

Warringtonfire
Chiltern House
Stocking Lane
High Wycombe
HP14 4ND
United Kingdom
T: +44 (0)1494 569750
W: www.warringtonfire.com



Title:

Field of Application
Permadoor Composite 30 Minute
Fire Resisting Doorsets

WF Report

WF417802 Revision A

WF Contract No.

WF418706

Valid From: 27th September 2019

Valid Until: 27th September 2024

Prepared for:

Specialist Building Contracting Ltd
t/a Permadoor
Unit 1
Station Road
Upton-upon-Severn
Worcestershire
WR8 0RX

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1 Foreword

This field of application report has been commissioned by Permadoor and relates to the fire resistance of a 30 minute composite doorset design.

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 door assemblies, in order to extend the scope of application by determining the limits for the design 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 and therefore can neither be considered for a CE marking application nor can the conclusion be used to establish a formal classification against EN13501-2.

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.

The scope presented in this report relates to the behaviour of the proposed door design variations with associated hardware 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.

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

2 Proposal

It is proposed to consider the fire resistance performance of the Permadoor Tricore doorset design described in the technical specification in section 4 of this field of application report, for 30 minutes fire resistance, if the doorsets 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 Evidence

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

Note: dimensions are in mm unless otherwise stated.

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

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

3.1 Test Afiti Licof No. 9650/18

The referenced test report, the essential details of which are summarised below, is the primary data for a timber leaf with PVCu facings and a Profile 22 PVC frame, together with a Fab & Fix letter plate, STS eye viewers, Cooke Brothers Phoenix steel butt hinges, Rutland TS11204 and the Winkhaus AV2 multipoint auto lock/latch being considered for assessment in this report. The design was tested both opening into and away from the furnace condition.

| | | |
|-------------------------------------|---|---|
| Date of test: | 13 th December 2018 | |
| Identification of test body: | Afiti Licof Centre for Fire Testing and Research ENAC ENSAYOS No. 41/LE104 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated single leaf, single acting, composite doorsets. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorsets A and B leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorsets A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate with 354 (w) x 72 (h) security shield and 2No STS eye viewers. Both doorsets were fitted with Rutland TS11204 overhead closers and Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaves were hung on 4No. Cooke Brothers Ltd Phoenix steel concealed bearing butt type hinges. Profile 22 PVC C085 cills were fitted at the threshold.</p> <p>Doorset A was oriented to open away from the heat conditions whereas Doorset B was orientated to open towards the heat conditions. Both door leaves were engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476 Part 22: 1987 | |
| Performance | Doorset A | Integrity: 34 minutes Insulation: 34 minutes |
| | Doorset B | Integrity: 34 minutes Insulation: 34 minutes |

3.2 Test WF406196 B Revision A

The referenced test report, the essential details of which are summarised below, is primary data for a timber leaf with PVCu facings and a Profile 22 PVC frame, together with additional hardware including Rutland TS11204 closer, SEA Hinges, Fab & Fix letter plate, Fab & Fix Knocker, STS viewer, ERA Door chain and Fab & Fix Letters and Numbers, being considered for assessment in this report. The doorset was tested opening towards the furnace condition.

| | | |
|-------------------------------------|--|---|
| Date of test: | 22 nd October 2018 | |
| Identification of test body: | Exova Warringtonfire now trading as Warringtonfire Testing and Certification. UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated single leaf, single acting, composite doorset. For the purpose of the test the doorset was referenced as Doorset B.. | |
| Summary of test specimen: | <p>Doorset B leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorset B: Tricore blank comprising a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate with 354 (w) 72 (h) security shield and an STS eye viewer. The leaf was fitted with a Fab & Fix Nu Victorian Urn Knocker, ERA door chain and Fab & Fix letters and numbers. The leaf was hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaf was hung on 4No. SEA Ltd mkIV aluminium butt type hinges and was fitted with a Rutland TS11204 overhead closer and a Winkhaus AV2 automatic multipoint latch, positioned at approximately mid-height of the doorset.</p> <p>The doorset was oriented to open towards the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset B | Integrity: 37 minutes Insulation: 37 minutes |

3.3 Test WF412546 B Revision A

The referenced test report, the essential details of which are summarised below, is primary data supporting a timber leaf with PVCu facings and a Profile 22 PVC frame, together with additional hardware including, Cooke Brothers Phoenix steel butt hinges, Rutland TS11204 closer, Fab & Fix letter plate, Fab & Fix Knocker, ERA Door chain, Fab & Fix Letters and Numbers, STS viewers, and Exitex aluminium rain deflector, being considered for assessment in this report.

| | | |
|-------------------------------------|---|---|
| Date of test | 6 th April 2019 | |
| Identification of test body: | Warringtonfire Testing and Certification UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated, single leaf, single acting, composite doorset with overpanel. For the purpose of the test the doorset was referenced Doorset B | |
| Summary of test specimen: | <p>Doorset B leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorset B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 75 (h) with security shield, 2No STS eye viewer, Fab & Fix Victorian Urn door knocker, ERA security door chain, Fab & Fix numerals and Exitex aluminium rain deflector.</p> <p>Doorset B was hung in a Profile 22 PVC frame and incorporating an overpanel with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. A Profile 22 PVC Transom was fitted incorporating a 29 (w) x 46 (d) beech infill reinforcement. The overpanel was fitted with a 544 (h) x 895 (w) x 28 (t) STS PVC faced Corex board with an aperture size 550 (h) x 901 (w). The leaf was hung on 4No. Cooke brothers Phoenix Concealed Bearing steel hinges and was fitted with a Rutland TS11204 closer and a Winkhaus AV2 automatic multipoint latch, positioned at approximately mid-height of the doorset.</p> <p>Doorset B was oriented to open towards the heat condition. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset B | Integrity: 36 minutes Insulation: 36 minutes |

3.4 Test WF415388

The referenced test report, the essential details of which are summarised below, is the primary data for larger and smaller leaf sizes incorporating double glazed apertures, Cooke Brothers Phoenix steel butt hinges, Rutland TS11204 closers, Fab & Fix Knocker, ERA Door chain, Fab & Fix Letters and Numbers, and Exitex aluminium rain deflector, being considered for assessment in this report.

| | | |
|-------------------------------------|--|--|
| Date of test | 23 rd July 2019 | |
| Identification of test body: | Warringtonfire Testing and Certification. UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated, single leaf, single acting, composite doorsets. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2085 (h) x 894 (w) x 44 (t) Doorset B leaf dimensions: 1842 (h) x 732 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) x 75 (h) with security shield and 2No STS eye viewers. The leaves were fitted with Exitex aluminium rain deflector, Fab & Fix Nu Victorian Urn Knocker and Fab & Fix letters and numbers.</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaves were hung on 4No. Cooke Brothers Ltd Phoenix steel concealed bearing butt type hinges and were fitted with Rutland TS11204 closers and Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both doorsets included two glazed apertures, each 178 (h) x 229 (w), positioned 114 apart and 185 from the top leaf edge (doorset A) and 65 from the top leaf edge (doorset B). The apertures were glazed with double glazed units (DGU) each comprising AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam and a 10 thick steel spacer between, fitted into an ODL TriSys glazing cassette. The DGU was tested from both sides.</p> <p>Doorset A was oriented to open towards the heat conditions and Doorset B was orientated to open away from the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 37 minutes Insulation: 34 minutes |
| | Doorset B | Integrity: 29 minutes ¹ Insulation: 29 minutes |

¹ Integrity failure due to cotton pad test at the leaf head. It is the opinion of Warringtonfire that had the glazed apertures been further from the leaf head, creating a larger effective head rail, as tested in WF415386, this doorset would have achieved 30 minutes integrity performance. See section 6 for assessed minimum solid and glazed panel to leaf head dimensions.

