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Title:

Field of Application for:

Falcon Stredor 44 Doorsets

For **30** Minutes Fire Resistance

Report No:

BMT/CNA/F15159 Revision F

Issue Date:

1st July 2022

Valid Until:

1st July 2027

Job Reference:

WF516032

Prepared for:

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The version/revision stated on the front of this Field of Application supersedes all previous versions/revisions and must be used to manufacture doorsets from the stated validity date on this front cover. Previous revisions of the Field of Application cannot be used once an updated Field of Application has been issued under a new revision.

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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: Part 22: 1987.

This field of application has been written using appropriate test evidence generated at UKAS accredited laboratories[1], 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 with specific evidence for hardware listed in Appendix B.

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 fire performance of construction products based on fire test evidence 2021 (Industry Standard Procedure). The aim of the PFPF guidelines is to give confidence to end-users that assessments that exist in the UK are of a satisfactory standard to be used for building control and other purposes.

The PFPF guidelines are produced by the UK Fire Test Study Group (FTSG) an association of the major fire testing laboratories in the UK and are published by the PFPF, the representative body for the passive fire protection industry in the UK.

CERTIFIRE and/or assessment 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.

[1] Test evidence from overseas laboratories has also been considered as supporting evidence for the designs in this assessment report. The test evidence is from a laboratory that has been accredited by a national accreditation body that is a signatory of the International Laboratories Accreditation Co-operation (ILAC).

2 Proposal

It is proposed to consider the fire resistance performance of the specified doorset designs based on 44mm thick Stredor® door leaves fitted into timber frames for 30 minutes fire resistance integrity, if the doorset designs were to be tested to the requirements of BS 476: Part 22: 1987, *Fire tests on building materials and structures – Part 22: Method for determination of the fire resistance of non-load bearing 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 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.

3 Test Data

The evidence has been generated to BS 476: Part 22: 1987 and EN 1634-1. The EN 1634-1 test standard 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 EN 1634-1 tests have been undertaken at a number of British and European laboratories.

The same time temperature curve is used to control the temperature within the furnace for both test methods (the heating curve given within ISO 834-1). However, the plate thermocouple used to record the temperature within the furnace for the EN test method, requires a higher thermal input 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. This results in more onerous test conditions for door assemblies tested to the 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 fire resistance performance of the Stredor® 44 doorset design can be assessed to provide at least 30 minutes fire resistance integrity performance, if the doorset design, constructed in accordance with the specifications documented in this field of application, were to be tested in accordance with BS 476: Part 22: 1987.

The test evidence tabulated briefly below and then a summary for each test has been generated to support the fire resistance performance of the door designs that are the subject of this field of application.

Note:

Dimensions are in mm unless otherwise stated.

Abbreviations: (h) = height; (w) = width; (d) = depth; (t) = thickness.

Latches fitted but disengaged for the test, are reported as ‘unlatched’.

3.1 Primary tests for timber envelopes

The following tests have been used to establish the the maximum leaf size envelopes for the different configurations when used in conjunction with a timber based timber frame given in section 4 with other relevant details on hardware and glazing etc are used as appropriate.

3.1.1 Summary of Test Report FEP/F15066

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity and insulation performance and supports the inclusion of: double leaf doorsets in timber frames with locksets, flushbolts and glazed apertures

Date of Test:	26th May 2015
Identification of Test Body:	BM TRADA UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched, Double leaf single acting doorset (ULSADD)
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Sampling information:	Prototype specimen, no sampling information available

Summary of Test Specimen:	LEAF:
	Overall Size (each leaf): 2448mm(h) x 1000(w) x 44mm(t)
	Door Core:
	• Falcon Panel Products Stredor 44mm (F7 mill)
	  ○ (Inner Core Layer) – 2.1mm poplar ply (510kg/m³)
	  ○ (Outer Core Layers) – 19.5mm pine lamels (480kg/m³)
	  ○ (Surface Core Layer) – 1.4mm poplar ply (510kg/m³)
	  ○ Facing: 0.4mm beech veneer (600kg/m³)
	Lipping (both leaves): Sapele (640kg/m³), 6mm thick to all four edges
	
	FRAME:
	Head & Jambs: European Redwood (510kg/m³), 70mm(d) x 32mm(w), with 25mm(w) x 14mm(d) planted stop.
	Frame Fixing: 4No. Ø8 x 100 steel woodscrews
	Threshold: Non combustible
	
	INTUMESCENT:
	Frame Reveal: 1No. 15 x 4 Pyroplex brush box seal ref: 8712 fitted 16mm from the opening face in the frame reveal
	Leaf Edge: 1No. 10 x 4 Pyroplex brush box seal ref: 8512 fitted 8mm from the opening face in the right leaf edge and 1 No. 10 x 4 Pyroplex rigid box seal ref: 8500 fitted 28mm from the opening face in the right leaf edge

Summary of Test Specimen continued:	GLAZING: Glass: Pilkington Pyroshield 7mm thick Overall Size: 144x1494mm Aperture Size: 150x1500mm Sight Size: 115x1460mm Beading: Sapele (640kg/m³), 18mm(w) x 15mm(h) with 10°chamfer and a 6x5mm bolection Bead Fixing: 60mm long steel pins at 10°, 150mm centres & 50mm from corners. GLAZING SYSTEM: Glazing Perimeter: 10 x 2 ISL Therm-A-Glaze fitted between the glass and bead on both faces HARDWARE: Hinges: 4no Hafele SUS – 304 bearing buitt type hinges Closer: Arrone AR1500 Lock/Latch: ERA Steel mortice lock re:ERA 226 Lock/Latch Size: • Forend: 160x25mm • Keep: 178x30mm • Lock case: 110 x 75 x 15mm Aluminimum type lever handle Lock/Latch Status: Engaged for test (auto firing multi-point latches but with the central deadbolt withdrawn) Hoppe flush bolts ref: AR236, dimensions 203 x 22 (body size) and 490 x 20 (keep size) fitted at head and threshold of left leaf HARDWARE PROTECTION: Under Hinge: 1mm Interdens fitted under hinge blade on frame and leaf Lock/Latch: • Under forend plate: 2 (t) Norsound Ltd NOR 910 graphite • Under keep: 2 (t) Norsound Ltd NOR 910 graphite • Encasing flush bolt body: 2 (t) Norsound Ltd NOR 910 graphite fitted lining the cut out for the flush bolt Under flush bolt keep: 2(t) Norsound Ltd NOR 910 graphite under keep in the frame head
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: 34 minutes Insulation: 34 minutes

3.1.2 Summary of Test Report FEP/F16031

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity performance and supports the inclusion of:

Date of Test:	22nd January 2016
Identification of Test Body:	Exova Warringtonfire
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched double leaf single acting doorset (ULSADD)
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Sampling Information:	Prototype specimen, no sampling information available
Summary of Test Specimen:	LEAF: Overall Size (each leaf): 2447mm(h) x 1000(w) x 44mm(t) Door Core: • Falcon Panel Products Stredor 44mm (F7 mill) ○ (Inner Core Layer) – 2.1mm poplar ply (510kg/m³) ○ (Outer Core Layers) – 19.5mm pine lamels (480kg/m³) ○ (Surface Core Layer) – 1.4mm poplar ply (510kg/m³) ○ Facing: 0.6mm beech veneer (600kg/m³) Lipping (both leaves): Sapele (640kg/m³), 6mm thick to all four edges FRAME: Head & Jambs: European Redwood (510kg/m³), 100mm(d) x 32mm(w), with 32mm(w) x 12mm(d) planted stop. Frame Fixing: 4No. Ø8 x 100 steel woodscrews Threshold: Non-combustible Architrave: MDF fitted on the exposed face 45 (w) x 18 (t) 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 LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face

Summary of Test Specimen continued:	<u>GLAZING (both leaves):</u> Glass: Pyroguard clear 7mm thick Overall Size: 1595 (h) x 395 (w) Aperture Size: 1600 (h) x 400 (w) Sight Size: 1555 (h) x 360 (w) Beading: Sapele (640kg/m³), 22mm(w) x 22mm(h) with 20°chamfer and a 7x7mm bolection Bead Fixing: 40mm long steel pins at 30mm corners and 130mm centres on the vertical edges and 30-40mm corners and 130mm centres on horizontal edges <u>GLAZING SYSTEM:</u> Glazing Perimeter: Lorient Polyproducts FF1 (Flexible Figure 1) glazing system fitted between the glass and the bead on both faces <u>HARDWARE:</u> Hinges: 3no Hafele bearing butt type hinges Ref: SUS-304 Closer: Arrone AR1500 overhead closer Lock/Latch: Hafele mortice latch Ref: 911.23.465 Lock/Latch Size: • Forend: 235x24mm • Keep: 170 x 25mm Hafele Aluminium type lever handle 902.21.010 Shoot bolts: Hafele 900.17.984 150 x 22mm footprint <u>HARDWARE PROTECTION:</u> Under Hinge blades: 1mm thick Lorient Polyproducts MAP Lock/Latch: • Under latch forend plate: 1mm thick Lorient Polyproducts MAP • Under latch keep: 1mm thick Lorient Polyproducts MAP • Encasing latch body: 1mm thick Lorient Polyproducts MAP • Around flush bolt body: 1mm thick Lorient Polyproducts MAP • Under shoot bolt keep: 1mm thick Lorient Polyproducts MAP
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: 40 minutes Insulation not evaluated in accordance with Section 8.6.1 of BS 476: Part 22: 1987

3.1.3 Summary of Test Report WF 426419

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity and insulation performance and supports the inclusion of: Sealed Tight Solutions Limited (STS) seals, STS hardware protection, STS glazing system, face-fixed mouldings, 15mm Pyrostop glass and aluminium threshold.

Date of Test:	27th February 2020
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Two latched, single-acting, single-leaf doorsets - LSASD
Tested Orientation:	Doorset A: Stredor 44mm Type A door blank hung opening in towards heating condition Doorset B: Stredor 44mm Type B door blank hung opening in towards heating condition
Sampling Information:	The doorsets were sampled by a representative of Warringtonfire on 11/02/20 and 12/02/20 under contract reference FM424838
Summary of Test Specimen:	LEAF: Overall Size (both leaves): 2399mm(h) x 1047(w) x 44mm(t) Doorset A Core: • Falcon Panel Products Stredor 44mm (F14 mill) ○ (Inner Core Layer) – 4mm poplar ply (510kg/m³) ○ (Outer Core Layers) – 15mm pine lamels (480kg/m³) ○ (Surface Core Layer) – 4.6mm poplar ply (510kg/m³) ○ Facing: 0.4mm EV (600kg/m³) Doorset B Core: • Falcon Panel Products Stredor 44mm (F7 mill) ○ (Inner Core Layer) – 2.1mm poplar ply (510kg/m³) ○ (Outer Core Layers) – 19.5mm pine lamels (480kg/m³) ○ (Surface Core Layer) – 1.4mm poplar ply (510kg/m³) ○ Facing: 0.4mm beech veneer (600kg/m³)

Summary of Test Specimen continued:	Decorative Moulding (both leaves): 70x19mm European redwood, affixed with 18g x 30mm pins Lipping (both leaves): Sapele (640kg/m³), 8mm thick to all four edges <u>FRAME:</u> Head & Jambs: European Redwood (510kg/m³), 69.5mm(d) x 44mm(w), with 42mm(w) x 15mm(d) integral stop. Frame Fixing: 4No. Ø5 x 80 steel woodscrews, 500-600mm centres Threshold: Sealed Tight Solutions Limited STH004 aluminium threshold. 1111mm(w) x 15mm(h) x 47mm(d) <u>INTUMESCENT:</u> Frame Reveal: 2no 10x4mm Sealed Tight Solutions Limited ST104FO 10mm apart, 7mm from the opening face. <u>GLAZING:</u> Glass: Pilkington Pyrostop 15mm thick Overall Size: 394x1534mm Aperture Size: 400x1540mm Sight Size: 358x1498mm Beading: Sapele (640kg/m³), 19mm(w) x 21mm(h) with 15°chamfer and a 6x6mm bolection Bead Fixing: 16g x 50mm long steel pins at 25-35°, 150mm centres & 50mm from corners. <u>GLAZING SYSTEM:</u> Glazing Perimeter: 9x3mm Sealed Tight Solutions Limited STS ST105-3 closed-cell foam tape Glazing Liner: 15x2mm Sealed Tight Solutions Limited STS302 (cut in half) <u>SMOKE/ACOUSTIC SEALS:</u> Head and Jambs: 1no 10x9mm Sealed Tight Solutions Limited ST1009 self-adhered to the corner of the stop and frame reveal. Leaf bottom edge: 12x20mm Sealed Tight Solutions Limited ST422 drop seal centrally rebated into the bottom edge of the leaf.

Summary of Test Specimen continued:	HARDWARE: Hinges: 4no Eurospec HIN 1433/13 Closer: Astra 4003 Lock/Latch: ERA SureFire Heritage 2 hook multi-point door lock with 75mm ERA Fortress 3* thumbturn cylinder* Cylinder Pull: ERA Fab&Fix Heritage Euro Cylinder Pull* *NOTE: Cylinder and pull fitted in alternate orientations for Doorset A and B Lock/Latch Size: • Forend: 1634x20mm • Top/bottom keep: 151x24mm • Top/bottom case: 150x42mm • Centre keep: 170x24mm • Centre case: 213x61mm Lock/Latch Status: Engaged for test (auto firing multi-point latches but with the central deadbolt withdrawn) Eye viewer: Sealed Tight Solutions Limited 4008 Barrel: Ø14mm, Footprint: Ø16mm fitted 849mm from the leaf head HARDWARE PROTECTION: Under Hinge: 1mm Sealed Tight Solutions Limited raw graphite Lock/Latch: • Forend plate: None • Top/bottom keep: Sealed Tight Solutions Limited 1mm graphite based intumescent • Top/bottom case: Sealed Tight Solutions Limited 1mm graphite based intumescent • Centre keep: Sealed Tight Solutions Limited 1mm graphite based intumescent • Centre case: Sealed Tight Solutions Limited 1mm graphite based intumescent Eye viewer: Sealed Tight Solutions Limited 1mm graphite based intumescent
Test Standard:	BS EN 1634-1:2014 + A1: 2018
Performance	Doorset A: Integrity 35, Insulation 35 Doorset B: Integrity 41, Insulation 38

3.1.4 Summary of Test Report WF 416690 – Issue 2

The referenced test report, the essential details of which are summarised below, is the secondary data for supporting the inclusion of ERA SureFire Classic multipoint locking system, various items of hardware and STS hardware protection into the Stredor 44 EI30 FED design. The data also provides evidence for the restraining and supporting hardware exposed to test conditions in both directions:

Date of Test:	8th August 2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Two latched, single-acting, single-leaf doorsets – LSASD
Tested Orientation:	Doorset A hung opening out away from heating condition Doorset B hung opening in towards heating condition
Sampling information:	All of the components apart from the 3 point latch on doorset B were sampled by a representative of Warringtonfire on 31/07/2019 under contract reference FM416656
Summary of Test Specimen:	Both test specimens (Door A and Door B) had the same specification as follows: LEAF: Overall Size (both leaves): 2153mm(h) x 933(w) x 44mm(t) Core: • Falcon Panel Products Stredor 44mm (F14 mill) ○ (Inner Core Layer) – 4mm poplar ply (510kg/m³) ○ (Outer Core Layers) – 15mm pine lamels (480kg/m³) ○ (Surface Core Layer) – 4.6mm poplar ply (510kg/m³) ○ Facing: 0.4mm EV (600kg/m³) Lipping: Sapele (640kg/m³), 8mm thick to all four edges FRAME: Head & Jambs: Sapele (621kg/m³), 80mm(d) x 44mm(w), with 33mm(w) x 12mm(d) integral stop. Frame Fixing: 4No. Ø10 x 100 steel woodscrews, 400-500mm centres Threshold: Non-combustible INTUMESCENT: Frame Reveal: 2no 10x4mm Pyroplex 8500 separated by 5mm either side of the centre line of the frame reveal

Summary of Test Specimen continued:	GLAZING: Glass: Fireglass Pyrobelite 9EG, 11mm thick Overall Size: • Top: 984x224mm • Bottom: 632x224mm Aperture Size: • Top: 990x230mm • Bottom: 638x230mm Sight Size: • Top: 960x205mm • Bottom: 610x205mm Beading: Sapele (685kg/m³), 19mm(w) x 21mm(h) with 15°chamfer and a 13mm(w) x 6mm(h) rebate forming a 6x6mm bolection return Bead Fixing: 1.6g x 50mm long steel pins at 25-35°, 150mm centres & 45mm from corners. GLAZING SYSTEM: Glazing Perimeter: 10x4mm Sealmaster Black Glazing Tape (BGT) SMOKE/ACOUSTIC SEALS: Head and Jambs: 1no 11x10mm Norseal NOR710 self-adhered to the corner of the stop and frame reveal. Leaf bottom edge: 12x20mm Norseal NOR810S drop seal centrally rebated into the bottom edge of the leaf. HARDWARE: Hinges: 4no. Zoo ZHSS243RS butt hinge Closer: Hoppe AR1500 Lock/Latch: ERA SureFire Classic 2 hook multi-point door lock with 70mm ERA Fortress 3* thumbturn cylinder Lock/Latch Size: • Forend: 1634x20mm • Top/bottom keep: 136x24mm • Top/bottom case: 150x41mm • Centre keep: 170x24mm • Centre case: 214x60mm Lock/Latch Status: Engaged for test (auto firing multi-point latches but with the central deadbolt withdrawn) Handle: ERA 1X000 lever type handle. Eye viewer: ERA Fab&Fix Barrel: Ø12mm, Footprint: Ø16mm fitted 1500mm from the bottom of the leaf

Summary of Test Specimen continued:	Letterplate: ERA Fab&Fix Numail door letterplate with security cowl fitted 850mm from the bottom of the leaf. Security Chain: ERA PVCu/Timber Door Chain 791-65 fitted 400mm down from the top of the leaf Numerals: ERA Fab&Fix Door Numerals FFNUM8BC Knocker: ERA Ingot Door Knocker – 4A550 <u>HARDWARE PROTECTION:</u> Under Hinge: 1mm thick MAP Lock/Latch: • Forend plate: Sealed Tight Solutions Limited 1mm graphite based intumescent • Top/bottom keep: Sealed Tight Solutions Limited 1mm graphite based intumescent • Top/bottom case: Sealed Tight Solutions Limited 1mm graphite based intumescent • Centre keep: Sealed Tight Solutions Limited 1mm graphite based intumescent • Centre case: Sealed Tight Solutions Limited 1mm graphite based intumescent Eye viewer: 0.5mm graphite wrap supplied with viewer Letterplate: 40x2mm Sealed tight solutions Limited graphite based intumescent, wrapped twice around letterplate channel
Test Standard:	BS EN 1634-1:2014+A1:2018
Performance:	Doorset A: 34minutes integrity, 33minutes insulation Doorset B: 50minutes integrity, 29 minutes insulation

3.1.5 Summary of Test Report EFR-18-H-003671

The referenced test report, the essential details of which are summarised below, is the primary data for supporting the inclusion of ERA SureFire Classic multipoint locking mechanism, STS seals and STS hardware protection into the Stredor 44 design. The data also provides evidence for the restraining and supporting hardware exposed to test conditions in both directions:

Date of Test:	15th November 2018
Identification of Test Body:	Efectis France – COFRAC No. 1-1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Two latched, single-acting, single-leaf doorsets – LSASD
Tested Orientation:	Doorset A: opening in towards heating condition Doorset B: opening out away from heating condition
Sampling Information:	Sampling conducted by a representative of Exova on 01/11/2018, sampling report reference PS 18 1001
Summary of Test Specimen:	Both test specimens (Door A and Door B) had the same specification as follows: LEAF: Overall Size (both leaves): 2402mm(h) x 1047(w) x 44mm(t) Core (Both Doorsets): • Falcon Panel Products Stredor 44mm (F7 mill) ○ (Inner Core Layer) – 2.1mm poplar ply (510kg/m³) ○ (Outer Core Layers) – 19.5mm pine lamels (480kg/m³) ○ (Surface Core Layer) – 1.4mm poplar ply (510kg/m³) ○ Facing: 0.4mm beech veneer (600kg/m³) Lipping (both leaves): Sapele (640kg/m³), 8mm thick to all four edges FRAME: Head & Jambs: European Redwood (510kg/m³), 90mm(d) x 44mm(w), with 43mm(w) x 15mm(d) integral stop. Frame Fixing: 4No. Ø5 x 80 steel woodscrews, 500-600mm centres Threshold: Non-Combustible INTUMESCENT: Frame Reveal: 2no 10x4mm Sealed Tight Solutions Limited ST104FO 10mm apart, 7mm from the opening face.

Summary of Test Specimen continued:	GLAZING: Glass: Pyrobelite 9EG 12mm thick Overall Size: 394x1534mm Aperture Size: 400x1540mm Sight Size: 370x1410mm Beading: Sapele (640kg/m³), 19.5mm(w) x 23mm(h) with a 15°chamfer and a 8x6mm bolection Bead Fixing: Ø3.5 x 50mm long steel pins at 25-35°, 150mm centres & 50mm from corners. GLAZING SYSTEM: Glazing Perimeter: 10x3mm Sealed Tight Solutions Limited STS ST105-3 GT closed-cell foam tape SMOKE/ACOUSTIC SEALS: Head and Jambs: 1no 10x9mm Sealed Tight Solutions Limited ST1009 self-adhered to the corner of the stop and frame reveal. Leaf bottom edge: 12x20mm Sealed Tight Solutions Limited ST422 drop seal centrally rebated into the bottom edge of the leaf. HARDWARE: Hinges: 3no Royde & Tucker H207 Closer: Astra 4000 jamb-mounted concealed closer Lock/Latch: ERA SureFire Classic 2 hook multi-point door lock with 75mm ERA Fortress 3* thumbturn cylinder* Lock/Latch Size: • Forend: 1634x20mm • Top/bottom keep: 151x24mm • Top/bottom case: 150x42mm • Centre keep: 170x24mm • Centre case: 213x61mm Lock/Latch Status: Engaged for test (auto firing multi-point latches but with the central deadbolt withdrawn) Handle: Stanza ZPZ090SC Eye viewer: Sealed Tight Solutions Limited 4008 Barrel: Ø14mm, Footprint: Ø16mm fitted 1540mm from the bottom of the leaf

Summary of Test Specimen continued:	HARDWARE PROTECTION: Under Hinge: 1mm Sealed Tight Solutions Limited raw graphite Lock/Latch: • Forend plate: Sealed Tight Solutions Limited 1mm graphite based intumescent, interrupted where necessary to allow for free movement of mechanical parts. • Top/bottom keep: Sealed Tight Solutions Limited 1mm graphite based intumescent • Top/bottom case: Sealed Tight Solutions Limited 1mm graphite based intumescent • Centre keep: Sealed Tight Solutions Limited 1mm graphite based intumescent • Centre case: Sealed Tight Solutions Limited 1mm graphite based intumescent Eye viewer: Sealed Tight Solutions Limited 1mm graphite based intumescent Closer forend and body: Sealed Tight Solutions Limited 1mm graphite based intumescent
Test Standard:	EN 1634-1:2014 + A1: 2018
Performance	Doorset A: 36 minutes integrity, 21 minutes insulation Doorset B: 36 minutes integrity, 32 minutes insulation

3.1.6 Summary of Test Report WF 385685

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity and insulation performance and supports the inclusion of: double leaf (and by assessment) single leaf doorsets with groove pattern to both faces and 8mm MDF faces in timber frames

Date of Test:	13th July 2017
Identification of Test Body:	Exova Warringtonfire
Sponsor:	Sealed Tight Solutions Ltd
Tested Product:	Unlatched single acting double leaf doorset (ULSADD)
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Sampling Information:	The door blanks were sampled by a representative of Warringtonfire on 1st December 2016
Summary of Test Specimen:	LEAF: Overall Size (each leaf): 2400mm(h) x 950(w) x 44mm(t) reduced to 38mm (t) at the groove locations Door Core: • Falcon Panel Products Stredor 44mm (F14 mill) ○ (Inner Core Layer) – 2.1mm poplar ply (450-550kg/m³) ○ (Outer Core Layers) – 13mm spruce lamels (450-550kg/m³) ○ (Surface Core Layer) – 8mm MDF (700kg/m³) reduced to 5mm at groove locations (decorative grooves – 10 (w) x 3 (t)) Lipping (both leaves): Sapele (640kg/m³), 6mm thick to all four edges FRAME: Head & Jambs: European Redwood (510kg/m³), 90mm(d) x 32mm(w), with 25mm(w) x 12mm(d) planted stop. Frame Fixing: 4No. Ø5.5 x 100 steel woodscrews with plastic packers Threshold: Non combustible European redwood architrave 55 (w) x 15 (t) INTUMESCENT: Frame Reveal: 1No. 15 x 4 Sealed Tight Solutions ref: STS 154FO fitted 14mm from the opening face in the frame reveal Leaf Edge: 2 No. 10 x 4 Sealed Tight Solutions re: STS 104FO spaced 10mm apart and fitted 7.5mm from the opening face in the right leaf edge

Summary of Test Specimen continued:	SMOKE/ACOUSTIC Sealed Tight Solutions ST1009 fitted to the upstand of the stop HARDWARE: Hinges: 3no Royde and Tucker Hi-Load H101 lift off type hinge Closer: Arrone AR1500 overhead type closer Lock/Latch: Zoo hardware steel mortice latch Lock/Latch Size: • Forend: 235 x 22mm • Keep: 180 x 24mm Zoo stainless steel type lever handle HARDWARE PROTECTION: Under Hinge blades: 1 (t) Sealed Tight Solutions raw graphite Lock/Latch: • Encasing latch body: 1 (t) Sealed Tight Solutions raw graphite • Under forend plate: 1 (t) Sealed Tight Solutions raw graphite • Under keep: 1 (t) Sealed Tight Solutions raw graphite
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: 40 minutes Insulation: 40 minutes

3.1.7 Summary of Test Report WF 399749

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity performance and supports the inclusion of: double leaf (and by assessment) single leaf doorsets with glazing and plywood faces in timber frames

Date of Test:	22nd May 2018
Identification of Test Body:	Warringtonfire
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched single acting double leaf doorset (ULSADD)
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Sampling Information:	Prototype specimen, no sampling information available
Summary of Test Specimen:	LEAF: Overall Size (each leaf): 2445mm(h) x 1000(w) x 42mm(t) Door Core: • Falcon Panel Products Stredor 44mm (F14 mill) ○ (Inner Core Layer) – 2.1mm poplar ply (450-550kg/m³) ○ (Outer Core Layers) – 19mm spruce lamels (450-550kg/m³) ○ (Surface Core Layer) – 1.6mm poplar ply (510kg/m³) ○ (outer face) – 0.6mm beech plywood **NB**: The test specimen was constructed under thickness for the testing but has been deemed appropriate to support double leaf plywood face door designs from F14 mill Lipping (both leaves): Sapele (640kg/m³), 6mm thick to all four edges FRAME: Head & Jambs: European Redwood (510kg/m³), 97mm(d) x 32mm(w), with 32mm(w) x 12mm(d) planted stop. Frame Fixing: 4No. Ø8 x 100 steel woodscrews with plastic packers Threshold: Non combustible European redwood architrave 45 (w) x 18 (t)

Summary of Test Specimen continued:	<u>INTUMESCENT:</u> Frame Reveal (head and jambs): 1No. 15 x 4 Lorient Polyproducts Ltd LP1504 Type 617 fitted 13mm from the opening face in the frame reveal Leaf Edge: 2 No. 10 x 4 Lorient Polyproducts Ltd LP1004TS Type 617 fitted 10mm apart, 6mm from the opening face in the meeting edge of one leaf only <u>GLAZING:</u> Glass: Pyroguard clear 30/0 7.2mm thick Aperture Size: 395mm (w) x 1595mm (h) Beading: Sapele (640kg/m³), 21mm(w) x 21mm(h) with a 18°chamfer and a 7x7mm bolection Bead Fixing: 40mm long steel pins at 25-35°, 130mm centres & 30mm from corners. <u>GLAZING SYSTEM:</u> Glazing Perimeter: Lorient Polyproducts Ltd FF1 (Flexible Figure 1) glazing system 13 x 3.5 fitted between glass and bead on both faces <u>HARDWARE:</u> Hinges: 3no Cooke Brothers concleaed bearing butt hinges 102mm x 37mm blade size Closer: Rutland TS3204 overhead closer Lock/Latch: Eurospec tubular steel mortice latch Lock/Latch Size: • Forend: 58 x 25mm • Keep: 65 x 28mm Easyclick Apollo lever on rose (aluminimum alloy) Hafele shoot bolts 205 (h) x 20 (w) <u>HARDWARE PROTECTION:</u> Under Hinge blades: 1 (t) Sealed Tight Solutions raw graphite Lock/Latch: • Encasing latch body: 1 (t) Sealed Tight Solutions raw graphite • Under forend plate: 1 (t) Sealed Tight Solutions raw graphite • Under keep: 1 (t) Sealed Tight Solutions raw graphite
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: 31 minutes Insulation: Not evaluated

3.1.8 Summary of Test Report WF 414781

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity performance and supports the inclusion of: double leaf doorsets in timber frames with locksets, flushbolts and glazed apertures and concleaed closers

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)
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Sampling Information:	Sampling of the test specimens was carried out by a representative of Warringtonfire under report number FM414654
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)

Summary of Test Specimen continued:	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 Polyproduct 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) Loreint 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

3.1.9 Summary of Test Report WF 432578

The referenced test report, the essential details of which are summarised below, is the primary data for the Stredor 44 design for 30 minute integrity and insulation performance and supports the inclusion of: single leaf doorsets in timber frames with various items of hardware (typical front door), bi-directional performance and fanlights.

Date of Test:	2nd September 2020
Identification of Test Body:	BM TRADA UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	2No. Latched single acting single leaf doorsets (LSASD)
Tested Orientation:	Doorset A oriented to open towards the furnance conditions and Doorset B oriented to open away from furnace conditions
Sampling information:	Sampling was carried out remotely by a representative of BM TRADA. Process completed on 28th August 2020. Sampling contract reference SC20148
Summary of Test Specimen:	Both test specimens (Door A and Door B) had the same specification as follows: LEAF: Overall Size (each doorset): 2790mm(h) x 990(w) incorporating leaves 2040mm(h) x 926mm(w) x 44mm(t) Door Core: • Falcon Panel Products Stredor 44mm (F14 mill) ○ (Inner Core Layer) – 1.8mm poplar ply (510kg/m³) ○ (Outer Core Layers) – 16mm pine lamels (480kg/m³) ○ (Surface Core Layer) – 4.6mm poplar ply (510kg/m³) ○ Facing: 0.4mm beech veneer (600kg/m³) Lipping (both leaves): Sapele (640kg/m³), 8mm thick to all four edges applied by edge bander using PUR adhesive 70mm (w) x 19mm (t) beads forming 620mm (h) x 200mm (w) panels (glued and pinned into position) FRAME: Head & Jambs: European Redwood (529kg/m³), 80mm(d) x 44mm(w), with 33mm(w) x 15mm(d) rebated stop. Frame Fixing: 4No. Ø5 x 100 steel woodscrews Threshold: Stormguard – Low Height Macclex – thermally broken

Summary of Test Specimen continued:	<u>INTUMESCENT:</u> Frame Reveal: 2No. 10 x 4 Lorient Polyproducts Ltd LP1004 separated by 5mm either side of the centre line of the leaf, to the head and jambs <u>SMOKE SEALING:</u> Schlegel Aquamac 21 foam seal 9.1mm wide x 10.7mm thick with 3.4mm x 5.5mm kerf Sealed Tight Solutions Ltd ST422GT 14mm (w) x 35mm (d) fitted within the bottom of the leaf <u>HARDWARE:</u> Hinges: 3no Eurospec butt hinges (HIN 1433/13) Closer: Rutland TS9205 overhead face fitted Lock/Latch: Yale Lockmaster Autoengage 2LB Classic 45mm (3-point lock) Lock/Latch Size: • Forend: 1770mm (h) x 15.5mm (w) x 62.5mm (d) • Centre strike plate: 210mm (h) 178x30mm • Top and bottom strike plate: 120mm (h) x 20mm (w) Yale inline steel lever handle Lock/Latch Status: Engaged for test (auto firing multi-point latches) Yale Platinum 3* steel cylinder Yale Postmaster Professional (aluminimum body) Yale door viewer 26.5mm diameter body Yale B-WS6-20-SC brass security chain Yale Numerals fitted to the face of the leaf Yale contemporary knocker no spy hole (stainless steel) Stormguard rain deflector fitted to the unexposed face of doorset A and the exposed face of doorset B

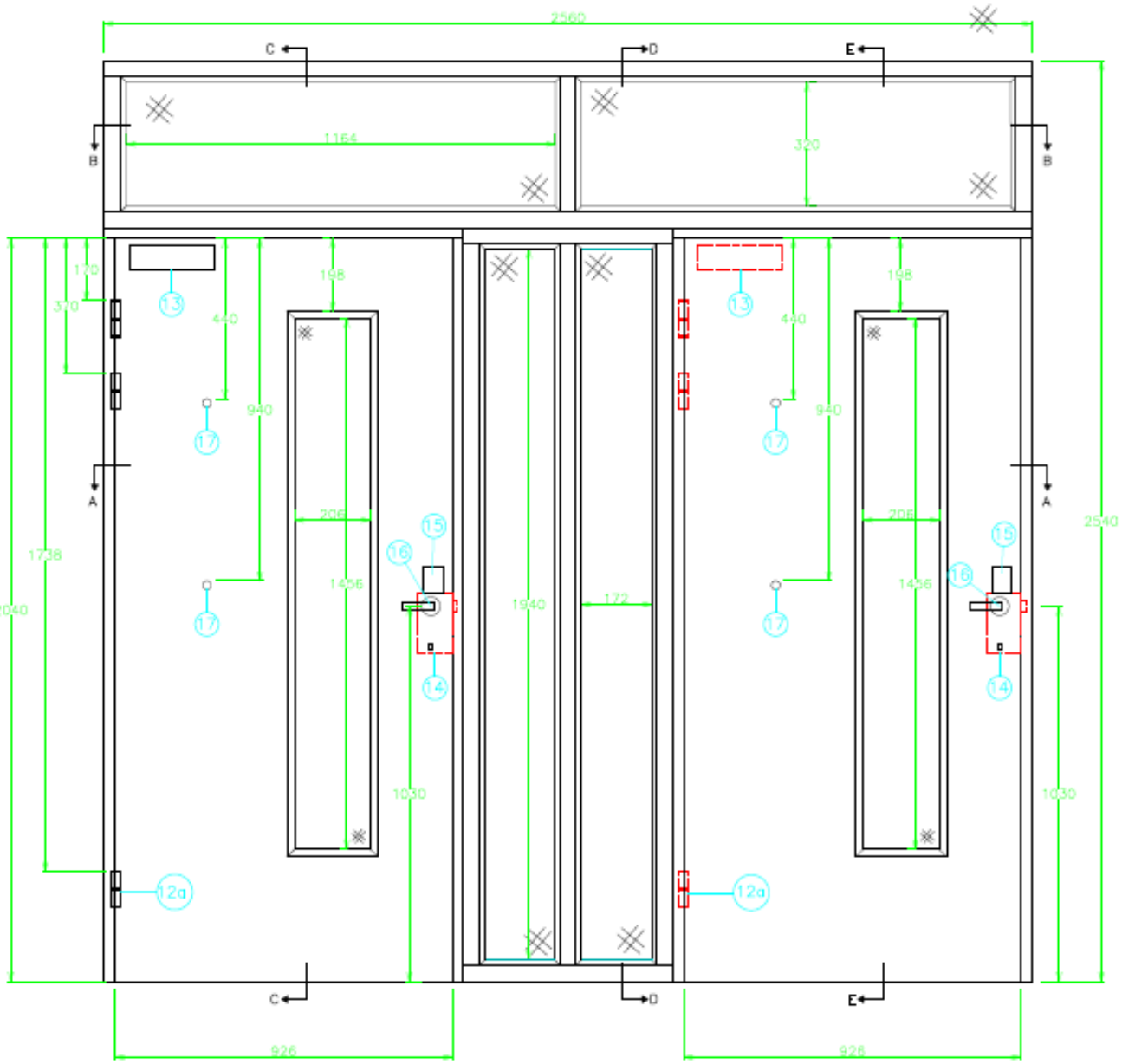
<table>
<tr><td>Summary of Test Specimen continued:</td><td colspan="2">HARDWARE PROTECTION:
Under Hinge: 1mm Interdens fitted under hinge blade on frame and leaf
Lock/Latch:
• Central lockcase: 1 (t) Interdens encasing lock case
• Top and bottom lockcase: 1 (t) Interdens encasing lock case
• Top, bottom and centre strikes: 1 (t) Interdens around box and under strike plate
Full graphite intumescent wrap around letter plate and graphite tubes around fixing posts as supplied integral to the letterplate
0.5mm graphite wrapped around body of eye viewer
FANLIGHT:
Glazed unit: 12mm Pyrobelit/8mm bar/6.8mm Low E laminated, sight size 902mm (w) x 620mm (h) with 3mm expansion allowance
Framing: 80mm (w) x 44mm (t) with 15 x 47mm rebate to form rebated beading (softwood 545kg/m^3). Fixed to door frame head with 70mm long screws. Bead of Lorient intumescent sealant between the fanlight and door frame both sides
Glazing system: STS 302 liner 30mm(w) x 2mm(t) around full perimeter of glazing. STS104 10mm (w) x 4mm (t) fitted to upstand of frame and to planted bead
Intumescent to rear of frame: 2No. STS154FO PVC encased graphite fitted 15mm from each side with 20mm gap between the seals across the top of the fanlight frame</td></tr>
<tr><td>Test Standard:</td><td colspan="2">BS EN 1634-1: 2014 + A1: 2018</td></tr>
<tr><td rowspan="2">Performance:</td><td>Doorset A</td><td>Integrity: 46 minutes
Insulation: 46 minutes</td></tr>
<tr><td>Doorset B</td><td>Integrity: 45 minutes
Insulation: 42 minutes</td></tr>
</table>

3.2 Supplementary test evidence

3.2.1 Evidence for Fanlights & Sidelights

3.2.1.1 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 Stredor door design where a 4 sided frame construction is utilised around the fanlights and sidelights. The tested door leaf design has been considered as being fundamentally the same design for the purpose of supporting sidelights and fanlights with the Stredor door design:



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 An 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

3.2.1.2 Third Party Evidence for Fanlights and Sidelights

The following test evidence has been incorporated to support the use of particular glass types and glazing systems, when used as sidelights or fanlights. From the sizes tested it is possible to establish the maximum pane size for the particular glass type in either landscape or portrait orientation.

The performance column indicates the result obtained by the screen and doorset. In some cases the doorset result is below 30 minutes. The only aspect of the test being considered in this assessment is the glazed screen component, and therefore the doorset result is not relevant.

