
Title:

Field of Application for:
Falcon Stredor® 54 Doorsets

For 30 & 60 Minutes Fire
Resistance

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Contents

Page No.

1	Foreword.....	4
2	Proposal.....	5
3	Test Data.....	5
3.1	Primary Test Evidence	6
3.2	Supplementary Test Evidence.....	20
4	Technical Specification.....	24
4.1	General	24
4.2	Intended Use.....	24
4.3	Door Leaf	24
4.4	Door Frames	24
4.5	Doorset Configurations & Maximum Leaf Sizes.....	25
5	General Description of Leaf Construction	60
5.1	Leaf 1: Stredor 54 with Plywood Facing	60
5.2	Leaf 2: Stredor 54 with MDF Facing.....	62
5.3	Lippings: Leaf 1 & 2	63
5.4	Leaf Facing Materials: Leaf 1 & 2.....	64
5.5	Feature Grooves: Leaf 1 Only	64
5.6	Leaf Size Adjustment Prior to Machining: Leaf 1 & 2.....	66
6	Glazing.....	67
6.1	General.....	67
6.2	Glass & Glazing Systems.....	68
6.3	Glazing Beads & Installation Detail.....	71
7	Door Frame Construction	80
7.1	Frame Specification	80
7.2	Standard Frame	80
7.3	Scalloped Frame	80
7.4	Square Frame	81
7.5	Frame Joints	81
8	Overpanels & Fanlights	83
8.1	Transomed Overpanels.....	83
8.2	Fanlights	84
9	Intumescent.....	86
9.1	Essential Hardware Protection	86
9.2	Door Perimeter Intumescent Seal.....	87

10 Adhesives.....	88
11 Hardware.....	89
11.1 General	89
11.2 Essential Hardware	90
11.3 Locks & Latches.....	90
11.4 Hinges.....	92
11.5 Automatic Closing	94
11.6 Flush Bolts	96
11.7 Additional Items of Hardware	97
12 Installation	102
12.1 General	102
12.2 Door Frame Installation: Frame 1	102
12.3 Firestopping	104
12.4 Packers.....	105
12.5 Wall Types	105
12.6 Onsite Leaf Size Adjustment	105
12.7 Door Gaps.....	105
12.8 Fixings	106
13 Insulation.....	107
14 Smoke Control.....	107
14.1 General	107
14.2 Further Considerations.....	107
15 Conclusion	108
16 Declaration by the Applicant	109
17 Limitations	110
18 Validity.....	111
19 Appendix A: Revisions.....	112
20 Appendix B: Performance Data	113

1 Foreword

This field of application report has been commissioned by Falcon Panel Products Limited and relates to the fire resistance of 30 and 60 minute fire resisting doorset designs.

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

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

This field of application has been written using appropriate test evidence generated at UKAS accredited laboratories¹, 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 and 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) guidelines to undertaking assessments. 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.

2 Proposal

It is proposed to consider the fire resistance performance of the specified proprietary Stredor 54 doorset designs, when used for 30 and 60 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.

3 Test Data

The test evidence summarised below has been generated to support the fire resistance performance of the door designs that are the subject of this field of application.

Note:

Dimensions are in mm unless otherwise stated.

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

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

3.1 Primary Test Evidence

3.1.1 Test Report CFR1812191_1

The referenced test report, the essential details of which are summarised below, is the primary data for:

Stredor Ply 54 incorporating ERA Surefire multi-point locking mechanism, STS glazing seals, STS perimeter seals, STS hardware protection, Pyrobelite 12 EI30/EW60 glass.

Date of Test:	01.Feb.2018
Identification of Test Body:	Cambridge Fire Research UKAS No. 4319
Sponsor:	Falcon Panel Products Ltd
Tested Product:	A single acting single leaf doorset comprising a Stredor 54 door blank with Pyrobelite 12 EI30/EW60 glazing tested as an insulated doorset. Door leaf was 3 point latched. LSASD
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2192 (h) x 1046 (w) x 54 (t)</p> <p>Core: Falcon Panel Products Stredor 54</p> <p><i>Inner Core Layer:</i> 4mm poplar ply (510kg/m³)</p> <p><i>Outer Core Layer:</i> 20mm pine lamel (480kg/m³)</p> <p><i>Surface Core Layer:</i> 5mm poplar ply with integral EV veneer face (510kg/m³)</p> <p>Lipping: Sapele (640kg/m³), 8mm thick to all four edges</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (640kg/m³), 90 x 44mm thick, with 15mm thick planted stop.</p> <p>Frame Fixing: 2No. Ø5 x 100 csk steel woodscrews at 35 to 45. centres vertically.</p> <p>Threshold: Non-combustible.</p> <p><u>Intumescent:</u></p> <p>Frame Reveal/Leaf Edges: 2no 15x4mm Sealed Tight Solutions STS154 FO fitted 8mm and 34mm from hinge knuckle face.</p> <p>Meeting Stiles: N/A</p> <p>Bottom Leaf Edge: N/A</p> <p><u>Hardware:</u></p> <p>Hinges: 3no Zoo bearing butt hinge per jamb</p> <p>Closer: Rutland TS9205</p> <p>Lock/Latch: ERA Surefire Classic</p> <p>Lock/Latch Size: (Forend): 1635(h) x 20(d) x 2.5(t). (Keep): 189(h) x 38(d) x 2(t) including tongue of 68 x 14. (Centre lock/latch Body): 214(h) x 58(w) x 14(d)</p>

	<p>Hook Box Size: (Body): 150(h) x 40(w) x 15(d). (Keep): 152(h) x 38(d) x 2(t) including tongue of 47 x 14mm</p> <p>Lock/Latch Status: Engaged</p> <p>Cylinder: ERA Fortress 3* TS007, KM553031</p> <p>Handle: Zoo ZPS Stainless steel lever handle on rose with escutcheons.</p> <p><u>Hardware Protection:</u></p> <p>Under Hinge: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Encasing Lockcase: Sealed Tight Solutions 1mm thick graphite based intumescent (2mm to vertical edge centre latch)</p> <p>Under Forend: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Under Keep: Sealed Tight Solutions 2mm thick graphite based intumescent</p> <p><u>Glazing (Main Leaf):</u></p> <p>Glass: AGC Pyrobelite 12mm thick EI30/EW60 glass with intumescent interlayers</p> <p>Aperture Size: 1215(h) x 523(w)</p> <p>Expansion Allowance: 3mm all round</p> <p>Beading: Sapele beads 30x26mm with mitred corners and a 5x7mm bolection with a 25° splay</p> <p>Bead Fixing: 1.6g x 60mm long steel pins pneumatically fired at 30°-35°, 150mm centres & 50mm from corners</p> <p><u>Glazing System:</u></p> <p>Glazing Perimeter: Sealed Tight Solutions STS104SG 10(w) x 2(t)</p> <p>Glazing Aperture Liner: Sealed Tight Solutions 302GL 30(w) x 2(t)</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 71 minutes</p> <p>Insulation: 34 minutes</p>
Reason for Use (if test failed)	N/A
Failure Mode: (if test failed)	<p>Initial Failure: Cotton pad at 71:19</p> <p>Further Failure: Sustained flaming at 71:48</p>

3.1.2 Test Report WF 369636

The referenced test report, the essential details of which are summarised below, is the primary data for:

Inclusion of ISL glazing system, ISL hardware protection, Pyroplex perimeter seals and Promat Pyrobelite 60/0 12mm within Stredor 54 scope. Manufactured in mill reference F7.

Date of Test:	26.Jul.2016
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd

Tested Product:	An unlatched, glazed, double leaf single acting doorset. - ULSADD
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2145mm(h) x 923/923mm(w) x 54mm(t)</p> <p>Core: Falcon Panel Products Stredor 54</p> <p><i>Inner Core Layer:</i> 4mm poplar (510kg/m³)</p> <p><i>Outer Core Layer:</i> 20.5mm thick (25-35mm wide) vertically orientated spruce and pine lamels (480 kg/m³)</p> <p><i>Surface Core Layer:</i> 4mm thick poplar (510kg/m³), 0.5mm long grain steamed beech veneer (600kg/m³)</p> <p>Lipping: Sapele (640kg/m³), 6mm thick to all four edges</p> <p>Facing: Beech veneer (integral)</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (640kg/m³), 100mm(d) x 35mm(w), with 32mm(w) x 12mm(d) planted, pinned stop.</p> <p>Frame Fixing: Mortice and tenon, screwed with 2no 5x100 steel woodscrews</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p> <p>Frame Reveal: 2no 15x4mm Pyroplex FO8700 10mm apart, 7mm from the exposed face</p> <p>Meeting Stiles: 2no 15x4mm Pyroplex FO8700 10mm apart, 7mm from the exposed face</p> <p><u>Hardware:</u></p> <p>Hinges: 3no Smith & Locke bearing butt hinge Ref 2900G per jamb</p> <p>Closer: Arrone AR 1500</p> <p>Lock/Latch: Unbranded tubular steel mortice</p> <p>Lock/Latch Size: (Backset): 45mm. (Case): 67mm(d) x 21mm(h) x 16mm(w)</p> <p>Lock/Latch Status: Disengaged for test</p> <p>Flush Bolt: Smith & Locke Ref 5050J to top & bottom of slave leaf, disengaged for purpose of test</p> <p>Handle: Smith & Locke lever handle Ref 2812H</p> <p><u>Hardware Protection:</u></p> <p>Under Hinges: 2mm thick ISL Therm-A-Flex graphite</p> <p>Under Forend & Keep: 2mm thick ISL Therm-A-Flex graphite</p> <p>Encasing Lockcase: 2mm thick ISL Therm-A-Flex graphite</p> <p><u>Glazing (Main Leaf):</u></p> <p>Glass: Promat Pyrobelite 60/0 12mm</p> <p>Aperture Size: 200 x 1500mm</p> <p>Beading: 31mm(h) x 22mm(w) including 5x5mm bolection and a 22° chamfer</p>

	<p>Bead Fixing: 1.6g x 60mm long steel pins, at 35°, 150mm centres & 50mm from corners.</p> <p><u>Glazing (Slave Leaf):</u></p> <p>Glass: Promat Pyrobelite 60/0 12mm</p> <p>Aperture Size: 200 x 1500mm</p> <p>Beading: 31mm(h) x 22mm(w) including 5x5mm bolection and a 22° chamfer</p> <p>Bead Fixing: 1.6g x 60mm long steel pins, at 35°, 150mm centres & 50mm from corners.</p> <p><u>Glazing System:</u></p> <p>Glazing Perimeter: ISL Therm-A-Bead 25x4mm, between glass & bead.</p> <p>Glazing Aperture Liner: ISL Therm-A-Line 54x2 between glass & aperture</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 65 minutes</p> <p>Insulation: 35 minutes</p>
Reason for Use (if test failed)	
Failure Mode: (if test failed)	<p>Initial Failure: Cotton pad at 65:39</p> <p>Further Failure: Continuous flaming at 66:07</p>

3.1.3 Test Report WF 412601 (Doorset A)

The referenced test report, the essential details of which are summarised below, is the primary data for:

Stredor 54 alternative production comparison test (A against B). Manufactured in mill reference F7.

Date of Test:	18.Apr.2018
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched, single leaf, double acting doorset (DASD)
Tested Orientation:	N/A
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2040mm (h) x 926mm (w) x 54mm (t)</p> <p>Core: Stredor 54 Ply (518kg/m³), 54mm thick</p> <p>Lipping: Sapele (635kg/m³), 18mm to hinge side, top & bottom, 8mm to lock side.</p> <p>Facing: 0.5mm thick, Beech veneer (integral to core)</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (635kg/m³), 100 x 44mm thick, with 8mm scallop @ 58mm radius</p>

	<p>Frame Fixing: 4No 5 x 80mm long steel screws per jamb</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p> <p>Frame Reveal: 2 No 15x4 Lorient LP1504. Fitted centrally, 10mm apart.</p> <p><u>Hardware:</u></p> <p>Top Pivot/Strap: Rutland-PS.190</p> <p>Closer (Floor Spring): Rutland TS7104</p> <p>Lock/Latch: N/A</p> <p><u>Hardware Protection:</u></p> <p>Lining Strap Mortices: 2mm thick interdens</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 71 minutes</p> <p>Insulation: 71 minutes</p>
Reason for Use (if test failed)	
Failure Mode: (if test failed)	<p>Initial Failure: Sustained flaming top strap position @ 71:26</p> <p>Further Failure: Sustained flaming top closing position @ 73:02</p>

3.1.4 Test Report BMT/FEP/F16174

The referenced test report, the essential details of which are summarised below, is the primary data for:

Inclusion of ISL glazing system, Pyroplex hardware protection, Pyroplex perimeter seals and Pilkington Pyrodur EW60-10 10mm CS within Stredor 54 scope. Manufactured in mill reference F7.

Date of Test:	13.Jun.2016
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	One glazed, unlatched single acting double doorset - ULSADD
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2140mm(h) x 923/923mm(w) x 54mm(t)</p> <p>Core: Falcon Panel Products Stredor 54</p> <p><i>Inner Core Layer:</i> 4mm poplar ply (450-550kg/m³)</p> <p><i>Outer Core Layer:</i> 18mm thick vertically orientated spruce and pine lamels (450-550kg/m³)</p> <p><i>Surface Core Layer:</i> 7mm thick MDF (700kg/m³)</p>

	<p>Lipping: Sapele (640kg/m3), 6mm thick to all four edges</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (640kg/m3), 100mm(d) x 35mm(w), with 32mm(w) x 12mm(d) planted, pinned sapele stop.</p> <p>Frame Fixing: Mortice and tenon, screwed with 2no 5x100 steel woodscrews</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p> <p>Frame Reveal: 2no 15x4mm Pyroplex FO8700 8mm apart, 6mm from the exposed face</p> <p>Meeting Stiles: 2no 15x4mm Pyroplex FO8700 10mm apart, 7mm from the exposed face</p> <p><u>Hardware:</u></p> <p>Hinges: 3no Smith & Locke bearing butt hinge Ref 2900G per jamb</p> <p>Closer: Arrone AR 1500</p> <p>Lock/Latch: Electr Brass tubular steel mortice latch</p> <p>Lock/Latch Size: (Forend): 60x32mm. (Case): 67mm(d) x 21mm(h) x 16mm(w)</p> <p>Lock/Latch Status: Disengaged for test</p> <p>Flush Bolt: Smith & Locke Ref 5050J to top & bottom of slave leaf, disengaged for purpose of test</p> <p>Handle: Smith & Locke lever handle Ref 2812H</p> <p><u>Hardware Protection:</u></p> <p>Under Hinges: 2mm thick Pyroplex graphite sheet</p> <p>Under Forend & Keep: 2mm thick Pyroplex graphite sheet</p> <p>Around Lockcase: 2mm thick Pyroplex graphite sheet</p> <p>Under flush bolt keep: 2mm thick Pyroplex graphite sheet</p> <p><u>Glazing (Main Leaf):</u></p> <p>Glass: Pilkington Pyrodur EW60-10 10mm CS</p> <p>Aperture Size: 1600x400mm</p> <p>Beading: 31mm(h) x 24mm(w) including 6x6mm bolection and a 16° chamfer</p> <p>Bead Fixing: 1.6mm or 16 gauge x 60mm long steel pins, at 35°, 150mm centres & 50mm from corners.</p> <p><u>Glazing (Slave Leaf):</u></p> <p>Glass: Pilkington Pyrodur EW60-10 10mm CS</p> <p>Aperture Size: 1600x400mm</p> <p>Beading: 31mm(h) x 24mm(w) including 6x6mm bolection and a 16° chamfer</p> <p>Bead Fixing: 1.6mm or 16 gauge x 60mm long steel pins, at 35°, 150mm centres & 50mm from corners.</p> <p><u>Glazing System:</u></p> <p>Glazing Perimeter: ISL Therm-A-Bead 25x4mm, between glass & bead.</p> <p>Glazing Aperture Liner: ISL Therm-A-Line 54x2 between glass & aperture</p>
Test Standard:	BS 476: Part 22: 1987

Performance:	Integrity: 68 minutes Insulation: N/A
Reason for Use (if test failed)	
Failure Mode: (if test failed)	Initial Failure: Continuous flaming at 68:16 Further Failure: Cotton pad at 71.05 Further Failure: Continuous flaming at 71.15

3.1.5 Test Report WF 374929 (Doorset B)

The referenced test report, the essential details of which are summarised below, is the primary data for:

Stredor 54 MDF FD60 with STS perimeter seals, hardware protection and glazing system.

Date of Test:	26.Oct.2016
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Sealed Tight Solutions
Tested Product:	A one and a half leaf unlatched single acting doorset, with a glazed main leaf. ULSADD
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u> Overall Size: 2400mm(h) x 927/582mm(w) x 54mm(t) Core: Falcon Panel Products Stredor 54 <i>Inner Core Layer:</i> 4mm poplar ply (450-550kg/m³) <i>Outer Core Layer:</i> 18mm thick vertically orientated spruce and pine lamels (450-550kg/m³) <i>Surface Core Layers:</i> 7mm thick MDF (700kg/m³) Lipping: Sapele (640kg/m³), 6mm thick to all four edges Facing: N/A</p> <p><u>Frame:</u> Head & Jambs: Sapele (640kg/m³), 95mm(d) x 32mm(w), with 30mm(w) x 15mm(d) planted, pinned sapele stop. Frame Fixing: Mortice and tenon, screwed with 2no 5x100 steel woodscrews Threshold: Non-combustible</p> <p><u>Intumescent:</u> Frame Reveal/Leaf Edges: 2no 15x4mm Sealed Tight Solutions STS1504 fitted 10mm apart and 7mm from the exposed face. Meeting Stiles: 2no 15x4mm Sealed Tight Solutions STS1504 fitted 10mm apart and 7mm from the exposed face.</p> <p><u>Hardware:</u></p>

	<p>Hinges: 4no. EuroSpec bearing butt hinges per jamb</p> <p>Closer: Arrone AR 1500</p> <p>Lock/Latch: Zoo Hardware mortice latch</p> <p>Lock/Latch Size: (Forend): 130x22mm (the case cannot be bigger than forend but this is what test report says). (Case): 165x87x14mm. (Keep): 180x25.</p> <p>Lock/Latch Status: disengaged for test</p> <p>Flush Bolt: Zoo Hardware Ref: ZA503 Body: 205x22x40 Keep: 42x15</p> <p>Handle: Union steel lever type handle</p> <p><u>Hardware Protection:</u></p> <p>Under Hinge: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Under Lockcase: Sealed Tight Solutions 1mm thick graphite based intumescent (2mm to vertical edge centre latch)</p> <p>Under forend plate: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Under flush bolt keep/flush bolt: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p><u>Glazing (Main Leaf):</u></p> <p>Glass: Promat Securiglass Pyrobelite 12mm thick</p> <p>Aperture Size: 1500x200mm</p> <p>Beading: Sapele bead 24mm(h) x 23mm(d) including 5x7mm bolection and an 18° chamfer</p> <p>Bead Fixing: Pneumatically fired steel pins, 16 gauge x 50mm long, fitted 50mm from corners at 150mm centres at 45° to the face of the glass</p> <p><u>Glazing System:</u></p> <p>Glazing Perimeter: Sealed Tight Solutions ST105 GT3 9(w) x 3(t)</p> <p>Glazing Aperture Liner: Sealed Tight Solutions ST302GL 30(w) x 2(t)</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 67 minutes</p> <p>Insulation: 67 minutes</p>
Reason for Use (if test failed)	
Failure Mode: (if test failed)	<p>Initial Failure: Continuous flaming at 67:15</p> <p>Further Failure: N/A</p>

3.1.6 Test Report WF 392155

The referenced test report, the essential details of which are summarised below, is the primary data for:

Inclusion of horizontal and vertical grooves in ply-faced 54mm thick Stredor, with extended leaf size envelopes and STS seals.

Date of Test:	24.Nov.2017
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Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	An unlatched single acting double doorset, with 3mm deep vertical and horizontal grooves to both faces of both leafs - ULSADD
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2400mm(h) x 952/952(w) x 54mm(t)</p> <p>Core: Falcon Panel Products Stredor 54</p> <p><i>Inner Core Layer:</i> 4mm poplar ply (510kg/m³)</p> <p><i>Outer Core Layers:</i> 20mm spruce lamels (480kg/m³)</p> <p><i>Surface Core Layer:</i> 4mm poplar ply with (510kg/m³)</p> <p><i>Core Feature:</i> 10mm wide and 3mm deep 9No vertical and 24No horizontal decorative grooves to both faces.</p> <p>Lipping: Sapele (640kg/m³), 8mm thick to all four edges.</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (640kg/m³), 90mm(d) x 32mm(w), with 25mm(w) x 12mm(d) planted, pinned sapele stop.</p> <p>Frame Fixing: 4No. Ø5 x 100 steel woodscrews</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p> <p>Frame Reveal/Leaf Edges: 2no 15x4mm Sealed Tight Solutions STS 154FO fitted 10mm apart and 7mm from the exposed face.</p> <p>Meeting Stiles: 2no 15x4mm Sealed Tight Solutions STS 154FO fitted 10mm apart and 7mm from the exposed face.</p> <p><u>Hardware:</u></p> <p>Hinges: 4no. Royde & Tucker H101 lift-off hinge</p> <p>Closer: Rutland TS.11204 cam action slide arm overhead closer</p> <p>Lock/Latch: Arrone steel mortice latch</p> <p>Lock/Latch Size: (Forend): 235x20mm. (Keep): 170x24mm,</p> <p>Lock/Latch Status: disengaged for test</p> <p>Handle: Arrone stainless steel lever type handle</p> <p><u>Hardware Protection:</u></p> <p>Under Hinge: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Encasing latch body: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Under forend plate: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Under keep: Sealed Tight Solutions 1mm thick graphite based intumescent</p>
Test Standard:	BS 476: Part 22: 1987

Performance:	Integrity: 57 minutes Insulation: 57 minutes
Reason for Use (if test failed)	Supporting evidence for feature grooves on Stredor 54 door leaf.
Failure Mode: (if test failed)	Initial Failure: Cotton Pad at 57:52 minutes, at the meeting stile, approximately 200mm up from threshold (in line with intumescent join). Further Failure: Cotton Pad at 68:00, top hinge corner R/H leaf.

Note:

Although the test evidence reports an initial failure at 57 minutes, it is the opinion of Warringtonfire based on a technical review of the test report that the failure is not related to the specific feature of interest (grooves), and can therefore be used for this particular purpose.

3.1.7 Test Report WF 391032 (Doorset A)

The referenced test report, the essential details of which are summarised below, is the primary data for:

Inclusion of cable ways, multipoint locking system and electronic locking mechanism within ply-faced 54mm thick Stredor, with extended leaf size envelopes, STS seals and STS hardware protection.