3.5 Test No9665/19.R1

The referenced test report, the essential details of which are summarised below, is primary data for 2 single doorsets with glazing, opening in both directions, together with Cooke Brothers Phoenix steel butt hinges, Fab & Fix Knocker, ERA Door chain, Fab & Fix Letters and Numbers, STS eye viewer, Fab & Fix Letter Plate, Rutland TS11204 surface mounted closer and Winkhaus AV2 automatic latch, being considered for assessment in this report.

| | | |
|-------------------------------------|---|---|
| Date of test | 23 rd January 2019 | |
| Identification of test body: | AFITI LICOF Centre for Fire Testing and Research. ENAC ENSAYOS No: 41/LE104 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Single leaf, single acting, composite doorsets. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2085 (h) x 894 (w) x 44 (t) Doorset B leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 75 (h) with security shield and STS eye viewers, Fab & Fix Nu Victorian Urn Knocker, Fab & Fix letters and numbers and ERA door chain.</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaves were hung on 4No. Cooke Brothers Ltd Phoenix steel concealed bearing butt type hinges and were fitted with Rutland TS11204 closers and Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both doorsets included a glazed aperture, each 215 arch (h) x 510 (w) sight size, incorporating AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass and a x 12 (t) steel spacer between. The glass was positioned 1603 from the bottom of the leaf edge and was tested from both sides.</p> <p>Doorset A was oriented to open away from the heat conditions and Doorset B was orientated to open towards the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 34 minutes Insulation: 34 minutes |
| | Doorset B | Integrity: 38 minutes Insulation: 32 minutes |

3.6 Test No 9667/19.R1

The referenced test report, the essential details of which are summarised below, is the primary data for 2 single doorsets with glazed fanlight, opening in both directions, together with Cooke Brothers Phoenix steel butt hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch and Exitex aluminium rain deflector, being considered for assessment in this report.

| | | |
|-------------------------------------|--|---|
| Date of test | 24 th January 2019 | |
| Identification of test body: | AFITI LICOF Centre for Fire Testing and Research. ENAC ENSAYOS No: 41/LE104 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated, single leaf, single acting, composite doorsets with fanlight. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2085 (h) x 894 (w) x 44 (t) Doorset B leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and was fitted with a Exitex aluminium rain deflector</p> <p>Both leaves were hung in a Profile 22 PVC frame and incorporating a fanlight with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. A Profile 22 PVC Transom was fitted to both leaves with a 29 (w) x 46 (d) beech infill reinforcement. The leaves were hung on 4No. Cooke Brothers Ltd Phoenix steel concealed bearing butt type hinges, Rutland TS11204 closer, and was fitted with Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both doorsets included a glazed fanlight, each 550 (h) x 901 (w) aperture size, comprising AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass, and a 7 x 14 (t) steel spacer between. The DGU was tested from both sides.</p> <p>Doorset A was oriented to open away from the heat conditions and Doorset B was orientated to open towards the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 35 minutes Insulation: 35 minutes |
| | Doorset B | Integrity: 34 minutes Insulation: 34 minutes |

3.7 Test No CFR1902011 B Revision 1

The referenced test report, the essential details of which are summarised below, is the primary data for 2 single doorsets with glazed apertures, opening in both directions, together with Cooke Brothers Phoenix steel butt hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch, Fab & Fix knocker, STS eye viewer, Fab & Fix letter plate, Fab & Fix numerals and ERA security chain, being considered for assessment in this report.

| | | |
|-------------------------------------|--|---|
| Date of test | 1 st February 2019 | |
| Identification of test body: | Cambridge Fire Research UKAS Testing No: 4319 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Single leaf, single acting, composite glazed doorsets. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2086 (h) x 895 (w) x 44 (t) Doorset B leaf dimensions: 2086 (h) x 895 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 76 (h) with security shield and a STS eye viewer, Fab & Fix Nu Victorian Urn Knocker, Fab & Fix numerals and ERA security chain.</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaves were hung on 4No. Cooke Brothers Ltd Phoenix steel concealed bearing butt type hinges and were fitted with Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both doorsets included 2No. glazed apertures, each 885 (h) x 170 (w) sight size, incorporating DGU's comprising AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass, with a 12 (t) steel spacer between. The DGU was tested from both sides.</p> <p>Doorset A was oriented to open towards the heat conditions and Doorset B was orientated to open away from the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 35 minutes Insulation: 32 minutes |
| | Doorset B | Integrity: 34 minutes Insulation: 32 minutes |

3.8 Test No WF403079

The referenced test report, the essential details of which are summarised below, is the primary data for 2 single doorsets with double glazed apertures, that were tested in both directions and with the addition of beech reinforcement in the frame head of doorset A and an aluminium box section reinforcement in the head of doorset B, together with SEA Ltd mkIV aluminium butt hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch and Fab & Fix and UAP letter plates, being considered for assessment in this report.

| | | |
|-------------------------------------|--|---|
| Date of test | 6 th August 2018 | |
| Identification of test body: | Warringtonfire Testing and Certification. UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated, single leaf, single acting, composite doorsets with glazing. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2084 (h) x 894 (w) x 44 (t) Doorset B leaf dimensions: 2084 (h) x 894 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and doorset A incorporated a Fab & Fix letter plate 310 (w) 76 (h) with security shield and doorset B incorporated a UAP Soterian Fire TS008 aluminium letter plate 305 (w) x 75 (h).</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and doorset A incorporating a 29 (w) x 46 (d) beech infill reinforcement and doorset B incorporating 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame head. The leaves were hung on 4No. SEA Ltd mkIV aluminium butt type hinges and was fitted with Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both doorsets included 2No double glazed apertures, each 882 (h) x 170 (w) sight size, incorporating AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass, with a 12 (t) steel spacer between. The Pyrobelite was fitted to the unexposed sided in the left aperture and the exposed side in the right aperture. The glazing cassettes were fitted 80 apart, 208 from the leaf head and 150 from the closing edges.</p> <p>Both doorsets were oriented to open towards the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 35 minutes Insulation: 35 minutes |
| | Doorset B | Integrity: 35 minutes Insulation: 35 minutes |

3.9 Test No WF404897 Rev A

The referenced test report, the essential details of which are summarised below, is the primary data for 2 single doorsets, one with glazing, together with SEA Ltd mkIV aluminium butt hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch and a Fab & Fix letter plate, being considered for assessment in this report.

| | | |
|-------------------------------------|--|---|
| Date of test | 19 th September 2018 | |
| Identification of test body: | Warringtonfire Testing and Certification. UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Single leaf, single acting, composite doorsets one with glazing. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2085 (h) x 895 (w) x 44 (t) Doorset B leaf dimensions: 2085 (h) x 895 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 75 (h) with security shield.</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaves were hung on 4No. SEA Ltd mkIV aluminium butt type hinges and was fitted with Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Doorset B included 2No double glazed apertures, each 883 (h) x 170 (w) sight size, comprising AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass and a 12 (t) steel spacer between. The Pyrobelite was fitted to the unexposed side. The glazing cassettes were fitted 208 from the head and 148 from the hanging and closing edges.</p> <p>Both doorsets were oriented to open away from the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 38 minutes Insulation: 27 minutes |
| | Doorset B | Integrity: 34 minutes Insulation: 34 minutes |

3.10 Test No WF406216

The referenced test report, the essential details of which are summarised below, is the primary data for 2 single doorsets, with glazing that was tested in both directions, together with SEA Ltd mkIV aluminium butt hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch, Fab & Fix knocker, STS eye viewer, Fab & Fix letter plate, Fab & Fix numerals and ERA security chain, being considered for assessment in this report.

| | | |
|-------------------------------------|---|---|
| Date of test | 22 nd October 2018 | |
| Identification of test body: | Warringtonfire Testing and Certification. UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated, single leaf, single acting, composite doorsets with glazing. For the purpose of the test the doorsets were referenced 'A' and 'B' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2085 (h) x 894 (w) x 44 (t) Doorset B leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorset A and B: Tricore blanks comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 75 (h) with security shield, an STS Brass body eye viewer, Fab & Fix Nu Victorian Urn door knocker, ERA security door chain and Fab & Fix numerals.</p> <p>Both leaves were hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaves were hung on 4No. SEA Ltd mkIV aluminium butt type hinges and were fitted with Rutland TS11204 closers and Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Both doorsets included a glazed aperture 161 (h) x 436 (w) sight size, comprising AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass and a 12 (t) steel spacer between. The Pyrobelite was fitted to the unexposed side in doorset A and the exposed side in doorset B. The glazing cassettes were fitted 215 from the leaf head and 186 from the hanging and closing edges.</p> <p>Doorsets A was oriented to open away from the heat conditions and doorset B was orientated to open toward the heat condition. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 34 minutes Insulation: 34 minutes |
| | Doorset B | Integrity: 34 minutes Insulation: 34 minutes |

