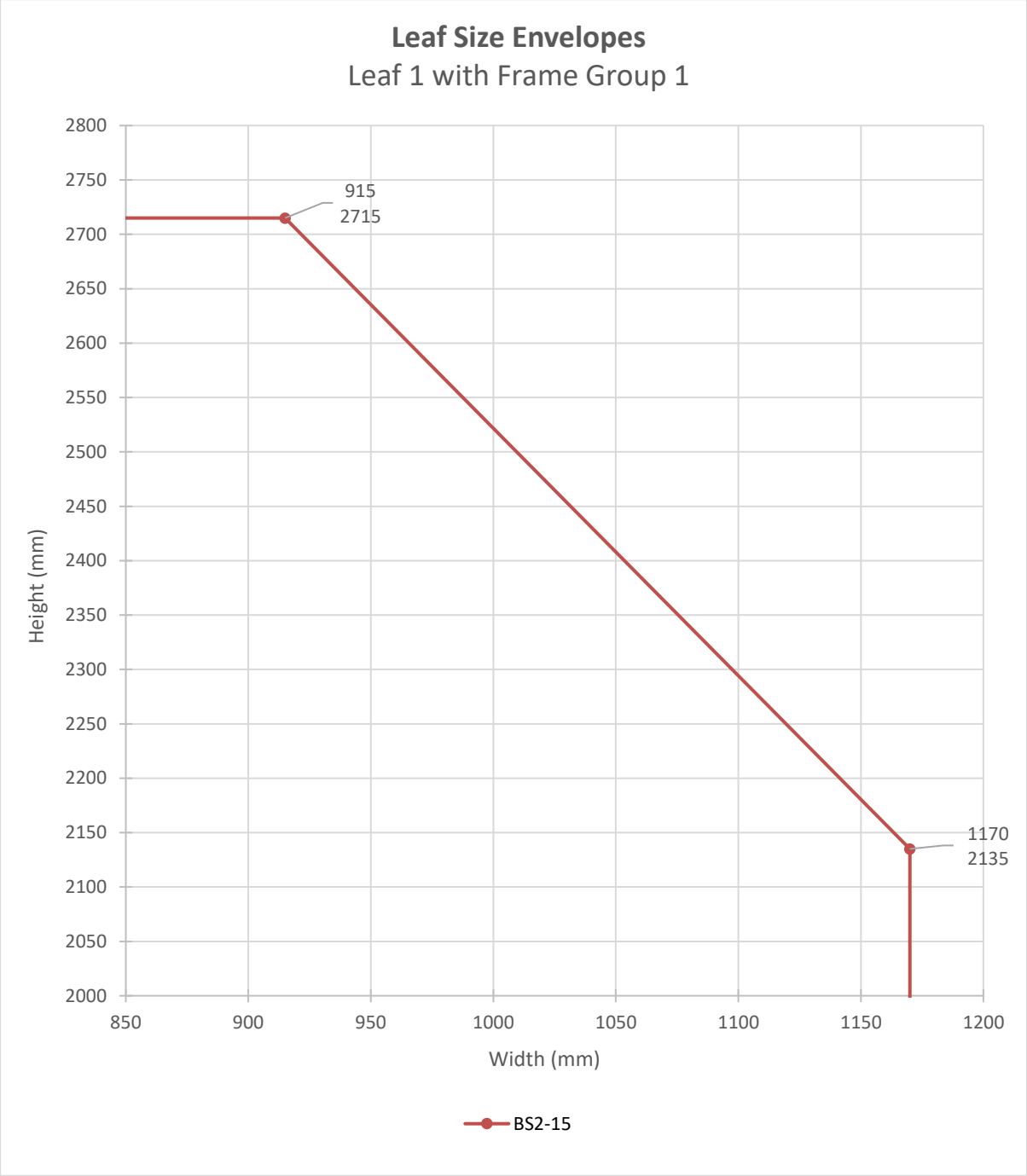
4.5.7 Leaf 1 – Configurations

4.5.7.1 LSASD Configuration: Leaf Sizes & Intumescent Specification



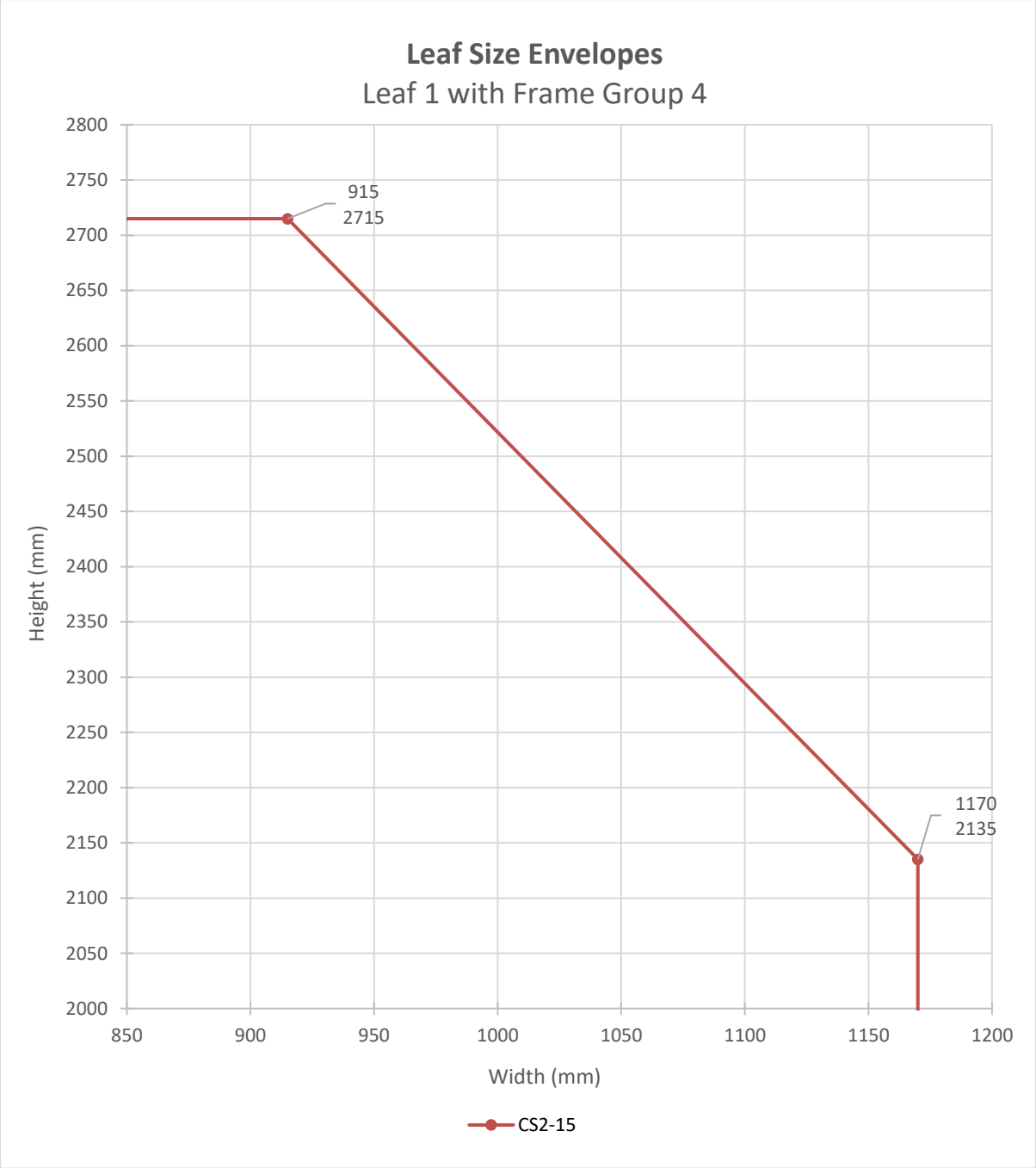
Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
AS1-15 (WF418407)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
AS2-15 (Chilt/RF11172)	FO8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
AS3-15 (WF426842)	STS154	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.7.2 ULSASD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
BS2-15 (Chilt/RF11172)	FO8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.7.3 DASD Configuration: Leaf Sizes & Intumescent Specification

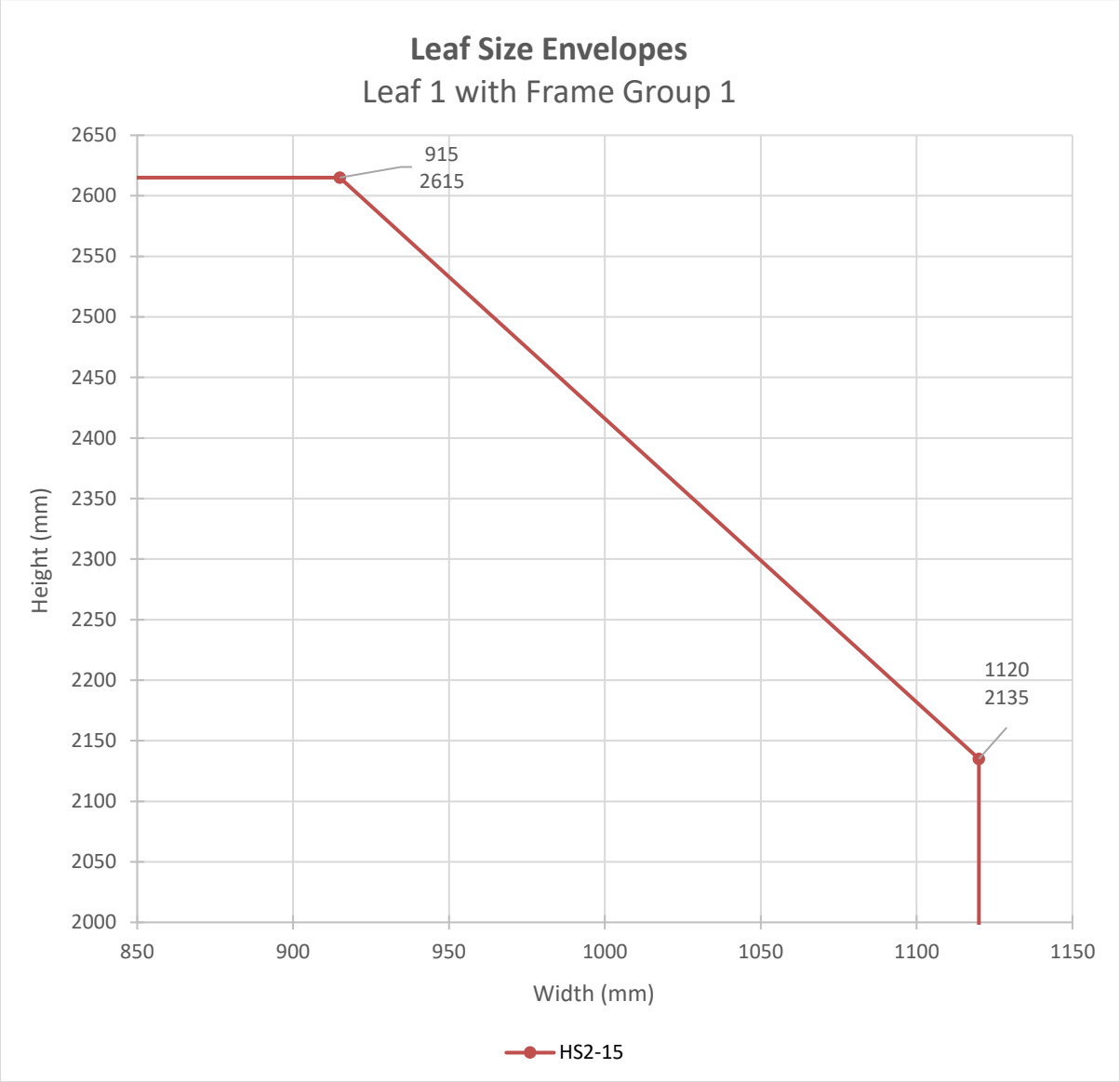


Intumescent Specification for DASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
CS2-15 (Chilt/RF11172)	FO8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.7.4 LSADD Configuration: Leaf Sizes & Intumescent Specification

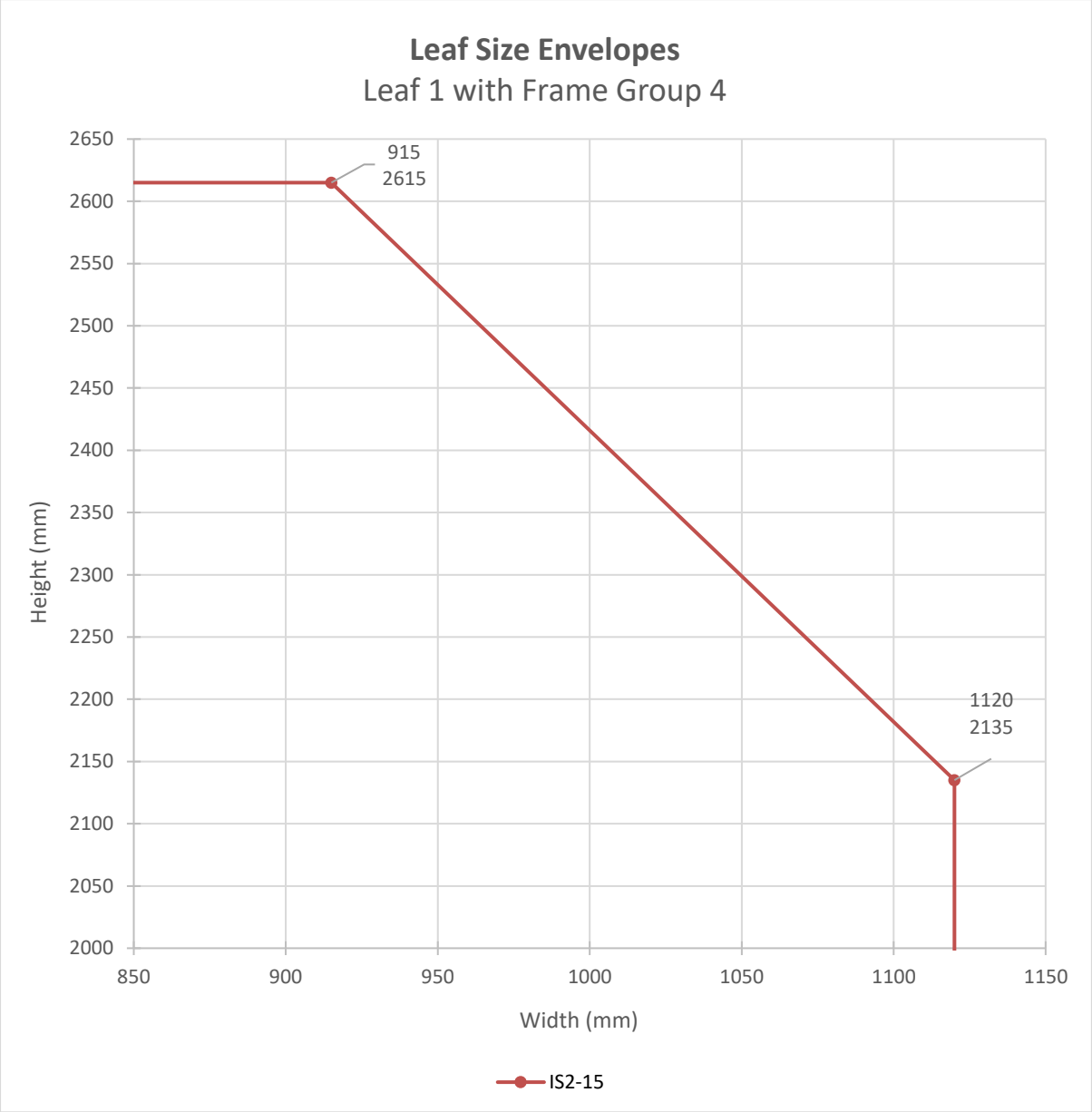
Intumescent Specification for LSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
GS2-15 (Chilt/RF11172)	FO8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 1no 15x4. Fitted centrally in the primary leaf edge.

4.5.7.5 ULSADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for ULSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
HS2-15 (Chilt/RF11172)	FO8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 1no 15x4. Fitted centrally in the primary leaf edge.

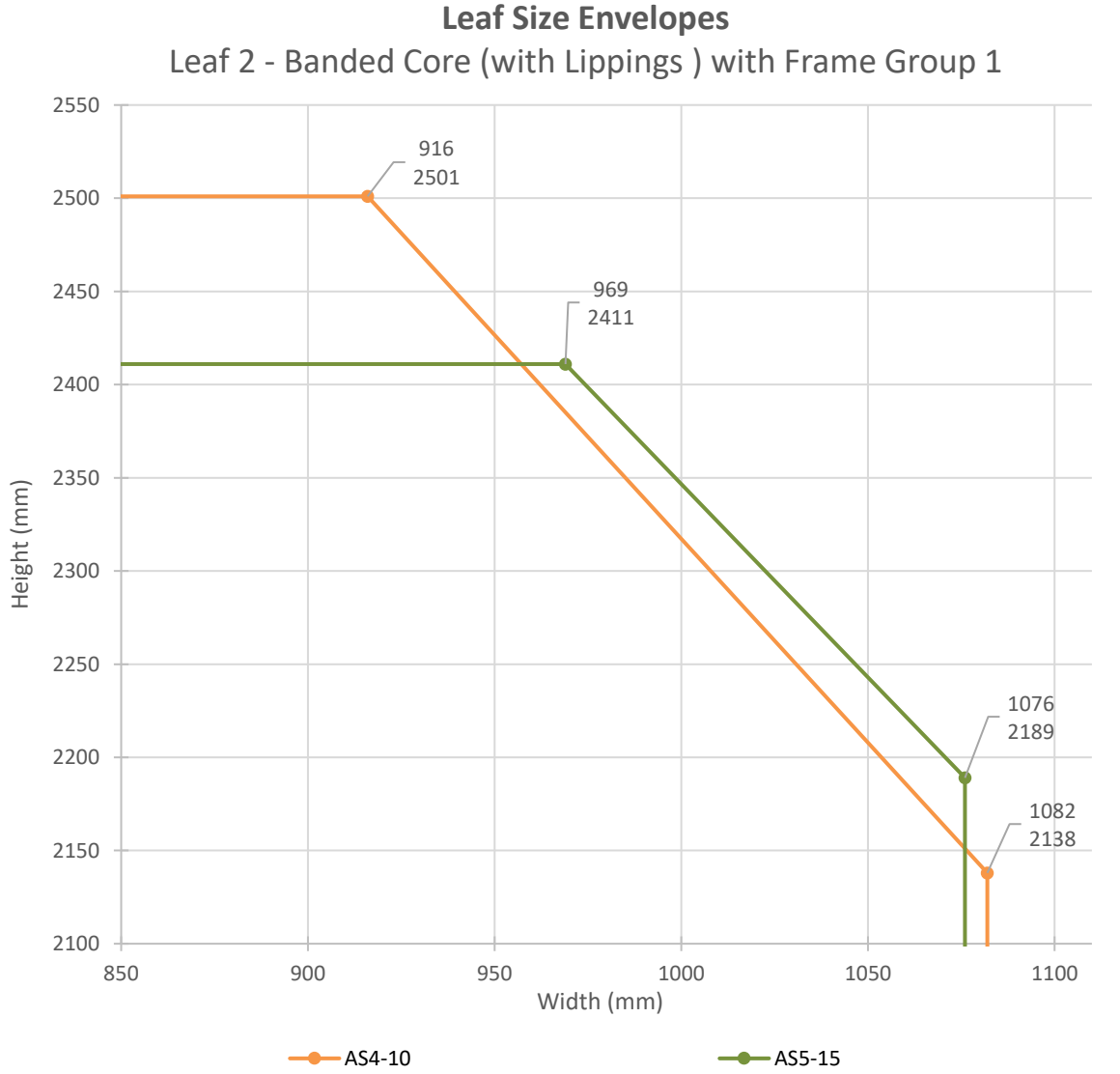
4.5.7.6 DADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for DADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
IS2-15 (Chilt/RF11172)	FO8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 1no 15x4. Fitted centrally in the primary leaf edge.

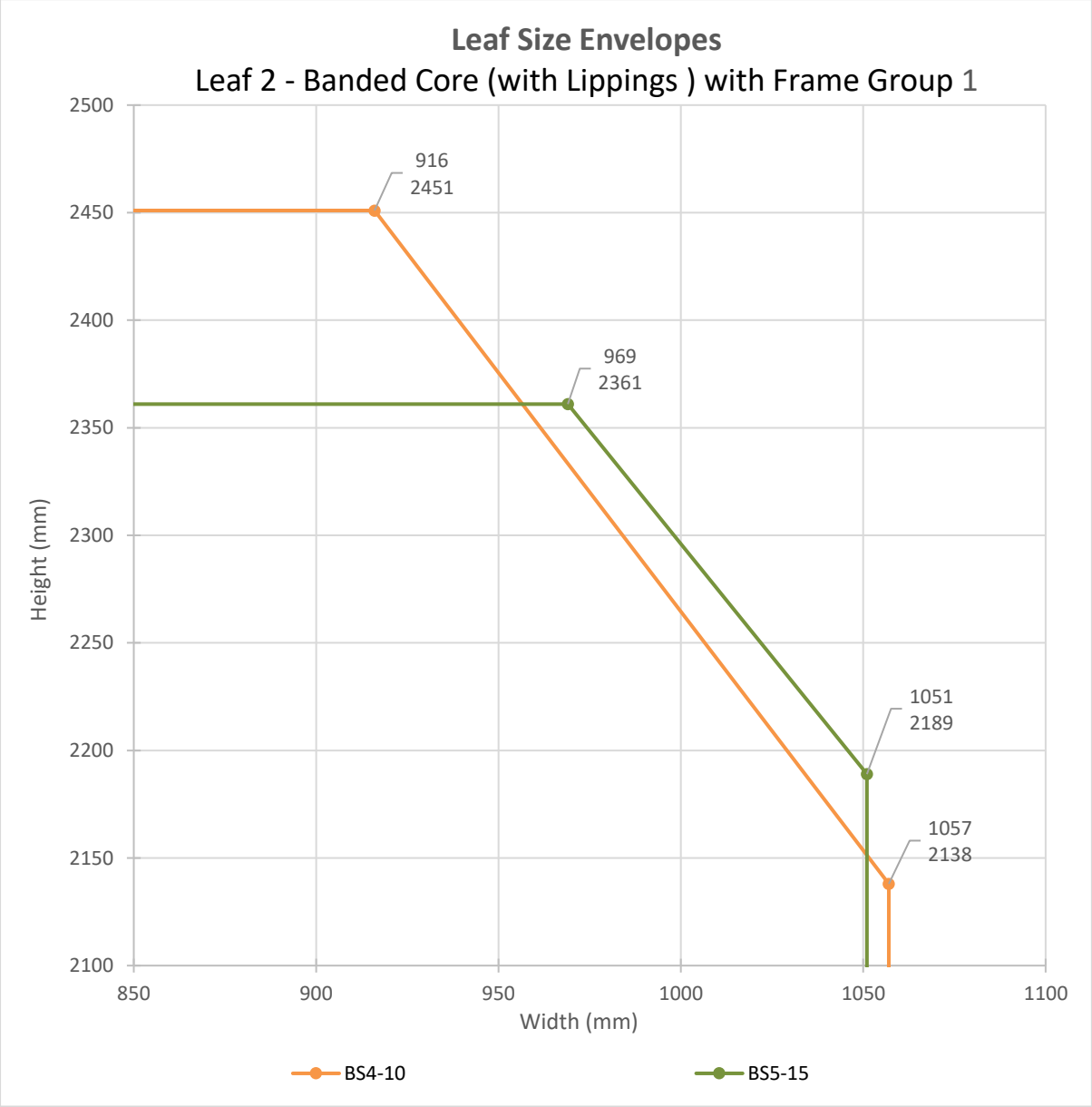
4.5.8 Leaf 2 – Banded Core – Lipped to Vertical or All Edges

4.5.8.1 LSASD Configuration: Leaf Sizes & Intumescent Specification



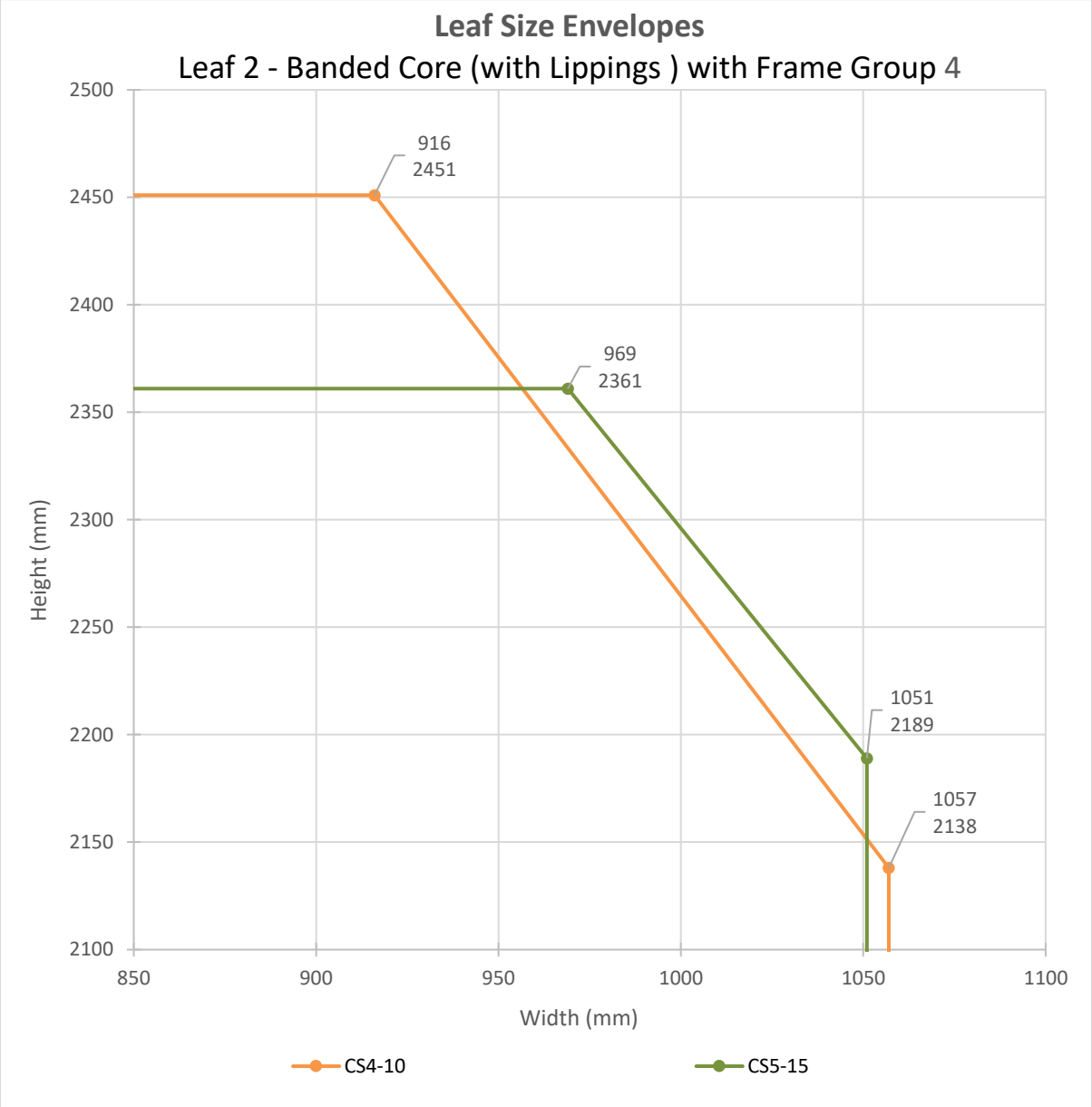
Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
AS4-10 (Chilt/RF12061)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
AS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.8.2 ULSASD Configuration: Leaf Sizes & Intumescent Specification