Date of Test:	26.Oct.2017
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	One single acting single doorset, latched with a multi-point lock - LSASD
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2395mm(h) x 1180(w) x 54mm(t)</p> <p>Core: Falcon Panel Products Stredor 54</p> <p><i>Inner Core Layer:</i> 4mm poplar ply (510kg/m³)</p> <p><i>Outer Core Layers:</i> 20.5mm spruce lamels (480kg/m³)</p> <p><i>Surface Core Layer:</i> 4mm poplar ply inner facing (510kg/m³) with 0.5mm thick long grain beech outer facing (600kg/m³)</p> <p><i>Core Feature:</i> Ø11mm hole drilled through width of leaf central to leaf thickness.</p> <p>Lipping: Sapele (640kg/m³), 8mm thick to all four edges</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (640kg/m³), 80mm(d) x 32mm(w), with 20mm(w) x 10mm(d) integral stop.</p> <p>Frame Fixing: 4No. Ø5 x 100 steel woodscrews</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p>

	<p>Frame Reveal: 2no 15x4mm Sealed Tight Solutions ST154FO fitted 10mm apart and 7mm from the exposed face.</p> <p><u>Smoke Seal:</u></p> <p>Abutted to upstand of stop: 1no 11x5mm Sealed Tight Solutions ST1009 acoustic/smoke seal</p> <p><u>Hardware:</u></p> <p>Hinges: 4no. Royde & Tucker H101 lift-off hinge</p> <p>Closer: Rutland TS.11205 cam action slide arm overhead closer</p> <p>Lock/Latch: ERA SureFire Classic 2 hook (with ERA auto fire electric motor box)</p> <p>Lock/Latch Size: (Forend): 1630x20mm. (Top/bottom keep): 150x24mm. (Centre keep): 190x24mm. (Electric motor body): 200x48mm</p> <p>Lock/Latch Status: Engaged for test</p> <p>Handle: Fab & Fix Balmoral inline Lever Lever 1A000 240x30mm</p> <p>Cable Loop: Stainless steel loop 290x25mm including a 12Ø spring assembly rebated into the hanging edge jamb 1050mm from the head.</p> <p>Eye viewer: Sealed Tight Solutions STS4008 fitted 790mm down from head and 580mm in from closing edge. Body: 14Ø Footprint: 26Ø</p> <p>Letterplate: Sealed Tight Solutions STS4001 fitted 865mm up from threshold and 435mm in from closing edge. Footprint: 75x310mm</p> <p><u>Hardware Protection:</u></p> <p>Under Hinge: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Encasing centre latch body: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Encasing top and bottom lock bodies: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Encasing electric motor body: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Around cable loop: Partially interrupted</p> <p>Under cable loop forend: Sealed Tight Solutions ST302 2mm thick graphite based intumescent</p> <p>Lining base of cable loop: Sealed Tight Solutions ST302 2mm thick graphite based intumescent</p> <p>Cable loop body: Sealed Tight Solutions ST302 2mm thick graphite based intumescent</p> <p>Eye viewer: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Lining the outer edge of the letter plate body: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Lining the inside of the letter plate body: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Lining the cable run: Sealed Tight Solutions 1mm thick graphite based intumescent</p> <p>Around the closer arm in the head of the frame: 2mm thick raw graphite as supplied with Rutland ITS 11205</p> <p>On top of closer body forend: 2mm thick raw graphite as supplied with Rutland ITS 11205</p>
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	Encasing closer body within leaf: 2mm thick raw graphite as supplied with Rutland ITS 11205
Test Standard:	BS 476: Part 22: 1987
Performance:	Integrity: 43 minutes Insulation: 19 minutes
Reason for Use (if test failed)	Proving cable way, electronic locking system.
Failure Mode: (if test failed)	Initial Failure: Continuous flaming at 43:24, threshold Further Failure: Cotton Pad at 56:40, closer position in leaf head

3.1.8 Test Report WF 412601 (Doorset B)

The referenced test report, the essential details of which are summarised below, is the primary data for:

Stredor 54 alternative production comparison test (A against B). Manufactured in mill reference F14.

Date of Test:	18.Apr.2018
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Unlatched, single leaf, double acting doorset (DASD)
Tested Orientation:	N/A
Summary of Test Specimen:	<p><u>Leaf:</u> Overall Size: 2040mm (h) x 926mm (w) x 54mm (t) Core: Stredor 54 Ply (548kg/m³), 54mm thick Lipping: Sapele (635kg/m³), 18mm to hinge side, top & bottom, 8mm to lock side. Facing: 0.4mm thick, EV veneer (integral to core)</p> <p><u>Frame:</u> Head & Jambs: Sapele (635kg/m³), 100 x 44mm thick, with 8mm scallop @ 58mm radius Frame Fixing: 4No 5 x 80mm long steel screws per jamb Threshold: Non-combustible</p> <p><u>Intumescent:</u> Frame Reveal: 2 No 15x4 Lorient LP1504. Fitted centrally, 10mm apart. Meeting Stiles: N/A Bottom Leaf Edge: N/A</p> <p><u>Hardware:</u> Top Pivot/Strap: Rutland-PS.190</p>

	<p>Closer (Floor Spring): Rutland TS7104</p> <p>Lock/Latch: N/A</p> <p><u>Hardware Protection:</u></p> <p>Lining Strap Mortices: 2mm thick interdens</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 71 minutes</p> <p>Insulation: 71 minutes</p>
Reason for Use (if test failed)	
Failure Mode: (if test failed)	<p>Initial Failure: Cotton Pad at threshold position @ 71:06</p> <p>Further Failure: Sustained flaming top closing position @ 75:30</p>

3.1.9 Test Report WF 407334

The referenced test report, the essential details of which are summarised below, is the primary data for:

Stredor 54 alternative production, similar arrangement to WF369636. Manufactured in mill reference F14.

Date of Test:	22.Nov.2018
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	Glazed, unlatched, double leaf, single acting doorset (ULSADD)
Tested Orientation:	Opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u></p> <p>Overall Size: 2146mm (h) x 923/923mm (w) x 54mm (t)</p> <p>Core: Stredor 54 Ply (513kg/m³), 54mm thick</p> <p>Lipping: Sapele (640kg/m³), 7mm thick to all four edges</p> <p>Facing: 0.4mm thick, EV veneer (integral to core)</p> <p><u>Frame:</u></p> <p>Head & Jambs: Sapele (640kg/m³), 100 x 32mm thick, with 32 x 12mm thick planted stop.</p> <p>Frame Fixing: 4No 8 x 100mm long steel screws per jamb</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p> <p>Frame Reveal/Leaf Edges: 2 No 15x4 Pyroplex FO8700. Fitted centrally, 8mm from exposed face, 10mm apart.</p> <p>Meeting Stiles: 2 No 15x4 Pyroplex FO8700. Fitted centrally, 7mm from exposed face, 10mm apart, main leaf only</p>

	<p><u>Hardware:</u></p> <p>Hinges: 3 No Eurospec Enduromax Butt Hinges H2N1103/13/R</p> <p>Closer: Arrone AR3500</p> <p>Lock/Latch: Altro Eurospec Heavy Duty Tubular Mortice Latch Ref 376113</p> <p>Lock/Latch Size: (Lockcase): 24 x 61 x 17mm, (Forend): 59 x 25 x 2mm, (Keep): 65 x 40 x 3mm,</p> <p>Lock/Latch Status: disengaged for test</p> <p>Flush Bolt: Smith & Locke Ref 746895 101 x 16.</p> <p>Handle: Mitre Lever Handle on Rose Ref 625900</p> <p><u>Hardware Protection:</u></p> <p>Under Hinges: 2mm thick interdens</p> <p>Under Forend & Keep: 2mm thick interdens</p> <p>Around Lockcase: 2mm thick interdens</p> <p>Under flush bolt keep: 2mm thick interdens</p> <p>Lining flush bolt mortice: 2mm thick interdens</p> <p><u>Glazing (Main Leaf):</u></p> <p>Glass: AGC Pyrobelite 12 12mm thick</p> <p>Aperture Size: 1500 high x 200 wide</p> <p>Glass Size: 1491 high x 191 wide</p> <p>Expansion allowance: 4.5mm all round</p> <p>Beading: Sapele (640kg/m³), 37 high x 28 deep 16° chamfer & 10x12 bolelection.</p> <p>Bead Fixing: 1.6x1.4 x 60mm long steel pins (Timco Firmahold BG1664), at 35 degrees, 98-160mm centres & 35mm from corners.</p> <p><u>Glazing (Slave Leaf):</u></p> <p>Glass: AGC Pyrobelite 12 12mm thick</p> <p>Aperture Size: 1500 high x 200 wide</p> <p>Expansion allowance: 4.5mm all round</p> <p>Beading: Sapele (640kg/m³), 37 high x 28 deep 16° chamfer & 10x12 bolelection.</p> <p>Bead Fixing: 1.6x1.4 x 60mm long steel pins (Timco Firmahold BG1664), at 35 degrees, 98-160mm centres & 35mm from corners.</p> <p><u>Glazing System:</u></p> <p>Glazing Perimeter: 25x4mm thick ISL Therm-A-Bead, between glass & bead.</p> <p>Glazing Aperture Liner: 2 x 54mm Therm-A- Line</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 65 minutes</p> <p>Insulation: 65 minutes* (glazing not evaluated)</p>
Reason for Use (if test failed)	
Failure Mode:	Initial Failure: Cotton Pad Test at top meeting edge @ 65:15

(if test failed)	Further Failure: N/A
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3.2 Supplementary Test Evidence

3.2.1 Test Report WF 413865

The referenced test report, the essential details of which are summarised below, is the supplementary data for:

Strelip® 60 engineered timber lippings.

Date of Test:	13.May.2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	One unlatched, double-leaf, single acting doorset - ULSADD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u> Overall Size: 2135mm(h) x 935/935mm(w) x 54mm(t) Core: Falcon Panel Products Strebord 54mm particleboard (590kg/m³) Lipping: Falcon Panel Products Strelip® 60 (661kg/m³), 8mm thick to all four edges.</p> <p><u>Frame:</u> Head & Jambs: Sapele (644kg/m³), 100mm(d) x 32mm(w), with a 32mm x 12mm planted stop. Frame Fixing: 4No. Ø5mm x 100mm steel woodscrews. Threshold: Non-combustible</p> <p><u>Intumescent:</u> Meeting Stile: 1no 15x4mm Lorient Polyproducts Ltd LP1504 type 617 fitted 7mm from the exposed face of the master leaf 1no 15x4mm Lorient Polyproducts Ltd LP1504DS type 617 fitted 32mm from the exposed face of the master leaf Frame Reveal: 1no 15x4mm Lorient Polyproducts Ltd LP1504 sodium silicate seal fitted 7mm from the exposed face of the frame reveal. 1no 15x4mm Lorient Polyproducts Ltd LP1504DS sodium silicate seal fitted 32mm from the exposed face of the frame reveal</p> <p><u>Smoke/Acoustic Seals:</u> Leaf: 1no 15x4mm Lorient Polyproducts Ltd LP1504DS type 617 fitted 32mm from the exposed face of the master leaf Frame Reveal: 1no 15x4mm Lorient Polyproducts Ltd LP1504DS type 617 fitted 32mm from the exposed face of the frame reveal</p> <p><u>Hardware:</u> Hinges: 4no Carlisle Brass/Eurospec HIN1433/13 steel ball bearing butt Closer: Astra Door Controls 4003 concealed jamb mounted closer. Body: Ø28mm x 212mm(l) Forend (leaf side): 32mm(w) x 106mm(h) x 3mm(t) Forend (hinge side): 32mm(w) x 106mm(h) x 3mm(t) Lock/Latch: Eurospec Easi-Exit DLS7260ESC Lockcase: 150mm(h) x 86mm(w) x 14mm(d)</p>

	<p>Forend plate: 235mm(h) x 24mm(w) x 5mm(t) Keep: 175mm(h) x 22mm(w) {with 40mm(w) strike} x 1.5mm(t) Cylinder: Assa Abloy/Union J2X28 Euro Thumbturn Cylinder Handle: Zoo Hardware Stanza ZPZ090SC lever on rose Escutcheon: Eurospec A Spec Euro, Ø50mm x 6mm(t) Flushbolt: Zoo ZAS03RSS, 205mm(h) x 20mm(w) x 38mm(return) x 4mm(t) with 19mm x 42mm receiver/socket <u>Hardware Protection:</u> Under hinge blade: 1mm thick Intumescent Seals Ltd Therm-A-Strip Encasing closer body: 1mm thick Intumescent Seals Ltd Therm-A-Strip Under closer forend (leaf side): 1mm thick Intumescent Seals Ltd Therm-A-Strip Under closer forend (hinge side): 1mm thick Intumescent Seals Ltd Therm-A-Strip Around lockcase (cheeks only): 1mm Lorient Polyproducts Ltd MAP Under lockcase forend plate: 1mm Lorient Polyproducts Ltd MAP Under keep: 1mm Lorient Polyproducts Ltd MAP Under flushbolt: 2mm thick Sealed Tight Solutions Ltd graphite based intumescent</p>
Test Standard:	BS 476: Part 22: 1987
Performance:	<p>Integrity: 70 minutes Insulation: 70 minutes</p>
Reason for Use (if test failed)	
Failure Mode: (if test failed)	<p>Initial Failure: Continuous flaming at 70:13 – top meeting edge. Further Failure: Cotton pad at 73:30 – top hanging corner, left leaf.</p>

3.2.2 Test Report WF 414781

The referenced test report, the essential details of which are summarised below, is the supplementary data for:

Strelip and concealed overhead closer for 30 minute applications

Date of Test:	07.Jun.2019
Identification of Test Body:	Warringtonfire Testing and Certification Ltd. UKAS No. 1762
Sponsor:	Falcon Panel Products Ltd
Tested Product:	An unlatched, single acting double doorset with glazing - ULSADD
Tested Orientation:	Hung opening in towards heating condition
Summary of Test Specimen:	<p><u>Leaf:</u> Overall Size (Both Leafs): 2040mm(h) x 935(w) x 44mm(t) Core: Falcon Panel Products Stredor 44 <i>Inner Core Layer:</i> 2mm poplar ply (594-613kg/m³) <i>Outer Core Layers:</i> 13mm thick vertically orientated pine lamels (594-613kg/m³) <i>Surface Core Layers:</i> 8mm thick MDF (700kg/m³) Lipping: Strelip 30 (686-698kg/m³), 8mm thick to all four edges. <u>Frame:</u></p>

	<p>Head & Jamb: European Redwood (423kg/m³), 90mm(d) x 32mm(w), with 32mm(w) x 12mm(d) planted (pinned) European redwood stop.</p> <p>Frame Fixing: 4No. Ø5 x 100 steel woodscrews.</p> <p>Threshold: Non-combustible</p> <p><u>Intumescent:</u></p> <p>Frame Reveal: 1no 15x4mm Lorient Polyproducts Ltd LP1504 Type 617 fitted 15mm from the exposed face.</p> <p>Meeting stile (right leaf only): 1no 10x4mm Lorient Polyproducts Ltd LP1004 Type 617 fitted 6mm from the exposed face.</p> <p>1no 10x4mm Lorient Polyproducts Ltd LP1004DS Type 617 fitted 26mm from the exposed face.</p> <p><u>Smoke/Acoustic Seals:</u></p> <p>Meeting stile: 1no 10x4mm Lorient Polyproducts Ltd LP1004DS Type 617 fitted 26mm from the exposed face.</p> <p>Leaf bottom edge: 35mm(h) x 14mm(w) Lorient Polyproducts Ltd LAS8001si drop seal rebated centrally within the bottom of each leaf.</p> <p><u>Hardware:</u></p> <p>Hinges: 3no Carlisle Brass (Eurospec) HIN1433/113SSS/R butt hinge</p> <p>Closer: Rutland Door Controls ITS11204 concealed overhead closer fitted as per manufacturers instructions to the head of each leaf. Body size: 243mm(l) x 52mm(d) x 32mm(w)</p> <p>Latch: Assa Abloy Union steel latch (Ref. JHD72ESL-RSS60) fitted with Assa Abloy cylinder (Ref. J-228AA-SC)</p> <p>Lock/Latch Size:</p> <p>Forend: 235x24mm</p> <p>Case: 165x89x14mm</p> <p>Lock/Latch Status: Disengaged for test</p> <p>Handle: Altro stainless steel lever type handle (Ref. 908356 TH 105)</p> <p>Flush Bolts: Zoo Hardware stainless steel (Ref. ZAS03RSS)</p> <p><u>Hardware Protection:</u></p> <p>Under Hinge: 1mm thick Lorient Polyproducts Ltd MAP</p> <p>Lining closer rebate: Manufacturer supplied 2mm thick graphite kit</p> <p>Encasing latch body: 1mm thick Lorient Polyproducts Ltd MAP Under latch forend: 1mm thick Lorient Polyproducts Ltd MAP</p> <p>Under latch keep: 1mm thick Lorient Polyproducts Ltd MAP</p> <p>Lining drop seal rebate: 1mm thick Lorient Polyproducts Ltd MAP</p> <p>Lining flush bolt rebate: 1mm thick Lorient Polyproducts Ltd MAP</p> <p><u>Glazing:</u></p> <p>Glass: Fireglass Pyrobelite 7, 7mm thick</p> <p>Aperture Size:</p> <p>(Top): 1200x250mm</p> <p>(Bottom): 440x250mm</p> <p>Beading: Sapele (654kg/m³), 19mm(w) x 21mm(h) with 15° chamfer and 6x6mm bolection return</p> <p>Bead Fixing: Ø1.6g x 50mm long steel pins at 30°, 200mm centres & 50mm from corners.</p> <p><u>Glazing System:</u></p> <p>Glazing Perimeter: 15x3.5mm Lorient Polyproducts Ltd Flexible Figure 1 (FF1) fitted between the glass and bead on both faces.</p>
Test Standard:	BS EN 1634-1:2014

Performance:	Integrity: 33 minutes Insulation (I ₁): 10 minutes Insulation (I ₂): 10 minutes
Reason for Use (if test failed)	
Failure Mode: (if test failed)	Initial Failure: Cotton pad at 33:44 – latch position. Further Failure: N/A

4 Technical Specification

4.1 General

The technical specification for the proposed door assembly is given in the following sections and is based on the test evidence for the door 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 54 with Plywood Facing

The construction for door leaves of this design comprises a 3-layer core with a plywood facing, lipped on all four edges.

The door designs can include:

1. Glazing
2. Grooves
3. Decorative facings
4. Decorative planted on timber mouldings

See section 5.1 for further constructional detail.

4.3.2 Leaf 2: Stredor 54 with MDF Facing

The construction for door leaves of this design comprises a 3-layer core with an MDF facing, lipped on all four edges.

The door designs can include:

1. Glazing
2. Decorative facings
3. Decorative planted on timber mouldings

See section 5.2 for further constructional detail.

4.4 Door Frames

4.4.1 Frame 1: Timber

The construction for door frames of this design comprises of a hardwood timber.

For further information on the specification and construction of the door frames see section 7.

4.5 Doorset Configurations & Maximum Leaf Sizes

4.5.1 General

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

- the margin of over performance above 60 minutes integrity for the design has been used for 60 minute applications.
- the margin of over performance above 30 minutes integrity for the design has been used for 30 minute applications. The design used is identical to the 60 minute 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 a doorset with a flush overpanel is more onerous than a test on a doorset without an overpanel. A flush overpanel has the same thickness as the door leaf and is flush with the leaves.
- 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 – BUT this does not cover doorsets with flush overpanels
- 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 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 for timber based doorsets.

Table 2 of clause 13.4.1 BS EN 1634-1:2014 +A1:2018 states that the results obtained for timber doorsets tested opening into the furnace can be used to support the use of timber doorsets opening away from the furnace.

4.5.3 Configuration

The table below shows the permitted configurations for the Stredor 54 doorset designs, with the abbreviation and full description of the each configuration.

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

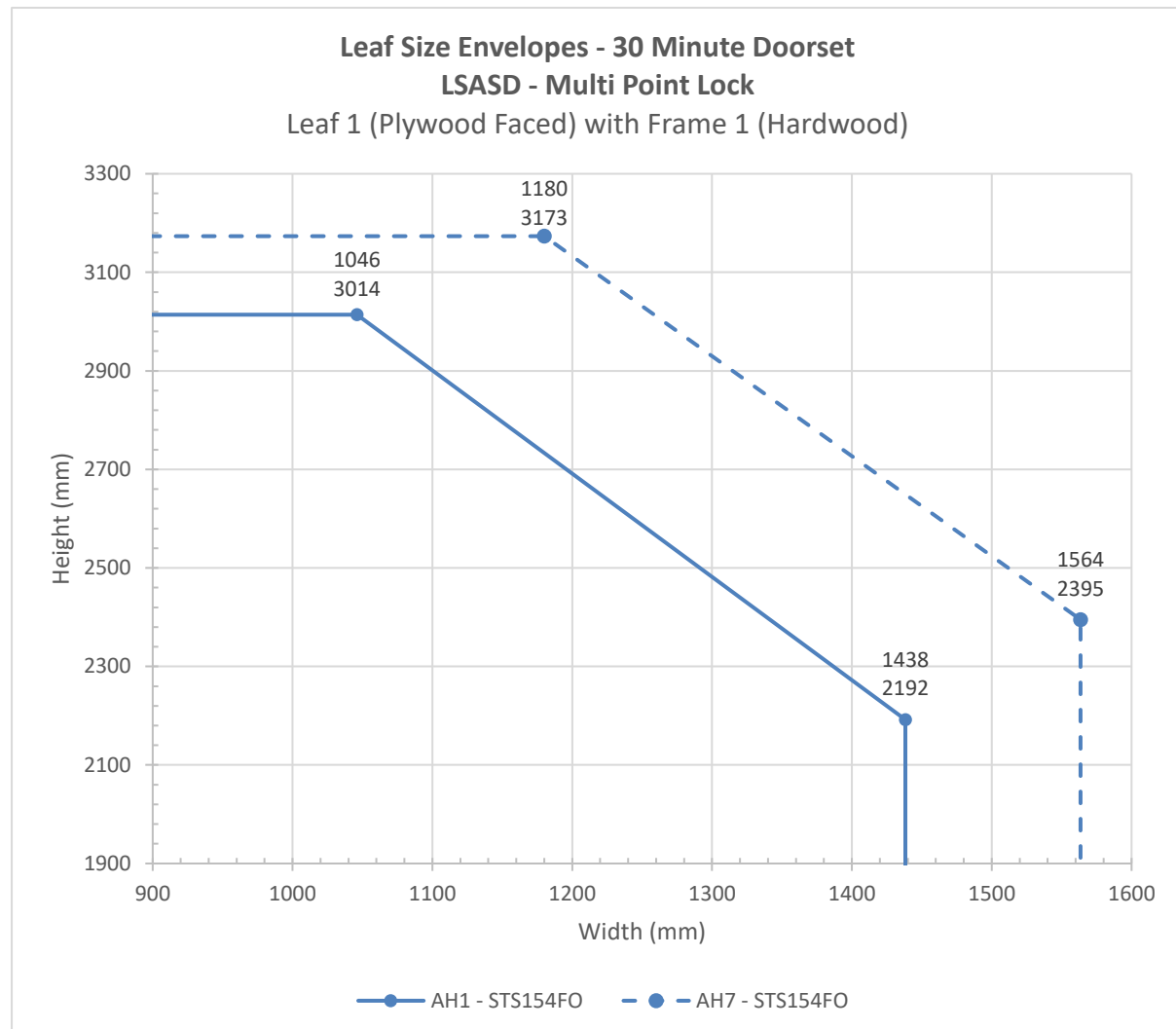
Doorset Configurations		
Ref.	Abbreviation	Description
A	LSASD	Latched Single Acting Single Doorset
B	ULSASD	Unlatched Single Acting Single Doorset
C	DASD	Double Acting Single Doorset
D	LSASD+OP	Latched Single Acting Single Doorset + Overpanel NOT PERMITTED
E	ULSASD+OP	Unlatched Single Acting Single Doorset + Overpanel NOT PERMITTED
F	DASD + OP	Double Acting Single Doorset + Overpanel NOT PERMITTED
G	LSADD	Latched Single Acting Double Doorset
H	ULSADD	Unlatched Single Acting Double Doorset
I	DADD	Double Acting Double Doorset
J	LSADD+OP	Latched Single Acting Double Doorset + Overpanel NOT PERMITTED
K	ULSADD+OP	Unlatched Single Acting Double Doorset + Overpanel NOT PERMITTED
L	DADD + OP	Double Acting Double Doorset + Overpanel NOT PERMITTED