3.11 Test No WF413752 Revision A

The referenced test report, the essential details of which are summarised below, is the primary data for a single doorsets, with a solid overpanel, together with Cooke brothers Phoenix Concealed hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch, Fab & Fix knocker, 2No STS eye viewer, Fab & Fix letter plate, Fab & Fix numerals, ERA security chain and Exitex rain deflector, being considered for assessment in this report.

| | | |
|-------------------------------------|--|---|
| Date of test | 24 th May 2019 | |
| Identification of test body: | Warringtonfire Testing and Certification. UKAS Testing No: 1762 | |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor | |
| Tested Product: | Fully insulated, single leaf, single acting, composite doorset with overpanel. For the purpose of the test the doorset was referenced 'A' | |
| Summary of test specimen: | <p>Doorset A leaf dimensions: 2085 (h) x 894 (w) x 44 (t)</p> <p>Doorset A: Tricore blank comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 75 (h) with security shield, 2No STS eye viewer, Fab & Fix Nu Victorian Urn door knocker, ERA security door chain, Fab & Fix numerals and Exitex aluminium rain deflector.</p> <p>The leaf was hung in a Profile 22 PVC frame and incorporated an overpanel with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. A Profile 22 PVC Transom was fitted with a 29 (w) x 46 (d) beech infill reinforcement. The overpanel was fitted with a 544 (h) x 895 (w) x 28 (t) STS PVC faced Corex board with a sight size of 516 (h) x 867 (w). The leaf was hung on 4No. Cooke brothers Phoenix Concealed bearing steel hinges and was fitted with a Rutland TS11204 closer and Winkhaus AV2 automatic multipoint latches, positioned at approximately mid-height of the doorset.</p> <p>Doorset A was oriented to open away from the heat conditions. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> | |
| Test Standard: | BS 476: Part 22: 1987 | |
| Performance | Doorset A | Integrity: 31 minutes Insulation: 31 minutes |

3.12 Test No WF415386

The referenced test report, the essential details of which are summarised below, is the primary data for doorsets with glazing, together with Cooke brothers Phoenix Concealed hinges, Rutland TS11204 surface mounted closer, Winkhaus AV2 automatic latch, Fab & Fix letter plate, 2No STS eye viewer, Fab & Fix knocker, ERA door chain, Fab & Fix numerals and a Exitex aluminium rain guard, being considered for assessment in this report.

| | |
|-------------------------------------|---|
| Date of test | 19th August 2019 |
| Identification of test body: | Warringtonfire Testing and Certification. UKAS Testing No: 1762 |
| Sponsor: | Specialist Building Contracting Ltd t/a Permadoor |
| Tested Product: | Single leaf, single acting, composite doorset with glazing |
| Summary of test specimen: | <p>Doorset leaf dimensions: 1903 (h) x 732 (w) x 44 (t)</p> <p>Tricore blank comprising: a 13 (t) softwood lamel core with 2 outer layers of 12.6 (t) softwood lamels faced on each side with an inner 0.9 (t) softwood veneer and 1.7 (t) outer PVCu facing. The leaf was lipped with 2 (t) PVCu, and incorporated a Fab & Fix letter plate 310 (w) 75 (h) with security shield, 2No STS Brass body eye viewer, Fab & Fix Nu Victorian Urn door knocker, ERA security door chain, Fab & Fix numerals and a Exitex aluminium rain guard.</p> <p>The leaf was hung in a Profile 22 PVC frame with a 29.5 (w) x 46.5 (d) x 2 (t) aluminium box section reinforcement in the frame jambs and a 29 (w) x 46 (d) beech infill reinforcement in the frame head. The leaf was hung on 4No. Cooke Brothers Pheonix Concealed bearing butt type hinges and was fitted with a Rutland TS11204 closer and Winkhaus AV2 automatic multipoint latch, positioned at approximately mid-height of the doorset.</p> <p>The doorset included 2 double glazed apertures, each 178 (h) x 229 (w) overall size and fitted 114 apart and 80 from the hanging edges, incorporating AGC Glass UK Ltd 7.9 (t) Pyrobelite 7, Pilkington UK Ltd 6.8 (t) Optilam laminated glass and a 10 (t) steel spacer between. The Pyrobelite was fitted to the unexposed side of the door leaf. The aperture was fitted 160 from the head and 80 from the hanging and closing edges The doorset was oriented to open away from the heat condition. The door leaf was engaged at all 3 latch positions for the duration of the test.</p> |
| Test Standard: | BS 476: Part 22: 1987 |
| Performance | Integrity: 34 minutes Insulation: 34 minutes |

4 General Description of Construction

4.1 Tricore Blank Construction

The construction of door leaves to this design must be to the following specification:

| Element | | Material | Dimensions (mm) | Density (kg/m ³) |
|--|---------------|--|---|------------------------------|
| Stiles and rails | | None fitted | - | - |
| Core 3 layers (38.2 thick overall) | Inner | Albasia falcata ¹ horizontally orientated lamels | 13 (t) softwood lamels | 180-335 ¹ |
| | Outer | Albasia falcata ¹ vertically orientated lamels | 12.6 (t) softwood lamels Fielded area grooves 43mm wide x 14mm deep ² | 180-335 ¹ |
| Facings ² | Inner | Albasia falcata veneer ¹ | 0.9 thick ¹ | 300-335 ¹ |
| | Outer | Vacuum formed PVC-U ¹ | 1.7 thick ¹ | 1410 ¹ |
| Adhesive | Lippings | TECHNOMELT PUR 270-7 known as Purmelt RS 270-7 ¹ | - | - |
| | Core | Exterior Melamine Urea Formaldehyde ¹ | - | - |
| | Inner Facings | Exterior Melamine Urea Formaldehyde ¹ | - | - |
| | Outer facings | Leeson Polyurethanes D2655 Single Component moisture curing laminating adhesive ¹ | - | - |
| Lippings – all edges | | PVC-U | 2 thick | - |

Notes:

1. Stated by manufacturer, not verified by laboratory.
2. The blank is supplied with the veneer inner facings already applied to the 3 layer lamel core to produce a blank 40mm thick overall. Fielded areas are then created by CNC routing square edge channels into the door leaf before application of the outer PVC facings.
3. Diagrams of the door construction are contained in appendix B.

5 Configurations and Orientation

5.1 Door Leaf Configurations

Based on the tests conducted and detailed in section 3 and summarised in Appendix A, the following doorset configurations are permitted for the design covered by this field of application:

| Abbreviation | Description |
|--------------|--|
| LSASD | Latched, single acting, single leaf doorsets |

5.2 Door Leaf Orientation

The primary fire resistance tests for this design included tests with the doorset hung such that the door leaf opened both towards and away from the fire. Based on this testing, assessment is made that doorsets to this design may be hung to open either away from or towards the fire risk side of the doorset, making the doorset bi-directional with respect to the fire risk.

NB: The internal and external faces of the door leaf can be oriented as pull or push faces to enable outward opening doorsets.

6 Leaf Sizes

6.1 Maximum leaf sizes

Tricore door blanks are manufactured to the following maximum size which is covered by the testing detailed in section 3 of this report:

| Maximum height (mm) | Maximum width (mm) |
|---------------------|--------------------|
| 2085 | 894 |

Note: the supplied blank size of 2095 x 905mm must be reduced during manufacture to the tested maximum size of 2085mm x 894mm.