Evidence for Fanlights & Sidelights			
Report Reference (Glass Type)	Pane Size & Glazing System (mm)	Test Standard	Performance (minutes)
RF09134 (EW30 Pyroguard)	Portrait: 2510 high x 810 wide Landscape: 816 high x 921 wide Glazing system: 15x3 K ceramic tape	BS EN 1634-1	Doorset: 29 Screen: 34
RF09201 (EW30 Pyroguard)	Portrait: 1415 high x 320 wide Landscape: 816 high x 2510 wide Glazing system: 10 x 2 Interdens	BS EN 1634-1	Doorset: 33 Screen: 33
RF10070 (EW30 Pyroguard)	Portrait: 1415 high x 310 wide Landscape: 816 high x 2510 wide Glazing system: 10 x 2 Interdens	BS EN 1634-1	Doorset: 29 Screen: 32
RF10081 (EW30 Pyroguard)	Portrait: 2510 high x 1010 wide Landscape: 816 high x 921 wide and 320 high x 1010 wided Glazing system: 10 x 2 Interdens	BS EN 1634-1	Doorset: 29 Screen: 32

Evidence for Fanlights & Sidelights			
Report Reference (Glass Type)	Report Reference (Glass Type)	Report Reference (Glass Type)	Report Reference (Glass Type)
RF10120 (EW30 Pyroguard)	Portrait: 2510 high x 1010 wide Landscape: 816 high x 921 wide and 320 high x 1010 wided Glazing system: 10 x 2 Interdens	BS EN 1634-1	Doorset: 32
			Screen: 32
RF10163 (EW30 Maxi Pyroguard)	Portrait: 1415 high x 320 wide and 987 high x 749 wide Landscape: 816 high x 2510 wide Glazing system: 10 x 2 Interdens	BS EN 1634-1	Doorset: 38
			Screen: 38
IFT 27128098 (EI30 Pyroguard)	Portrait: 2520 high x 225 wide and 1141 high x 1100 wide Landscape: 350 high x 2890 wide Glazing system: 7 x 2 Egopren glazing tape	BS EN 1634-1	Doorset: 34
			Screen: 34
IFT 27129622 Revision 1 (15mm Pyranova)	Portrait 2264 high x 350 wide Landscape 425 high x 2280 wide Glazing system 8 x 3 close cell foam	BS EN 1634-1	Doorset: 35
			Screen: 35
RF00138 (7 Pyrodur)	Portrait: 2016 high x 515 wide Landscape: 720 high by 1670 wide Glazing system: 20 x 2 Interdens	BS EN 1634-1	Doorset: 40
			Screen: 32

Evidence for Fanlights & Sidelights			
Report Reference (Glass Type)	Report Reference (Glass Type)	Report Reference (Glass Type)	Report Reference (Glass Type)
RF01024 Rev. A (10 Pyrodur)	Portrait: 2000 x 1400 Landscape: 720 high by 1670 wide Glazing system: 20 x 2 Interdens	BS 476: Part 22: 1987	Doorset: 60
			Screen: 57
RF03068 (7 Pyrodur)	Portrait: 2057 high x 917 wide Landscape: 720 high by 1670 wide Glazing system: 20 x 2 Interdens	BS EN 1634-1	Doorset: 37
			Screen: 37
RF05037 (15 Pyrostop)	Portrait: 2910 x 1406 wide Landscape: 720 high by 1670 wide Glazing system: 13 x 3 Hodgesons Firestrip 30	BS EN 1634-1	Doorset: 43
			Screen: 59
RF10028 (Pyroshield 2)	Portrait: 2040 high x 485 wide Landscape: 810 high x 1830 wide Glazing system: 10 x 2 Interdens	BS 476: Part 22: 1987	Doorset: 39
			Screen: 39

3.2.2 Miscellaneous Supplementary Evidence

3.2.2.1 Summary of Test Report WF 421795

The referenced test report, the essential details of which are summarised below, is secondary data for supporting the inclusion of: door closer and eye viewer into the Stredor 44 design, based on using a door core that is considered fundamentally the same for the purpose of adding the alternative hardware:

Date of Test:	21st November 2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Two latched, single-leaf, single acting doorsets - LSASD
Tested Orientation:	Doorset A hung opening in towards heating condition Doorset B hung opening out away from heating condition
Summary of Test Specimen:	LEAF: Overall Size: 2100mm(h) x 950(w) x 44mm(t) Core: Falcon Panel Products Strebord 44mm particleboard (590kg/m³) Lipping: Sapele (640kg/m³), 8mm thick to all four edges FRAME: Head & Jambs: Poplar (510kg/m³), 100mm(d) x 47mm(w), with 53mm(w) x 15mm(d) integral stop. Frame Fixing: 4No. Ø5 x 100 steel woodscrews, 600mm centres Threshold: Non-combustible INTUMESCENT: Frame Reveal/Leaf Edges: 2no 10x4mm Sealed Tight Solutions Limited STS 104FO fitted 10mm apart and 7mm from the exposed face. SMOKE/ACOUSTIC SEALS: Head and Jambs: 1no 11x5mm Sealed Tight Solutions Limited ST1009 acoustic/smoke seal self-adhered to the upstand of the stop. Leaf bottom edge: 12x20mm Sealed Tight Solutions Limited ST422 drop seal fitted centrally rebated into the bottom edge of the leaf.

Summary of Test Specimen continued:	HARDWARE: Hinges: 3no. Consort bearing butt hinge Ref CF5511 Closer: Dormakaba TS93 overhead closer Lock/Latch: Winkhaus AV3 3-point lock/latch fitted with a 70mm ERA fortress 3* thumbturn cylinder Lock/Latch Size: • Forend: 1770x20mm • Top/bottom keep: 160x22mm • Top/bottom case: 113x44mm • Centre keep: 245x22mm • Centre case: 185x63mm Lock/Latch Status: Engaged for test Handle: Consort CH100/G4 lever type handle and Consort CH311/8/316 escutcheon. Eye viewer: DESWLAF EI30 Barrel: Ø14mm, Footprint: Ø27mm fitted 1500mm from the bottom of the leaf Letterplate: Royde & Tucker LP08 letterplate with TS008 cowl fitted 900mm from the bottom of the leaf. HARDWARE PROTECTION: Under Hinge: Sealed Tight Solutions Limited 1mm thick graphite based intumescent Encasing latch bodies: 1mm interdens supplied as kit with lock Under keeps: 1mm interdens supplied as kit with lock Eye viewer: Sealed Tight Solutions Limited 1mm thick raw graphite
Test Standard:	BS EN 1634-1:2014+A1:2018
Performance:	Doorset A: Integrity 34minutes, Insulation 33minutes Doorset B: Integrity 50minutes, Insulation 29minutes

3.2.2.2 Summary of Test Report WF146520

The essential details of the referenced test report are summarised below.

Date of test:	08.Jun.2005
Identification of test body:	Warringtonfire Testing and Certification Ltd
Sponsor:	Pyroplex Ltd.
Tested Product:	Indicative test of 4no. air transfer grilles within timber door leaf constructions
Summary of test specimen:	Leaf: Overall Size: 990mm (h) x 900mm (w) x 44/54mm (t) Core: Particle board door core 44mm thick (containing Grilles C & D) and 54mm thick (containing Grilles A & B) with 6mm hardwood lining Hardware: All grilles 0.6mm galvanised steel assembled in a modular format with a clip system to connect the grille facings Grille A: 225mm x 112mm x 40mm in top half of door leaf Grille B: 300mm x 300mm x 40mm in bottom half of door leaf Grille C: 225mm x 112mm x 40mm in top half of door leaf Grille D: 300mm x 300mm x 40mm in bottom half of door leaf Hardware Protection: Grille A: 4no layers, 40mm (w) x 3.5mm (t) and 224mm (l) of Pyroplex intumescent Grille B: 5no layers, 40mm (w) x 3.5mm (t) and 148mm (l) of Pyroplex intumescent Grille C: 4no layers, 40mm (w) x 3.5mm (t) and 224mm (l) of Pyroplex intumescent Grille D: 5no layers, 40mm (w) x 3.5mm (t) and 148mm (l) of Pyroplex intumescent Specific Feature Being Tested: Pyroplex Air Transfer Grilles
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: Grille A 41 minutes Grille B 55 minutes Grille C 46 minutes Grille D 45 minutes

3.2.2.3 Summary of Test Report WF414882

The referenced test report, the essential details of which are summarised below, is supporting data for the use of Fire and Acoustic Seals Ltd Fire Door Foam in timber door frames.

Date of Test:	11.JUN.2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel products Ltd
Tested Product:	A glazed, unlatched, single acting double doorset – ULSADD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	LEAF: Overall Size (both leaves): 2040mm(h) x 926(w) x 44mm(t) Core: Falcon Panel Products Strebord® 44 Lipping: Falcon Panel Products Ltd Streframe® (450kg/m³), 8mm thick to all edges. FRAME: Head & Jambs: European Redwood (510kg/m³), 102mm(d) x 32mm(w), with 32mm(w) x 12mm(d) planted (pinned) MDF stop. Fire stopping: Fire and Acoustic Seals Ltd Fire Door Foam with softwood timber packers, 2.5 – 13.8mm wide x full depth of frame. Threshold: Non-combustible. INTUMESCENT: Leaf edge – right leaf meeting edge: Lorient Polyproducts Ltd. LP1004DS 10x4mm & Pyroplex Rigid Box Seal 8700 10x4mm. Frame Reveal, head and jambs: Pyroplex Rigid Box Seal 8700 15x4mm Leaf edge – bottom edge only: Fire and Acoustic Seals Ltd FAS45 drop seal 28mm (h) x 12mm (w) SMOKE/ACOUSTIC SEALS: Frame Reveal & Upstand of the stop: Fire and Acoustic Seals Ltd FAS35 self-adhesive seal 12mm (w) x 5mm (h). HARDWARE: Hinges: 3no Vier (Zoo Hardware) stainless steel lift off type hinge Ref. VLHL243RS and VLHR243RS fitted 170mm, 370mm and 1740mm from the head of each leaf. Closer: Rutland Aluminium and Steel composition overhead surface mounted door closer reference TS.9205, 55 high x 236 wide x 40 thick (body size)

Latch: Vier (Zoo Hardware) stainless steel latch with UAP 70mm key/thumbturn cylinder Ref. ZL30T/30CAS, latch nib fitted 865mm from the bottom of the leaf.

- Forend size: 235mm(h) x 22mm(w)
- Body size: 165mm(h) x 15mm(w) x 90mm(d)
- Keep size: 180mm(h) x 40mm(w)

Lock/Latch Status: Disengaged for test

Handle: Hoppe Amsterdam Stainless steel inline lever type handle 51mmØ fitted appropriate to the latch.

Letter plate: Fab and Fix letterplate and letterplate security shield

Letterplate ref. 3C018, Security shield ref. 3F005. 75 high x 310mm wide (face plate footprint).

Flush bolts: ZOO Hardware Steel Lever action flush bolt reference ZAS03RSS 20mm (w) x 203mm (h).

HARDWARE PROTECTION:

Under hinge blades: 1mm (t) Fire and Acoustic Seals Ltd intumescent sheet.

Encasing latch and lock bodies: 1mm (t) Fire and Acoustic Seals Ltd intumescent sheet.

Under latch forend: 1mm (t) Fire and Acoustic Seals Ltd intumescent sheet.

Under latch keep: 1mm (t) Fire and Acoustic Seals Ltd intumescent sheet.

Lining flush bolt rebate: 1mm (t) Fire and Acoustic Seals Ltd intumescent sheet.

Lining drop seal rebate: 1mm (t) Fire and Acoustic Seals Ltd intumescent sheet.

GLAZING (both leaves):

- Glass: Fireglass UK Pyrobelite 7 EW30 –(B)3-34dB 7mm thick
  - Aperture Size: 186mm wide x 1436mm high
  - Glass Size: 180mm wide x 1430mm high
  - Sight Size: 155mm wide x 1405mm high
- Beading: MDF (700kg/m^3) 22mm high x 21mm deep including a 7mm high x 5mm deep bolection return and an 18° chamfer
- Bead Fixing: Pneumatically fired rectangular steel brad nails, 18G x 50mm long, fitted 50mm from corners at 155mm centres,

	GLAZING Intumescent: • Closed cell foam, 3mm thick, fitted between the glass and bead on both faces and Fire and Acoustic Seals Ltd Intumescent Acoustic Acrylic Sealant, continuous bead fitted around the glazing perimeter.
Test Standard:	BS EN 1634-1:2014 +A1:2018 and BS EN 1363-1: 2012
Performance:	**Integrity:** 32 minutes **Insulation:** 13 minutes

3.2.2.4 Summary of Test Report WF386959

The referenced test report, the essential details of which are summarised below, is supporting data for the use of ST88 mastic capping ST99 Fire Foam in timber door frames.

Date of test	18th August 2017	
Identification of test body:	Exova Warringtonfire, now trading as Warringtonfire Testing and Certification Ltd. UKAS Notified Body 1762.	
Sponsor:	Falcon Panel Products Ltd	
Summary of test specimens (mm)**:**	**Specimen A comprised:** a single leaf Strebord 44 particleboard core with integral facings. All leaf edges were lipped with 8(t) Sapele of nominal density 640kg/m3. **Leaf Size:** 2438(h) x 950(w) x 44(t). **Leaf Edge Intumescent Seals**: 1No STS STS154FO perimeter intumescent seals were centrally fitted in the frame reveals of the head and jambs. **Door frame**: European Redwood of nominal density 510kg/m3 31mm wide with 15 thick MDF architraves on both faces. **Hardware:** The doorset was hung on 4No H101 lift of type steel hinges; a Rutland ITS11024 concealed head mounted closer with a Porta DIN sashlock with a 230mm high forend (disengaged for the test) and an Abloy EA280 cable loop in the hanging edge. **Specimen B comprised:** a double leaf Strebord FD60 particleboard core with integral facings, a 10mm diameter hole was drilled horizontally across the full width of the core. All leaf edges were lipped with 8(t) Sapele of nominal density 640kg/m3. **Leaf Size:** 2438(h) x 1050/400(w) x 54(t). **Leaf Edge Intumescent Seals**: 2No STS STS154FO perimeter intumescent seals were centrally fitted in the frame reveals of the head and jambs and one meeting edge. **Door frame**: Sapele of nominal density 640kg/m3 31mm wide with 15 thick MDF architraves on both faces. **Hardware:** The doorset was hung on 4No H101 lift of type steel hinges; a Rutland TS52014 surface mounted closer with a Winkhaus mortice latch with a 310mm high forend (disengaged for the test) and GEM electric strike and an Abloy EA280 cable loop	
Test Standard:	BS 476: Part 22: 1987	
Performance	Specimen A	Specimen B
	Integrity: 32 minutes Insulation: 32 minutes	Integrity: 61 minutes Insulation: 61 minutes

3.2.3 Summary of Test Report WF 384630 Rev A

The essential details of the referenced test report are summarised below and is to be used to justify the use of the engineered Streframe® E material for door frames. The evidence has been included on the basis of the tested door design being fundamentally similar to the Stredor design, with respect to the potential fire resistance performance of the Stredor doorset when hung in Streframe® E. The test evidence has also been used to justify the Woodex® engineered product based on a review of the Woodex® specification (red grandis, hardwood and softwood product) and its known performance in fire test conditions as a door frame material

Date of Test:	15.JUN.2017
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	A latched, single acting double doorset - LSADD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	LEAF: Overall Size: • Left-hand leaf: 2440mm(h) x 1050(w) x 44mm(t) • Right-hand leaf: 2440mm(h) x 400(w) x 44mm(t) Core: Falcon Panel Products Strebord® 44 including: 1. A Ø10mm hole drilled through the left-hand leaf horizontally 1154mm from the bottom of the leaf across the width at mid-leaf thickness. 2. A 10mm(w) x 42mm(d) channel routed out centrally in the left-hand leaf edge around the bottom half perimeter to accept a cable. Routed channel was capped with a 10mm(w) x 30mm(d) hardwood insert installed with PU adhesive and pre-applied 10mm x 1mm graphite. Lipping: Sapele (640kg/m³), 8mm thick to all edges. FRAME: Head & Jambs: Streframe®E (510kg/m³), 80mm(d) x 32mm(w), with 35mm(w) x 12mm(d) planted (pinned) European redwood stop. Fire stopping: Rockwool mineral fibre capped with Sealed Tight Solutions Ltd ST88 intumescent mastic ~10-15mm(w) Threshold: Non-combustible. INTUMESCENT: Frame Reveal: 1no 15x4mm Sealed Tight Solutions Ltd ST1504FO seal fitted 15mm from the exposed face within the frame reveal. Meeting stile (left leaf only): 2no 10x4 Sealed Tight Solutions Ltd ST1004FO fitted 11mm apart, central within the leaf edge. HARDWARE: Hinges: 4no Royde & Tucker H101 lift-off type hinge fitted 150mm, 820mm, 1490mm and 2160mm from the top of each leaf.

	Closer: • Left leaf: Rutland TS.5204 surface-mounted overhead closer fitted on the exposed face of the leaf as per manufacturer's instructions. Body size: 297mm(w) x 68mm(h) x 45mm(d) • Right leaf: Hoppe Arrone AR1500 surface-mounted overhead closer fitted on the exposed face of the leaf as per manufacturer's instructions. Body size: 255mm(w) x 67mm(h) x 57mm(d) Latch: Laidlaw 13861 DIN latch fitted 1030mm from the bottom of the left leaf. Forend size: 235mm(h) x 20mm(w) Case size: 165mm(h) x 90mm(d) x 16mm(w) Strike: Gem GK700 Electric strike fitted appropriate to the latch in the right leaf. Body size: 175mm(h) x 44mm(w) x 27mm(d) Lock/Latch Status: Engaged for test Handle: Lever type handle fitted appropriate to the latch. Size: 90mm(w) x 44mm(d) <u>HARDWARE PROTECTION:</u> Under latch forend: 1mm thick Sealed Tight Solutions Ltd graphite Encasing latch body: 1mm thick Sealed Tight Solutions Ltd graphite Encasing latch keep body: 1mm thick Sealed Tight Solutions Ltd graphite Lining strike plate: 2mm thick Sealed Tight Solutions Ltd graphite Lining wireway channel in leaf edge: 10mm x 1mm thick Sealed Tight Solutions Ltd graphite fitted lining the base of the wireway channel Lining wireway through centre of leaf core: 10mm x 1mm thick Sealed Tight Solutions Ltd graphite fitted within a Ø10mm hole, nominally 50% of the cable circumference.
Test Standard:	BS 476: Part 22: 1987
Performance:	**Integrity:** 43 minutes

3.2.4 Summary of Test Report BMT/FEP/F15034

The following test report has been included to support the lower density of solid softwood and hardwood frame profiles with the Stredor door design. The essential details of the test report are summarised below. The evidence has been included on the basis of the tested door design being fundamentally similar to the Stredor design, with respect to the potential fire resistance performance of the Stredor doorset when hung in lower density door frames (minimum density 450kg/m^3). The intumescent materials and lipping is similar to that used on the Stredor design and the lower density frame will maintain fire resistance if the leaf were to be changed for Stredor instead of the tested Strebord leaf. Essentially the performance of the door frame in fire test conditions is not significantly influenced by the door leaf type, providing the tested perimeter specification is comparable to the testing conducted on the alternative leaf, and the alternative leaf has been successfully tested for a minimum of 30minutes fire resistance to the relevant test standard (i.e. BS 476: Part 22)

Date of Test:	9.FEB.2015
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Sealed Tight Solutions Ltd
Tested Product:	A glazed, unlatched, single acting double doorset – ULSADD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	LEAF: Overall Size (both leaves): 2900mm(h) x 1000(w) x 44mm(t) Core: Falcon Panel Products Strebord® 44 Lipping: Sapele (640kg/m^3), 6mm thick to all edges. FRAME: Head & Jambs: European Redwood (450kg/m^3), 70mm(d) x 32mm(w), with 20mm(w) x 12mm(d) planted (pinned) European redwood stop. Fire stopping: Rockwool mineral fibre capped with intumescent mastic, ~10-15mm wide. Threshold: Non-combustible. INTUMESCENT: Frame Reveal: 1no 15x4mm Sealed Tight Solutions Ltd ST1504FO seal fitted centrally within the frame reveal. Meeting stile (right leaf only): 2no 10x4 Sealed Tight Solutions Ltd ST1004FO fitted 7mm and 27mm from the exposed face of the leaf. SMOKE/ACOUSTIC SEALS: Frame Reveal: 1no 10x3mm Sealed Tight Solutions ST1009 fitted to the upstand of the stop on the right jamb and across the head of the right-hand leaf.

	HARDWARE: Hinges (Both Doorsets): 4no Intelligent Hardware HST.100.BZP butt type hinge fitted 150mm, 965mm and 1780mm and 2600mm from the head of each leaf. Closer (Both Doorsets): Rutland TS.3204 surface-mounted overhead closer fitted on the exposed face of each leaf as per manufacturer's instructions. Body size: 220mm(w) x 59mm(h) x 42mm(d) Latch: Union JL2C22R-PS55 sashlock with spindle fitted 950mm from the base of the right-hand leaf. • Forend size: 235mm(h) x 25mm(w) • Body size: 175mm(h) x 18mm(w) x 85mm(d) • Keep size: 235mm(h) x 25mm(w) Lock/Latch Status: Disengaged for test Handle: Aluminium lever type handle fitted appropriate to the latch. Flush bolts: • Head: Zoo Architectural Hardware Ltd ZAS1355 fitted at the threshold of the left leaf. Footprint size: 609mm(h) x 20mm(w) • Threshold: Zoo Architectural Hardware Ltd ZAS03 fitted at the threshold of the left leaf. Footprint size: 205mm(h) x 20mm(w) HARDWARE PROTECTION: Under hinge blades: 1mm Sealed Tight Solutions Ltd raw graphite. Under latch forend: 1mm Sealed Tight Solutions Ltd raw graphite. Under latch keep: 1mm Sealed Tight Solutions Ltd raw graphite. Lining flush bolt rebate: 1mm Sealed Tight Solutions Ltd raw graphite. GLAZING (both leaves): • Glass: Promat Securiglass Pyrobelite 7mm thick o Aperture Size: 1150m(h) x 600mm(w) o Glass Size: 1145mm(h) x 595mm(w) o Sight Size: 1125mm(h) x 570mm(w) • Beading: Sapele o Left leaf: 15mm(h) x 14mm(d) including a 3x3mm quirk. o Right leaf: 20mm(h) x 19mm(d) including a 5x5mm bolection and a 19° chamfer. • Bead Fixing: Steel pins 1.6g x 38mm fitted 50mm from corners and at 150mm centres. GLAZING SYSTEM: Glazing perimeter: 10x5mm Sealed Tight Solutions ST105GT fitted between the glass and glazing bead on both faces.
Test Standard:	BS 476: Part 22: 1987
Performance:	**Integrity:** 33 minutes

3.2.5 Summary of Test Report FEP/F16012 Revision A

The referenced test report, the essential details of which are summarised below, is supplementary data for the Stredor 44 design for 30 minute integrity performance and supports the inclusion of: double leaf doorsets in timber frames with glazing and locksets and flush bolts.

Date of Test:	27th January 2016
Identification of Test Body:	Exova Warringtonfire
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched double leaf single acting doorset (ULSADD)
Tested Orientation:	Stredor door core tested with leaves opening towards the furnace conditions
Sampling information:	Prototype specimen, no sampling information available

Summary of Test Specimen:	LEAF:
	Overall Size (each leaf): 2450mm(h) x 1000(w) x 44mm(t)
	Door Core:
	• Falcon Panel Products Stredor 44mm (F7 mill)
	  ○ (Inner Core Layer) – 2.1mm poplar ply (510kg/m³)
	  ○ (Outer Core Layers) – 19.5mm pine lamels (480kg/m³)
	  ○ (Surface Core Layer) – 2mm MDF veneer (700kg/m³)
	
	Lipping (both leaves): Sapele (640kg/m³), 6mm thick to all four edges
	
	FRAME:
	Head & Jambs: European Redwood (510kg/m³), 100mm(d) x 32mm(w), with 32mm(w) x 12mm(d) planted stop.
	Frame Fixing: 4No. Ø8 x 100 steel woodscrews
	Threshold: Non-combustible
	Architrave: MDF fitted on the exposed face 45 (w) x 18 (t)
	
	INTUMESCENT:
	Frame Reveal: 1No. 15 x 4 Pyroplex brush box seal ref: 8700 fitted 15mm from the opening face in the frame reveal
	Leaf Edge: 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face

Summary of Test Specimen continued:	<u>GLAZING (both leaves):</u> Glass: Pyroguard clear 7mm thick Overall Size: 1595 (h) x 395 (w) Aperture Size: 1600 (h) x 400 (w) Sight Size: 1570 (h) x 370 (w) Beading: Sapele (640kg/m³), 24mm(w) x 22mm(h) with 18°chamfer and a 7x7mm bolection Bead Fixing: 40mm long steel pins at 40 corners and 120-150mm centres on the vertical edges and 40mm corners and 80-110mm centres on horizontal edges <u>GLAZING SYSTEM:</u> Glazing Perimeter: Pyroplex FG30 glazing system Ref: 30049 fitted between the glass and the bead on both faces <u>HARDWARE:</u> Hinges: 3no Hafele bearing butt type hinges Ref: SUS-304 Closer: Rutland TS3204 overhead closer Lock/Latch: Hafele mortice latch Ref: 911.23.465 Lock/Latch Size: • Forend: 235x24mm • Keep: 170 x 25mm Aluminium type lever handle Shoot bolts: Hafele 900.17.984 150 x 22mm footprint <u>HARDWARE PROTECTION:</u> Under Hinge: 1mm Pyroplex graphite Lock/Latch: • Under latch forend plate: 1mm thick Pyroplex graphite • Under latch keep: 1mm thick Pyroplex graphite • Encasing latch body: 1mm thick Pyroplex graphite • Under flush bolt body: 1mm thick Pyroplex graphite fitted in the flush bolt rebate • Under shoot bolt keep: 1mm thick Pyroplex graphite
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: 42 minutes Insulation not evaluated in accordance with Section 8.6.1 of BS 476: Part 22: 1987

Analysis: The reason the above test evidence is considered supplementary is due to the thickness of the MDF facing at 2mm, as the Stredor design is supplied with either nominally 2-4mm thick plywood faces or 7-8mm MDF faces. However when considering the performance

of the designs tested with 7-8mm thick faces (WF385685 and WF414781), which included onerous details compared with the design tested under PF16012 Rev A (WF385685 included feature grooves, which would have reduced the stability of the door by reducing the thickness and therefore resistance to thermally induced distortion and bow under fire test conditions. WF414781 was tested to the EN 1634-1 test standard which is known to be more onerous than the BS476: Part 22 standard), the results of the design tested under PF16012 Rev A have been deemed appropriate to support leaf size envelopes, intumescent configurations, glazing and other design options for the 7-8mm faced product.

The test on the 2mm faced design has also been compared with the the design tested with 2mm thick plywood faces (PF16031 – test was on a similar configuration and door design), and the performance of the door leaf designs can be seen to be comparable in terms of distortion (differential movement at the leaf edges) and both designs provided in excess of 40minutes integrity performance, where the first failure in both tests was observed at the glazed apertures. The results of the testing on the 2mm MDF faced product can therefore be used to support specific design options (such as hardware and glazing) for the Stredor design with 2-4mm plywood faces

4 Technical specification

4.1 General

The technical specification for the proposed doorset is given in the following sections and is based on the test evidence for the doorset design, 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

4.3.1 Leaf 1 – Stredor 44

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

Ply Faced Stredor 44

- (Inner Core Layer) – 2.1mm poplar ply (510kg/m³)
- (Outer Core Layers) – 16.95-18.8mm pine lamels (480kg/m³)
- (Surface Core Layer) – 1.75-3.6mm poplar ply (510kg/m³)
- Facing: 0.4mm engineered veneer (600kg/m³)

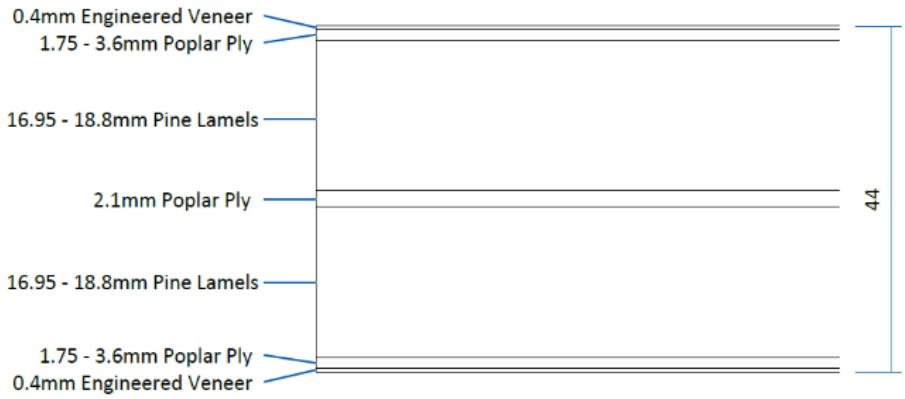


Fig.1 – Cross section through Stredor 44 ply faced door blank design

- The door leaf thickness is nominally 44mm thick and is hung within a timber door frame.
- The doorset design incorporates hardware, intumescent seals and non-intumescent seals (i.e. smoke and weather seals).

MDF Faced Stredor 44

- (Inner Core Layer) – 2.1mm poplar ply (510kg/m³)
- (Outer Core Layers) – 12.95-13.95mm pine lamels (480kg/m³)
- (Surface Core Layer) – 7-8mm MDF (680kg/m³)
- Facing: 0.4mm beech veneer (600kg/m³)

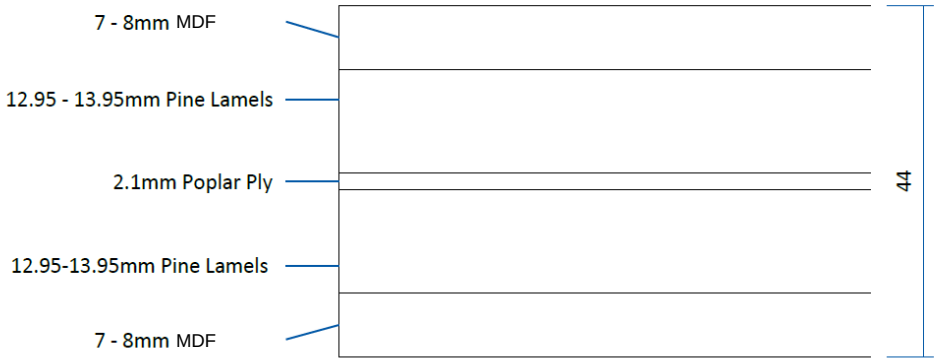


Fig.2 – Cross section through Stredor 44 MDF faced door blank design

- The door leaf thickness is nominally 44mm thick and is hung within a timber door frame.
- The doorset design incorporates hardware, intumescent seals and non-intumescent seals (i.e. smoke and weather seals).

The test evidence cited in section 3.1 of this assessment report was generated using two variants of the Stredor design (constructed at F7 mill and F14 mill – internal BM TRADA and Falcon mill reference held on file WF 516032) with the primary difference being the thickness of the inner and outer layers of poplar ply and pine lamels. Falcon Panel Products have stated that Stredor 44 will only be manufactured as one design variant going forward (F14 mill) and have requested that this assessment is written to cover the design type described above (section 4.3.1). The testing that has been conducted on both variants has demonstrated equivalent performance and it has therefore been deemed acceptable to use the evidence for both design vartiants to support the scope in this assessment for the Stredor variant described in section 4.3.1.

The ply faced and MDF face Stredor variants have been tested from both the F7 mill and F14 mill. Apart from the approved leaf sizes, configurations and intumescent specification (See section 4.5) all other designs options given in this assessment apply to both design variations.

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, 2, 4, 5 – Timber based frame	Masonry wall Timber stud partition Steel stud partition

4.4.1 Frame 1 and 2 Group - SA

The construction of the Frame 1 and Frame 2 door frame types includes the following materials and profiles.

4.4.1.1 Frame 1.1 and 2.1 – Standard with planted stop – SA

Minimum dimensions

Frame 70 x 30

Stop 12 x 20

Jamb

Head

Permitted Materials for frame type 1.1	Minimum Density (kg/m³)
Softwood/Hardwood	450
MDF[1]	650
Streframe® Lightweight Hardwood[1]	450
Streframe® E Engineered Softwood[1]	500
Woodex® Engineered Timber[1, 2]	500

1. Transoms and mullions are not permitted using this material type.
2. Woodex ® has been assessed as a suitable alternative engineered timber based on the results of the testing conducted on Streframe E, as summarised in section 3.2

Permitted Materials for frame type 2.1	Minimum Density (kg/m³)
Hardwood	650
MDF[3]	750

3 Transoms and mullions are not permitted using this material type.

4.4.1.2 Frame 1.3 and 2.3 – Standard with integral stop – SA

Minimum dimensions

Frame 70 x 30

Stop 20 x 12

Hinge Side Jamb

Head

Permitted Materials for frame type 1.3	Minimum Density (kg/m³)
Softwood/Hardwood	450
MDF[1]	650
Streframe® Lightweight Hardwood[1]	450
Streframe® E Engineered Softwood[1]	500
Woodex® Engineered Timber[1,2]	500

1. Transoms and mullions are not permitted using this material type.
2. Woodex ® has been assessed as a suitable alternative engineered timber based on the results of the testing conducted on Streframe E, as summarised in section 3.2

Permitted Materials for frame type 2.3	Minimum Density (kg/m³)
Hardwood	650
MDF[3]	750

3 Transoms and mullions are not permitted using this material type.

4.4.1.3 Frame 1.7 and 2.7 – Integral architrave with planted stop – SA

Minimum dimensions

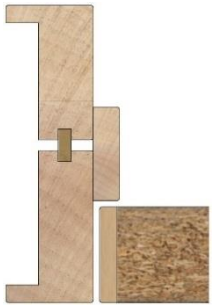
Frame 70 x 32

Stop 20 x 12

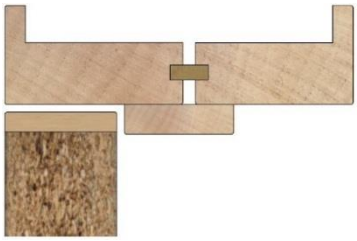
Integral architrave around wall 25 x 12

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 12.

Jamb



Head



Permitted materials for frame 1.7 and 2.7	Minimum Density (kg/m^3)
Softwood	500
Hardwood	500

4.4.1.4 Frame 1.8 and 2.8 – Integral architrave with integral stop – SA

Minimum dimensions

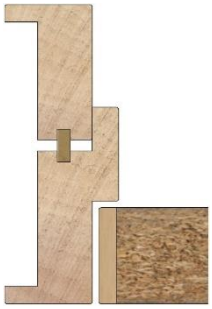
Frame 70 x 32

Stop 20 x 12

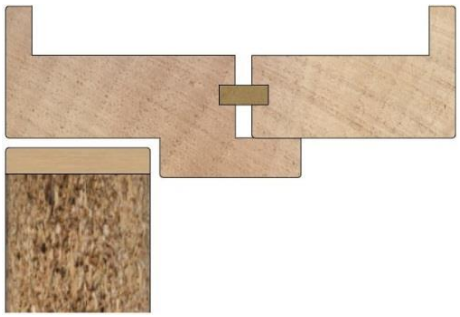
Integral architrave around wall 25 x 12

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 12.

Jamb



Head



Permitted materials for frame 1.8 and 2.8	Minimum Density (kg/m³)
Softwood	500
Hardwood	500

4.4.2 Frame 4 and 5 Group - DA

The construction of the Frame 4 and Frame 5 door frame types includes the following materials and profiles.

4.4.2.1 Frame 4.1 and 5.1 – 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	Depends on 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	450
MDF[1]	650
Streframe® Lightweight Hardwood[1]	450
Streframe® E Engineered Softwood[1]	500

1 Transoms and mullions are not permitted using this material type.

Permitted materials for frame 5.1	Minimum Density (kg/m³)
Hardwood	650
MDF[1]	750

1 Transoms and mullions are not permitted using this material type.

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 configuration included in this field of application is based on the configuration tested. The principle is that the more components i.e., door leaves and overpanel – the harder it becomes to pass a test. This is because the junction between two door leaves or door leaf and overpanel introduces a discontinuity into the doorset which can cause failures. This leads to the following statements:

- A test on a double doorset is more onerous than a test on a single doorset
- A test on an unlatched doorset is more onerous than a test on a latched doorset
- A test on an unlatched single acting doorset is considered to be equivalent to a double acting doorset
- A doorset with transomed overpanel is considered to perform as the same as 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 intumescent specification and frame option. The following section details the maximum leaf size for each door leaf option and configuration based on the intumescent, hardware and frame details tested.

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

4.5.2 Orientation

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

However, tests referenced WF 416690, EFR-18-H-003671 and WF 432578 were successfully undertaken on doorsets where the leaves were tested both opening in towards the furnace heating conditions and out away from the heating conditions, and can be considered as supplementary evidence for the performance of the doorset design in both directions with respect to exposure to fire test conditions.

4.5.3 Configuration

The table below shows a list of the different doorset configurations, their abbreviations and full description. The following sections detail the permitted leaf sizes for the listed configurations based on the intumescents and door frame.

Doorset Configurations			
Ref.	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:

1. Unequal leaf double doorsets are covered by this Field of Application. The smaller door leaf must be no less than 300mm.
2. For double doorsets both leaves must comply with the door leaf envelope size limitations.
3. 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

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 option and door frame option.

For Double Doors:

1. When using these envelopes for double doorsets, the meeting stile intumescent detail must be adequate to contribute to the protection of any hardware present.
2. The requirements for intumescent strips when a lock is fitted are given in section 9.2 and 11.3 and supercede any single strip specification given in section 4.5.6 to 4.5.11.
3. Unequal leaf double doorsets are covered by this Field of Application. The smaller door leaf must be no less than 300mm.
4. For double doorsets both leaves must comply with the door leaf envelope size limitations.

For Intumescent Seals:

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

4.5.5 Explanation for the Following Sections

The performance of a doorset in terms of configuration and size is dependent on the intumescent and frame type and are not automatically interchangeable. The following sections present the envelopes for the 4 frame types. Each envelope is linked to a specific intumescent which is given a unique reference and is based directly on test evidence. The tables below indicate which configuration is covered for each of the frame types.

The envelopes are presented as follows:

- for LSASD increasing in configuration complexity up to ULSADD/DADD
- the permitted configuration for each frame type combination is considered separately
- and a unique envelope of permitted leaf sizes is presented based on the configuration, frame type 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 following the rules in section 4.5.1.

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.