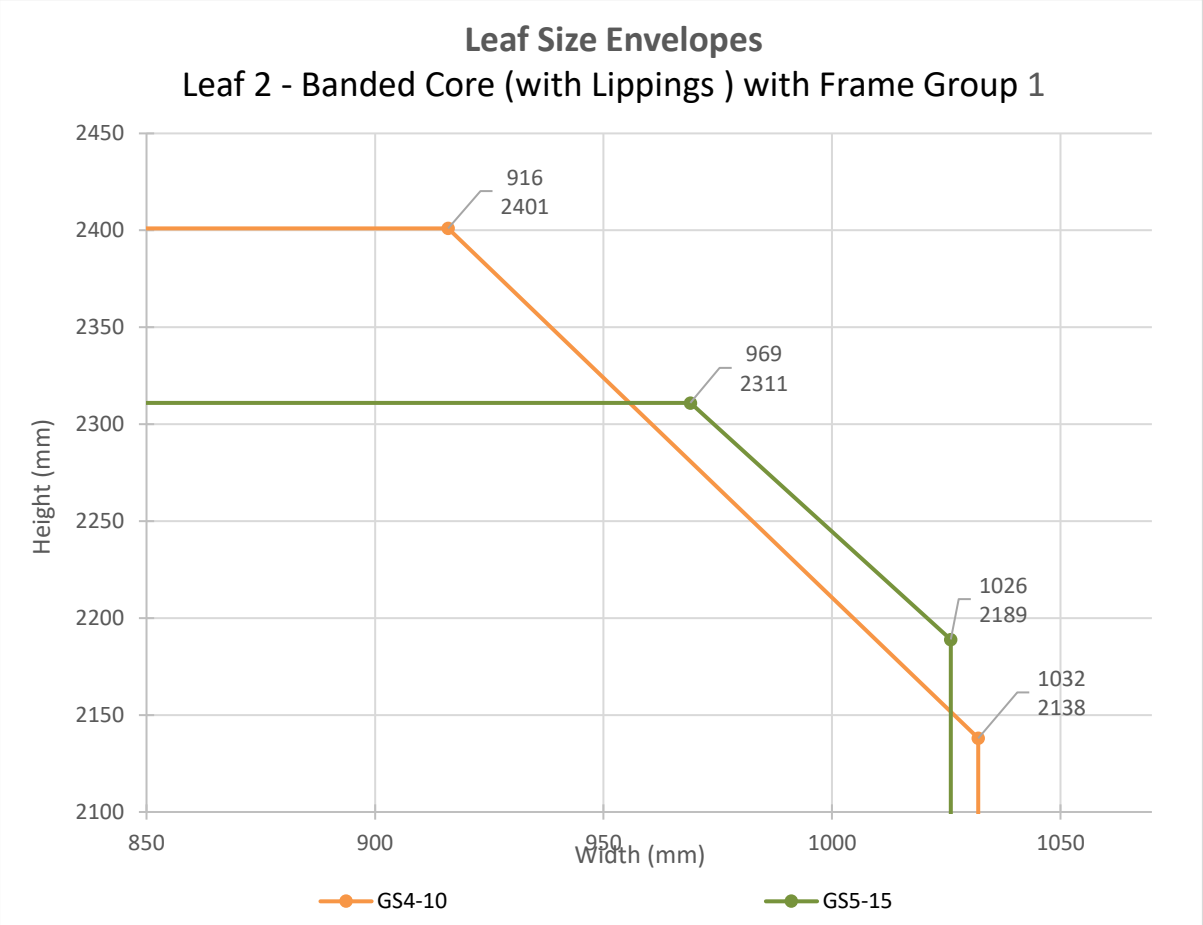
Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
BS4-10 (Chilt/RF12061)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
BS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.8.3 DASD Configuration: Leaf Sizes & Intumescent Specification



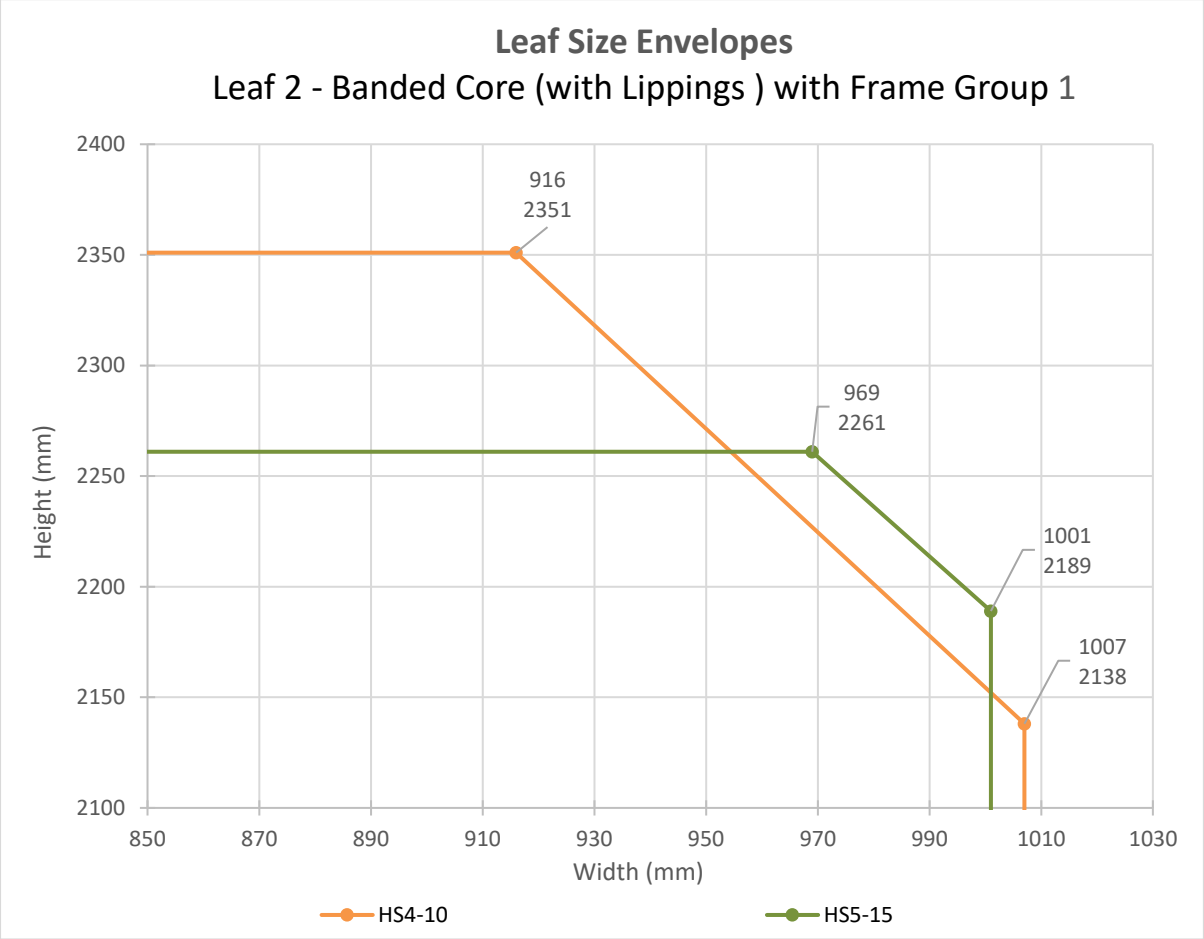
Intumescent Specification for DASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
CS4-10 (Chilt/RF12061)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
CS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.8.4 LSADD Configuration: Leaf Sizes & Intumescent Specification



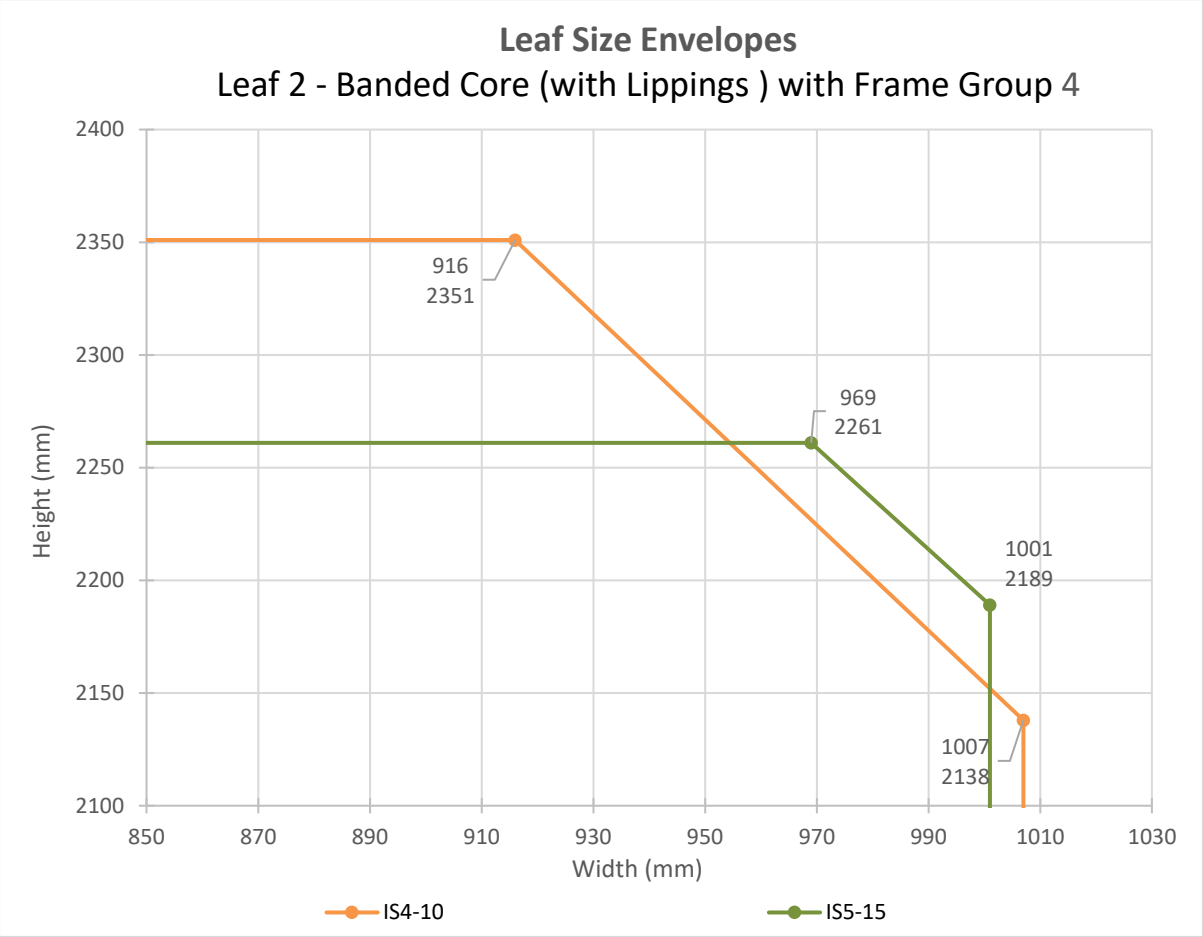
Intumescent Specification for LSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
GS4-10 (Chilt/RF12061)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.
GS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

4.5.8.5 ULSADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for ULSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
HS4-10 (Chilt/RF12061)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.
HS5-15 (WF514734))	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

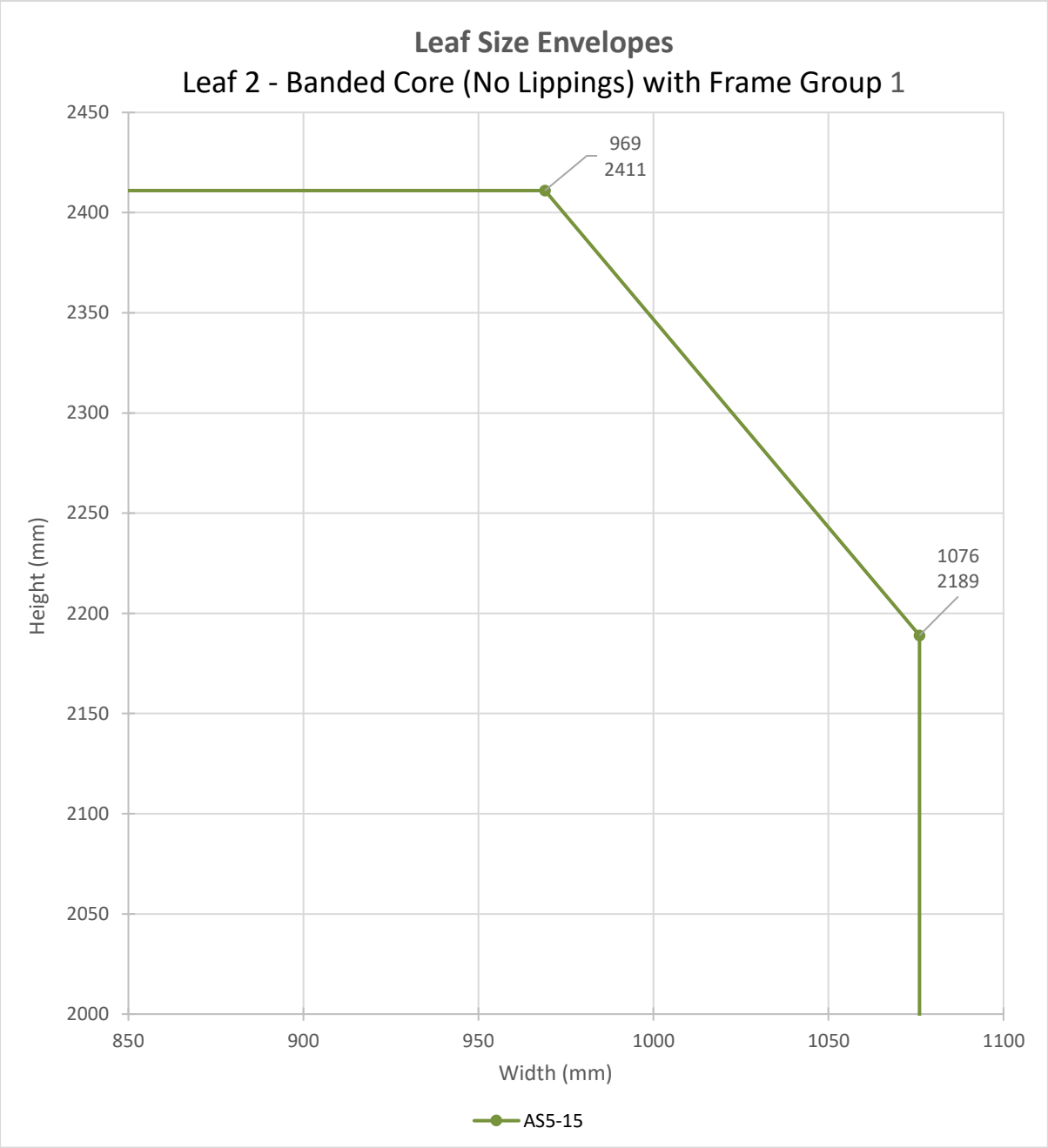
4.5.8.6 DADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for DADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
IS4-10 (Chilt/RF12061)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.
IS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

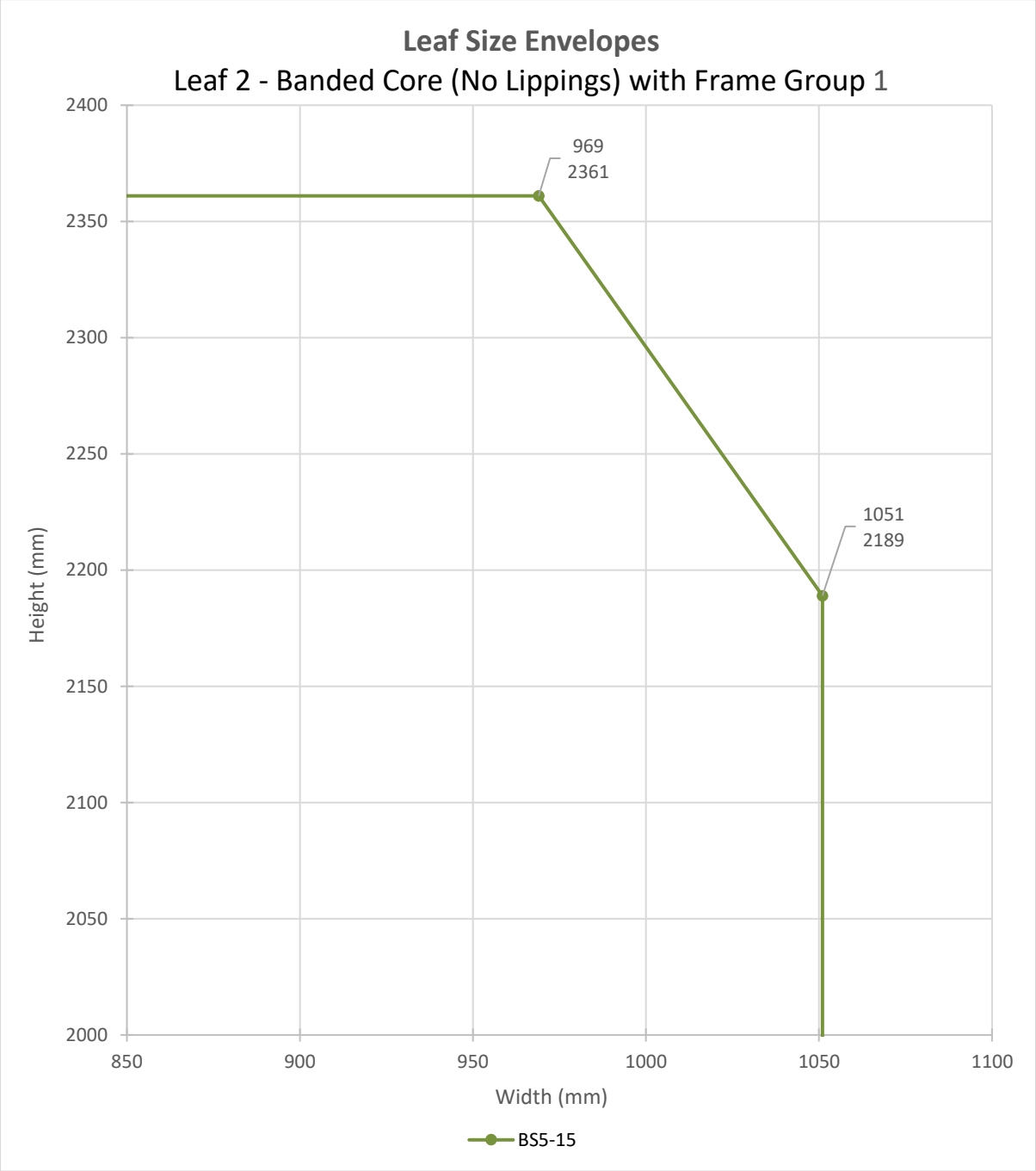
4.5.9 Leaf 2 – Banded Core without lippings

4.5.9.1 LSASD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
AS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.9.2 ULSASD Configuration: Leaf Sizes & Intumescent Specification

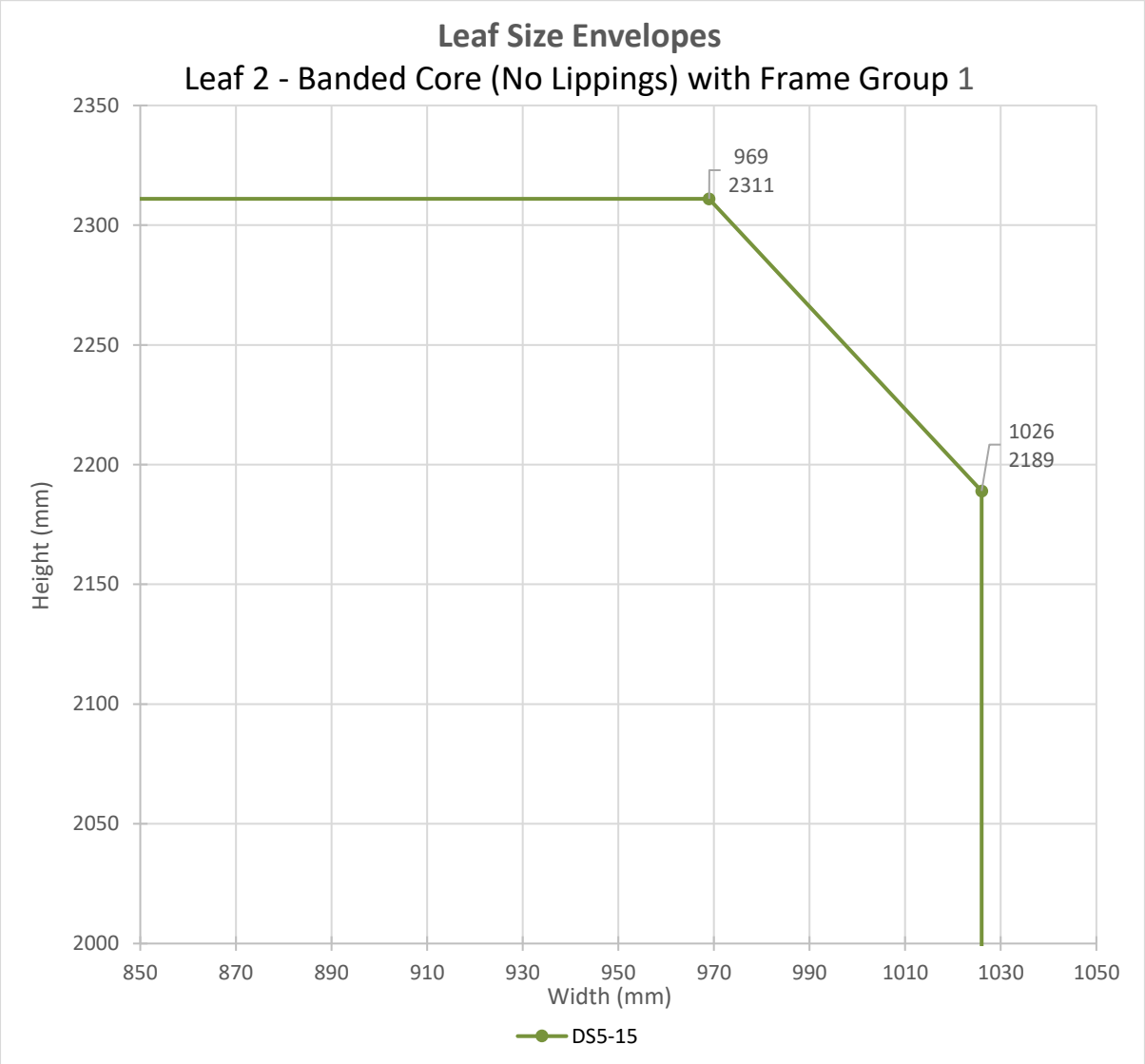


Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
BS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.

4.5.9.3 DASD Configuration: Leaf Sizes & Intumescent Specification

This configuration is not permitted with Leaf 2 (banded core without lippings)

4.5.9.4 LSADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for LSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
GS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

4.5.9.5 ULSADD Configuration: Leaf Sizes & Intumescent Specification

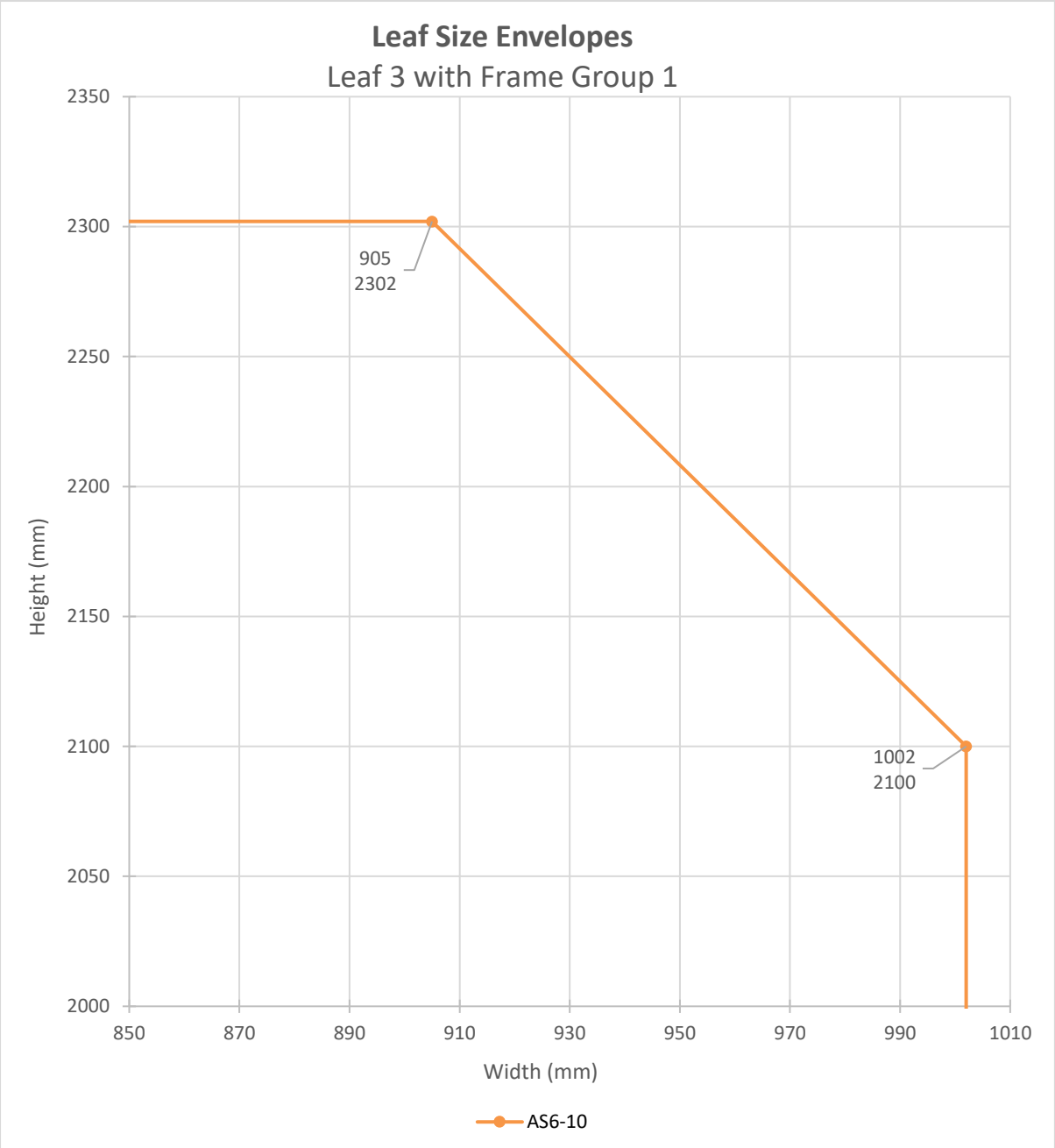
Intumescent Specification for ULSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
HS5-15 (WF514734)	LP1504-617	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

4.5.9.6 DADD Configuration: Leaf Sizes & Intumescent Specification

This configuration is not permitted with Leaf 2 (banded core without lippings)

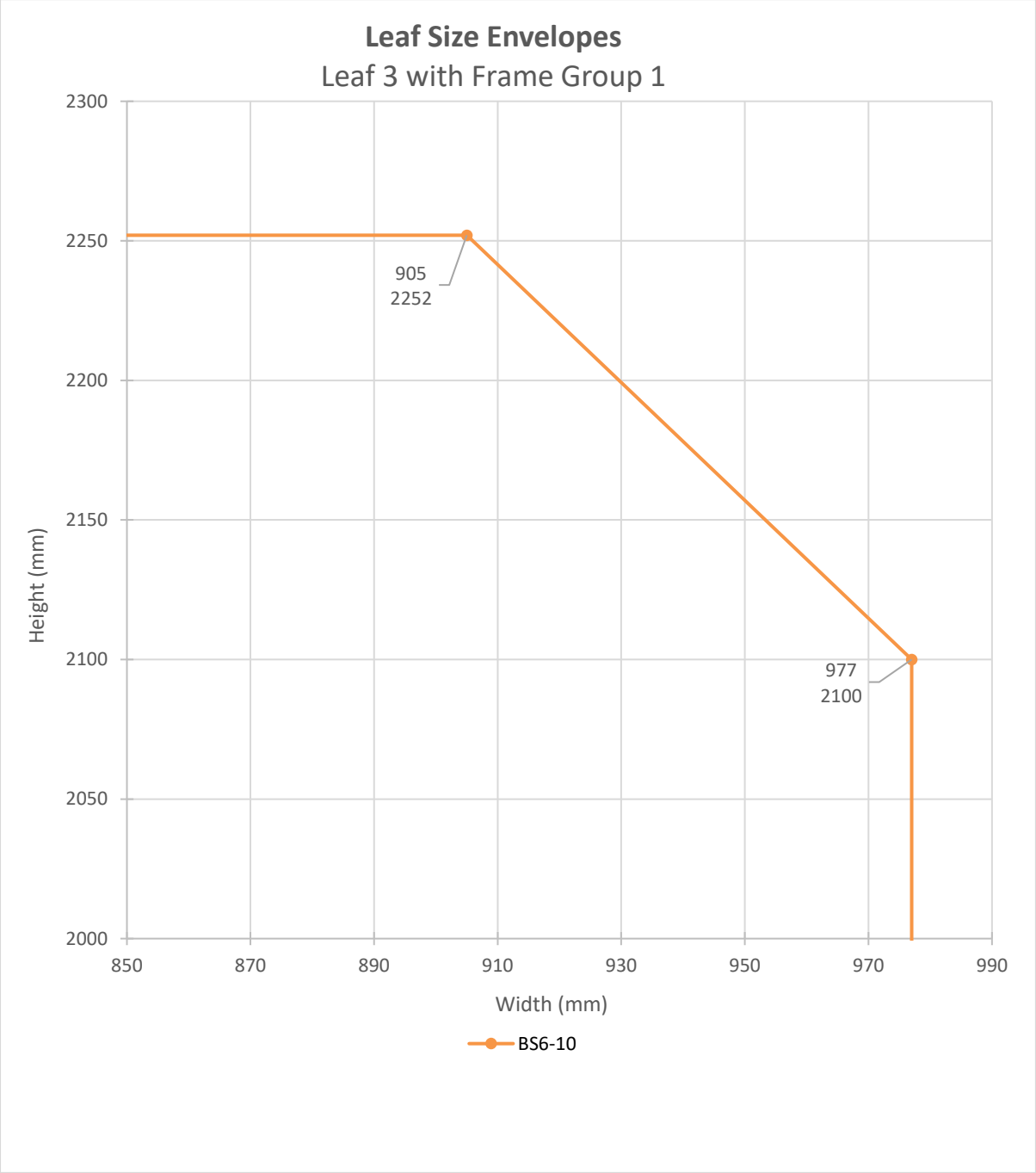
4.5.10 Leaf 3 – Doorset Configurations & Size Envelopes