6.2 Minimum Leaf Sizes

Based on the testing conducted the following minimum leaf dimensions apply:

| Design Option (leaf) | Minimum height (mm) | Minimum width (mm) |
|---|---------------------|--------------------|
| Panelled and/or glazed | 1903 | 732 |
| Flush (no panels or glazing fitted in leaf) | 1820 | 600 |

6.3 Minimum dimensions between panels

Additionally, based on the testing conducted, the following minimum distances between panels and between panels and leaf edges must be maintained:

| Minimum dimensions (mm) | | | | |
|---|------------------------------------|----------------------------------|--|---|
| Panel edges to horizontal leaf edges ¹ | Panel edges to vertical leaf edges | Central Mullion (between panels) | Top rail (between top and middle panels) | Mid rail (between middle and bottom panels) |
| 120 | 74 | 118 ² | 116 ² | 164 ² |

¹ i.e. to the leaf head edge and leaf bottom edge.

² these dimensions are fixed by the panel machining programme for the Tricore design and cannot be altered.

6.4 Minimum dimensions between glazed apertures

Additionally, based on the testing conducted, the following minimum distances between glazed apertures and between glazed apertures and leaf edges must be maintained:

| Minimum dimensions (mm) | | | | |
|--|---------------------------------------|-------------------------------------|--|---|
| Aperture edges to horizontal leaf edges ¹ | Aperture edges to vertical leaf edges | Central Mullion (between apertures) | Top rail (between top aperture and middle panel) | Mid rail (between middle aperture and bottom panel) |
| 160 ³ | 74 | 80 ² | 116 ² | 164 ² |

¹ i.e. to the leaf head edge and leaf bottom edge.

² dimensions are fixed by the Tricore aperture machining programme and cannot be altered.

³ If the door style includes glazed apertures and panels within the leaf, the minimum dimensions stated in the table above must be used for the glazed aperture edges to horizontal leaf edges

7 Leaf Size Adjustment

Tricore door leaves may be altered as follows:

| Element | Reduction |
|----------|--|
| Leaf | The size of the leaf may be altered down to the minimum sizes stated in section 6 during manufacture, but may not be altered once the PVC edge banding is applied post-manufacture |
| Lippings | The edge banded PVC lippings must remain as manufactured |

8 Door Styles

8.1 Panelled Doors

The testing conducted evaluated the door design with 6 moulded, CNC cut, raised and fielded style panels. Based on the fact that if the number of panels were reduced, the percentage of reduced panel core thickness would also be reduced, we therefore consider that assessment of the following variations to the construction are permitted.

1. A flush door and doorsets incorporating a maximum of up to 6 moulded, CNC cut, panels may be produced.
2. The moulding detail may be altered providing the moulding is no wider or deeper than tested (43mm wide x 14mm deep, excluding the facings) and the total length of the fielding cut into the leaf is not increased.

8.2 Glazed Doors

The testing conducted evaluated the door design with glazed apertures and panels. Based on the rationale in section 8.1 above and the test evidence generated on the glazed designs, the door styles listed in section 10 are permitted subject to the dimensional requirements given in section 6.4 above.

9 Leaf Facing Materials

The tested and assessed leaf facing options are as follows:

| Design | Facing Material |
|----------------|-------------------------|
| Tricore Design | 1.7-2.0mm profiled UPVC |

10 Glazing

The testing cited in section 3 demonstrates that the Permadoor Tricore doorset design is capable of successfully incorporating glazed apertures fitted with the double glazed unit (DGU) specified in section 10.2, whilst providing a margin of over performance. Glazing is therefore acceptable within the following parameters.

The glazing orientations depicted below have been tested and assessed as acceptable:

| Design Orientation | Maximum Area Size | Position | Glazing System | Glass Type | Fire Test evidence |
|---|-----------------------------------|-----------------|------------------|------------------|---|
| Larkin  | 0.21m ² (each pane) | See section 6.4 | See section 10.1 | See section 10.2 | CFR1902011B Rev 1 WF403079 WF404897 Rev A |
| Causley H  | 0.11m ² | See section 6.4 | See section 10.1 | See section 10.2 | WF406216 |
| Chaucer  | 0.24m ² arch | See section 6.4 | See section 10.1 | See section 10.2 | 9665/19.R1 |
| Byron  | 0.04m ² (each pane) | See section 6.4 | See section 10.1 | See section 10.2 | WF415388 WF415386 |

10.1 Tested Glazing System

The tested and approved glazing system, comprises the following:

| Element | Make/type | Dimensions (mm) | Location |
|---|--|---|---|
| Glazing Cassette | ODL TriSys three part glazing cassette Comprising: - Inner frame and cover all made from ABS (Acrylonitrile Butadene Styrene) - Outer frame made from ASA (Acrylonitrile Styrene Acryolite) | 45 high x 15 deep (outer profile) | Fitted around the perimeter of the glass on both faces – Inner frame screwed to outer frame to hold the glazed unit. Inner frame cover clipped to inner frame to complete the assembly. |
| Cassette fixings | Steel screws (Number varies according to cassette style) | 4.2 x 40 long | Fitted at cassette manufacturers pre fixed locations. |
| Sealants (As tested in WF315386 and WF315388) | Alansons Aro-Seal Ref. 1101 clear hybrid polymer sealant | Continuous bead | Adhering cassette outer frame to door leaf face |
| | UK Industrial Glazing Tapes Ltd ProLINK Ref. 1000R acrylic glazing tape | 9 x 1 | Adhering cassette outer frame to glass unit on the external side of the door |
| | UK Industrial Glazing Tapes Ltd PVC foam as tested | 9 x 2 | Adhering cassette inner frame to glass unit on the internal side of the door |
| Glazing perimeter | Everbuild Building Products Ltd Tecnic Fire Sealant 300 intumescent sealant | Fully filling voids between DGU cassette and glazing aperture | Fitted around the perimeter of the glazing unit. |

10.2 Glazed Unit

The tested glazed unit comprises the glass types listed below. The unit has been tested in both directions with respect to exposure to fire test conditions:

| Element | Make/type | Size (mm) |
|----------------------------------|-----------------------------|---------------------------------|
| Glass type -- double glazed unit | AGC Flat Glass Pyrobelite 7 | 7.9 thick |
| | Pilkington UK Ltd Optilam | 6.8 thick |
| | Steel spacer | 10,12, or 14 thick ¹ |

¹ 10mm spacers were tested in WF415386 & WF415388;
14mm spacers were tested in 9667/19.R1.

10.3 Glazing Notes

1. Glazed apertures must be fitted in accordance with the specification given in section 10. The double glazed units (DGU's) as described in section 10.2 above must be installed in accordance with the tested specifications as detailed in the drawings contained in appendix E.
2. Glazing was tested in both directions (see test evidence listed in the table contained in section 10). Therefore, DGU's may be orientated in either direction with respect to the fire risk such that the glazing unit may be considered bi-directional with respect to fire.
3. This DGU design is suitable for all the designs listed in section 10.
4. The approved DGU must be fitted fully in accordance with the tested details/installation requirements, particularly with respect to edge cover and expansion clearance.

10.4 Top Lights (Fanlights)

A top light or fanlight was successfully tested in 9667/19.R1 and must utilise a Profile 22 CD70 profiled PVC extrusion transom measuring 85mm wide x 70mm deep with a 20mm deep with a 21.5mm integral stop, incorporating a CND Beech reinforcement measuring 29mm wide x 46mm deep, as detailed in Appendix F. The fanlight frame head and jambs must follow the specification in section 12.1.

The fanlight must be fitted with a double glazed unit as detailed in 10.2 and incorporate Steel L Brackets fixed at 240mm maximum centres and 100mm from corners in pairs to secure the glazing in place. Large brackets measuring 80mm long x 20mm deep x 15mm high must be fitted between the frame stop and glazing with the small bracket measuring 80mm long x 5mm deep x 15mm high fitted between the glazing and the bead. Profile 22 Profiled PVC extrusion bevelled glazing beading measuring 17mm high x 12mm wide must be clipped into the opposite side to the stop, as show in Appendix F

Top lights (fanlights) aperture size are permitted to a maximum height of 550mm. The transom must be butt jointed to the frame jambs and mechanically fixed with 2No M5 x 100mm screws at each end.

Fanlight frame intumescent seal protection must be in accordance with the door frames protection including the transom, listed in section 16.

Glazed fanlights have been tested in both directions in test No.9667/19.R1. The DGU's may be orientated in either direction with respect to the fire risk such that the fanlight may be considered bi-directional with respect to fire.