4.5.6 LSASD Configuration – Leaf Size Envelopes & Intumescent Specification

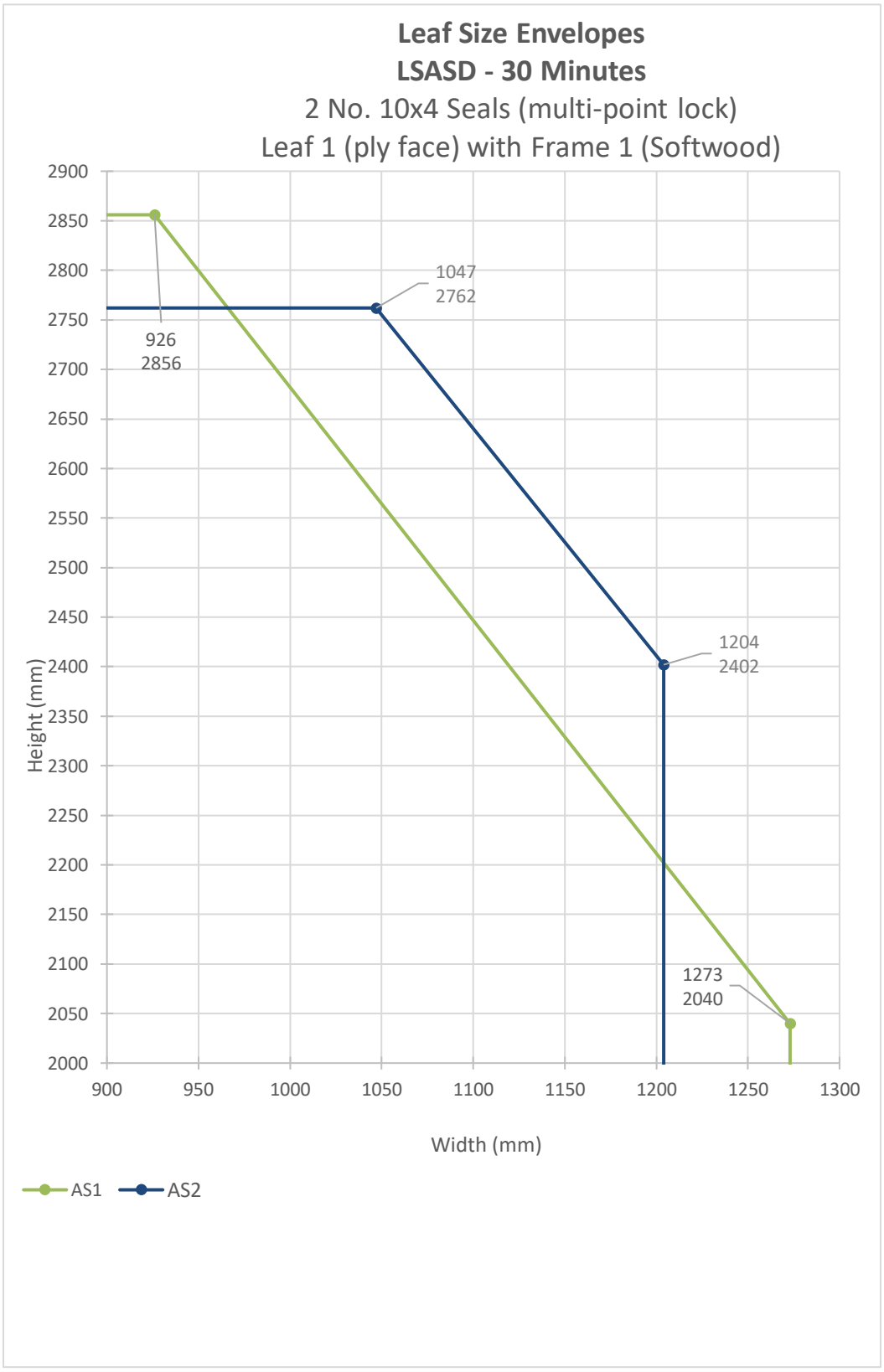


Table 1.1.1

Intumescent Specification for LSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS1 (WF432578)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges, 10mm apart.
AS2  (EFR-18-H-003671)	STS104	Sealed Tight Solutions	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges, 10mm apart.

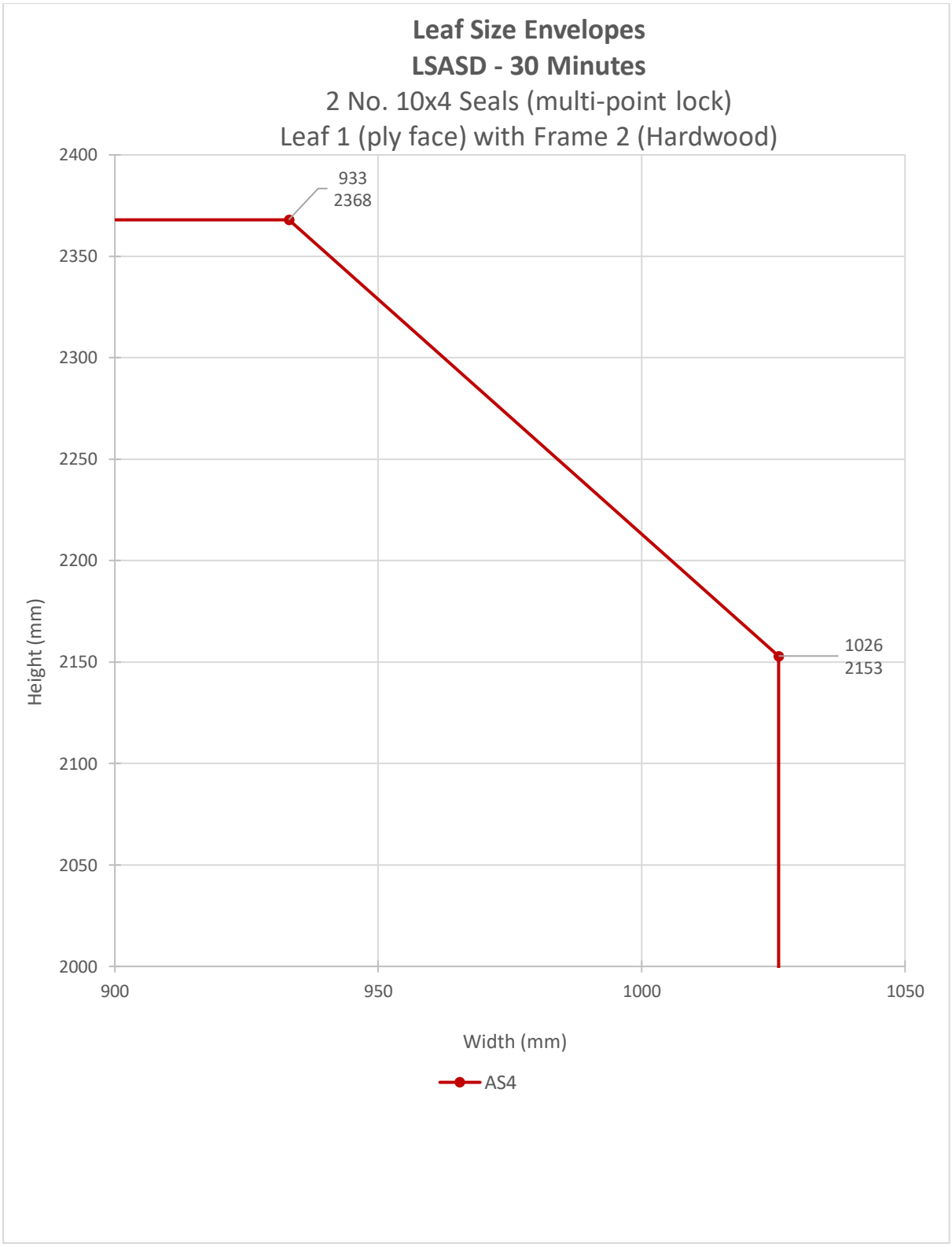

Leaf Size Envelopes
LSASD - 30 Minutes
2 No. 10x4 Seals (multi-point lock)
Leaf 1 (ply face) with Frame 2 (Hardwood)
2400
2350
2300
2250
2200
2150
2100
2050
2000
Height (mm)
933
2368
1026
2153
900
950
1000
1050
Width (mm)
AS4

Table 1.1.2

Intumescent Specification for LSASD

Leaf 1 (ply face) with Frame 2 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS4 (WF416690)	FO8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges, 10mm apart.


Leaf Size Envelopes
LSASD - 30 Minutes
1 No. 15x4 Seals
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3209
1000
2843
1175
2448
1325
2447
AS5
AS6

Table 1.2.1

Intumescent Specification for LSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS5 (BMT/FEP/F16031)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
AS6 (BMT/FEP/F15066)	8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
LSASD - 30 Minutes
1 No. 20x4 Seals
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3209
1000
2843
1175
2448
1325
2447
AS7
AS8

Table 1.2.2

Intumescent Specification for LSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS7 (BMT/FEP/F16031)	LP2004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
AS8 (BMT/FEP/F15066)	8600	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
LSASD - 30 Minutes
2 No. 10x4 Seals
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3209
1000
2843
1175
2448
1325
2447
AS9
AS10

Table 1.2.3

Intumescent Specification for LSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS9 (BMT/FEP/F16031)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
AS10 (BMT/FEP/F15066)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.

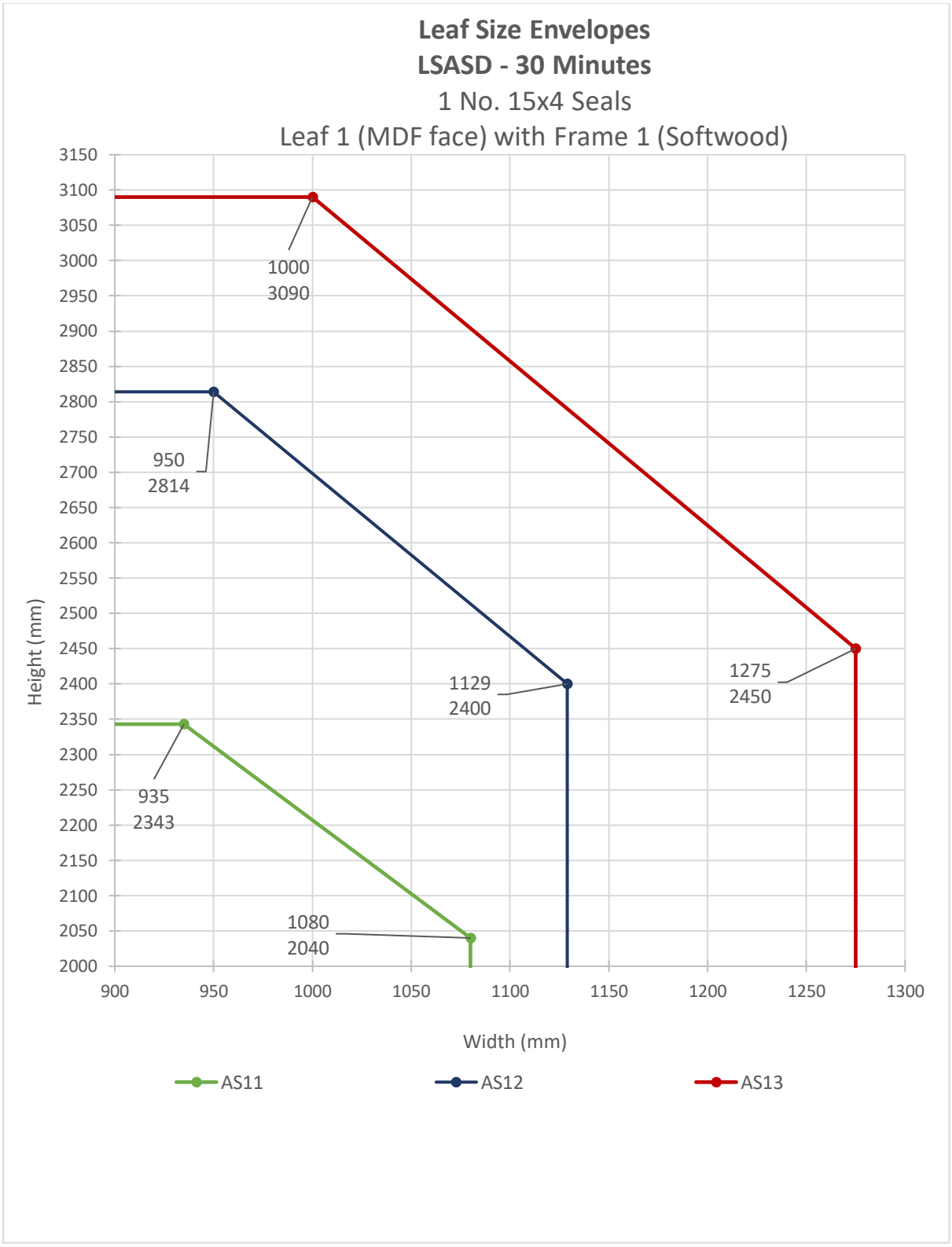

Leaf Size Envelopes
LSASD - 30 Minutes
1 No. 15x4 Seals
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3090
950
2814
1129
2400
1275
2450
935
2343
1080
2040
AS11
AS12
AS13

Table 1.2.4

Intumescent Specification for LSASD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS11 (WF414781)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
AS12 (WF385685)	ST154	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
AS13 (BMT/FEP/F16012)	8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
LSASD - 30 Minutes
1 No. 20x4 Seals
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3090
950
2814
1129
2400
1275
2450
935
2343
1080
2040
AS14
AS15
AS16

Table 1.2.5

Intumescent Specification for LSASD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS14 (WF414781)	LP2004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
AS15 (WF385685)	ST204	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
AS16 (BMT/FEP/F16012)	8600	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
LSASD - 30 Minutes
2 No. 10x4 Seals
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3090
950
2814
1129
2400
1275
2450
935
2343
1080
2040
AS17
AS18
AS19

Table 1.2.6

Intumescent Specification for LSASD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AS17 (WF414781)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
AS18 (WF385685)	ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
AS19 (BMT/FEP/F16012)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.

4.5.7 ULSASD Configuration – Leaf Size Envelopes & Intumescent Specification

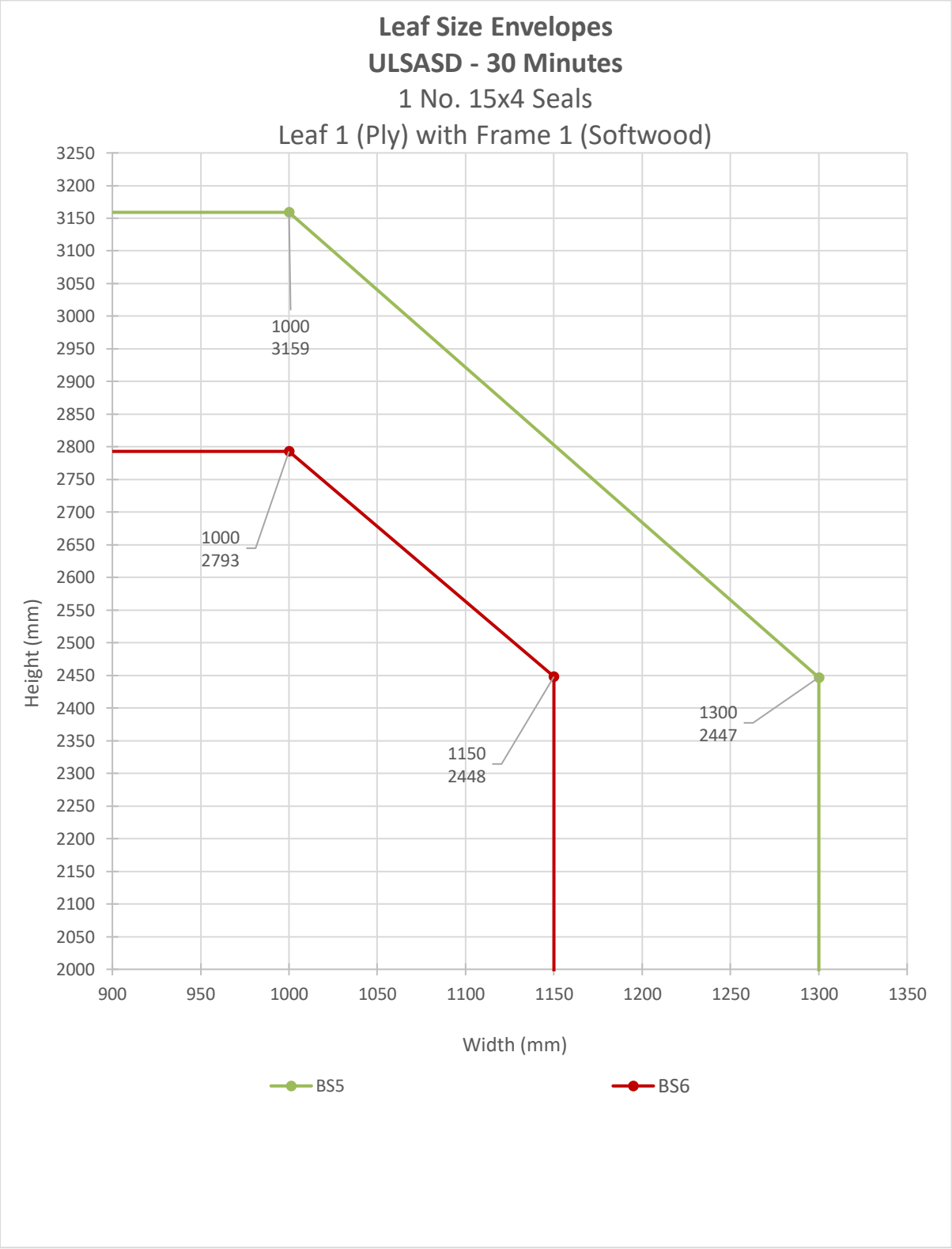


Table 2.1.1

Intumescent Specification for ULSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS5 (BMT/FEP/F16031)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
BS6 (BMT/FEP/F15066)	8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
ULSASD - 30 Minutes
1 No. 20x4 Seals
Leaf 1 (Ply) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3159
1000
2793
1150
2448
1300
2447
BS7
BS8

Table 2.1.2

Intumescent Specification for ULSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS7 (BMT/FEP/F16031)	LP2004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
BS8 (BMT/FEP/F15066)	8600	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
ULSASD - 30 Minutes
2 No. 10x4 Seals
Leaf 1 (Ply) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3159
1000
2793
1150
2448
1300
2447
BS9
BS10

Table 2.1.3

Intumescent Specification for ULSASD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS9 (BMT/FEP/F16031)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
BS10 (BMT/FEP/F15066)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.


Leaf Size Envelopes
ULSASD - 30 Minutes
1 No. 15x4 Seals
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3040
950
2764
1104
2400
1250
2450
935
2293
1055
2040
BS11
BS12
BS13

Table 2.1.4

Intumescent Specification for ULSASD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS11 (WF414781)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
BS12 (WF385685)	ST154	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
BS13 (BMT/FEP/F16012)	8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
ULSASD - 30 Minutes
1 No. 20x4 Seals
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3040
950
2764
1104
2400
1250
2450
935
2293
1055
2040
BS14
BS15
BS16

Table 2.1.5

Intumescent Specification for ULSASD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS14 (WF414781)	LP2004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
BS15 (WF385685)	ST204	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
BS16 (BMT/FEP/F16012)	8600	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
ULSASD - 30 Minutes
2 No. 10x4 Seals
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3040
950
2764
1104
2400
1250
2450
935
2293
1055
2040
BS17
BS18
BS19

Table 2.1.6

Intumescent Specification for ULSASD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BS17 (WF414781)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
BS18 (WF385685)	ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
BS19 (BMT/FEP/F16012)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.

4.5.8 DASD Configuration – Leaf Size Envelopes & Intumescent Specification

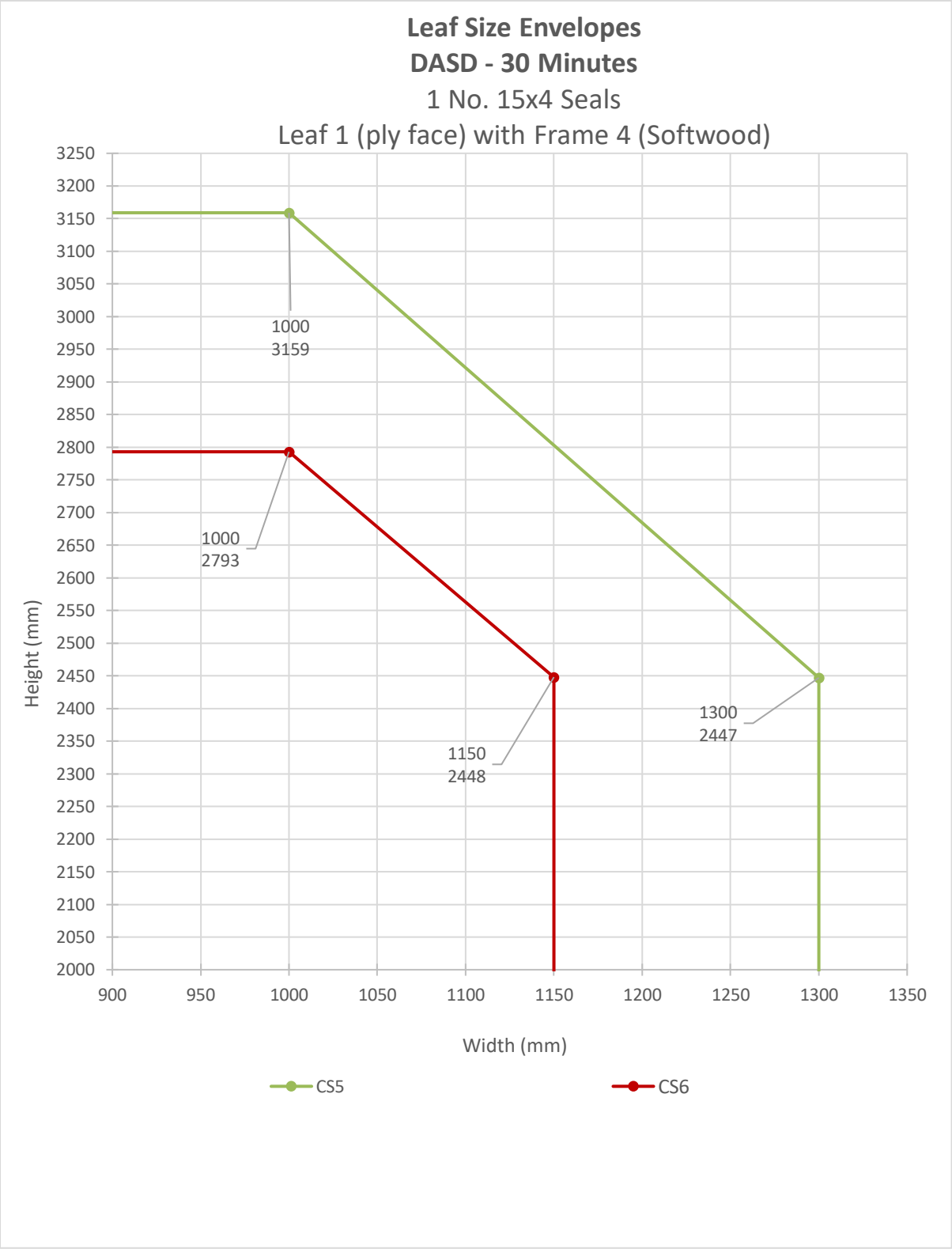


Table 3.1.1

Intumescent Specification for DASD

Leaf 1 (ply face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS5 (BMT/FEP/F16031)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
CS6 (BMT/FEP/F15066)	8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
DASD - 30 Minutes
1 No. 20x4 Seals
Leaf 1 (ply face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
1000
3159
1000
2793
1150
2448
1300
2447
CS7
CS8

Table 3.1.2

Intumescent Specification for DASD

Leaf 1 (ply face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS7 (BMT/FEP/F16031)	LP2004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
CS8 (BMT/FEP/F15066)	8600	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
DASD - 30 Minutes
2 No. 10x4 Seals
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
1000
3159
1000
2793
1150
2448
1300
2447
CS9
CS10

Table 3.1.3

Intumescent Specification for DASD

Leaf 1 (ply face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS9 (BMT/FEP/F16031)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
CS10 (BMT/FEP/F15066)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.


Leaf Size Envelopes
DASD - 30 Minutes
1 No. 15x4 Seals
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
1000
3040
950
2764
1104
2400
1250
2450
935
2293
1055
2040
CS11
CS12
CS13

Table 3.1.4

Intumescent Specification for DASD

Leaf 1 (MDF face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS11 (WF414781)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
CS12 (WF385685)	ST154	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.
CS13 (BMT/FEP/F16012)	8700	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
DASD - 30 Minutes
1 No. 20x4 Seals
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
1000
3040
950
2764
1104
2400
1250
2450
935
2293
1055
2040
CS14
CS15
CS16

Table 3.1.5

Intumescent Specification for DASD

Leaf 1 (MDF face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS14 (WF414781)	LP2004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
CS15 (WF385685)	ST204	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.
CS16 (BMT/FEP/F16012)	8600	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges.


Leaf Size Envelopes
DASD - 30 Minutes
2 No. 10x4 Seals
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
1000
3040
950
2764
1104
2400
1250
2450
935
2293
1055
2040
CS17
CS18
CS19

Table 3.1.6

Intumescent Specification for DASD

Leaf 1 (MDF face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CS17 (WF414781)	LP1504	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
CS18 (WF385685)	ST154	Sealed Tight Solutions Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.
CS19 (BMT/FEP/F16012)	8700	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 fitted centrally in frame reveal or leaf edges spaced 10mm apart.

4.5.9 LSADD Configuration – Leaf Size Envelopes & Intumescent Specification

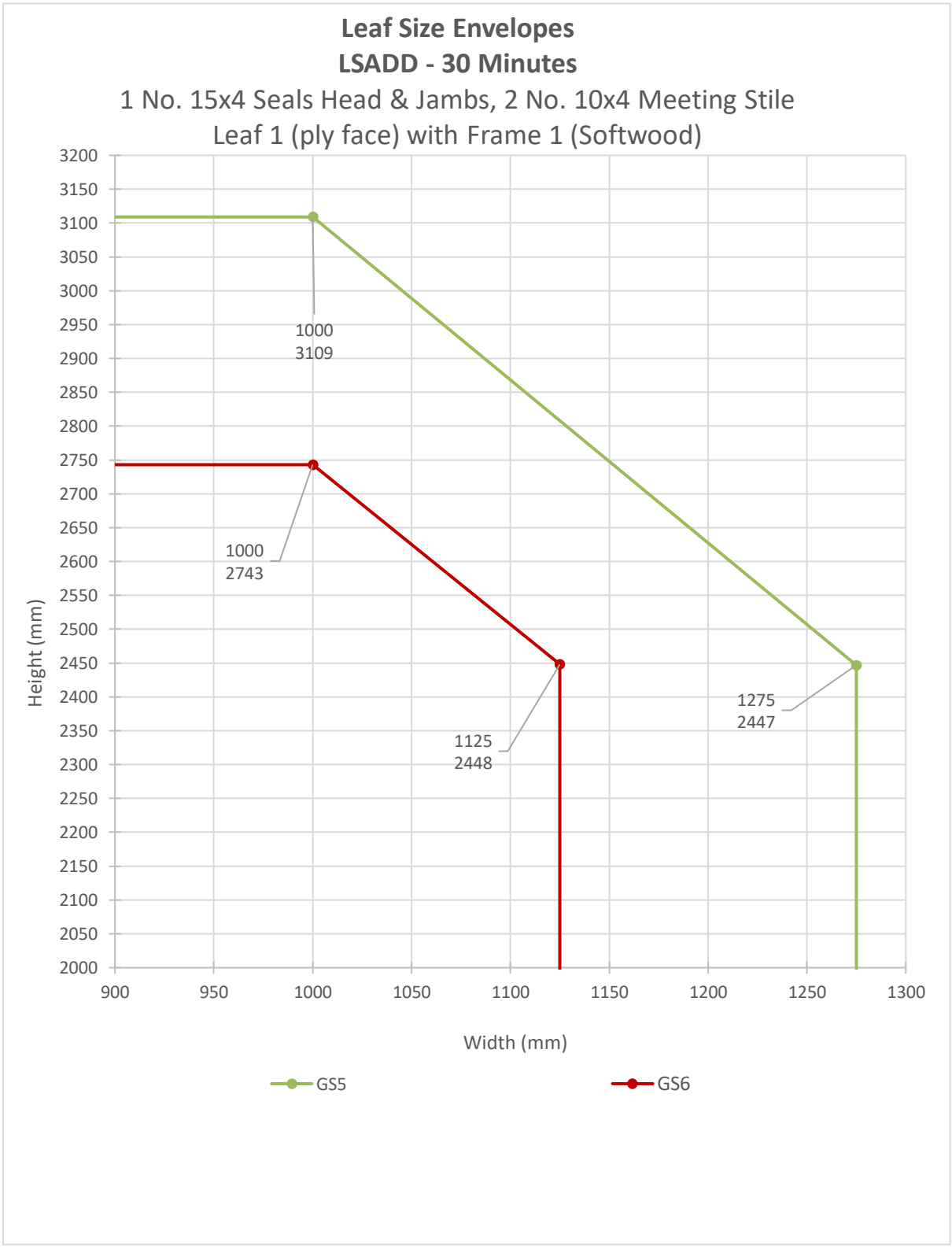


Table 4.1.1

Intumescent Specification for LSADD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GS5 (BMT/FEP/F16031)	LP1504 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
GS6 (BMT/FEP/F15066)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

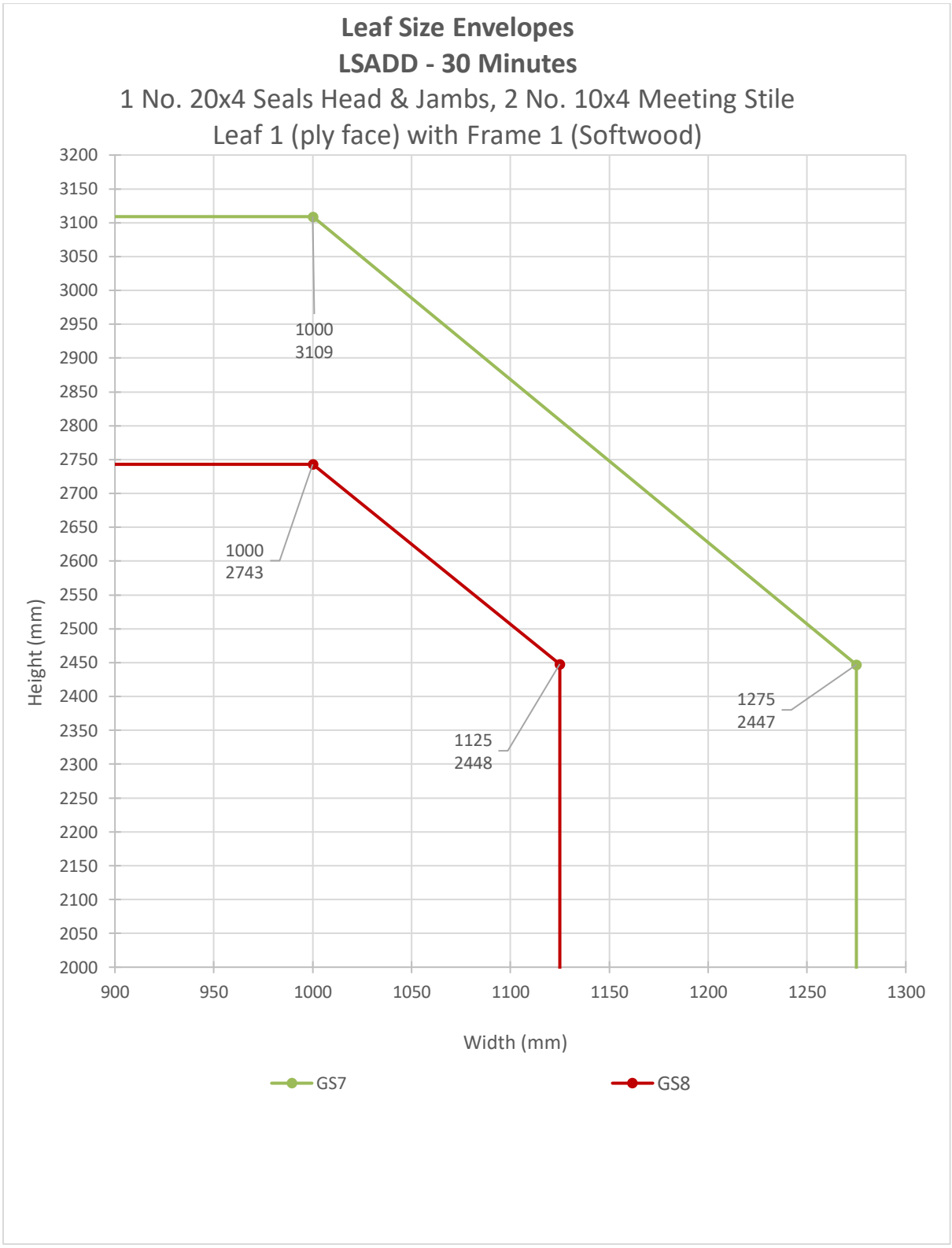

Leaf Size Envelopes
LSADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3200
3150
3100
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1300
1000
3109
1000
2743
1125
2448
1275
2447
GS7
GS8

Table 4.1.2

Intumescent Specification for LSADD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GS7 (BMT/FEP/F16031)	LP2004 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
GS8 (BMT/FEP/F15066)	8600 8500	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

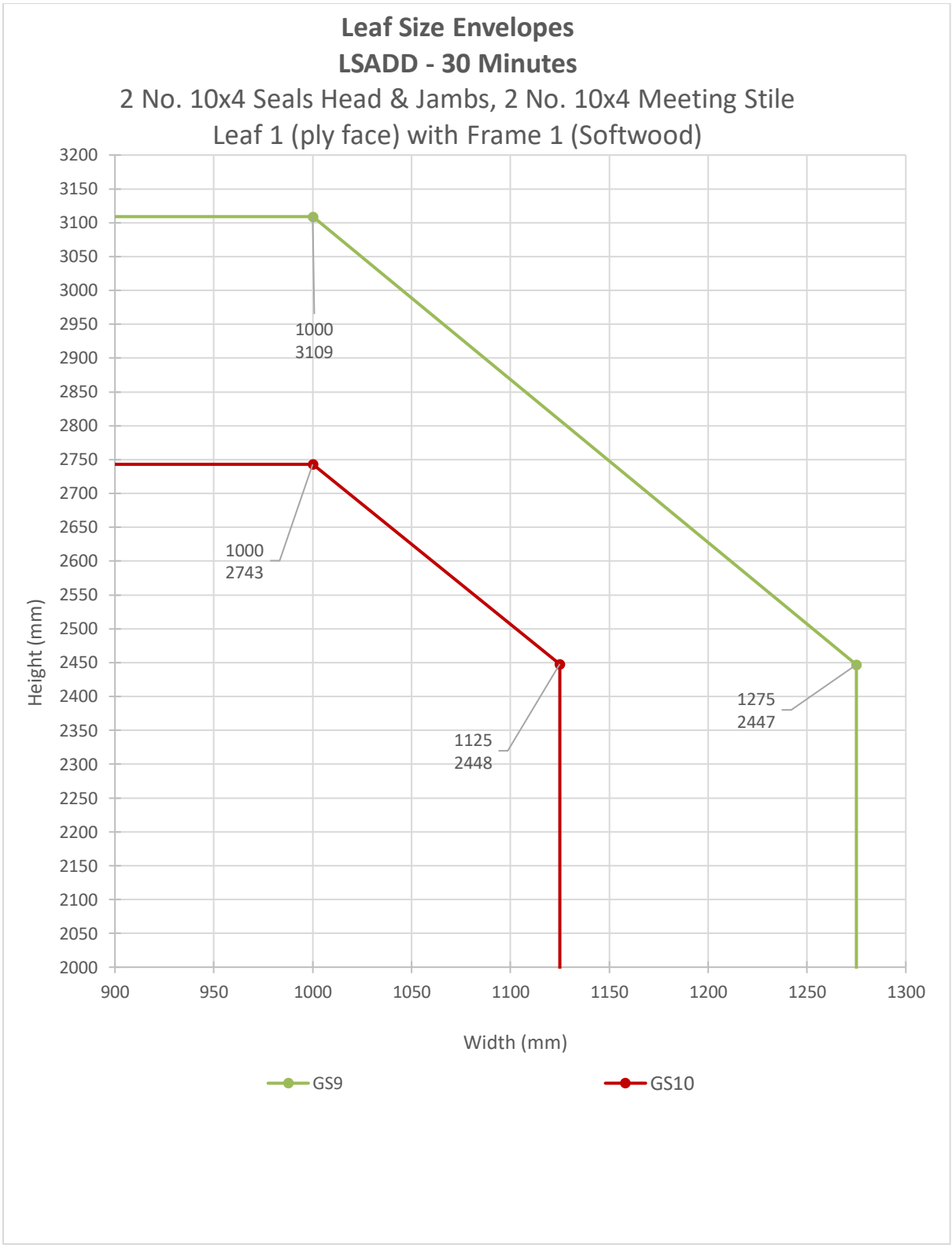

Leaf Size Envelopes
LSADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3200
3150
3100
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1300
1000
3109
1000
2743
1125
2448
1275
2447
GS9
GS10

Table 4.1.3

Intumescent Specification for LSADD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GS9 (BMT/FEP/F16031)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges and spaced 10mm apart. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
GS10 (BMT/FEP/F15066)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges and spaced 10mm apart. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