4.5.10.1 LSASD Configuration: Leaf Sizes & Intumescent Specification



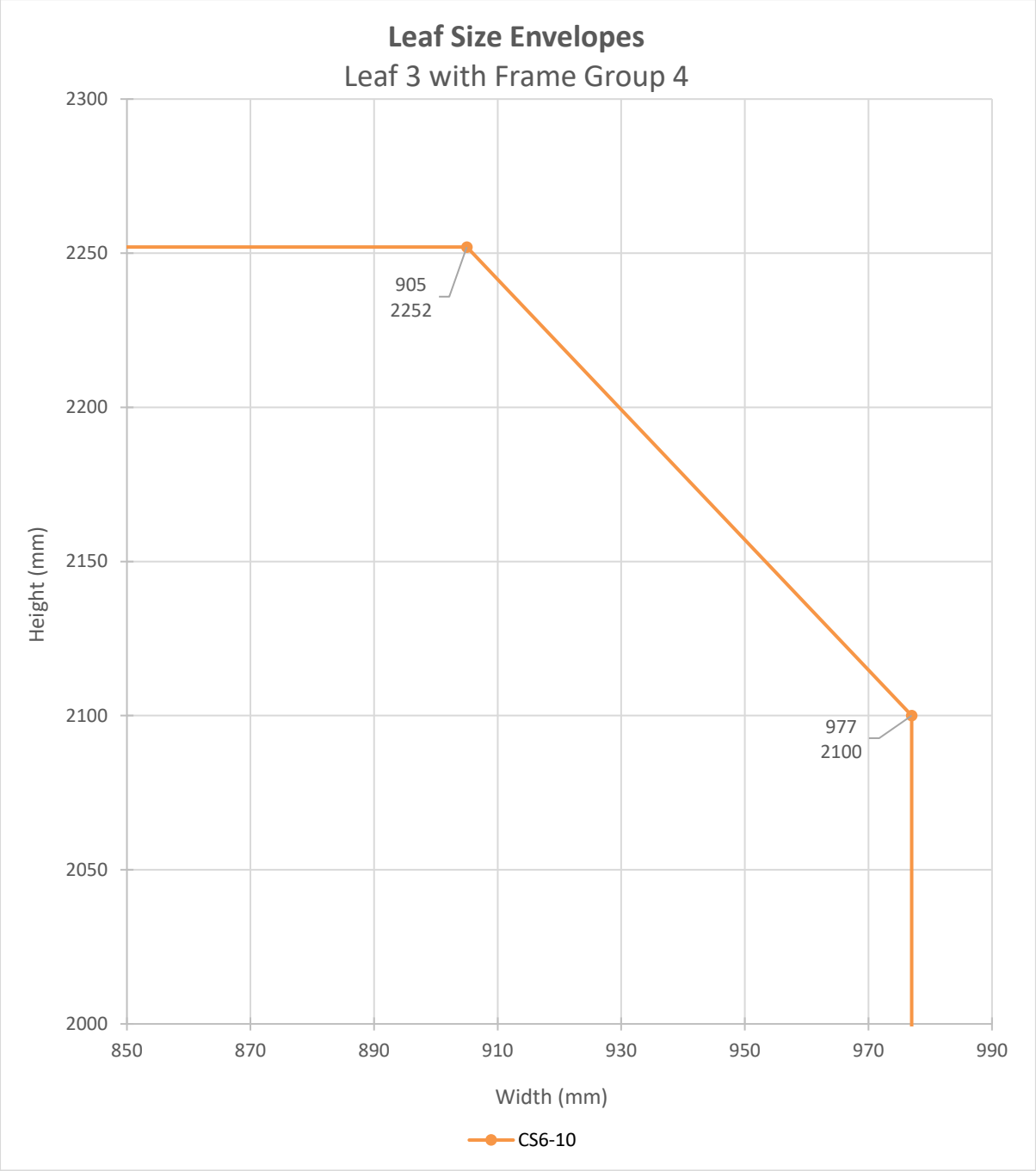
Intumescent Specification for LSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
AS6-10 (WF433833)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.

4.5.10.2 ULSASD Configuration: Leaf Sizes & Intumescent Specification



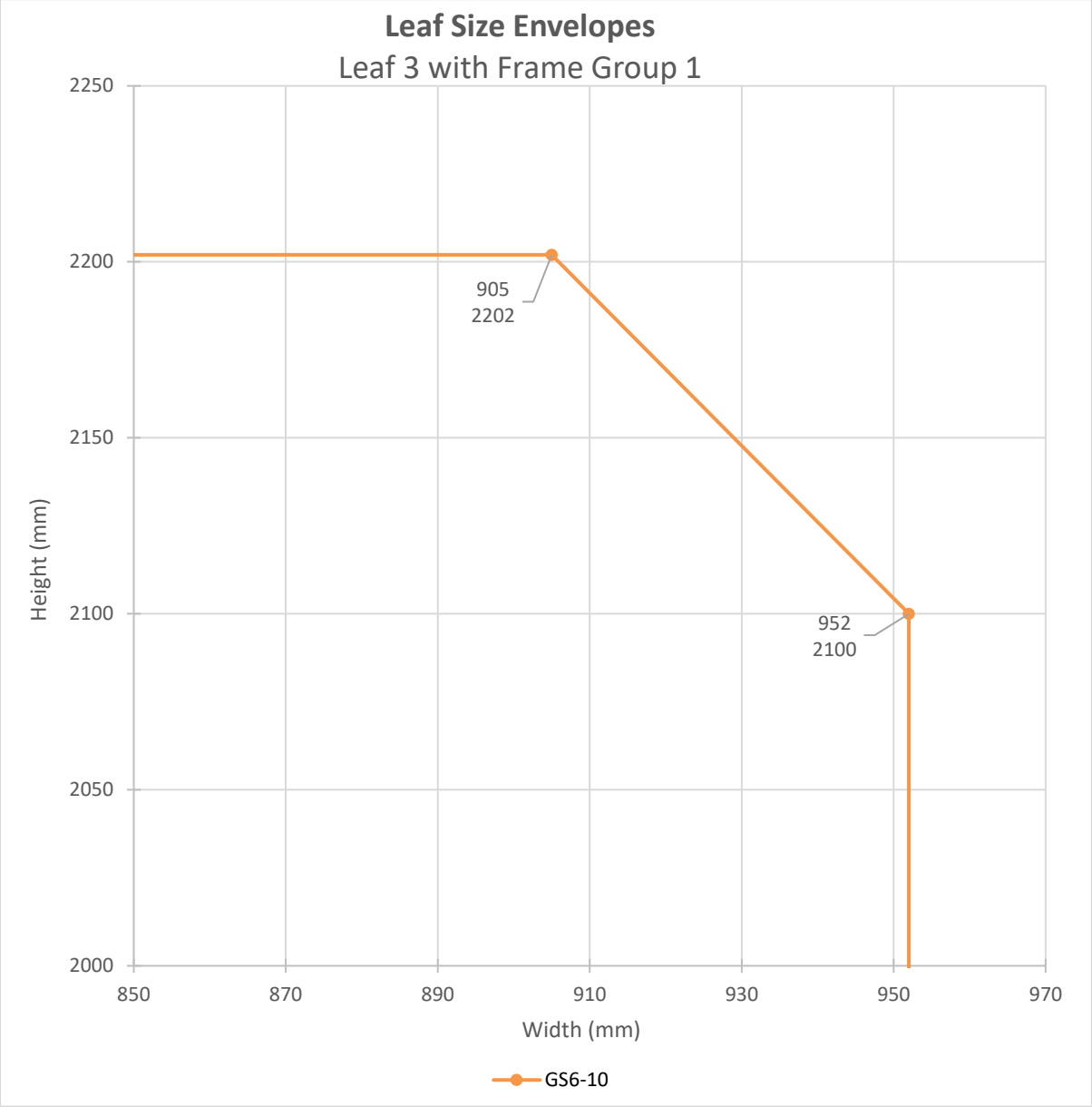
Intumescent Specification for ULSASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
BS6-10 (WF433833)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.

4.5.10.3 DASD Configuration: Leaf Sizes & Intumescent Specification



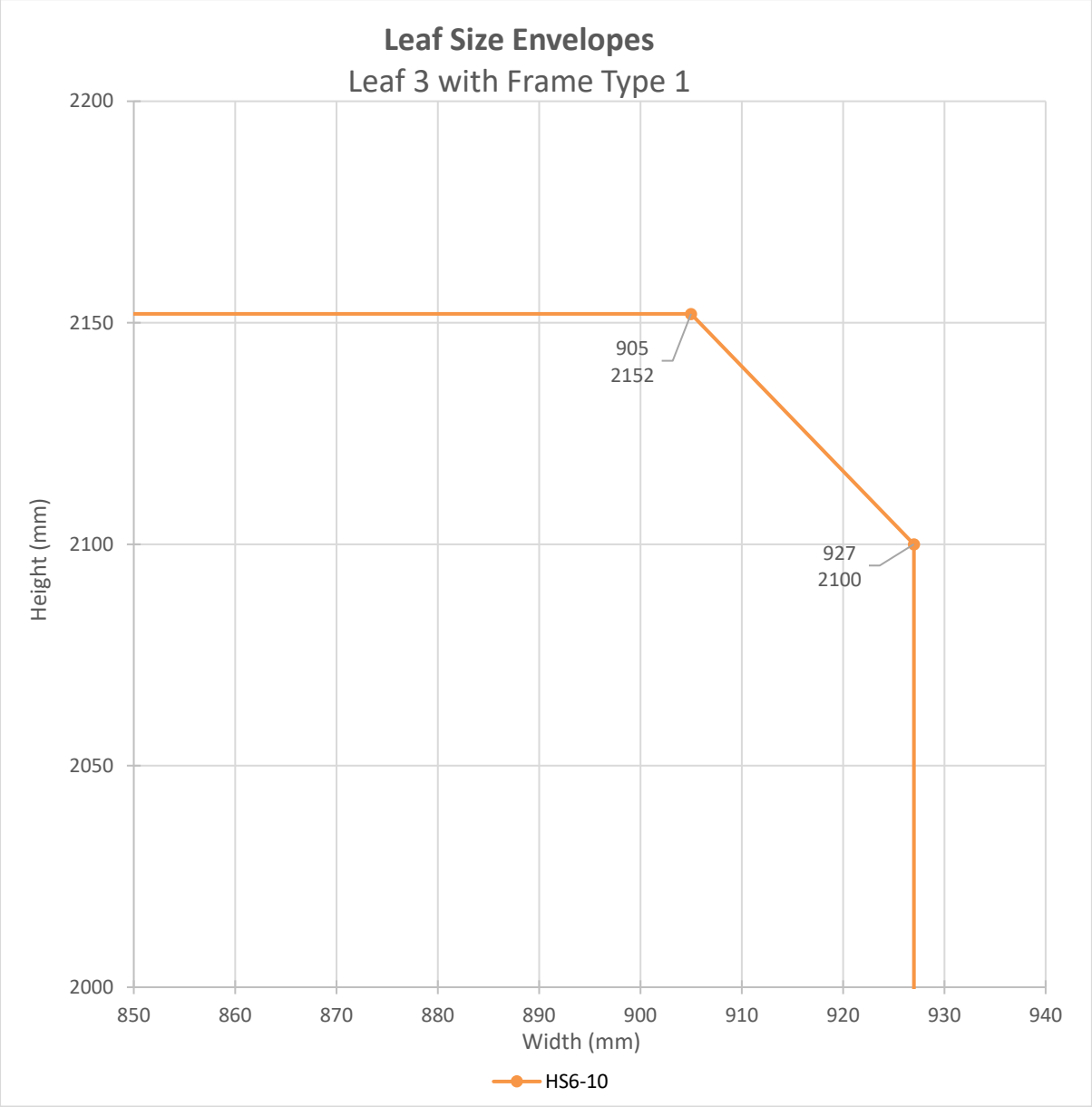
Intumescent Specification for DASD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
CS6-10 (WF433833)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.

4.5.10.4 LSADD Configuration: Leaf Sizes & Intumescent Specification



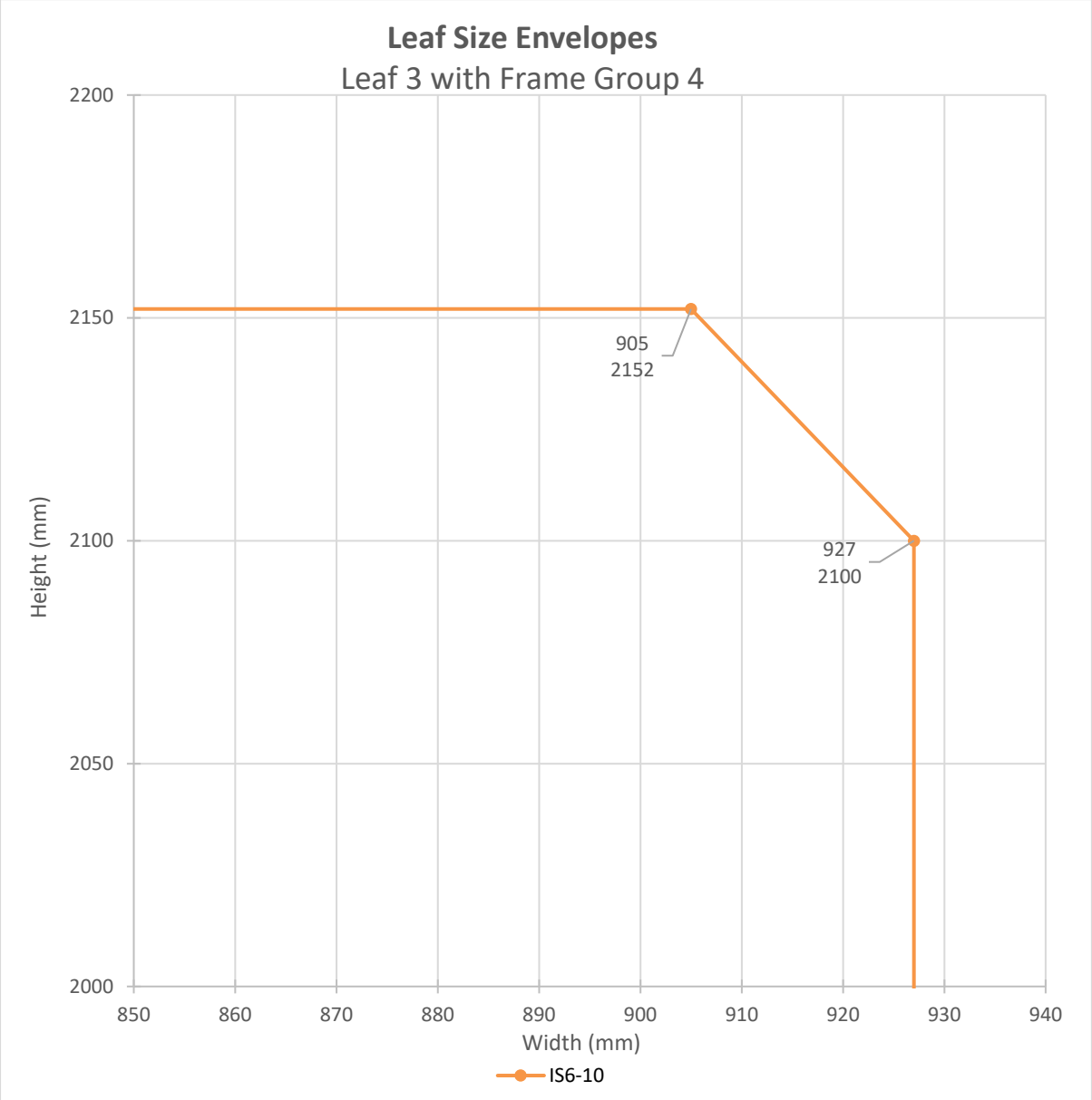
Intumescent Specification for LSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
GS6-10 (WF433833)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

4.5.10.5 ULSADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for ULSADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
HS6-10 (WF433833)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

4.5.10.6 DADD Configuration: Leaf Sizes & Intumescent Specification



Intumescent Specification for DADD			
Intumescent Spec. Reference & (Test Reference)	**Make / Type**	**Manufacturer / Supplier**	**Location & Size**
IS6-10 (WF433833)	Pyrostrip 100P	Mann McGowan	**Head & Jambs:** 1no 10x4. Fitted centrally in frame reveal or leaf edges.
			Meeting Stiles: 2no 10x4. Fitted centrally in the primary leaf edge, 10mm apart.

5 General Description of Construction

5.1 Leaf Core Construction

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

5.1.1 Leaf 1 – Strebord© 35+ – 3mm thick

The primary construction for door leaves of this design comprises the following:

1. A core of 35mm thick Strebord© particleboard (minimum density 560kg/m^3).
2. 4mm thick MDF facings (min density 750kg/m^3) are applied to both faces of the blank
3. The MDF faces are to be bonded to the 35mm core by the fabricator / doorset manufacturer.
4. The applied MDF facings for this design may butt up to or conceal the lipping.
5. Lippings are required to the vertical edges as a minimum. These may be oversailed by the MDF facing or be applied to the finished (43mm thick) core construction.

Lipping and Facing adhesives can be found in Section 10

5.1.2 Leaf 2 – Strebord© 35+ Banded Core – 43mm thick

The primary core construction (for door leaves of this design comprises the following:

- A single piece core of 35mm thick Strebord© particleboard (minimum density 560kg/m^3) fitted with softwood or hardwood (min density 500kg/m^3) stiles and rails to the perimeter of the core. Refer to section 4.3.2 for maximum and minimum dimensions after trimming.
- Stiles and rails are glued (PVA D3 Crosslinking) to core edges and held in place using approx. 14mm staples, positioned at the butt joints of the perimeter framing and at nominally 180mm centres to one face of the blank only, to hold the rails in position during pressing
- The Strebord© 35+ Banded Core has been fire tested with no lippings (as per test WF514734 44mm thick
- Where trimming of the blank is required the maximum dimensions of the perimeter framing (stile and rail) are to be 35x45mm to allow for a maximum of 10mm trimming to any leaf edge either to square the blank in production or to allow for site trimming of the door blanks where no lippings are applied. The minimum and maximum stile and rail dimension after trimming must be 35x32mm or 35x40mm.
- MDF facings (min density 750kg/m3) are applied to both faces of the leaf, oversailing the stiles and rails.
- The MDF faces are to be bonded to the 35mm core by the door blank or doorset manufacturer.

Additionally the banded cores may be lipped if required to the following conditions:

- The applied MDF facings for this design butt up the lipping i.e. the lipping is exposed prior to any final facing (e.g. laminate or veneer)..
- Lippings may be adhered to the vertical edges or if required to all edges The lippings must be applied to the finished (43mm thick) core construction.

Lipping and Facing adhesives can be found in Section 10

5.1.3 Leaf 3 – Strebord© Superpan – 44mm thick (Nominal)

The primary construction for door leaves of this design comprises the following:

A solid sheet of nominal 38mm thick graduated density particleboard (minimum density 560kg/m^3) with nominal 3mm thick outer MDF facings, fully bonded and integrated during the board manufacturing process. The leaves are to be lipped to vertical edges only with hardwood.

Lipping adhesives can be found in Section 10

5.2 Lippings

The requirements for lipping Leaf types 1 to 3 are given in the following sections

5.2.1 Timber Lipping – Leaf 1

Leaves must be lipped on vertical edges. Lippings to horizontal edges are optional unless doorset configuration or hardware type requires otherwise. All lippings must comply with the following specification:

Timber Lipping Specification		
Material	Size (mm)	Min Density (kg/m^3)
Hardwood[1]	1. **Flat Lipping** = 8 – 13 thick with a maximum of 2mm profiling permitted at corners of lipping 2. **Rounded Lipping** = 13 – 18 thick with a radius matching the distance between leaf edge and floor pivot	640
	3. Rebated = Not Permitted	N/a
Strelip® Engineered Hardwood (based on WF414781)	**Flat Lipping** = 7–10 thick with a maximum of 2mm profiling permitted at corners of lipping	650

Notes:

1. All door lipping timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects)
2. For Hardwood lippings (not Strelip), MDF faces may oversail the lippings (the lippings being applied prior to the MDF facing) or alternatively the lippings may be applied to the completed core construction after the MDF facings are applied i.e. the lippings are 43mm wide.
3. Strelip® Engineered lippings may only be applied to the completed core construction after the MDF facings are applied i.e. the lippings are 43mm wide.
4. Overpanels separated from the leaf heads with a transom do not need to be lipped.
5. Examples of permissible edge profiling and adjustments to lippings to aid closing are detailed in Sections 5.2.4.1 & 5.2.4.2
6. Lippings 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. Refer to section 10 for permitted adhesives.

5.2.2 Timber Lipping – Leaf 2

As described in section 5.1.2, Leaf 2 does not require lipping, however where lippings are required they must comply with the following specification:

Timber Lipping Specification		
Material	Size (mm)	Min Density (kg/m^3)
Hardwood[1]	1. Flat = 8 – 13 thick with a maximum of 2mm profiling permitted at corners of lipping 2. Rounded = 13 – 18 thick with a radius matching the distance between leaf edge and floor pivot	640
	3. Rebated = Not Permitted	N/a
Strelip® Engineered Hardwood (based on WF414781)	**Flat Lipping** = 7–10 thick with a maximum of 2mm profiling permitted at corners of lipping	650

Notes:

1. All door lipping timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects)
2. Overpanels separated from the leaf heads with a transom do not need to be lipped
3. Single and double doorsets with or without transomed overpanels do not require lippings. However they may be lipped if required, to the vertical edges only or lipped to all four edges.
4. Lippings (Hardwood or Strelip®) are to be applied to the completed core construction after the MDF facings are applied i.e. the lippings are 43mm wide.
5. Examples of permissible edge profiling and adjustments to lippings to aid closing are detailed in Sections 5.2.4.1 & 5.2.4.2
6. Lippings 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. Refer to section 10 for permitted adhesives.
7. Lippings must be applied as a minimum to the vertical edges of banded cores where used in double acting configurations.

5.2.3 Timber Lipping Leaf 3

Leaves must be lipped on vertical edges. Lippings to horizontal edges are required for all double swing applications, however these are optional for single swing doorsets unless the hardware type incorporated requires otherwise. All lippings must comply with the following specification:

Timber Lipping Specification		
Material	Size (mm)	Min Density (kg/m^3)
Hardwood[1]	1. Flat = 8 – 13 thick with a maximum of 2mm profiling permitted at corners of lipping 2. Rounded = 13 – 18 thick with a radius matching the distance between leaf edge and floor pivot	640
	3. Rebated = Not Permitted	N/a
Strelip® Engineered Hardwood (based on WF414781)	**Flat Lipping** = 7–10 thick with a maximum of 2mm profiling permitted at corners of lipping	650

Notes:

1. All door lipping timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects)
2. Overpanels separated from the leaf heads with a transom do not need to be lipped
3. Examples of permissible edge profiling and adjustments to lippings to aid closing are detailed in Sections 5.2.4.1 & 5.2.4.2
4. Lippings 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. Refer to section 10 for permitted adhesives

5.2.4 Lipping Examples

The following details are standard lipping specifications based on timber

Section 5.2.4.2 gives details on the permitted adjustments to lipping to aid closing

5.2.4.1 Standard Lipping based on timber

Hardwood Lippings Min Density 640 kg/m³

Flat | 8-13mm

Rounded | 13-18mm (hanging edge of double acting configurations only)

5.2.4.2 Standard lippings based on Falcon Panel Products engineered timber products

Strelip® Lippings Min Density 650 kg/m³

5.2.4.3 Permitted adjustments to lippings to aid closing

Permissable edge profiling to all lipping types & materials

Round over | max 3x3mm

45° chamfer | max 3x3mm

5.3 Edge Protectors

Not permitted within this assessment

5.4 Decorative & Protective Facings – All Leaf Options

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

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

Decorative & Protective Facing Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint[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 43mm for Leaf 1 & 2 and 44mm for Leaf 3 after finishing has been applied.
3. Materials may over sail lippings but must not return around leaf edges.
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 – all Leaf Options

Decorative mouldings can be applied to all door leaf options providing the following criteria is adhered to:-

The mouldings:

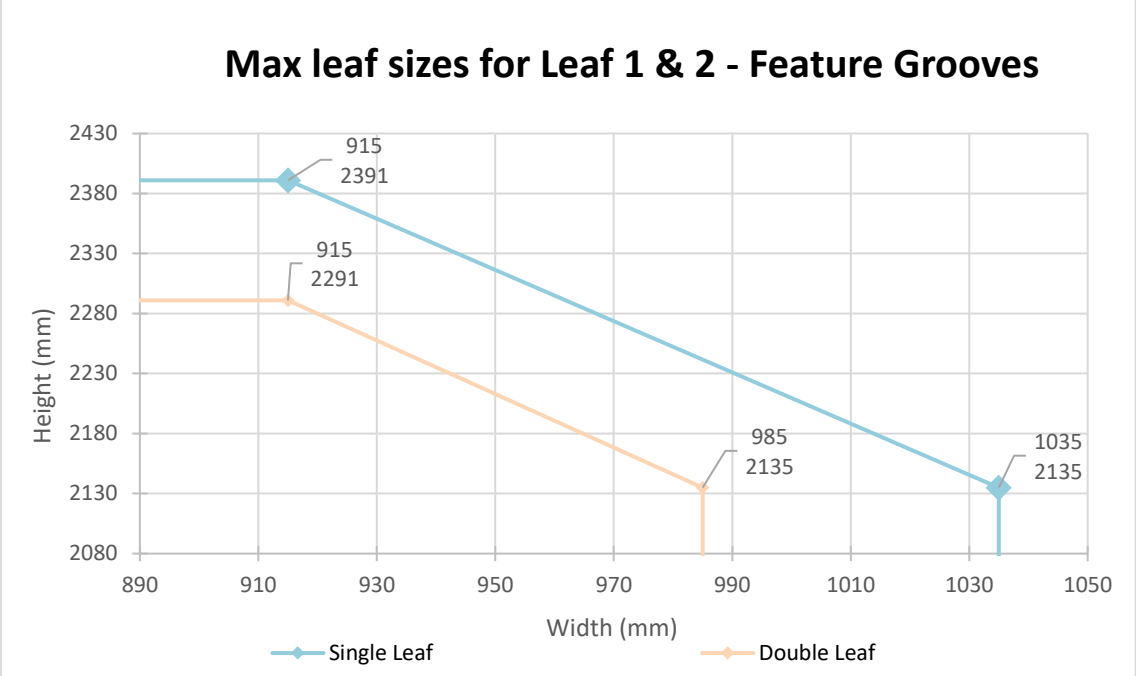
- Are surface applied to the door
- Are no higher than 30mm i.e. proud of the door
- Are no wider than 70mm
- Cover no more than 30% of the door leaf area
- Are no closer than 80mm to the door leaf edge
- Are bonded into position with no mechanical fixings or using small screws penetrating the door core to a depth of 12mm maximum.
- Are bonded using any glue which is suitable for bonding the lipping of the door.

5.6 Feature Grooves – Leaf 1 & 2

Testing conducted on Falcon Panel Products Ltd. Strebord® 35 door cores under test reference RF11161 demonstrated that the 35mm core material with no additional faces capable of exceeding the required 30 minutes fire performance. It is therefore the opinion of this report that where MDF faces are fitted that grooves into the completed core, no deeper than the facing material will not be detrimental to the performance of the door construction. Subject to the following stipulations:

The door leaf envelopes shown below give the maximum permitted leaf sizes where feature grooves are required.