10.5 Overpanels

Overpanels were successfully tested in reports WF413752 Revision A and WF412546B Revision A and must utilise a Profile 22 CD70 profiled PVC extrusion transom measuring 85mm wide x 70mm deep with a 20mm deep with 21.5mm integral stop. This must incorporate a CND Beech reinforcement infill measuring 29mm wide x 46mm deep, as detailed in Appendix G. The fanlight frame head and jambs must follow the specification in section 12.1.

The overpanel must be fitted with a Sealed Tight Solutions PVC faced Corex board panel and must be fitted as tested in WF413752 Revision A and WF412546B Revision A. Steel L Brackets must be fixed at 240mm maximum centres and 100mm from corners in pairs to secure the panel in place. Large brackets measuring 80mm long x 20mm deep x 15mm high must be fitted between the frames stop and panel with the small bracket measuring 80mm long x 5mm deep x 15mm high fitted between the panel and the bead. Profile 22 Profiled PVC extrusion bevelled glazing beading measuring 17mm x 12mm must be clipped into the opposite side to the stop, as show in Appendix G. PVC Packers measuring 100mm long x 24mm wide x 4mm thick must be inserted at the bottom of the aperture at 200mm from the corners to prevent the panel from dropping.

Overpanels are permitted to a maximum panel height of 550mm. The transom must be butt jointed and to the frame jambs and mechanically fixed with 2No M5 x 100mm screws at each end.

Overpanel frame intumescent seal protection must be in accordance with the door frames protection including the transom, listed in section 16.

Overpanels have been tested in both directions in test WF412546B Revision A and WF413752 Revision A. The panel may be orientated in either direction with respect to the fire risk such that the overpanel may be considered bi-directional with respect to fire.

11 Lippings

The following materials have been tested for the door design covered by this field of application.

| Element | Lipping Material | Dimensions (mm) |
|------------|------------------|-----------------|
| Leaf edges | PVC | 2 thick |

12 Door Frames

12.1 Profile 22 Door Frames

The tested Profile 22 door frame design detailed below is assessed for use with the Tricore door design specified in this report:

| Element | | Material | Dimensions (mm) |
|--|-------|--|---|
| Profile 22 Frames ¹ - head and jambs | | Profile 22 CD70 profiled PVC extrusion Product reference 78004 ² | 67 wide x 70 deep including a 21.5 wide x 20 deep integral stop |
| Frame reinforcement | Head | CND Beech | 46 wide x 29 deep |
| | Jambs | Aluminium box section Ref:7812 | 2 thick x 46.5 wide x 29.5 deep |
| Stops – integral | | - | - |
| Frame jointing detail | | Mitred – plastic welded | - |
| Cill | | Profile 22 PVC-u extrusion Ref: C085, with CND Beech reinforcement (density 720 Kg/m ³) or 21 x 24 x 1 steel U profile reinforcement | 85 deep x 30 high (overall dimensions) 22 wide x 20 tall (beech reinforcement) |

1. Profile 22 door frames must be fully contained within the structural opening
2. In addition to the frame to supporting construction fire stopping details shown in the table contained in section 22, Profile 22 CD70 frames (product reference: 78004), must be fitted with 2No. Sealed Tight Solutions 15 x 2 intumescent strips, reference STS 15/2, positioned within the two outer profiled channels to the rear of the frame profile.

Diagrams of the tested door frame profile are depicted in appendix C.

12.2 Cills

The cill referenced C085 depicted in appendix D was tested in tests 9650/18, WF412546B, 9665/19.R1, WF406216, WF415386 and CFR1902011 B Rev 1. In tests WF406196B and WF403079 the doorset was tested without a cill. Therefore, assessment is made that doorsets to this design may be used with or without the tested cills and may additionally use the two deeper cills with the same profile and reinforcement but with deeper noses (155mm and 180mm deep), as depicted in appendix D.

13 Environmental Seals

The following weather seal has been incorporated in the testing conducted.

| Element | Product | Dimensions (mm) | Location |
|--------------|--|-----------------|---|
| Weather seal | Profile 22 78004 PVC /Nitrile Butyl rubber co-extruded gasket: Ref: EP4180900AA | 10 high blade | Fitted in the upstand of the door stops |

14 Thresholds

The following products have been tested for use with the Tricore door design covered by this field of application.

| Element | Type | Dimensions (mm) | Location |
|----------------------|--|-----------------------------------|--|
| Threshold | Profile 22 aluminium Low Threshold – Ref 2438 Aluminium extrusion incorporates 2No. Seals fitted within the extruded channels as below: Centre seal Ref:1832 Front seal Ref: 1831/T | 15 high x 60 wide (overall) | Fitted with a low threshold end cap at each end with 2No. 50mm long screws* |
| Threshold End Cap | Profile 22 Low Threshold End Cap Product reference L7835/LR* | 35 wide x 60 deep x 40 high | Fitted to each end of threshold between each of the vertical jambs, fixed within the frame reveal with 2No.25mm self- tapping screws |
| Threshold | Exitex aluminium threshold– MXS 15/67 supplied with intumescent – see section 16 | 15 high x 67 deep | Frame end milled to accept the threshold. Must be fitted with supplied intumescent |
| Rain deflector | Exitex radius profile – concealed fit Ref: 1.01.0148 | 37 high x 19 deep | |

15 Adhesives

The adhesives used in construction of the Tricore design are as follows:

| Element | Product |
|------------------------|--|
| Core and Inner facings | Melamine Urea Formaldehyde Exterior Glue |
| Outer facings | Leeson Polyurethanes D2655 Single Component moisture curing laminating adhesive |
| Lippings | TECHNOMELT PUR 270-7 known as Purmelt RS 270-7 |

16 Intumescent Materials

Intumescent materials tested for this doorset design are as follows:

| Element | Product | Size (mm) | Location |
|------------------------------------|---|--------------------|---|
| Frame reveal – head and jambs | Sealed Tight Solutions ST30/2.5 graphite seal | 30 x 2.5 | Lining the door frame reveal |
| Behind Profile 22 78004 frame | 2No. Sealed Tight Solutions ST15/2 graphite seal | 15 x 2 | Fitted in the rear of the frame in the outer profiled channels |
| Locks/latches | Pyroplex graphite sheet | 1 thick | Encasing centre latch body only |
| | Norseal 001 graphite sheet Ref: KITB/315 | 0.5 thick | |
| | Lorient Polyproducts Ltd MAP paper | 1 thick | |
| | Sealed Tight Solutions ST140x50 | 1 thick | One piece fitted each side of centre latch/lock case |
| Letter plate | Fab & Fix FFLPINTSTR | 40 x 2 | Fitted round the letterplate sleeve |
| Eye viewer | STS Ltd 4008C graphite intumescent supplied with viewer | 47 x 25 x 1 | Wrapped around the eye viewer body |
| Fielded areas | Lorient Polyproducts Ltd MAP paper | 1 thick x 43 wide | Stapled, with a minimum of 2No. staples, to the bottom of the fielded grooves |
| Threshold Exitex MXS 15/67 only | Exitex graphite intumescent supplied with threshold | 3 thick x 20 wide | Threshold platform |
| Glazing Perimeter | Everbuild Building Products Ltd – Tecnic Fire Sealant | Fully filling void | Between DGU/cassette and the glazing aperture (see appendix E for details) |