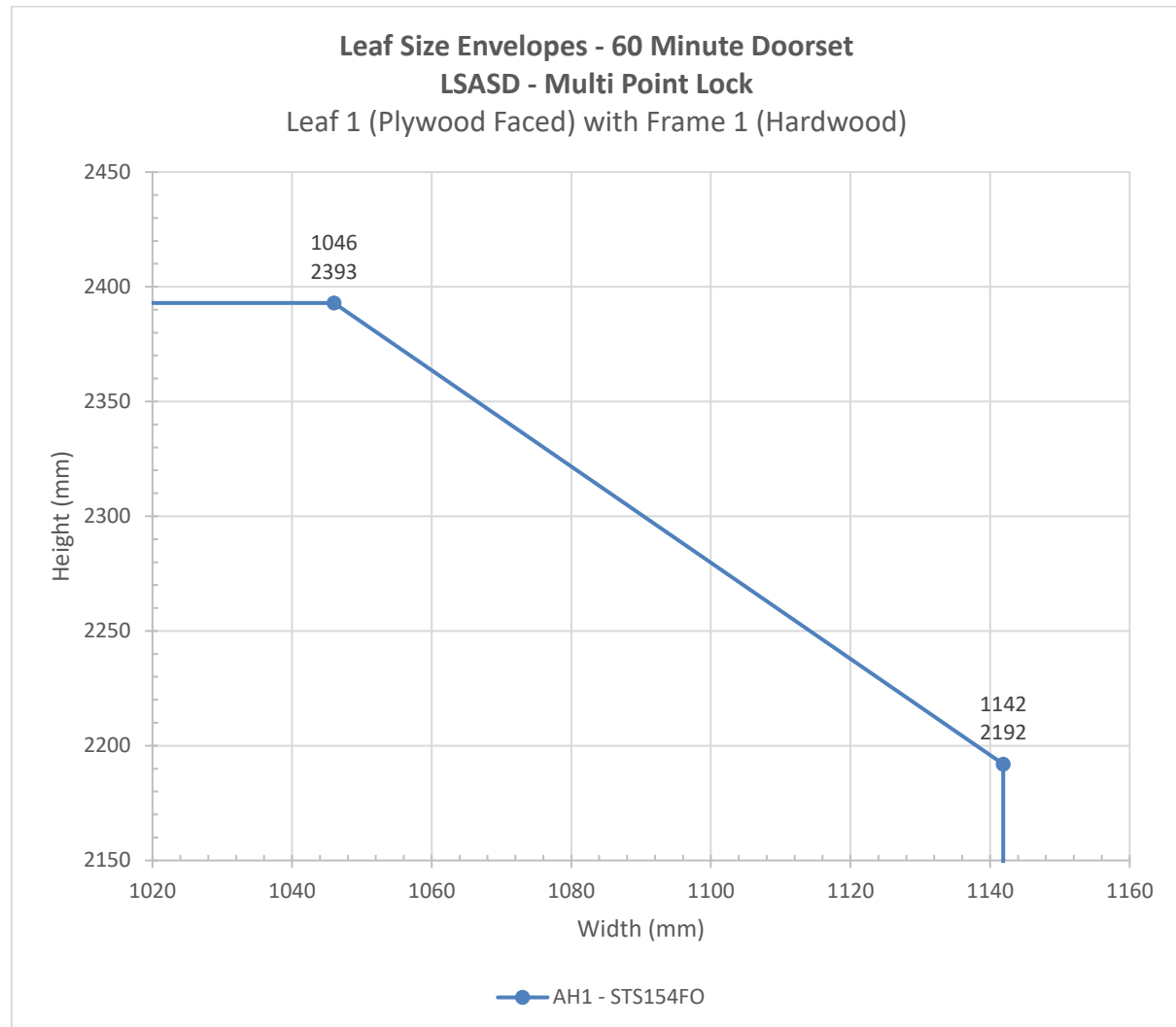
Note:

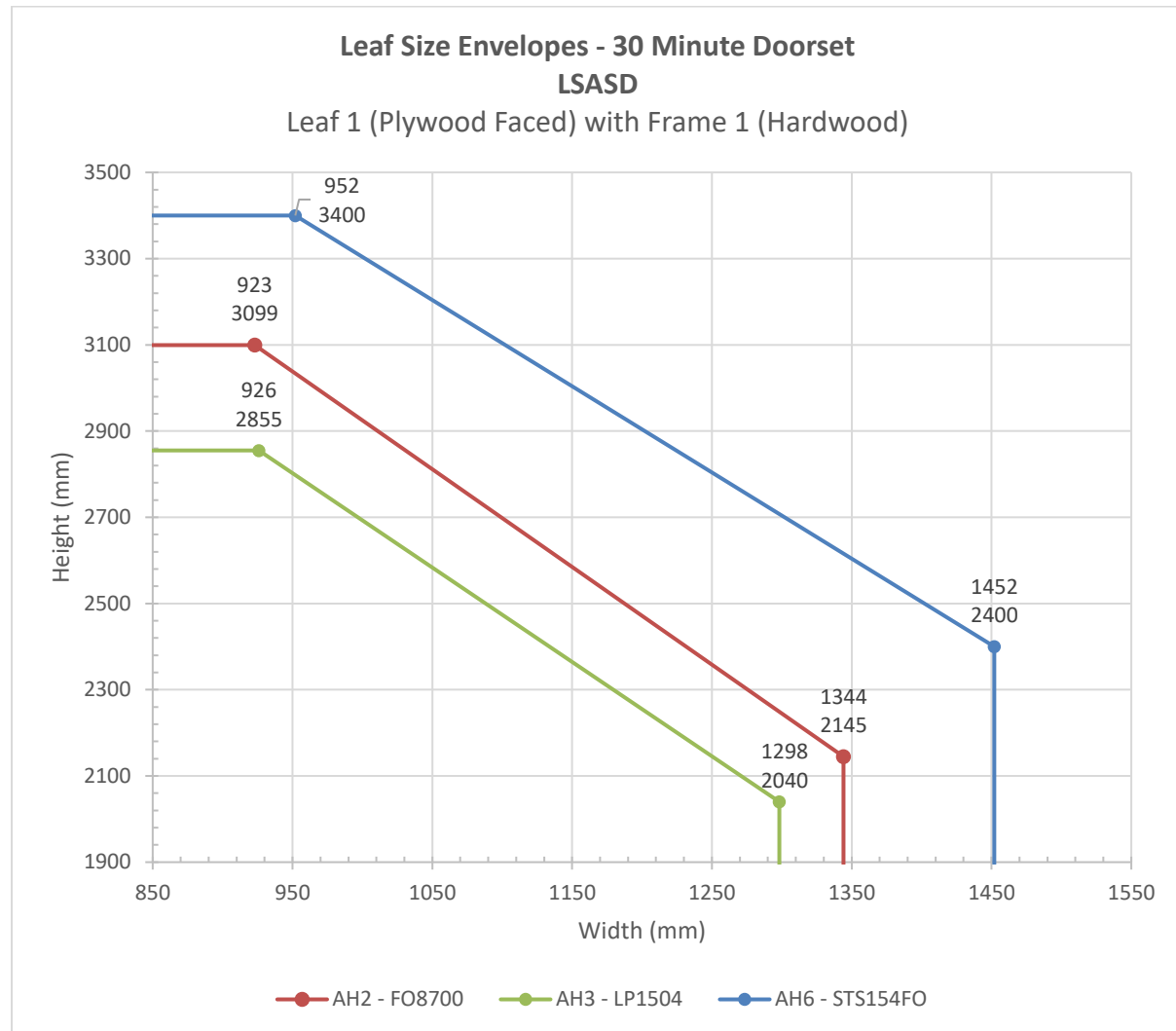
1. Unequal leaf double doorsets are covered by this Field of Application. The smaller door leaf must be no less than 300mm.
2. For double doorsets both leaves must comply with the door leaf envelope size limitations.

4.5.4 LSASD Configuration: Leaf Size Envelopes & Intumescent Specification






4.5.4.1 Leaf 1 + Frame 1 Doorset









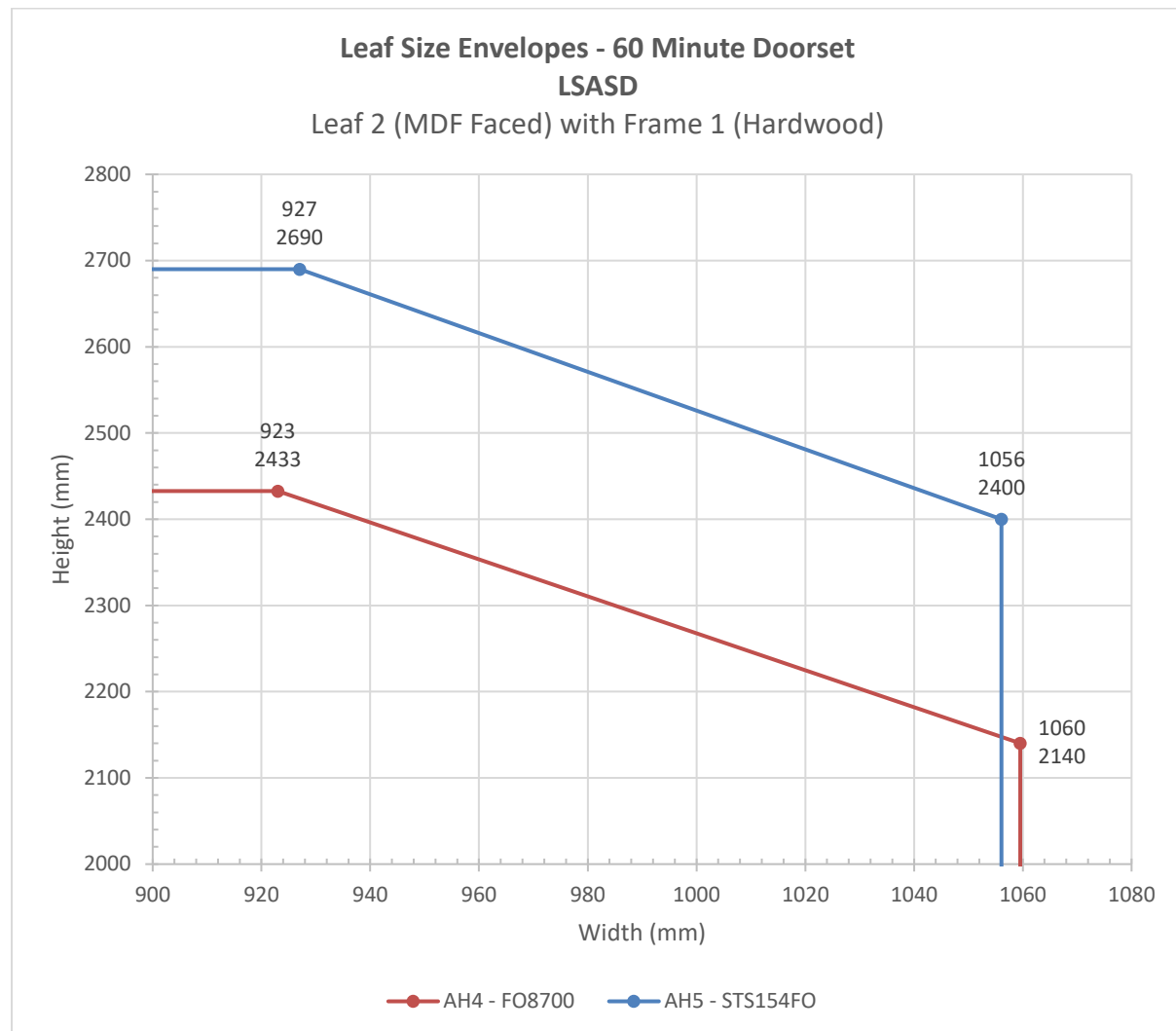
Intumescent Specification for LSASD Leaf 1 (Plywood Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AH1  (CFR1812191_1) Multi Point Lock	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal.
AH2  (WF369636)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
AH3  (WF412601A)	LP1504	Lorient Polyproducts Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
AH6  (WF392155) Feature Grooves	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
AH7  (WF391032A) Multi Point Lock with Electric motor box	STS154FO ¹	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal.

Note:

1. Leaf size and intumescent specification permitted only for 30 minutes fire resisting doorsets with ERA multiple point lock with electric motor box.

4.5.4.2 Leaf 2 + Frame 1 Doorset

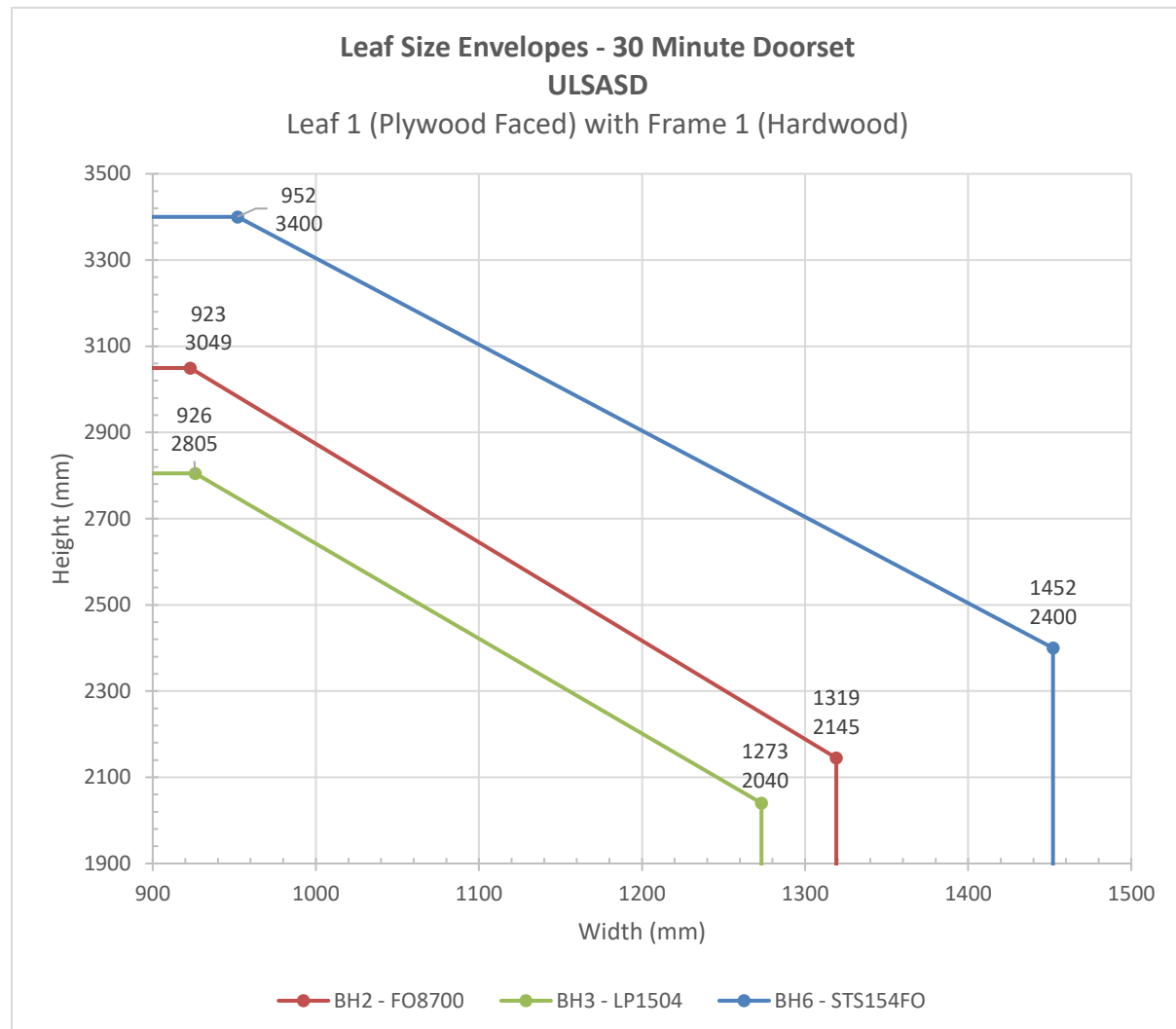




Intumescent Specification for LSASD Leaf 2 (MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
AH4 —●— (BMT/FEP/F16174)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
AH5 —●— (WF374929B)	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.

4.5.5 ULSASD Configuration: Leaf Size Envelopes & Intumescent Specification

4.5.5.1 Leaf 1 + Frame 1 Doorset





Intumescent Specification for ULSASD Leaf 1 (Plywood Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BH2 —●— (WF369636)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
BH3 —●— (WF412601A)	LP1504	Lorient Polyproducts Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
BH6 —●— (WF392155) Feature Grooves	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.

4.5.5.2 Leaf 2 + Frame 1 Doorset





Intumescent Specification for ULSASD Leaf 2 (MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
BH4 —●— (BMT/FEP/F16174)	FO8700	Pyroplex Ltd	Head & Jamb: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
BH5 —●— (WF374929B)	STS154FO	Sealed Tight Solutions Ltd	Head & Jamb: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.

4.5.6 DASD Configuration: Leaf Size Envelopes & Intumescent Specification

4.5.6.1 Leaf 1 + Frame 1 Doorset





Intumescent Specification for DASD Leaf 1 (Plywood Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CH2 —●— (WF369636)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
CH3 —●— (WF412601A)	LP1504	Lorient Polyproducts Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
CH6 —●— (WF392155) Feature Grooves	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.

4.5.6.2 Leaf 2 + Frame 1 Doorset

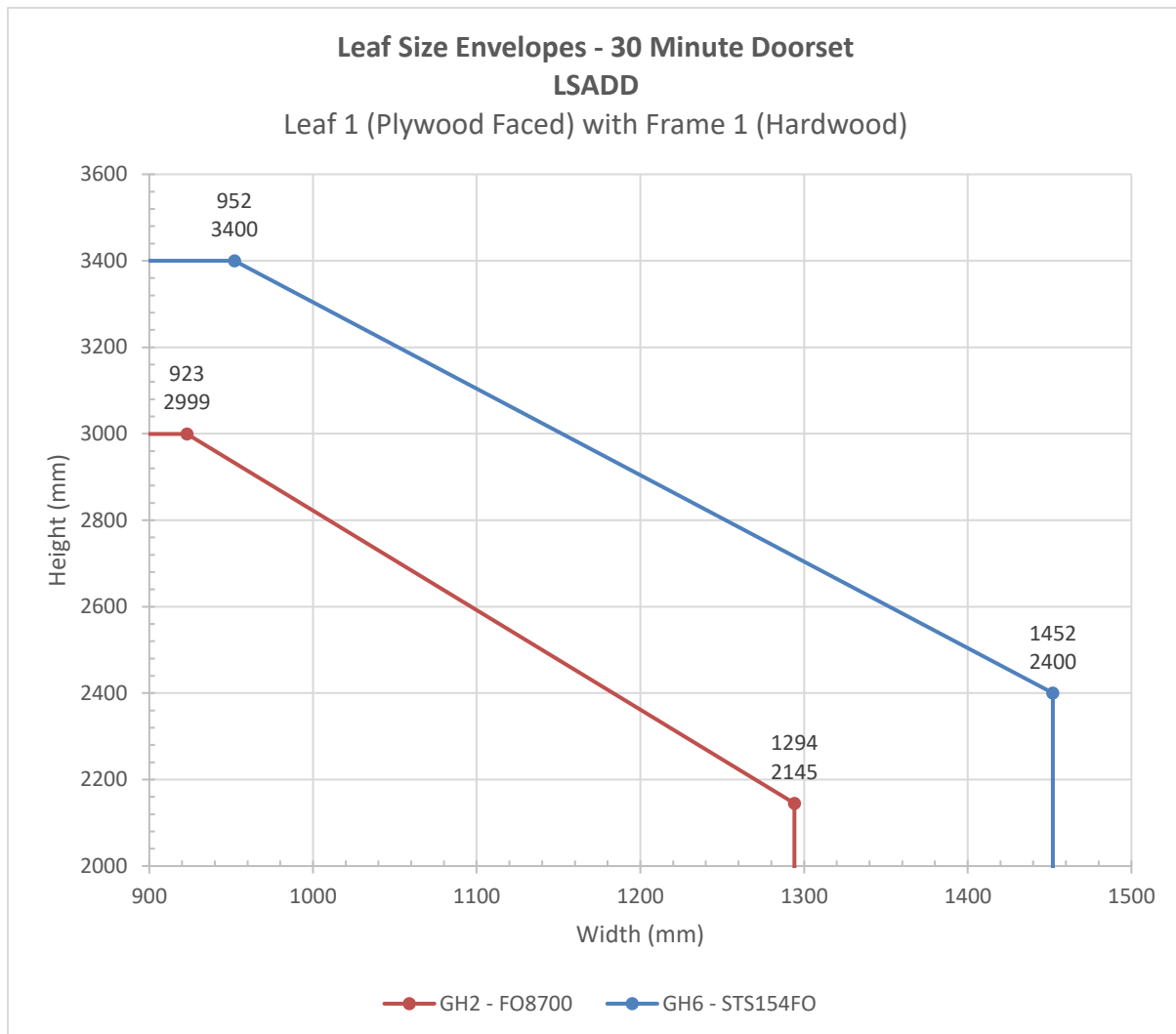


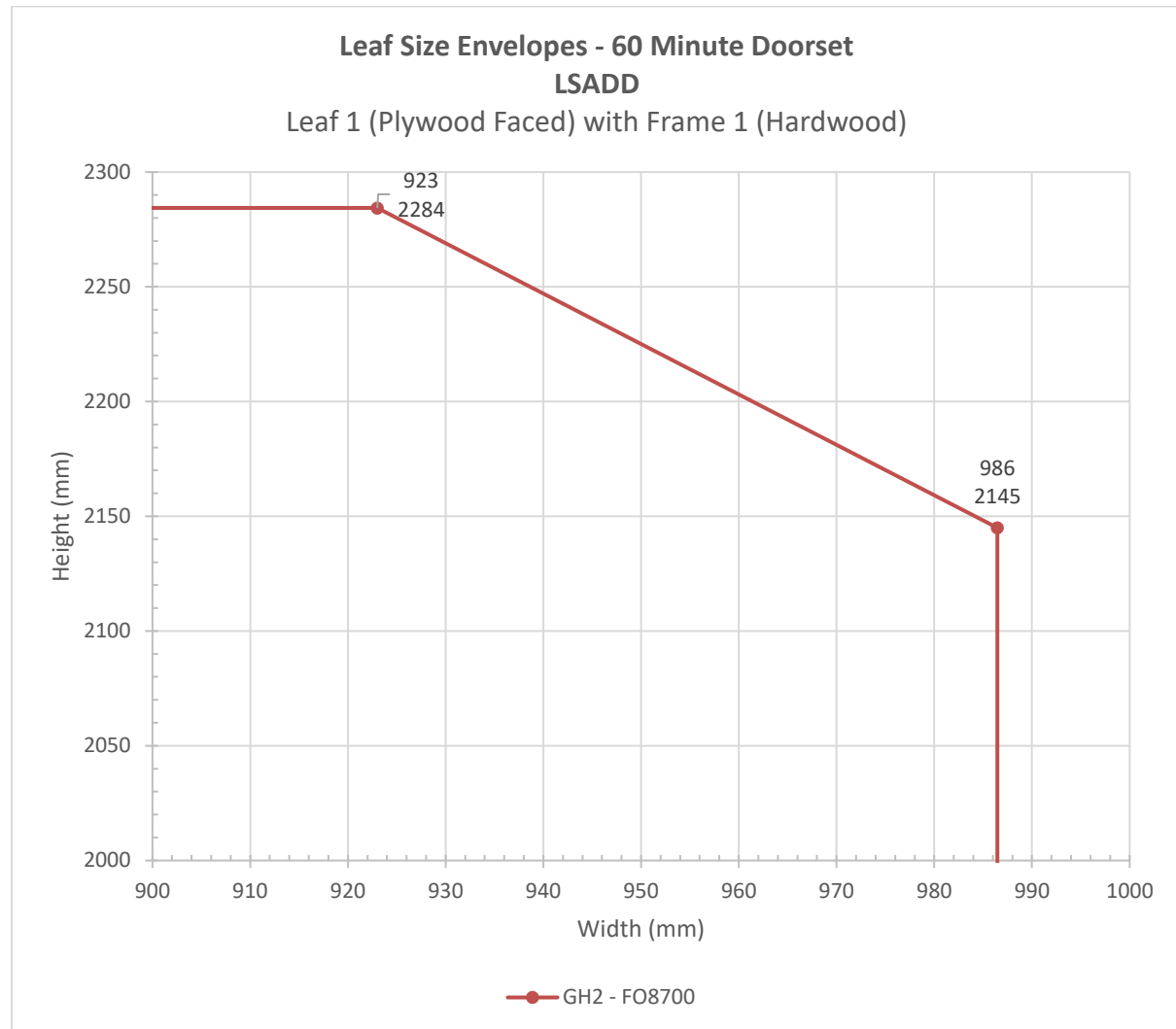




Intumescent Specification for DASD Leaf 2 (MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
CH4 —●— (BMT/FEP/F16174)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.
CH5 —●— (WF374929B)	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges.