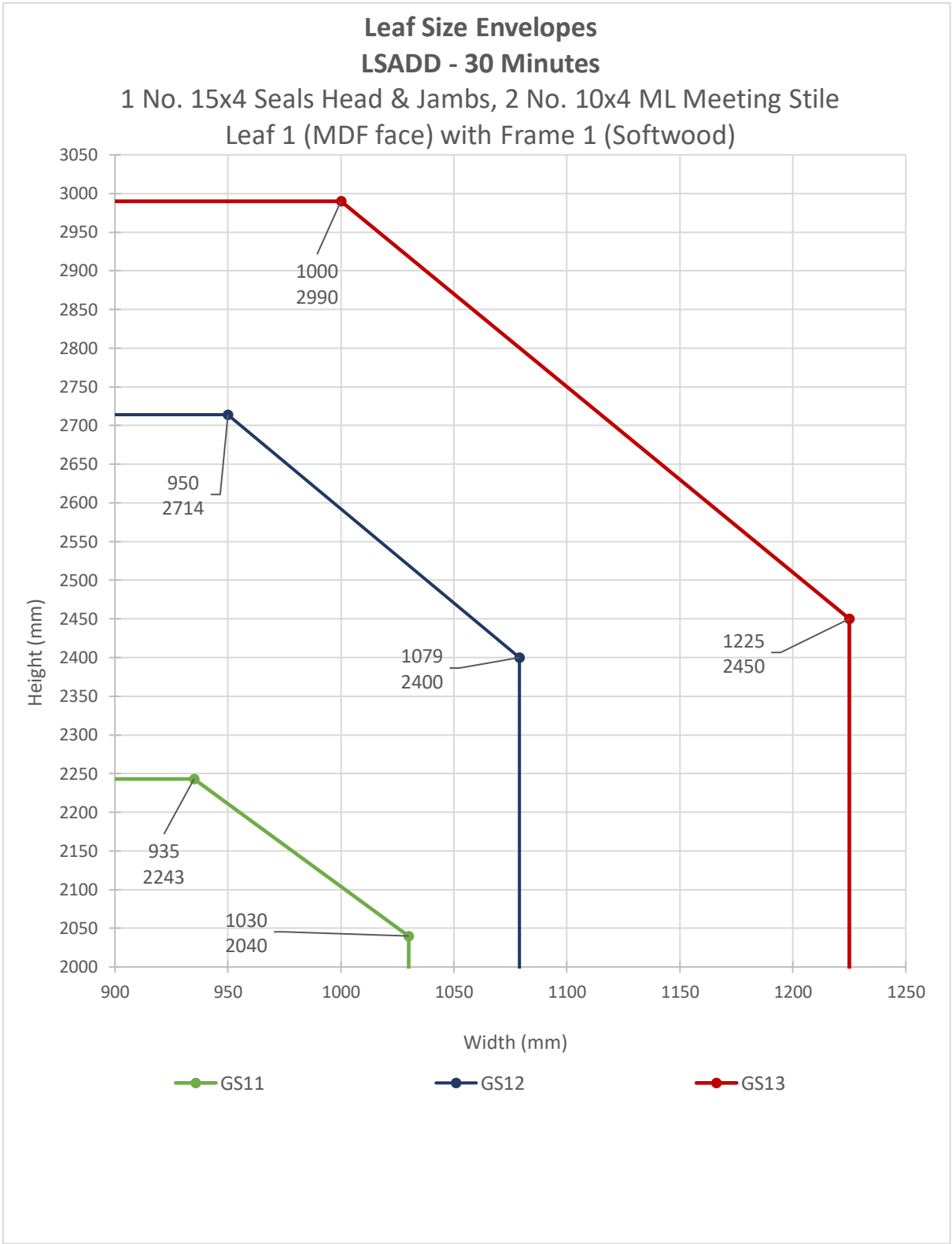

Leaf Size Envelopes
LSADD - 30 Minutes
1 No. 15x4 Seals Head & Jambs, 2 No. 10x4 ML Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1000
2990
950
2714
1079
2400
1225
2450
935
2243
1030
2040
GS11
GS12
GS13

Table 4.1.4

Intumescent Specification for LSADD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GS11 (WF414781)	LP1504 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
GS12 (WF385685)	ST154 ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge
GS13 (BMT/FEP/F16012)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

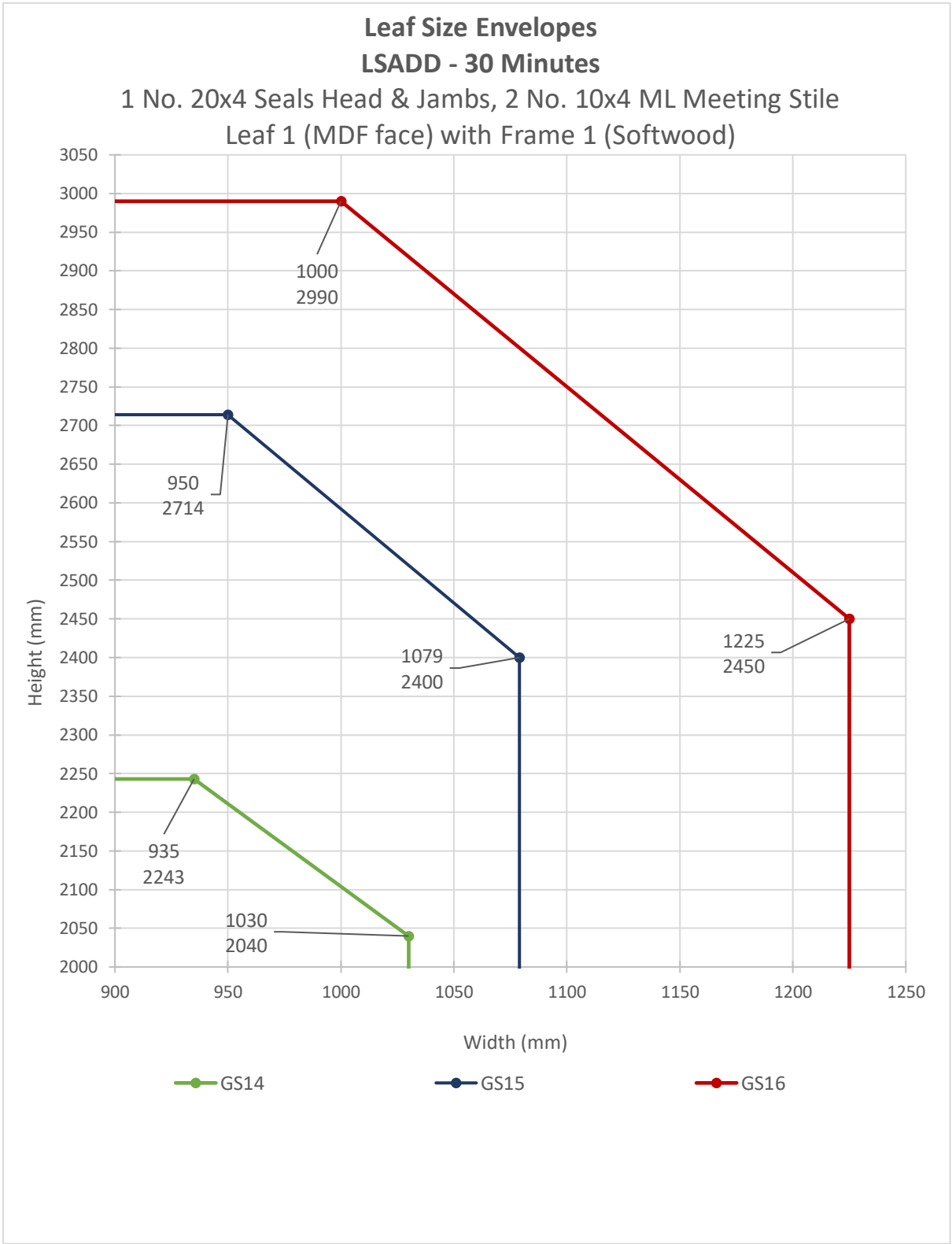

Leaf Size Envelopes
LSADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 ML Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1000
2990
950
2714
1079
2400
1225
2450
935
2243
1030
2040
GS14
GS15
GS16

Table 4.1.5

Intumescent Specification for LSADD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GS14 (WF414781)	LP2004 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
GS15 (WF385685)	ST204 ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge
GS16 (BMT/FEP/F16012)	8600 8500	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

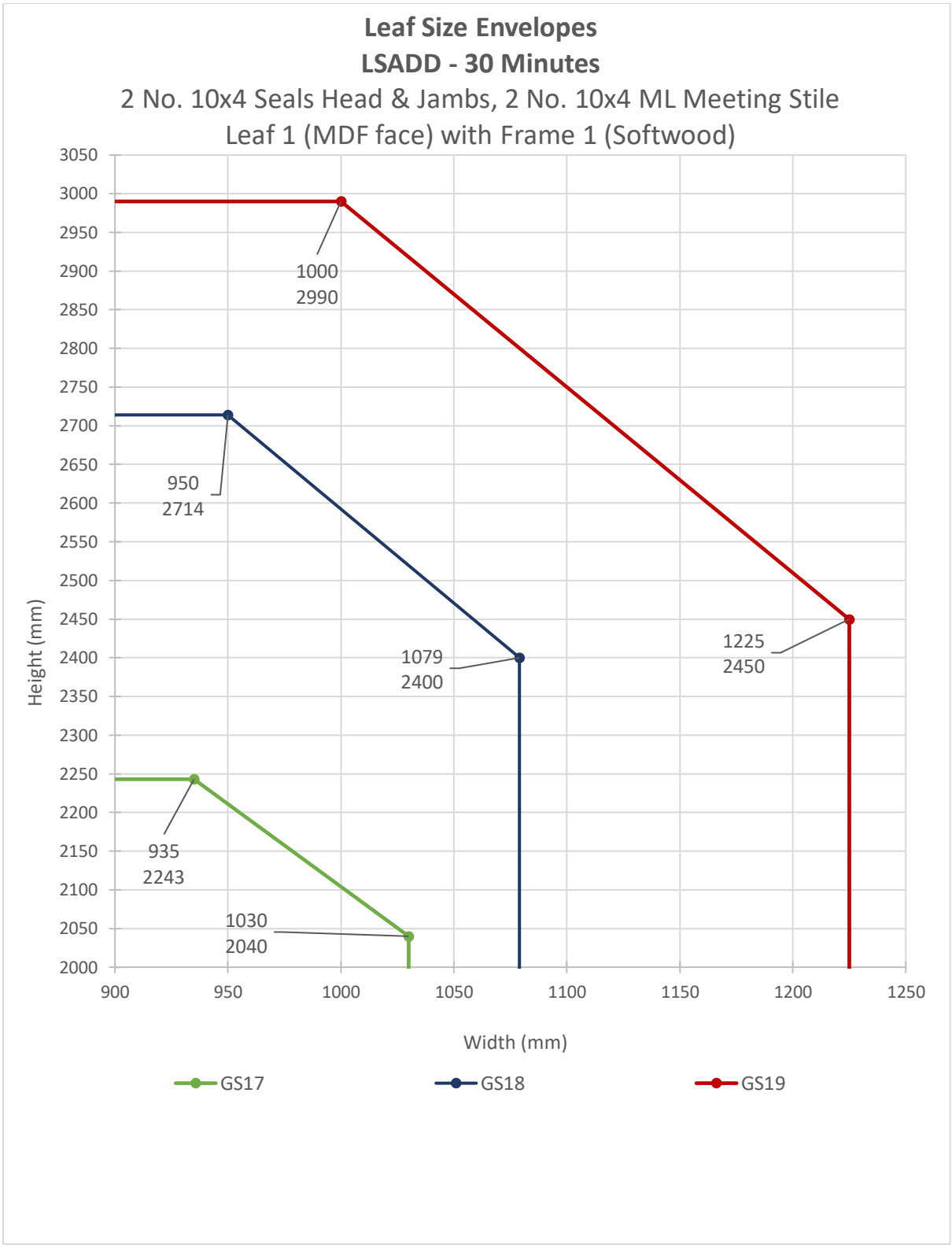

Leaf Size Envelopes
LSADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 ML Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1000
2990
950
2714
1079
2400
1225
2450
935
2243
1030
2040
GS17
GS18
GS19

Table 4.1.6

Intumescent Specification for LSADD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GS17 (WF414781)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges and spaced 10mm apart. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
GS18 (WF385685)	ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges and spaced 10mm apart. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge
GS19 (BMT/FEP/F16012)	8500	Pyroplex Ltd	**Head & Jambs:** 2no 10x4 Fitted centrally in frame reveal or leaf edges and spaced 10mm apart. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

4.5.10 ULSADD Configuration – Leaf Size Envelopes & Intumescent Specification

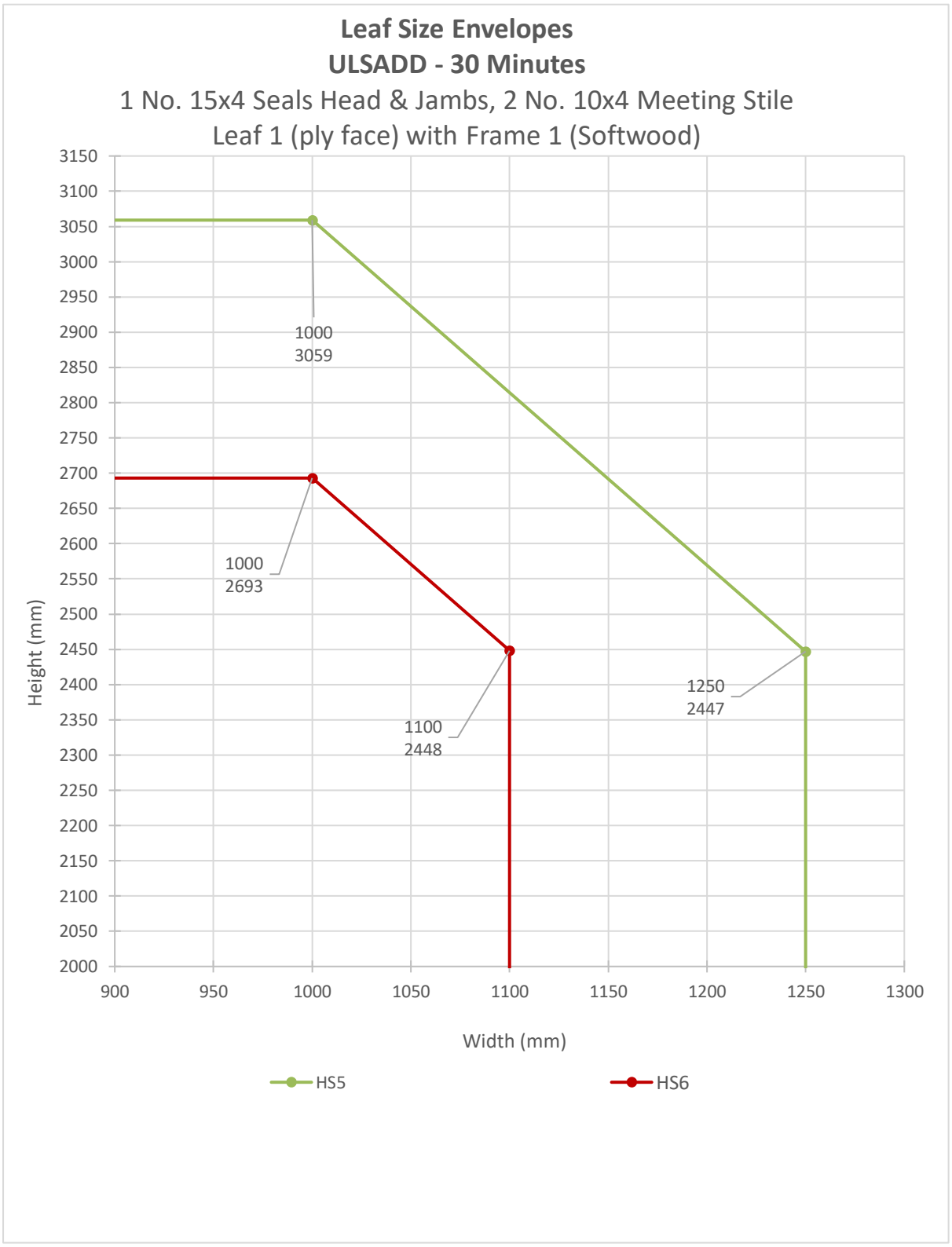


Table 5.1.1

Intumescent Specification for ULSADD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS5 (BMT/FEP/F16031)	LP1504 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
HS6 (BMT/FEP/F15066)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal ref: fitted 28mm from the opening face, in the meeting edge of one leaf only

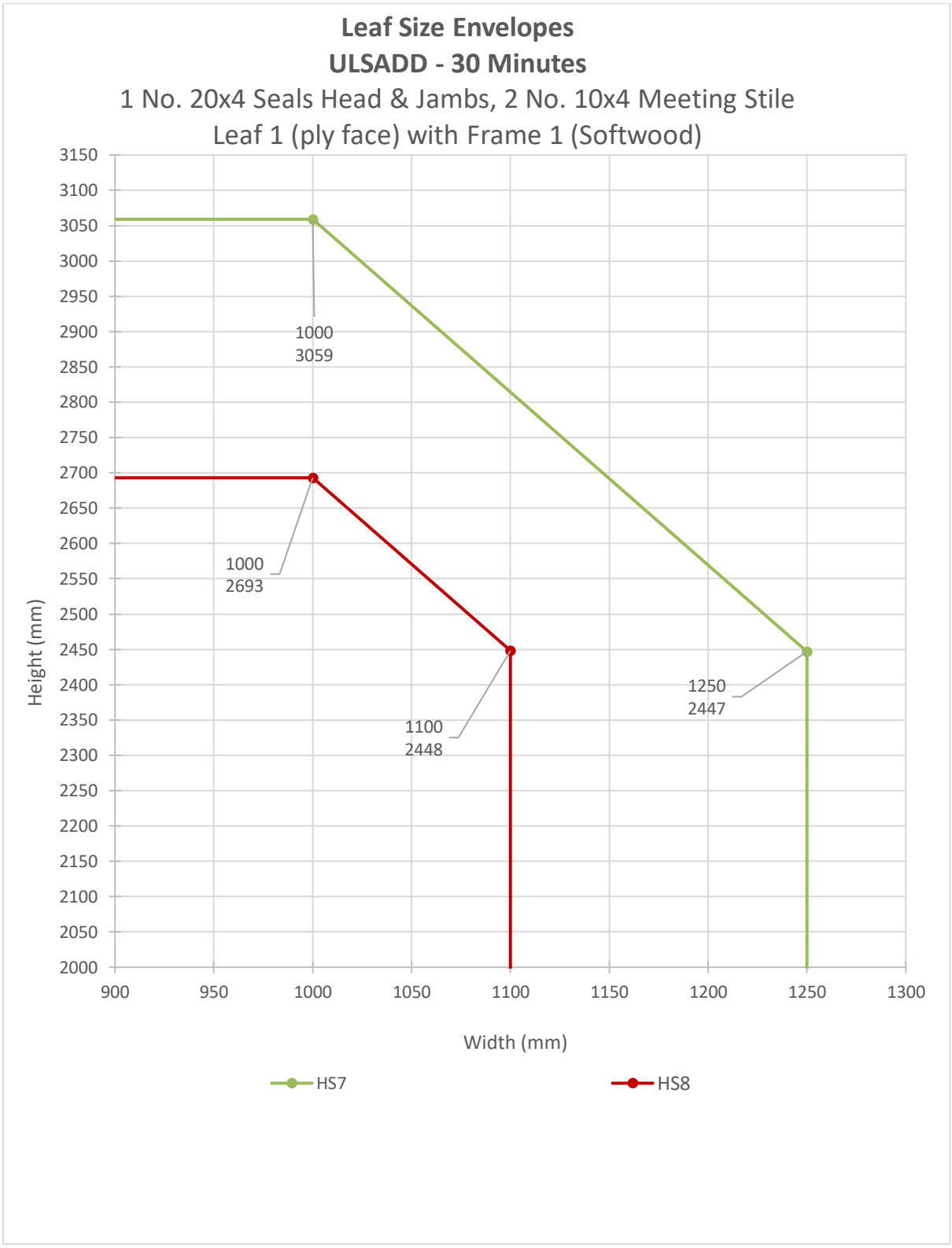

Leaf Size Envelopes
ULSADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3150
3100
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1300
1000
3059
1000
2693
1100
2448
1250
2447
HS7
HS8

Table 5.1.2

Intumescent Specification for ULSADD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS7 (BMT/FEP/F16031)	LP2004 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
HS8 (BMT/FEP/F15066)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

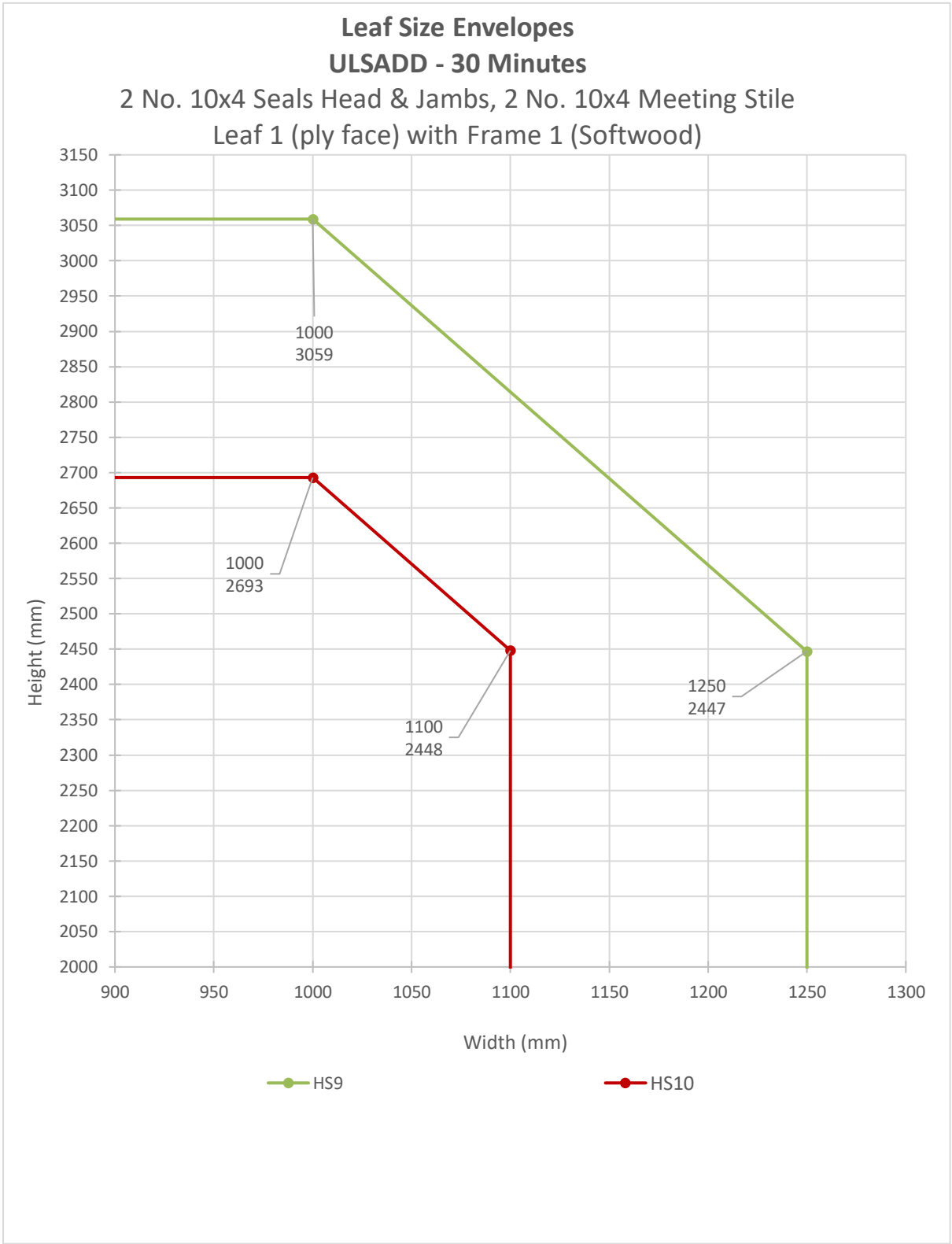

Leaf Size Envelopes
ULSADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (ply face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
3150
3100
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1300
1000
3059
1000
2693
1100
2448
1250
2447
HS9
HS10

Table 5.1.3

Intumescent Specification for ULSADD

Leaf 1 (ply face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS9 (BMT/FEP/F16031)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face in the frame reveal or leaf edges **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
HS10 (BMT/FEP/F15066)	8500	Pyroplex Ltd	**Head & Jambs:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the frame reveal or leaf edges **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

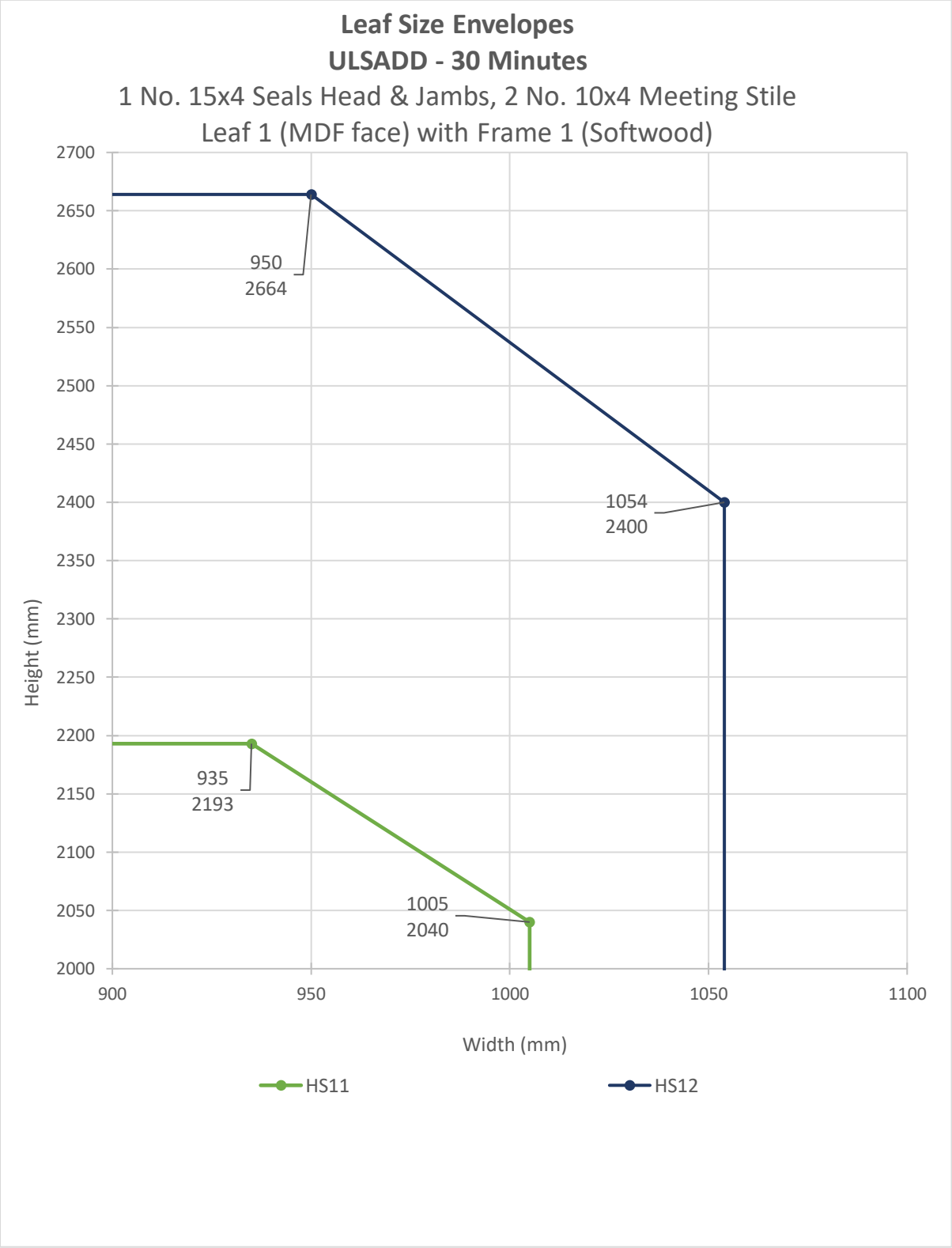

Leaf Size Envelopes
ULSADD - 30 Minutes
1 No. 15x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
950
2664
1054
2400
935
2193
1005
2040
HS11
HS12

Table 5.1.4

Intumescent Specification for ULSADD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS11 (WF414781)	LP1504 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
HS12 (WF385685)	ST154 ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge

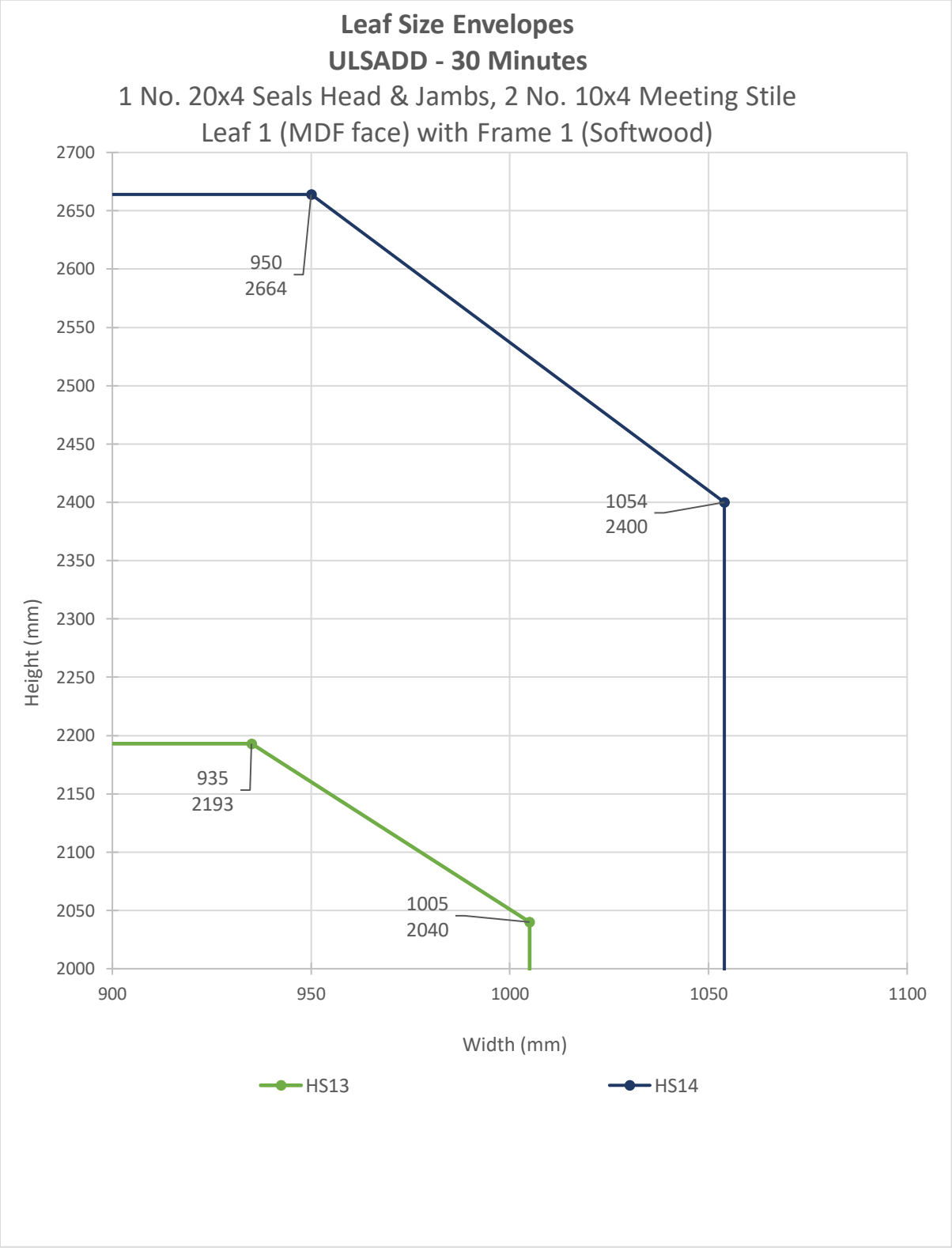

Leaf Size Envelopes
ULSADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
950
2664
1054
2400
935
2193
1005
2040
HS13
HS14

Table 5.1.5

Intumescent Specification for ULSADD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS13 (WF414781)	LP2004 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
HS14 (WF385685)	ST204 ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge

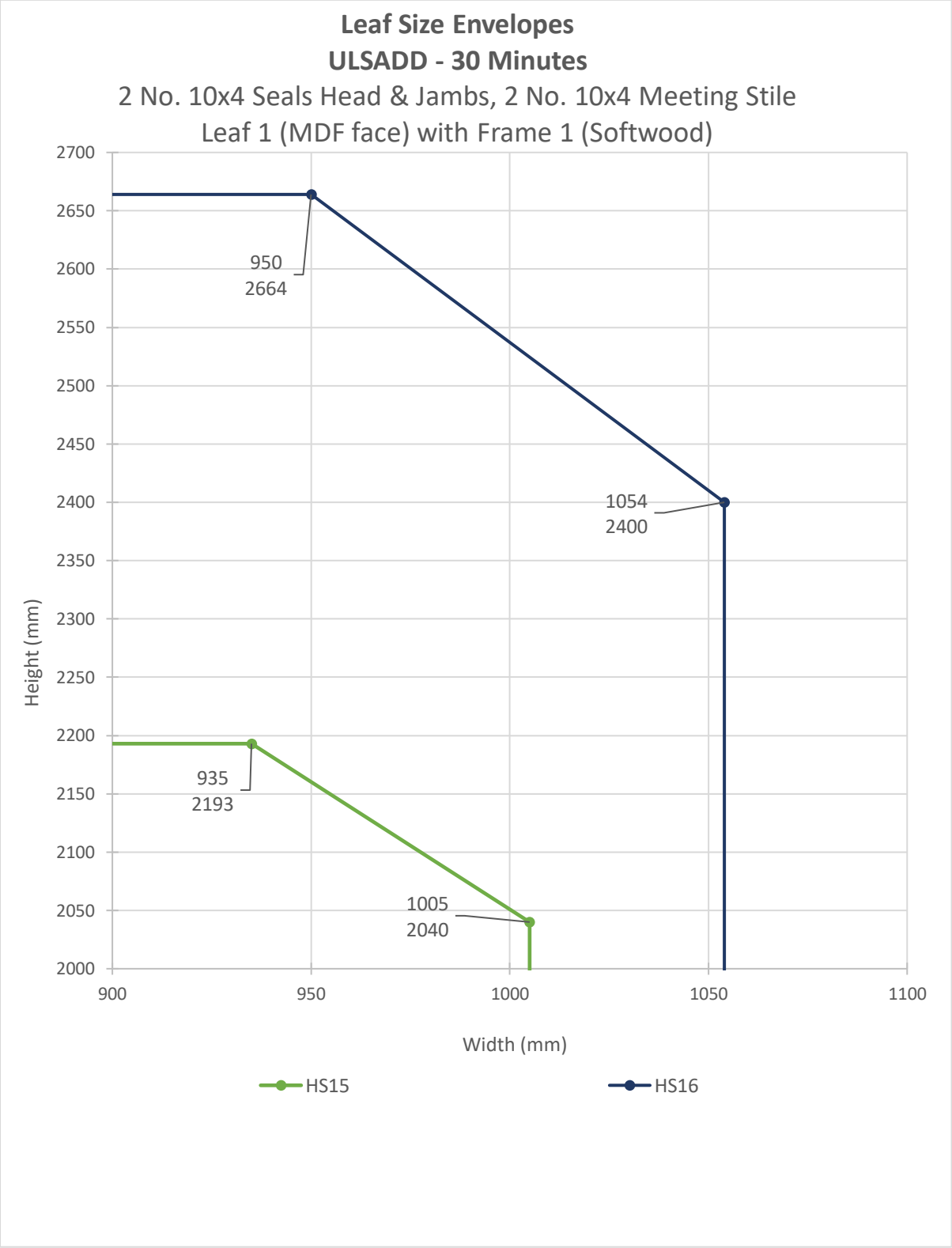

Leaf Size Envelopes
ULSADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
Width (mm)
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
950
2664
1054
2400
935
2193
1005
2040
HS15
HS16

Table 5.1.6

Intumescent Specification for ULSADD

Leaf 1 (MDF face) with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS15 (WF414781)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face in the frame reveal or leaf edges **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
HS16 (WF385685)	ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in the frame reveal or leaf edges **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge

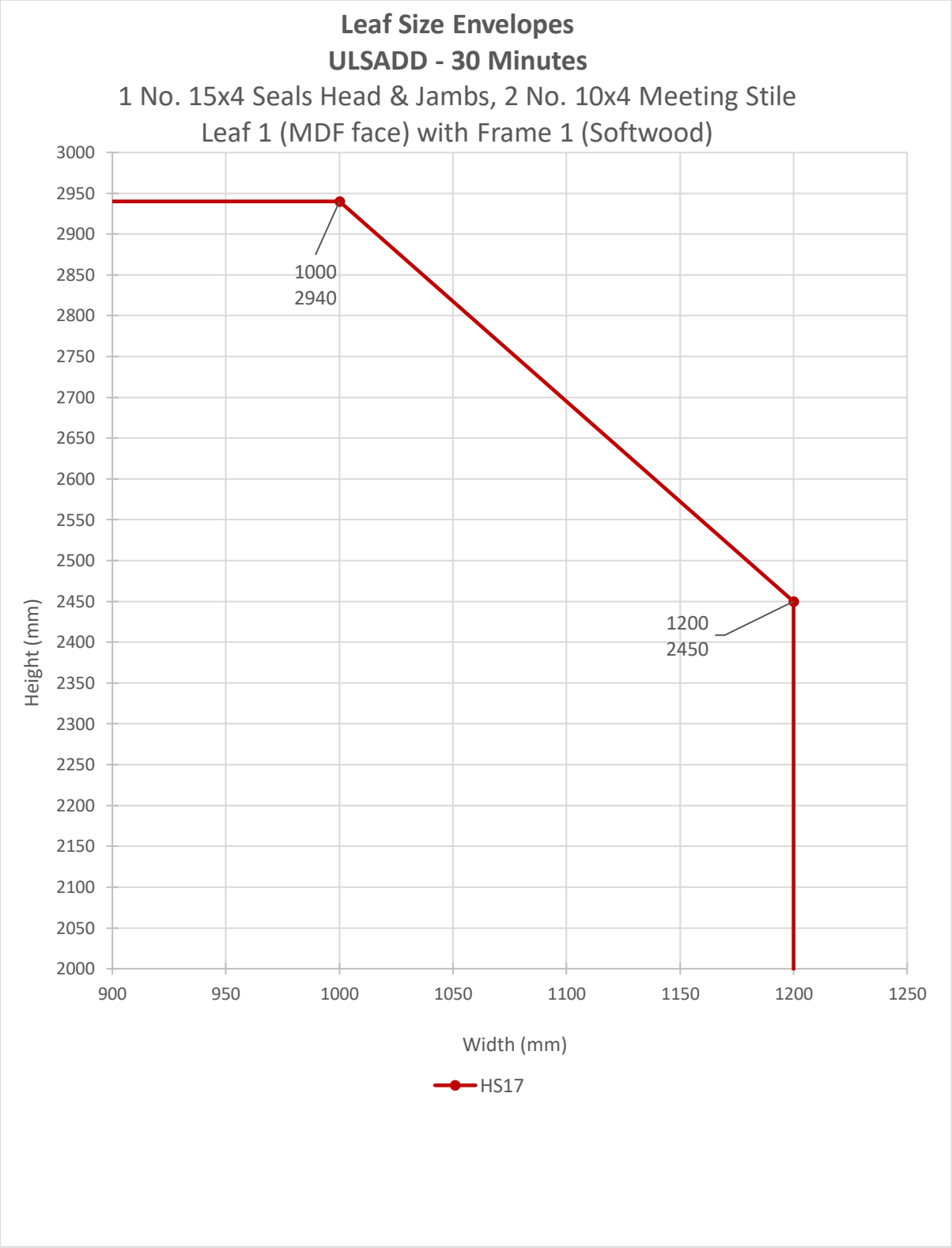

Leaf Size Envelopes
ULSADD - 30 Minutes
1 No. 15x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
Width (mm)
1000
2940
1200
2450
HS17

Table 5.1.7

Intumescent Specification for ULSADD

Leaf 1 MDF with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS17 (BMT/FEP/F16012)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