17 Tested Hardware

The following hardware has been successfully incorporated in the tests on the Tricore door leaf design referred to in section 3 of this field of application report:

| Element | Product | Dimensions (mm) | Location |
|---|---|---|--|
| Hinges | Cooke Brothers steel bearing butt hinges: Phoenix 7735 | 102 x 37 x 3 (blade size) | Fitted 100, 300, 990, 1785 from head of the leaf ¹ |
| | SEA Ltd mkIV aluminium butt hinges | 101 x 40 x 3 (blade size) | Fitted 100, 300, 990, 1780 from head of the leaf ¹ |
| Locks and latches | Winkhaus AV2 Automatic multipoint lock | 1770 x 20 x 3 (forend size) 185 x 65 x 15 (centre case size) 113 x 42 x 15 (top and bottom hook bolt case size) | |
| Lock Cylinder | Yale Brass Europrofile cylinder Ref. KM3030 | 70 | |
| Cylinder Guard | Winkhaus Armorshield | 66 x 22 x 42 (footprint) | |
| Overhead Surface Mounted Closers | Rutland TS11204 overhead type closer | 254 x 60 (footprint) | May be mounted on both push and pull sides – a drop plate is used for push side fixing |
| Letterplates | Fab 'n Fix Hardex coated zinc: Nu Mail fire Letterplate fitted with Fab 'n Fix zinc security shield Ref: Nu Mail TS008. | 310 x 75 (footprint) 354 x 72 (footprint) | |
| Eye viewer (testing conducted with two viewers) | STS Ltd eye brass viewer Ref. 4008. | 14Ø (cut out) 26 Ø (external footprint) 24 Ø (internal footprint) | |
| Glazing Perimeter | Everbuild Building Products Ltd Tecnic Fire Sealant 300 | Fully filling the voids | Between the DGU cassette and the glazing aperture |

¹ locations are for the maximum leaf size.

| Element | Product | Dimensions (mm) | Location |
|-----------|---|---|----------|
| Furniture | ERA Brass plated steel door chain Ref. 791 | 38 x 45 (door fitting) 45 x 15 (frame fitting) | |
| | Fab 'n Fix in line lever type handle Hardex coated zinc | 243 x 32 (footprint) | |
| | Fab & Fix Hardex coated Zinc Letters & Numbers Ref. 4B Range | 52 x 80 (footprint) | |
| | Fab 'n Fix Hardex coated zinc door knocker: Nu Victorian Urn Medium Face Fix | 162 x 76 (footprint) | |

18 Additional & Alternative Hardware

The following sections detail the permitted scope and constraints for fitting additional and alternative hardware to the door design.

18.1 Latches and Locks

The latch/lock must be the Winkhaus AV2, 3 point, auto latching, multipoint latch, fitted as tested, combined with the Yale Brass Europrofile lock cylinder, as referenced in section 17, above. Alternative brass Europrofile lock cylinders are permitted providing the brass has a melting point in excess of 800°C.

See section 16 for the required intumescent protection.

18.2 Hinges

The Tricore design must be hung on a minimum of 4No. hinges.

Hinges may be either. Cooke Brothers Phoenix steel butt hinges, Ref: 7735, or SEA mkIV aluminium butt hinges, both as tested and specified in section 17.

A limited hinge position tolerance is given in the table below to allow for permitted smaller door leaf sizes.

| | | |
|-------------------------------|-----------------------------------|---|
| Fixings | As tested | |
| Materials | As tested | |
| Hinge positions | Top | 100mm from the leaf head to top of hinge blade |
| | 2 nd & 3 rd | 2 nd hinge a minimum of 100mm and a maximum of 200mm from the bottom of the top hinge with the 3 rd hinge between 445mm (smallest leaf size) and 700mm from the bottom of the 2 nd hinge |
| | Bottom | 150 - 200mm from foot of leaf to bottom of hinge blade |
| Intumescent protection | Not required | |

18.3 Automatic Closing

Automatic closing devices, must be the Rutland TS11204, as tested.

18.4 Push Plates and Kick Plates

Steel, stainless steel or brass (melting point $\geq 800^{\circ}\text{C}$) face fixed hardware such as push plates and kick plates may be fitted to the doorsets utilising screws and/or adhesive, providing they do not exceed 10% of the door leaf area.

18.5 Letter Boxes/Plates

The Fab & Fix Nu Mail letter plate may be fitted to this design, as specified in section 17 and must be fitted exactly as tested, including the supplied intumescent.

Other letter plate designs are not permitted.

18.6 Furniture

Alternative door numerals, knockers, chains and handles may be fitted providing they do not exceed the tested sizes, are positioned as the tested items and are fitted with intumescent gaskets, where applicable, as specified in section 16.

Notes:

1. Alternative chains must be made from steel
2. Alternative door numerals, knockers and handles can be constructed using zinc, aluminium or steel, given the low melting point of the zinc tested.

19 Door Gaps

For fire resistance applications, door gaps and alignment tolerances must fall within the following range:

| Location | Dimensions |
|----------------------|---|
| Door edge gaps | Nominally 3mm to leaf head and hinge edges, and nominally 4mm to closing edge. Both with a tolerance of $\pm 1\text{mm}$ |
| Alignment tolerances | Leaves must not be proud of the door frame by more than 1mm |
| Threshold | 10mm between bottom of leaf and top of floor covering. For ambient (cold) smoke control tolerances see section 24. |

20 Structural Opening

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

21 Fixings

The frame jambs are to be fixed to the supporting construction using a minimum of 4 steel fixings per jamb.

Fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 50mm.

Where packers are required between the back of the frame and the structural surround they may be manufactured from softwood or hardwood timber of minimum density 510kg/m³.

Plastic packers may be utilised but they must be the Broadfix type, as tested, and must be coated on both sides with an approximately 1mm thick layer of intumescent mastic to protect against burn through of the packer.

Other proprietary packers may be utilised providing there is test evidence to either BS 476 Part 22: 1987 or BS EN 1634-1 for their successful use in this application with extruded PVC composite door frames.

22 Sealing to Structural Opening

Door frame to structural opening gaps must be protected using one of the following methods:

1. Gaps up to 20mm must be tightly packed with rock mineral fibre (rock mineral fibre to meet Euroclass A1 or A2 to EN 13501-1 and heat resistant to 1000°C) and sealed on both sides with a 10mm depth of intumescent mastic/sealant, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional. 65 x 6mm, 45 x 6mm or 25 x 6mm PVC architraves may be fitted as tested (see below).

2. Gaps over 20mm and up to 50mm wide may be filled, for the full depth of the frame, with a subframe up to 50mm thick, manufactured from either a non-combustible material or a timber based material (softwood, hardwood or MDF, of minimum density 510kg/m³), with gaps up to 10mm between the components filled using method 1 above. The joint must be fitted with 15mm thick architraves of softwood, hardwood or MDF, of minimum density 510kg/m³, overlapping at least 15mm each side.

Notes:

1. The following intumescent acrylic sealants have been tested by Permadoor as a frame to supporting construction fire stopping detail, and are therefore approved for method 1 contained in the table above:

- a. Mann McGowan Pyromas A intumescent acrylic sealant
- b. Sealed Tight Solutions Ltd ST88 intumescent acrylic sealant

2. The following rock mineral fibre has been tested by Permadoor as a frame to supporting construction fire stopping detail, and is therefore approved for method 1 contained in the table above:

- a. Rockwool Thermal Insulation Roll

22.1 Architraves

The design has been tested both with and without architraves and therefore architraves are optional for gaps up to 20mm wide (method 1 above). Gaps above 20mm must use architraves as specified in method 2 above.

PVC architraves were tested as follows:

- WF412546 B: 65 x 6mm to the exposed face, 45 x 6mm to the unexposed face;
- WF415388: 65 x 6mm to the exposed face, 25 x 6mm to the unexposed face.
- WF415386: 65 x 6mm to the exposed face, 25 x 6mm to the unexposed face

Based on the testing conducted, all three tested dimensions of architrave (65 x 6mm, 45 x 6mm, 25 x 6mm) are assessed for use with this doorset design. Any of the three sizes of architrave can be used on either face.

23 Insulation

Insulation performance may be claimed for doorsets to this design as follows:

| Type | Details |
|----------------------|--|
| Partially insulating | Doorsets incorporating up to 20% of non-insulating glazing |
| Fully insulating | Unglazed doorsets |

24 Smoke Control

24.1 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 3m³/m/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.

Note: The incorrect specification and fitting of smoke seals may impair the operation of a doorset and therefore compromise the fire resistance performance. Advice should be sought from the seal manufacturers regarding the correct specification and installation of smoke seals or combined smoke and intumescent seals.

24.2 Further Considerations

Note that there is other guidance available, including BS 9999-2017 - *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.