4.5.7 LSADD Configuration: Leaf Size Envelopes & Intumescent Specification

4.5.7.1 Leaf 1 + Frame 1 Doorset

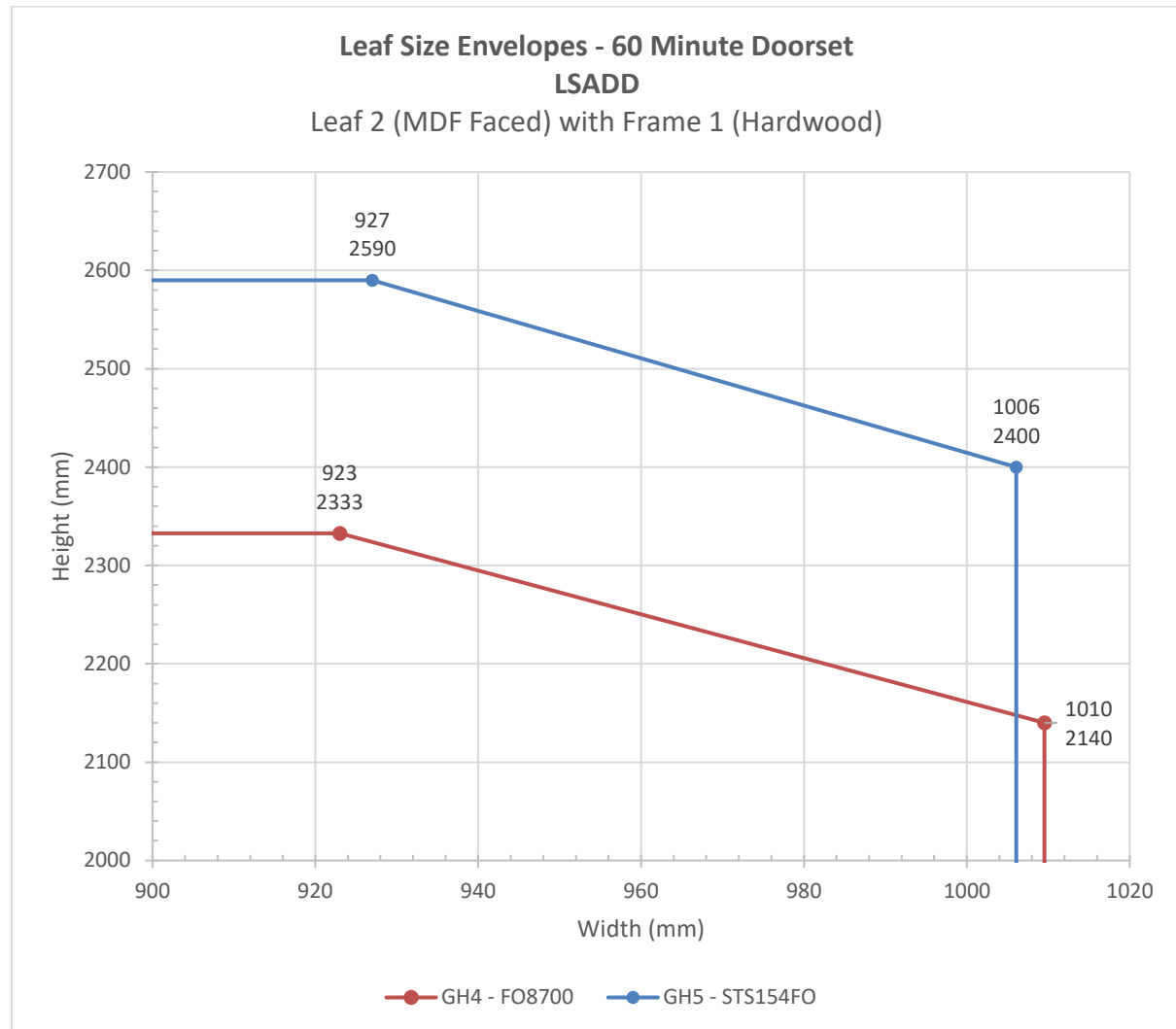






Intumescent Specification for LSADD Leaf 1 (Plywood Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GH2  (WF369636)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.
GH6  (WF392155) Feature Grooves	STS154FO	Sealed Tight Solution Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.

4.5.7.2 Leaf 2 + Frame 1 Doorset

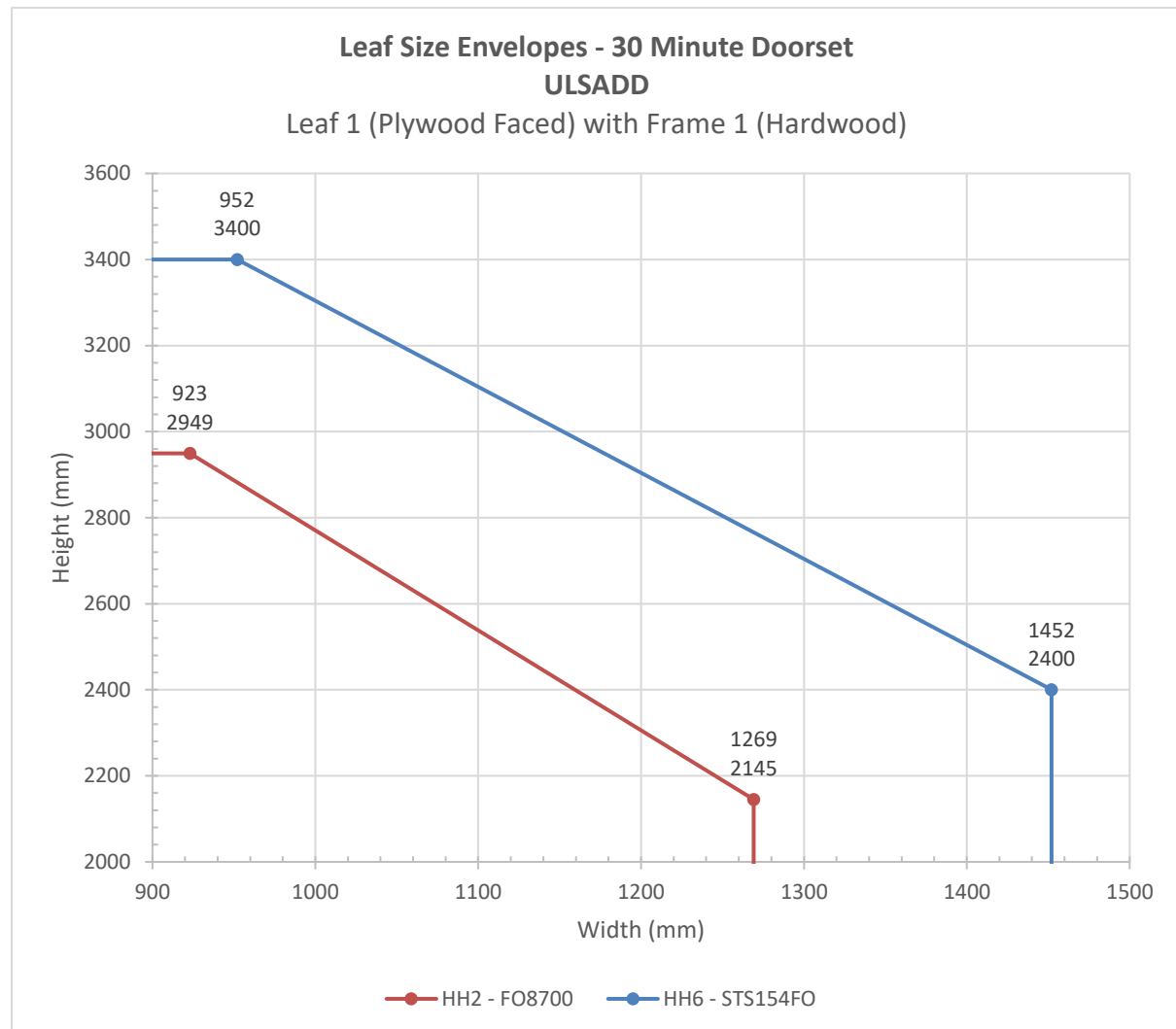


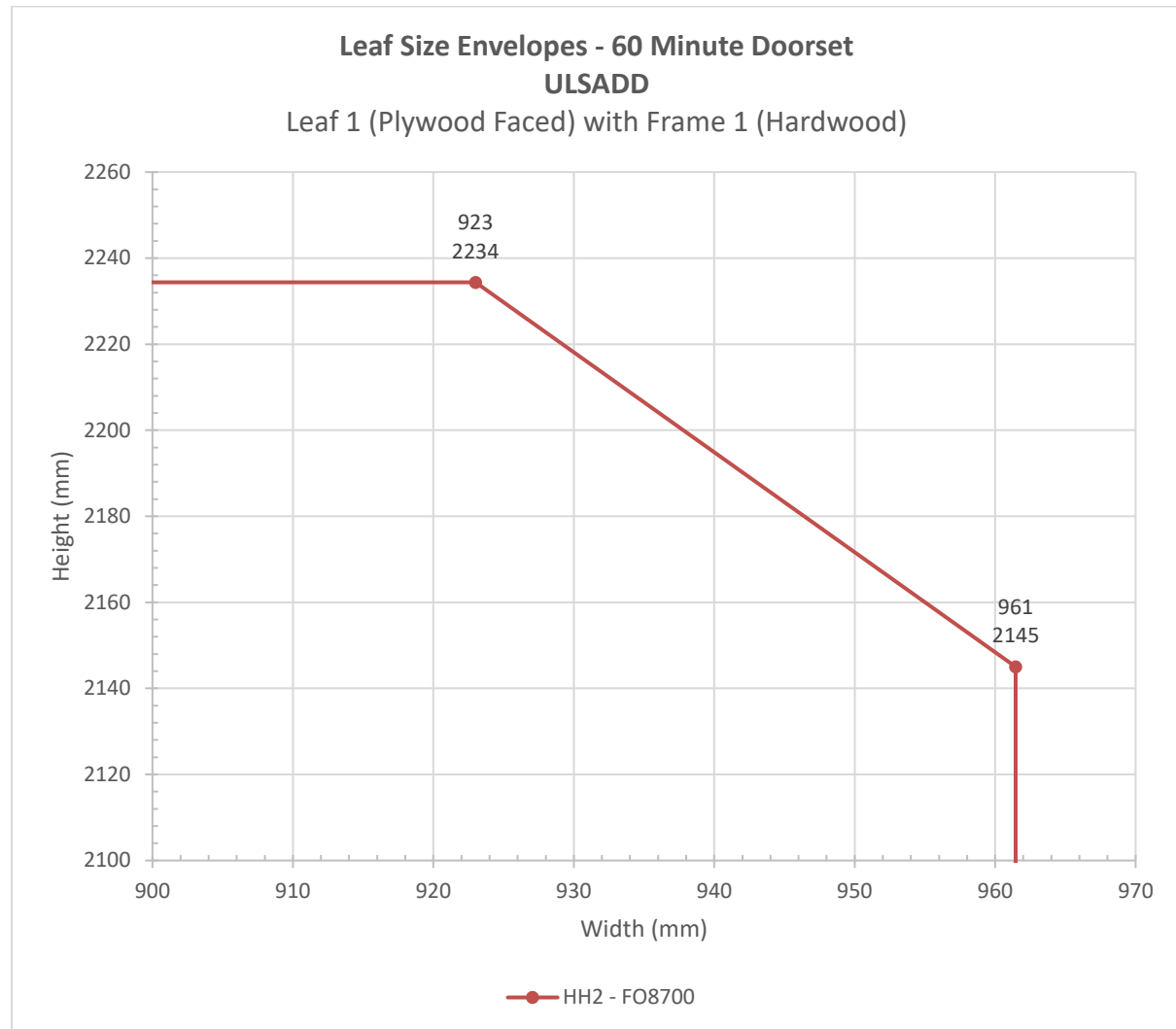




Intumescent Specification for LSADD Leaf 2 (MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
GH4  (BMT/FEP/F16174)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.
GH5  (WF374929B)	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.

4.5.8 ULSADD Configuration: Leaf Size Envelopes & Intumescent Specification

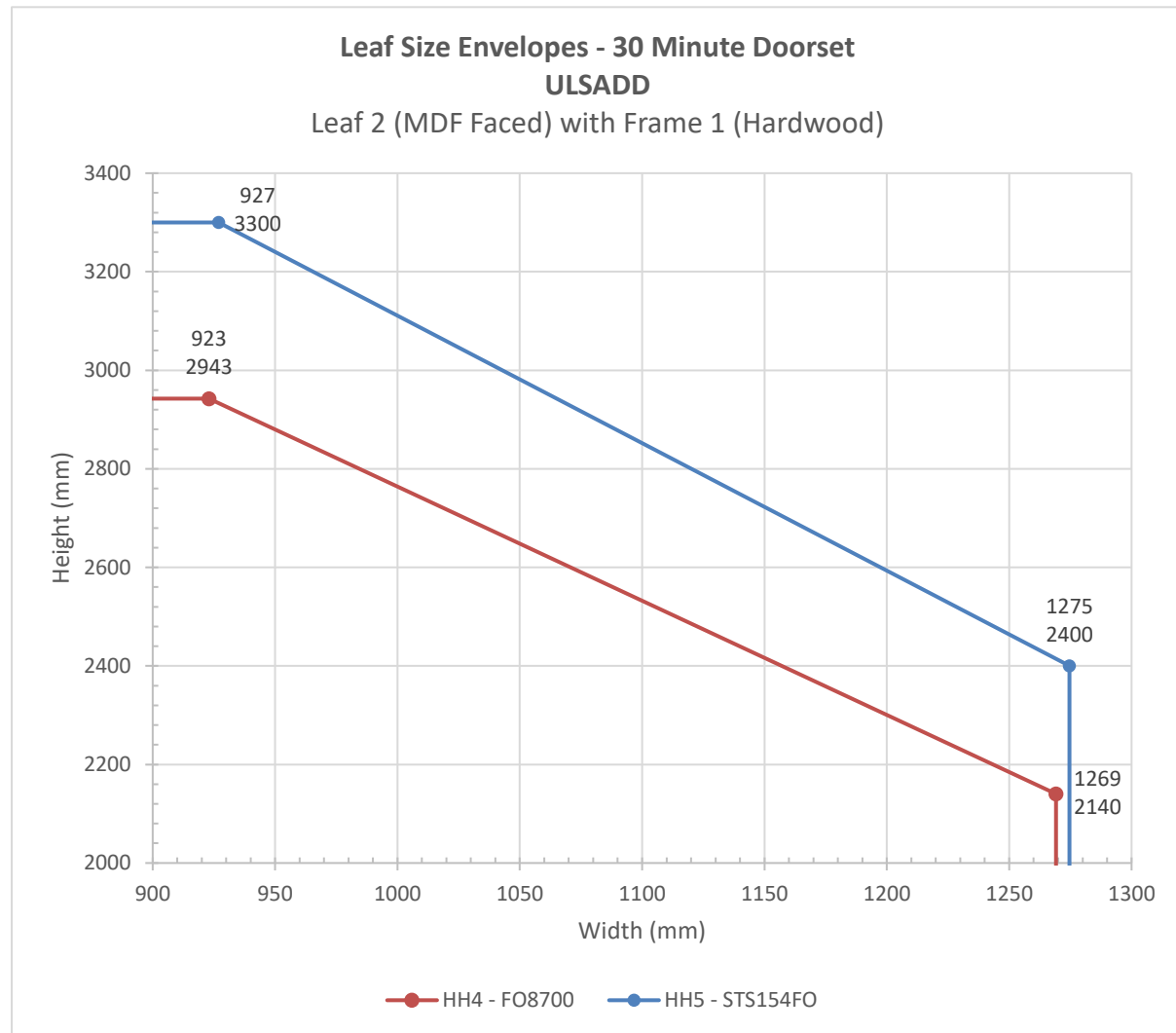
4.5.8.1 Leaf 1 + Frame 1 Doorset

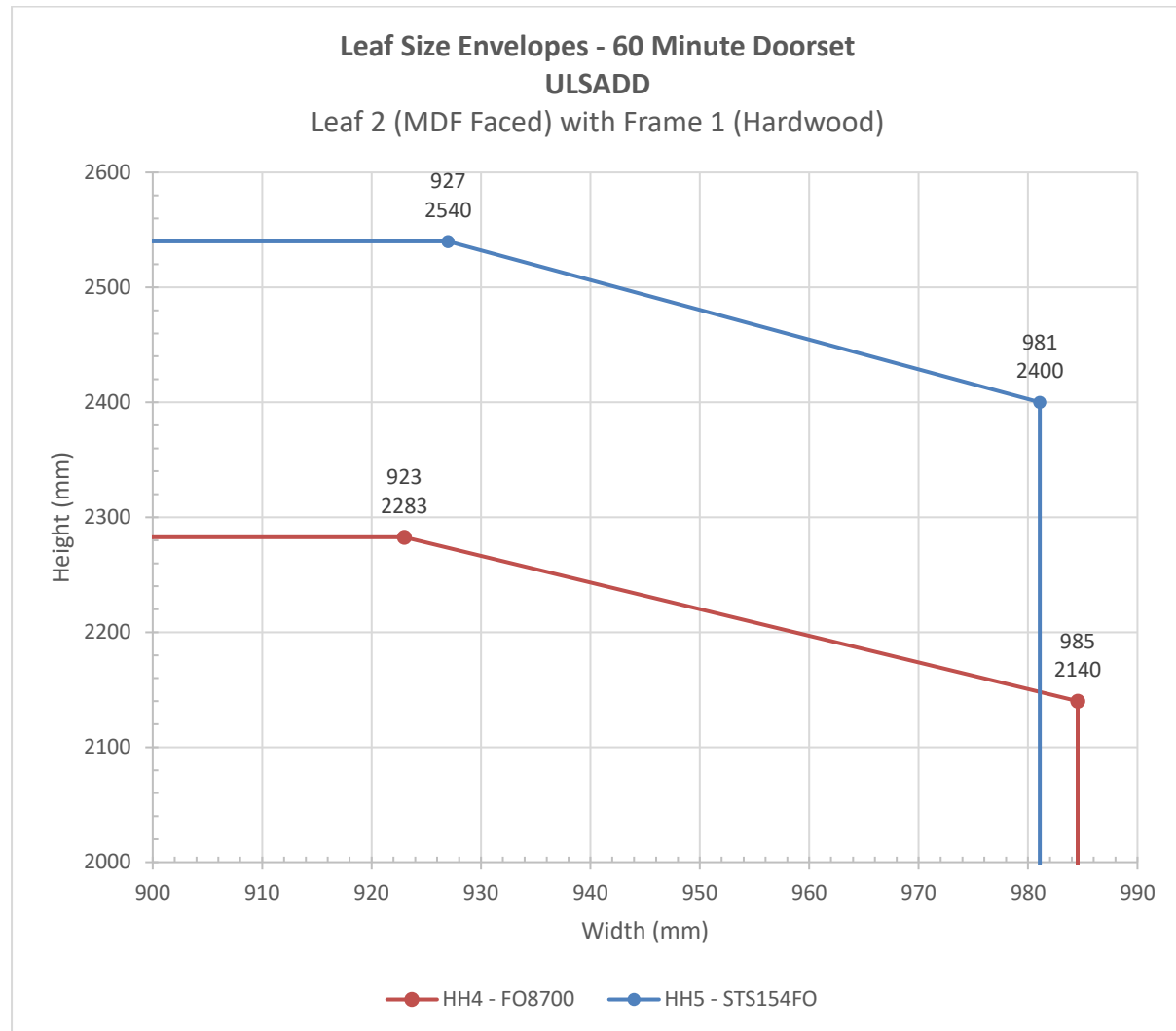






Intumescent Specification for ULSADD Leaf 1 (Plywood Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HH2  (WF369636)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.
HH6  (WF392155) Feature Grooves	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.