- Where the leaf size envelopes in Section 4.5 permit a larger leaf than shown below, the leaf size envelope below must be used.
- Where the leaf size envelopes in Section 4.5 permit a smaller leaf than shown below, the leaf size envelope from Section 4.5 must be used.
- Maximum permitted leaf sizes for grooves to be applied (based on Chilt/RF11161) are:
    - Single Leaf: Max Height: 2391mm (at 915mm Wide)
      Max Width: 1035mm (at 2135mm High)
    - Double Leaf: Max Height: 2291mm (at 915mm Wide)
      Max Width: 985mm (at 2135mm High)



The above graph gives the maximum leaf sizes when including feature grooves, however, the leaf size must never exceed the leaf size maximum envelope in section 4.5 for the particular intumescent specification and leaf configuration (Leaf Type 1 or Leaf Type 2)

5.6.1 Leaf 1 - Feature Grooves Parameters

- Grooves may run to the leaf edge
- Horizontal grooves must be no closer than 75mm to the top and bottom of the door leaf and vertical grooves must be no closer than 75mm to the sides of the leaf.
- Groove depth is limited to the facing thickness after calibration and must not be cut into the core material – therefore a maximum of 3mm.
- The groove width is limited to a maximum width of 20mm.
- Grooves must be no closer than 20mm to each other
- The groove pattern, angle of the grooves and intersections are unrestricted
- The groove must not coincide with any apertures (e.g. glazing, ATG, letter plates, etc.) and must stop short a minimum of 5mm from the aperture or be adequately infilled with one of the approved infill materials listed above, for the full depth of the groove
- Grooves must not coincide with cableways, being at least 50mm away from the cableway.
- Grooves must not coincide with recessed/morticed items of hardware
- Grooves can be included in Latched, Unlatched, single acting and double acting, single leaf and double leaf doorsets.
- Grooves can be included when a transom is present and the over panel may be grooved following the limitations above.
- The intumescent seal present must be a minimum of 15 by 4mm at the doorsets head and jambs and 2 Nos 10 by 4mm at meeting stile

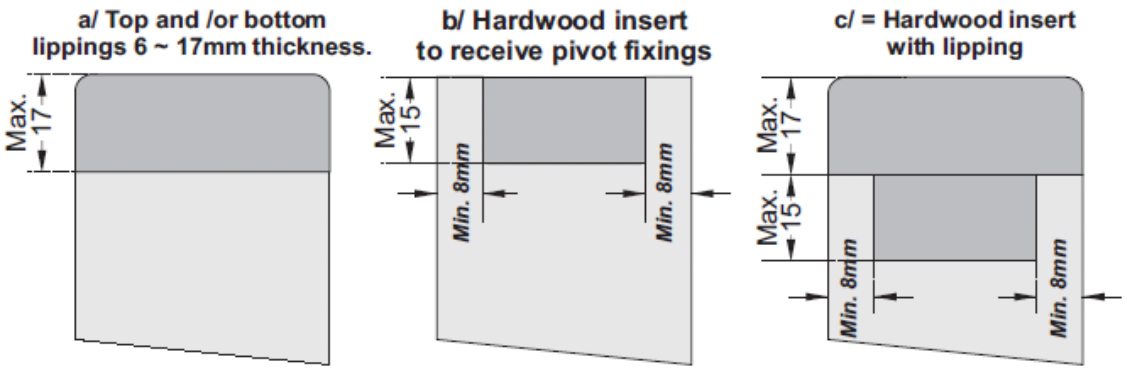
5.6.2 Leaf 2 - Feature Grooves Parameters

- Grooves are not permitted to run to the leaf edge. A minimum 75mm margin around the door leaf perimeter must be maintained.
- Groove depth is limited to the facing thickness after calibration and must not be cut into the core material – therefore a maximum of 3mm.
- The groove width is limited to a maximum width of 20mm.
- Grooves must be no closer than 20mm to each other
- The groove pattern, angle of the grooves and intersections are unrestricted
- The groove must not coincide with any apertures (e.g. glazing, ATG, letter plates, etc.) and must stop short a minimum of 5mm from the aperture or be adequately infilled with one of the approved infill materials listed above, for the full depth of the groove
- Grooves must not coincide with cableways, being at least 50mm away from the cableway.
- Grooves must not coincide with recessed/morticed items of hardware
- Grooves can be included in Latched, Unlatched, single acting and double acting, single leaf and double leaf doorsets.
- Grooves can be included when a transom is present and the over panel may be grooved following the limitations above.
- The intumescent seal present must be a minimum of 15 by 4mm at the doorsets head and jambs and 2 Nos 10 by 4mm at meeting stile

5.7 Hardwood Blocking For Pivots – Leaf 1 & 3

The following leaf edge option is permitted for lipping the top and bottom of doors that are to receive pivot fixings and are to be used in severe duty locations.

The hardwood insert must be a size (length) suited to the particular item of hardware plus a maximum of 50mm (but not be full door width) and must be securely adhered to the door core. The hardwood insert should not be greater than 15mm in depth and when fitted should provide for a minimum margin of 8mm to either face of the leaf. The inserted blocks must be bonded on all contact faces using adhesives approved for the application of lippings (see section 10). The hardwood insert must have a minimum density of 640 kg/m3.



5.8 Leaf Size Adjustment Prior to Machining

Door Leaf 1 and 3 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 (where necessary) in accordance with Section 5.2
Timber lipping	Once applied to the core, flat timber lippings may be reduced in thickness provided the lipping is not reduced below the minimum requirements stated in section 5.2 Horizontal timber lippings may be completely removed unless the door assembly configuration or hardware type requires otherwise

Door Leaf 2 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 only be reduced in height or width if the dimensions of the stiles and rails (after trimming)_ are no smaller than the minimum dimensions given in Section 4.3.2 (i.e. the door leaf would need to be made with stiles and rails larger than that stated in section 4.3.2 to accommodate any trimming that may be required for machining purposes).
Timber lipping	Once applied to the core, flat timber lippings may be reduced in thickness provided the lipping is not reduced below the minimum requirements stated in section 5.2 Horizontal timber lippings may be completely removed unless the door assembly configuration or hardware type requires otherwise

5.9 Cableways - Leaf 1 & 3

The following cableway arrangements have been tested in WF384630 and WF386959 (test evidence referenced in Appendix B),

Cableways have been successfully tested in Strebord© 44 doorsets comprising a 44mm thick three layer chipboard blank. It is considered that due to the similarity of 35mm three layer chipboard tested in RF11161 to the Strebord© 44, in conjunction with additional facings to make up the leaf thickness that the method of boring the cableways tested in the Falcon Strebord© 44 may be employed within all leaf refs. and are therefore assessed for use with the Strebord doorset design:

- The cableway arrangement can be fitted into all single acting configurations.
- The cableway should be within 1200mm from the bottom of the door leaf.
- The lipping should have a minimum density of 600 kg/m^3
- For limitations on the use of a cableway with grooves and recessed areas see section 5.6.
- A cableway must not be closer that 90mm to any apertures (e.g., glazing, ATG, letter plates, etc.).

The hole for the cableway can be created by:

- Drilling a 10mm hole through the centre of the door
- Routing out a 10mm wide by 42mm deep channel along the vertical and horizontal edges capping it off with a 640kg/m^3 hardwood infill of dimensions 10mm by 30mm and bonded in position with a PU glue.

The hole must be lined with 10mm by 1mm wide Seal Tight Solutions Ltd, ST CablePro graphite strip

6 Glazing within the Leaf

This section considers the glazing permitted for Leaves 1, 2 & 3 based on the test evidence in Section 3 and the relevant Certifire certificate associated with each glass type and glazing system.

Section 6.1 details the maximum amount of glazing that the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset designs can tolerate based on the total number of apertures, the minimum distance from the edges of the apertures to the leaf edge and the minimum distances between glazed apertures.

Section 6.2 details the maximum area of a particular glass type and glazing system.

6.1 Permitted Apertures in Leaf

6.1.1 Leaf 1

Test RF11172 tested a double doorsets 2135 (h) x 915/915 (w)mm with a single aperture in the secondary leaf of dimensions 685mm high x 685mm wide and achieved 34 mins. RF11161 a 35mm three layer core with no facings incorporated a glazed aperture of 690mm high x 690mm wide and achieved 32 mins duration provides further confidence in the ability of the doorblanks ability to incorporate apertures and these dimensions have been used for the maximum size and area.

- Maximum area of glazing is 0.58m^2 (assessed area from max tested aperture)
- Minimum margins around glazing are:-
  - Top, bottom and sides = 100mm
  - Minimum distance between apertures is 100mm.

The maximum height of an aperture is 828mm (max tested aperture width increased by 20%)
The maximum width of an aperture is 828mm (max tested aperture width increased by 20%)

The testing detailed above demonstrates the performance of the glazed Strebord© 35+ doorset design and its ability to accommodate apertures. It is the opinion of Warringtonfire that the influence of the frame on the doorset when glazed will be negligible and therefore the limits defined above for glazing can be used in frames 1 & 4.

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

6.1.2 Leaf 2

Test WF514734 tested a double doorset 2135 (h) x 969/969 (w)mm with multiple apertures in both leaves of dimensions 989mm high x 669mm wide and 640mm high x 240mm wide. The glass fractured in the primary leaf at 4 minutes which is the cause of the noted integrity failure, however the glazing in the secondary leaf suffered no failures and was still intact at the termination of the test at 32 minutes. This provides confidence that the door construction is able to achieve up to 30 minutes fire integrity with large apertures.

- Maximum area of glazing is 1.01m^2 (assessed area from max tested aperture)
- Minimum margins around glazing are:-
  - Top, bottom and sides = 100mm
  - Minimum distance between apertures is 100mm.

The maximum height of an aperture is 1162 (max tested aperture height increased by 20%)
The maximum width of an aperture is 802mm (max tested aperture width increased by 20%)

The testing detailed above demonstrates the performance of the glazed Strebord©35 Banded Core doorset designs and their ability to accommodate apertures. It is the opinion of Warringtonfire that the influence of the frame on the doorset when glazed will be negligible and therefore the limits defined above for glazing can be used in frames 1 & 4.

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

6.1.3 Leaf 3

Glazing has not been tested within this core type. However confidence in the design is provided by test RF11161 a 35mm three layer core with no facings incorporated a glazed aperture of 690mm high x 690mm wide and achieved 32 mins duration.

- Maximum area of glazing is 0.58m^2 (assessed area from max tested aperture)
- Minimum margins around glazing are:-
    - Top, bottom and sides = 100mm
    - Minimum distance between apertures is 100mm.

The maximum height of an aperture is 828mm (max tested aperture width increased by 20%)
The maximum width of an aperture is 828mm (max tested aperture width increased by 20%)

The testing detailed above demonstrates the performance of the glazed Strebord© 35 which are fundamentally the same core make up as the Strebord© Superpan doorset design. It is the opinion of Warringtonfire that the influence of the frame on the doorset when glazed will be negligible and therefore the limits defined above for glazing can be used in frames 1 & 4.

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

6.2 Glass & Glazing Systems

The following tables give the maximum aperture size for the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset design:

Each glass and glazing combination has been given a maximum area for an individual aperture. The maximum dimensions must not exceed those given in section 6.1. More than 1 aperture can be included in the leaf providing the total glazed area of that leaf does not exceed that given in section 6.1.

The maximum area given is based on the appropriate Certifire Certificate or a Warrington fire assessment. If there is a specific test which improves that given by Certifire or by assessment, then that test is referenced in the relevant cell. It is the opinion of Warringtonfire that the maximum glass area detailed in Certifire can be also used for a thicker glass of the same product family and from the same manufacturer

6.2.1 Non / Partially Insulating Glass

Glazing Systems by DIG			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)									
Non / Partially Insulating Glass Types		Glass Thickness (mm)	1		2		3		4		5	
			Therm-A-Bead 30 (CF 284)		Therm-A-Glaze 30 (CF 284)		Therm-A-Glaze 30 Plus (CF 284)		Therm-A-Glaze 45 Or Therm-A-Strip 10x2 (CF 284)*		Therm-A-Seal 10x4 (CF 284)	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
1	Pyroshield 2 (Clear /Wired)[1]	6 or 7	N/a	N/a	0.54	0.54	0.58	1.01	0.58	1.01	0.21	0.21
2	Pyrostem	6 or 7	N/a	N/a	0.54	0.54	0.58	1.01	0.58	1.01	N/a	N/a
3	Pyran S	6	N/a	N/a	0.54	0.54	0.58	1.01	0.58	1.01	0.21	0.21
4	Pyroguard EW30	7	N/a	N/a	N/a	N/a	0.58	1.01	0.58	0.64	N/a	N/a
5	Pyrobelite 7	7	0.58	0.69	0.54	0.54	0.58	1.01	0.58	1.01	0.21	0.21
6	Pyrodur 30-104	7	0.58	0.69	0.525	0.525	0.58	1.01	0.58	0.66	0.21	0.21
7	Pyrodur 60-10	10	0.58	0.69	0.525	0.525	0.58	1.01	0.58	0.66	0.21	0.21
8	Pyrodur 30-203	11	0.58	0.69	0.525	0.525	0.58	1.01	0.58	0.668	0.21	0.21
9	Pyroguard EW Maxi	11	N/a	N/a	N/a	N/a	N/a	N/a	N/a	0.64	N/a	N/a
10	Pyranova 15-S2.0	11	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
11	Pyrobelite 9EG	12	0.58	0.69	0.54	0.4	0.58	1.01	0.58	1.01	0.21	0.21
12	Pyrobelite 12	12	0.58	0.69	0.54	0.4	0.58	1.01	0.58	1.01	0.21	0.21
13	Pyrodur 60-20	13	0.58	0.69	0.525	0.525	0.58	1.01	0.58	0.66	0.21	0.21

Note:

5. Pyroshield 2 Obscured is not permitted

Glazing Systems by DIG			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)											
Non / Partially Insulating Glass Types		Glass Thickness (mm)	6		7		8		9		10		11	
			Fireglaze Compound (CF 221)		Fireglaze G30 Or LP15 (CF 221)		Sealmaster 10x3mm Intumescent Closed Cell Foam Tape (CF 5645)		Sealmaster 15x3mm Intumescent Closed Cell Foam Tape (CF 5645)		Sealmaster 10x4mm Black Glazing Tape		Sealmaster Intumescent Foam Glazing Tape (CF 5387)	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
1	Pyroshield 2 (Clear /Wired)[1]	6 or 7	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
2	Pyrostem	6 or 7	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
3	Pyran S	6	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
4	Pyroguard EW30	7	N/a	N/a	N/a	N/a	0.58	1.01	0.58	1.01	N/a	N/a	0.57	1.01
5	Pyrobelite 7	7	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
6	Pyrodur 30-104	7	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
7	Pyrodur 60-10	10	0.55	0.55	0.58	0.8	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
8	Pyrodur 30-203	11	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
9	Pyroguard EW Maxi	11	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	0.58	N/a
10	Pyranova 15-S2.0	11	N/a	N/a	N/a	N/A	N/a	N/a	N/a	N/a	N/a	N/a/	0.58	N/a
11	Pyrobelite 9EG	12	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	0.27 (WF416690)	0.27	0.58	1.01
12	Pyrobelite 12	12	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	0.27	0.27	0.58	1.01
13	Pyrodur 60-20	13	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01

Note:

1. Pyroshield 2 Obscured is not permitted

Glazing Systems by STS			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)					
Non/Partially Insulating Glass Types		Glass Thickness (mm)	12		13		14	
			ST105-3GT CNA F15058 Rev C		ST105GT CNA F15058 Rev C		ST104GT WF505552	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
1	Pyroshield 2 (Clear /Wired)[1]	6 or 7	N/a	N/a	0.4	0.4	N/a	N/a
2	Pyrostem	6 or 7	N/a	N/a	0.4	0.4	N/a	N/a
3	Pyran S	6	N/a	N/a	0.4	0.4	N/a	N/a
4	Pyroguard EW30		N/a	N/a	N/a	N/a	N/a	N/a
5	Pyrobelite 7	7	0.58	1.01	0.58	1.01	0.58	1.01
6	Pyrodur 30-104	7	0.58	1.01	0.58	1.01	0.58	1.01
7	Pyrodur 60-10	10	0.58	1.01	0.58	1.01	0.58	1.01
8	Pyrodur 30-203	11	N/a	N/a	N/a	N/a	N/a	N/a
9	Pyroguard EW Maxi	11	0.58	1.01	0.58	1.01	0.58	1.01
10	Pyranova 15-S2.0	11	0.58	1.01	0.58	1.01	0.58	1.01
11	Pyrobelite 9EG	12	0.58	1.01	0.58	1.01	0.58	1.01
12	Pyrobelite 12	12	0.58	1.01	0.58	1.01	0.58	1.01
13	Pyrodur 60-20	13	0.58	1.01	0.58	1.01	0.58	1.01

Note:

1. Pyroshield 2 Obscured is not permitted

Glazing Systems by Lorient Polyproducts Ltd			**Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)**					
Non/Partially Insulating Glass Types		Glass Thickness (mm)	18		19		20	
			System 36 PLUS (CF5060)		Flexible Figure 1 (CF327)		TBA	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
1	Pyroshield 2 (Clear /Wired)1	6 or 7	0.58	0.688	0. 58	0.66	-	-
2	Pyrostem	6 or 7	0. 58	0.688	0. 58	0.66	-	-
3	Pyran S	6	0. 58	0.688	0. 58	0.66	-	-
4	Pyroguard EW30	7	0. 57	0.66	N/a	N/a	-	-
5	Pyrobelite 7	7	0. 58	1.01	0. 58	0.66	-	-
6	Pyrodur 30-104	7	0. 58	0.66	0. 58	0.66	-	-
7	Pyrodur 60-10	10	0. 58	1.01	0. 58	0.66	-	-
8	Pyrodur 30-203	11	0. 58	1.01	0. 58	0.66	-	-
9	Pyroguard EW Maxi	11	0. 58	1.01	0. 58	0.71	-	-
10	Pyranova 15-S2.0	11	0. 58	1.01	N/a	N/a	-	-
11	Pyrobelite 9EG	12	0. 58	1.01	0. 58	0.66	-	-
12	Pyrobelite 12	12	0. 58	1.01	0. 58	0.66	-	-
13	Pyrodur 60-20	13	0. 58	1.01	0. 58	0.66	-	-

Note:

1. Pyroshield 2 Obscured is not permitted

Glazing Systems by Pyroplex Ltd			**Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)**							
Non/Partially Insulating Glass Types		Glass Thickness (mm)	21		22		23		24	
			8193 (CF348)		8492 (CF348)		30049 (CF348)		30054 (CF348)	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
1	Pyroshield 2 (Clear /Wired)1	6 or 7	0.58	0.8	0.58	0.8	0.58	0.8	N/a	N/a
2	Pyrostem	6 or 7	0.36	0.36	0.25	0.25	0.45	0.45	N/a	N/a
3	Pyran S	6	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
4	Pyroguard EW30	7	0.36	0.36	0.25	0.25	0.56	0.56	0.56	0.56
5	Pyrobelite 7	7	N/a	N/a	N/a	N/a	0.45	0.45	N/a	N/a
6	Pyrodur 30-104	7	0.58	0.76	0.25	0.25	0.45	0.45	0.56	0.56
7	Pyrodur 60-10	10	0.58	0.76	0.25	0.25	0.45	0.45	0.56	0.56
8	Pyrodur 30-203	11	0.58	0.76	0.25	0.25	0.58 (WF402305 (B))	0.65	0.56	0.56
9	Pyroguard EW Maxi	11	0.36	0.36	0.25	0.25	0.56	0.56	0.56	0.56
10	Pyranova 15-S2.0	11	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
11	Pyrobelite 9EG	12	N/a	N/a	N/a	N/a	0.45	0.45	N/a	N/a
12	Pyrobelite 12	12	N/a	N/a	N/a	N/a	0.45	0.45	N/a	N/a
13	Pyrodur 60-20	13	0.58	0.76	0.25	0.25	0.58	0.65	0.56	0.56

Note:

1. Pyroshield 2 Obscured is not permitted

Glazing Systems by **Hodgson Sealants**			**Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3** **Max. Assessed Area (m^2)**	
Non/Partially Insulating Glass Types		Glass Thickness (mm)	25	
			Firestrip 30 (CF297)	
			Leaf Ref 1 & 3	Leaf Ref 2
1	Pyroshield 2 (Clear /Wired)1	6 or 7	0.57	0.57
2	Pyrostem	6 or 7	0.57	0.57
3	Pyran S	6	0.57	0.57
4	Pyroguard EW30	7	0.58	0.58
5	Pyrobelite 7	7	N/a	N/a
6	Pyrodur 30-104	7	0.57	1.01
7	Pyrodur 60-10	10	0.57	0.57
7	Pyrodur 30-203	11	0.57	0.57
8	Pyroguard EW Maxi	11	0.57	0.57
9	Pyranova 15-S2.0	11	0.57	0.57
10	Pyrobelite 9EG	12	N/a	N/a
11	Pyrobelite 12	12	N/a	N/a
12	Pyrodur 60-20	13	0.57	0.57

Note:

1. Pyroshield 2 Obscured is not permitted

6.2.2 Fully Insulating Glass

Glazing Systems by DIG			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)									
Insulating Glass Types		Glass Thickness (mm)	1		2		3		4		5	
			Therm-A-Bead 30 (CF284)		Therm-A-Glaze 30 (CF284)		Therm-A-Glaze 30 Plus (CF284)		Therm-A-Glaze 45 or Therm-A-Strip 10x2 (CF284)*		Therm-A-Seal 10x4 (CF284)	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
14	Pyroguard EI30	15	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a	N/a
15	Pyrostop 30-10	15	0.75	0.69	0.525	0.525	0.58	1.01	0.58	0.66	N/a	N/a
16	Pyrobel 16	16	0.58	0.69	0.54	0.54	0.58	1.01	0.58	1.01	N/a	N/a

Glazing Systems by DIG			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)											
Insulating Glass Types		Glass Thickness (mm)	6		7		8		9		10		11	
			Fireglaze Compound (CF221)		Fireglaze G30 Or LP15 (CF221)		Sealmaster 10x3mm Intumescent Closed Cell Foam Tape (CF5645)		Sealmaster 15x3mm Intumescent Closed Cell Foam Tape (CF5645)		Sealmaster 10x4mm Black Glazing Tape		Sealmaster Intumescent Foam Glazing Tape (CF5387)	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
14	Pyroguard EI30	15	N/a	N/a	(0.0	(0.0	N/a	N/a	0.58	1.01	N/a	N/a	0.58	1.01
15	Pyrostop 30-10	15	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	N/a	N/a	0.58	1.01
16	Pyrobel 16	16	0.55	0.55	0.55	0.55	0.58	1.01	0.58	1.01	0.27	0.27	0.58	1.01

Glazing Systems by STS			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)					
Insulating Glass Types		Glass Thickness (mm)	12		13		14	
			ST105GT CNA F15058 Rev C		ST105-3GT CNA F15058 Rev C		ST104GT	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
14	Pyroguard EI30	15	N/a	1.01	0.58	1.01	0.58	1.01
15	Pyrostop 30-10	15	0.58	1.01	0.58	1.01	0.58	1.01
16	Pyrobel 16	16	0.58	1.01	0.58	1.01	0.58	1.01

Glazing Systems by Lorient Polyproducts Ltd			Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)					
Insulating Glass Types		Glass Thickness (mm)	18		19		20	
			System 36 PLUS (CF5060)		Flexible Figure 1		TBA	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
14	Pyroguard EI30	15	0.58	1.01	0.71	0.71	N/a	N/a
15	Pyrostop 30-10	15	0.58	1.01	0.66	0.66	N/a	N/a
16	Pyrobel 16	16	0.58	1.01	0.66	0.66	N/a	N/a

Glazing Systems by Pyroplex Ltd			**Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)**							
Insulating Glass Types		Glass Thickness (mm)	21		22		23		24	
			8193 (CF348)		8492 (CF348)		30049 (CF348)		30054 (CF348)	
			Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2	Leaf Ref 1 & 3	Leaf Ref 2
14	Pyroguard EI30	15	N/a	N/a	0.48	0.48	0.54 WF430460 (A)	0.54	0.48	0.48
15	Pyrostop 30-10	15	N/a	N/a	0.48	0.48	0.48	0.48	0.48	0.48
16	Pyrobel 16	16	N/a	N/a	0.48	0.48	0.48	0.48	0.48	0.48

Glazing Systems by Hodgson Sealants			**Glass & Glazing System Specification for Leaf Refs. 1, 2 & 3 Max. Assessed Area (m^2)**	
Insulating Glass Types		Glass Thickness (mm)	25	
			Firestrip 30 (CF297)	
			Leaf Ref 1 & 3	Leaf Ref 2
14	Pyroguard EI30	15	N/a	N/a
15	Pyrostop 30-10	15	0.58	1.01
16	Pyrobel 16	16	N/a	N/a

6.2.3 Glazing Systems

The following sections detail the permitted bead details, fixing types and hardwood aperture liners that are to be used with the different glazing systems.

Section 6.2.3.1 details the permitted sizes and shapes of bead and which glass types they can be used with.

Section 6.2.3.2 shows the glazing system when installed.

6.2.3.1 Bead Requirements

For the purpose of specifying different bead shapes the glass types detailed in section 6.2.1 and 6.2.2 are split into groups as follows:

Group 1 glasses 1 to 4 (integrity and radiation performance glass)

Group 2 glasses 5 to 16 (integrity and insulation performance)

General requirements

Hardwood beads: minimum density 640 Kg/m^3 free from knots, splits and checks

Liner (if required): see section 6.2.6

For bead fixing requirements see section 6.2.5

The beads shown below are to be used with doors, glass and glazing systems which all have different thicknesses and therefore bead depth will need to be adjusted accordingly, while maintaining the essential requirements given below. The essential requirements for the different bead types are as follows:

Chamfered bolection – permitted with Group 1 and 2

Angle of bead chamfer to horizontal 15^o +/– 5^o

Height of bead adjacent to glass 15mm min

Bolection 5mm by 5mm

Height of bead above bolection 10mm min

Depth of bead to be sized depending on glass, leaf and glazing system

Chamfered flush - permitted Group 2

Angle of bead chamfer to horizontal 15^o +/– 5^o

Height of bead adjacent to glass 15mm min

Quirk 2mm by 2mm

Height of bead above quirk 10mm min

Depth of bead to be sized depending on glass, leaf and glazing system

Square bolection - permitted with Group 2

Angle of bead to horizontal ZERO

Height of bead adjacent to glass 15mm min

Bolection 5mm by 5mm

Height of bead above bolection 15mm min

Depth of bead to be sized depending on glass, leaf and glazing system

Square flush - permitted with Group 2

Angle of bead to horizontal ZERO

Height of bead adjacent to glass 15mm min

Quirk 3mm by 3mm

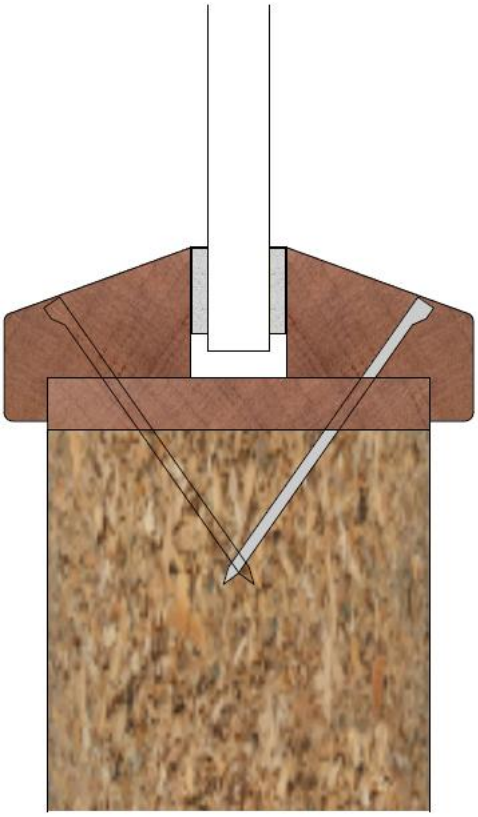
Height of bead above quirk 12mm min

Depth of bead to be sized depending on glass, leaf and glazing system

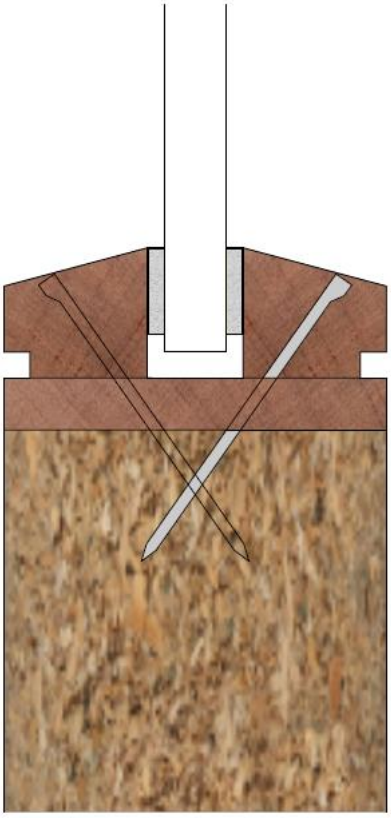
The following drawings show the different bead types.

Hardwood aperture liners are optional. See section 6.2.6 for specification if required.

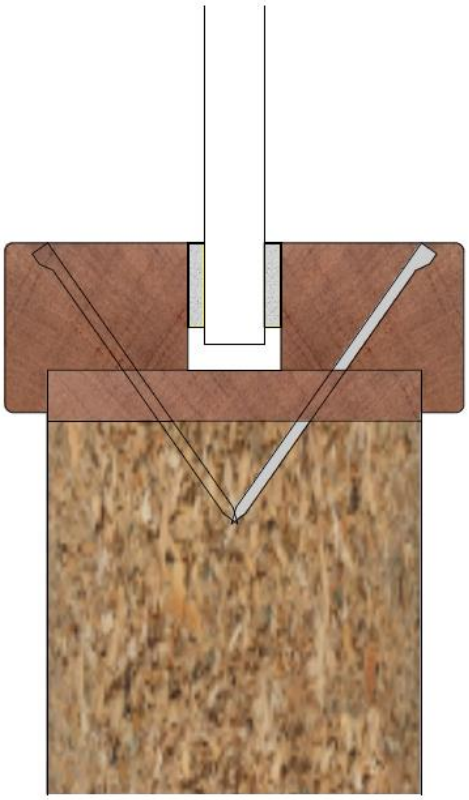
Note: The sectional details in the following pages are to illustrate the glazing elements in the door leaf. The cores shown are not intended as a representation of Strebord© 35+ and Strebord©35 Banded Core Strebord© Superpan.