25 Conclusion

If the Permadoor Tricore doorset design, constructed in accordance with the specifications documented in this field of application report, were to be tested in accordance with BS 476: Part 22: 1987, It is our opinion that it would provide a minimum of 30 minutes integrity and insulation performance (subject to section 23).

26 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, 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 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.
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: Permadoor

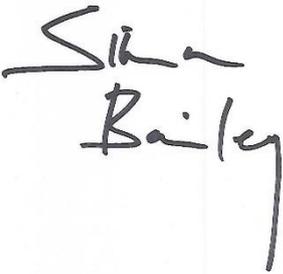
27 Limitations

The following limitations apply to this assessment:

- 1) This field of application addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
- 2) This field of application 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 field of application 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 interpretations 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 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 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.

28 Validity

1. The field of application is valid initially for a period of five years from the date of issue, after which time it must be submitted to Warringtonfire for technical review and revalidation.
2. This field of application report is not valid unless it incorporates the declaration given in Section 26 duly signed by the applicant.

| | | | |
|-------------------|---|--|---|
| Signature: |  |  |  |
| Name: | S Bailey | A M Winning | P Barker |
| Title: | Senior Product Assessor | Senior Product Assessor | Technical Manager |

Appendix A

Performance Data

Primary Data Summary

| Report No. | Configuration | Leaf Size (mm) | Test Standard | Performance (mins) |
|---------------------|---------------|-----------------------|------------------------|----------------------------|
| No.9650/18 | A - LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 34 |
| | | | | Insulation: 34 |
| | B - LSASD | 2085 x 894 x 44 | | Integrity: 34 |
| | | | | Insulation: 34 |
| WF406196 B Rev A | LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 37 |
| | | | | Insulation: 37 |
| WF412546 B Rev A | LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 36 |
| | | | | Insulation: 36 |
| WF415388 | A - LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 37 |
| | | | | Insulation: 34 |
| | B - LSASD | 1842 x 732x 44 | | Integrity: 29 ¹ |
| | | | | Insulation: 29 |
| 9665/19.R1 | A - LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 34 |
| | | | | Insulation: 34 |
| | B - LSASD | 2085 x 894 x 44 | | Integrity: 38 |
| | | | | Insulation: 32 |
| 9667/19.R1 | A - LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 35 |
| | | | | Insulation: 35 |
| | B - LSASD | 2085 x 894 x 44 | | Integrity: 34 |
| | | | | Insulation: 34 |

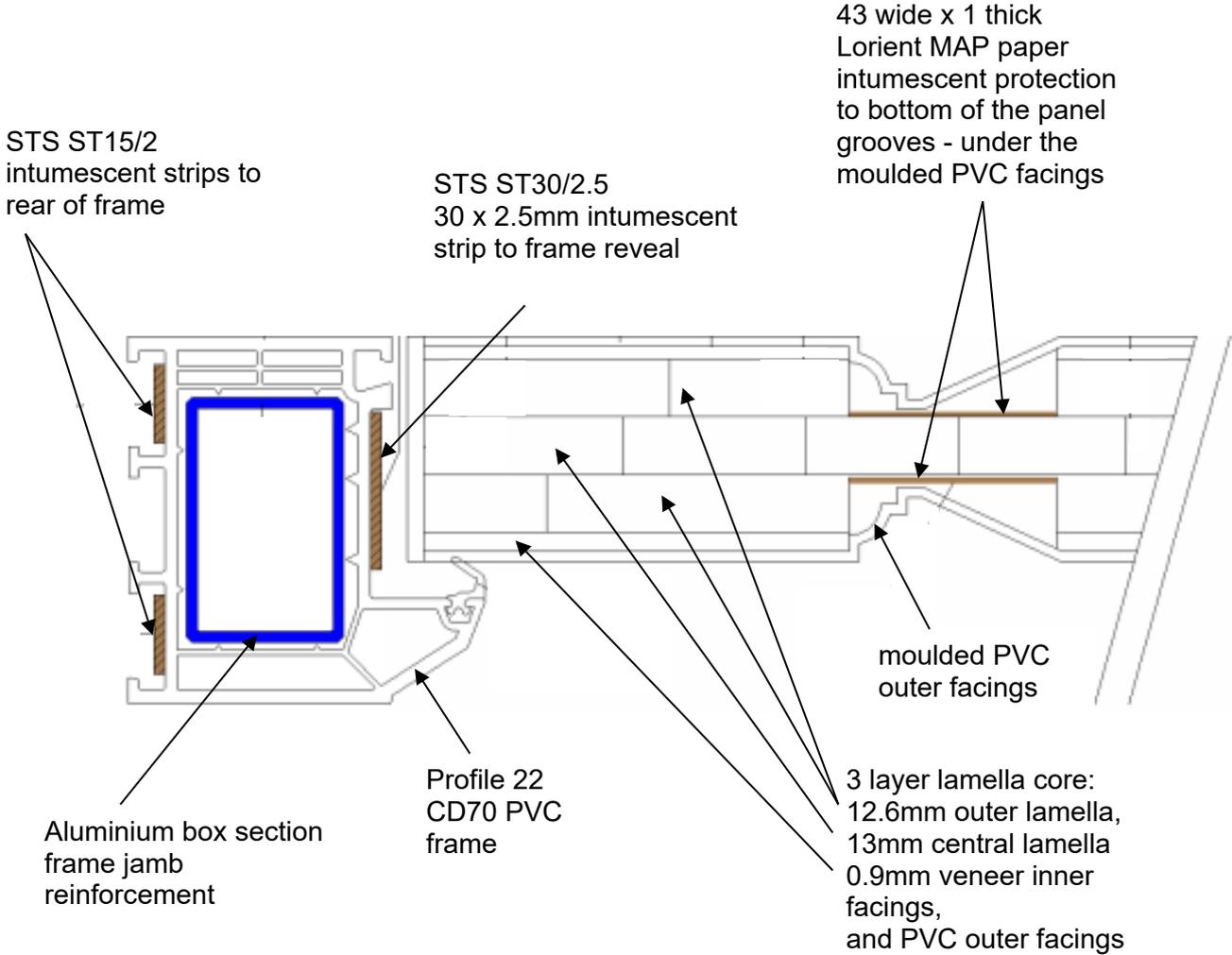
| | | | | |
|-----------------------|-----------|-----------------------|------------------------|----------------|
| CFR1902011 B Rev 1 | A - LSASD | 2086 x 895 x 44 | BS 476 Part 22:1987 | Integrity: 35 |
| | | | | Insulation: 32 |
| | B - LSASD | 2083 x 895 x 44 | | Integrity: 34 |
| | | | | Insulation: 32 |
| WF403079 | A - LSASD | 2084 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 35 |
| | | | | Insulation: 35 |
| | B - LSASD | 2084 x 894 x 44 | | Integrity: 35 |
| | | | | Insulation: 35 |
| WF404897 Rev A | A - LSASD | 2084 x 895 x 44 | BS 476 Part 22:1987 | Integrity: 38 |
| | | | | Insulation: 27 |
| | B - LSASD | 2084 x 895 x 44 | | Integrity: 34 |
| | | | | Insulation: 34 |
| WF406216 | A - LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 34 |
| | | | | Insulation: 34 |
| | B - LSASD | 2085 x 894 x 44 | | Integrity: 34 |
| | | | | Insulation: 34 |
| WF413752 Rev A | LSASD | 2085 x 894 x 44 | BS 476 Part 22:1987 | Integrity: 31 |
| | | | | Insulation: 31 |
| WF415386 | LSASD | 1903 x 732 x 44 | BS 476 Part 22:1987 | Integrity: 34 |
| | | | | Insulation: 34 |

¹ Failure due to continuous flaming at the leaf head. The door design has since been re-tested in test WF415386, with the glazed apertures located further from the leaf head and been shown to provide in excess of 30 minutes fire resistance performance. It is therefore the opinion of Warringtonfire that had the glazed apertures been further from the leaf head, creating a larger effective head rail, this doorset would have achieved 30 minutes integrity performance.