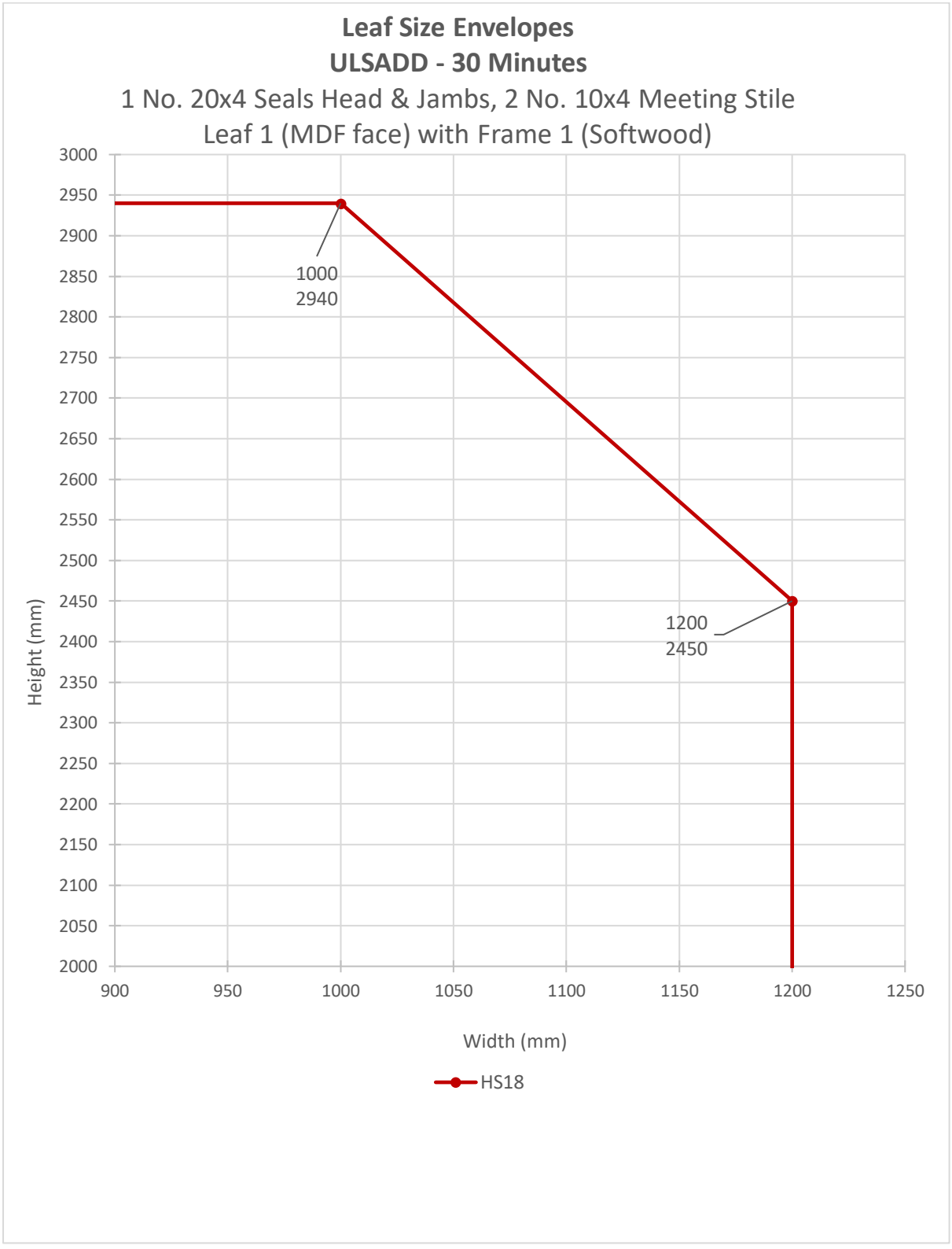

Leaf Size Envelopes
ULSADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
Width (mm)
1000
2940
1200
2450
HS18

Table 5.1.8

Intumescent Specification for ULSADD

Leaf 1 MDF with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS18 (BMT/FEP/F16012)	8600 8500	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

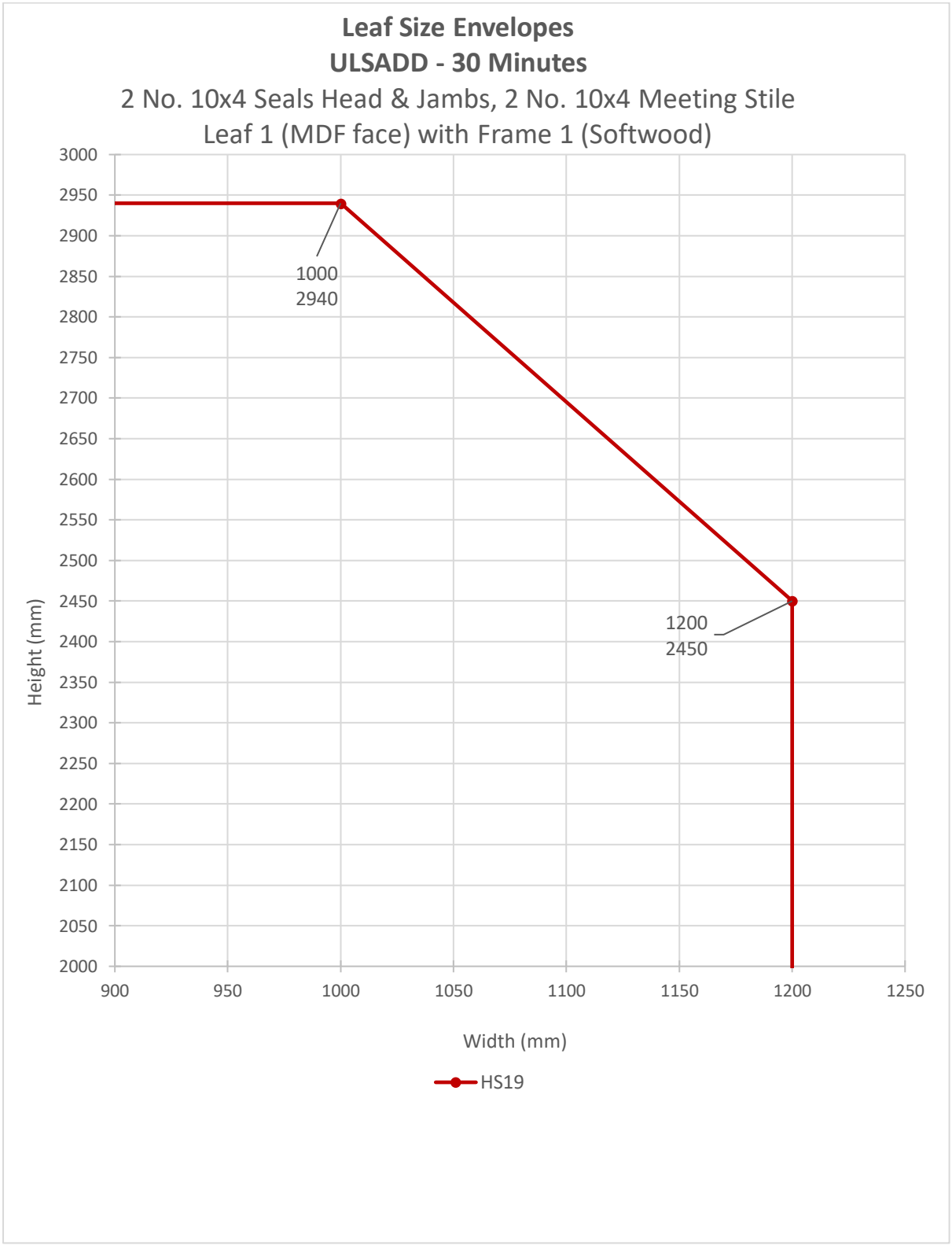

Leaf Size Envelopes
ULSADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 1 (Softwood)
Height (mm)
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
Width (mm)
1000
2940
1200
2450
HS19

Table 5.1.9

Intumescent Specification for ULSADD

Leaf 1 MDF with Frame 1 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HS19 (BMT/FEP/F16012)	8500	Pyroplex Ltd	**Head & Jambs:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in the leaf edge or frame reveal **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

4.5.11 DADD Configuration – Leaf Size Envelopes & Intumescent Specification

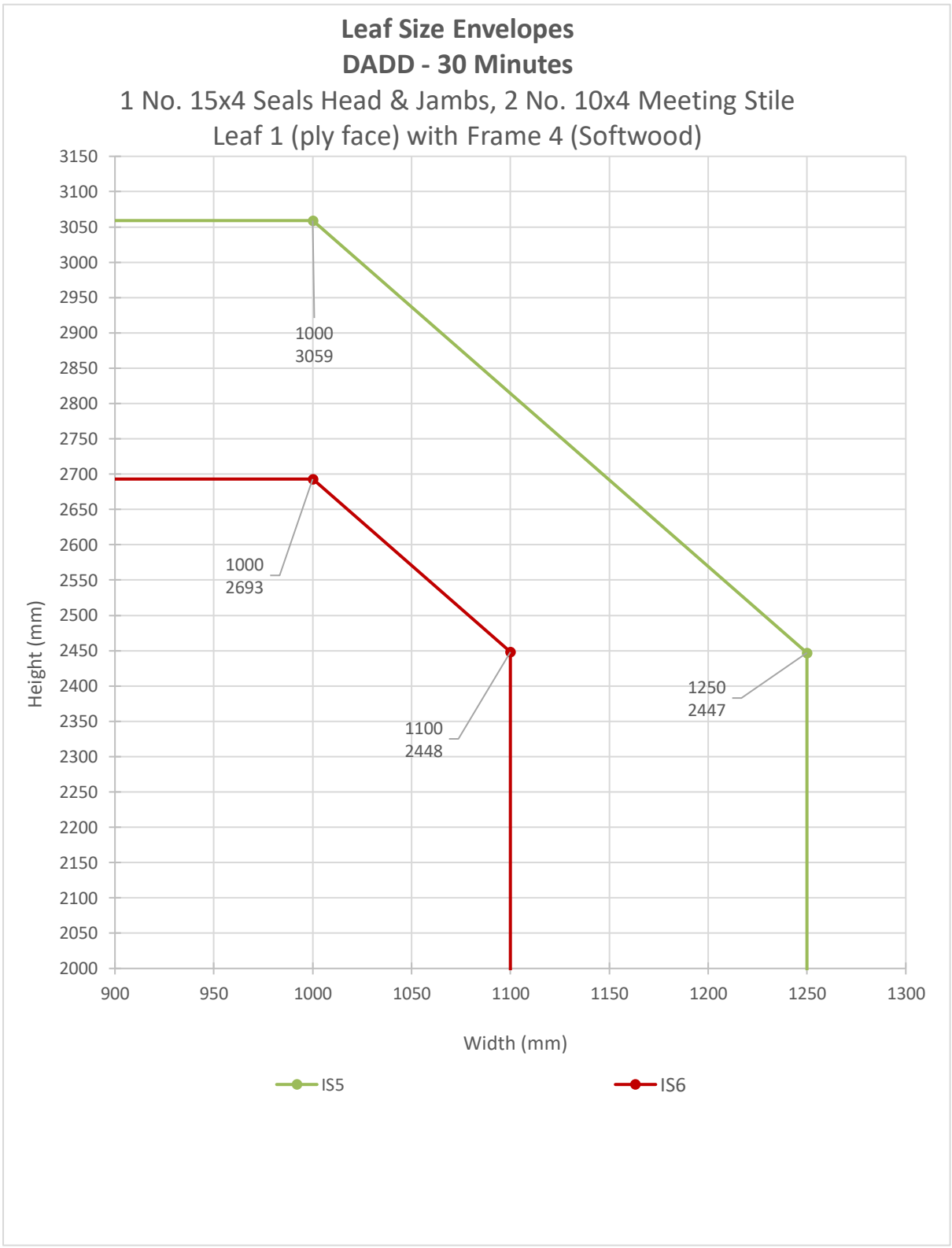


Table 6.1.1

Intumescent Specification for DADD

Leaf 1 (ply face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS5 (BMT/FEP/F16031)	LP1504 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
IS6 (BMT/FEP/F15066)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal ref: fitted 28mm from the opening face, in the meeting edge of one leaf only

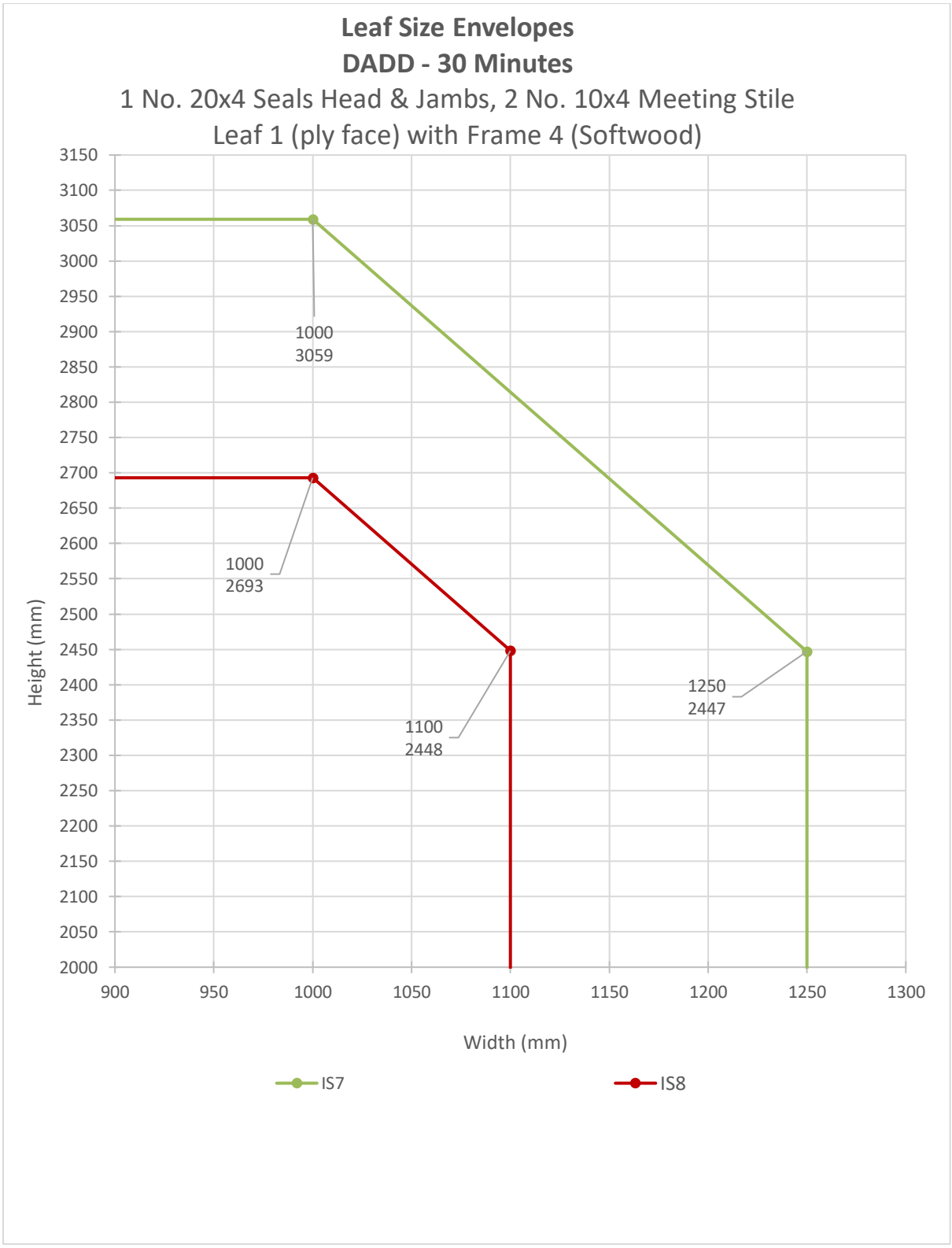

Leaf Size Envelopes
DADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (ply face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
3150
3100
3050
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
1300
1000
3059
1000
2693
1100
2448
1250
2447
IS7
IS8

Table 6.1.2

Intumescent Specification for DADD

Leaf 1 (ply face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS7 (BMT/FEP/F16031)	LP2004 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
IS8 (BMT/FEP/F15066)	8600 8500	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

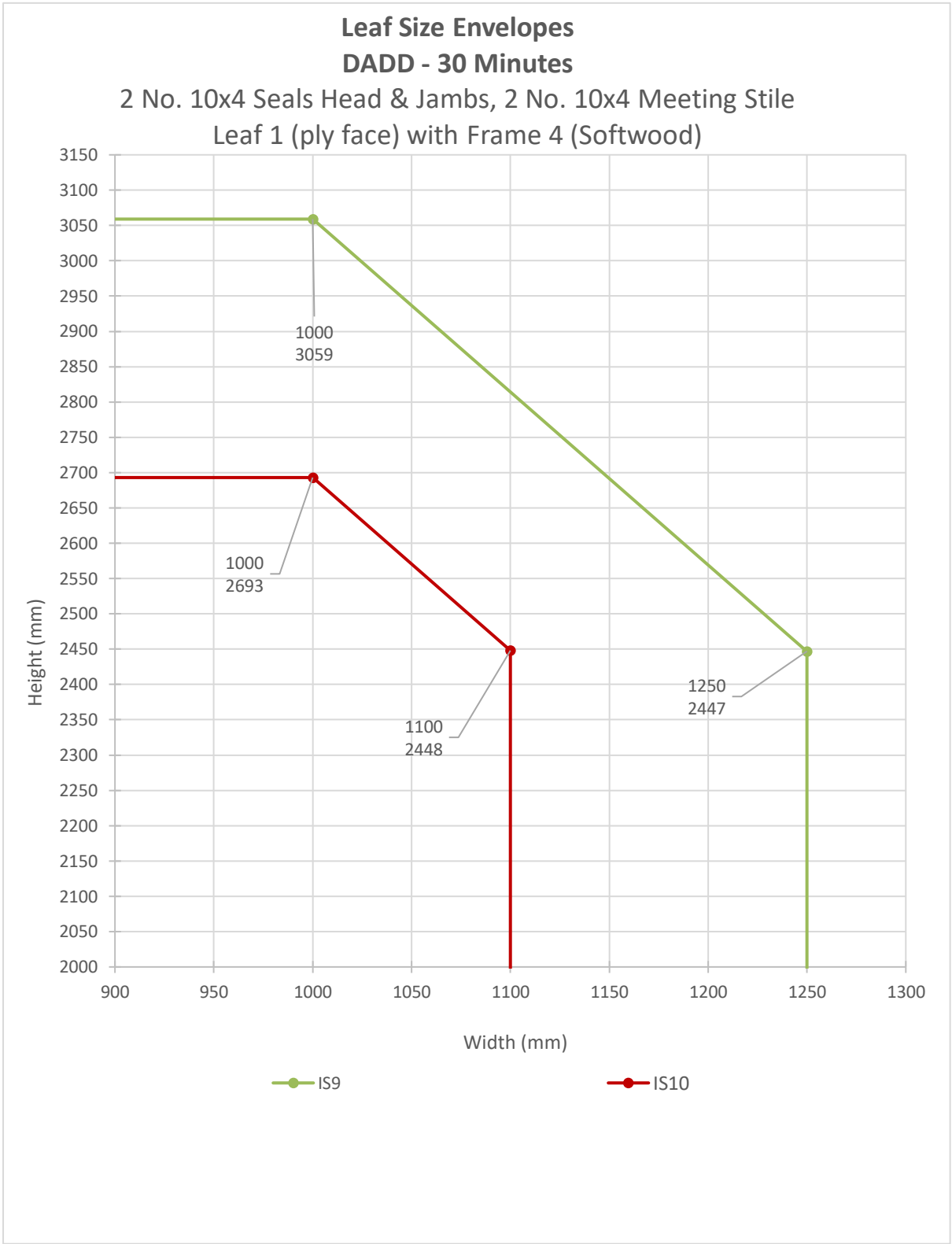

Leaf Size Envelopes
DADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (ply face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
1000
3059
1000
2693
1100
2448
1250
2447
IS9
IS10

Table 6.1.3

Intumescent Specification for DADD

Leaf 1 (ply face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS9 (BMT/FEP/F16031)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face in the frame reveal or leaf edges **Meeting Edges:** 2No. 10 x 4 Lorient LP1004 Type 617 fitted 10mm apart with the first seal 7mm from the opening face
IS10 (BMT/FEP/F15066)	8500	Pyroplex Ltd	**Head & Jambs:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the frame reveal or leaf edges **Meeting Edges:** 1No. 10 x 4 Pyroplex seal fitted 8mm from the opening face and 1 No. 10 x 4 Pyroplex seal fitted 28mm from the opening face, in the meeting edge of one leaf only

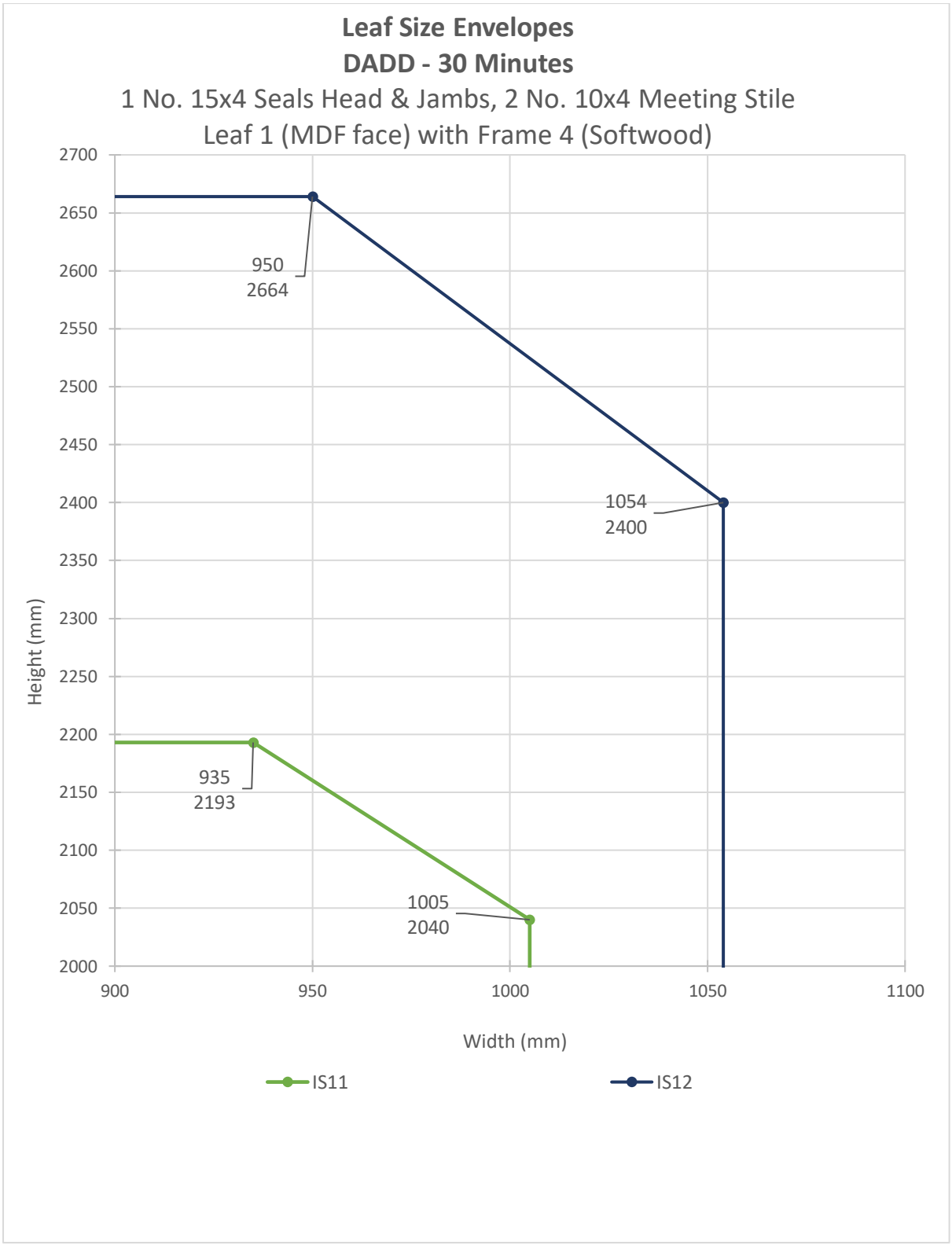

Leaf Size Envelopes
DADD - 30 Minutes
1 No. 15x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
950
2664
1054
2400
935
2193
1005
2040
IS11
IS12

Table 6.1.4

Intumescent Specification for DADD

Leaf 1 (MDF face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS11 (WF414781)	LP1504 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
IS12 (WF385685)	ST154 ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge

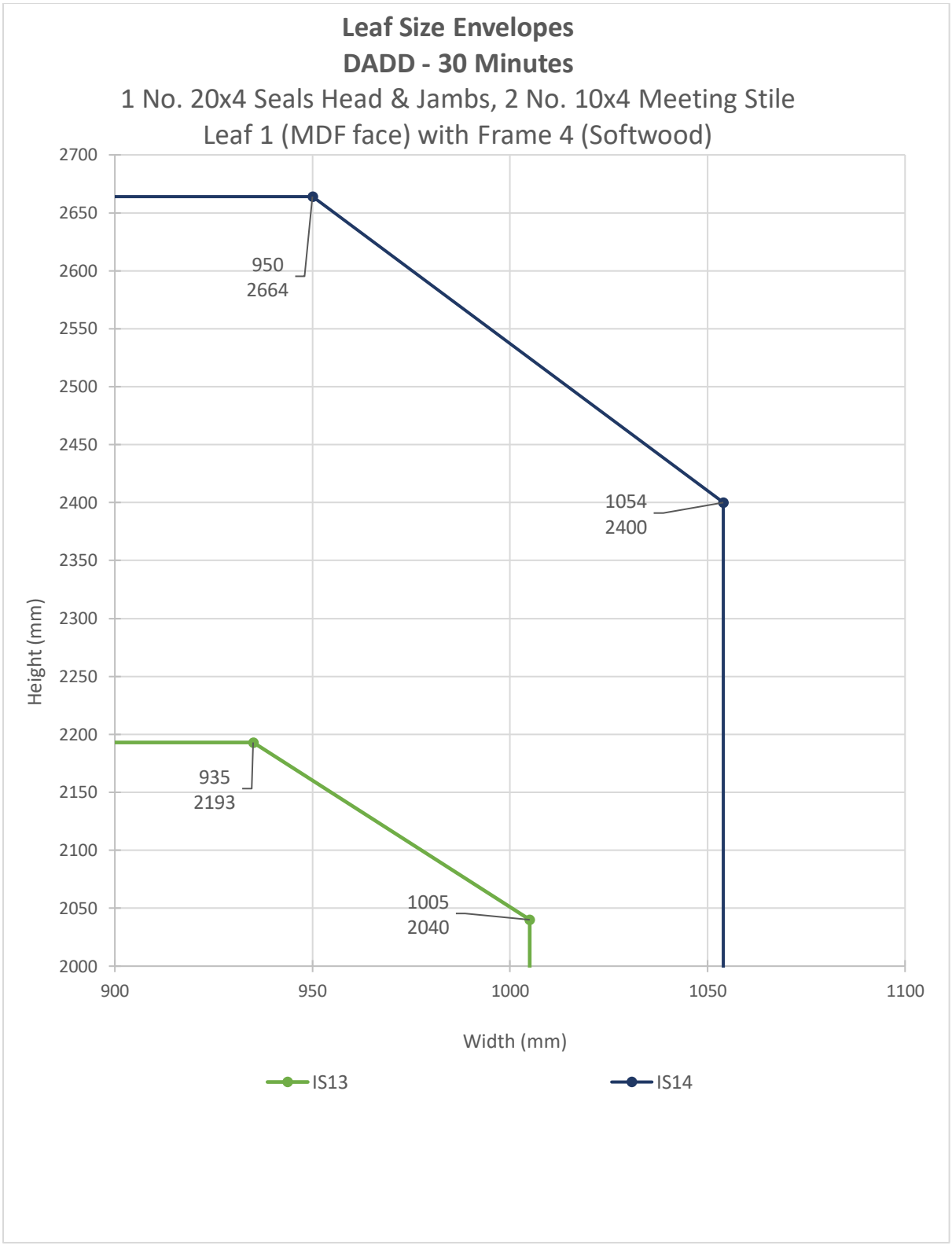

Leaf Size Envelopes
DADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
950
2664
1054
2400
935
2193
1005
2040
IS13
IS14

Table 6.1.5

Intumescent Specification for DADD

Leaf 1 (MDF face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS13 (WF414781)	LP2004 LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
IS14 (WF385685)	ST204 ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge

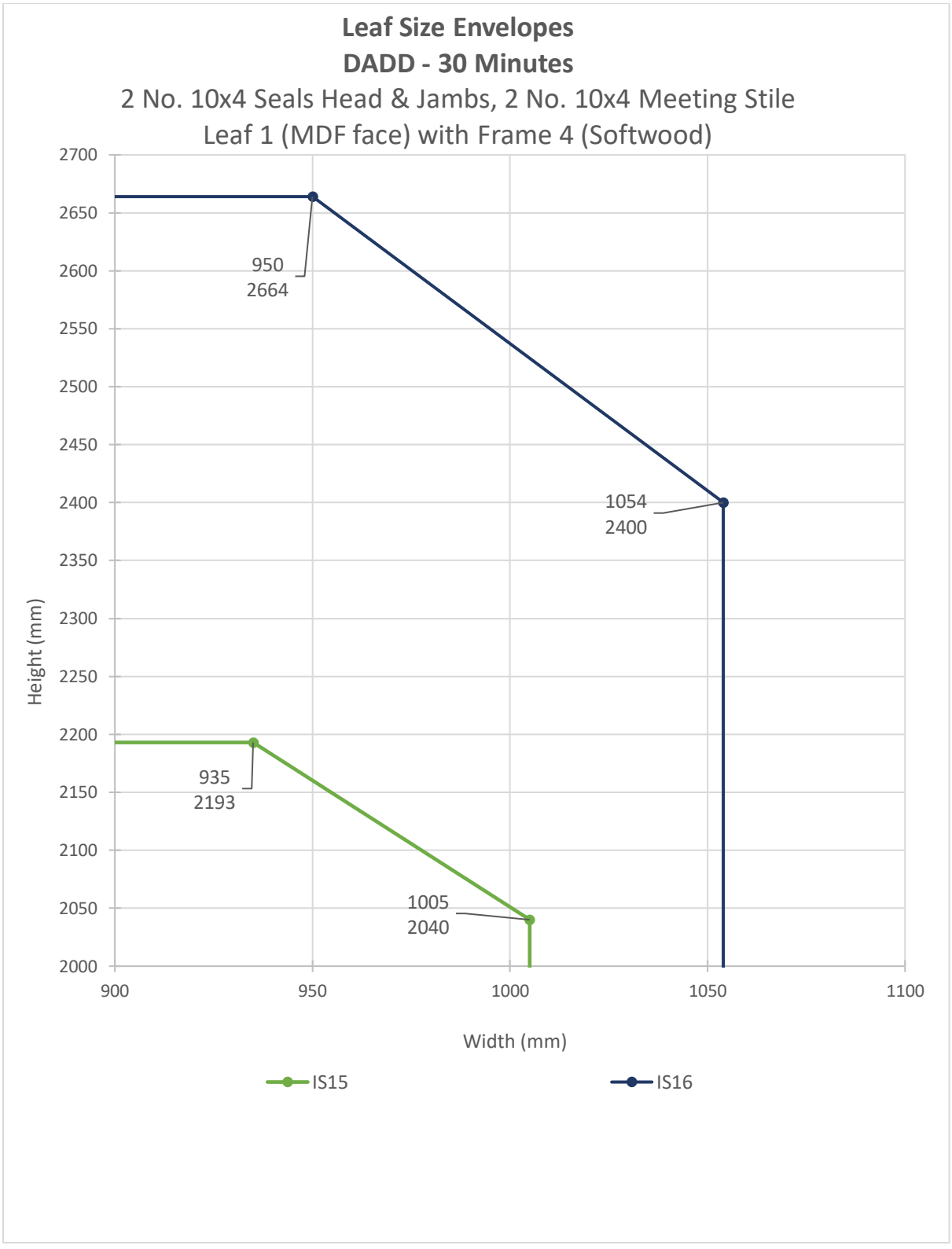

Leaf Size Envelopes
DADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
Width (mm)
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
950
2664
1054
2400
935
2193
1005
2040
IS15
IS16

Table 6.1.5

Intumescent Specification for DADD

Leaf 1 (MDF face) with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS15 (WF414781)	LP1004	Lorient Polyproducts Ltd	**Head & Jambs:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face in the frame reveal or leaf edge **Meeting Edges:** 2No. 10 x 4 Lorient LP1004DS Type 617 fitted 10mm apart with the first seal 6mm from the opening face
IS16 (WF385685)	ST104	Sealed Tight Solutions Ltd	**Head & Jambs:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in the frame reveal or leaf edge **Meeting Edges:** 2 No. 10 x 4 Sealed Tight Solutions re: ST104FO spaced 10mm apart and fitted 7.5mm from the opening face in one meeting edge

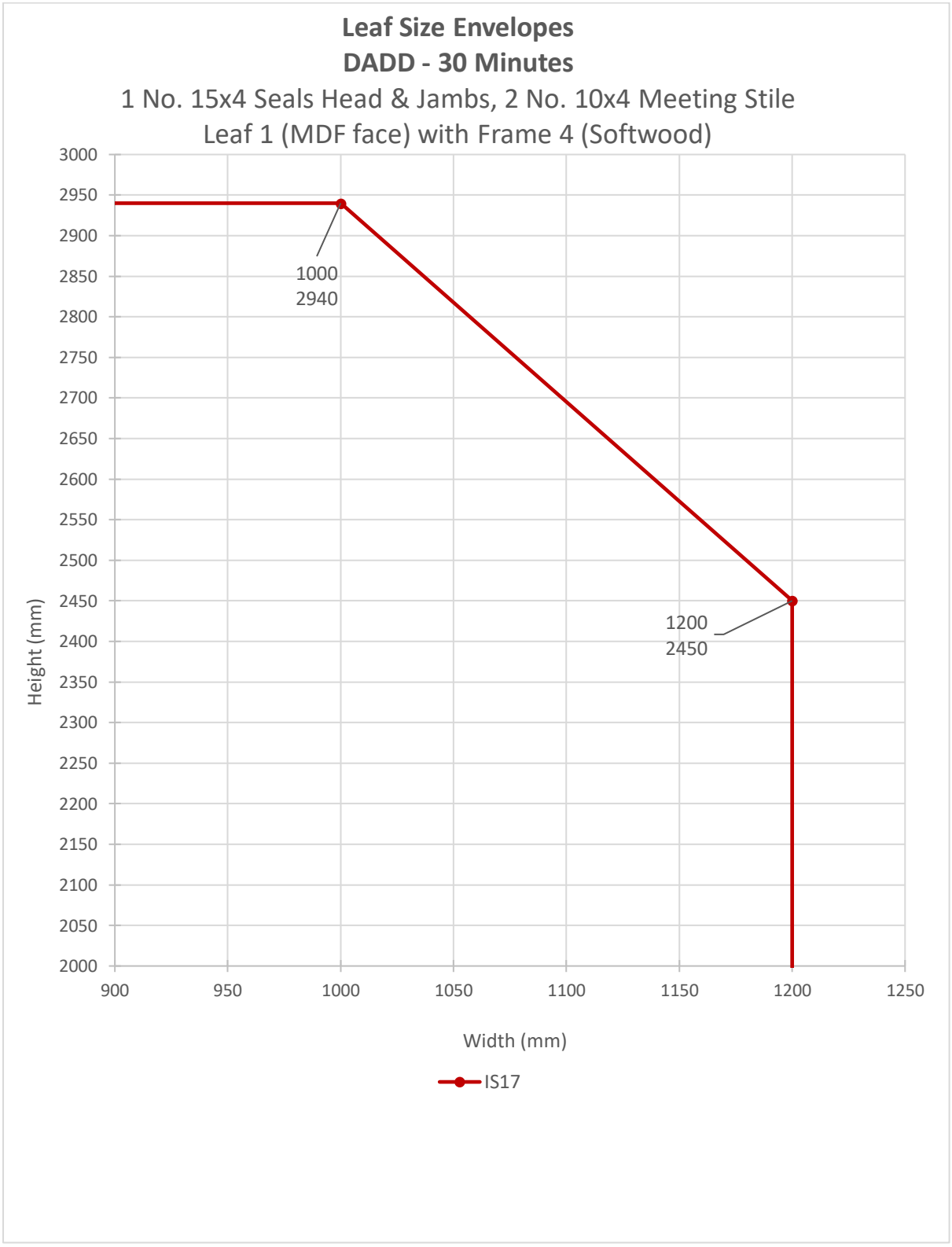

Leaf Size Envelopes
DADD - 30 Minutes
1 No. 15x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
Width (mm)
1000
2940
1200
2450
IS17

Table 6.1.6

Intumescent Specification for DADD

Leaf 1 MDF with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS17 (BMT/FEP/F16012)	8700 8500	Pyroplex Ltd	**Head & Jambs:** 1no 15x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