4.5.8.2 Leaf 2 + Frame 1 Doorset

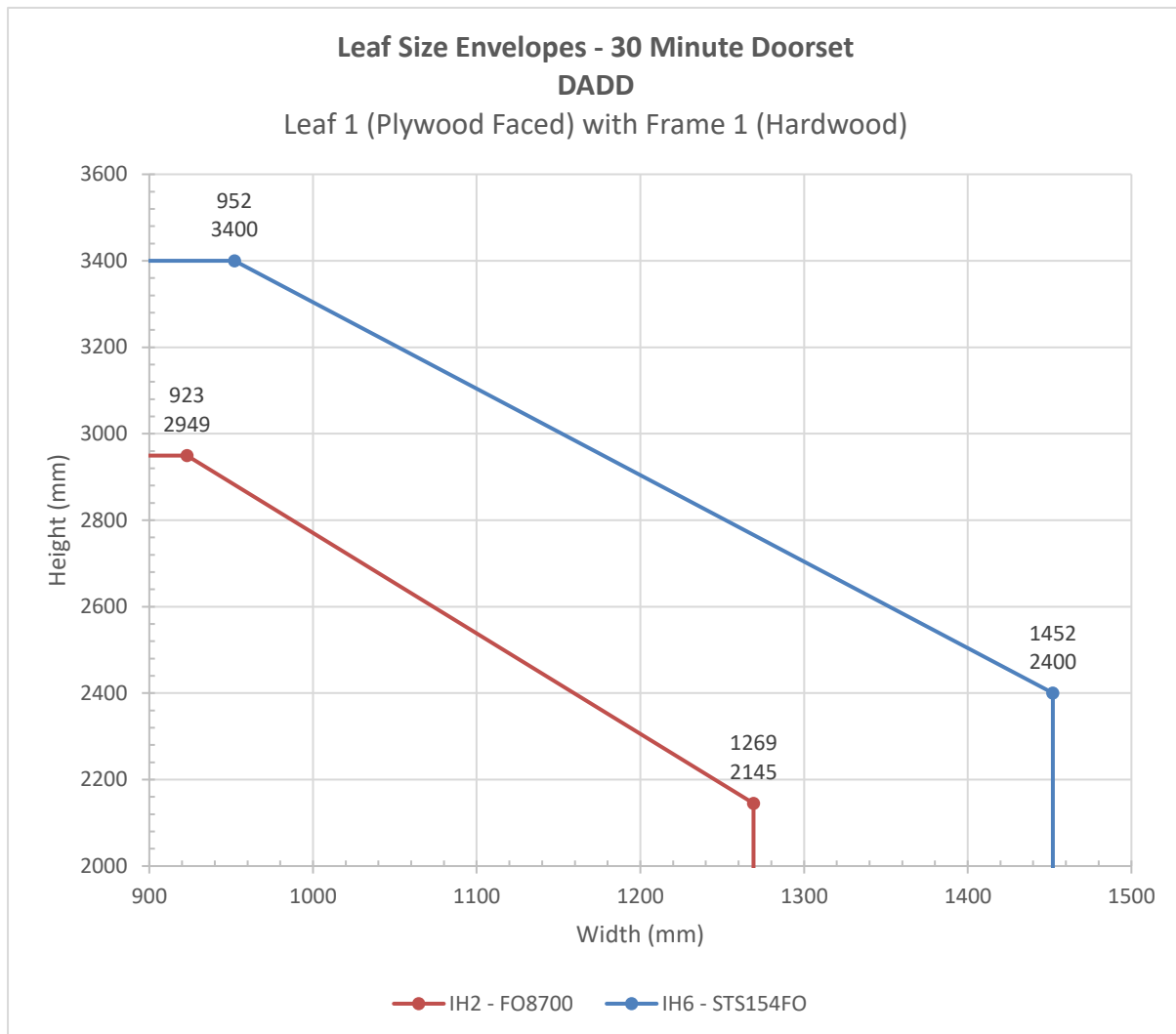


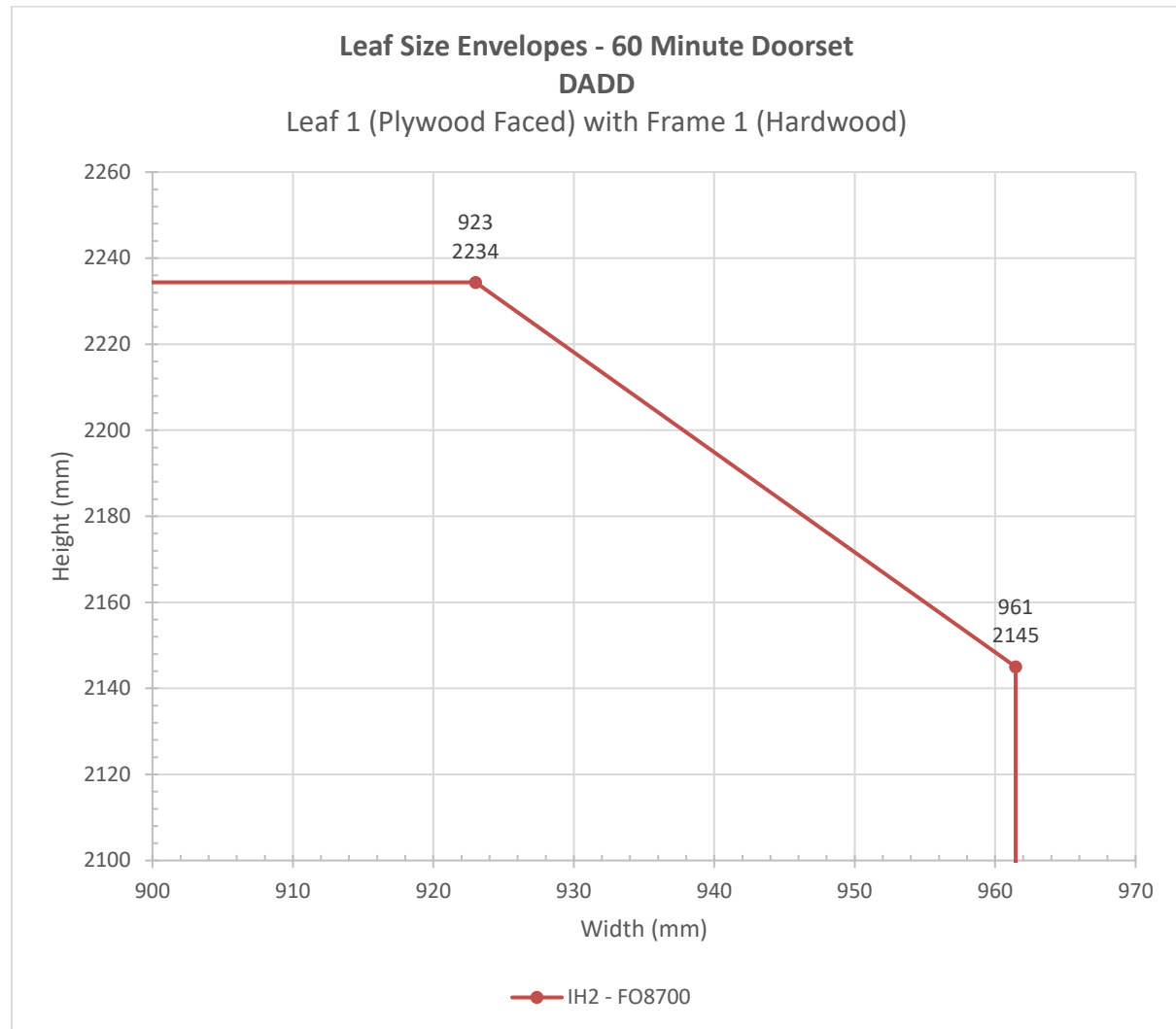




Intumescent Specification for ULSADD Leaf 2 (MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
HH4  (BMT/FEP/F16174)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.
HH5  (WF374929B)	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.

4.5.9 DADD Configuration: Leaf Size Envelopes & Intumescent Specification

4.5.9.1 Leaf 1 + Frame 1 Doorset







Intumescent Specification for DADD Leaf 1 (Plywood Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IH2  (WF369636)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.
IH6  (WF392155) Feature Grooves	STS154FO	Sealed Tight Solution Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.

4.5.9.2 Leaf 2 + Frame 1 Doorset





Intumescent Specification for DADD Leaf 2 (MDF Faced) with Frame 1 (Hardwood)			
Intumescent Spec. Reference (Test Reference)	Make / Type	Manufacturer / Supplier	Location & Size
IH4  (BMT/FEP/F16174)	FO8700	Pyroplex Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.
IH5  (WF374929B)	STS154FO	Sealed Tight Solutions Ltd	Head & Jambs: 2no 15x4. Fitted centrally and 10mm apart, in frame reveal or leaf edges. Meeting Edge: 2no 15x4. Fitted centrally and 10mm apart in main leaf edge.

5 General Description of Leaf Construction

5.1 Leaf 1: Stredor 54 with Plywood Facing

There are two types of plywood faced Stredor 54 door leaf construction, the details of which are given in section 5.1.1 and section 5.1.2, and their comparative behaviour is discussed in section 5.1.3.

5.1.1 Leaf 1: Stredor 54 with Plywood Facing (Type 1)

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

Leaf 1 (Type 1) Construction Details				
Element		Material		Dimensions (mm)
				Minimum Density (kg/m ³)
Core	Inner	Poplar ply		4 (t)
	Outer	Spruce & Pine – vertically orientated and butt jointed		20.5 (t) x 28 (w) (nominal individual lamel size)
Facing	Plywood	Inner: Cross grain Poplar	4 (t)	510
		Outer: Long grain Beech	0.5 (t)	600

The leaf must be lipped on all four edges as specified in section 5.3.

The minimum leaf thickness after calibration is 53mm (i.e. a maximum of 0.5mm from one side).

The minimum leaf thickness after finishes applied is 54mm.

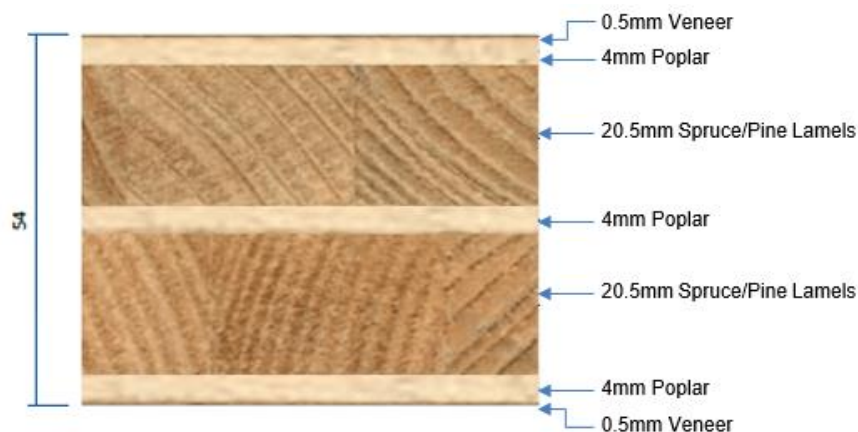


Figure 5.1 – Leaf 1 (Type 1) Stredor 54 with plywood facing

5.1.2 Leaf 1: Stredor 54 with Plywood Facing (Type 2)

The basic tested construction of this Stredor 54 door leaf design comprises the following:

Leaf 1 (Type 2) Construction Details				
Element		Material		Minimum Density (kg/m ³)
Core	Inner	Poplar ply		4 (t)
	Outer	Pine – vertically orientated and butt jointed		20 (t) x 25 – 35 (w) (nominal individual lamel size)
Facing		Plywood	Inner: Long grain poplar	4.2 (t)
			Outer: Long grain beech	0.4 (t)

The leaf must be lipped on all four edges as specified in section 5.3.

The minimum leaf thickness after calibration is 53mm (i.e. a maximum of 0.5mm from one side).

The minimum leaf thickness after finishes applied is 54mm.

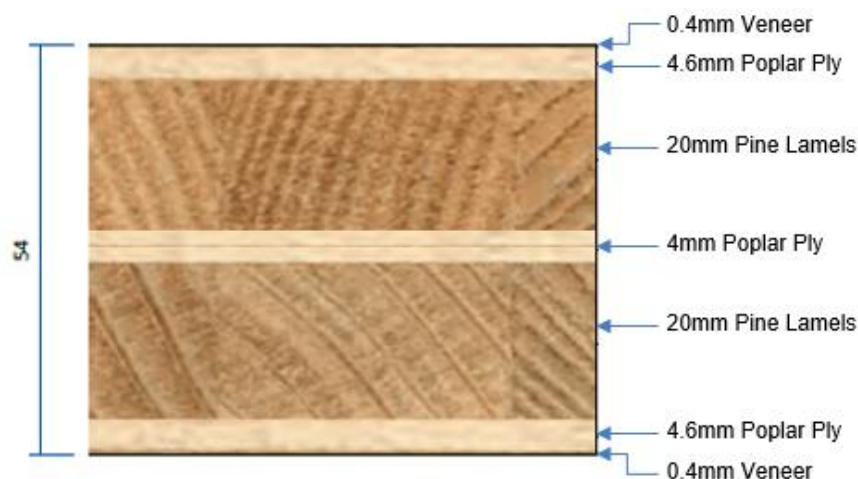


Figure 5.2 – Leaf 1 (Type 2) Stredor 54 with plywood facing

5.1.3 Comparison of Leaf 1: Type 1 & Type 2

The Type 1 and Type 2 plywood faced Stredor 54 door leaves are of similar construction, but are manufactured in two different mills. Type 1 is manufactured in mill referenced F7, while Type 2 is manufactured in mill referenced F14.

Test report WF 412601 is a comparison test between the Type 1 and Type 2 Stredor 54 door leaves, used in a double action single leaf doorset design, with the same schedule of components.

The overall performance of both door leaves is summarised below:

Type 1 (specimen A) achieved: 71:26 minutes fire integrity and insulation. Failure by way of sustained flaming at top strap location. A maximum deflection of 20mm at the top closing corner at 60 minutes.

Type 2 (specimen B) achieved: 71:06 minutes fire integrity and insulation. Failure by way of cotton pad ignition at the threshold. A maximum deflection of 21mm at the top closing corner at 60 minutes.

Also, test reports WF 369636 and WF 407334 can be used for comparison between the Type 1 and Type 2 Stredor 54 door leaves, used in a single action double leaf doorset design, with the same schedule of components.

The overall performance of both door leaves is summarised below:

Type 1 (WF 369636) achieved a: 65:39 minutes fire integrity and insulation. Failure by way of cotton pad ignition at top meeting edge. A maximum deflection of 7/14mm at the centre of meeting stile at 60 minutes.

Type 2 (WF 407334) achieved a: 65:15 minutes fire integrity and insulation. Failure by way of cotton pad ignition at top meeting edge. A maximum deflection of -1/-12mm at the bottom of meeting stile at 60 minutes.

Based on the similarities in performance of both door leaves as reported in the tests referenced above, it is the opinion of Warringtonfire that the two door types are equivalent and are therefore interchangeable.

5.2 Leaf 2: Stredor 54 with MDF Facing

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

Leaf 2 Construction Details				
Element		Material	Dimensions (mm)	Minimum Density (kg/m ³)
Core	Inner	Poplar ply	4 (t)	450 – 550
	Outer	Vertically orientated finger-jointed spruce lamels	18 (t) x 25 – 30 (w) (nominal individual lamel size)	450 – 550
Facing		MDF	7 (t)	700

The leaf must be lipped on all four edges as specified in section 5.3.

The minimum leaf thickness after calibration is 53mm (i.e. a maximum of 0.5mm from one side).

The minimum leaf thickness after finishes applied is 54mm.

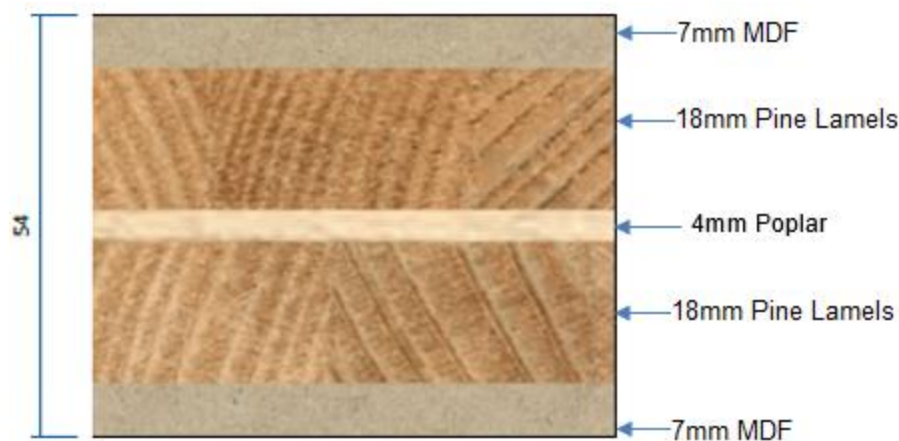


Figure 5.3 – Leaf 2 – Stredor 54 with MDF facing

5.3 Lippings: Leaf 1 & 2

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

Lipping Specification		
Material	Size (mm)	Minimum Density (kg/m ³)
Hardwood: All lipping timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects) The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.	Flat Lipping = 6–11 thick with a maximum of 2 profiling permitted at corners of lipping (see frame detailing in section 7)	640
	Rounded Lipping = 8–18 thick with a radius matching the distance between leaf edge and floor pivot (see frame detailing in section 7)	
Strelip® Engineered Hardwood	Flat Lipping = 8–10 thick with a maximum of 2 profiling permitted at corners of lipping (see standard frame detailing in section 7)	661
	Rounded Lipping = Not permitted	

Note:

1. Lippings must not conceal intumescent materials.
2. A 2.5° chamfer is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 12.
3. Rounded lippings must only be fitted to the hanging edges of double acting door leaves.

5.4 Leaf Facing Materials: Leaf 1 & 2

5.4.1 Decorative & Protective 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.

Facing Material Specification	
Facing Material	Maximum Permitted Thickness (mm)
Paint	0.5
Timber veneers	2
Plastic & resin laminates	2
Cellulosic Foils	0.4

Note:

1. Metallic facings are not permitted except for push plates and kick plates.
2. The door leaf thickness may be reduced by a total maximum of 0.5mm to each face (a maximum of 1mm in total) for calibration purposes, only in order to accommodate one of the additional facings shown in the table above.
3. Materials must not conceal intumescent strips.
4. PVC/plastic laminates must not be applied to the edges of leaves.

5.4.2 Decorative Planted on Timber Mouldings

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

The mouldings:

1. Are surface mounted to the door
2. Are no higher than 30mm i.e. proud of the door
3. Are no wider than 50mm
4. Cover no more than 20% of the door leaf area
5. Are no closer than 80mm to the door leaf edge
6. Are bonded into position and fixed in place with small pins at 150mm centres (min) penetrating the door leaf by no more than 12mm

5.5 Feature Grooves: Leaf 1 Only

Based on test evidence WF 392155, plywood faced Stredor 54 door leaves may be grooved in line with the specification given in the table below. Grooves may coincide with the top and bottom of glazed apertures if required.

Feature grooves are permitted for both 30 and 60 minutes fire resisting doorsets.

Door Leaf Groove Specification		
Element	Details	
Max. groove size (mm)	10mm (w) x 3mm (d)	
Inserts	Not permitted	
Proximity to leaf edges (mm)	Horizontal grooves	Must be no closer than 70mm from bottom or top edges
	Vertical grooves	Must be no closer than 70mm from either side
Groove spacing (mm)	The grooves must be no closer than 90mm apart. Maximum 24No horizontal grooves & maximum 9No vertical grooves per leaf face. Vertical & horizontal grooves may intersect each other.	
Orientation	Vertical or horizontal	
Configuration	Latched & Unlatched, Single & Double Acting, Single & Double Leaf Doorsets	
Leaf option	Leaf 1 only	
Leaf size range	See section 4.5 for leaf size envelopes based on test report WF 392155. Leaf sizes specified for 30 minutes fire resisting doorsets is applicable to 60 minutes fire resisting doorsets.	
Frame option	Frame 1	
Intumescent seal dimensions	15x4mm STS154FO	

Note:

- Butt jointing of intumescent seals in Stredor 54 doorset containing decorative face grooves is not permitted.

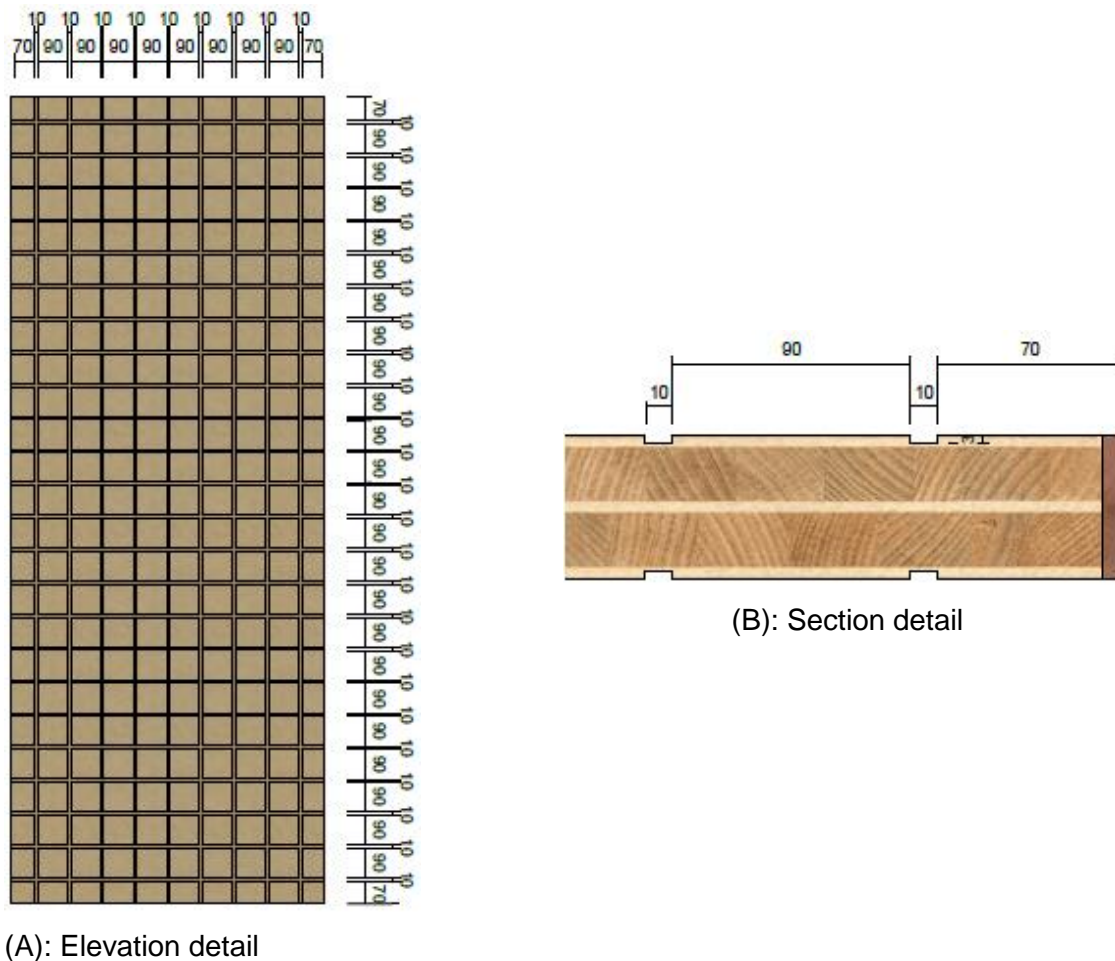


Figure 5.4 – Decorative groove detail on Leaf 1

5.6 Leaf Size Adjustment Prior to Machining: Leaf 1 & 2

The door leaves may be altered in line with the specification given in the table below, prior to the machining for hardware.