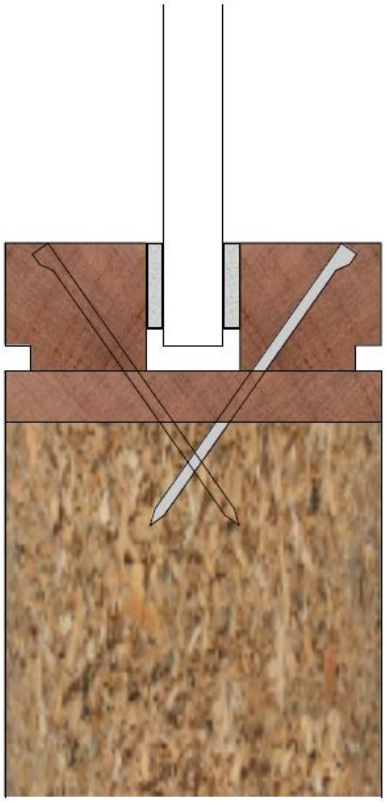
Chamfered Bolection



Chamfered Flush



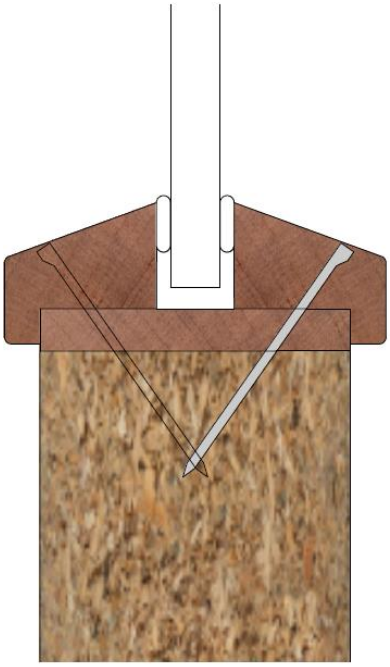
Square Bolection



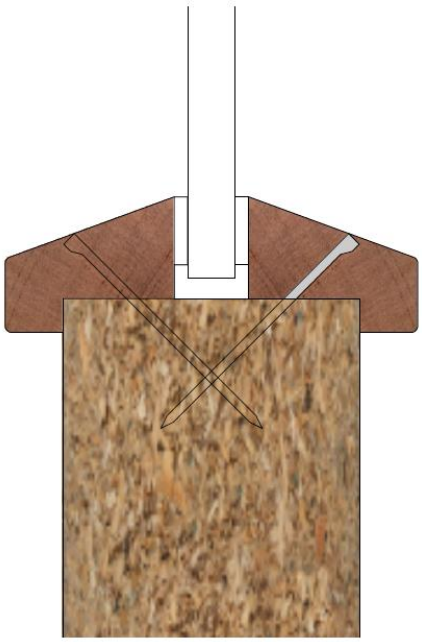
Square Flush

6.2.3.2 Bead, Liner & Screw Arrangements

The following drawings show the arrangement of each glazing system around the glass and between the beads. The drawings are illustrative and the systems can be used with or without hardwood aperture liners (see section 6.2.6) and the beads can be fixed in position using pin fixings or screws (see section 6.2.5). Each system must be used with the glass types as assessed and listed in sections 6.2.1 and 6.2.2, as appropriate.

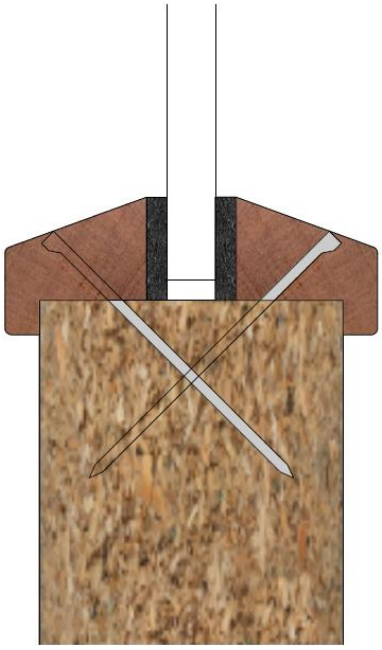


DIG Fireglaze G30 or LP15

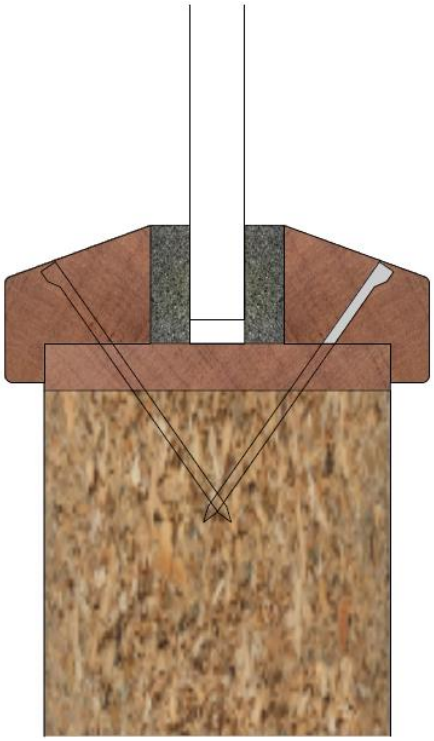


DIG Fireglaze Compound

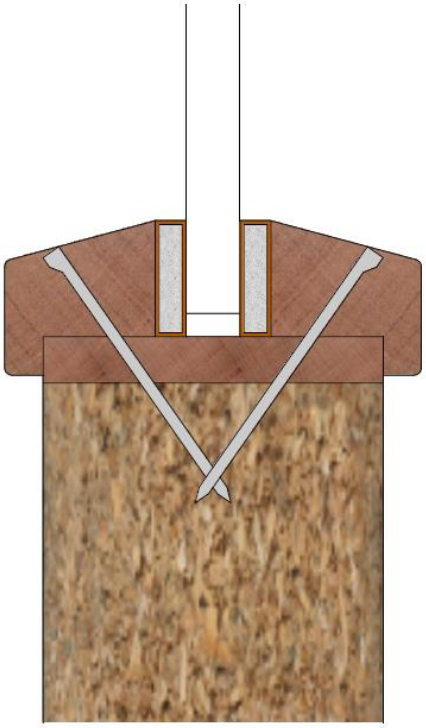
DIG Sealmaster Intumescent Close Cell Foam Tape 10x3



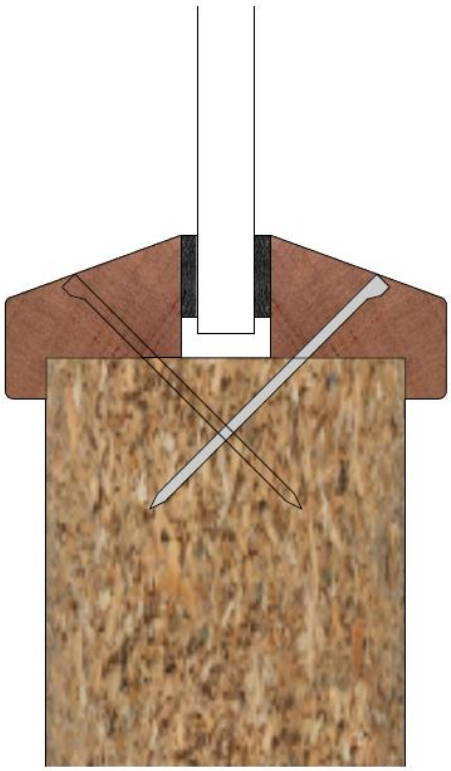
DIG Sealmaster Intumescent Close Cell Foam Tape 15x3



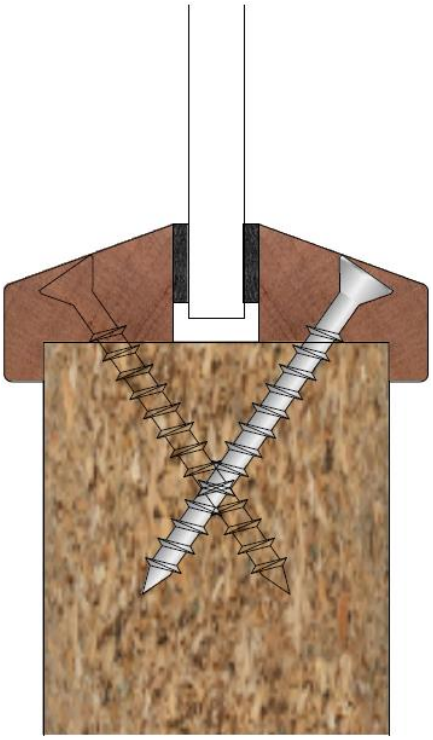
DIG Sealmaster Intumescent Foam Glazing



DIG Therm A Bead 30



DIG Therm A Glaze 30 plus



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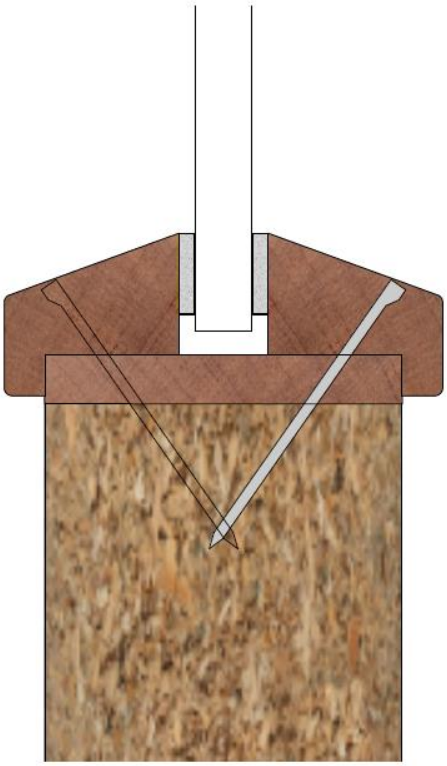
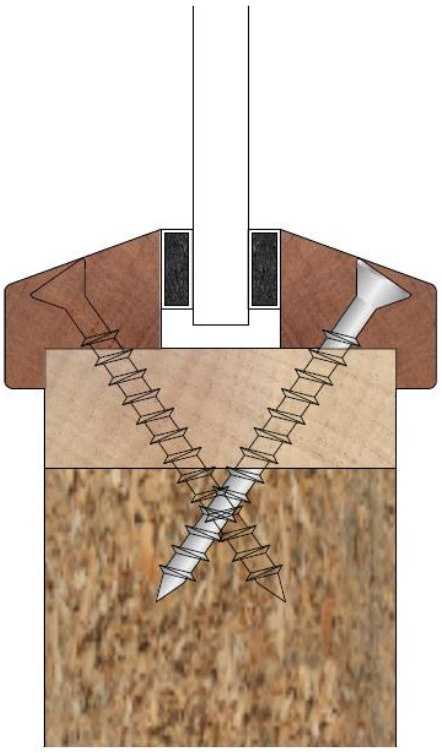
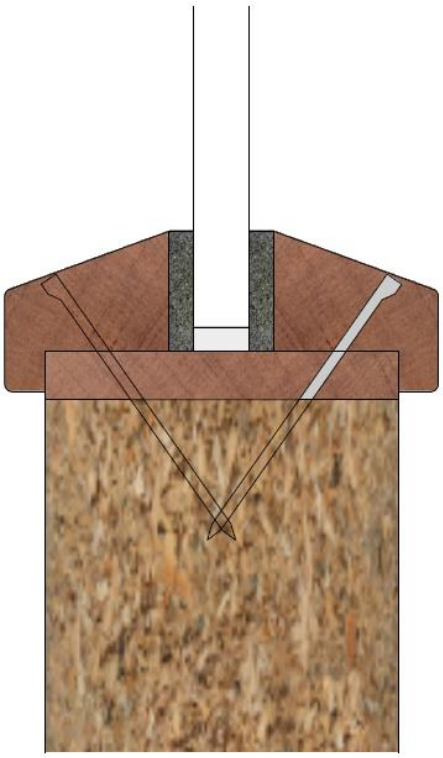


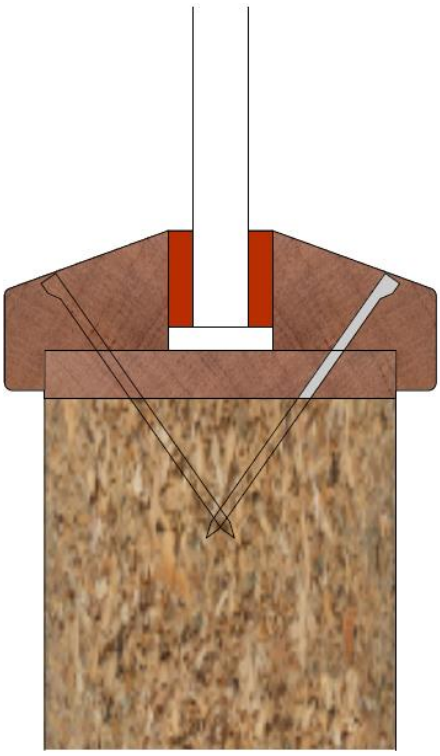
IG Therm A Glaze 45 or Therm A Strip 10 x 2



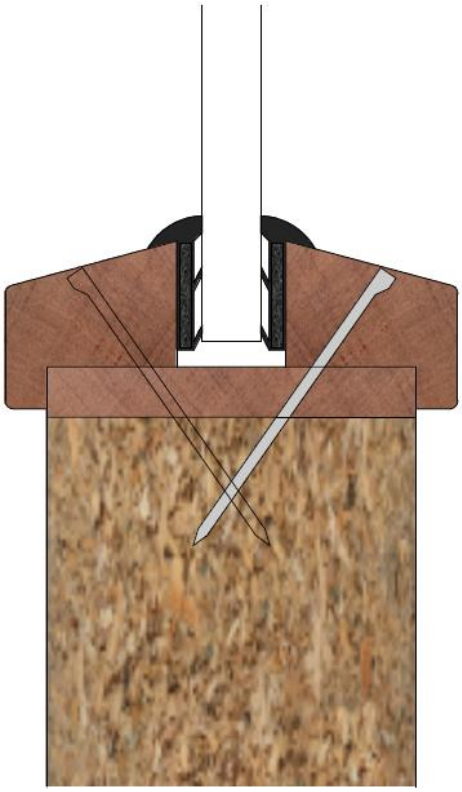
DIG Therm A Seal 10x4



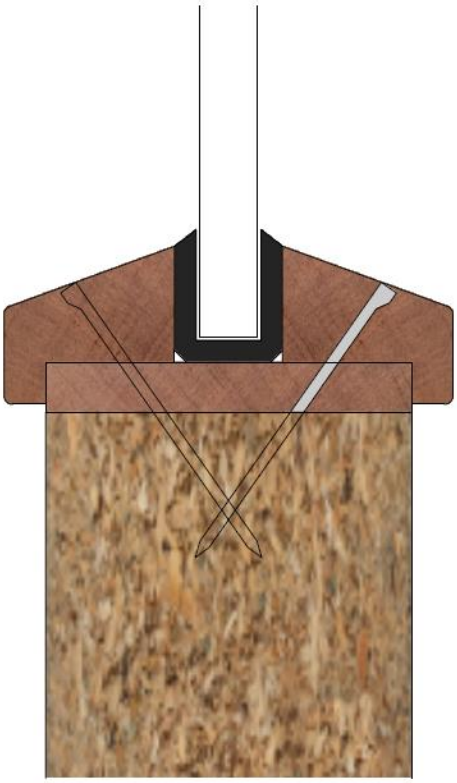
FAS Closed Cell Foam Tape 15x3 with Intumescent Mastic



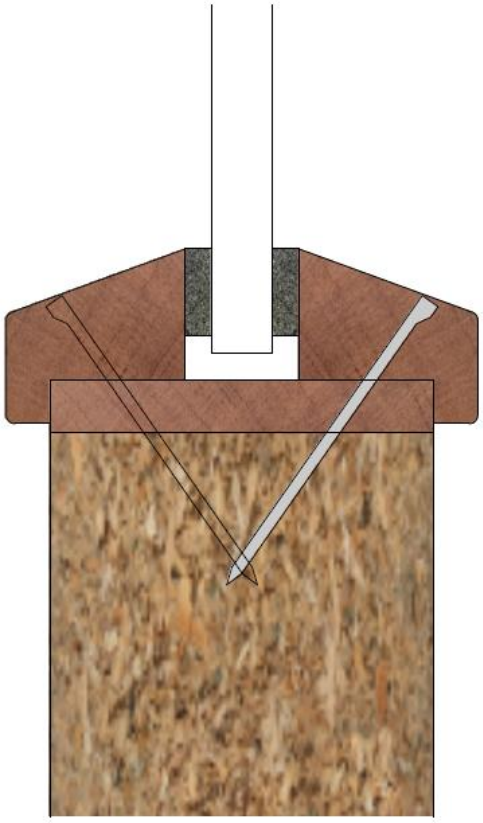
Hodgson Firestrip 30



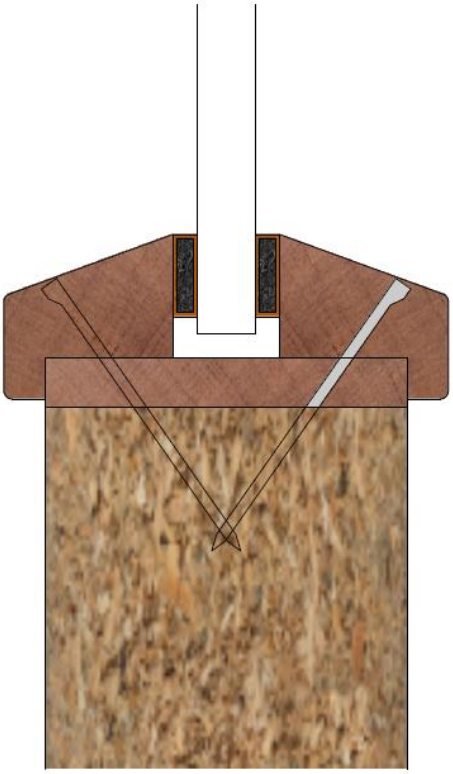
Lorient FF1



Lorient System 36 Plus



STS S105GT



Mann McGowan Pyroglaze 30

6.2.4 False Beads

False timber beads are designed to fall off from the glass when heated, in order to limit any potential influence of the false bead on the performance of the glass from the fire side. The false beads are used in conjunction with partially and fully insulating glasses in order to prevent the timber from getting hot enough to ignite from pilot ignition on the non-fire side.

False timber beads of similar density and species as the glazing beads may be bonded to the glass face with an intumescent mastic/silicon, or a 0.5 – 2mm thick self-adhesive intumescent tape/strip of the types shown below. Mechanical fixing of the false beads to the leaf framing is not permitted. Suitable glass for this application is restricted to glass types 5 to 16 in sections 6.2.1 and 6.2.2.

Suitable Self-Adhesive Intumescent Tape			
Glazing System		Manufacturer	Minimum Size (mm)
1.	Therm-A-Strip 30	Intumescent Seals Ltd.	10 wide x 0.5 – 3 thick.
2.	Fireglaze 30	Sealmaster Ltd.	
3.	Firestrip 30	Hodgsons Sealants Ltd.	

Note:

Preformed strip systems 1 – 3 may be self-adhesive and grooved into the rear of the glazing bars.

6.2.5 Bead Fixings

Glazing beads of approximately 15mm glass cover (upstand) must be retained in position with 38 to 40mm long steel pins meeting the specification in section 6.2.5.1 or 38 to 40mm long No. 6 - 8 screws, inserted at 35º +/- 5º to the vertical at no more than 50mm from each corner and at 150mm maximum centres.

Pneumatically fired pins are acceptable providing the pins meet the specification given below.

6.2.5.1 Gun (Pneumatically) Fired Pins

The following pin specification is permitted and has been considered suitable for gun (pneumatically) fired applications:

Option 1: Round, Oval & Rectangular Pins

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

Minimum Standard Wire Gauge (SWG) 16.

Minimum cross section area of 2.03mm^2.

Minimum linear dimension of 1.6mm in any direction.

Figure 6.1 – Round, Oval & Rectangular pin detail – minimum dimension 1.6mm

Option 2: Rectangular Pins

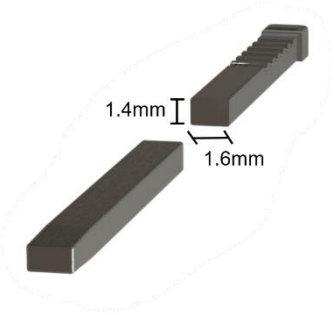
The following dimension of rectangular pin has been deemed suitable for gun (pneumatically) fired applications, providing the 1.6mm dimension is predominately oriented perpendicular to the glass, where possible:

Minimum Standard Wire Gauge (SWG) 16.

Minimum cross section area of 2.24mm^2.

Minimum linear dimension of 1.4mm.

Figure 6.2 – Rectangular pin detail – minimum dimension 1.4mm



Note:

Pins with dimensions less than those stated above are not covered by this Field of Application.

6.2.6 Glazing Liner

A 6–10mm thick square aperture liner is permitted for use providing it is constructed from hardwood of minimum density 640kg/m^3 and glued in position using a UF, PVA or PU type adhesive.

Glazing liners are optional for the glass types listed in sections 6.2.1 and 6.2.2 and when used with the glazing systems depicted in 6.2.3.

7 Door Frame Construction

7.1 Frame Specification

The frame specifications are given in Section 4.4

7.2 Frame Thresholds

Timber or aluminium thresholds are not covered by this report.

7.3 Door Frame Joints

Below are depictions of the door framing joints that are deemed acceptable. Please note that the drawings are provided as general illustrations of each type of door frame joint; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies. The door frame joints are required to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Frame joints may additionally be reinforced with any of the adhesives approved for the application of lippings, on the basis that the approved lipping adhesive has been proven to contribute to the positive fire resistance performance of the timber to timber junction at the door leaf edge.

Half Lapped Joint | Mitre Joint | Mortice & Tenon Joint

Butt Joint | Trenched Joint

Figure 4 – Approved door frame jointing options

8 Overpanels & Fanlights, Sidepanel & Sidelights

8.1 General

Overpanels, and fanlights can be used in conjunction with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset design. Overpanels are fitted with sections of door core and must be separated by a transom. Fanlights can either be fitted in combination frames with the doorset or can be installed as a jointed doorframes and fanlight system.

The following sections give the required construction details for the overpanels, and fanlights.

8.2 Transom Overpanels

Transomed overpanels, where the overpanel is separated from the head of the door leaves with a horizontal transom. It is possible to permit transomed overpanel by way of assessment as the overpanel is constructed from a section of the tested door leaf design and is fixed in position on all sides using mechanical fixings and the tested intumescent specification that is used at the perimeter of the door leaves is also included on all four edges of the overpanel. The overpanel section is therefore stable, has been proven as being able to maintain integrity and also includes the same sealing detail as that tested and proven for the swinging door leaves.

Table below specifies the maximum assessed solid overpanel dimensions.

Maximum Overpanel Dimension		
Configuration	Maximum Overpanel Height (mm)	Width (mm)
Single Leaf doorsets	2000	Overall door width
Double Leaf doorsets	1500	Overall door width

8.2.1 Transom Over panel Details

The overpanel is to be constructed to the same specification as the door leaf.

Transom overpanels can be supplied for:

- All Leaf Refs
- Frame 1.1, 1.3

The door frame and transom must meet all aspects of the door frame construction and specification given in this assessment for the materials listed above but with minimum dimensions no less than 70mm wide x 32mm thick (excluding stops) and with a minimum density of 510kg/m^3.

Transom joints must utilise one of the following methods: mortice and tenon joints or butt joints (see section 7.5). Either method requires joints to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Butt joints must be additionally bonded with urea formaldehyde.

Overpanels must be fixed to the frame by using the following method:

- Screwing through the rear of the frame with steel screws passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between

Overpanels of the same construction as the door leaves may be used, only when separated by a transom, and must comply with the following:

- Overpanels must be fully contained within the door frame (see diagram below).
- The intumescent specified for the jambs as given in the relevant envelopes and tables in section 4, must be fitted to all edges of the overpanel (either in the frame reveal or edge of the overpanel). The frame to overpanel junction is permitted to have a maximum 0.5mm gap tolerance
- The transom must be one of the frame types listed above but with minimum dimensions no less than 70mm wide x 32mm thick (excluding stops) and with a minimum density of 510kg/m^3

Figure 8.1 – Transomed overpanel detail – cross section

Note: The image below is for reference only – please refer to sections 4.5.7, 4.5.8, 4.5.9 and 4.5.10 for perimeter intumescent requirement.

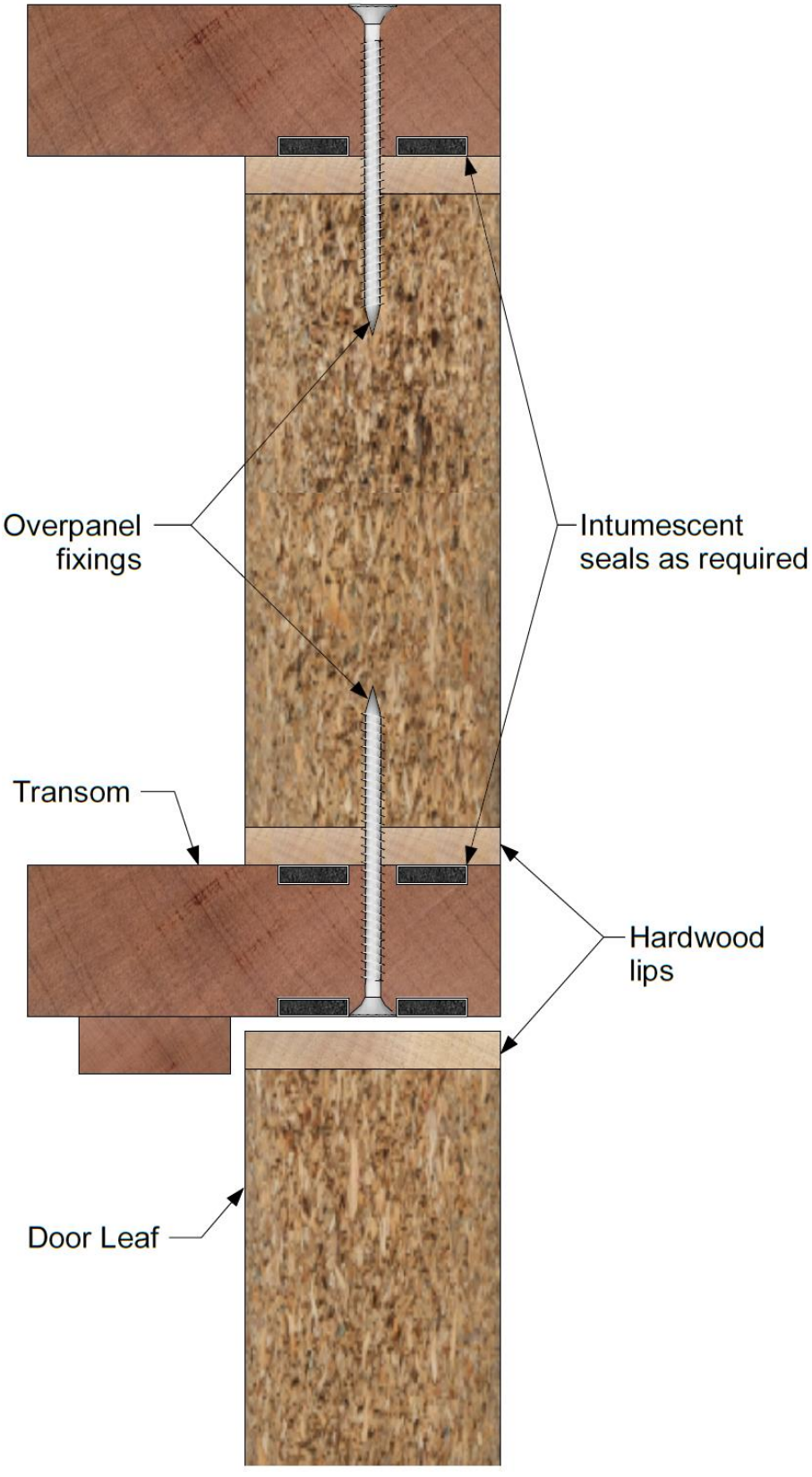


Figure 8.2 – Transomed overpanel – front elevation

8.3 Fanlights and Sidelights

8.3.1 General

Fanlights and sidelights can be used in conjunction with the following door leaf and door frame types:

- All Leaf Refs
- Frame 1.1 & 1.3

NOTE: Frames for fanlights and sidelights cannot be constructed using MDF

There are 2 systems which could be used to create a fanlight or sidelight using 2 different construction methods.