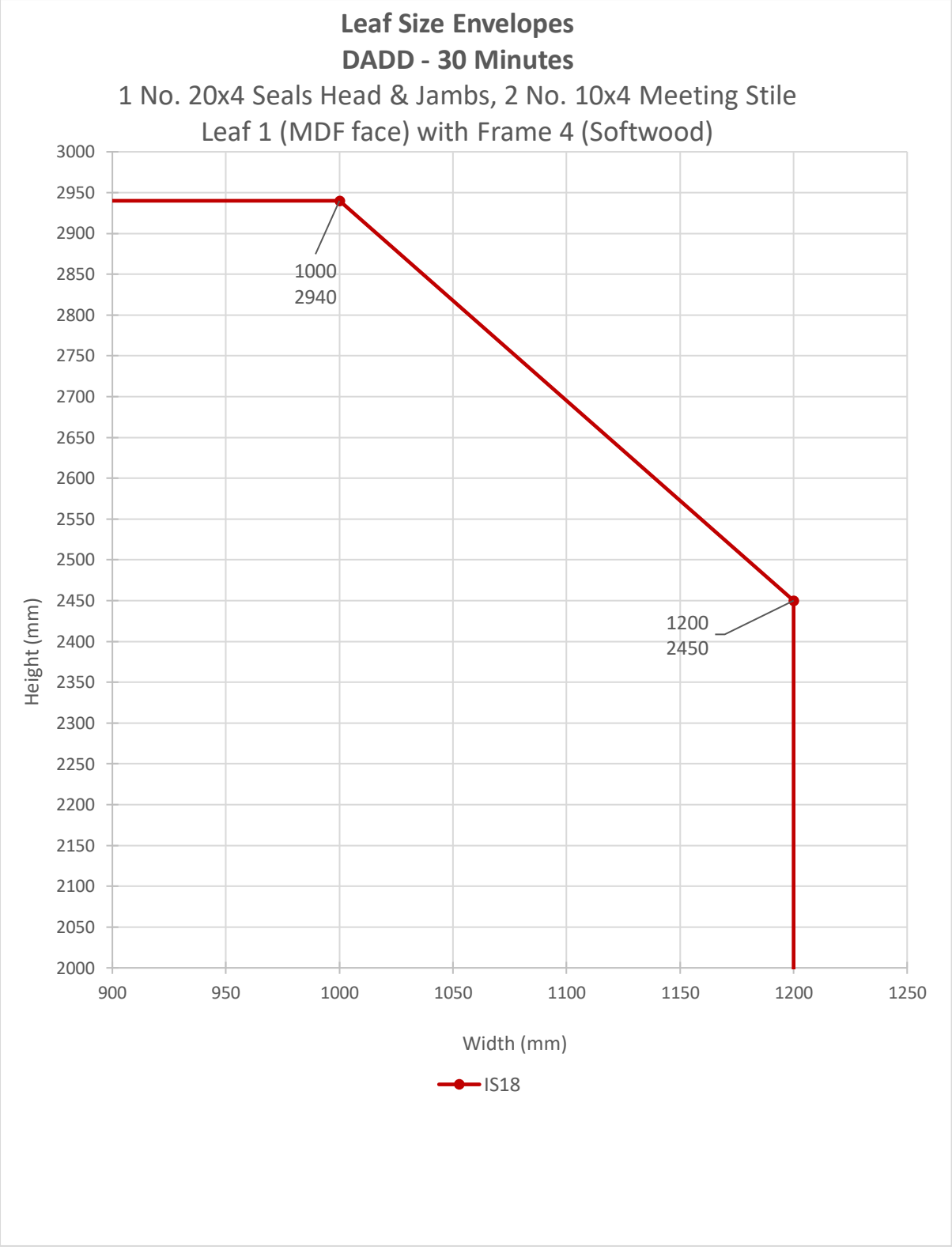

Leaf Size Envelopes
DADD - 30 Minutes
1 No. 20x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
900
950
1000
1050
1100
1150
1200
1250
Width (mm)
1000
2940
1200
2450
IS18

Table 6.1.7

Intumescent Specification for DADD

Leaf 1 MDF with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS18 (BMT/FEP/F16012)	8600 8500	Pyroplex Ltd	**Head & Jambs:** 1no 20x4 Fitted centrally in frame reveal or leaf edges. **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

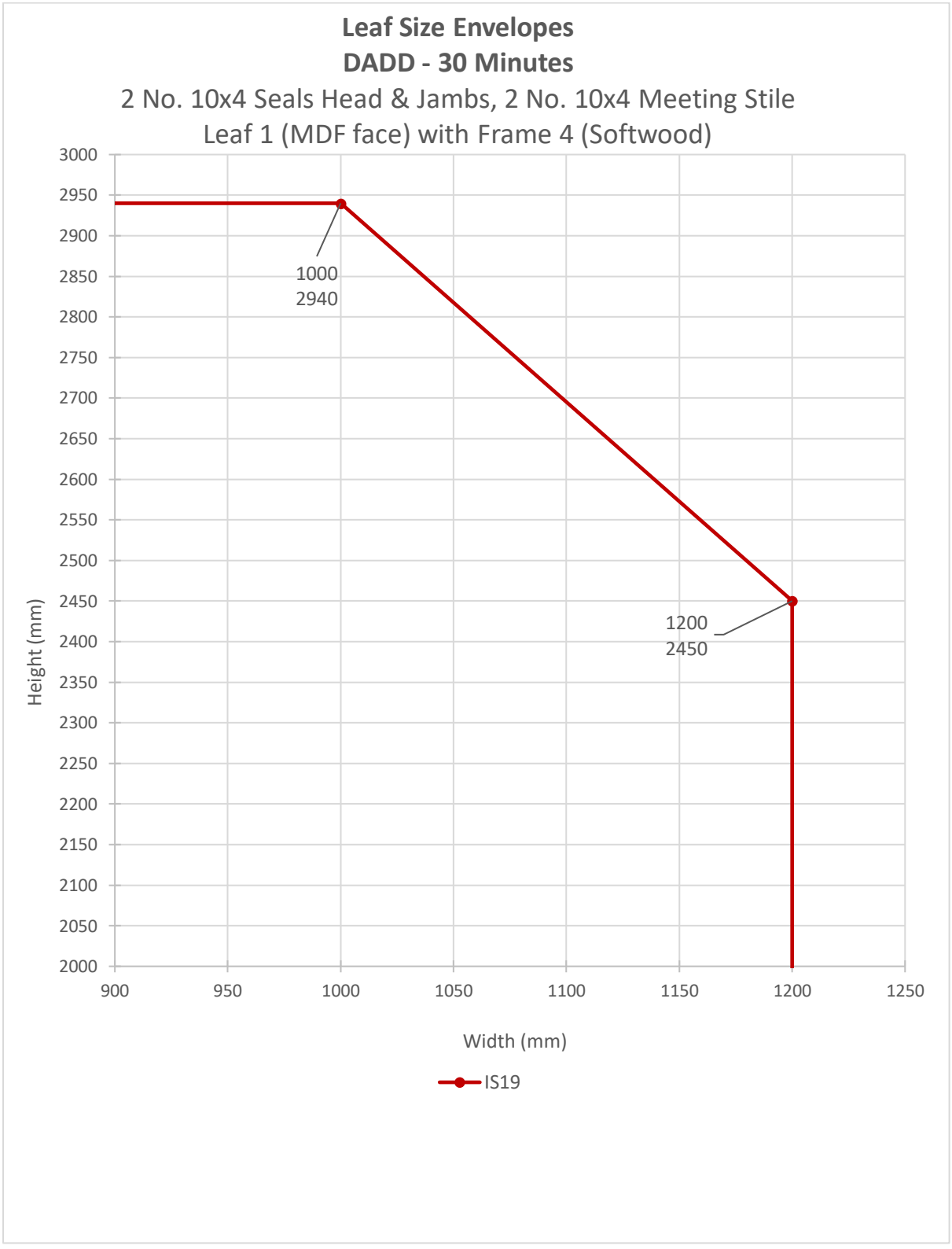

Leaf Size Envelopes
DADD - 30 Minutes
2 No. 10x4 Seals Head & Jambs, 2 No. 10x4 Meeting Stile
Leaf 1 (MDF face) with Frame 4 (Softwood)
Height (mm)
3000
2950
2900
2850
2800
2750
2700
2650
2600
2550
2500
2450
2400
2350
2300
2250
2200
2150
2100
2050
2000
1000
2940
1200
2450
900
950
1000
1050
1100
1150
1200
1250
Width (mm)
IS19

Table 6.1.8

Intumescent Specification for DADD

Leaf 1 MDF with Frame 4 (Timber/Timber Substrate)

Intumescent Spec. Reference & (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IS19 (BMT/FEP/F16012)	8500	Pyroplex Ltd	**Head & Jambs:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in the leaf edge or frame reveal **Meeting Edges:** 2No. 10 x 4 Pyroplex brush box seal ref: 8500 fitted 10mm apart with the first seal 7mm from the opening face in one meeting edge

5 General Description of Leaf Construction

5.1 Leaf 1 – Stredor 44

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

- A solid sheet of 44mm thick Stredor® 44 laminated door core with a central poplar plywood layer and outer pine lamels faced with either nominally 2-4mm (t) plywood and 0.4mm engineered veneer or 7-8mm MDF. Where specified, the leaves are lipped with hardwood.

Minimum Door Leaf Thickness:

- With permitted decorative facing/finishes 43.4mm

Minimum Door Blank Thickness:

- Without decorative facings/finishes 42.4mm.

The door designs can include:

- Lippings
- Glazing
- Grooves
- Decorative facings

The Field of Application presented in this report is relevant to Stredor 44 doorsets constructed using the Stredor door blanks tested and referenced in section 3 of this FoA report (Stredor to be supplied by Falcon Panel Products from mill F14 only, based on testing conducted using Stredor door blanks from mills F7 and F14 with the same essential construction details. NB: the address of each mill is held in confidence by Falcon Panel Products Ltd and Warringtonfire (file ref: WF 516032)).

5.2 Lippings

The requirements for lipping Leaf type 1 is given in the following sections.

5.2.1 Leaf 1

Leaves must be lipped on all edges and must comply with the following specification:

Lipping Specification		
Material	Size (mm)	Minimum Density (kg/m³)
Hardwood[1]	**Flat Lipping** = 6–11 thick with a maximum of 2mm profiling permitted at corners of lipping[2]	640
	Rounded Lipping = 8–11 thick with a radius matching the distance between leaf edge and floor pivot[3]	
Strelip® Engineered Hardwood (based on WF414781)[1]	**Flat Lipping** = 7–10 thick with a maximum of 2mm profiling permitted at corners of lipping[2]	650

Note:

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. Examples of permissible edge profiling are detailed in Section 5.2.2.3
3. Rounded lippings must only be applied to the hanging edges of door leaves where the door frame jamb has also been profiled to ensure door gaps meet the requirements of section 12.5. Examples of permissible rounded edges are detailed in Section 5.2.2.1
4. Lippings must not conceal intumescent materials.
5. A 2.5° chamfer (leading edge detail) is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 12.5. Examples of permissible chamfered lippings are detailed in Section 5.2.2.3

5.2.2 Lipping examples

The following lipping specifications details are split into 2 sub – sections:

- Standard lipping based on timber
- Standard lipping based on Falcon Panel Products bespoke timber products

Section 5.2.2.3 gives details on the permitted adjustments to lipping to aid closing

5.2.2.1 Standard lipping based on timber

Hardwood Lippings Min Density 640 kg/m³

Flat | 6-11mm

Rounded | 8-11mm

5.2.2.2 Standard lipping based on Falcon Panel Products bespoke timber products

Strelip® Lippings Min Density 650 kg/m³

Flat | 7-10mm

5.2.2.3 Permitted adjustments to lipping to aid closing

Permissable edge profiling to all lipping types & materials

Round over | max 3x3mm

45° chamfer | max 3x3mm

Feathered edge | max 2x8mm

Leading edge | max 2.5°

5.3 Facings and Decorative mouldings

Decorative or Protective facings which are bonded directly to the leaf can be applied to ply faced and MDF faced, leaf type 1.

The following sections give the limitations associated with the above.

5.3.1 Decorative Facings

The following additional facing materials specified below are also permitted on this door design since they would degrade rapidly under test conditions without significant effect.

Decorative Facing Material Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint/lacquer	0.2
Timber veneers	2
Plastic & resin laminates	2
PVC	2
Cellulosic foils/paper	0.5

Note:

1. Facings may be fixed to the core before or after edges/lippings are applied.
2. Facings may cover lippings if required, apart from PVC
3. Metallic facings are not permitted except for push plates and kick plates.
4. The door leaf thickness may be reduced by a total maximum of 0.6mm to each face (a maximum of 1.2mm in total) for calibration purposes, only in order to accommodate one of the additional facings shown in the table above.
5. Decorative materials must not conceal perimeter intumescent strips

5.3.2 Decorative Planted on Timber Mouldings

Decorative mouldings can be applied to the door leaves provided the following criteria is adhered to:

The mouldings:

- Are surface mounted to the door leaf
- Are no higher than 30mm, i.e. do not protrude more than 30mm from the surface of the door leaf
- Are no wider than 90mm
- Cover no more than 30% of the door leaf area
- Stop short of the leaf edge where the door stop is located, so that the full thickness of the door leaf is located within the frame reveal
- Are bonded into position with PVA/PU/UF adhesive. Small mechanical fixings (no thicker than 1.2mm and not penetrating the door core by more than 25mm) may be used in addition to bonding if required.

5.4 Feature Grooves and recessed features – Leaf 1 only

The door can either be grooved within the limits defined in Section 5.4.1 or recessed decorative features can be created as detailed in Section 5.4.2.

5.4.1 Grooves

The testing conducted on Falcon Panel Products Ltd. Stredor® 44 door cores under test references WF 385685 demonstrated that material could be removed from both faces of the door leaf without negating the integrity performance.

Based on the test evidence referenced above door leaves may be grooved within the following parameters:

- For an unlined groove the maximum depth of the groove must not exceed 3mm
- The groove width must be no more than 10mm
- Grooves may run to the leaf edge
- Grooves must not not interfere with any edge mounted sealing system.
- Horizontal grooves must be no closer than 57mm to the top and bottom of the door leaf and vertical grooves must be no closer than 57mm to the sides of the leaf.
- Grooves must be no closer than 90mm to each other
- 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
- Doors with cableways are not permitted with vertical grooves
- Cableways must be located at least 50mm from horizontal grooves
- 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 – head and Jambs (single and double leaf) and 2 Nos 10 by 4mm at meeting stile (double leaves)

5.4.2 Recessed features forming panels

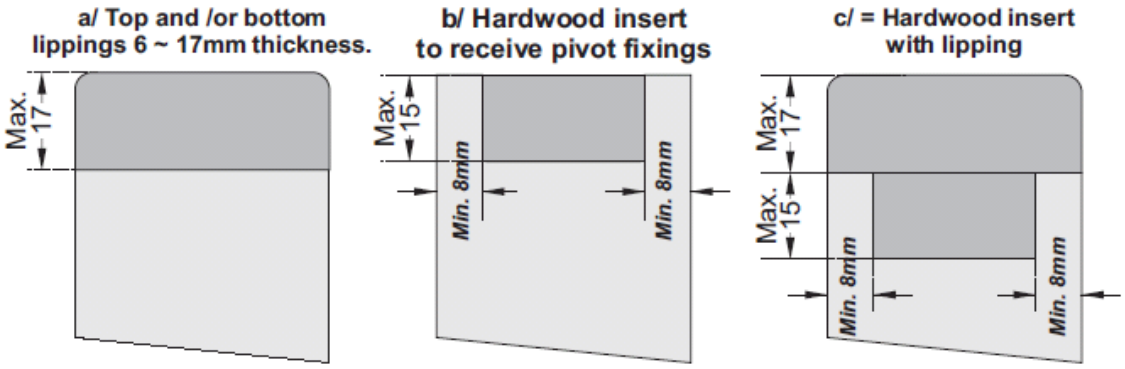
Recessed features can be machined into the surface of Leaf 1, based on the testing conducted on the design tested in WF 385685, to create a panelled design. The following has been allowed on the principle of rearranging the pattern of the recessed grooves from the tested 'chequerboard' design into squares or rectangles that can provide the appearance of a panelled door design. The amount of material removed from the face of the leaf will be comparable to the tested 'chequerboard' design and the leaves will therefore have comparable stability in fire test conditions. The following specification must be followed :

- The door leaf may be recessed on both sides to create the appearance of panels
- A minimum of 1 and a maximum of 6 rectilinear panels are permitted
- The thickness of the panels, framed by the recessed areas that are forming the perimeter of the rectilinear panels, must remain at the full thickness of the door leaf (i.e. nominally 44mm thick)
- The recessed areas forming the perimeter of the rectilinear panels must not be located within 100mm from the edge of the door leaf
- The recessed areas forming the perimeter of the rectilinear panelled areas are to be no wider than 50mm
- The depth of the recess cannot exceed 3mm for leaf 1
- The recessed areas forming the perimeter of the rectilinear panels must be no closer than 75mm to each other (i.e. panels must be a minimum of 75mm apart)
- The recessed areas forming the perimeter of the rectilinear panels must not be closer than 75mm to any apertures (e.g., glazing, ATG, letter plates, etc.)
- Cableways must not pass under a recessed area.
- Cableways must be located at least 50mm from a recessed area
- Recessed/morticed in items of hardware must not be located within 50mm of a recessed area.
- Recessed areas forming panels can be included in Latched, Unlatched, single acting and double acting, single leaf and double leaf doorsets.
- Recessed areas can be included when a transom is present and the over panel may contain recessed areas following the limitations above.
- The intumescent seal present must be a minimum of 15 by 4mm – head and Jambs and 2 Nos 10 by 4mm at meeting stile

5.5 Hardwood Blocking for Pivots – Leaf 1 and 2

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 the 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/m^3.



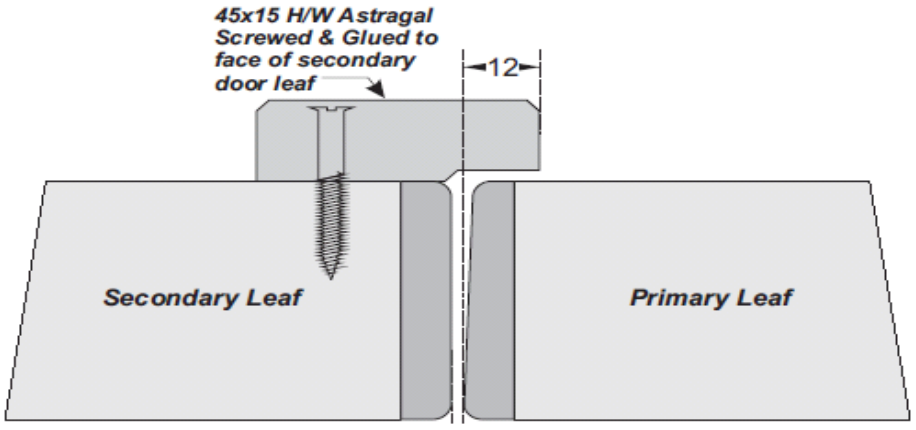
5.6 Meeting Stile Astragals – Leaf 1

Generally fire doors should be able to open simultaneously. However, where additional performances are required (e.g. acoustic performances) it may be necessary to provide for sequential opening.

An astragal detail may be used where these conditions apply, without adverse influence on existing fire test/assessment data.

Astragals can be applied to both door leaves provided a suitable door selector is fitted and may be profiled for aesthetic effect providing they meet the minimum specification given below.

The hardwood for the astragal must be hardwood of the same minimum density being used for the lipping material. See following diagram:



5.7 Leaf Size Adjustment Prior to Machining

Door leaf 1 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

6 Glazing

This section considers the glazing permitted for the leaf type 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 Stredor 44 doorset design 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 aperture in leaf

The Stredor 44 design has been tested with glazing on many occasssions as seen in section 3.

The largest glazed apertures tested were in tests RF16012 Rev A and RF16031 where the aperture was 1600mm high by 400mm wide and achieved in excess of 30 mins. Test WF416690 tested two single leaf doorsets with 2 apertures in each leaf of sizes 900mm high by 230mm wide and achieved in excess of 30 mins. Other tests have been conducted on Stredor 44 as summarised in section 3 of this report, using different glass types with different thickness and insulation performances. These tests have demonstrated the ability of the Stredor 44 design to accommodate apertures and the following limitations have been set.

Leaf 1

Maximum area of glazing is 0.8m^2 (max tested with 25% factor increase applied)

Minimum margins around glazing are:-

Top, bottom and sides = 100mm

Minimum distance between apertures is 80mm.

The maximum height of an aperture is 1920mm (max tested aperture height with 20% factor increase applied)

The maximum width of an aperture is 480mm (max tested aperture width with 20% factor increase applied)

The testing detailed above demonstrates the performance of the glazed Stredor 44 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, 2, 4 and 5.

6.2 Glass & Glazing Systems

The following tables give the maximum aperture size for the Stredor doorset design:

Each glass and glazing combination has been 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 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)
1.	Pyroshield 2	6 or 7	N/A	0.54	0.8	0.8	0.21
2.	Pyrostem	6 or 7	N/A	0.54	0.8	0.8	N/A
3.	Pyran S	6	N/A	0.54	0.8	0.8	0.21
4.	Pyroguard EW30	7	N/A	N/A	0.8	0.64	N/A
5.	Pyrobelite 7	7	0.69	0.54	0.8	0.8	0.21
6.	Pyrodur 30-104	7	0.69	0.525	0.8	0.66	0.21
7.	Pyrodur 60-10	10	0.69	0.525	0.8	0.66	0.21
8.	Pyrodur 30-203	11	0.69	0.525	0.8	0.66	0.21
8.	Pyroguard EW Maxi	11	N/A	N/A	N/A	0.64	N/A
9.	Pyranova 15-S2.0	11	N/A	N/A	N/A	N/A	N/A
10.	Pyrobelite 9EG	12	0.69	0.54	0.8	0.8	0.21
11	Pyrobelite 12	12	0.69	0.54	0.8	0.8	0.21
12.	Pyrodur 60-20	13	0.69	0.525	0.8	0.66	0.21

Glazing Systems by DIG			Glass & Glazing System Specification Max. Assessed Area (m^2)					
Non/Partially Insulating Glass Types		Glass Thickness (mm)	6 Fireglaze Compound (CF 221)	7 Fireglaze G30 Or LP15 (CF 221)	8 Sealmaster Intumescent Closed Cell Foam Tape 10x3 (CF 5645)	9 Sealmaster Intumescent Closed Cell Foam Tape 15x3 (CF 5645)	10 Sealmaster Black Glazing Tape 10x4	11 Sealmaster Intumescent Foam Glazing Tape (CF 5387)
1.	Pyroshield 2	6 or 7	0.55	0.55	0.8	0.8	N/A	0.8
2.	Pyrostem	6 or 7	0.55	0.55	0.8	0.8	N/A	0.8
3.	Pyran S	6	0.55	0.55	0.8	0.8	N/A	0.8
4.	Pyroguard EW30	7	N/A	N/A	0.8	0.8	N/A	0.8
5.	Pyrobelite 7	7	0.55	0.55	0.8	0.8	N/A	0.8
6.	Pyrodur 30-104	7	0.55	0.55	0.8	0.8	N/A	0.8
7.	Pyrodur 60-10	10	0.55	0.8	0.8	0.8	N/A	0.8
8.	Pyrodur 30-203	11	0.55	0.55	0.8	0.8	N/A	0.8
8.	Pyroguard EW Maxi	11	N/A	N/A	N/A	N/A	N/A	N/A
9.	Pyranova 15-S2.0	11	N/A	N/A	N/A	N/A	N/A	N/A
10.	Pyrobelite 9EG	12	0.55	0.55	0.8	0.8	0.27 (WF416690)	0.8
11	Pyrobelite 12	12	0.55	0.55	0.8	0.8	0.27	0.8
12.	Pyrodur 60-20	13	0.55	0.55	0.8	0.8	N/A	0.8

Glazing Systems by STS			Glass & Glazing System Specification 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
1.	Pyroshield 2	6 or 7	N/A	0.4	N/A
2.	Pyrostem	6 or 7	N/A	0.4	N/A
3.	Pyran S	6	N/A	0.4	N/A
4.	Pyroguard EW30	7	0.68	0.8	N/A
5.	Pyrobelite 7	7	0.8	0.8	N/A
6.	Pyrodur 30-104	7	0.8	0.8	N/A
7.	Pyrodur 60-10	10	0.8	0.8	N/A
8.	Pyrodur 30-203	11	N/A	N/A	N/A
8.	Pyroguard EW Maxi	11	0.8	0.8	N/A
9.	Pyranova 15-S2.0	11	0.8	0.8	N/A
10.	Pyrobelite 9EG	12	0.8	0.8	N/A
11	Pyrobelite 12	12	0.8	0.8	N/A
12.	Pyrodur 60-20	13	0.8	0.8	N/A

Glazing Systems by Mann McGowan			Glass & Glazing System Specification Max. Assessed Area (m^2)		
Non/Partially Insulating Glass Types		Glass Thickness (mm)	15	16	17
			Pyroglaze 30 (CF 316)	Pyroglaze Channel (CF 316)	Pyrostrip 300 (CF 316)
1.	Pyroshield 2	6 or 7	0.8	N/A	0.19
2.	Pyrostem	6 or 7	N/A	N/A	N/A
3.	Pyran S	6	N/A	N/A	N/A
4.	Pyroguard EW30	7	N/A	N/A	N/A
5.	Pyrobelite 7	7	N/A	N/A	N/A
6.	Pyrodur 30-104	7	0.29	0.29	N/A
7.	Pyrodur 60-10	10	0.29	0.29	N/A
8.	Pyrodur 30-203	11	0.29	0.29	N/A
8.	Pyroguard EW Maxi	11	N/A	N/A	N/A
9.	Pyranova 15-S2.0	11	N/A	N/A	N/A
10.	Pyrobelite 9EG	12	N/A	N/A	N/A
11	Pyrobelite 12	12	N/A	N/A	N/A
12.	Pyrodur 60-20	13	0.29	0.29	N/A

Glazing Systems by Lorient Polyproducts Ltd			Glass & Glazing System Specification Max. Assessed Area (m^2)		
Non/Partially Insulating Glass Types		Glass Thickness (mm)	18	19	20
			System 36 PLUS (CF 5060)	Flexible Figure 1 (CF 327)	TBA
1.	Pyroshield 2	6 or 7	0.688	0.66	-
2.	Pyrostem	6 or 7	0.688	0.66	-
3.	Pyran S	6	0.688	0.66	-
4.	Pyroguard EW30	7	0.66	0.71	-
5.	Pyrobelite 7	7	0.8	0.66	-
6.	Pyrodur 30-104	7	0.66	0.66	-
7.	Pyrodur 60-10	10	0.8	0.66	-
8.	Pyrodur 30-203	11	0.8	0.66	-
8.	Pyroguard EW Maxi	11	0.8	0.71	-
9.	Pyranova 15-S2.0	11	0.8	N/A	-
10.	Pyrobelite 9EG	12	0.8	0.66	-
11	Pyrobelite 12	12	0.8	0.66	-
12.	Pyrodur 60-20	13	0.8	0.66	-

Glazing Systems by Pyroplex Ltd			Glass & Glazing System Specification Max. Assessed Area (m^2)			
Non/Partially Insulating Glass Types		Glass Thickness (mm)	21	22	23	24
			8193 (CF 348)	8492 (CF 348)	30049 (CF 348)	30054 (CF 348)
1.	Pyroshield 2	6 or 7	0.36	0.25	0.67	N/A
2.	Pyrostem	6 or 7	0.36	0.25	0.45	N/A
3.	Pyran S	6	N/A	N/A	N/A	N/A
4.	Pyroguard EW30	7	0.36	0.25	0.56	0.56
5.	Pyrobelite 7	7	N/A	N/A	0.45	N/A
6.	Pyrodur 30-104	7	0.76	0.25	0.45	0.56
7.	Pyrodur 60-10	10	0.76	0.25	0.45	0.56
8.	Pyrodur 30-203	11	0.76	0.25	0.65 (WF402305 (B))	0.56
8.	Pyroguard EW Maxi	11	0.36	0.25	0.56	0.56
9.	Pyranova 15-S2.0	11	N/A	N/A	N/A	N/A
10.	Pyrobelite 9EG	12	N/A	N/A	0.45	N/A
11	Pyrobelite 12	12	N/A	N/A	0.45	N/A
12.	Pyrodur 60-20	13	0.76	0.25	0.65	0.56

Glazing Systems by Hodgson Sealants			Glass & Glazing System Specification Max. Assessed Area (m^2)
Non/Partially Insulating Glass Types		Glass Thickness (mm)	25
			Firestrip 30 (CF 297)
1.	Pyroshield 2	6 or 7	0.57
2.	Pyrostem	6 or 7	0.57
3.	Pyran S	6	0.57
4.	Pyroguard EW30	7	0.57
5.	Pyrobelite 7	7	N/A
6.	Pyrodur 30-104	7	0.8
7.	Pyrodur 60-10	10	0.57
8.	Pyrodur 30-203	11	0.57
8.	Pyroguard EW Maxi	11	0.57
9.	Pyranova 15-S2.0	11	0.57
10.	Pyrobelite 9EG	12	N/A
11	Pyrobelite 12	12	N/A
12.	Pyrodur 60-20	13	0.57

Glazing Systems by Norseal			Glass & Glazing System Specification Max. Assessed Area (m^2)
Non/Partially Insulating Glass Types		Glass Thickness (mm)	26 Norvision 30B (ChiltA12161 Rev B)
1.	Pyroshield 2	6 or 7	0.66
2.	Pyrostem	6 or 7	0.66
3.	Pyran S	6	0.66
4.	Pyroguard EW30	7	0.66
5.	Pyrobelite 7	7	0.66
6.	Pyrodur 30-104	7	0.66
7.	Pyrodur 60-10	10	0.66
8.	Pyrodur 30-203	11	0.66
8.	Pyroguard EW Maxi	11	0.66
9.	Pyranova 15-S2.0	11	0.66
10.	Pyrobelite 9EG	12	0.66
11	Pyrobelite 12	12	0.66
12.	Pyrodur 60-20	13	0.66

Glazing Systems by Fire & Acoustic Seals Ltd			Glass & Glazing System Specification Max. Assessed Area (m^2)
Non/Partially Insulating Glass Types		Glass Thickness (mm)	27 Fire & Acoustic Seals Ltd Closed Cell Foam Tape 15x3 with Intumescent Acrylic Mastic
1.	Pyroshield 2	6 or 7	N/A
2.	Pyrostem	6 or 7	N/A
3.	Pyran S	6	N/A
4.	Pyroguard EW30	7	0.1 (WF405307)
5.	Pyrobelite 7	7	0.41 (WF411193)
6.	Pyrodur 30-104	7	N/A
7.	Pyrodur 60-10	10	N/A
8.	Pyrodur 30-203	11	N/A
8.	Pyroguard EW Maxi	11	0.1
9.	Pyranova 15-S2.0	11	N/A
10.	Pyrobelite 9EG	12	0.41
11	Pyrobelite 12	12	0.41
12.	Pyrodur 60-20	13	N/A

6.2.2 Fully Insulating Glass

Glazing Systems by DIG			Glass & Glazing System Specification Max. Assessed Area (m^2)				
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)
13.	Pyroguard EI30	15	N/A	N/A	N/A	N/A	N/A
14.	Pyrostop 30-10	15	0.69	0.525	0.8	0.66	N/A
15.	Pyrobel 16	16	0.69	0.54	0.8	0.8	N/A

Glazing Systems by DIG			Glass & Glazing System Specification Max. Assessed Area (m^2)					
Insulating Glass Types		Glass Thickness (mm)	6	7	8	9	10	11
			Fireglaze Compound (CF 221)	Fireglaze G30 Or LP15 (CF 221)	Sealmaster Intumescent Closed Cell Foam Tape 10x3 (CF 5645)	Sealmaster Intumescent Closed Cell Foam Tape 15x3 (CF 5645)	Sealmaster Black Glazing Tape 10x4	Sealmaster Intumescent Foam Glazing Tape (CF 5387)
13.	Pyroguard EI30	15	N/A	(0.0	N/A	0.8	N/A	0.8
14.	Pyrostop 30-10	15	0.55	0.55	0.8	0.8	N/A	0.8
15.	Pyrobel 16	16	0.55	0.55	0.8	0.8	0.27	0.8

Glazing Systems by STS			Glass & Glazing System Specification 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
13.	Pyroguard EI30	15	N/A	0.8	0.8
14.	Pyrostop 30-10	15	0.8	0.8	0.8
15.	Pyrobel 16	16	0.8	0.8	0.8

Glazing Systems by Mann McGowan			Glass & Glazing System Specification Max. Assessed Area (m^2)		
Insulating Glass Types		Glass Thickness (mm)	15	16	17
			Pyroglaze 30 (CF 316)	Pyroglaze Channel (CF 316)	Pyrostrip 300 (CF 316)
13.	Pyroguard EI30	15	N/A	N/A	N/A
14.	Pyrostop 30-10	15	0.29	0.29	N/A
15.	Pyrobel 16	16	N/A	N/A	N/A

Glazing Systems by Lorient Polyproducts Ltd			Glass & Glazing System Specification Max. Assessed Area (m^2)		
Insulating Glass Types		Glass Thickness (mm)	18	19	20
			System 36 PLUS (CF 5060)	Flexible Figure 1	TBA
13.	Pyroguard EI30	15	0.8	0.71	N/A
14.	Pyrostop 30-10	15	0.8	0.66	N/A
15.	Pyrobel 16	16	0.8	0.66	N/A

Glazing Systems by Pyroplex Ltd			Glass & Glazing System Specification Max. Assessed Area (m^2)			
Insulating Glass Types		Glass Thickness (mm)	21	22	23	24
			8193 (CF 348)	8492 (CF 348)	30049 (CF 348)	30054 (CF 348)
13.	Pyroguard EI30	15	N/A	0.48	0.54 WF430460 (A)	0.48
14.	Pyrostop 30-10	15	N/A	0.48	0.48	0.48
15.	Pyrobel 16	16	N/A	0.48	0.48	0.48

Glazing Systems by Hodgson Sealants			Glass & Glazing System Specification Max. Assessed Area (m^2)
Insulating Glass Types		Glass Thickness (mm)	25
			Firestrip 30 (CF297)
13.	Pyroguard EI30	15	N/A
14.	Pyrostop 30-10	15	0.8
15.	Pyrobel 16	16	N/A

Glazing Systems by Norseal			Glass & Glazing System Specification Max. Assessed Area (m^2)
Insulating Glass Types		Glass Thickness (mm)	26
			Norvision 30B Chilt A12161 Rev B
13.	Pyroguard EI30	15	0.66
14.	Pyrostop 30-10	15	0.66
15.	Pyrobel 16	16	0.66

Glazing Systems by Fire & Acoustic Seals Ltd			Glass & Glazing System Specification Max. Assessed Area (m^2)
Non/Partially Insulating Glass Types		Glass Thickness (mm)	27
			Fire & Acoustic Seals Ltd Closed Cell Foam Tape 15x3 with Intumescent Acrylic Mastic
13.	Pyroguard EI30	15	N/A
14.	Pyrostop 30-10	15	N/A
15.	Pyrobel 16	16	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 15 (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

Note: for the Norseal 30 B system the chamfer is 10 deg

Height of bead adjacent to glass minimum 15mm

Bolection minimum 5mm by 5mm

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

Note: for the Norseal 30 B system the chamfer is 10 deg

Height of bead adjacent to glass minimum 15mm

Quirk maximum 3mm by 3mm

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 minimum 15mm

Bolection minimum 5mm by 5mm

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

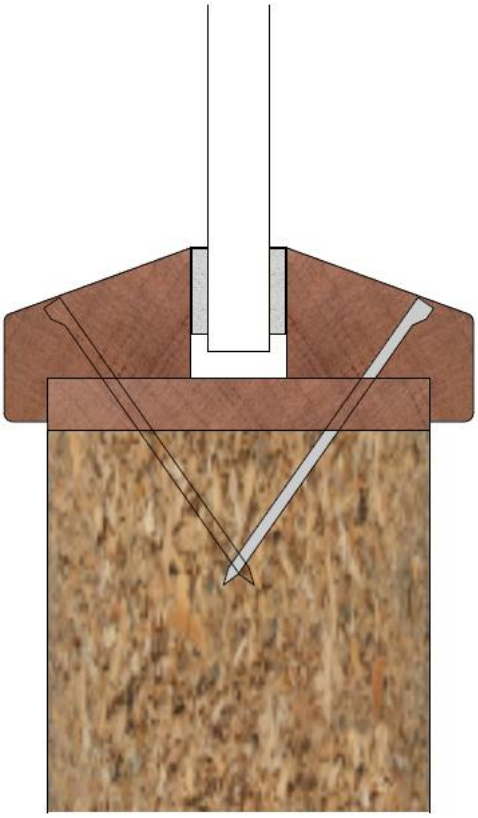
Height of bead adjacent to glass minimum 15mm

Quirk maximum 3mm by 3mm

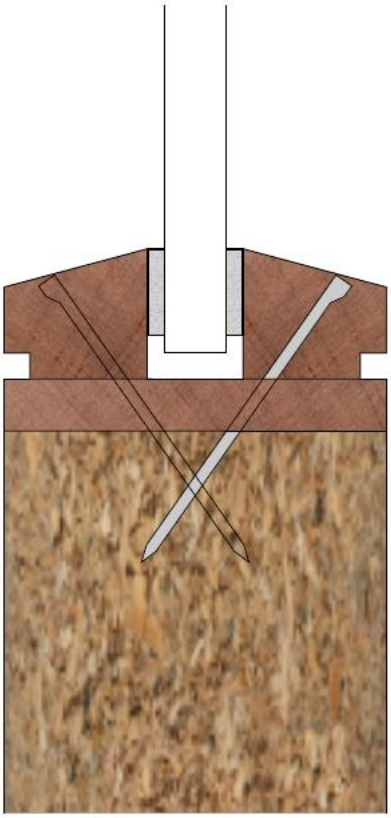
Depth of bead to be sized depending on glass, leaf and glazing system

The following drawings show the different bead types.

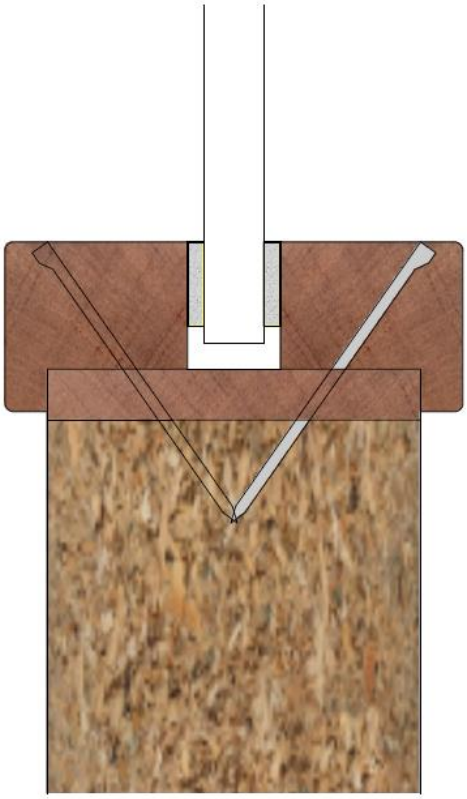
Hardwood aperture liners are optional. See section 6.2.6 for specification if required.