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

6 Glazing

6.1 General

The tests evidence e.g. CFR1812191_1 and WF374929B, summarised in section 3, demonstrates that the Stredor 54 doorset is capable of tolerating glazed apertures, whilst providing a margin of over-performance.

Glazing is therefore acceptable on these doorsets, in line with the following parameters:

Maximum area of glazing:

1. For Leaf 1 = 1.1m²
2. For Leaf 2 = 1.1m².

Note: The maximum glazed area is the total area of glazing and may be made up of more than 1 aperture.

Glazed openings must comply with the following:

1. Not be less than 150mm from any door edge.
2. Multiple apertures are acceptable up to the maximum approved area, with a minimum dimension of 80mm between apertures.
3. The aperture shape is not restricted, providing the intumescent material and beads are proven to be compatible with that shape.

6.2 Glass & Glazing Systems

Based on the tests evidence in section 3, the following glass types and glazing systems in the table below have been assessed and are permitted for use on the Stredor 54 doorset.

The table below specifies the maximum assessed area of glazing for an individual glazed aperture using the following permitted glass type and glazing system.

Glass & Glazing System Specification											
Maximum Assessed Area (m ²)											
Glass Type & Manufacturer (Test Reference)		Glazing System & Manufacturer									
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
		Therm A Glaze 60 Intumescent Seals Ltd	Fireglaze 60 Sealmaster UK Ltd	System 36 Plus Lorient Polyproducts Ltd For 30 minutes application only	System 90+ Lorient Polyproducts Ltd	Pyroglaze 60 Mann McGowan Ltd	System 63 (circular apertures only) Lorient Polyproducts Ltd For 30 minutes application only	STS105GT3 /ST302GL Sealed Tight Solutions Ltd ²	ISL60 Plus Intumescent Seals Ltd	Fireglaze Tape Sealmaster UK Ltd	STS104SG /ST302GL Sealed Tight Solutions Ltd ²
1.	Pyroshield 2 Pilkington UK Ltd ⁴	0.715	0.715	0.715	0.4	0.715	0.715	×	0.54	0.54	×
2.	Pyran S Schott Glass Ltd	1.1	1.1	1.1	1.1	1.1	1.1	×	0.54	0.54	×
3.	Pyrodur 60-10 Pilkington UK Ltd	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1

	(BMT/FEP/F16174)										
4.	Pyroguard EW Maxi Pyroguard UK Ltd	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.54	0.54	0.58
5.	Pyranova 15-S2.0 Schott Glass Ltd	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1
6.	Pyrobelite 12 AGC Flat Glass UK (WF374929B) (CFR1812191_1)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1
7.	Pyrodur 60-20 Pilkington UK Ltd	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1
8.	Pyroguard EI30 Pyroguard UK Ltd	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1
9.	Pyrostop 30-10 Pilkington UK Ltd	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1
10.	Pyrobel 16 AGC Flat Glass UK ⁵	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.54	0.54	1.1

Note:

1. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.
2. Glazing system 7 and 10 may only be used with glass types 3 – 10.

3. Sectional drawings detailing the tested and approved proprietary glazing systems are contained in section 6.3.6.
4. See section 6.2.1 below for further size limitations relating to Pyroshield 2.
5. Glass type 10 is fully insulating for 60 minutes in terms of the criteria set out in BS 476: Part 20: 1987.

6.2.1 Pyroshield 2: Size Limitation

The following table details the maximum pane sizes and approved glazing systems permitted for Pyroshield 2.

Size Limitation & Glazing System for Pyroshield 2			
Glass Type	Glazing System (see section 6.2)	Maximum Pane Size (mm)	Maximum Area (m ²)
Pyroshield 2	1	1300 (h) x 550 (w)	0.715
	4	1300 x 310	0.4

Note:

The heights and widths listed are the maximum single dimensions allowable for an individual pane utilising the relevant glazing system; maximum dimensions may not be increased even if the other dimension for the pane is reduced.

6.3 Glazing Beads & Installation Detail

6.3.1 Chamfered Beads

Chamfered bead must be as specified below:

Chamfered Bead Specification			
Material	Application	Minimum Section Size (mm)	Minimum Density (kg/m ³)
<p>Hardwood:</p> <p>Glazing beads must be straight grained joinery quality hardwood timber, free from knots, splits and checks.</p> <p>The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.</p>	Permitted for use with all glass types and glazing systems as specified in the table in section 6.2.	See diagrams in section 6.3.6 for minimum bead dimension for each permitted glass type and glazing system.	≥ 640

6.3.2 Square Beads

Square bead must be as specified below:

Square Bead Specification			
Material	Application	Minimum Section Size (mm)	Minimum Density (kg/m ³)
Hardwood:	Permitted for use with glass types 3–10 and	See diagram below.	≥ 640

Glazing beads must be straight grained joinery quality hardwood timber, free from knots, splits and checks. The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.	glazing systems 1 and 2 as specified in the table in section 6.2.		
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The minimum permitted dimensions of the bead is as shown in the diagram below.

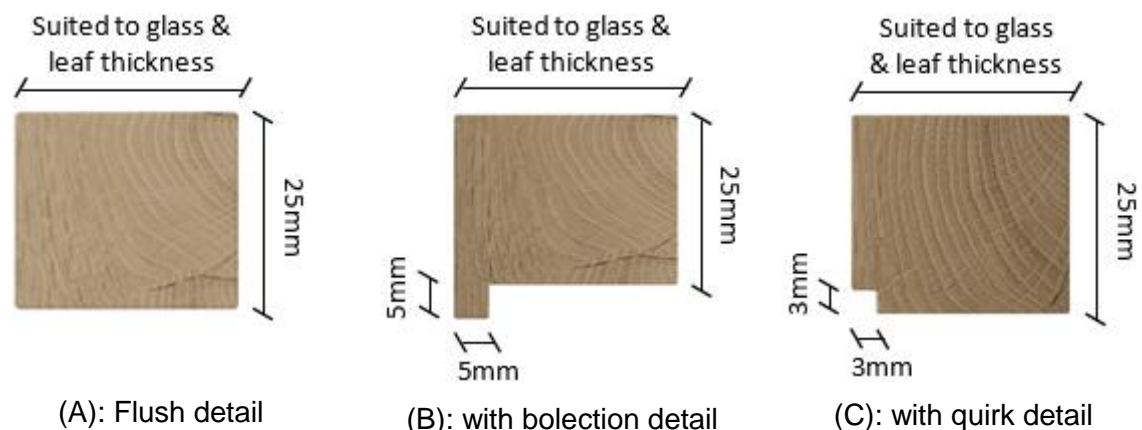


Figure 6.1 – Square bead detail

6.3.3 False Beads

False timber beads are intended to fall away from the glass under fully developed fire conditions so cannot cause a problem on the fire side and are used in conjunction with partially insulating glasses so that the bead on the unexposed face will not get hot enough to cause non-pilot ignition, but is more likely to fall away from the glass.

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 types 3–10 in section 6.2

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.	
4.	Envirograf Product 77 – G10/10	Intumescent Seals Ltd.	

Note:

Preformed strip systems 1 – 4 may be self-adhesive and grooved into the rear of the glazing bars.

6.3.4 Bead Fixings

Glazing beads must be retained in position with 60mm long steel pins meeting the specification in section 6.3.4.1 below; or 60mm long No. 6 - 8 screws, inserted at 35 - 40° 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.

6.3.4.1 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 2.03mm².
- Minimum linear dimension of 1.6mm in any direction.



Figure 6.2 – 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 2.24mm².
- Minimum linear dimension of 1.4mm.

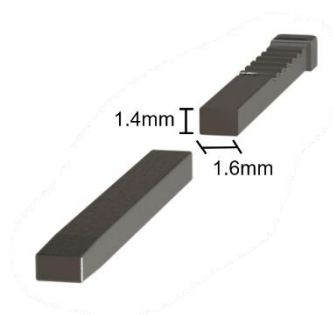


Figure 6.3 – Rectangular pin detail – minimum dimension 1.4mm

Note:

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

6.3.5 Glazing Liner

A 6–10mm thick square aperture liner is permitted for use with all glazing beads, providing it is constructed from hardwood of minimum density 640kg/m³ and glued in position using a UF, PVA or PU type adhesive.

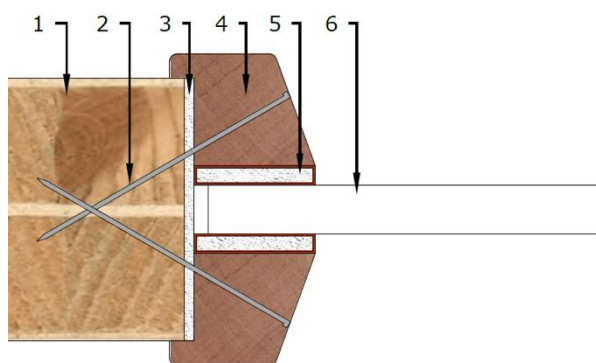
6.3.6 Installation Detail

The fitting of the glazing seal between the bead and the glass should generally be in accordance with the manufacturer's instructions with a tight fit present between the substrates.

All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion tolerances.

The following diagrams shows the installation detail with minimum bead size for each permitted glazing system and glass type.

6.3.6.1 ISL Therm A Glaze 60: Installation Detail



Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 54mm ISL Therm-A-Line intumescent liner.
- (4) Hardwood beading measuring 30mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 20° chamfer, fitted around the glazing apertures on both faces.
- (5) ISL 25 x 4mm Therm-A-Bead intumescent strip fitted between the glass and beads on both faces.
- (6) Assessed glass

Figure 6.4 – ISL Therm-A-Glaze 60 installation detail

6.3.6.2 Sealmaster Fireglaze Mastic: Installation Detail

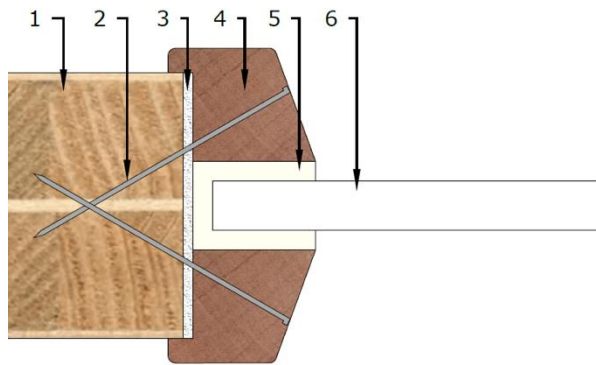


Figure 6.5 – Sealmaster Fireglaze Mastic installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 54mm Sealmaster G60 intumescent liner.
- (4) Hardwood beading measuring 30mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 20° chamfer, fitted around the glazing apertures on both faces.
- (5) Fire Glaze 30 mastic fitted between the glass and beads on both faces.
- (6) Assessed glass

6.3.6.3 Lorient System 36 Plus: Installation Detail

Permitted for 30 minutes fire resisting doorsets only

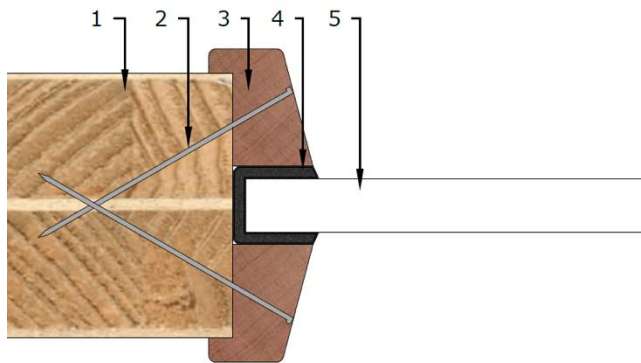


Figure 6.6 – Lorient System-36 Plus installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) Hardwood beading measuring 21mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 10 - 15° chamfer, fitted around the glazing apertures on both faces.
- (4) Lorient System-36 Plus intumescent U-Channel gasket fitted around the glass, between the glass and beading and glass and aperture.
- (5) Assessed glass

6.3.6.4 Lorient System 90 Plus: Installation Detail

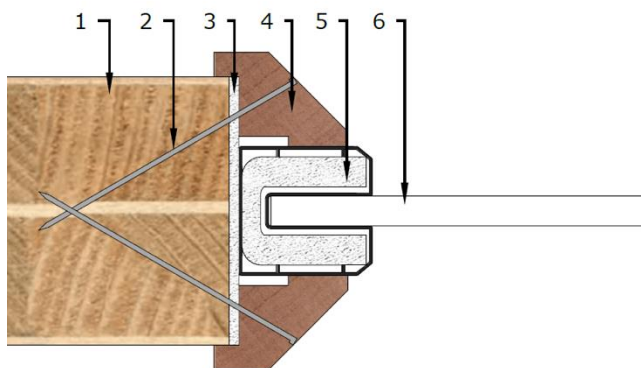


Figure 6.7 – Lorient System-90 Plus installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 54mm Lorient B25402 intumescent liner
- (4) Hardwood beading measuring 27mm high x 19mm wide, including a minimum 5mm x 5mm bolection return, a 10mm x 2mm internal cut out and a 45° chamfer, fitted around the glazing apertures on both faces.
- (5) Lorient System-90 Plus intumescent U-Channel gasket fitted around the glass, between the glass and beading and glass and aperture.
- (6) Assessed glass

6.3.6.5 Mann McGowan Pyroglaze 60: Installation Detail

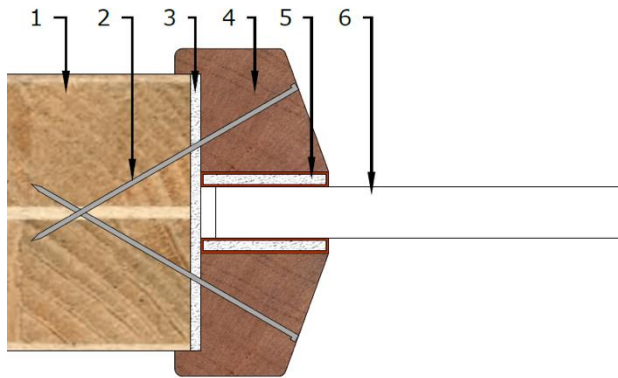


Figure 6.8 – Mann McGowan Pyroglaze 60 installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 54mm Mann MacGowan Pyroglaze 300 intumescent liner
- (4) Hardwood beading measuring 30mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 20° chamfer, fitted around the glazing apertures on both faces.
- (5) Mann McGowan 25 x 3mm Pyroglaze 60 500P or 500 PSA intumescent strip fitted between the glass and beads on both faces.
- (6) Assessed glass

6.3.6.6 Lorient System 63Ø – for circular glazing: Installation Detail

Permitted for 30 minutes fire resisting doorsets only

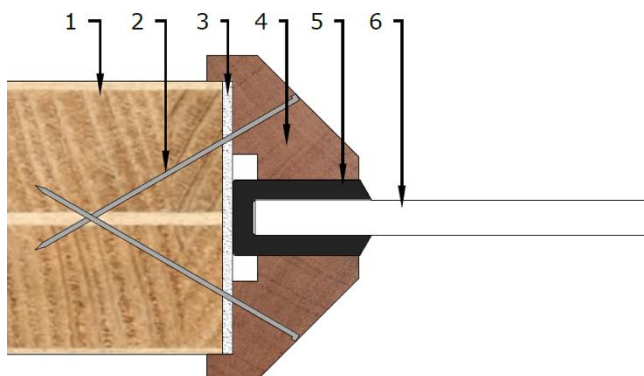


Figure 6.9 – Lorient System-63Ø – for circular glazing installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 54mm Lorient B25402 intumescent liner
- (4) Hardwood beading measuring 30mm high x 25mm wide, including a minimum 5mm x 5mm bolection return, a 5mm x 5mm internal cut out and a 45° chamfer, fitted around the glazing apertures on both faces.
- (5) Lorient System-63Ø intumescent U-Channel gasket fitted around the glass, between the glass and beading and glass and aperture.
- (6) Assessed glass

6.3.6.7 Sealed Tight Solutions STS105GT3 / STS302GL: Installation Detail

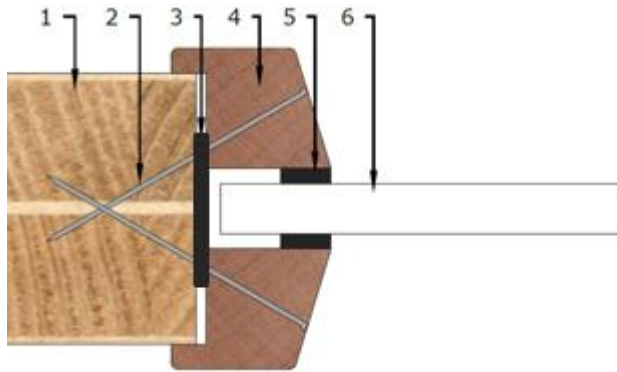


Figure 6.10 – Sealed Tight Solutions STS105GT3 / STS302 installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 30mm Sealed Tight Solutions STS 302 intumescent liner
- (4) Hardwood beading measuring 32mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 17° chamfer, fitted around the glazing apertures on both faces.
- (5) Sealed Tight Solutions 10 x 3mm STS 105GT-3 glazing tape fitted between the glass and beads on both faces.
- (6) Assessed glass

6.3.6.8 ISL 60 Plus: Installation Detail

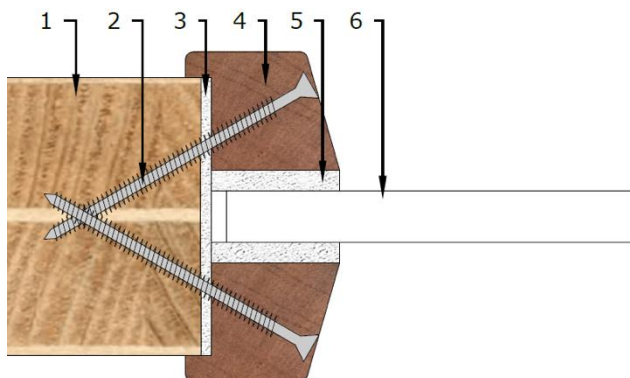


Figure 6.11 – ISL 60 Plus installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm screws
- (3) 2mm x 54mm ISL Therm-A-Line intumescent liner
- (4) Hardwood beading measuring 30mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 16° chamfer, fitted around the glazing apertures on both faces.
- (5) ISL 25 x 5.8mm (compressed to 4mm in fitting) ISL60 Plus glazing tape fitted between the glass and beads on both faces.
- (6) Assessed glass

6.3.6.9 Sealmaster Fireglaze: Installation Detail

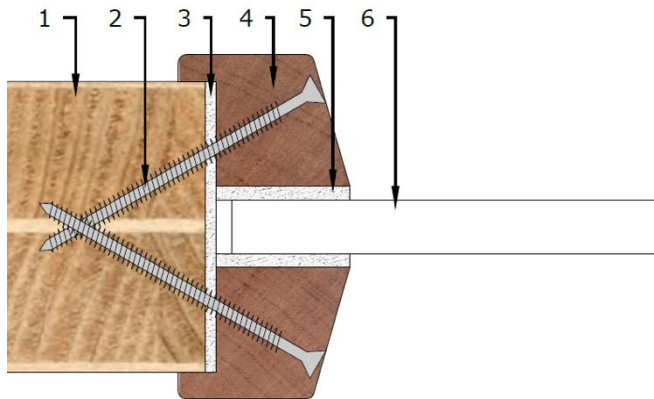


Figure 6.12 – Sealmaster Fireglaze installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm screws
- (3) 2.5mm x 54mm Sealmaster Fireglaze tape as intumescent liner
- (4) Hardwood beading measuring 32mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 16° chamfer, fitted around the glazing apertures on both faces.
- (5) ISL 25 x 2.5mm Sealmaster Fireglaze tape fitted between the glass and beads on both faces.
- (6) Assessed glass

6.3.6.10 Sealed Tight Solutions STS104SG / ST302GL: Installation Detail

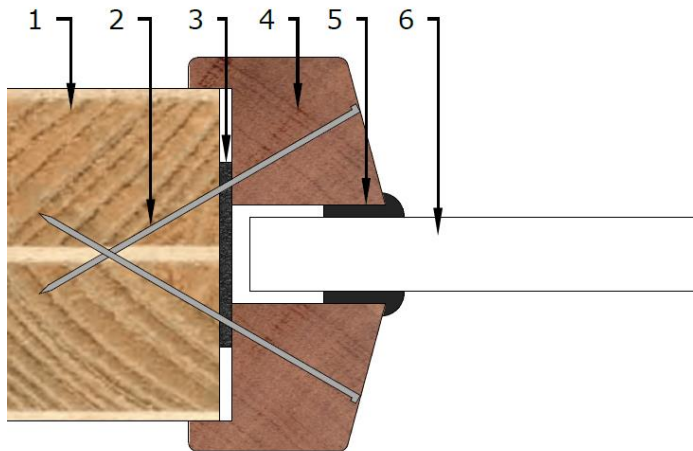


Figure 6.13 – STS104SG/ST302GL installation detail

Key:

- (1) Stredor® 54 leaf
- (2) 60mm pins or screws
- (3) 2mm x 30mm Sealed Tight Solutions STS 302 intumescent liner
- (4) Hardwood beading measuring minimum 30mm high with width to suit glass type, including a minimum 5mm x 5mm bolection return and a 17° chamfer, fitted around the glazing apertures on both faces.
- (5) Sealed Tight Solutions 10 x 2mm STS (including cap = 14x4) 104SG glazing tape fitted between the glass and beads on both faces.
- (6) Assessed glass

7 Door Frame Construction

7.1 Frame Specification

Based on tested construction, the door frames must comply with the following specification:

Frame Specification			
Frame	Material	Minimum Section Size (mm)	Minimum Density (kg/m ³)
1	<p>Hardwood:</p> <p>All door frame timber must meet or exceed class J30 as specified in BS EN 942: 2007 (subject to adequate repair of any defects).</p> <p>The use of Beech (<i>Fagus sylvatica</i>) is NOT permitted.</p>	Frame: 70 x 29 (excluding stop) Stop: 13 x 15 (integral or planted on)	640
		Frame: 70 x 32 (excluding stop) Stop: 13 x 12 (integral or planted on)	
		Frame: 70 x 32 (at narrowest point)	

Note:

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

7.2 Standard Frame

The diagram below shows detail of the standard frame construction. Minimum section is determined based on hardware requirements and whether a transomed overpanel is part of the doorset design.