Combination Frames for fanlights only:

This is where a single framing element has been used which separates the glass and doorleaf. This type of construction has been tested by others. See section 8.3.2 for details and limitations associated with this design.

Jointed Door Frames for fanlights and sidelights:

This is where the door leaf has its own door frame and each pane of glass is surrounded by a frame, to create separate glazed modules. The individual modules are then fixed together to create a door and fanlight (described as a modular type system). The doorset has to comply with the requirements of this assessment and the individual framed glass panes and timber framing are based on test WF411193. See Section 8.3.3 for details and limitations.

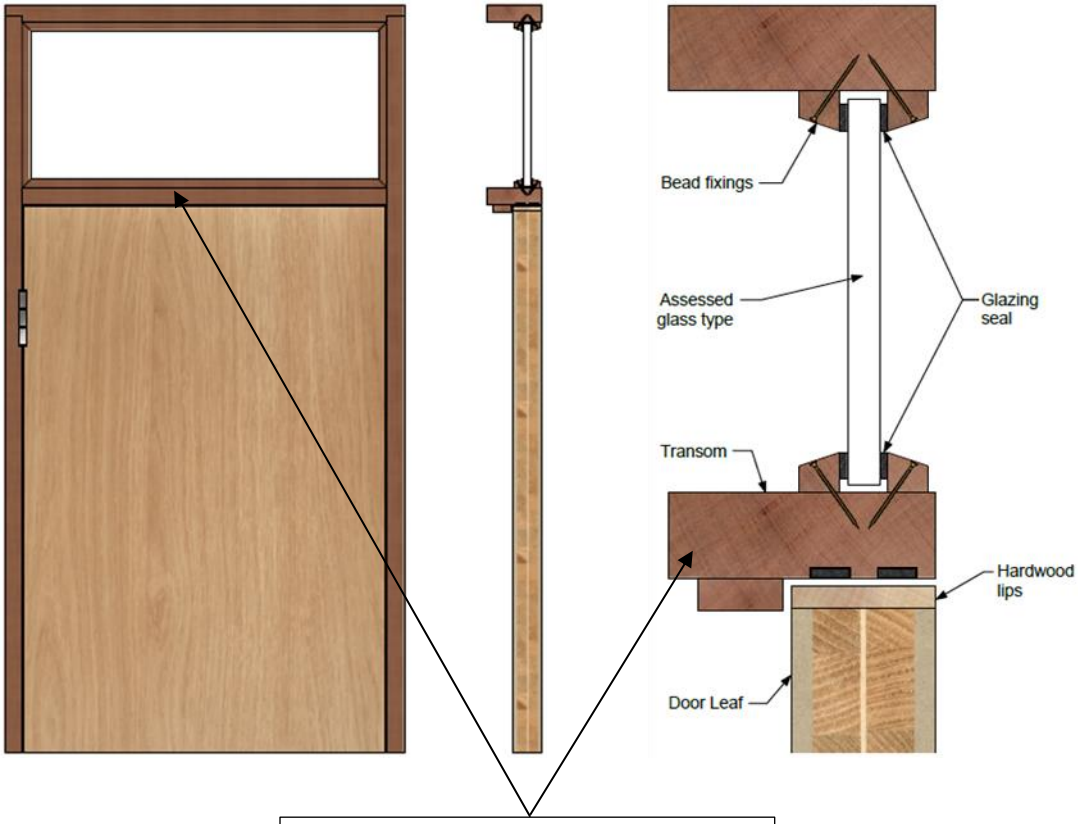
8.3.2 Combination Frames for fanlights only

8.3.2.1 General

When constructing a doorset assembly using combination frames the following limitations apply:

- Frame sections, glass type and dimensions, beads and glazing seals must be as described in the following sections, as appropriate for the glass type listed
- The centreline of the glass must be aligned with the centreline of the timber frame.
- The maximum width and height of the overall assembly is 2950mm x 2950mm.
- The assembly may only contain either 1no single leaf doorset or 1no double leaf doorset.
- The jamb must run continuously for the full height of the door and fanlight.

This method combines the door frame members with the fanlight frame members as illustrated in the example below:



The following sections give the required specification for fanlights and sidelights when using the combination frame system. Each section gives information on:

- Timber framing requirements
- Permitted glass types
- Maximum panel size in either portrait or landscape orientation
- Glazing details including: *Glazing material, Bead type and size, Fixings*

8.3.2.2 Fireswiss, Pyrostop 30-10 & Pyrobel 16

Transom/frame details:

- The timber framing must be hardwood with a minimum density of 640kg/m^3, and a minimum section of 80mm x 44mm.

Glazing details:

- System Thermaglaze 45
- Beading 25mm high and 30mm wide with 16 deg chamfer (minimum density 640kg/m^3) fixed with 50mm screws at 150 centres and 50mm from corner inserted at 30^o to the plane of the glass.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	866	1872

8.3.2.3 Pyroguard EW30 (7mm Thick) – Pyroguard UK Ltd

Transom/Frame details:

- Minimum 75mm deep x 40mm thick softwood or hardwood (minimum density 510kg/m^3). This timber section can be used for both door jambs and transoms above doors.

Glazing details:

- 15mm high x 32mm deep hardwood beads (minimum density 640kg/m^3). The bead shape may be square or incorporate a 10 - 15^o chamfer
- 50mm long size 6 - 8 steel wood screws at maximum of 70mm from corners and 200mm centres inserted at 30^o to the plane of the glass
- 10mm x 2mm Interdens located between the glass and the beads
- 5mm high x 7mm wide x 40mm long hardwood or non-combustible setting blocks with 5mm expansion allowance to all edges.

Maximum single pane dimensions:

Element		**Height** (mm)	**Width** (mm)
Fanlight	From:	1074	808
	To:	808	2600

- The pane dimensions given above represent the maximum permitted width against maximum permitted height. Panes with smaller dimensions are acceptable
- Transoms supporting single panes above 900mm wide must be centrally supported by at least one vertical mullion.

8.3.2.4 Pyroguard EW30 Maxi (11mm Thick) – Pyroguard UK Ltd.

Transom/Frame details:

- Minimum 75mm deep x 40mm thick hardwood (minimum density 640kg/m^3).

Glazing details:

- 20mm high x 30mm deep hardwood beads (minimum density 640kg/m^3). The bead shape may be square or incorporate a 10 - 15^o chamfer
- 50mm long size 6 - 8 steel wood screws at maximum of 70mm from corners and 200mm centres inserted at 30^o to the plane of the glass
- 10mm x 2mm Interdens located between the glass and the beads
- 5mm high x 11mm wide x 40mm long hardwood or non-combustible setting blocks with 5mm expansion allowance to all edges.

Maximum single pane dimensions:

Element		**Height** (mm)	**Width** (mm)
Fanlight	From:	967	2525
	To:	808	3000

- The pane dimensions given above represent the maximum width against maximum height. Panes with smaller dimensions are acceptable.

8.3.2.5 Pyroguard EI30 (15mm thick) – Pyroguard UK Ltd.

Transom/Frame details:

- Minimum 80mm deep x 40mm thick hardwood (minimum density 640kg/m^3).

Glazing details:

- 20mm high x 23mm deep hardwood beads (minimum density 640kg/m^3). The bead shape may be square or incorporate a 10 - 15^o chamfer;
- 50mm long size 6 - 8 steel wood screws at maximum of 70mm from corners and 200mm centres inserted at 30^o to the plane of the glass;
- 7mm x 2mm Egopren glazing tape located between the glass and the beads;
- 15mm x 2mm Kerafix Pan 200 edge seal fitted around edge of glass;
- 3mm high x 15mm wide x 80mm long hardwood or non-combustible setting blocks with 5mm expansion allowance to all edges.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	350	2890

- The pane dimensions given above represent the maximum width against maximum height. Panes with smaller dimensions are acceptable.
- Transoms supporting single panes above 1100mm wide must be centrally supported by at least one vertical mullion.

8.3.2.6 Pyranova (15mm Thick) – Schott Ltd.

Transom/Frame details:

- Minimum 68mm deep x 80mm thick softwood or hardwood (minimum density 640kg/m^3).

Glazing details:

- 20mm high x 23.5mm deep hardwood beads (minimum density 640kg/m^3). The bead shape may be square or incorporate a 10 - 15^o chamfer
- 40mm long size 6 - 8 steel wood screws at maximum of 70mm from corners and 200mm centres inserted at 30^o to the plane of the glass
- 8mm x 3mm closed cell foam glazing tape located between the glass and the beads
- 3mm high x 15mm wide x 80mm long hardwood or non-combustible setting blocks.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	425	2280

- The pane dimensions given above represent the maximum width against maximum height. Panes with smaller dimensions are acceptable;

Transoms supporting single panes above 1100mm wide must be centrally supported by at least one vertical mullion

8.3.2.7 Pyroshield 2 (6mm thick) – Pilkington Ltd.

Transom/Frame details:

- Minimum 80mm deep x 44mm thick softwood or hardwood (minimum density 510kg/m^3).

Glazing details:

- 15mm high x 20mm deep hardwood beads (minimum density 640kg/m^3) with an 18º chamfer
- 40mm long size 6 - 8 steel wood screws at maximum of 50mm from corners and 150mm centres inserted at 45˚ to the glass
- 10mm x 2mm Interdens located between the glass and the beads
- 3mm high x 6mm wide x 40mm long hardwood or non-combustible setting blocks fitted at 300mm centres along bottom edge of glass with 3mm expansion allowance to all edges.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	810	1830

- The pane dimensions given above represent the maximum permitted width against maximum permitted height. Panes with smaller dimensions are acceptable.

8.3.2.8 Pyrodur 30-104 (7mm thick) – Pilkington Ltd.

Transom/Frame details:

- Minimum 80mm deep x 44mm thick hardwood (minimum density 640kg/m^3).

Glazing details:

- 20mm high x 20mm deep hardwood beads (minimum density 640kg/m^3) with a 15º chamfer;
- 40mm long size 6 - 8 steel wood screws at maximum of 50mm from corners and 150mm centres inserted at 30˚ to the glass;
- 20mm x 2mm Interdens located between the glass and the beads;
- 3mm high x 6mm wide x 40mm long hardwood or non-combustible setting blocks fitted at 300mm centres along bottom edge of glass with 3mm expansion allowance to all edges.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	810	1670

- The pane dimensions given above represent the maximum permitted width against maximum permitted height. Panes with smaller dimensions are acceptable.

8.3.2.9 Pyrodur 60-10 (10mm Thick) – Pilkington Ltd.

Transom/Frame details:

- Minimum 80mm deep x 44mm thick hardwood (minimum density 640kg/m^3).

Glazing details:

- 20mm high x 20mm deep hardwood beads (minimum density 640kg/m^3) with a 15º chamfer
- 40mm long size 6 - 8 steel wood screws at maximum of 50mm from corners and 150mm centres inserted at 30˚ to the glass
- 20mm x 2mm Interdens located between the glass and the beads
- 3mm high x 6mm wide x 40mm long hardwood or non-combustible setting blocks fitted at 300mm centres along bottom edge of glass with 3mm expansion allowance to all edges.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	810	1670

- The pane dimensions given above represent the maximum permitted width against maximum permitted height. Panes with smaller dimensions are acceptable.

8.3.2.10 Pyrostop 30-10 (15mm thick) – Pilkington Ltd.

Transom/Frame details:

- Minimum 95mm deep x 44mm thick hardwood (minimum density 640kg/m^3).

Glazing details:

- 20mm high x 37mm deep hardwood beads (minimum density 640kg/m^3). Can be square or chamfered
- 60mm long size 6 - 8 steel wood screws at maximum of 50mm from corners and 150mm centres inserted at 45˚ to the glass
- 12mm x 3mm Hodgsons Sealants Firestrip 30 located between the glass and the beads
- 5mm high x 15mm wide x 40mm long hardwood or non-combustible setting blocks fitted at 300mm centres along bottom edge of glass with 5mm expansion allowance to all edges.

Maximum single pane dimensions:

Element	**Height** (mm)	**Width** (mm)
Fanlight	733	1001

The pane dimensions given above represent the maximum permitted width against maximum permitted height. Panes with smaller dimensions are acceptable.

8.3.3 Jointed Frames for Fanlights and Sidelights

The approval of fanlights/sidelights which are joined on to compliant doorsets is based on the on WF411193 for the framing, glazing system and glass type being used to form a module.

The following general principles apply:

1. The maximum height of the overall assembly constructed using modular units is 2950mm.
2. A maximum of 2 single or double leaf doorsets can be included.
    - The maximum width is unlimited provided the doorset and each glass/solid panel module complies with this assessment and following details in 8.3.3.1 respectively.
    - The sidelights and or fanlights can be glazed or consist of a solid panels constructed. Solid panels are fitted as detailed for overpanels (see section 8.2).

8.3.3.1 Glass, Glazing System & Framing

Based on WF411193 the following details are permitted:

Module Framing:

- Maximum of 2 panes/panels within one framed module.
- Timber – Softwood or hardwood of minimum density 520 kg/m^3
- Dimensions – 44mm (w) x 100mm (d) – used around glass/panel perimeter or as a mullion or transom to separate 2 panes/panels.

Glazing:

The glass tested in the modular units was Pyrobelite 7 from AGC Flat Glass. Based on this glass type it is permitted to fit other glass types that have the same or better integrity and insulation performance. The following glass types are therefore approved with jointed door frames and sidelights/fanlights

- Pyrobelite 7 - AGC Flat Glass
- Pyrostop 30-10 - Pilkington
- Pyrobel 16 – AGC Flat Glass
- Pyroguard EI30 - Pyroguard
- Pyranova 15- Schott
- Pyrodur 30-104 - Pilkington
- Pyrodur 60-10 - Pilkington
- Pyrostop 30-10 - Pilkington

The following maximum dimensions are permitted for each of the modular units depending on where they are located:

Fanlight dimensions:

Maximum area 0.648m^2

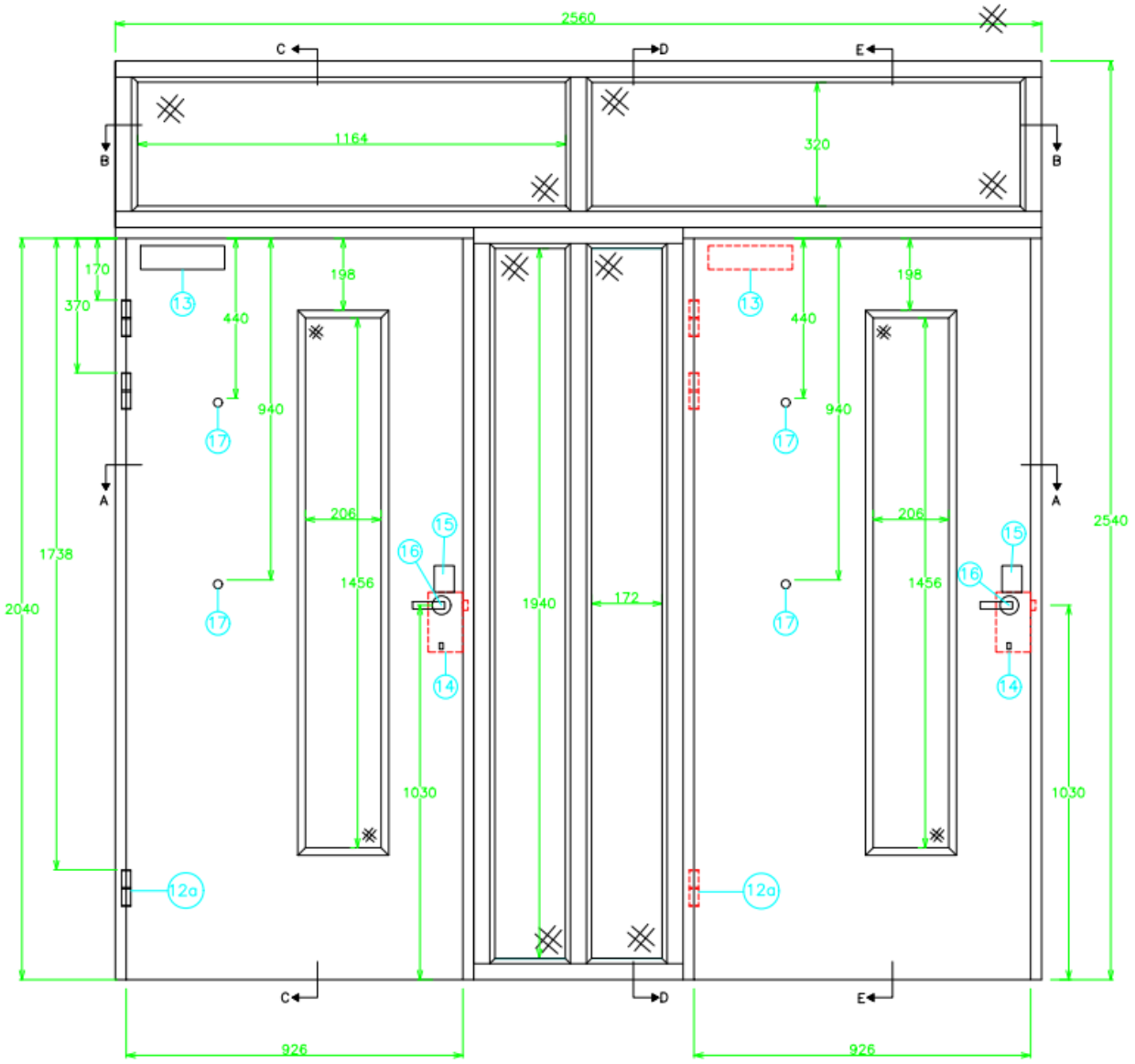
Maximum height 666mm(h)

Maximum width 1800mm(w)

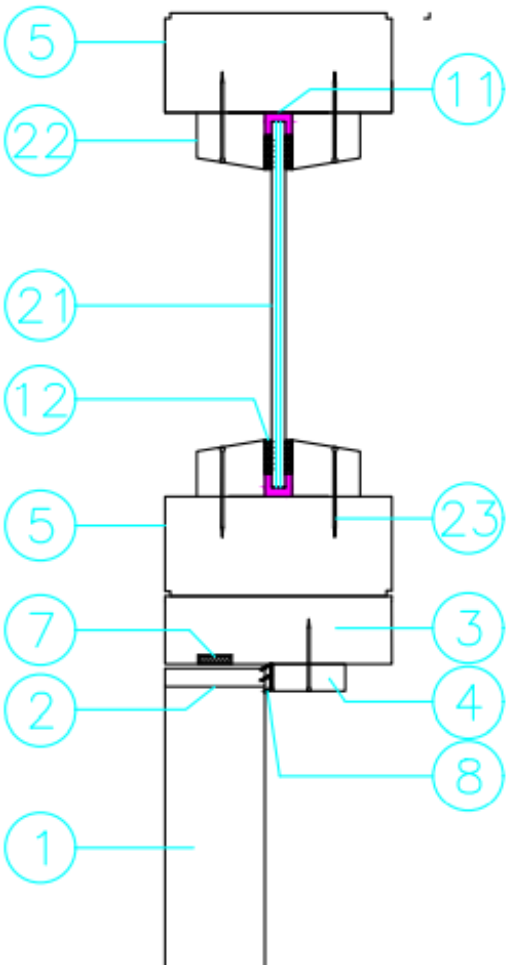
The following glazing system is to be used when glazing the modular units:

- Beading: Hardwood with minimum density 640kg/m³, measuring 25mm(h) x 30mm(d) including a 17° chamfer
- Bead Fixing: 38mm (l) steel pins 18g or 40mm long No. 6 or 8 steel woodscrews located a maximum 100mm from corners and at 200mm centres.
- Glazing perimeter: 15x3mm FAS Ceramic fibre fitted between glass and bead with FAS filling the remaining glazing void.

An example of a jointed door frame and sidelight can be seen below (taken from test report WF411193):



The following drawing is taken from test report WF 411193 and shows a modular fanlight above a door leaf. The components are given in the key underneath the drawing:



Key:

1 – Strebord door leaf type 1 or 2

2 – Flat lipping (see section 5.2 for options)

3 – Door frame

4 – Stop

5 – Perimeter framing for modular unit

7 – Perimeter intumescent strip

11 – FAS fibre filling the glazing pocket

12 – 15 x 3 FAS Ceramic fibre

21 – Approved glass type

22 – Glazing bead for modular unit

23 – Fixing for glazing beads

Notes:

- When using separate modular units with the doorset, each section must be suitably fixed to one another using appropriate steel screw fixings and glued using one of the adhesives approved for the lipping in the adhesive section of this report.
- Screws must be fixed at 600mm centres and located to approximately 2/3 depth of the adjacent timber section.
- The overall dimensions of the door frame and frame around glass/solid panel must not be less than 80mm by 44mm.
- Joints must be tight with no gaps.
- It is permitted to include maximum 3mm (w) x 3mm (d) quirks at the junction of each timber section.
- The drawing above is representative of each type of common frame member; actual construction in terms of intumescent seal location and material, etc. must be as given within this document for the doorset.

9 Intumescent

9.1 Door Perimeter Intumescent

Tested and permitted intumescent seal configurations are as specified in section 4 for all permitted door configurations. Leaf size envelope charts are specific to the same type and manufacturer. The lines in the charts are colour coded for the two seal sizes supplied by the same manufacturer (see colour coding in table below).

The intumescent seals may be provided with or without pile or elastomeric fins in order to provide additional performance i.e., smoke or acoustic control. Whilst seals may be installed with the additional features; it is beyond the remit of this Field of Application report to provide scope for acoustic or cold smoke control performance.

Variations of the tested intumescent seal from the same product group in the table below are available and are considered acceptable:

Manufacturer	Product Group	Product Variations	Envelope Colour Code
Lorient Polyproducts Ltd	Type 617	LP (no additional seal) LP SS (with pile brush) LP AS (with elastomeric fin) LP TS (with 2 elastomeric fins) LP DS (with 2 elastomeric fins) LP Finesse (with 2 elastomeric fins)	
Mann McGowan Ltd	Pyrostrip 100P	100P (no additional seal) 100PSS (with pile brush) 100PSS Flexifin (with 2 elastomeric fins) 100PSS Flexifin Co-Extruded (with 2 elastomeric fins)	

Manufacturer	Product Group	Product Variations	Envelope Colour Code
Pyroplex Ltd	Rigid Box	Rigid Box (with no additional seal) Rigid Box – Pile (with pile brush) Rigid Box – Pile with fin (with pile brush and fin) Rigid Box – Single Flipper (with elastomeric fin) Rigid Box – Side Flipper (with elastomeric fin) Rigid Box – Twin Flipper (with 2 elastomeric fins) Rigid Box – Triple Flipper (with 3 elastomeric fins)	
Sealed Tight Solutions Ltd	STS	STS FO (with no additional seal) STS FS (with pile brush) STS SBS (with elastomeric fin)	

Each leaf size envelope chart in Section 4.5 is specific to a particular seal size, or combination of seal sizes.

9.2 Essential Hardware Protection

Hardware protection is usually in the form of an intumescent sheet material, often with a self-adhesive backing, applied to parts of a hardware component or lining the mortice to which the component is to be installed. The hardware protection types considered are in the following table:-

Manufacturer	Thickness	Product/Reference	Material Type
Dixon International Group Ltd	1mm	Therm-A-Strip	Monoammonium Phosphate
	2mm	Therm-A-Strip	Monoammonium Phosphate
	1mm	Therm-A-Flex	Graphite
	2mm	Therm-A-Flex	Graphite
	1mm	Sealmaster G30	Monoammonium Phosphate
	2mm	Sealmaster G30	Monoammonium Phosphate
Dufaylite Developments Ltd	1mm	Interdens	Monoammonium Phosphate
	2mm	Interdens	Monoammonium Phosphate
Lorient Polyproducts Ltd	1mm	MAP Paper	Monoammonium Phosphate
	2mm	MAP Paper	Monoammonium Phosphate
Mann McGowan Ltd	1mm	Pyrostrip Interdens	Monoammonium Phosphate
	2mm	Pyrostrip Interdens	Monoammonium Phosphate
	1mm	Pyrostrip Heat Seal	Graphite
	2mm	Pyrostrip 500F	Graphite
Manufacturer	**Thickness**	**Product/Reference**	**Material Type**
Sealed Tight Solutions Ltd	1mm	STS Graphite	Graphite
	2mm	STS Graphite	Graphite

The following sections provide the requirements for hardware protection across various components that can form part of a doorset using the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan systems. Hardware protection is denoted as either “required” or “enhanced permitted”.

Where hardware protection is “required” in the individual component tables that follow, the **minimum** required specification is detailed.

Where hardware protection is “enhanced permitted” in the individual component tables that follow, it is has been proven through testing (and therefore accepted) that the application of additional/thicker intumescent materials for the protection of hardware will not be detrimental to expected performance. Where this is the case, only the hardware protection types in the above table which are of the same type to those permitted for the particular hardware item, being of equal or increased thickness to the “required” protection are considered. If the hardware item does not require intumescent protection but “enhanced permitted” is denoted as acceptable, any intumescent protection from the above table may be used.

It is not permitted to increase the intumescent gasket thickness beyond 2mm, unless specifically required for a certain item of hardware.

Any hardware protection types **not** listed are not permitted by this Field of Application. For certain items of hardware, there may be specific guidance regarding the required intumescent protection, which will be detailed in the relevant section for that item of hardware (e.g. ensuring there is a certain amount of perimeter intumescent that runs past a piece of hardware in addition to any gasket protection or where there are specific requirements for certain types of hardware).

9.2.1 Single Point Locks

The hardware protection permissible for this doorset design is as follows:

Single Point Lock/Latch Intumescent Specification						
Leaf Ref	Frame Group	Configuration	Location	Required	Enhanced Permitted	Product & Manufacturer
1, 2 & 3	1 &, 4	Single leaf doorsets	Lining all sides of the mortice for the lockset and/or fitted under the forend and keep	Yes	Yes	All 1mm thick or above
1, 2 & 3	1 &, 4	Double leaf doorsets (twin strip at meeting edge)	Fitted under the forend and keep	Yes	Yes	All 1mm thick or above

9.2.2 Butt & Lift Off Hinges

The hardware protection permissible for this doorset design are as follows:

Butt and Lift-Off Hinge Intumescent Specification						
Leaf Ref	Frame Group	Configuration	Location	Required	Enhanced Permitted	Type
1, 2 & 3	1	All Single Action	Under all hinge blades of door leaf heights 2400mm or under	No	Yes	All
1, 2 & 3	1	All Single Action	Under all hinge blades of door leaf heights 2401mm or over	Yes	Yes	All 1mm thick or above

9.2.3 Flush Bolts

The hardware protection permissible for this doorset design are as follows:

Flush bolts Intumescent Specification						
Leaf Ref	Frame Group	Configuration	Location	Required	Enhanced Permitted	Type
1	1 & 4	All Single Action	Lining all sides of the mortice for the flush bolt for bolts up to 210mm (h)	Yes	Yes	All minimum 1mm thick

9.2.4 Automatic Closing

9.2.4.1 Overhead Face Fixed Closers: Single Acting

Face fixed closing devices do not require any intumescent protection.

9.2.4.2 Concealed Overhead Closers

These are permitted for use only with the Leaf Type 1

The position of the guide rail in the frame rebate will partially or fully interrupt the perimeter intumescent strips. Therefore the installation and positioning instructions from the closer manufacturer must be adhered to.

The hardware protection permissible for this doorset design are as follows and is specific to each closer model:

Overhead Concealed Closer Intumescent Specification						
Rutland ITS11204 (various)						
Leaf Ref.	Frame Group	Arrangement	Location	Required	Enhanced Permitted	Type
1	1	All Single Action	Lining long sides of mortice for closer slider channel and on top of closer body	Yes	No	Rutland IP.114 kit

Arrone 7383 (WF 423917)						
Leaf Ref.	Frame Group	Arrangement	Location	Required	Enhanced Permitted	Type
1	1	All Single Action	Lining all sides of mortice for both closer arm and closer body	Yes	No	Arrone AR7383 MAP Intumescent Kit (AR/INT-7383)

10 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	Adhesive Type
Decorative Facings (Section 5.4)	UF, PRF, PF, PU, PVA or CR
MDF Facings (Section 5.1)	PVA
Lippings (Section 5.2)	UF, PRF, PF, PU[1] or PVA
Aperture Linings (Section 6.3)	UF, PRF, PF, PU or PVA

Notes

1. Includes Hot Melt Polyurethane

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

UF = Urea Formaldehyde (Plastic Resin Glue)

PRF = Phenol Resorcinol Formaldehyde (Resorcinol Formaldehyde)

PF = Phenol Formaldehyde (Phenolic Resin)

PU = Polyurethane (PUR)

PVA = Polyvinyl Acetate (PVAc, Polyethenyl Ethanoate)

CR = Polychloroprene Rubber (Contact Adhesive, Neoprene)

11 Hardware

11.1 General

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

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

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

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

Each item of hardware is considered in each section giving the items of hardware which:

- Have been tested
- Can be used as a result of an assessment of the appropriateness of the item of hardware, based on test evidence not commissioned by Falcon Panel Products
- Can be used 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.