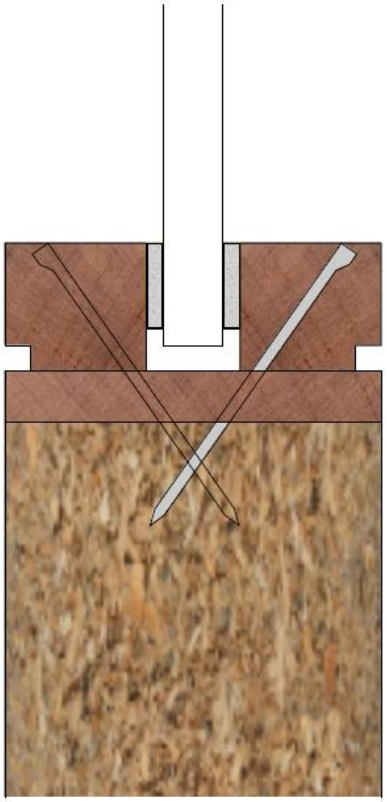
Chamfered Bolection



Chamfered Flush



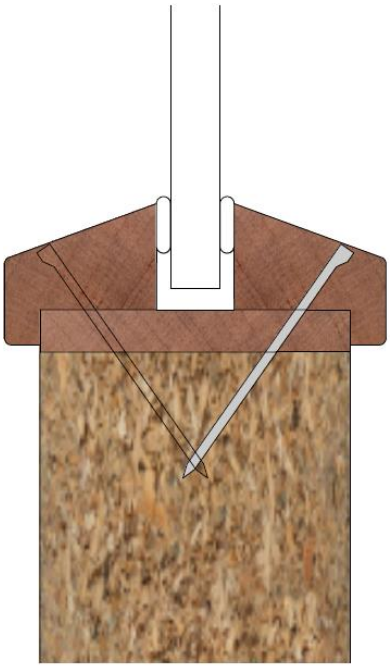
Square Bolection



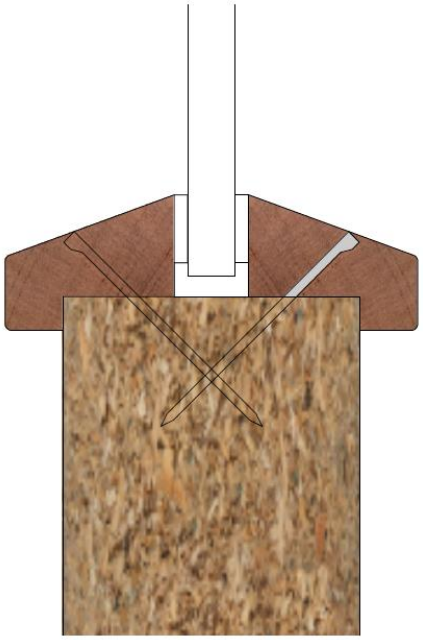
Square Flush

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.



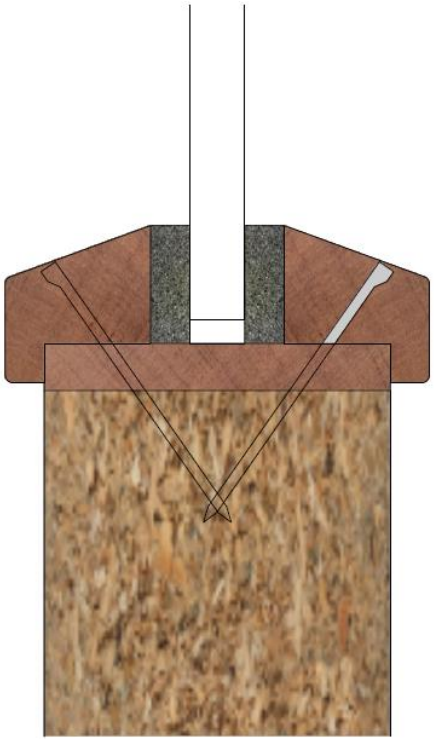
DIG Fireglaze G30 or LP15



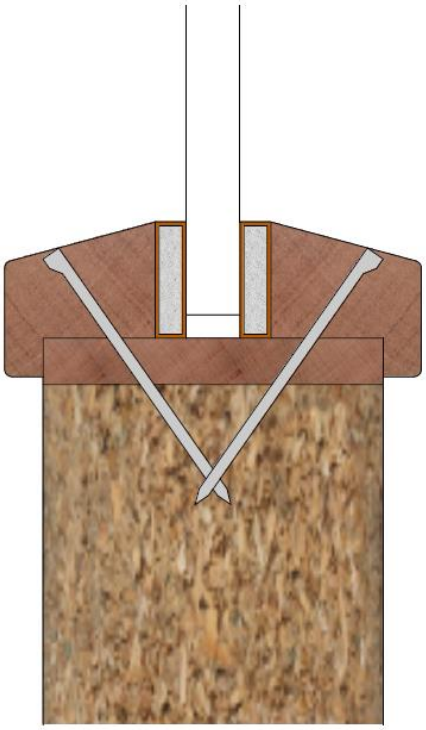
DIG Fireglaze Compound

DIG Sealmaster Intumescent Close Cell Foam Tape 10x3

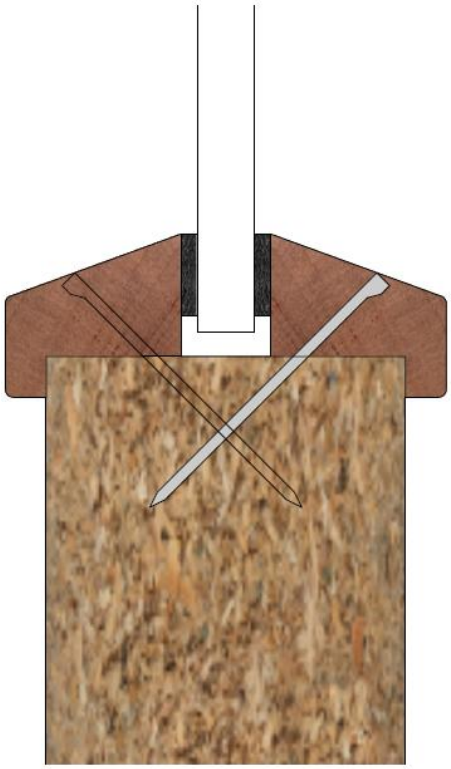
DIG Sealmaster Intumescent Close Cell Foam Tape 15x3



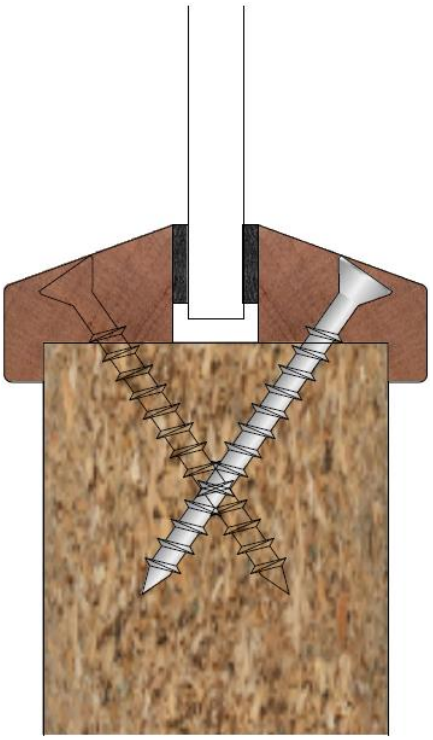
DIG Sealmaster Intumescent Foam Glazing



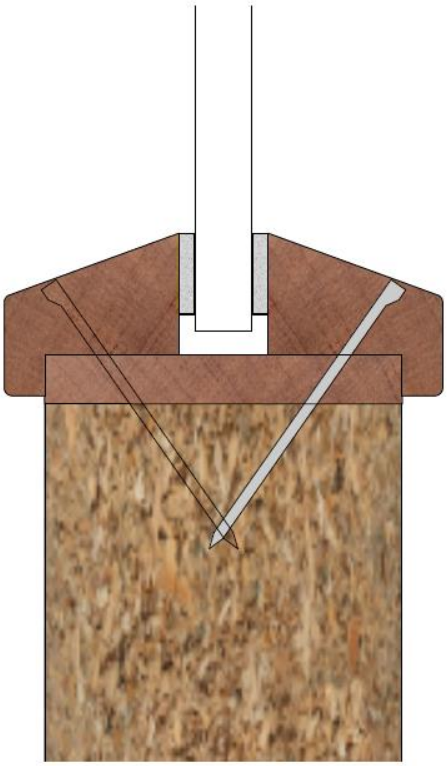
DIG Therm A Bead 30



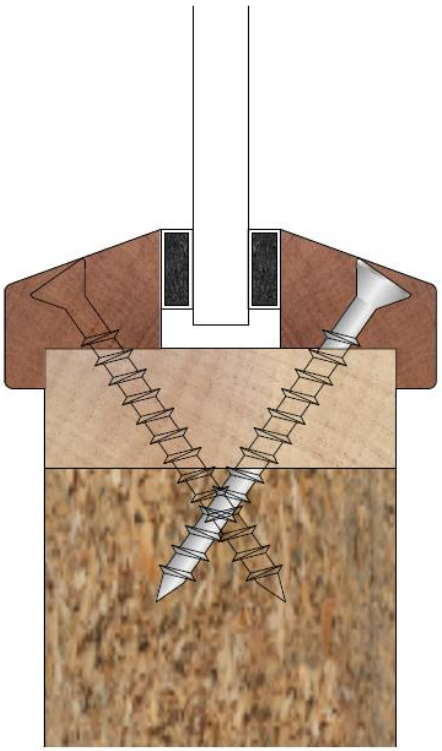
DIG Therm A Glaze 30 plus



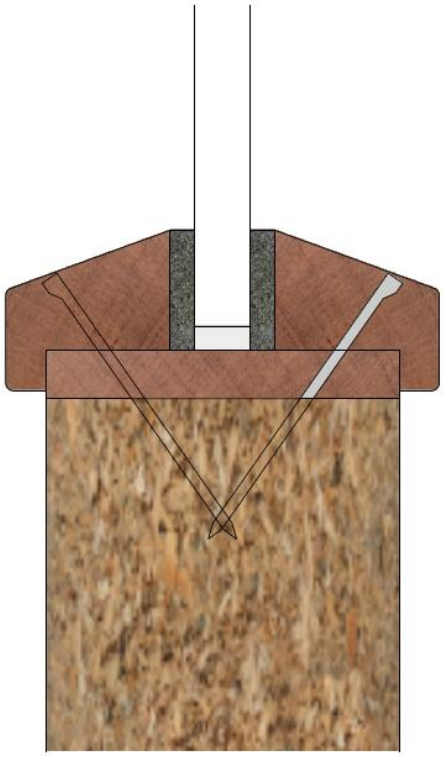
DIG Therm A Glaze 30



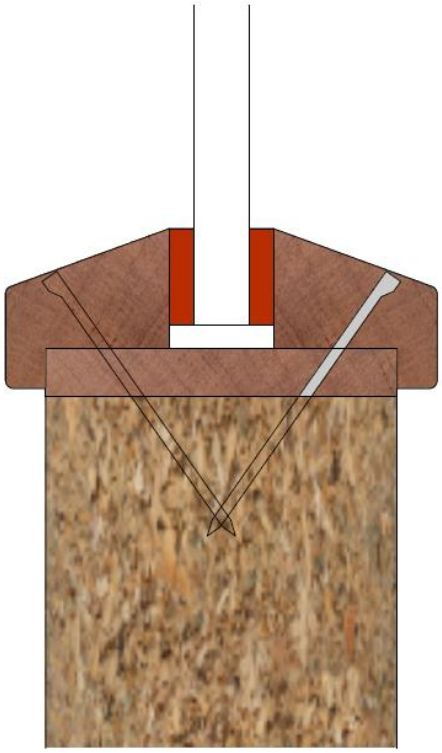
IG Therm A Glaze 45 or Therm A Strip 10 x 2



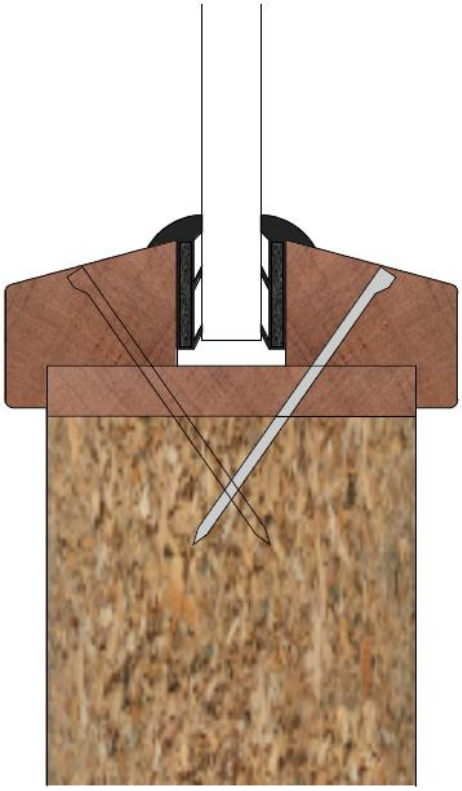
DIG Therm A Seal 10x4



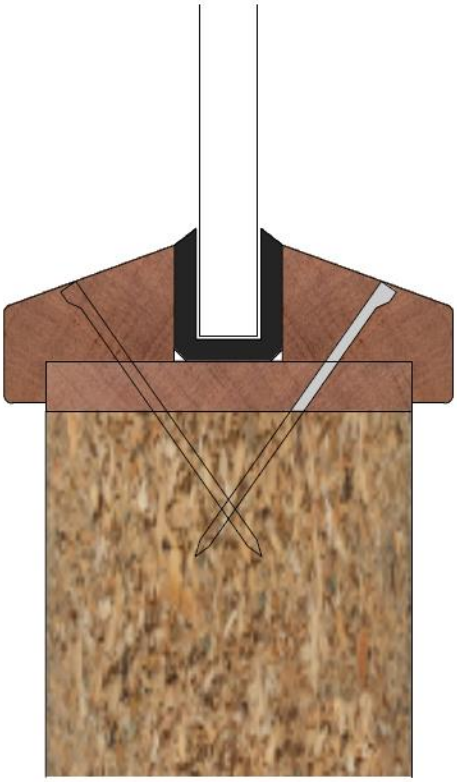
FAS Closed Cell Foam Tape 15x3 with Intumescent Mastic



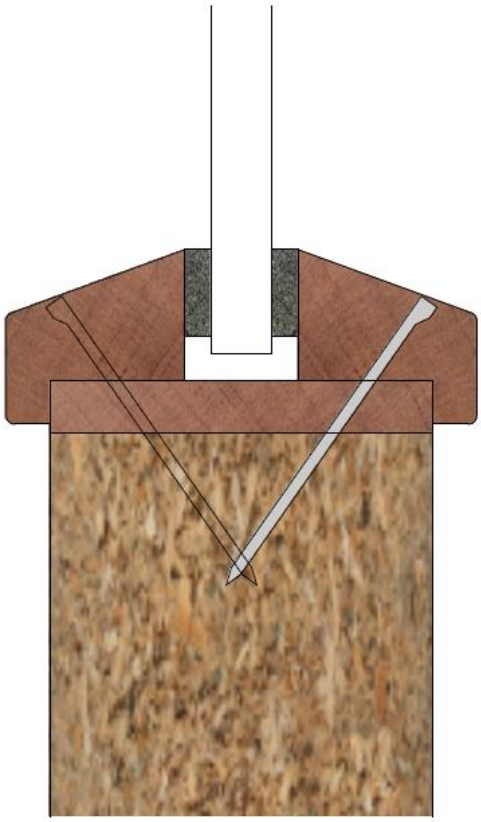
Hodgson Firestrip 30



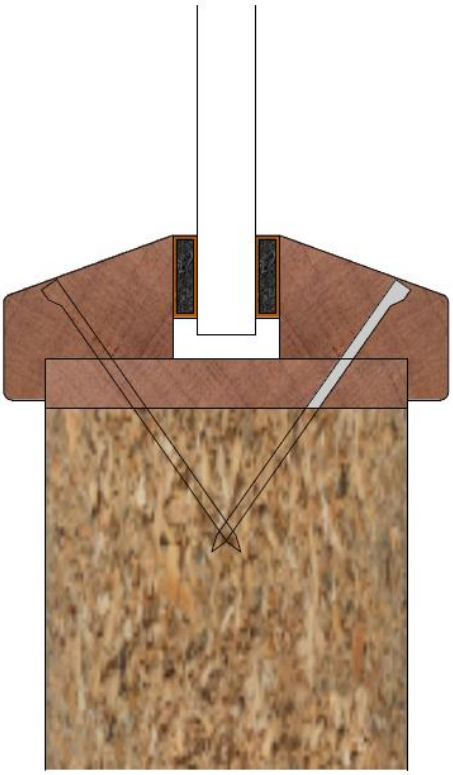
Lorient FF1



Lorient System 36 Plus

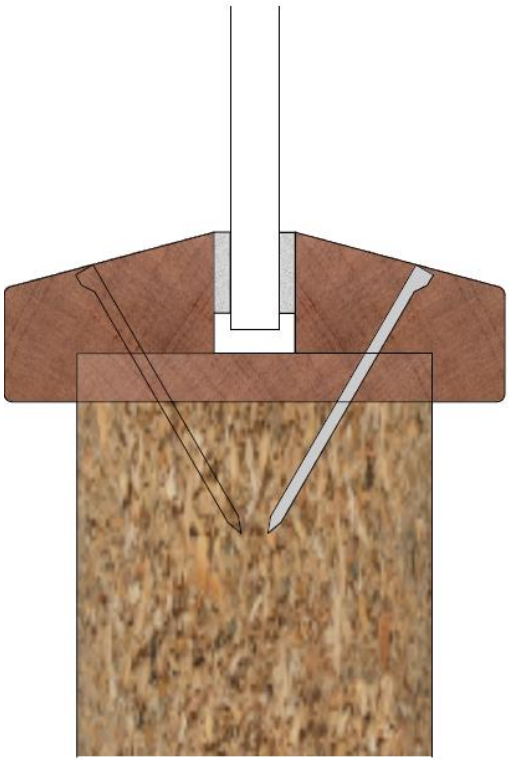


STS S105GT



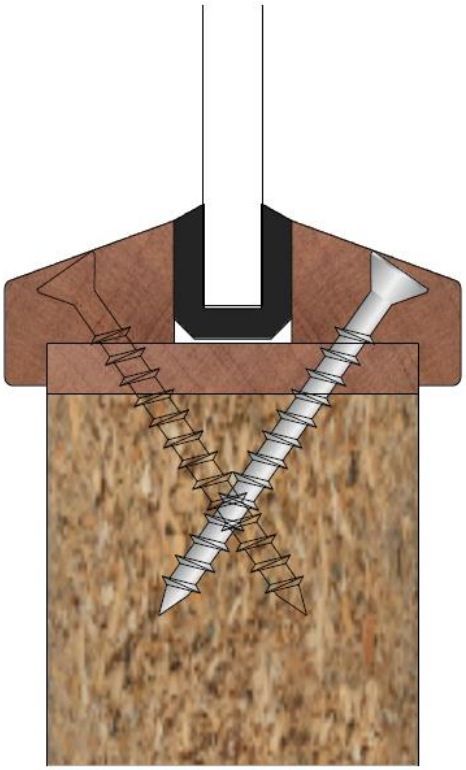
Mann McGowan Pyroglaze 30

Mann McGowan Pyroglaze Channel

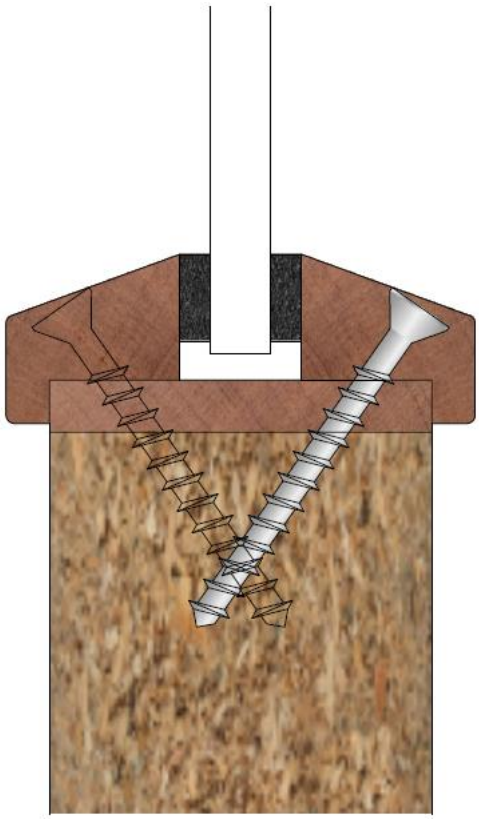


Mann McGowan Pyrostrip 300

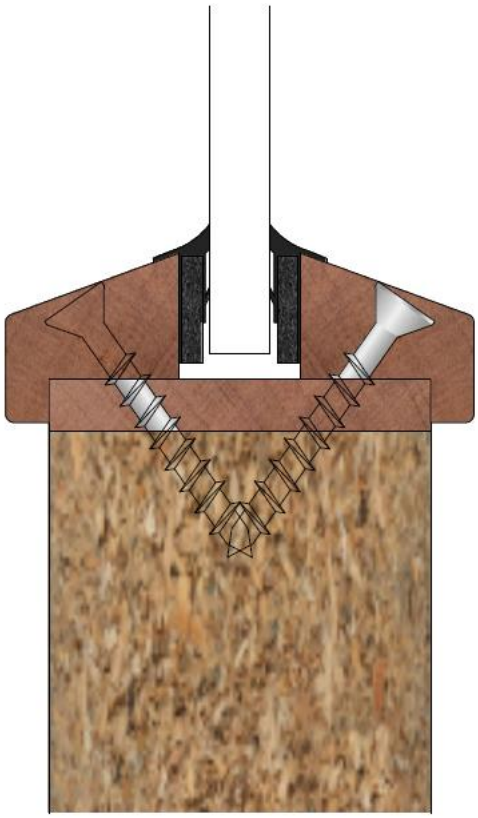
Norseal Norvision 30B



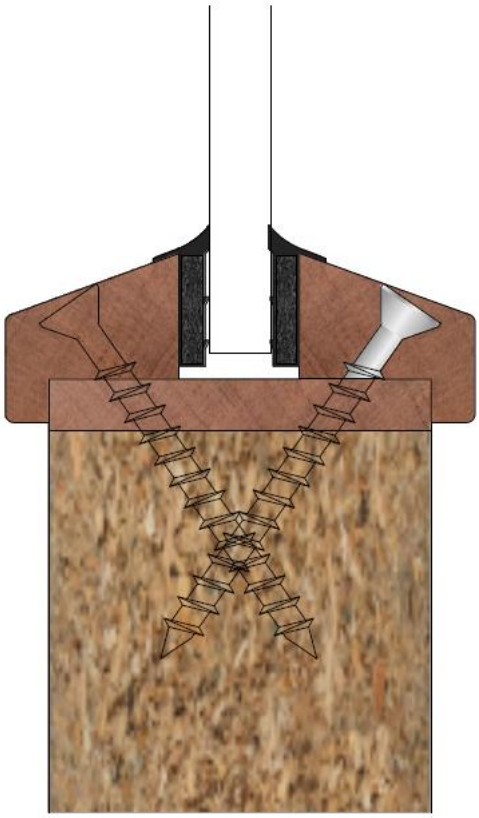
Pyroplex 8193



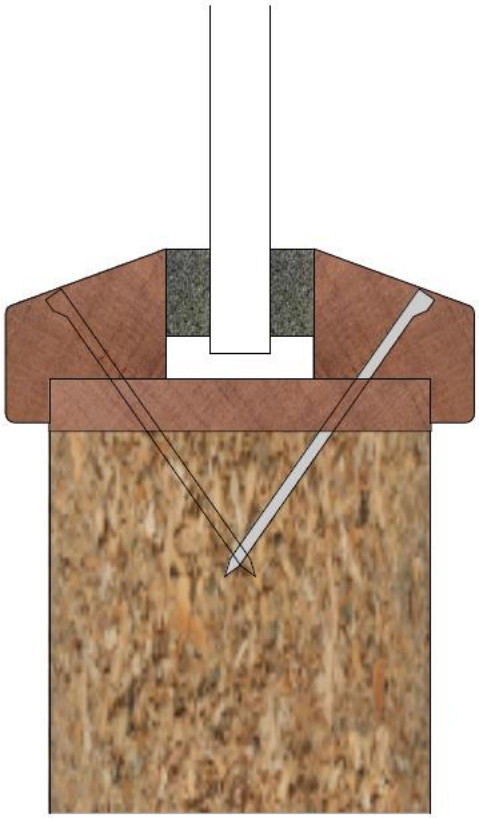
Pyroplex 8492



Pyroplex 30049



Pyroplex 30054



STS ST105-3GT

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 15 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 must be retained in position with 40mm long steel pins meeting the specification in section 6.2.5.1 or 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

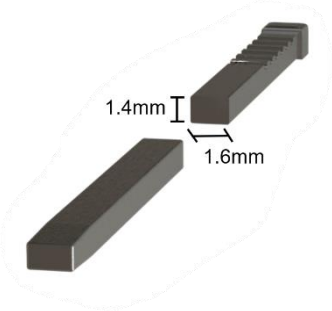
The following dimension of rectangular pin has been deemed suitable for gun (pneumatically) fired applications, providing the 1.6mm dimension is predominately oriented perpendicular to the glass, where possible:

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

Proprietary thresholds have been successfully tested with this doorset design and are approved for use in section 11.6.7.2 of this field of application.

7.3 Frame Joints

Frame joints may be mortice and tenoned, mitred, half lapped or butted and with no gaps (see diagram below).

All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws.

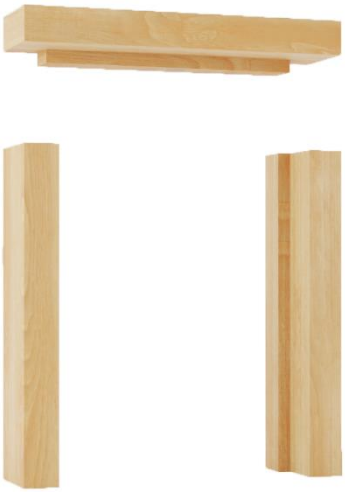
Figure 6.3 – Frame jointing detail

(A)
Half Lapped Joint

(B)
Mitre Joint

(C)

Mortise and Tenon Joint



(D)

Butt Joint

Note:

For butt jointed frames, the head element must oversail the frame jambs.

8 Overpanels, Fanlights and Sidelights

8.1 General

Overpanels, fanlights and sidelights can be used in conjunction with the Stredor doorset design. Overpanels are fitted with sections of door core and must be separated from the leaf heads by a transom. Fanlights and sidelights can either be fitted in combination frames with the doorset or can be installed as a modular system and both can be used to create a doorset within a glazed screen.

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

8.2 Overpanels

8.2.1 General

Transomed overpanels have the overpanel 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 ovepanel 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

8.2.2 Transom overpanels

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

Transom overpanels can be supplied for:

- Leaf 1
- Frame 1.1, 2.1, 1.3 and 2.3

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 7.3). 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 gap between the edges of overpanel and frame reveal should be a tight fit.
- 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

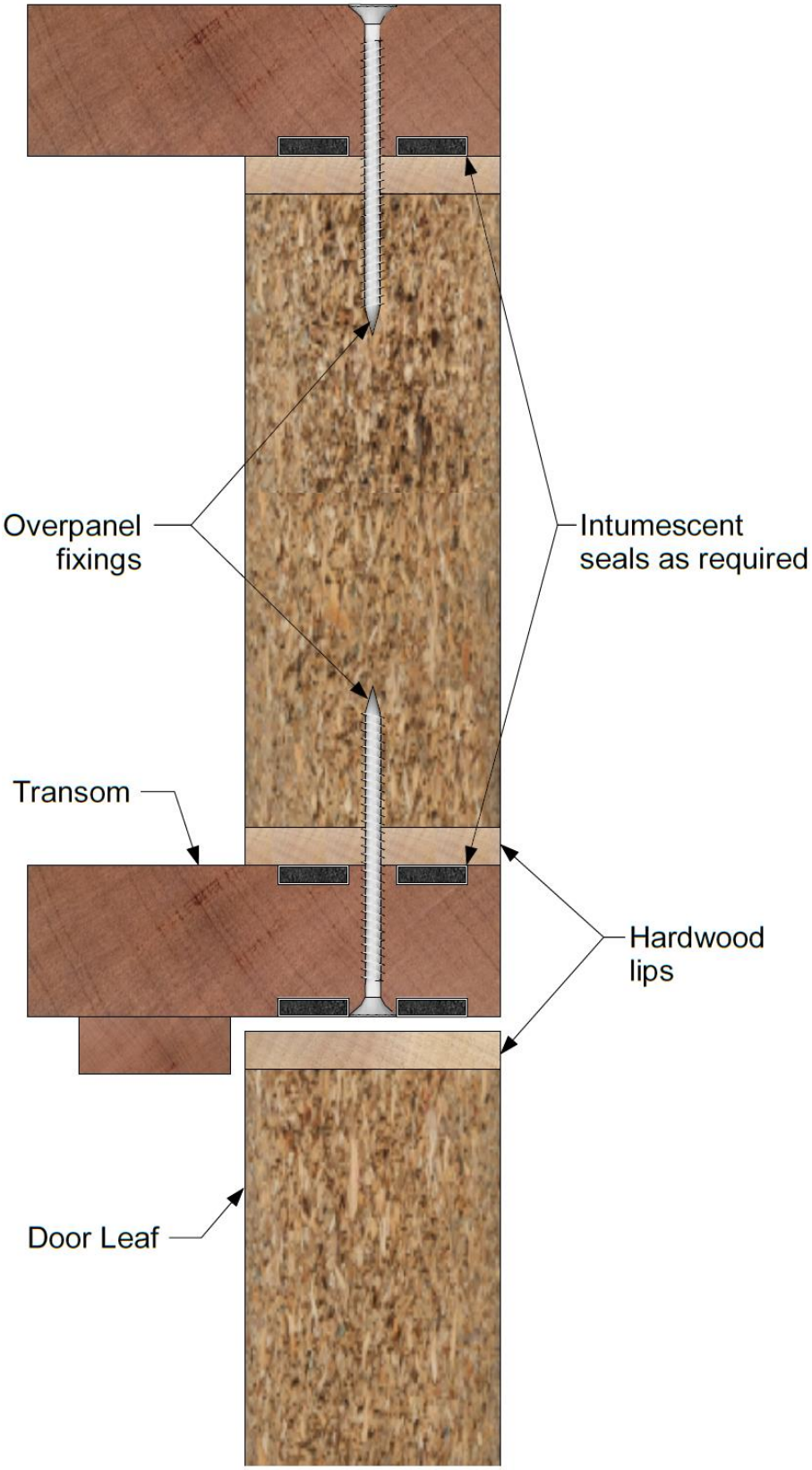


Figure 8.2 – Transomed overpanel – front elevation

8.3 Fanlights & Sidelights

8.3.1 General

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

- Leaf 1
- Frame 1.1, 1.3, 2.1 and 2.3

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:

This is where a single framing element has been used which separates 2 panes of glass or the glass and doorleaf. This type of construction has been tested as detailed in a number of test reports (see section 3.2 for further details) and developed by others which have tested doors and screens using this construction method. See section 8.3.2 for details and limitations associated with this design.

Jointed Door Frames & Fanlights/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 screen (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 for details and limitations.

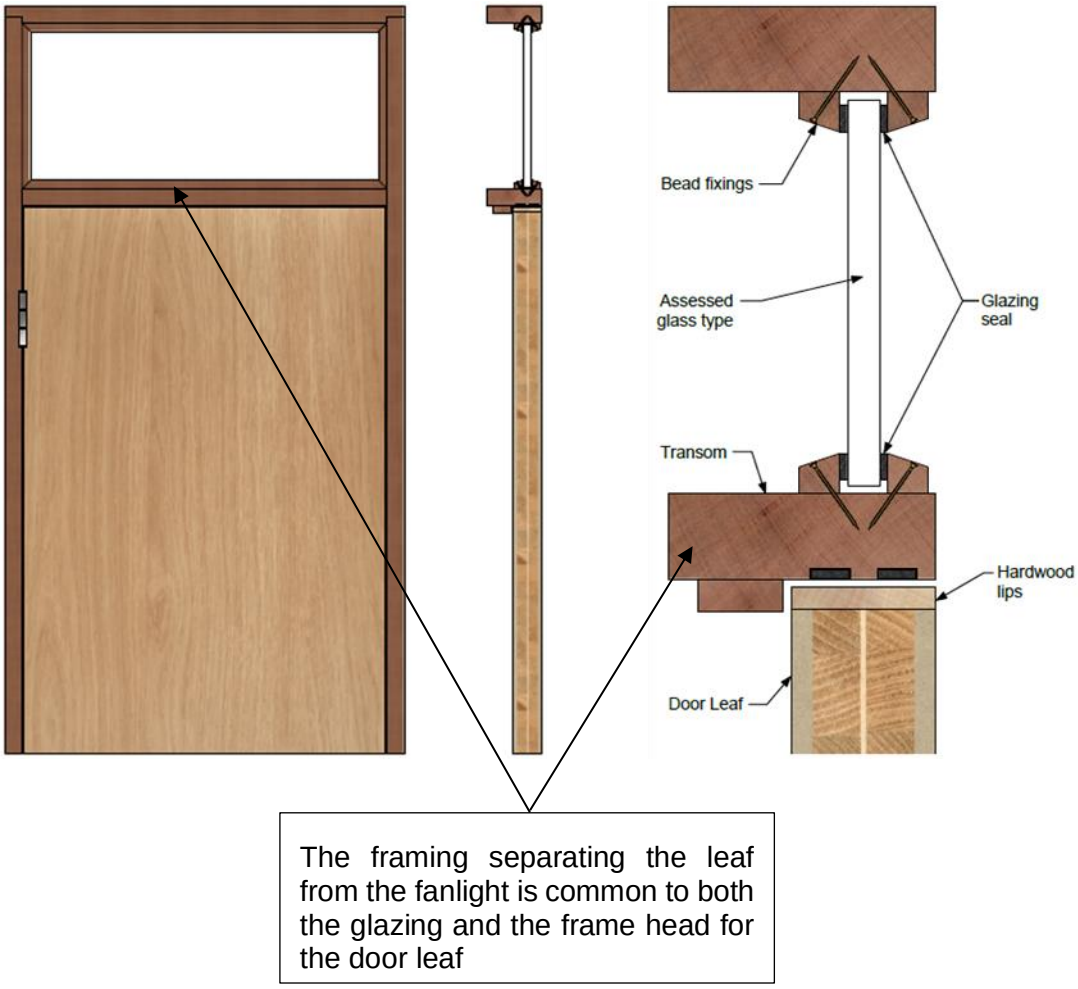
8.3.2 Combination Frames

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 common hanging jamb/screen mullion must run continuously for the full height of the door and fanlight.
- The sidelights and or fanlights can be glazed or consist of solid panels constructed and fitted as detailed for transomed overpanels.

This method combines the door frame members with the side screen and 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/mullion 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:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	866	1872
Side screen	2006	996

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

Transom/mullion 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 included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element		**Height** (mm)	**Width** (mm)
Fanlight	From:	1074	808
	To:	808	2600
Side screen		2500	1000

- 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/mullion details:

- Minimum 75mm deep x 40mm thick hardwood (minimum density 640kg/m^3). This timber section can be used for both door jambs and transoms above doors included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element		**Height** (mm)	**Width** (mm)
Fanlight	From:	967	2525
	To:	808	3000
Side screen		2700	1500

- 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/mullion details:

- Minimum 80mm deep x 40mm thick hardwood (minimum density 640kg/m^3). This timber section can be used for both door jambs and transoms above doors included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element		**Height** (mm)	**Width** (mm)
Fanlight		350	2890
Side screen	From:	2520	225
	To:	1141	1100

- 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/mullion details:

- Minimum 68mm deep x 80mm thick softwood or hardwood (minimum density 400kg/m^3). This section must be used for door jambs and transom above head of door leaves;
- Minimum 68mm deep x 40mm thick softwood or hardwood (minimum density 400kg/m^3) can be used for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	425	2280
Side screen	2264	350

- 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/mullion details:

- Minimum 80mm deep x 44mm thick softwood or hardwood (minimum density 510kg/m^3). This timber section can be used for both door jambs and transoms above doors included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	810	1830
Side screen	2040	485

- 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/mullion details:

- Minimum 80mm deep x 44mm thick hardwood (minimum density 640kg/m^3). This timber section can be used for both door jambs and transoms above doors included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	810	1670
Side screen	2057	956

- 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/mullion details:

- Minimum 80mm deep x 44mm thick hardwood (minimum density 640kg/m^3). This timber section can be used for both door jambs and transoms above doors included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	810	1670
Side screen	2057	956

- 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/mullion details:

- Minimum 95mm deep x 44mm thick hardwood (minimum density 640kg/m^3). This timber section can be used for both door jambs and transoms above doors included within screens and for the perimeter framing of the screen and the transoms and mullions separating individual panes of glass within the fanlights and side screens.