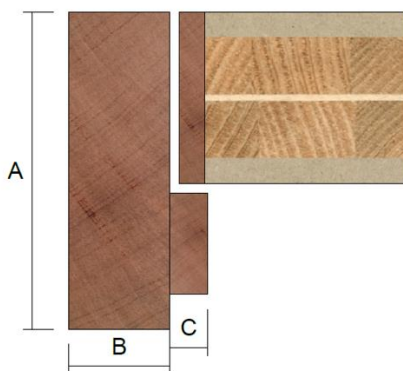


Figure 7.1 – Standard frame detail

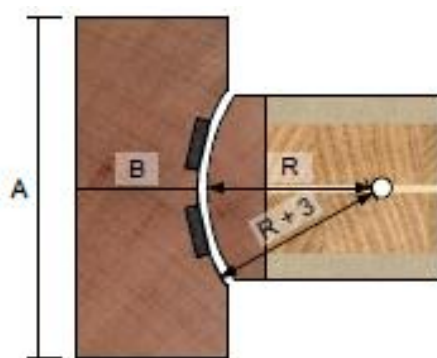
- (A) Frame depth = 70mm minimum
- (B) Frame thickness = 29mm minimum
- (C) Stop thickness = 15mm minimum

Minimum section size when using a transomed overpanel:

- (A) Frame depth = 70mm minimum
- (B) Frame thickness = 44mm minimum
- (C) Stop thickness = 12mm minimum

7.3 Scalloped Frame

The diagram below shows detail of the scalloped frame construction. When using scalloped frames for double acting doorsets, the groove for the specified intumescent strips must be as shown below and to the correct depth.

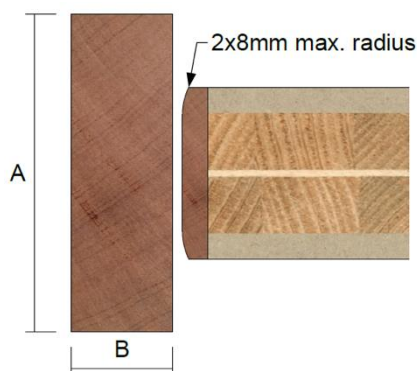


- (A) Frame depth = 70mm minimum
- (B) Frame thickness = 32mm minimum
- (R) Radius from floor spring or pivot = 8mm maximum to create a maximum 2mm edge profiling

Figure 7.2 – Scalloped frame detail

7.4 Square Frame

The diagram below shows detail of the square frame construction. Where utilising square frames for double acting doorsets, the maximum radius to the corners of the leaf is 8mm.



- (A) Frame depth = 70mm minimum
- (B) Frame thickness = 32mm minimum
- Radius to corner of leaf = maximum 8mm to create a maximum 2mm edge profiling

Figure 7.3 – Square frame detail

7.5 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.

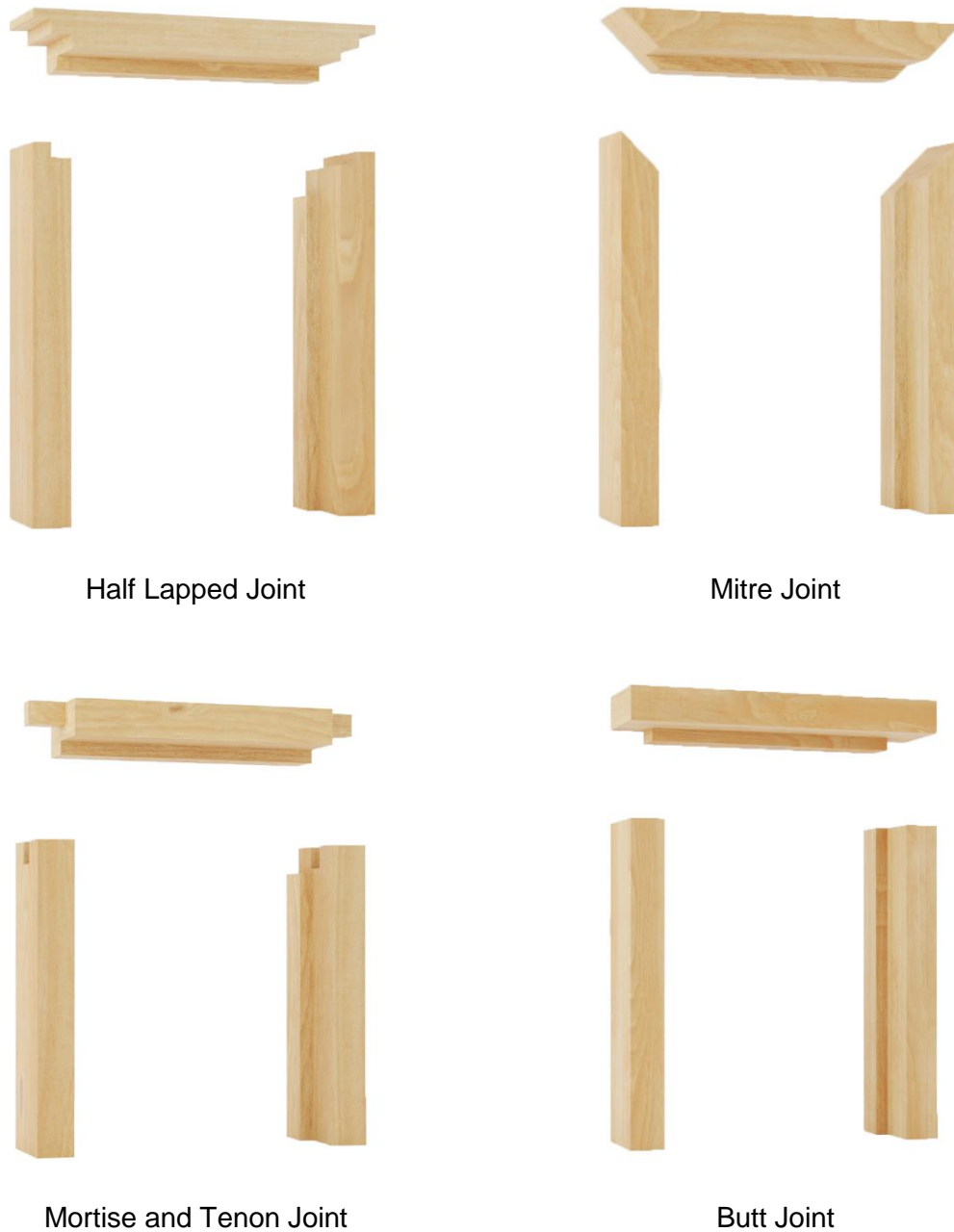


Figure 7.4 – Frame jointing detail

Note:

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

8 Overpanels & Fanlights

8.1 Transomed Overpanels

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

Overpanel:

- must be fully contained within the door frame (see diagram below).
- gap between the edges of overpanel and frame reveal should be a tight fit.

Transom:

- must be to the same material specification as the door frame construction. Frame and transom must have a minimum section size of 70 x 44mm plus a 12mm stop.
- joint must be either: mortice and tenon or butt joint (see section 7.5). Joints must be tight, with no gaps, and requires mechanical fixing with the appropriate size ring shank nails or screws. Butt joints must be additionally bonded with urea formaldehyde.

8.1.1 Overpanel Fixing

Overpanels must be fixed as follows:

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

8.1.2 Overpanel Fire Sealing

The jamb intumescent seals as specified in section 4.5 must also be fitted to all concealed edges of the overpanel. The intumescent seals may be fitted in the overpanel edges or alternatively in the frame reveal (see diagram below).

8.1.3 Overpanel Sizing

The maximum assessed overpanel dimensions are given in the table below, subject to the restrictions above.

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

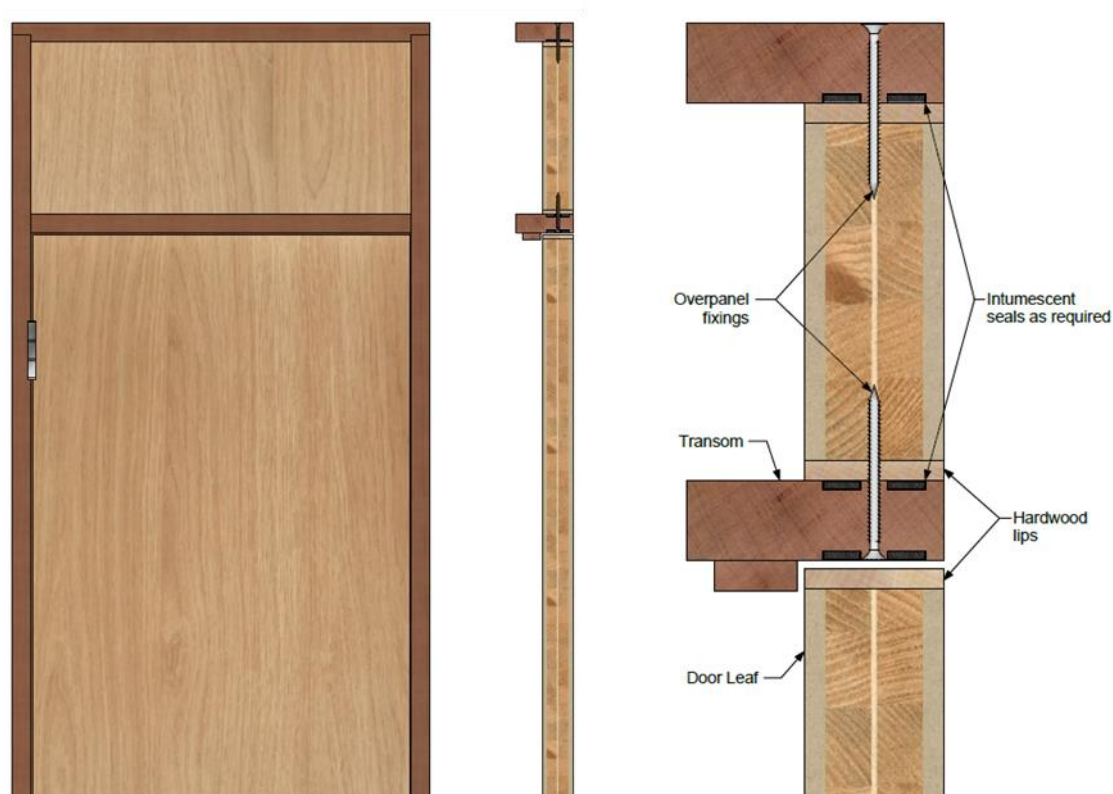


Figure 8.1 – Transomed overpanel detail

8.2 Fanlights

Glazing may be used in lieu of an overpanel, only when separated by a transom, and must comply with the following:

Transom:

- must be to the same material specification as the door frame construction. Frame and transom must have minimum section size of 70 x 44mm plus a 12mm stop.

Glass and Glazing system:

- glasses 5–10 in section 6.2 and glazing system 1 and 2 in section 6.2 are permitted.

Glazing Bead:

- must be hardwood with minimum density of 640 kg/m³. Beech hardwood (*Fagus sylvatica*) is NOT permitted.

8.2.1 Fanlight Sizing

The maximum assessed fanlight dimensions are given in the table below:

Maximum Fanlight Dimensions		
Configuration	Height (mm)	Width (mm)
Single & Double Leaf doorsets	≤ 600	Overall door width

The diagram below shows a detailed illustration of the fanlight.

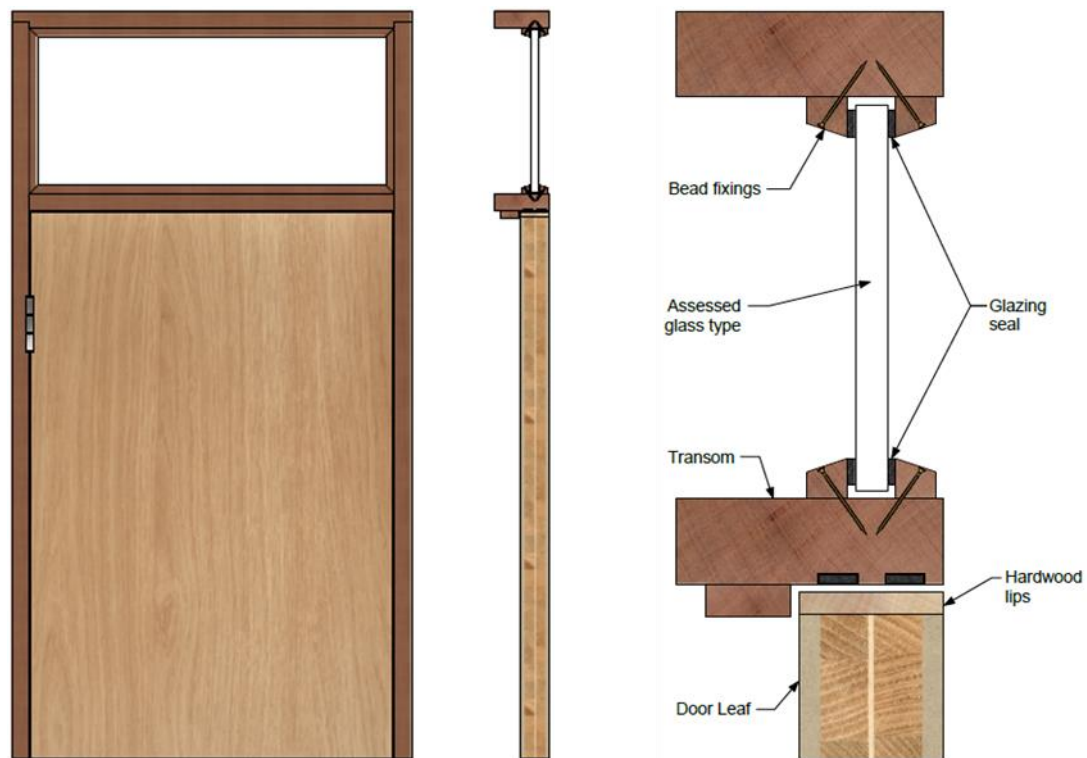


Figure 8.2 – Fanlight detail

9 Intumescent

9.1 Essential Hardware Protection

The intumescent seals for hardware protection tested and assessed for this doorset design are as follows:

Hardware Intumescent Specification		
Application	Location	Product & Manufacturer
Hinges	Under hinge blades	1mm thick STS graphite – Sealed Tight Solutions Ltd 2mm thick Therm-A-Flex – Intumescent Seals Ltd 2mm thick Pyroplex graphite – Pyroplex Ltd 2mm thick Interdens 2mm thick MAP – Lorient Polyproducts Ltd
Top pivots, bottom straps	Lining all sides of strap mortices:	2mm thick Interdens 2mm thick MAP – Lorient Polyproducts Ltd
Locks/Latches	Under forend & keep, & encasing lock/latch body	1–2mm thick STS graphite – Sealed Tight Solutions Ltd 2mm thick Therm-A-Flex – Intumescent Seals Ltd 2mm thick Pyroplex graphite – Pyroplex Ltd 2mm thick Interdens 2mm thick MAP – Lorient Polyproducts Ltd
Hook boxes	Encasing hook box body	1mm thick STS graphite – Sealed Tight Solutions Ltd
Electric motor	Encasing body	1mm thick STS graphite – Sealed Tight Solutions Ltd
Flush bolts	Under flush bolt keep & lining flush bolt rebate in leaf	2mm thick Pyroplex graphite – Pyroplex Ltd 1mm thick STS graphite – Sealed Tight Solutions Ltd 2mm thick Interdens 2mm thick MAP – Lorient Polyproducts Ltd
Cableway	Lining whole of cableway	1mm thick graphite – Sealed Tight Solutions Ltd
Cable loop	Under forend, Lining base of cable loop, & encasing Body	ST302 2mm thick graphite – Sealed Tight Solutions Ltd

Concealed closer	Lining closer rebate	2mm thick manufacturer supplied graphite kit – Rutland UK
Eye viewer	Around diameter of hole	1mm thick graphite – Sealed Tight Solutions Ltd
Letter plate	Lining outer edges	2mm thick graphite – Sealed Tight Solutions Ltd
	Lining inner edges	1mm thick graphite – Sealed Tight Solutions Ltd

9.2 Door Perimeter Intumescent Seal

Tested and permitted intumescent seal is as specified in section 4.5 for all permitted door configurations.

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. Seals may be installed with the additional features, it is beyond the remit of this assessment to discuss likely acoustic or cold smoke control performance.

Other variations of the tested intumescent seals are available and are considered acceptable (see diagram below).

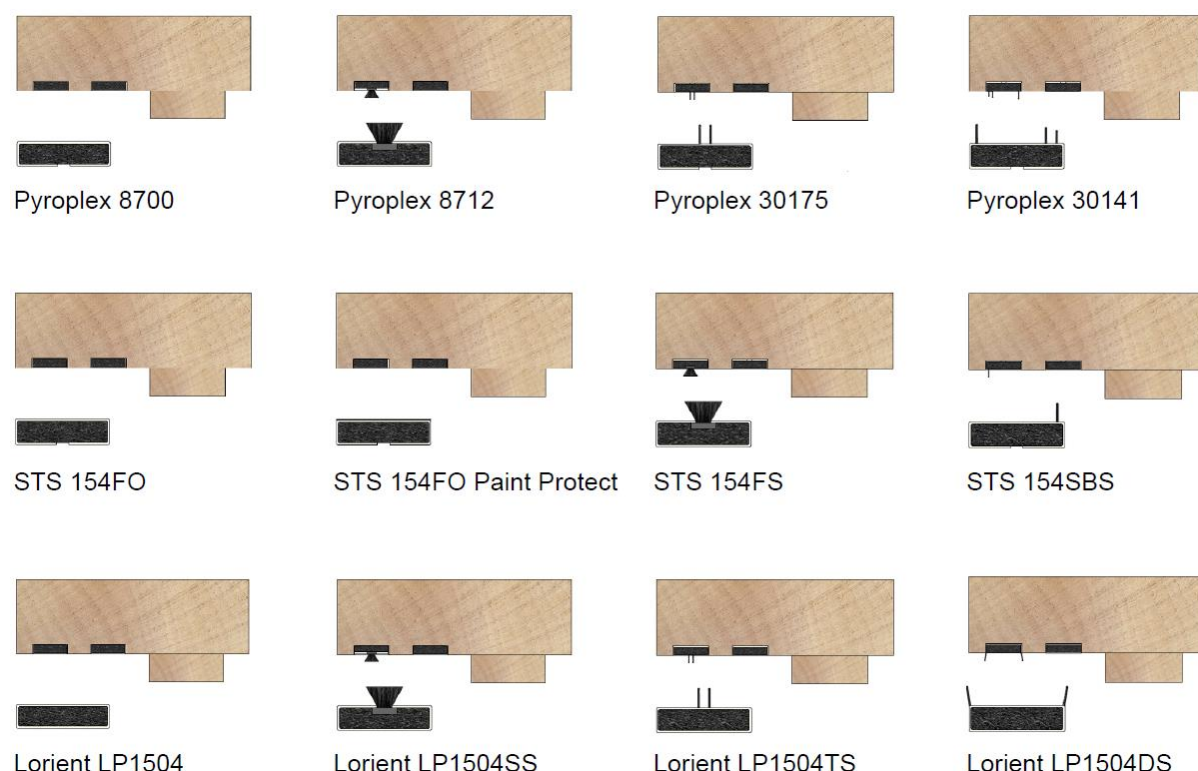


Figure 9.1 – Alternative intumescent seals with additional features

10 Adhesives

Based on the tested doorsets and leaf construction, the following adhesives must be used.

Adhesive Specification			
Element			Product
Leaf 1	Core	Inner to Outer	Confidential – details held in draft version of report
		Outer (lamels)	Confidential – details held in draft version of report
			Confidential – details held in draft version of report
Leaf 2	Core	Inner to Outer	Confidential – details held in draft version of report
		Outer (lamels)	Confidential – details held in draft version of report
Facing			Melamine urea formaldehyde
Lippings			Polyurethane/PUR Cold/UF
Glazing liner			
Decorative facings			PVA/PU/UF/Contact Adhesive
Frame joints			PVA/PU/UF

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 CE Mark:

1. Locks & Latches: Test Standard EN 12209
2. Single axis hinges: Test Standard EN 1935
3. Controlled door closing devices: Test Standard EN 1154
4. Electrically powered hold-open devices: Test Standard EN 1155
5. Door co-ordinators: Test Standard EN 1158
6. Emergency exit hardware: Test Standard EN 179
7. Panic exit hardware: Test Standard EN 1125.

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:

1. Have been tested
2. 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
3. Can be used as a result of the CERTIFIRE approval of the item of hardware
4. Can be used based on the generic guidance or CE marking but final approval will be with another approving body.

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

1. Leaf size
2. Configuration
3. Intumescent seals
4. Intumescent protection
5. Frame

No item of hardware at the hanging stile and head should be within 200mm of another item of hardware unless there is successful test evidence with the items installed closer together.

11.2 Essential Hardware

The 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 considered in section 4.5, section 7 and section 9.1.

The following table details the essential hardware for each permitted door leaf configuration.

Essential Hardware	
Configuration	Hardware
LSASD	<ul style="list-style-type: none"> • Latch • Hinges • Overhead face fixed closer
ULSASD	<ul style="list-style-type: none"> • Hinges • Overhead face fixed closer
DASD	<ul style="list-style-type: none"> • Top pivot / bottom strap • Floor spring
LSADD	<ul style="list-style-type: none"> • Latch • Hinges • Overhead face fixed closer • Flush bolt • Selector if rebated meeting stile present
ULSADD	<ul style="list-style-type: none"> • Hinges • Overhead face fixed closer • Flush bolt • Selector if rebated meeting stile present
DADD	<ul style="list-style-type: none"> • Top pivot / bottom strap • Floor spring

11.3 Locks & Latches

The different types of locking and latching devices are considered in the following section.

11.3.1 Single Point Locks & Latches

The following single point locks and latches have been successfully incorporated in the tests on the Stredor 54 design.

Tested Lock & Latch Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
Ref. 376113	Altro Eurospec	Forend: 59 x 25

tubular steel mortice latch (WF407334)		Keep: 65 x 40 Case: 61 x 24 x 17
Ref. Not given in test report Electr brass tubular steel mortice latch (BMT/FEP/F16174)	Smith & Locke	Forend: 60 x 32 Keep: 60 x 22
Ref. Not given in test report mortice latch (WF374929B)	Zoo Hardware	Forend: 130 x 22 (case is bigger than forend according to test report) Keep: 180 x 25 Case: 165 x 87 x 14
Ref. Not given in test report Steel mortice latch (WF 392155)	Arrone	Forend: 235 x 20 Keep: 170 x 24
Ref. 12781 Tubular steel mortice latch (WF369336)	Not given in test report	Forend: 60 x 27 Keep: 60 x 22

These locks and latches are permitted for use in:

Leaf 1 + Frame 1 doorsets

Leaf 2 + Frame 1 doorsets

Configuration: LSASD and LSADD

Alternative Single Point Locks & Latches

Locks and latches must either be as tested, or alternatively components with the following specification are acceptable.