11.2 Essential Hardware

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

Configuration	Hardware
LSASD	• Latch • Handle • Hinges • Self-closing device (closer)
ULSASD	• Hinges • Self-closing device (closer)
DASD	• Top pivot & bottom strap • Floor spring self-closing device (closer)
LSADD	• Latch • Handle • Hinges • Self-closing device (closer) • Flush bolt
ULSADD	• Hinges • Self-closing device (closer) • Flush bolt
DADD	• Top pivot & bottom strap • Floor spring self-closing device (closer)

11.3 Locks & Latches

11.3.1 Single Point Engagement

Single point locks and latches which have been successfully tested in the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset design for 30 minute applications are detailed in Section 19.3 alongside the associated test reference and are therefore approved for use with the Falcon Strebord 35+ and Falcon Superpan doorset design.

This Field of Application also considers locks and latches tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor and listed these items in section 19.3.

Single point locks and latches are permitted for use in:

Leaf Ref: 1, 2 & 3

Frame Refs: All

The lock and latch must comply with the following.

Based on the maximum size of locks tested in the Falcon Strebord 35+ and Falcon Superpan doorset design, alternative locks and latches which meet the following specification are acceptable, providing the lock has been tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a timber door assembly incorporating a maximum 44mm thick door leaf that has achieved a minimum of 30 minutes fire resistance.

Lock & Latch Specification	
Element	**Specification**
Maximum forend & keep dimensions	235 (h) x 25 (w) x 4mm (t)
Maximum body dimensions	180 (h) x 100 (w) x 18mm (t)
Intumescent protection	See section 9.2.1
Materials	All parts essential to the locking/latching action (including the latch bolt, forend & keep) to be steel or brass (with a melting point ≥800°C)
Location[1]	Between 750 – 1200mm from the threshold[2]

Based on the maximum size of lock tested in single and double leaf configurations, alternative latches/locks which meet the following specification are acceptable:

- A latch/lock which has been tested to BS 476 Part 22 1987 or BSEN 1634 Part 1 in a solid timber doorset 44mm thick and achieved a minimum of 30 minutes integrity performance. The higher specification of hardware intumescent protection as tested or as required for the inclusion of the lock/latch within this Field of Application must be used. For example if the lock/latch test specifies intumescent protection to all concealed faces of the lock/latch and this Field of Application does not require intumescent protection to all concealed faces of the lock/latch, the fitting of the intumescent specified in the test report is required.
- A Certifire approved lock/latch which is approved for 30 minutes in an ITT doorset, (i.e. a doorset incorporating Intumescent, Timber leaf and Timber frame), is acceptable providing the higher specification of hardware intumescent protection as required for the inclusion of the lock/latch within this Field of Application or the Certifire certificate are complied with. For example if the Certifire Certificate specifies intumescent protection to all concealed faces of the lock/latch and this Field of Application does not require intumescent protection to all concealed faced of the lock/latch, the fitting of the intumescent specified in the Certifire Certificate is required.

Notes:
1 – Threshold is defined as finished floor level.

11.3.2 Multipoint Locks

These have not been tested with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan and are therefore not permitted within this report.

11.3.3 Electronic Locking – Leaf 1 & 3

The following electronic locking systems have been tested in the Strebord 44 design as well as other timber based door constructions that have been considered to be fundamentally the same as the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan designs, Based on the testing conducted all of the listed locksets are assessed for use with leaf refs 1, and 3.

The electronic locking systems must be used in latched single leaf, single acting doorsets comprising hardwood door frames (frame types 1.1 and 1.3) of minimum density 640kg/m^3. The frames must be single acting.

The locksets must be fitted with minimum 1mm (t) monoammonium phosphate based gaskets, which are to be located underneath the forend and keep of the lockset, as well as to all sides of the mortice for the lockset.

The intumescent strip arrangement at the perimeter of the doorset must be no less than a single centrally fitted 15 x 4mm intumescent seal or 2 No. 10 x 4mm intumescent seals spaced 10mm apart. The intumescent seals are to be located in the frame reveal.

The lockset can be located between 750mm and 1200mm from the threshold of the doorset

- NSP 614 Digital Lock
- CISA eGO ANZ
- Dormakaba 79/RT Series
- Dormakaba Quantum Pixel LH
- NSP 814
- TLJ Security Systems Infinity Keycard Lock
- TLJ Security Systems Identity Keycard Lock
- TLJ Security Systems Revolution Keycard Lock

The locksets are to be installed following the lockset manufacturers guidance taking into account the necessary details for fire resistance as stated above.

11.3.4 Electronic Strikes

These have not been tested with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan and are therefore not permitted within this report

11.3.5 Cylinders

Cylinders have not been tested with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan. However based on testing carried out on the Strebord 44 design as well as other timber based door constructions similar to the Strebord 44 design cylinders are assessed for use with leaf refs 1, 2, & 3 with the following conditions:

- Providing the hole for the cylinder is cut tight to the shape of the cylinder, no additional intumescent protection is necessary. However, if an oval shape is cut to receive the cylinder, any resulting gap between the hole cut for the cylinder and the body of the cylinder must be filled with intumescent gasket.
- Cylinders can be fitted up to 1400mm from the threshold of the doorset and no closer than 50mm to the leaf edge, or any aperture, groove or recess.

11.3.6 Rebated Meeting Edges

These have not been tested with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan designs and are therefore not permitted within this report.

11.4 Hinges & Pivots

11.4.1 Butt Hinges

Hinges which have been successfully tested in the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan door assembly system for 30 minute applications are detailed in Section 19.

This Field of Application also considers hinges tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor and these items are listed in Section 19.1 alongside the associated test reference.

These hinges are permitted for use in:

Leaf Ref: All

Frame Refs: 1.1, 1.3, 1.7, 1.8, 1.9 & 1.10

Based on the dimensions of the hinges tested in the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset design, alternative hinges which meet the following specification are acceptable, providing the hinges have been tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a timber door assembly having a maximum[1] 44mm thick door leaf and achieved a minimum of 30 minutes.

<table>
<tr><th colspan="5">Alternative Hinge Specification</th></tr>
<tr><th colspan="2">Element</th><th colspan="2">Specification</th></tr>
<tr><td colspan="2">Blade height</td><td colspan="2">90 – 120mm</td></tr>
<tr><td colspan="2">Blade width (excluding knuckle)</td><td colspan="2">28 – 35mm</td></tr>
<tr><td colspan="2">Blade thickness</td><td colspan="2">2.5 – 4mm</td></tr>
<tr><td colspan="2">Fixings</td><td colspan="2">Minimum of 4No. 30 long No. 8 or No. 10 steel wood screws per blade or tested screw fixings as supplied with the hinge</td></tr>
<tr><td colspan="2">Materials</td><td colspan="2">Steel or stainless steel or brass (melting point ≥800°C)</td></tr>
<tr><td rowspan="2">Hinge positions</td><td rowspan="2">Leaf height: <1200mm</td><td>Top</td><td>120 – 200mm from head of leaf to top of hinge</td></tr>
<tr><td>Bottom</td><td>150 – 300mm from foot of leaf to bottom of hinge</td></tr>
<tr><td></td><td rowspan="3">Leaf height: 1201-2400mm</td><td>Top</td><td>120 – 200mm from head of leaf to top of hinge</td></tr>
<tr><td></td><td>2nd</td><td>Min - 100mm from top hinge
Max - centrally between top and bottom hinge</td></tr>
<tr><td></td><td>Bottom</td><td>150 – 300mm from foot of leaf to bottom of hinge</td></tr>
<tr><td></td><td rowspan="4">Leaf height: >2401mm</td><td>Top</td><td>120 – 200mm from head of leaf to top of hinge</td></tr>
<tr><td></td><td>2nd</td><td>Min - 100mm from top hinge
Max - centrally between top and 3rd hinge</td></tr>
<tr><td></td><td>3rd</td><td>Min – 100mm from bottom hinge
Max – centrally between 2nd and bottom hinge</td></tr>
<tr><td></td><td>Bottom</td><td>150 – 300mm from foot of leaf to bottom of hinge</td></tr>
<tr><td colspan="2">Intumescent protection</td><td colspan="2">See section 9.2.2</td></tr>
</table>

Alternatively, Certifire approved hinges approved for 30 minutes in an ITT door assembly (i.e. a door assembly containing intumescent, a timber frame and a timber leaf) are acceptable providing all the requirements for intumescent and frame are complied with.

Notes:

1 -Additional intermediate hinges may be included within door assemblies in between the hinges required for the leaf as specified in the table above, provided there is a minimum 100mm between hinges. Where intermediate hinges are introduced, their positioning may influence 2nd and 3rd hinge parameters. No more than 5 hinges at the hanging edge of doorsets may be fitted and providing the spacing requirements of this assessment can be met
2 – Rising butt hinges are not assessed for the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan 30 minute doorset systems.

11.4.2 Concealed Hinges

These have not been tested with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan designs and are therefore not permitted within this report.

11.4.3 Pivots

This Field of Application considers pivots tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor and these items are listed in Section 19.8 alongside the associated test reference.

Pivots are permitted for use in:

Leaf Ref: All

Frame Groups: 4

Configurations: DASD & DADD.

The frame head dimensions must be a minimum of 100mm wide x 44mm deep (excluding the stop if they are to be used with single acting frames) to accommodate the body of the top pivot.

The body of the pivot in the frame head and the top and bottom strap in the leaf must be fitted with a 1mm intumescent gasket lining all sides of the mortice.

The pivots are to be fitted in accordance with manufacturer's instructions taking into account the necessary details for fire resistance as stated above.

Offset pivot variants are not allowed by this assessment

11.5 Automatic Closing

11.5.1 Overhead Face Fixed Closers – Single Acting

Closers which have been successfully tested in the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan design for 30 minute applications are detailed in Section 19.

This Field of Application also considers closers tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor and these items are listed in Section 19.2 alongside the associated test reference.

These closers are permitted for use in:

Leaf Ref: All

Frame Ref: All single acting frames

Based on the range of overhead face fixed closers tested in Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset design , alternative closers are acceptable, providing the closers have been tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a timber door assembly achieving a minimum of 30 minutes.

Alternatively, Certifire approved overhead face fixed closers approved for 30 minutes in the following:

- A closer that is approved with an ITT door assembly is acceptable for use with doorsets in timber based door frames (i.e. a door assembly containing intumescent, a timber frame and a timber leaf),

Providing all the requirements for intumescent and frame are complied with.

Note:
1 – Closers with mechanical (i.e. not automatically disengaged through alarm system or similar) back-check/hold-open functionality are not approved for the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan 30 minute door assembly system.

11.5.2 Concealed Overhead Closers – Single Action Only

Overhead concealed closers which have been successfully tested in the Strebord® 35+ doorsets for 30 minute applications are detailed below:

- Arrone 7383

The following closer has been successfully tested in the Strebord® 44 door assembly system for 30 minute applications:

- Rutland ITS 11204

The required intumescent specification for the approved closers is given in Section 9. The closers may be used with a single strip or double strip intumescent arrangement at the head of the doorset providing the associated intumescent protection is fitted to the closer. The single strip must be at least 15 x 4mm.

These closers are permitted for use in:

Leaf Refs: All

Frame Refs: 1.1 and 1.3 where the stop is increased to 18mm and minimum density of frame is 510kg/m^3.

- Certifire Certificated Concealed Closers

These closers are permitted for use in:

Leaf Refs: 1 & 3

Frame Refs: 1.1 and 1.3 where the stop is increased to 18mm and minimum density of frame is 510kg/m^3.

Based on the size of overhead concealed closers tested in Falcon Strebord 35+ and Strebord® door assemblies, alternative closers are acceptable, providing the closers have been tested to BS 476: Part 22: 1987 or BS EN 1634-1 in a timber door assembly having a minimum 44mm thick door leaf and achieved a minimum of 30 minutes.

The position of the guide rail in the frame rebate will partially or fully interrupt the perimeter intumescent strips. Therefore the installation and positioning instructions from the closer manufacturer must be adhered to.

Note:
Closers with mechanical (i.e. not automatically disengaged through alarm system or similar) back-check/hold-open functionality are not approved for the Strebord® 30 minute door assembly system.

11.5.3 Jamb Mounted Concealed Closers – Single Acting

Jamb mounted concealed closers which have been successfully tested in the Falcon Strebord © 44 door assembly system for 30 minute applications. These are:

- The Astra 4000 Series

These closers are permitted for use in:

Leaf Ref: All

Frame Ret: 1.1 & 1.3

For timber based frames the perimeter intumescent must be a minimum of 1 No. 15 x 4mm centrally fitted in the frame reveal or leaf edge or 2No. 10 x 4mm intumescent seals spaced 10mm apart in either the frame reveal or leaf edge.

The closer may be fitted up to 1000mm from the threshold.

11.5.4 Flushbolts

Flush bolts may be incorporated centrally into the top and bottom of one meeting edge, providing the following maximum mortice dimensions are not exceeded

- 210 long x 22mm deep x 22mm wide.
- Flush bolts must be steel or brass and the mortice must be as tight to the mechanism as is compatible with its operation.
- All edges of the mortices in the frame and leaf must be protected with intumescent gaskets as specified in section 9.2.3.
- Intumescent strips in door leaf edge must be located opposite the flush bolt so that they run continuously to the head of the leaf.
- Bottom flush bolts cannot be used in conjunction with a drop down seal morticed into the bottom edge of the doorset

Alternatively, the hardware manufacturers tested gaskets may be used. See diagram below for example of intumescent protection to flush bolt:

Flush bolt intumescent protection example

11.6 Additional Hardware Items

11.6.1 Handles

11.6.1.1 Pull Handles Leaf 1, 2 and 3

Pull handles may be surface-fixed or bolted through the door leaf, providing they are steel or brass and 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.

11.6.1.2 Lever Handles

Lever type handles have been successfully tested with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan door blank, and they are suitable for use within the following scope:

- Leaf Ref : All
- Frame Ref: 1.1, 1.3, 1.7 & 1.8 & 4
- Configuration: All configurations
- Intumescent protection: none required

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 design may be either lever on rose or lever on back plate up to the following maximum sizes:
    - Lever on rose with a rose diameter up to 54mm
    - Lever on back plate with a back plate size up to 243mm high x 56mm wide
    - Lever handle length 250mm

11.6.2 Push Plates / Kick Plates – Leaf 1, 2 & 3

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 or ‘notch out’/interrupt the door stop.

Components with the above 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.

11.6.3 Door Security Viewers

- 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 +1mm). Lenses must be glass and the item must be bedded into a tested intumescent mastic. The viewer(s) must be fitted no closer than 100mm to door edge, glazing or any other hardware component

11.6.4 Environmental Seals

The following flame retardant acoustic, weather and dust seals are approved for use with the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan doorset design with timber based door frames:

- Fire and Acoustic Seals Ltd: FAS35, FAS39, FAS-Trident, FAS-Twin
- Lorient Polyproducts Ltd: IS1212, IS1511, IS7025, IS7060
- Mann McGowan ACS-1, TD5, Tri-blade
- Norsound Ltd: NOR710, NOR710FR, NOR710SR, NOR710STOP, NOR720
- Raven Products Pty. Ltd: RP120, RP124, RP134, RP150, RP500, RP520, RP670
- Reddiplex Ltd: 9927, 9945, 9946, 10623, 11300, 11301, 11302
- Schlegal: Aquamac 21
- Sealed Tight Solutions Ltd: ST1009, ST1009K
- Sealmaster: Delta, Double Fin Seal, Duxback

It must be ensured that the fitting of the seals listed above does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

11.6.5 Letter Boxes / Plates

Letter Box/Plate Specification			
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)	Hardware Intumescent
ERA Fab & Fix 3C018 with security shield 3F005	ERA	75(h) x 310(w)	Fire and Acoustic Seals Ltd Spartan FASGP1013 100mm(l) x 40mm(w) x 1.3mm(t)
Royde & Tucker LP08	Royde and Tucker	80(h) x 312(w)	Royde & Tucker LP008 intumescent kit
Sealed Tight Solutions Ltd STS 4001	Sealed Tight Solutions	80(h) x 310(w)	Sealed Tight Solutions Ltd intumescent liner 30mm(w) x 2.3mm(t)
Royde & Tucker LP08 with TS008 security cowl	Royde and Tucker	80(h) x 312(w)	Royde & Tucker LP008 intumescent kit

The letterboxes may be fitted between 400mm and 900mm from the threshold. The area occupied by the letter box/plate must be deducted from the area of glazing, if both elements are fitted.

This Field of Application considers letterboxes/plates tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor and these items are listed below.

These letter boxes/plates are permitted for use in:

Leaf Refs: All

Frame Refs: All

The letter boxes must be fitted in accordance with manufacturer's instructions, they must be fitted no closer than 80mm to any other aperture or mortice location within the leaf or any closer than 80mm from any edge of the leaf.

The intumescent protection must be fitted to the letterplate as listed below. No other letterplates other than those listed below may be fitted to the Strebord doorset design:

11.6.6 Threshold Drop Seals

The table below identifies drop seals that have been successfully tested and therefore are acceptable for use in all door designs.

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.

Tested Threshold Seals			
Product Reference	**Core Type**	**Test Ref**	**Intumescent Protection**
Lorient LAS8001si	Leaf 2 – Banded Core	WF514734	None
STS 422	Leaf 1	WF426842 Doorset A	20x2mm STS Raw Graphite to the vertical sides
Norsound NOR810s	Strebord 35[1]	WF380214 (Doorset A)	None

Note

1. The Norsound NOR810s has been tested in a Strebord 35 core which forms the basis of Leaf Types 1 & 2. It has been considered by Warringtonfire that for Leaf Type 3, which has facings integral to the inner core, has a similar core composition and therefore the inclusion of the drop seal would not prevent the doorset from achieving if tested fire integrity of minimum 30 minutes.
2. if a rebated drop seal is fitted to the doorset then flush bolts, if approved, cannot be fitted to the bottom of the doorset.

The threshold drop seals listed in the table below are deemed acceptable when recessed into the bottom of leaves. Drop seals that have been fire tested with intumescent protection must be installed with the same specification of intumescent as tested or with the drop seal manufacturer's proprietary gaskets. Alternatively, 1mm Interdens (MAP) may be installed lining all edges of the drop seal channel and under the drop seal faceplates.

Threshold Seal Specification	
Product Reference	**Manufacturer /Supplier**
Pemko 411_NBL / PKL / RL / SL	Assa Abloy
Schall-Ex Duo L-15	Athmer
FAS45	Fire & Acoustic Seals Ltd.
LAS8001si	Lorient Polyproducts Ltd.
DD-1703ACU, DD-420S	Mann McGowan Ltd
NOR810, NOR810S, NOR810dB+	Norsound Ltd.
RP8Si	Raven
HID, HEID	Reddiplex Ltd.
STS 422, STS 422GT	Sealed Tight Solutions Ltd.
DRP2712	Sealmaster (Dixon International Group Ltd)

11.6.7 Air Transfer Grilles

The following Lorient and Pyroplex air transfer grilles have been assessed as acceptable for use with all door leaf types referred to in this assessment based on test reports WF380214 WF146520 (held on file by Warringtonfire).

The grilles must be fitted 100mm from the edge of the door leaf and 80mm apart if more than one grille is to be fitted. The area occupied by the air transfer grille(s) must be deducted from the percentage of glazing, if both elements are fitted.

11.6.7.1 Pyroplex Air Transfer Grilles

The grilles may be fitted up to a maximum height of 2200mm from the threshold.

Part No.	**Dimensions** (mm)	**Air Flow** (sq. cm)	**Compatible Faceplates**
ATG 1500	150 x 150	153	FP1500
ATG 1503	150 x 300	307	FP1503
ATG 1300	300 x 300	614	FP1300
ATG 2251	112 x 225	161	FP2251
ATG 2250	225 x 225	323	FP2250

The Pyroplex air transfer grilles must be installed in accordance with the manufacturer's installation details, which include a 6mm thick hardwood aperture liner and Pyroplex intumescent mastic applied around the perimeter of the grille. Full details can be obtained from Pyroplex Ltd.

11.6.7.2 Lorient Air Transfer Grilles

The grilles may be fitted up to a maximum height of 2200mm from the threshold.

Tested dimensions – 300 (h) x 600(w) mm

The Lorient air transfer grilles must be installed in accordance with the manufacturer's installation details. Fire test WF380214 included a 6mm thick hardwood aperture liner and Lorient intumescent mastic applied around the perimeter of the grille. Full details can be obtained from Lorient Polyproducts Ltd.

Tested dimensions must not be exceeded, however the air transfer grille may (if required) be oriented 600 (h) x 300(w) mm.

11.6.8 Cable loop

This Field of Application considers cable loops tested in timber based door constructions that have been considered to be fundamentally the same as the Strebord© 35+ Strebord©35 Banded Core and Strebord© Superpan designs. The following cable loops have been successfully incorporated in the tests on Strebord© 44 doorset design:

- Abloy EA280 (footprint) 320mm (h) x 25mm (w) including a Ø12 spring assembly
- Securefast steel cableloop (footprint) 290mm (h) x 25mm (w) including a Ø12 spring assembly (tested

This cable loops are permitted for use in:

Leaf Refs: 1 & 3

Frame Refs: 1.1 and 1.3 (minimum density 510kg/m^3)

Configurations Single acting, Single and double leaf application.

The top of the loop should be below 1200mm from the threshold and no closer than 200mm from another item of hardware.

The body of the cable loop is to be located centrally in the frame. The entry point for the cable into the leaf is to be central within the leaf thickness

The cable loops are to be protected using a minimum 2mm thick intumescent liner and can be used in conjunction with a single strip or double strip intumescent arrangement, where the single strip arrangement is no less than 15 x 4mm. The seal can be in the frame reveal or the leaf edge.

11.6.9 Cableways

Cableways have been successfully tested in Strebord© 44 doorsets comprising a 44mm thick three layer chipboard blank. It is considered that due to the similarity of 35mm three layer chipboard tested in RF11161 to the Strebord© 44, in conjunction with additional facings to make up the leaf thickness that the method of boring the cableways tested in the Falcon Strebord 44 may be employed are only permitted in Leaf 1 and 3 within this assessment without detriment to the fire performance of the doorset.

Cableways are to be used to route cables though or around the door leaf to operate electronic hardware. The cableway will be routed from a cable loop fitted at the jambs of a doorset to the relevant item of hardware (e.g. a lockset or electronic strike).

The methods for cable routing are given in Section 5.9.

11.6.10 Security Chains - Leaf 1, 2 and 3

Face fixed security chains have been assessed as acceptable for use with all door leaf types and may be fitted at the closing edge of single leaf, single acting doorsets providing they do not remove any material from the door leaf or frame and do not interfere with any edge mounted sealing system.

It is also possible to fit the following tested concealed security chain to single leaf single acting doorsets without compromising the integrity performance of the doorset.

Frame types: 1.1, 1.3

The chain must be no closer than 50mm to any other mortice or ironmongery within the doorset. The item does not require any additional intumescent protection and can be fitted up to 1400mm from the threshold:

11.6.11 Door Selectors

Rebated meeting stiles and meeting stile astragals are not covered by this assessment therefore door selectors are not required by or permitted within this report

12 Installation

12.1 General

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

- the door frame and architrave installation position relative to the wall
- the fire stopping between the frame and the wall and the use of shadow gaps
- the fixing requirement including packers
- the requirements for door edge gaps
- the trimming of door edges
- The following table details which wall type the frame can be installed into

Frame Ref	Wall construction
1 & 4,	Masonry wall Timber stud partition Steel stud partition

The following sections consider the fire stopping arrangement between door frame and wall.

12.1.1 Generic Systems

The following tables detail permitted fire stopping details

The architrave can be softwood minimum density 500 kg/m^3 or MDF minimum density 600kg/m^3. Architrave to be mechanically fixed in place.

For the generic systems that specific the application of intumescent mastic, the sealant must have been fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1 and shown to provide at least the level of fire resistance required from the doorset.

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

Mineral rock fibre with Architraves

Wall construction	Timber stud / masonry	
Architrave	15mm thick overlapping 15mm each side	
Linear gap joint seal	Mineral rock fibre packed to full depth	
Maximum gap size	20mm	

Mineral rock fibre and mastic with architraves

Wall construction	Steel and Timber stud / masonry	
Architrave	15mm thick overlapping 15mm each side	
Linear gap joint seal	Mineral rock fibre packed to full depth with 10mm intumescent capping both sides	
Maximum gap size	20mm	

Mineral rock fibre and mastic

Wall construction	Steel and Timber stud / masonry	
Architrave	None	
Linear gap joint seal	Mineral wool packed to full depth with 10mm intumescent capping both sides	
Maximum gap size	15mm	

Intumescent mastics with architraves

Wall construction	Timber stud / masonry	
Architrave	15mm thick overlapping 15mm each side	
Linear gap joint seal	Minimum 10 mm depth of intumescent mastic each side	
Maximum gap size	10mm	

12.1.2 Specific Fire Stopping Solutions

12.1.2.1 Sealed Tight Solutions Ltd

Based on test WF 386595 which supports assessment WF419831 the following Sealed Tight Solutions Ltd have been considered appropriate.

ST88 intumescent mastic

Wall construction	Steel and Timber stud / masonry	
Architrave	Optional	
Linear gap joint seal	10mm depth ST88 intumescent mastic either side.	
Maximum gap size	10mm	

Mineral Fibre or ST99 fire foam with ST88 intumescent mastic both sides

Wall construction	Steel and Timber stud / masonry	
Architrave	Optional	
Linear gap joint seal	ST99 full depth foam or mineral wool and 10mm deep ST88 intumescent mastic each side	
Maximum gap size	10 to 20mm	

ST99 Expanding foam with architraves

Wall construction	Steel and Timber stud / masonry	
Architrave	18mm thick overlapping 15mm each side minimum 45mm wide	
Linear gap joint seal	Full depth foam	
Maximum gap size	20mm	

Large gaps with timber/non-combustible subframe

Wall construction	Steel and Timber stud / masonry	
Architrave	18mm thick overlapping 15mm each side minimum 45mm wide l	
Linear gap joint seal	Timber or non-combustible sub frame bedded on wall with ST88 and gap between sub frame and frame filled with ST99	
Maximum gap size	Gap between frame and sub frame 25mm Overall gap 60mm max	

12.1.2.2 Fire & Acoustic Seals Ltd

Based on test WF 414882 which supports assessment WF385912 the following Fire and Acoustic Seals Ltd have been considered appropriate.

Intumescent mastics

Wall construction	Timber stud / masonry	
Architrave	Optional	
Linear gap joint seal	Minimum 10 mm depth of intumescent mastic each side	
Maximum gap size	10mm	

Expanding foam and mastics – Wall depth 100mm min

Wall construction	Steel and Timber stud / masonry	
Architrave	Optional	
Linear gap joint seal	Successfully tested full depth Fire and Acoustic Seals Ltd foam and 10mm deep intumescent mastic each side	
Maximum gap size	25mm	

Expanding foam with architraves – Wall depth 70mm min

Wall construction	Steel and Timber stud / masonry	
Architrave	18mm thick overlapping 15mm each side minimum 45mm wide	
Linear gap joint seal	Successfully tested full depth Fire and Acoustic Seals foam and 10mm deep intumescent mastic each side	
Maximum gap size	25mm	

12.2 Packers

For frame types 1 & 4, packers between the frame and the structural opening 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.

Plastic packers should be cut short and capped with intumescent mastic unless test evidence demonstrates that mastic capping is not required.

12.3 Wall Types

The frame needs to be fixed back to a supporting construction which will remain in place for the duration of the fire resistance period. The following aspect of the different supporting constructions need to be considered.

12.3.1 Masonry, Concrete and Solid Blockwork

These are considered as rigid constructions and are solid throughout the depth of the wall and have inherent fire resistance. These walls are denoted as rigid constructions in BSEN 1364 Part 1 as they deflect very little during a fire test. Due to the solid nature of the wall firestopping as detailed above will be adequate. Highly perforated blockwork is not covered by this category and specific test evidence must be referenced to ensure adequate support during the fire exposure period.

12.3.2 Steel Stud Partitions

These are considered as flexible constructions and incorporate large voids in their construction. These walls deflect during a fire test. Specific evidence is required to ensure the stud supporting the door frame is stabilised to reduce deflection during the fire test and the aperture is adequately lined to prevent gases getting into the void.

12.3.3 Timber Stud Partitions

These are not categorised but tend not to distort significantly during a fire test. A timber stud does not need to be stabilised during the fire test and the aperture will only need to be lined if the timber stud is not fully protecting the void in the partition.

12.3.4 Bespoke Walls and Partitions

These will require specific test evidence.