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:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	733	1001
Side screen	2870	1366

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

8.3.3 Jointed Door Frames & Fanlights/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.
3. 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.
4. 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 and 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:

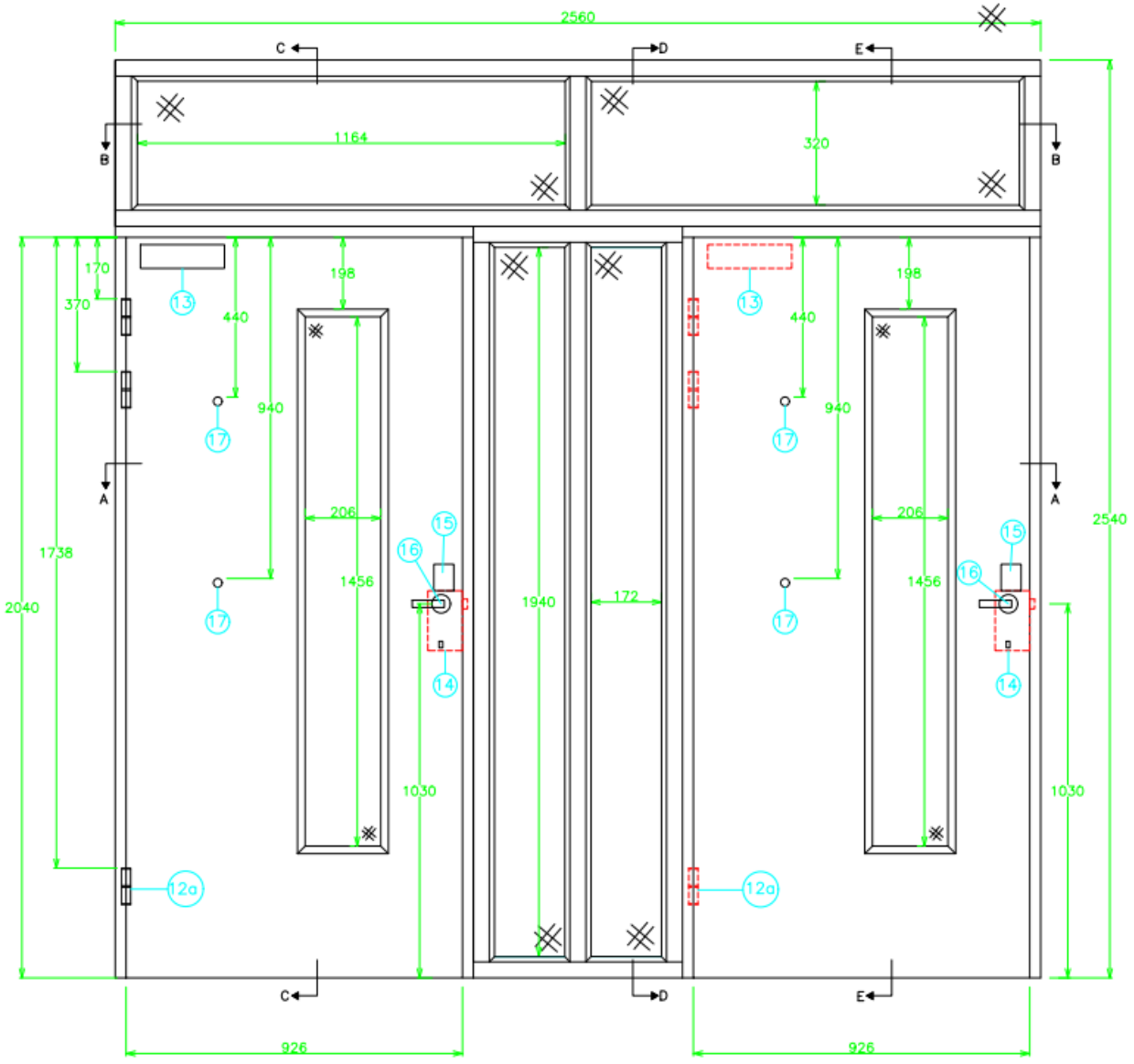
Fanlight dimensions:
Maximum area 0.648m^2
Maximum height 666mm(h)
Maximum width 1800mm(w)

Sidelight dimensions:
Maximum area 0.636m^2
Maximum height 2865mm(h)
Maximum width 400mm(w)

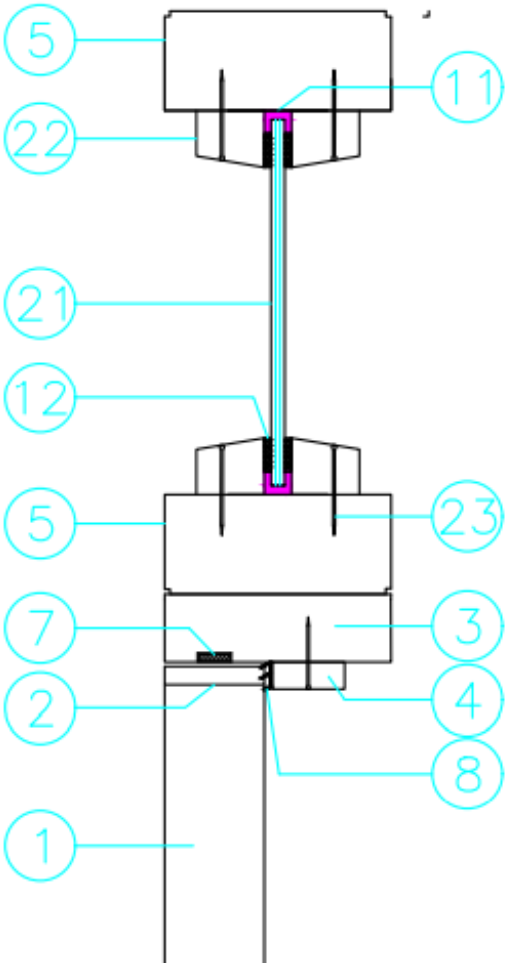
The following glazing system is to be used when glazing the modular units:

- Beading: Hardwood with minimum density 640kg/m^3, 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):


2560
C
D
E
1164
320
B
B
170
370
13
440
198
940
17
206
1738
2040
15
16
1456
1940
172
14
1030
12a
A
A
2540
926
926

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 – Stredor door leaf type 1

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:

1. 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.
2. Screws must be fixed at 600mm centres and located to approximately 2/3 depth of the adjacent timber section.
3. The overall dimensions of the door frame and frame around glass/solid panel must not be be less than 80mm by 44mm.
4. Joints must be tight with no gaps.
5. It is permitted to include maximum 3mm (w) x 3mm (d) quirks at the junction of each timber section.
6. 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.

8.3.3.2 Solid Panels

It is permitted to infill the modular unit with panels constructed using Leaf 1.

Single piece solid panels can be fitted in lieu of glazing. Modular side panels or overpanels can be fitted providing the following is complied with:

- Maximum size in portrait orientation: 2100mm high by 900mm wide
- Maximum size in landscape orientation: 2100 mm wide by 900mm high

The panel to be lipped on all 4 edges with a minimum 15mm by 4mm intumescent seal centrally fitted on all 4 edges. The seal must be one of the types specified and approved in section 4 of this assessment.

The solid side panels must be fixed in line with the fixing details for overpanels given in section 8.2

8.3.3.3 Double Glazed Unit – 12mm Pyrobelite and Low E laminated

A double glazed unit was tested as a fanlight in a separate unit in WF 432578. The unit was tested in both directions with respect to exposure to fire test conditions and is therefore approved for fire resistance from both sides. The following specification is approved for single leaf doorsets with fanlights only.

Transom details:

- Framing: minimum 80mm (w) x 44mm (t) with 15 x 47mm rebate to form rebated beading (softwood 545kg/m3). Door frame head fixed to lower frame of fanlight with 70mm long screws located through door stop up into fanlight framing and 50mm long screws located through the door frame rebate into fanlight framing. Bead of Lorient intumescent sealant is to be applied between the fanlight and door frame both sides Intumescent to rear of frame (only to be applied to rear of fanlight frame at the head of the doorset, between frame and structural opening): 2No. STS154FO PVC encased graphite fitted 15mm from each side with 20mm gap between the seals across the top of the fanlight frame

Glazing details:

- Glazed unit: 12mm Pyrobelite/8mm bar/6.8mm Low E laminated, fitted with 3mm expansion allowance
- Glazing system: STS 302 liner 30mm(w) x 2mm(t) around full perimeter of glazing. STS104 10mm (w) x 4mm (t) fitted to upstand of frame and to planted bead
- Planted bead 15mm x 15mm with 2mm quirk fixed with 50mm x 2mm panel pins fitted 50mm from the corners at 140mm centres, nominally 45 degrees to the glass. Beads to be constructed using hardwood (minimum density 640kg/m^3). Can be square or chamfered

Maximum single pane dimensions:

Screen Element	**Height** (mm)	**Width** (mm)
Fanlight	744	1082

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

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 against each approved 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 seals 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)	
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. The tested intumescent specifications have been consolidated on the basis of making sure there is at least the same or more intumescent material appropriately configured around the leaf edges or in the frame reveal. Care has been taken to ensure that there is not too much intumescent around the edges of leaves, to avoid the increased intumescent specification potentially forcing the doors open in test conditions (particularly relevant to unlatched doorsets). The consolidated intumescent specifications are provided in the envelopes and tables in section 4 but still refer to the base test evidence from which they have been derived.

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
Astroflame	0.8mm	Flexiseal	Graphite
Dixon International Group Ltd	1mm 2mm 1mm 2mm 1mm 2mm	Therm-A-Strip Therm-A-Strip Therm-A-Flex Therm-A-Flex Sealmaster G30 Sealmaster G30	Monoammonium Phosphate Monoammonium Phosphate Graphite Graphite Monoammonium Phosphate Monoammonium Phosphate
Dufaylite Developments Ltd	1mm 2mm	Interdens Interdens	Monoammonium Phosphate Monoammonium Phosphate
Fire & Acoustic Seals Ltd	0.8mm 1mm 2mm	Spartan Spartan Spartan	Graphite Monoammonium Phosphate Monoammonium Phosphate
Lorient Polyproducts Ltd	1mm 2mm	MAP Paper MAP Paper	Monoammonium Phosphate Monoammonium Phosphate
Mann McGowan Ltd	1mm 2mm 1mm 2mm	Pyrostrip Interdens Pyrostrip Interdens Pyrostrip Heat Seal Pyrostrip 500F	Monoammonium Phosphate Monoammonium Phosphate Graphite Graphite
Norsound Ltd	0.5mm 1mm 2mm	NOR905 NOR910 NOR920	Graphite Graphite Graphite

Continued from previous page

Manufacturer	Thickness	Product/Reference	Material Type
Pyroplex Ltd	0.5mm	PMFS1 Mineral Fibre Sheet	Graphite
	1mm	PMFS2 Mineral Fibre Sheet	Graphite
Sealed Tight Solutions Ltd	1mm	STS Graphite	Graphite
	2mm	STS Graphite	Graphite
Vanquish Hardware Protection Ltd	0.8mm	FlexiFire	Graphite
	1mm	FlexiFire	Graphite
	2mm	FlexiFire	Graphite
	1mm	Vanquish Interdens	Monoammonium Phosphate
	2mm	Vanquish Interdens	Monoammonium Phosphate

The following sections provide the requirements for hardware protection across various components that can form part of a doorset using the Stredor system. 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 relavnt 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 additon to any gasket protection or where there are specific requirements for certain types of hardware).

It has been requested by Falcon Panel Products to include the option for increasing the hardware protection, if required for the following reasons:

- To consolidate/simplify manufacturing processes and tolerances
- To follow guidance from the component manufacturer whilst maintaining the requirements of this Field of Application report

9.2.1 Locks

9.2.1.1 Single Point Locks and Latches

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

Single Point Lock/Latch Intumescent Specification						
Leaf Type	Frame Type	Configuration	Location	Required	Enhanced Permitted	Product & Manufacturer
1	1, 2, 4 and 5	Single leaf doorsets	Lining all sides of the mortice for the lockset and/or fitted under the forend and keep	No	Yes	All 1mm thick or above
1	All	Double leaf doorsets (twin strip at meeting edge)	Fitted under the forend and keep	Yes	Yes	All 1mm thick or above

9.2.1.2 Multi Point Locks and Latches

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

Multi Point Lock/Latch Intumescent Specification						
Leaf Type	Frame Type	Configuration	Location	Required	Enhanced Permitted	Product & Manufacturer
1	1 and 2	LSASD – 3pt	Lining all keep mortices or adhered to back of keeps	Yes	Yes	All 1mm thick or above
			Lining lock case and hook case mortices or encasing lock and hook cases	Yes	Yes	All 1mm thick or above
			Behind forend and/or lining groove behind espagnolette drive bar	No	Yes	All

9.2.2 Hinges

9.2.2.1 Butt and Lift-Off Hinges

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

Butt and Lift-Off Hinge Intumescent Specification						
Leaf Type	Frame Type	Configuration	Location	Required	Enhanced Permitted	Type
1	1 and 2	All Single Action	Under all hinge blades of door leaf heights 2670mm or under	No	Yes	All
1	1 and 2	All Single Action	Under all hinge blades of door leaf heights 2671mm 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 Type	Frame Type	Configuration	Location	Required	Enhanced Permitted	Type
1	All SA type	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
1	All SA type	All Single Action	Lining all sides of the mortice for the flush bolt for bolts up to 900mm (h)	Yes	Yes	Minimum 1mm thick STS graphite

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 Overhead Concealed Closers: Single and Double Acting

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 Type	Frame Type	Arrangement	Location	Required	Enhanced Permitted	Type
1	1 and 2	All Single Action	Lining long sides of mortice for closer slider channel and on top of closer body, fitted as per manufacturers instructions for the supplied kit	Yes	No	Rutland IP.114 kit

Arrone 7383 (WF414162 -supplementary evidence)						
Leaf Type	Frame Type	Arrangement	Location	Required	Enhanced Permitted	Type
1	1 and 2	All Single Action	Lining all sides of mortice for both the closer arm and the closer body, fitted as per the manufacturers supplied intumescent kit	Yes	No	Monoammonium Phosphate 2mm thick

10 Adhesives

The following adhesives must be used in construction:

Element	Adhesive Type
Decorative Facings (section 5.3)	UF, PRF, PF, PU, PVA or CR
Lippings (section 5.2)	UF, PRF, PF, PU[1] or PVA
Aperture Linings (section 6)	UF, PRF, PF, PU or PVA

Notes

1. Includes Hot Melt Polyurethane

2. 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:

- Locks & Latches: 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 not permitted within the doorset design, unless it is specifically identified within the appropriate section of this Field of Application. All items of hardware must be fitted in accordance with requirements of this assessment.

The following sections consider what alternative items of essential hardware can be used on these doorsets.

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

No item of hardware at the hanging stile and head should be within 200mm of another item of hardware unless there is test evidence to demonstrate they can be closer.

11.2 Essential Hardware

The table of essential hardware is given for each door assembly configuration, as a baseline for the doorset described. Changes to hardware can affect the intumescent specification and frame details which are considered for each item of hardware as listed in the following sections.

The following table details the essential hardware for each permitted door leaf configuration. In some cases, it may be possible to apply hardware to a doorset that is not essential for the doorsets operation or configuration (e.g. fitting a lock into a double acting doorset).

Essential Hardware	
Configuration	Hardware
LSASD	• Latch • Hinges • Overhead face fixed closer
ULSASD	• Hinges • Overhead face fixed closer
DASD	• Top pivot / bottom strap • Floor spring
LSADD	• Latch • Hinges • Overhead face fixed closer • Flush bolt • Door selector (if astragal fitted)
ULSADD	• Hinges • Overhead face fixed closer • Flush bolt • Door selector (if astragal fitted)
DADD	• Top pivot / bottom strap • Floor spring

11.3 Locks & Latches

11.3.1 Locks & Latches: Single Point

Single point locks and latches which have been successfully tested in the Stredor doorset design for 30 minute applications are detailed in section 3 alongside the associated test reference and are therefore approved for use with the Stredor 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 sections 19.3 alongside the associated test reference.

Single point locks and latches are permitted for use in:

Leaf Types: 1

FrameTypes: All types

The lock and latch must comply with the following.

Based on the maximum size of locks tested in the Stredor 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]
	Between 1201 – 1400mm from the threshold[2, 3]

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

Notes:

1 – A maximum of 2 latches or locks may be included within the same leaf provided there is a minimum of 200mm between lock forends or keeps. The locks must be located within the height limitations from the threshold as defined in the table above.
2 – Threshold is defined as finished floor level.
3 – only allowed when lockset has been fitted with intumescent gasket under forend and keep and on all sides of the mortice for the lock

11.3.2 Locks & Latches: Multi Point

Multi-point locks which have been successfully tested in the Stredor door assembly system for 30 minute applications are detailed in section 3 alongside the associated test reference.

This Field of Application also considers multi-point locking systems tested in similarly constructed timber-based door assemblies where the evidence is made available to the sponsor and listed these items in section 19.3.2 alongside the associated test reference.

These locks and latches are permitted for use in:

Leaf Types: 1

FrameTypes: 1.1 and 2.1, 1.3 and 2.3

Configurations: LSASD

Alternative multi-point locking systems are not considered within this Field of Application report. Therefore multi-point locks included within Stredor 30 minute doorset designs are limited to the following:-

- ERA Surefire Classic
- ERA Surefire Heritage
- Glutz Mint 1893
- GU Ferco
- Winkhaus AV2
- Winkhaus AV3
- Yale Lockmaster Autoengage

The top of the face plate must be no closer than 150mm to the top of the leaf.

The multi-point locking devices assessed for use within the Stredor 30 minute door assembly system consist of both auto-engaging and manually-engaged bolts. The tests conducted to generate evidence for manually-engaged multi-point locks were undertaken with the centrepoint engaged but with deadbolts and end latches disengaged, which permits both the auto-engaging and manually engaging bolt options.

Multi-point locks are restricted to leaf sizes and intumescent configurations AS1, AS2 and AS4 only.

See section 9.2.1 for the required intumescent gasket protection when fitting these types of locksets.

It is not permissible to use other assessments or Certifire certificates to fit alternative multi-point locksets within the Stredor doorset design.

Note:

1 – The inclusion of multi-point locking systems within this Field of Application considers resistance to fire performance only and does not infer door assemblies fitted with these systems to support any security performance criteria.

11.3.3 Cylinders

A range of cylinders have been tested the Stredor 44 design as well as other timber based door constructions similar to the Stredor 44 design, in addition to solid timber based doorsets (see section 19.3.4). Based on the testing conducted all of the cylinders listed in section 19.3.4 are assessed for use with leaf type 1.

Providing the hole for the cylinder is cut tight to the shape of the cylinder, no additonal 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.

11.4 Hinges and Pivots

11.4.1 Butt & Lift-Off Hinges

Hinges which have been successfully tested in the Stredor door assembly system for 30 minute applications are detailed in section 3 alongside the associated test reference.

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 isted in section 19.1 alongside the associated test reference.

These hinges are permitted for use in:

Leaf Types: 1

FrameTypes: 1, 2

Based on the dimensions of the hinges tested in the Stredor 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 44mm thick door leaf and achieved a minimum of 30 minutes.

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

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) is acceptable providing all the requirements for intumescent and frame are complied with.

Notes:

1 - Additional intermediate hinges may be included within door assemblies inbetween 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 Stredor 30 minute doorset system.

11.4.2 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 19.7 alongside the associated test reference.

Pivots are permitted for use in:

Leaf Types: 1

FrameTypes: 4 and 5

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.

Pivots may be used conjunction with their associated double acting floor spring (supplied by the same manufacturer as the pivot set). The following pivot sets are assessed for use with the Stredor doorset design (offset pivot variations are not allowed by this assessment):

- Hoppe AR700 series – pivot set
- Rutland PS 190 – pivot set
- Rutland PS 260 – pivot set

11.5 Automatic Closing

11.5.1 Overhead Face Fixed Closers: Single Acting

Closers which have been successfully tested in the Stredor doorset design for 30 minute applications are detailed in section 3 alongside the associated test reference.

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 Types: 1

FrameTypes: All single acting frames

Based on the range of overhead face fixed closers tested in Stredor 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 acceptbale 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 Stredor 30 minute door assembly system.

11.5.2 Overhead Concealed Closers: Single and Double Acting

Overhead concealed closers which have been successfully tested in the Stredor door assembly system, or assessed based on a fundamentally similar door design, for 30 minute applications are detailed below:

- Rutland ITS 11204 (tested in Stredor)
- Arrone 7383 (tested in Strebord, deemed fundamentally similar to Stredor for the purpose of assessing an alternative concealed closer, based on the tested Rutland ITS 11204, which demonstrated that the Stredor design is capable of tolerating a concealed overhead closer in the head of the leaf when appropriately protected with intumescent gaskets)

These closers are permitted for use in:

Leaf Types: 1

FrameTypes: 1.1, 2.1, 1.3 and 2.3 where the stop is increased to 18mm and minimum density of frame is 510kg/m^3 (softwood or hardwood) for Rutland ITS11204 and 640kg/m^3 (hardwood) for Arrone 7383.

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.

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 Stredor 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 Stredor door assembly system for 30 minute applications are detailed in section 3 alongside the associated test reference. These are:

- The Astra 4000 Series

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 sections 19.2 alongside the associated test reference.

These closers are permitted for use in:

Leaf Types: 1

Frame Types: Frames 1.1, 2.1, 1.3 and 2.3

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 Flush Bolts

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 Items of Hardware

11.6.1 Handles

11.6.1.1 Pull handles

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 Stredor doorset design, and they are suitable for use within the following scope:

- Leaf: 1
- Frame: Frames 1, 2, 4, 5
- 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 250mm high x 60mm wide
  - Lever handle length 250mm

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

The following handles have been tested in the Stredor doorset design and are approved for use. Alternative handles are permitted providing they meet the specification given above:

Tested Handle Specification	
Product Reference (Test Reference)	Manufacturer/Supplier
Ref. 902.21.010 Hafele Aluminium lever type handle (RF16031)	Hafele
Ref. Easyclick Lever on rose type handle (WF399749)	Apollo
Ref: 908356 TH105 Altro Stainless Steel lever type handle (WF414781)	Altro

Tested Handle Specification	
Product Reference (Test Reference)	Manufacturer/Supplier
Heritage Euro Cylinder Pull (WF426419)	ERA Fab & Fix
Ref: 1X000 Lever type handle (WF416690)	ERA Fab & Fix
Ref: ZPZ090SC (EFR-18-H-003671)	Stanza
Steel lever type handle (WF385685)	Zoo Hardware
In line steel lever handle (WF432758)	Yale

11.6.2 Push Plates/Kick Plates

Face-fixed hardware such as push plates and kick plates may be fitted to the doorsets provided that their fitting requires the removal of no part of the door leaf. Based on test experience a limited area of face fixed metal plate has been shown as having no detrimental influence on the fire performance of the timber based fire reisting doorsets, subject to the provisos stated in this section.

Face fixed push plates and kick plates 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 thermo-softening contact adhesive. Plates must not return around the door leaf edges.

11.6.3 Panic Hardware

Panic hardware may be fitted, provided that its installation does not require the removal of any timber from the leaf, stop or frame reveal and it in no way interferes with the self-closing action of the door leaf.

11.6.4 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 following eye viewer has been tested and is approved for use. Alternative eye viewers are acceptable providing they meet the specification given above:

Tested Security Viewer Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
STS4008 (WF426419)	Sealed Tight Solutions	Body: Ø14 Footprint: Ø16
Fab & Fix Eye Viewer (WF416690)	ERA Fab & Fix	Body: Ø12 Footprint: Ø16

11.6.5 Environmental Seals

The following flame retardant acoustic, weather and dust seals are approved for use with the Stredor doorset design and 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.

11.6.6 Letter Boxes/Plates

Letter boxes/plates may be fitted providing the product can demonstrate contribution to the required performance of this type of 30 minute door assembly design, when tested to BS 476: Part 22: 1987 or BS EN 1634-1, when installed within a timber based doorset of comparable thickness. Products may be fitted up to 1200mm from floor level and not closer than 100mm to any leaf edge. The area occupied by the letter box/plate must be deducted from the area of glazing, if both elements are fitted.

Letterboxes/plates which have been successfully tested in the Stredor doorset design for 30 minute applications are detailed in section 3 alongside the associated test reference.

This Field of Application also 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 in sections 19.6 alongside the associated test reference.

These letter boxes/plates are permitted for use in:

Leaf Types: 1

Frame Types: All

The letterboxes may be fitted between 400mm and 900mm from the threshold.

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 rptoection must be fitted to the letterplate as listed below. No other letterplates other than those listed below may be fitted to the Stredor doorset design:

Tested Letter Box/Plate Specification			
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)	Hardware Intumescent
ERA Fab & Fix Numail door letter plate with security cowl	ERA	75(h) x 310(w)	40x2mm Sealed tight solutions Limited graphite based intumescent, wrapped twice around letterplate channel
Yale Postmaster Professional	Yale	-	Full graphite intumescent wrap around letter plate and graphite tubes around fixing posts as supplied integral to the letterplate

11.6.7 Threshold

11.6.7.1 Automatic Drop Seals

The following types of automatic threshold drop seals may be recessed into the bottom edge of leaves to this design without compromising the performance, based on test evidence on the Stredor design and other timber based doors that are considered to be fundamentally similar to the Stredor door design.

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)

11.6.7.2 Thresholds

The following product has been tested for use (WF426419) with the Stredor 44 design covered by this field of application and is therefore approved for use with single leaf doorsets.

The threshold must be fitted on to a non-combustible flooring with a minimum Reaction to Fire class A2,fl,s1 as tested.

Element	**Type**	**Dimensions** (mm)	**Location**
Threshold	Sealed Tight Solutions Limited STH004 aluminium threshold	15 high x 47 deep (overall)	The threshold is to be screwed to the jambs using 2No. 4mmØ x 50mm long woodscrews

Profile of Sealed Tight Solutions Limited STH004 aluminium threshold

11.6.8 Air Transfer Grilles

The following Pyroplex air transfer grilles have been assessed as acceptable for use with the door leaf types 1 referred to in this assessment based on test report WF146520 (held on file by Warringtonfire, under the same file reference as the test report).

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. 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.

11.6.9 Escutcheons

Escutcheons are permitted at the lock location and can be bolt through, screw fixed or glued in position. The escutcheon must not remove any material from the door leaf and may be constructed of metal or plastic.

12 Installation

This section considers the installation of the different 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
- 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 type	Wall construction
Frames1, 2, 4, 5	Masonry wall Timber stud partition Steel stud partition

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

12.1 Door Frame Installation: Frame 1, 2, 4, 5

12.1.1 Generic systems

The following tables detail permitted fire stopping details

The architrave can be softwood minimum density 450 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 reistance 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 test WF 386959 the following Sealed Tight Solutions Ltd products 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 and Acoustics Seals Ltd

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

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 frames 1 to 5, 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 & 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 & Partitions

These will require specific test evidence.

12.4 Onsite Leaf Size Adjustment

The door leaves should not be modified on site so only limited actions can be taken, see table below.

Leaf Size Adjustment Specification	
Element	Reduction
Lipping	The dimensions stated in section 5.2 may be reduced by 1mm for fitting purposes but cannot go below the minimum.

12.5 Door Gaps

For fire resistance performance, door edge gaps and alignment tolerances must fall within the range shown in the following table.

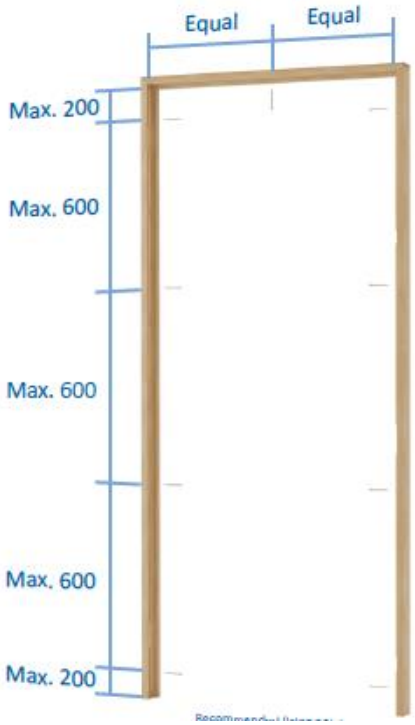
Door Edge Gaps & Alignment Tolerance Specification	
Location	Dimensions
Door edge gaps	A minimum of 2mm and a maximum of 4mm
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm
Threshold	10mm between bottom of leaf and top of floor covering

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

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

Insulation Performance Specification	
Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Unglazed doorsets and glazed doorsets with fully insulated glass (see section 6 for insulating glass types)

14 Conclusion

If the Falcon Panel Products Ltd. Stredor 44 doorset design (based on Leaf 1 and Frames 1, 2, 4 and 5), constructed in accordance with the specifications documented in this Field of Application, were to be tested in the appropriate configuration in accordance with BS 476: Part 22: 1987, it is our opinion that it would provide a minimum of 30minutes 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:

_____

For and on behalf of: Falcon Panel Products Ltd.

16 Limitations

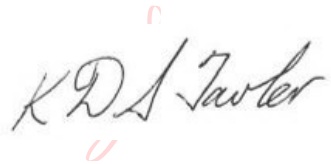
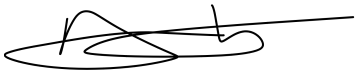
The following limitations apply to this assessment:

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

17 Validity

1) The assessment is valid 5 years from the date of issue, after which time it must be submitted to Warringtonfire for technical review and revalidation.

2) This assessment report is not valid unless it incorporates the declaration given in section 15 duly signed by the applicant.

Signature:		
Name:	Dr K.D.S Towler*	P N Barker*
Title:	**Senior Product Assessor**	**Senior Product Assessor**

* For and on behalf of Warringtonfire

18 Appendix A: Revisions

Revisions

Rev.	Ref.	Date	Description
A	CNA/F15193	05.08.15	Clarification of glazing bead pin fixings.
B	CNA/F16188	15.12.16	Technical review & update to new document format. Inclusion of FEP/F16012 Rev. A covering MDF facings, PU adhesive for lippings, tested hardware (Rutland TS3204 closer, Hafele shoot bolts & Hafele steel mortice latch), tested Pyroplex graphite hardware protection, tested Pyroplex 30049 glazing system, assessed leaf size & maximum glazed area aperture increases. Inclusion of FEP/F16031 covering Plywood facings, Type 617 perimeter seals with supporting data sheets, tested MAP hardware protection, assessed leaf size & maximum glazed area aperture increases. Addition of 7mm inner facings based on test FEP/F16174.
C	WF436806	23.12. 2020	The assessment has been written into the latest Warringtonfire format and revalidated for a further 6 months based on a review of the evidence contained in Appendix A. Blue 60 has been removed as a fire stopping for the back of frame as has generic sealant option for fixing mock glazing beads to glass.
D	WF506219	08.07.21	The assessment has been reviewed and revalidated for a further 4 months duration.
E	WF510227	01.11.21	The assessment has been reviewed and revalidated for a further 2 months duration
F	WF516032	28.03.21	Revised and revalidated version of report. Report rebranded in the Warringtonfire name and styling and updated following general requirements of EN 15725: 2010 and PFPF guidance to undertaking technical assessments. The assessment has been updated based on the following test evidence as the primary test evidence for following leaf designs. Key items for inclusion within the assessment have been identified against each of the test reports: Stredor 44 with 4mm (t) plywood faces and 8mm (t) MDF faces (production F14 mill) WF 424619 (Door A) - ply faced, single leaf doorsets, STS intumescent seals, glazed apertures, face fixed mouldings, multipoint lock, eye viewer WF 416690- issue 2 - ply faced, single leaf doorsets, Pyroplex intumescent seals, glazed apertures, multipoint lock WF 385685 - MDF faced, double leaf doorsets, single leaf doorsets, grooves in leaf facing, STS intumescent seals,

			WF 414781 - MDF faced, double leaf doorsets, single leaf doorsets, Type 617 intumescent seals, flush bolts, concealed closer, automatic drop seals WF 432578 - ply faced, single leaf doorsets, bi-directional performance, face fixed mouldings, fanlights, dropseals, Type 617 intumescent seals, thresholds, letter plate WF 399749 - ply faced, double leaf doorsets, single leaf doorsets, Type 617 intumescent seals, glazed apertures Supplementary evidence has been provided by the following test evidence on the Stredor design with 2mm (t) plywood faces and 8mm (t) MDF faces (production F7 mill) RF15066 - ply faced, double doors, Pyroplex intumescent seals, flush bolts, glazed apertures RF16031 - ply faced, double doors, locksets, flush bolts WF 424619 (Door B) - ply faced, cylinder pull in alternate direction to Door A EFR-18-H-003671 - ply faced, single leaf doorsets, multi-point locks, drop seals, jamb mounted closer Leaf construction details to be considered: Stredor 44 with 4mm (t) plywood faces (including outer 0.4mm engineered veneer), 17mm softwood lamels either side central 2.1mm plywood layer Stredor 44 with 8mm MDF faces with 13mm softwood lamels either side central 2.1mm plywood layer Following framing types have been considered: • Rebated door frame with integral stops • Door frame with planted stops • Double swing door frames Glazing permitted in Stredor 44 ply faced and Stredor 44 MDF faced (see test evidence above). Aperture sizes, assessed glass and glazing systems will be generated from the test evidence. Certifire scopes as applicable for alternative glass and glazing systems. Following side lights and fanlights have been considered: Back to back framed elements consisting of either: • Glass with appropriate tested system (based on the data for Chilt/A02066 Rev O) • Infill panel consisting of the following panel constructions: Stredor 44 ply faced and MDF faced

			The following items of hardware are to be included based on the primary test evidence listed above and where applicable, the items tested and assessed in Chilt/A02066 Rev O (Strebord 44 design): • Butt & Lift Off Hinges • Pivots • Surface mounted closers • Concealed overhead closers • Jamb closers • Large (DIN standard) lockcases • Flush bolts • Drop seals • Clarification of approved lever handle materials (Aluminium / Steel) • Electronic locking (cableways & cableloops) • Letterplates • Lorient & Pyroplex Air Transfer Grilles • Push & Kick plates • Pull Handles • Panic Hardware

19 Appendix B: Performance Data

The following test evidence has been generated on timber based doorsets that are considered to be fundamentally the same as the Stredor doorset design, in terms of their suitability to support alternative items of hardware. The primary evidence for the Stredor doorset design is summarised in section 3 of this report.

19.1 Hinges

19.1.1 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
BMT/FER/F13263 (A)	ULSASD	41	Redwood	Eclipse cranked bearing butt type hinge
BMT/FER/F13263 (B)	ULSASD	32	MDF	Eclipse cranked bearing butt type hinge
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 Manuf/ 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
WF (B)	LSASD	33	Redwood	Nico Load Pro Lift off

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
WF435986(A)	ULSADD	36	Simplis Soleco Steel Flush Frame	Hoppe Arrone AR8182

19.1.2 Tested in Similarly Constructed 44mm Substrates

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
CFR1505191	ULSASD	0	Redwood	R&T H101
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

19.1.3 Tested in Solid Timber 44mm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Hinge Manuf/ Model
WF419584	LSASD	0	Softwood	Hoppe Arrone AR8182
WF391843 (B)	LSASD	47	Redwood	R&T H101
WF399751	ULSADD	31	Redwood	CB7735
WF419854	LSASD	33	Redwood	Hoppe Arrone AR8182
WF369451	ULSADD	35	Redwood	Smith & Locke 2900G
WF428987 (A)	LSASD	31	Sapele	Rutland RH.BB.43R.SS
WF428987 (B)	LSASD	41	Sapele	Rutland RH.BB.43R.SS

19.2 Closers

19.2.1 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
WF391843 (A)	LSASD	51	Redwood	Astra 4000
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
WF402305	LSASD	51	Redwood	Astra 4000 (jamb mounted
CFR1811071 (A)	ULSASD	39	Softwood	Dorma TS68
WF411193	LSASD	37	MDF	Rutland TS11205
WF414162	LSASD	36	Ash	Arrone AR7383 (concealed in head)
WF426842 (B)	ULSADD	16	Redwood	Hoppe AR1500

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF386959 (A)	ULSASD	32	Redwood	Rutland ITS.11204
CFR1810221 (A)	ULSASD	37	Softwood	Rutland TS4204
CFR1810221 (B)	DASD	39	Softwood	Rutland ITS.11204
CFR1811071 (B)	ULSASD	38	Softwood	Dorma TS68
CFR1812111	ULSADD	36	Softwood	Rutland TS.9205
CFR1812121	ULSADD	36	Softwood	Rutland TS.5204BC.SRFB.SESE
BMT/FEP/F15050 (A)	LSADD	49	MDF	N/A
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
WF421964 (B)	LSASD	33	Redwood	TBC
CFR2003051	DADD	37	Redwood	Arrone AR700 Floor Spring

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF426603	LSADD	0	Redwood	Dorma TS73
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

19.2.2 Tested in Similarly Constructed 44mm Substrates

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
CFR1505191	ULSASD		Redwood	Dorma TS71
WF380214 (A)	LSASD	52	Redwood	Arrone AR1500
Chilt/RF11172	ULSADD	39	MDF	Rutland TS3204
Chilt/RF12061	ULSADD	34	Redwood	Rutland TS3204
WF423917	LSASD		Sapele	Arrone AR7383
WF426842 (A)	ULSASD	29	Redwood	Arrone 6383

19.2.3 Tested in Solid Timber 44mm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Closer Manuf/ Model
WF419584	LSASD	0	Softwood	Arrone F6700
WF391843 (B)	LSASD	47	Redwood	Astra 4000
WF399751	ULSADD	31	Redwood	Rutland TS9205
WF428987 (A)	LSASD	31	Sapele	Rutland ITS.11204
WF428987 (B)	LSASD	41	Sapele	Rutland ITS.11204

19.3 Locks & Latches

19.3.1 Single Point Locks

19.3.1.1 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 Æ lement 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

19.3.1.2 Tested in Similarly Constructed 44mm Substrates

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
CFR1505191	ULSASD		Redwood	Eurospec CE21121
WF380214 (A)	LSASD	52	Redwood	Eurospec DIN Latch
Chilt/RF11172	ULSADD	39	MDF	Eurospec tubular latch
Chilt/RF12061	ULSADD	34	Redwood	Arrone mortice latch
WF426842 (A)	ULSASD		Sapele	Arrone AR8100
WF419361 (A)	LSASD	29	Redwood	Frelan JL1091
WF151228 Issue 2	DASD	22 Indicative Test, Failure of lock @ 30 mins	Softwood	New Star LRB1

19.3.1.3 Tested in Solid Timber 44mm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
WF419584	LSASD	0	Softwood	NSP 814
WF399751	ULSADD	31	Redwood	Eurospec tubular latch
WF385685	ULSADD	40	Redwood	Zoo mortice latch

19.3.2 Multi-point Locks

19.3.2.1 Tested in Strebord 44

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
WF416689 (B)	ULSASD	46	Ash	Winkhaus AV2
WF401039 (A)	LSASD	36	Redwood	Glutz 1893 Mint
WF391843 (A)	LSASD	51	Redwood	ERA Surefire Classic
BMT/FEP/F14233 (A)	LSASD	45	Sapele	Winkhaus AV2
WF402305	LSASD	51	Redwood	Winkhaus AV2
WF414162	LSASD	36	Ash	Winkhaus AV3
BMT/FEP/F14168	LSASD	48	Sapele	Winkhaus AV2
WF419865	LSASD	34	Poplar	ERA Surefire Classic
WF421795	LSASD	35	Poplar	Winkhaus AV3
BMT/FEP/F15027A	LSASD	38	sapele	ERA Truelock multipoint

19.3.2.2 Tested in Solid Timber 44mm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Lock Manuf/ Model
WF391843 (B)	LSASD	47	Redwood	ERA Surefire Classic
WF428987 (A)	LSASD	31	Sapele	ERA Surefire Heritage
WF428987 (B)	LSASD	41	Sapele	ERA Surefire Heritage
WF412333 AR2 (A)	LSASD	36	Redwood	UAP Fullex Crimebeater XL16

19.3.3 Magnetic Locks

No test evidence has been made avaiable

19.3.4 Cylinders

19.3.4.1 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

19.3.4.2 Tested in Similarly Constructed 44mm Substrates

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

19.3.4.3 Tested in Solid Timber 44mm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Cylinder Manuf/ Model
WF391843 (B)	LSASD	47	Redwood	ERA Fortress
WF419854 (B)	LSASD	33	Redwood	NSP 814*
WF428987 (A)	LSASD	31	Sapele	Access2 Premier 3
WF428987 (B)	LSASD	41	Sapele	Access2 Premier 3

19.4 Bolts

19.4.1 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

19.4.2 Tested in Solid Timber 44mm 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

19.5 Door Viewers

19.5.1 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

19.5.2 Tested in Similarly Constructed 44mm Substrates

Test Ref	Tested Config	Time of First Failure	Frame Option	Frame Material	Viewer Manuf/ Model	Dimensions
WF147045	N/A	66		N/A	UAP Salamander Secure-to-view Firecheck SWALF	Barrel: Ø14mm Footprint: Ø26mm
WF147046	N/A	66		N/A	UAP Salamander Secure-to-view Firecheck SWALF	Barrel: Ø14mm Footprint: Ø26mm

19.5.3 Tested in Solid Timber 44mm Door Leaves

Test Ref	Tested Config	Time of First Failure	Frame Material	Viewer Manuf/ Model
WF426419 (A)	LSASD	35	Redwood	Sealed Tight Solutions 4008
WF426419 (B)	LSASD	41	Redwood	Sealed Tight Solutions 4008
WF428987 (A)	LSASD	31	Sapele	Rutland
WF428987 (B)	LSASD	41	Sapele	Rutland

19.6 Letter Plates

19.6.1 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

19.6.2 Tested in Solid Timber 44mm 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

19.7 Pivots & Floor Springs

19.7.1 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

19.8 Security Chains

19.8.1 Tested in Similarly Constructed 44mm Substrates

Test Ref	Tested Config	Time of First Failure	Frame Material	Type	Viewer 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)