Alternative Lock & Latch Specification	
Element	Specification
Maximum forend & keep dimensions	<i>For Single doorsets:</i> 235 (h) x 22 (w) x 4mm (t) <i>For Double doorsets:</i> 235 (h) x 22 (w) x 4mm (t)
Maximum body dimensions	180 (h) x 100 (w) x 18mm (t)
Intumescent protection	See section 9
Materials	All parts essential to the locking/latching action (including the latch bolt, forend & keep) to be steel or brass (with a melting point $\geq 800^{\circ}\text{C}$)
Location	Between 750 – 1200mm from the threshold

Certifire approved locks for 60 minutes for ITT classification as long as all of the requirements are complied with are approved.

11.3.2 Multi Point Locks & Latches: Leaf 1 Only

For multipoint locks, the tested ERA Surefire Classic multipoint latch may be utilised with Stredor® 54 door designs.

The installed latch must be protected with the tested intumescent protection detailed. It is preferable the latch be kept locked at all 3 locking points when not in active use.

The following locks and latches have been successfully incorporated in the tests on the Stredor 54 design.

Tested Lock & Latch Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
SureFire Classic 3 point auto locking latch (CFR1812191_1)	ERA	Forend: 1635 (h) x 20 (w) Centre Lock/Latch Body: 214 (h) x 58 (w) x 14 (d) Centre Keep: 189 (h) x 38 (w) x 2 (t) (including tongue of 68 x 14) Hook Box Body: 150 (h) x 40 (w) x 15 (d) Hook Keep: 152 (h) x 38 (d) x 2 (t) (including tongue of 47 x 14)
SureFire Classic 2 Hook with ERA auto fire electric motor box (WF391032A)	ERA ¹	Forend: 1635 (h) x 20 (w) Top & Bottom Keep: 150 (h) x 24 (w) Centre Keep: 190 (h) x 24 (w) Electric Motor Body: 200 x 48

These locks and latches are permitted for use in:

Leaf 1 + Frame 1 doorsets

Configuration: LSASD

Note:

1. ERA auto fire electric motor box is permitted for use in 30 minutes fire resisting doorset only

11.4 Hinges

The following hinges have been successfully incorporated in the tests on the Stredor 54 design.

Tested Hinge Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)

HIN1433/13 Bearing butt type hinge (WF374929B)	Eurospec Enduro	Blade: 101 x 30
H101 Lift off type steel hinge (WF392155) (WF391032A)	Royde & Tucker	Blade: 100 x 35
H102 Bearing butt type hinge	Royde & Tucker	Blade: 100 x 35
Ref. 2990G Bearing butt type hinges (WF369636)	Smith & Locke	Blade: 102 x 30
ZHSS43RP Bearing butt type hinge (CFR1812191_1)	Zoo Hardware	Blade: 102 x 31
H2N1103/13/R Bearing butt type hinge (WF407334)	Eurospec EnduroMax	Blade: 100 x 31
Ref. Not given in test report Bearing butt type hinge SL Class 13 (BMT/FEP/F16174)	Smith & Locke	Blade: 100 x 30

These hinges are permitted for use in:

Leaf 1 + Frame 1 doorsets

Leaf 2 + Frame 1 doorsets

Configuration LSASD, ULSASD, LSADD and ULSADD

Alternative Hinges

Hinges must either be as tested, or alternatively components with the following specification below are acceptable.

The door leaves must be hung on a minimum of 3 hinges. Leaves over 2400mm high must fit 4 hinges. Hinges with the following specification are acceptable.

Alternative Hinge Specification	
Element	Specification
Blade height	90 – 120mm
Blade width (excluding knuckle)	30 – 35mm

Blade thickness		2.5 – 4mm	
Fixings		Minimum of 4No. 30 long No. 8 or No. 10 steel wood screws per blade	
Materials		Steel or stainless steel or brass (melting point ≥800°C)	
Hinge positions	Leaf height: <2400mm	Top	120 – 200mm from head of leaf to top of hinge
		2 nd	Minimum 200mm from top hinge OR equally spaced between top & bottom hinges
		Bottom	150 – 300mm from foot of leaf to bottom of hinge
	Leaf height: >2400mm	Top	120 – 200mm from head of leaf to top of hinge
		2 nd & 3 rd	Minimum 200mm from top hinge to equispaced between top & bottom hinges
		Bottom	150 – 300mm from foot of leaf to bottom of hinge
Intumescent protection		See section 9	

Certifire approved hinges for 60 minutes for ITT classification as long as all of the requirements are complied with are approved.

11.5 Automatic Closing

The different types of automatic closing devices are considered in the following section.

11.5.1 Overhead Face Fixed Closers: Single Acting

The following overhead face fixed closers have been successfully incorporated in the tests on the Stredor 54 design.

Tested Overhead Faced Fixed Closer Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
AR1500 (WF374929B) (BMT/FEP/F16174)	Arrone	Footprint: 245 x 45 Footprint: 220 x 60
AR3500 (WF407334)	Arrone	Footprint: 247 x 60
TS9205 Size 2-5 (CFR1812191_1)	Rutland	Footprint: 269 x 69
R-11352 Size 3 Cam action slide arm	Rutland ¹	Footprint: 257 x 60

(WF392155)		
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These overhead face fixed closers are permitted for use in:

Leaf 1 and Frame 1 doorsets

Leaf 2 and Frame 1 doorsets

Configuration: LSASD, ULSASD, LSADD and ULSADD

Note:

1. R-11352 Size 3 is permitted for use in 30 minutes fire resisting doorset only

Alternative Overhead Face Fixed Closers: Single Acting

Certifire approved Overhead face fixed closers for 60 minutes for ITT classification as long as all of the requirements are complied with are approved.

11.5.2 Concealed Closer: Leaf 1 Only

The following concealed closer have been successfully incorporated in the tests on the Stredor 54 design.

Permitted for use in 30 minutes fire resisting doorsets only

Tested Concealed Closer Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
ITS11204 (WF 414781)	Rutland	Body: 243mm(l) x 52mm(d) x 32mm(w)

This concealed closer is permitted for use in:

Leaf 1 and Frame 1 doorsets

Configuration: LSASD, ULSASD, LSADD, ULSADD

11.5.3 Floor Spring & Pivot: Double Acting

The following floor springs have been successfully incorporated in the tests on the Stredor 54 design.

Tested Floor Spring Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
TS7104 Floor spring (WF412601)	Rutland	Body: 274 (l) x 50 (h) x 81 (w) Cover: 290 (l) x 102 (w) x 1.5 (t)

The following pivot have been successfully incorporated in the tests on the Stredor 54 design.

Tested Pivot Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
Pivot Kit: PS.190 Strap (WF412601)	Rutland	Top Strap Pivot: 175 (w) x 30 (d) x 28.5 (h) (with a Ø15mm retractable pivot) Top Strap: 124.5 (w) x 30 (d) x 15.5 (t) Bottom Strap: 235 (w) x 24 (d) x 19.5 (t)

These Floor Springs and Pivots are permitted for use in:

Leaf 1 and Frame 1 doorsets

Leaf 2 and Frame 1 doorsets

Configuration: DASD and DADD

Alternative Floor Spring & Pivot: Double Acting

Certifire approved Top pivot, bottom strap and floor spring for 60 minutes for ITT classification as long as all of the requirements are complied with are approved.

11.6 Flush Bolts

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

- 210mm long x 22mm deep x 22mm wide, and
- Flush bolts must be steel or brass with melting point in excess of 800C for 60 minutes fire resisting doorsets. 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 9.1.
- Intumescent strips in door leaf edge must be located opposite the flush bolt so that they run continuously to the head of the leaf.

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



Figure 11.1 – Flush bolt intumescent protection example

The following flush bolts (shoot bolts) have been successfully incorporated in the tests on the Stredor 54 design.

Tested Flush Bolt Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
Ref. 5020J Slide action flush bolt (WF369636) (BMT/FEP/F16174)	Smith & Locke	Footprint: 100 x 22 Keep: 40 x 22
ZA503 Lever action flush bolt (WF374929B)	Zoo Hardware	Body: 205 x 22 x 40 Keep: 42 x 15
Ref. 746895 (WF407334)	Smith & Locke	Footprint: 101 x 16

11.7 Additional Items of Hardware

11.7.1 Handles / Operating Furniture

Handles may be surface-fixed or bolted through the door leaf, providing they are steel or brass with melting point in excess of 800C for 60 minutes fire resisting doorsets. The length is limited to 1200mm between the fixing points. If through-fixed, there must be no more than 1mm clearance between the hole and stud.

The following handles have been successfully incorporated in the tests on the Stredor 54 design.

Tested Handle Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)

Ref. 1A000 Balmoral inline lever type handle (WF391032A)	Fab & Fix ¹	240 x 30
Ref. 625900 Mitre lever handle on rose (WF407334)	Not given in test report	Rose: Ø52
Ref. 2812H Lever on rose type handle (WF369636) (BMT/FEP/F16174)	Smith & Locke	Rose: Ø50
Ref. Not given in test report Union steel lever on rose type handle (WF374929B)	Union	Rose: Ø52
ZPS Steel lever handle on rose with escutcheon (CFR1812191_1)	Zoo Hardware	Handle: Ø19 x 130 Rose: Ø48 x 7 Escutcheon: Ø51 x 4 (stop face) Ø51 x 8 (hinge knuckle face)
Ref. Not given in test report Steel lever type handle (WF392155)	Arrone ¹	Rose: Ø53
Ref. Not given in test report Steel lever type handle (WF374929B)	Zoo Hardware	Rose: Ø52
Ref. 625900 Mitre lever handle in rose (WF407334)	Not given in test report	Rose: Ø52

Note:

- These handles are permitted for use in 30 minutes fire resisting doorsets only

11.7.2 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. Push plates and kick plates must be steel or brass with melting point in excess of 800C for 60 minutes fire resisting doorsets. These items of hardware are permitted up to a maximum of 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a thermo-softening contact adhesive. Plates must not return around the door leaf edges.

11.7.3 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.

11.7.4 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 in to a tested intumescent mastic.

The following door security viewers have been successfully incorporated in the tests on the Stredor 54 design.

Tested Security Viewer Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
STS4008 (WF391032A)	Sealed Tight Solutions ¹	Body: Ø14 Footprint: Ø26

Note:

1. STS4008 is permitted for use in 30 minutes fire resisting doorsets only

11.7.5 Environmental Seals

Flame retardant acoustic, weather and dust seals e.g;

- Fire and Acoustic Seals Ltd: FAS35, FAS39, FAS-Trident, FAS-Twin
- Lorient Polyproducts Ltd: IS1212, IS1511, IS7025, IS7060
- 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
- Sealed Tight Solutions Ltd: ST1009, ST1009K
- Sealmaster: Delta, Double Fin Seal, Duxback

may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

11.7.6 Letter Boxes/Plates

Letter boxes/plates may be fitted providing the product can demonstrate contribution to the required performance of this type of 30 or 60 minute doorset 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.

The following letter boxes/plates have been successfully incorporated in the tests on the Stredor 54 design.

Tested Letter Box/Plate Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
STS4001 (WF391032A)	Sealed Tight Solutions ¹	Footprint: 310 x 75

Note:

1. STS4001 is permitted for use in 30 minutes fire resisting doorsets only

11.7.7 Threshold 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.

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.
LAS8001 si	Lorient Polyproducts 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)

11.7.8 Air Transfer Grilles

Air transfer grilles may be fitted providing the product has suitable test evidence to BS 476: Part 22: 1987 or BS EN 1634-1, that demonstrates a minimum 60 minutes integrity performance when installed within a timber based doorset of comparable thickness. Margins to the leaf edges will remain as detailed for glazing and the position of the unit will be dictated by the pressure regime tested in the proving evidence (normally below mid-height). The area occupied by the air transfer grille must not exceed 0.2m² and must be deducted from the area of glazing, if both elements are fitted.

11.7.9 Cable Loop & Cableway

The following cable loops have been successfully incorporated in the tests on the Stredor 54 design.

The following limitations apply:

1. Cable loop is permitted for use in 30 minutes fire resisting doorsets only
2. The cableway must be located no higher than 1290mm from bottom of the leaf.
3. Cable loop and cableway not permitted with grooves in the door leaf.

Tested Cable Loop Specification		
Product Reference (Test Reference)	Manufacturer /Supplier	Dimensions (mm)
Ref. 633311 Steel cable loop (WF391032A)	Sealed Tight Solutions	Footprint: 290mm x 25mm (including a Ø12mm spring assembly)

12 Installation

12.1 General

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

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

12.2 Door Frame Installation: Frame 1

The following diagrams indicate acceptable door frame/wall installation arrangements and are used with leaf 1 and 2:

The drawings below show the relationship of frame to wall and location of firestopping between wall and frame.

See section 12.5 for preparation requirement for the aperture.

The frame is required to finish flush with the face of the wall, architraves are optional except where gaps are in excess of 20mm (see section 12.3 below).

12.2.1 Timber Stud Supporting Construction: Installation Detail

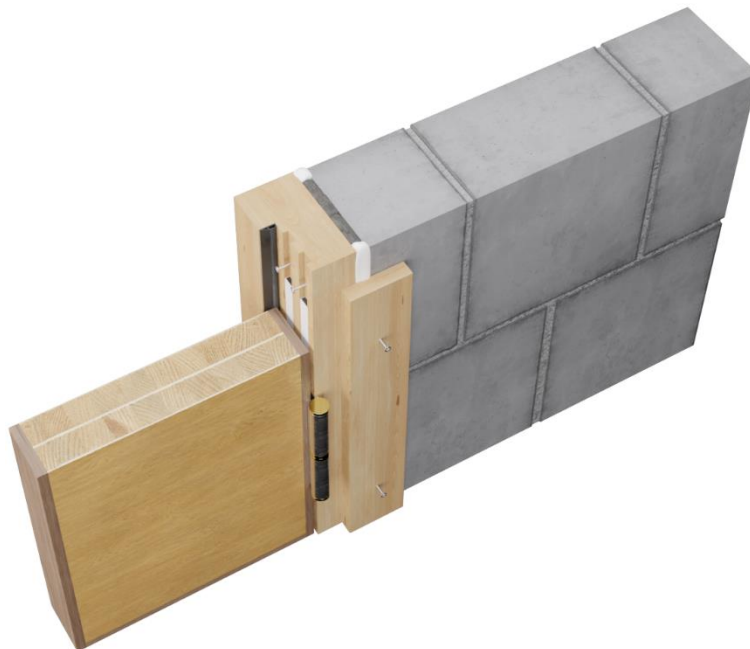


(A): without frame extension



B): with frame extension

12.2.2 Blockwork Supporting Construction: Installation Detail



(A): without frame extension



(B): with frame extension

12.3 Firestopping

The firestopping requirements between back of frame and wall are dependent on the gap size.

Gaps (mm)	Requirement
0 – 5	<p>this should not occur as it is practically not possible to apply a firestopping material into a gap of this size.</p> <p><i>If unavoidable the following must be applied:</i></p> <p>A 30x2mm strip of graphite fixed to back of the frame located central to the frame rebate and capped with intumescent mastic.</p>
5 – 10	<p>must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Based on the test evidence the use of architraves is optional.</p>
10 – 20	<p>must be tightly packed with mineral fibre capped on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1 or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional.</p>
Over 20	<p>this would be considered a poor preparation of the structural opening. A timber based or non-combustible subframe up to 50mm thick can be inserted and fixed to the wall and the gap between subframe and wall filled as follows:</p> <ul style="list-style-type: none"> • Gaps 5 to 10mm filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side. • The subframe to door frame gap filled as above.

12.4 Packers

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

12.5 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.

12.5.1 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.

12.5.2 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.

12.5.3 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.

12.5.4 Bespoke Walls & Partitions

These will require specific test evidence.

12.6 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 5.3 may be reduced by 1mm for fitting purposes but cannot go below the minimum.

12.7 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. (See section 14 for gap details with reference to smoke control)

12.8 Fixings

The frame jambs are to be fixed to the supporting construction using steel fixings at 600mm maximum centres. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 40mm. It is not necessary to fix the frame head, although packers must be inserted.

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. <i>For 30 minutes:</i> glass type 8 – 10 <i>For 60 minutes:</i> glass type 10 (See section 6.2)

14 Smoke Control

14.1 General

If the doorset design is required to provide a smoke control function to comply with Building Regulations, in the absence of a suitable pressurisation system, the doorset must meet one of the following criteria:

- (a) have a leakage rate not exceeding $3\text{m}^3/\text{m}/\text{hour}$ (head and jambs only) when tested at 25Pa under BS 476 Fire tests on building materials and structures, Section 31.1 – Methods for measuring smoke penetration through doorsets and shutter assemblies, Method of measurement under ambient temperature conditions; or
- (b) meet the additional classification requirement of Sa when tested to BS EN 1634-3: 2004 – *Fire resistance tests for door and shutter assemblies*, Part 3 – *Smoke control doors*.

Smoke seals or combined intumescent/smoke seals that are fitted to the door to achieve the performance requirements specified above, must have been tested in accordance with the associated test method. Providing the smoke seals, any interruptions, door gaps, and the type/configuration of the doorset are consistent with the detail tested, the doorset will comply with current smoke control legislation under Approved Document B; and a suffix 'S' or 'Sa', as appropriate, may be added to the designation. Any other components installed where smoke leakage may occur must also be taken into account.

14.2 Further Considerations

Note that there is other guidance available, including BS EN 9999-2008 – *Code of practice for fire safety in the design, management and use of buildings*, which may impose different or additional requirements, such as consideration of the gap between door leaf and threshold.

Responsibility for the appropriate smoke sealing specification and performance of the doors should be agreed between the relevant parties (i.e. specifier, manufacturer, contractor) prior to commencing manufacture and/or installation.

15 Conclusion

If the Falcon Panel Products Ltd. Stredor 54 doorset designs, 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 30 and 60 minutes integrity and insulation (subject to section 13).

16 Declaration by the Applicant

- 1) We the undersigned confirm that we have read and comply with obligations placed on us by FTSG Resolution No. 82: 2001.
- 2) We confirm that the component or element of structure, which is the subject of this field of application report, has not to our knowledge been subjected to a fire test to the Standard against which this field of application is being made.
- 3) We agree to withdraw this field of application report from circulation should the component or element of structure be the subject of a fire test to the Standard against which this field of application is being made.
- 4) We are not aware of any information that could adversely affect the conclusions of this field of application report.
- 5) If we subsequently become aware of any such information we agree to ask the assessing authority to withdraw the field of application.

Signed:

Name:

For and on behalf of: **Falcon Panel Products Ltd.**

17 Limitations

The following limitations apply to this field of application report:

- 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, Warringtonfire reserves the right to withdraw the report unconditionally but not retrospectively.
- 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 authority as sufficient for that or any other purpose. This field of application report is provided to the client for its own purposes and we cannot opine on whether it will be accepted by Building Control authorities or any other third parties for any 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.

18 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 16 duly signed by the applicant.

Signature:		
Name:	Dr K.D.S Towler	A.M. Winning
Title:	Senior Product Assessor	Senior Product Assessor

19 Appendix A: Revisions

Rev.	WF Ref.	Date	Description
A	428330	26.Jun.20	Technical review and revalidation of the stredor 54 FoA report.

20 Appendix B: Performance Data

PRIMARY DATA

Test Reference	Specific Tested Feature	Configuration	Leaf Size (h x w x t)(mm)	Test Standard	Performance (minutes)
CFR1812191_1	STS seals, ERA multipoint lock, Pyrobelite 12 EI30/EW60 glazing, STS glazing seals,	LSASD	2192 1046 54	BS 476: Part 22: 1987	Integrity: 71 Insulation: 34
WF369636	Pyroplex seals, Pyrobelite 12 60/0 glazing, ISL glazing seals,	ULSADD	2145 923/923 54	BS 476: Part 22: 1987	Integrity: 65 Insulation: 35
WF412601 A	Type 617 seals, Rutland pivot/strap, Rutland floor spring,	DASD	2040 926 54	BS 476: Part 22: 1987	Integrity: 71 Insulation: 71
BMT/FEP/F16174	Pyroplex seals, Pyrodur 10 EW60-10 glazing, ISL glazing seals,	ULSADD	2140 923/923 54	BS 476: Part 22: 1987	Integrity ¹ : 68 Insulation: 0
WF374929 B	STS seals, Pyrobelite 12 glazing, STS glazing seals,	ULSADD	2400 927/582 54	BS 476: Part 22: 1987	Integrity: 67 Insulation: 67
WF392155	STS seals, Feature grooves,	ULSADD	2400 952/952 54	BS 476: Part 22: 1987	Integrity: 57 Insulation: 57

WF391032	STS seals, ERA multipoint lock with ERA electric locking mechanism, Cableway, STS eye viewer, STS letterplate,	LSASD	2395 1180 54	BS 476: Part 22: 1987	Integrity: 43 Insulation: 19
WF412601 B	Type 617 seals, Rutland pivot/strap, Rutland floor spring,	DASD	2040 926 54	BS 476: Part 22: 1987	Integrity: 71 Insulation: 71
WF407334	Pyroplex seals, Pyrobelite 12 glazing, ISL glazing seals,	ULSADD	2146 923/923 54	BS 476: Part 22: 1987	Integrity: 65 Insulation: not evaluated

SUPPORTING DATA

CFR1404291 B	Pyrodur 10 EW60-10 glazing, ISL60 Plus glazing system,	Fixed Door Leaf	2135 665 64	Principles of BS 476: Part 22: 1987	Integrity: 104
CFR1405131 B	11mm Contraflam Door Lite glazing, ISL60 Plus glazing system,	Fixed Door Leaf	2135 665 64	Principles of BS 476: Part 22: 1987	Integrity: 105
CFR1405201 A	6mm Schott Pyran S glazing, Sealmaster Fireglaze glazing system,	Fixed Door Leaf	2135 665 64	Principles of BS 476: Part 22: 1987	Integrity: 76
CFR1405201 B	6mm Schott Pyran S glazing,	Fixed Door Leaf	2135 665	Principles of BS 476: Part 22: 1987	Integrity: 93

	ISL60 Plus glazing system,		64		
WF413865	Strelip 60 8mm thick engineered timber	ULSADD	2135 935/935 54	BS 476: Part 22: 1987	Integrity: 70 Insulation: 70
WF414781 ²	Rutland Door Controls ITS11204 overhead concealed	ULSADD	2040 935/935 44	BS 476: Part 22: 1987	Integrity: 33 Insulation: 10

Note:

1. In accordance with section 8.6.1 of BS476: Part22: 1987, the specimen has not been evaluated for insulation. Glass tested was Pilkington Group Ltd, Pyrodur EW60-10. Based on the performance recorded in the test it is our opinion that glass types known to have better or similar insulation performance may be utilised, up to maximum of 16mm thick as assessed in section 6. Glazed area was 0.616m². Based on internal assessment rules, a maximum glazed area of 1.1m² is permitted, subject to the requirements of section 6.
2. 30 minutes fire resisting doorsets only.

END OF REPORT