12.4 Post Production (Onsite) Leaf Size Adjustment

The Falcon Strebord 35+ and Falcon Superpan range of doorsets may be altered as follows:

Leaf Size Adjustment Specification	
Element	Reduction
Core (top & bottom of leaf) – Leaf Types 1 & 3	Where the door leaf is not lipped to top or bottom, the leaf may be reduced without restriction. Provided that all door gaps are maintained and that the reduction does not cause ironmongery positions or glazing margins to be reduced beyond the limits stated in the appropriate sections of this assessment.
Core (top & bottom of leaf) – Leaf Type 2 – Banded Core	Where lippings are not fitted the leaf may only be reduced in height or width in line with the minimum stile and rail dimensions given in Section 4.3.2
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

12.5 Door Gaps

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

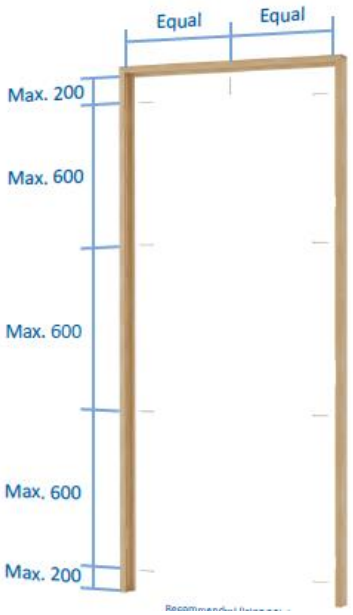
Door Gap & Alignment Tolerance Specification	
Location	Dimension
Door edge gaps	A minimum of 2mm and a maximum of 4mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm.
Threshold	8mm between bottom of leaf and top of floor covering. This is the maximum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

12.6 Structural Opening

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

12.7 Fixings

The following drawings show the location of the fixings and the minimum depth of 40mm into the wall. A plastic packer is shown and proprietary plastic packers have been successfully tested.



Frame fixing locations

Frame fixing depth

The fixings must be of the appropriate type for the supporting construction.

13 Insulation Performance

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

Insulation Performance Criteria		
Type		Details
Partially insulating		Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Timber frames	Unglazed doorsets or doorsets including 30-minute insulating glazing (e.g. 15mm Pyrostop or 16mm Pyrobel)

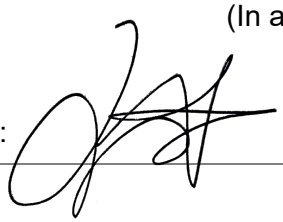
14 Conclusion

If Falcon Panel Products Ltd, Strebord© 35+, Strebord© 35+ Banded Cores & Strebord© Superpan 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 13).

15 Declaration by the Applicant

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

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

Signed: 

Name: Joshua Clare

Position: Technical Manager

Date: 23rd January 2023

For and on behalf of Falcon Panel Products Ltd

16 Limitations

The following limitations apply to this assessment:

1) This field of application addresses itself solely to the elements and subjects discussed and do not cover any other criteria 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.

17 Validity

1) The assessment is initially valid for five years after which time it is recommended to be submitted to Warringtonfire for re-appraisal.
2) This assessment report is not valid unless it incorporates the declaration given in Section 15 duly signed by the applicant.

Position:	Assessor	Co-author	Reviewer
Signature:			
Name:	**Chris Newton***	**Dr K D S Towler***	**Peter Barker***
Title:	Product Assessor	Senior Product Assessor	Technical Manager

* For and on behalf of Warringtonfire

18 Appendix A: Revisions

Rev.	WF Ref.	Date	Description
Original	380559	24/02/2017	First Issue
A	516033	23/01/2023	Falcon Superpan door size envelopes now based on test WF 433533 Projecting frame options added based on test WF514734 Adjustable telescopic door frame detail, STS perimeter seals for single leaf doorsets only included based on test WF 426842 Removed Options / Details: Smoke control section and references removed Strebord 38+ core type. 7mm Pyroguard with Lorient FF1 seals Cranked hinges Flush Overpanel option Over Rebated lippings option Post forming / edge protection. Steel frame option.

19 Appendix B: Performance Data

19.1 Hinges

19.1.1 Tested in Strebord 35 + / Strebord 35+ Banded Core/ Strebord Superpan

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
Chilt/RF11172	ULSADD	39	MDF	R&T H105
Chilt/RF12061	ULSADD	34	Redwood	R&T H101
WF426842 (A)	ULSASD	29 Glazing aperture, no failure to hinge	Redwood	Hoppe Arrone AR8182
WF433833	ULSADD	31	Redwood	R&T H101

19.1.2 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WF416689 (B)	ULSASD	46	Ash	Hoppe Arrone AR8182
WF414882	LSADD	32	Softwood	Zoo VLH243
RF11121*	ULSADD	38	Redwood	R&T H105
RF11170*	ULSADD	38	Redwood	R&T H101
RF13132	ULSADD	36	Redwood	R&T H101
RF13176 (A)	ULSASD	32	Redwood	R&T H101

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WF388638	ULSADD	39	PVC Wrapped Redwood	R&T H101
WF401039 (A)	LSASD	36	Redwood	Zoo ZHSS243
WF391843 (A)	LSASD	51	Redwood	R&T H101
WF384630	LSADD	43	Finger Jointed Softwood	R&T H101
WF405305 (A)	ULSASD	40	Redwood	Eurospec
BMT/FEP/F14233 (A)	LSASD	45	-	Zoo ZHSS243
WF402305	LSASD	51	Redwood	R&T H102
CFR1811071 (A)	ULSASD	39	Softwood	Eurospec Enduro HIN1433/13
WF411193	LSASD	37	MDF	Vier VLHL243RS &VLHR243RS

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manufacturer/ Model
WF414162	LSASD	36	Ash	R&T H207
WF426842 (B)	ULSADD	16	Redwood	Hoppe Arrone AR8182
WF386959 (A)	ULSASD	32	Redwood	R&T H101
CFR1810221 (A)	ULSASD	37	Softwood	Eurospec Enduro HIN1433/13
CFR1811071 (B)	ULSASD	38	Softwood	Eurospec Enduro HIN1433/13
CFR1812111	ULSADD	36	Softwood	Eurospec Enduro HIN1433/13
CFR1812121	ULSADD	36	Softwood	Eurospec Enduro HIN1433/13
BMT/FEP/F15050 (A)	LSADD	49	MDF	R&T H101
Chilt/RF03108	ULSADD	30	Redwood	R&T H105

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
RF01030	ULSADD	32	Redwood	R&T H105
RF08088	ULSADD	44	Redwood	R&T H105
RF08125	ULSADD	49	MDF	R&T H105
RF97059	ULSADD	37	Redwood	R&T H105
RF98048	ULSADD	42	Redwood	R&T H105
RF98137	ULSADD	32	Redwood	R&T H105
BMT/FEP/F14072	ULSADD	32	Redwood	R&T H101
Chilt/RF05134 (A)	ULSASD	37	Redwood	R&T H101
Chilt/RF05134 (B)	ULSASD	38	Redwood	R&T H101
Chilt/RF03083	ULSADD	30	Redwood	R&T H105

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
RF00136	ULSADD+OP	37	Redwood	R&T H105
Chilt/RF09170	ULSADD	36	Redwood	R&T H105
Chilt/RF11006	ULSADD	33	Redwood	R&T H105
Chilt/RF08135	ULSADD	31	Redwood	R&T H105
Chilt/RF08094	ULSADD	33	Redwood	R&T H105
Chilt/RF10098	ULSADD	32	Redwood	R&T H105
RF99050	ULSADD+OP	36	Redwood	R&T H105
Chilt/RF07109	ULSADD	36	Redwood	R&T H105
BMT/FEP/F16035	ULSADD	47	Softwood	R&T H101
BMT/FEP/F14168	LSASD	48	Sapele	R&T H101

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WARRES 141445	ULSADD	40	Softwood	R&T H102
Chilt/RF09060 (A)	ULSASD	19	Redwood	R&T H105
Chilt/RF09060 (B)	ULSADD	43	Redwood	R&T H105
CFR1403122	ULSADD	34	Redwood	R&T H101
Chilt/RF10011 (A)	ULSASD	51	Redwood	R&T H101
Chilt/RF02109 (A)	ULSASD	13.5	Redwood	R&T H101
Chilt/RF02109 (B)	LSASD	35	Redwood	R&T H101
BMT/FEP/F15178 (A)	LSASD	38	Redwood	Zoo CF849
BMT/FEP/F15178 (B)	LSASD	38	Redwood	Zoo CF849
BMT/FEP/F15178 (C)	LSASD	45	MDF	Zoo CF849

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WF427417	ULSASD	40	Meranti	Eclipse Frisco 14854
WF405307 (A)	LSASD	31	Softwood	Zoo VHP243
RK141-5A	LSASD	42	Steamed Beech	Euroart HINBB433/SSS
SF013-5A (A)	LSASD	46	Softwood	Dorma 3090F
SF013-9 (A)	LSADD	37	Veneer wrapped Spruce	Dorma 3090F
SF013-9 (B)	LSASD	44	Veneer wrapped MDF	Dorma 3090F
WF419865	LSASD	34	Poplar	Hoppe Arrone AR8182
WF421795	LSASD	35	Poplar	Consort CF5511

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WF426603	LSADD	0	Redwood	R&T H105
WF419820 (A)	ULSASD	35	Redwood	Eurospec Enduro CF339
WF419820 (B)	ULSASD	29	Redwood	Eurospec Enduro CF339
BMT/FEP/F15027A	LSASD	38	sapele	Nico Load Pro Lift off
BMT/FEP/F15034	ULSADD	33	Redwood	Intelligent Hardware HST.100
WF430460 (A)	ULSADD	35	Redwood	Hoppe Arrone AR8182
WF346351 (A)	LSASD	34	Softwood	R&T H101
WF433832	ULSADD	23	Redwood	R&T H105
BMT/FEP/F14265 (A)	ULSASD	47	Redwood	R&T H101
BMT/FEP/F14265 (B)	ULSADD	42	Redwood	R&T H101

19.2 Closers

19.2.1 Surface Mounted Closers Tested in Strebord 35 + / Strebord 35+ Banded Core/ Strebord Superpan

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF418407 (B)	LSASD	8* (Glazing) Perimeter failure at 34 min	Streframe E	Briton 1120B
Chilt/RF11172	ULSADD	39	MDF	Rutland TS3204
Chilt/RF12061	ULSADD	34	Redwood	Rutland TS3204
WF433833	ULSADD	31	Redwood	Rutland TS3204

19.2.2 Concealed Closers Tested in Strebord 35 + / Strebord 35+ Banded Core/ Strebord Superpan

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF426842 (A)	ULSASD	29	Redwood	Arrone 6383
WF423917 (B)	LSASD	13 (36 mins – latch failure)	Redwood	Arrone 7383

19.2.3 Surface Mounted Closers Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF416689 (B)	ULSASD	46	Ash	Arrow 324BP
WF414882	LSADD	32	Softwood	Hoppe AR8200-SE
RF11121*	ULSADD	38	Redwood	Dorma TS71
RF11170*	ULSADD	38	Redwood	Rutland TS3204
RF13132	ULSADD	36	Redwood	Rutland TS3204
RF13176 (A)	ULSASD	32	Redwood	Rutland TS3204
BMT/FER/F13263 (A)	ULSASD	41	Redwood	Turentek TSS225 OHC
BMT/FER/F13263 (B)	ULSASD	32	MDF	Turentek TSS225 OHC
WF388638	ULSADD	39	PVC Wrapped Redwood	Rutland ITS 11204

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF401039 (A)	LSASD	36	Redwood	Rutland TS9205
WF384630	LSADD	43	Finger Jointed Softwood	Arrone AR1500 & Rutland TS50204
WF405305 (A)	ULSASD	40	Redwood	Rutland TS9205
BMT/FEP/F14233 (A)	LSASD	45	Sapele	Dorma TS73V OHC
CFR1811071 (A)	ULSASD	39	Softwood	Dorma TS68
WF411193	LSASD	37	MDF	Rutland TS11205
WF426842 (B)	ULSADD	16	Redwood	Hoppe AR1500

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
CFR1810221 (A)	ULSASD	37	Softwood	Rutland TS4204
CFR1811071 (B)	ULSASD	38	Softwood	Dorma TS68
CFR1812111	ULSADD	36	Softwood	Rutland TS.9205
CFR1812121	ULSADD	36	Softwood	Rutland TS.5204BC.SRFB.SESE
Chilt/RF03108	ULSADD	30	Redwood	Dorma TS73V
RF01030	ULSADD	32	Redwood	Dorma TS73
RF08088	ULSADD	44	Redwood	Dorma TS71

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
RF08125	ULSADD	49	MDF	Dorma TS71
RF97059	ULSADD	37	Redwood	Dorma TS73
RF98048	ULSADD	42	Redwood	Dorma TS73
RF98137	ULSADD	32	Redwood	Dorma TS73
BMT/FEP/F14072	ULSADD	32	Redwood	Rutland TS3204
Chilt/RF05134 (A)	ULSASD	37	Redwood	Dorma TS73V
Chilt/RF05134 (B)	ULSASD	38	Redwood	Dorma TS73V
Chilt/RF03083	ULSADD	30	Redwood	Dorma TS73V
RF00136	ULSADD+OP	37	Redwood	Dorma TS73V
Chilt/RF09170	ULSADD	36	Redwood	Dorma TS71

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
Chilt/RF11006	ULSADD	33	Redwood	Dorma TS71
Chilt/RF08135	ULSADD	31	Redwood	Dorma TS71
Chilt/RF08094	ULSADD	33	Redwood	Dorma TS71
Chilt/RF10098	ULSADD	32	Redwood	Dorma TS73V
RF99050	ULSADD+OP	36	Redwood	Dorma TS73V
Chilt/RF07109	ULSADD	36	Redwood	Dorma TS73V
BMT/FEP/F16035	ULSADD	47	Softwood	Arrone AR1500
BMT/FEP/F14168	LSASD	48	Sapele	Arrone AR1500
WARRES 141445	ULSADD	40	Softwood	Dorma TS73V
Chilt/RF09060 (A)	ULSASD	19	Redwood	Dorma TS68

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
Chilt/RF09060 (B)	ULSADD	43	Redwood	Dorma TS68
CFR1403122	ULSADD	34	Redwood	Dorma TS68
Chilt/RF10011 (A)	ULSASD	51	Redwood	Dorma TS71
Chilt/RF02109 (A)	ULSASD	13.5	Redwood	Dorma TS73V
Chilt/RF02109 (B)	LSASD	35	Redwood	Dorma TS73V
BMT/FEP/F15178 (A)	LSASD	38	Redwood	Rutland TS3204
BMT/FEP/F15178 (B)	LSASD	38	Redwood	Rutland TS3204
BMT/FEP/F15178 (C)	LSASD	45	MDF	Rutland TS3204
Chilt/RF11192	ULSADD	34	Redwood	Rutland TS3204

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF427417	ULSASD	40	Meranti	Dorma TS72
WF405307 (A)	LSASD	31	Softwood	Rutland TS9205
RK141-5A	LSASD	42	Steamed Beech	Rutland TS11204
SF013-5A (A)	LSASD	46	Softwood	Dorma TS68 RA
SF013-9 (A)	LSADD	37	Veneer wrapped Spruce	Dorma TS83
SF013-9 (B)	LSASD	44	Veneer wrapped MDF	Dorma TS83
WF419865	LSASD	34	Poplar	Dorma TS92
WF421795	LSASD	35	Poplar	Dorma TS93

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF419820 (A)	ULSASD	35	Redwood	Smith & Locke 8709G
WF419820 (B)	ULSASD	29	Redwood	Smith & Locke 8709G
BMT/FEP/F15027A	LSASD	38	sapele	Rutland TS3204
BMT/FEP/F15034	ULSADD	33	Redwood	Rutland TS3204
WF430460 (A)	ULSADD	35	Redwood	Arrone AR6383
WF433832	ULSADD	23	Redwood	Rutland ETS.18314
BMT/FEP/F14265 (A)	ULSASD	47	Redwood	Arrone AR1500 OHC
BMT/FEP/F14265 (B)	ULSADD	42	Redwood	Arrone AR1500 OHC

19.2.4 Concealed Closers Tested in Strebord 44 Are these all surface mounted.

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF388638	ULSADD	39	PVC Wrapped Redwood	Rutland ITS 11204
WF391843 (A)	LSASD	51	Redwood	Astra 4000
WF402305	LSASD	51	Redwood	Astra 4000
WF414162	LSASD	36	Ash	Arrone AR7383
WF386959 (A)	ULSASD	32	Redwood	Rutland ITS.11204
CFR1810221 (B)	DASD	39	Softwood	Rutland ITS.11204

19.2.5 Floor Springs Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
CFR2003051	DADD	37	Redwood	Arrone AR700 Floor Spring

19.3 Locks & Latches

19.3.1 Single Point Locks

19.3.1.1 Tested in Strebord 35 + / Strebord 35+ Banded Core/ Strebord Superpan

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
WF418407 (B)	LSASD	8* (Glazing) Perimeter failure at 34 min	Streframe E	CISA eGO ANZ
Chilt/RF11172	ULSADD	39	MDF	Eurospec tubular latch
Chilt/RF12061	ULSADD	34	Redwood	Arrone mortice latch
WF426842 (A)	ULSASD		Sapele	Arrone AR8100
WF433833	ULSADD	31	Redwood	Sparka Tubular Steel Mortise Latch

19.3.1.2 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
WF414882	LSADD	32	Softwood	FS1257 Universal din sash lock
RF11121*	ULSADD	38	Redwood	Euro Spec mortice lock/latch
RF11170*	ULSADD	38	Redwood	Simplex mortice & Euro cylinder
RF13132	ULSADD	36	Redwood	Easi-T steel mortice latch and Eurospec Eurocylinder lock
RF13176 (A)	ULSASD	32	Redwood	Easi-T steel mortice latch and Eurospec Eurocylinder lock
BMT/FER/F13263 (A)	ULSASD	41	Redwood	Union/ASSA Abloy steel mortice latch and Eurocylinder lock with thumbturn on exposed face

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
BMT/FER/F13263 (B)	ULSASD	32	MDF	Union/ASSA Abloy steel mortice latch and Eurocylinder lock with thumbturn on exposed face
WF388638	ULSADD	39	PVC Wrapped Redwood	DIN Standard
WF384630	LSADD	43	Finger Jointed Softwood	Laidlaw 13861 & Gem GK700
WF405305 (A)	ULSASD	40	Redwood	ERA Tubular Latch
CFR1811071 (A)	ULSASD	39	Softwood	ERA Tubular Latch
WF411193	LSASD	37	MDF	Salto Ælement Mortice
WF386959 (A)	ULSASD	32	Redwood	Porta Din Sashlock
CFR1810221 (A)	ULSASD	37	Softwood	Eurospec Tubular Mortice
CFR1811071 (B)	ULSASD	38	Softwood	ERA Tubular Latch

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
CFR1812111	ULSADD	36	Softwood	ERA Tubular Latch
CFR1812121	ULSADD	36	Softwood	Altro Heavy Duty Tubular Latch - 65mm Case - 44mm Backset - SS
BMT/FEP/F15050 (A)	LSADD	49	MDF	Gridlock tubular latch
RF01030	ULSADD	32	Redwood	Henderson Hardware tubular latch
RF08125	ULSADD	49	MDF	Eurospec tubular latch
RF98048	ULSADD	42	Redwood	Henderson Hardware tubular latch
RF98137	ULSADD	32	Redwood	Henderson Hardware tubular latch
BMT/FEP/F14072	ULSADD	32	Redwood	Zoo tubular latch
RF00136	ULSADD+OP	37	Redwood	Henderson Hardware tubular latch
Chilt/RF09170	ULSADD	36	Redwood	Eurospec tubular latch

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
Chilt/RF11006	ULSADD	33	Redwood	Eurospec tubular latch
RF99050	ULSADD+OP	36	Redwood	Henderson Hardware tubular latch
Chilt/RF07109	ULSADD	36	Redwood	Eurospec tubular latch
BMT/FEP/F16035	ULSADD	47	Softwood	Zoo 3X910C-BO2O
WARRES 141445	ULSADD	40	Softwood	Tubular
CFR1403122	ULSADD	34	Redwood	Legge H810F
Chilt/RF10011 (A)	ULSASD	51	Redwood	E&S tubular latch
BMT/FEP/F15178 (A)	LSASD	38	Redwood	Yale Snapkeep 39-CH mortice latch
BMT/FEP/F15178 (B)	LSASD	38	Redwood	Yale Snapkeep 39-CH mortice latch
BMT/FEP/F15178 (C)	LSASD	45	MDF	Yale Snapkeep 39-CH mortice latch

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
Chilt/RF11192	ULSADD	34	Redwood	E&S tubular latch
WF405307 (A)	LSASD	31	Softwood	Zoo ZTKA76R
RK141-5A	LSASD	42	Steamed Beech	Euroart DLA7255EP/SSS
SF013-5A (A)	LSASD	46	Softwood	Dorma 281CE
SF013-9 (A)	LSADD	37	Veneer wrapped Spruce	Dorma 381E
SF013-9 (B)	LSASD	44	Veneer wrapped MDF	Dorma 381E
WF421964 (B)	LSASD	33	Redwood	NSP 614 Digital Lock
CFR2003051	DADD	37	Redwood	Altro Easi-T
WF426603	LSADD	29* (Top hanging corner)	Redwood	Henderson tubular mortice

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
WF419820 (A)	ULSASD	35	Redwood	Glutz 1052.7/60 Sashlock
WF419820 (B)	ULSASD	29	Redwood	Glutz 1052.7/60 Sashlock
BMT/FEP/F15034	ULSADD	33	Redwood	Union Sashlock
WF430460 (A)	ULSADD	35	Redwood	Hoppe AR8100
WF346351 (A)	LSASD	34	Softwood	GU Security Automatic M101313
WF433832	ULSADD	23	Redwood	Sparka tubular mortice
BMT/FEP/F14265 (A)	ULSASD	47	Redwood	Arrone 3 lever mortice sashlock
BMT/FEP/F14265 (B)	ULSADD	42	Redwood	Arrone 3 lever mortice sashlock

19.4 Cylinders

19.4.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Cylinder Manuf/ Model
WF416689 (B)	LSASD	46	Ash	ERA Fortress
WF414882	LSADD	32	Softwood	Vier thumbturn ZL30T/30CAS
RF11170*	ULSADD	38	Redwood	Eurocylinder
RF13132	ULSADD	36	Redwood	Eurocylinder
RF13176 (A)	ULSASD	32	Redwood	Eurocylinder
BMT/FER/F13263 (A)	ULSASD	41	Redwood	Eurocylinder
BMT/FER/F13263 (B)	ULSASD	32	MDF	Eurocylinder
WF401039 (A)	LSASD	36	Redwood	Glutz GC9991 Eurocylinder
WF391843 (A)	LSASD	51	Redwood	ERA Fortress

Test Ref	Tested Config	Time of First Failure	Frame Material	Cylinder Manuf/ Model
BMT/FEP/F14233 (A)	LSASD	45	Sapele	Winkhaus 30/30
WF402305	LSASD	51	Redwood	Eurocylinder
WF411193	LSASD	37	MDF	Salto thumbturn
WF414162	LSASD	36	Ash	ERA Fortress
WF426842 (B)	ULSADD	16	Redwood	Hoppe AR780
BMT/FEP/F14168	LSASD	48	Sapele	Winkhaus XR6
CFR1403122	ULSADD	34	Redwood	Eurocylinder
SF013-5A (A)	LSASD	46	Softwood	Dorma 600s
SF013-9 (A)	LSADD	37	Veneer wrapped Spruce	Dorma PC83
SF013-9 (B)	LSASD	44	Veneer wrapped MDF	Dorma PC83

Test Ref	Tested Config	Time of First Failure	Frame Material	Cylinder Manuf/ Model
WF421795	LSASD	35	Poplar	ERA Fortress
WF421964 (B)	LSASD	33	Redwood	NSP SMF614*
WF419820 (A)	ULSASD	35	Redwood	Glutz GUK002
WF419820 (B)	ULSASD	29	Redwood	Glutz GUK002
BMT/FEP/F15027A	LSASD	38	sapele	Eurospec cylinder
WF430460 (A)	ULSADD	35	Redwood	Hoppe AR780
WF346351 (A)	LSASD	34	Softwood	Assa Abloy KMT3030-NP

19.4.2 Tested in Similarly Constructed Substrates

Test Ref	Tested Config	Time of First Failure	Frame Material	Cylinder Manuf/ Model
WF419361 (A)	LSASD	38	Softwood	Frelan JL70-OPDPB

19.5 Bolts

19.5.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Bolt Manuf/ Model
WF414882	LSADD	32	Softwood	Zoo ZAS03RSS
BMT/FEP/F15050 (A)	LSADD	49	MDF	Zoo ZAS03RSS
CFR1403122	ULSADD	34	Redwood	Cambridge Fire Research
SF013-9 (A)	LSADD	37	Veneer wrapped Spruce	Dortez AFB 6” L
BMT/FEP/F15034	ULSADD	33	Redwood	Zoo ZAS1355 & ZAS03RSS
WF430460 (A)	ULSADD	35	Redwood	Hoppe Arrone AR326B

19.5.2 Tested in Solid Timber 44mmm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WF414781	ULSADD	33	Redwood	Zoo ZAS03RSS
BMT/FEP/PF16012	ULSADD	42	Redwood	Hafele 900.17.984
WF399749	ULSADD	31	Sapele	Hafele 900.17.984
WF399751	ULSADD	31	Redwood	Hafele 900.17.984
WF369451	ULSADD	35	Redwood	Smith and Locke 5020J

19.6 Door Viewers

19.6.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Viewer Manuf/ Model
WF416689 (B)	ULSASD	46	Ash	D&E Architectural 3850 Ultrascope
WF401039 (A)	LSASD	36	Redwood	Glutz GY3504
WF402305	LSASD	51	Redwood	Norseal DV160/C
WF411193	LSASD	37	MDF	2no UAP Nanocoast CVPLSSS 180° viewer
WF414162	LSASD	36	Ash	Jedo JV942
WF386959 (A)	ULSASD	32	Redwood	Sealed Tight Solutions STS4008
WF421795	LSASD	35	Poplar	D&E SWLAF EI30
WF421964 (B)	LSASD	33	Redwood	UAP CVPLCH

19.7 Letterplates

19.7.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Letterplate Manuf/ Model	Hardware Intumescent
WF414882	LSADD	32	Softwood	ERA Fab & Fix 3C018 with security shield 3F005	Fire and Acoustic Seals Ltd Spartan FASGP1013 100mm(l) x 40mm(w) x 1.3mm(t)
WF414162	LSASD	36	Ash	Royde & Tucker LP08	Royde & Tucker LP008 intumescent kit
WF419865	LSASD	34	Poplar	Sealed Tight Solutions Ltd STS 4001	Sealed Tight Solutions Ltd intumescent liner 30mm(w) x 2.3mm(t)
WF421795	LSASD	35	Poplar	Royde & Tucker LP08 with TS008 security cowl	Royde & Tucker LP008 intumescent kit

19.7.2 Tested in Solid Timber 44m Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model	Hardware Intumescent
WF428987 (A)	LSASD	31	Sapele	Lorient Polyproducts Ltd RJ008	As supplied by Lorient

19.8 Pivots & Floor Springs

19.8.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Item Type	Item Manuf/ Model
CFR1810221 (B)	DASD	39	Softwood	Pivot kit	Rutland PS.190
CFR1810221 (B)	DASD	39	Softwood	Floor spring	Rutland PS.260
CFR2003051	DADD	37	Redwood	Pivot kit	Hoppe Arrone AR700
CFR2003051	DADD	37	Redwood	Floor spring	Hoppe Arrone AR700

19.9 Cableways

19.9.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Cableway Location / Method	Dimensions	Hardware Intumescent
WF384630 Rev A	LSADD	43	Streframe® E	Drilled through the left hand leaf horizontally	Ø10mm borehole, 1154mm from the bottom of the leaf across the width at mid-leaf thickness.	Sealed Tight Solutions Ltd ST CablePro graphite 10mm x 1mm thick
WF384630 Rev A	LSADD	43	Streframe® E	Routed out centrally in the left hand leaf edge around the bottom half perimeter	10mm(w) x 42mm(d) channel capped with a 10mm(w) x 30mm(d) hardwood insert installed with PU adhesive	Sealed Tight Solutions Ltd 10mm x 1mm thick graphite
WF386959 (A)	LSASD	32	Redwood	Drilled through the leaf horizontally	Ø11mm borehole, 1150mm from the bottom of the leaf across the width at mid-leaf thickness.	Sealed Tight Solutions Ltd ST CablePro graphite 10mm x 1mm thick

19.10 Cable Loops

19.10.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Cable Loop Manuf / Model	Dimensions	Hardware Intumescent
WF386959 (A)	LSASD	32	Redwood	Abloy EA280	320mm(h) x 25mm(w) footprint including a Ø12mm spring assembly	Sealed Tight Solutions Ltd 2mm thick STS 302 liner

19.11 Security Chains

19.11.1 Tested in Similarly Constructed 44mm Substrates

Test Ref	Tested Config	Time of First Failure	Frame Material	Type	Manuf/Model	Dimensions
WF419361 (A)	LSASD	38	Softwood	Concealed Chain	Frelan J3004SN	Body: 91.5mm(l) x 16mm(t) Latch: 11mm x 6mm Forend: 56.5mm(h) x 25mm(w) x 2mm(t)