Appendix B

Tricore Construction

Horizontal Leaf Section

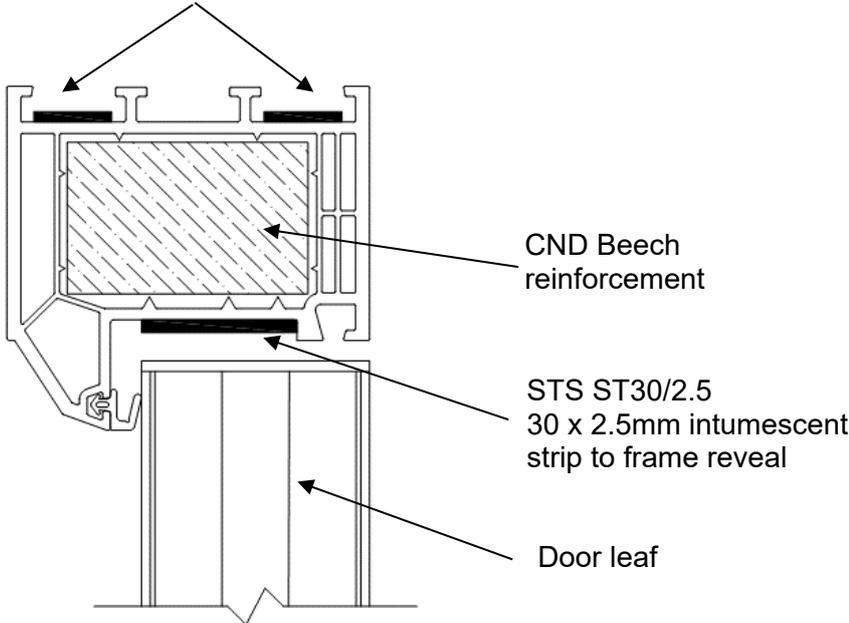


Appendix C

Frame Profiles

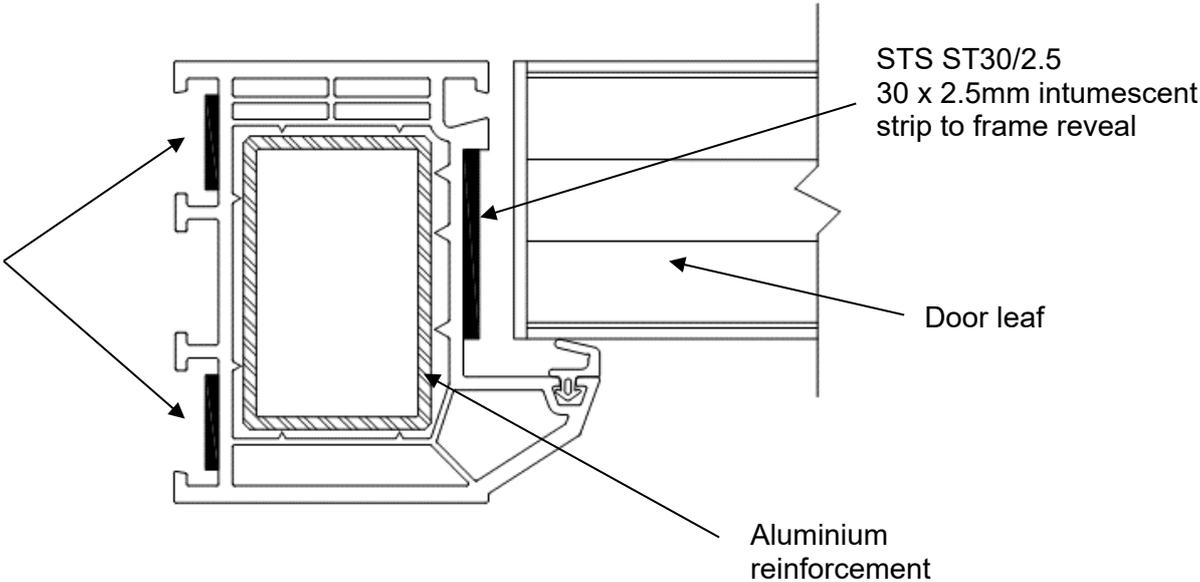
Frame Head – Vertical Section

2 No. ST15/2 15 x 2 mm intumescent strips fitted in rear of frame

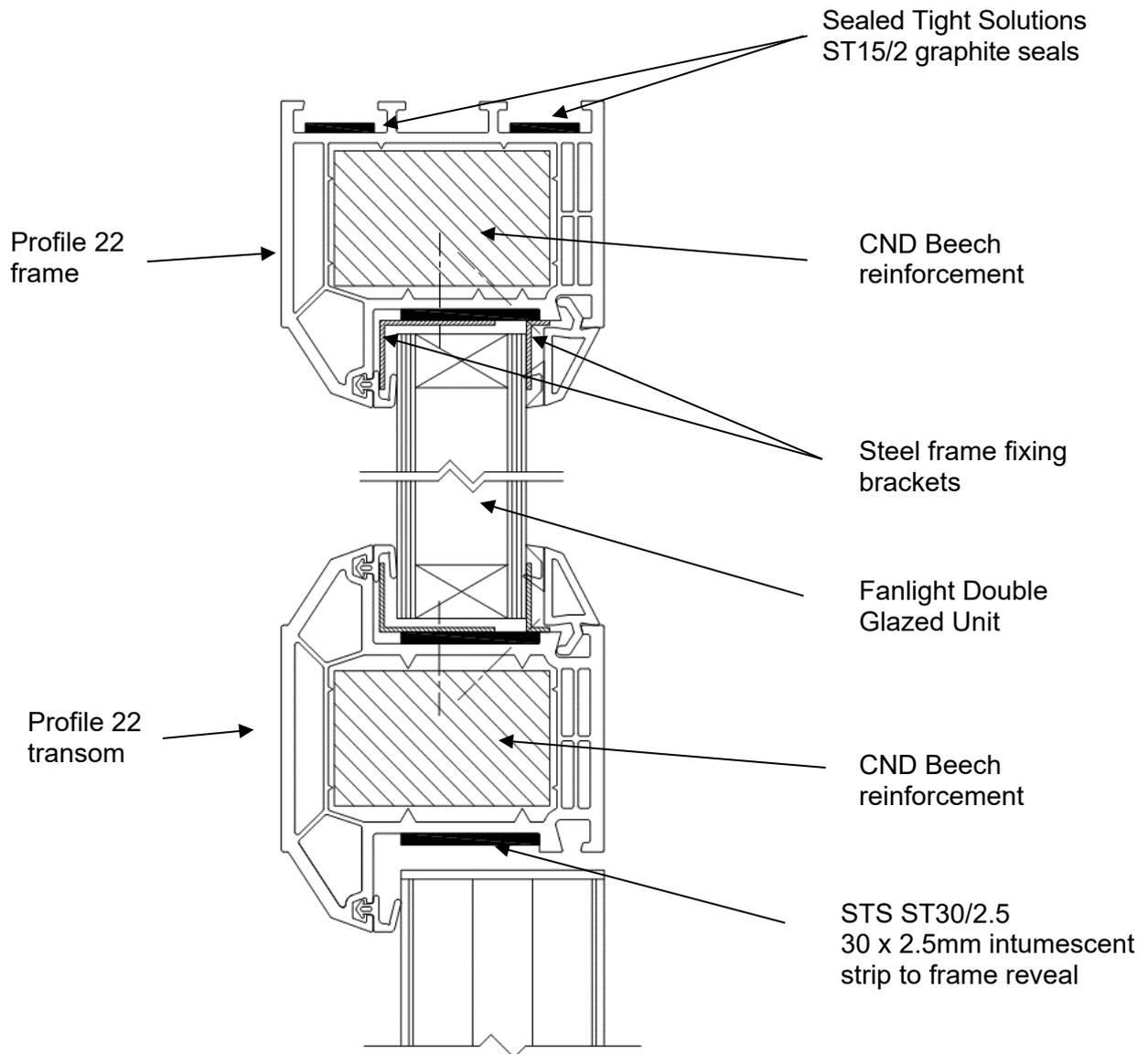


Frame leg – Horizontal Section

2 No. ST15/2 15 x 2 mm intumescent strips fitted in rear of frame



Glazed Fanlight (Top Light) – Vertical Section

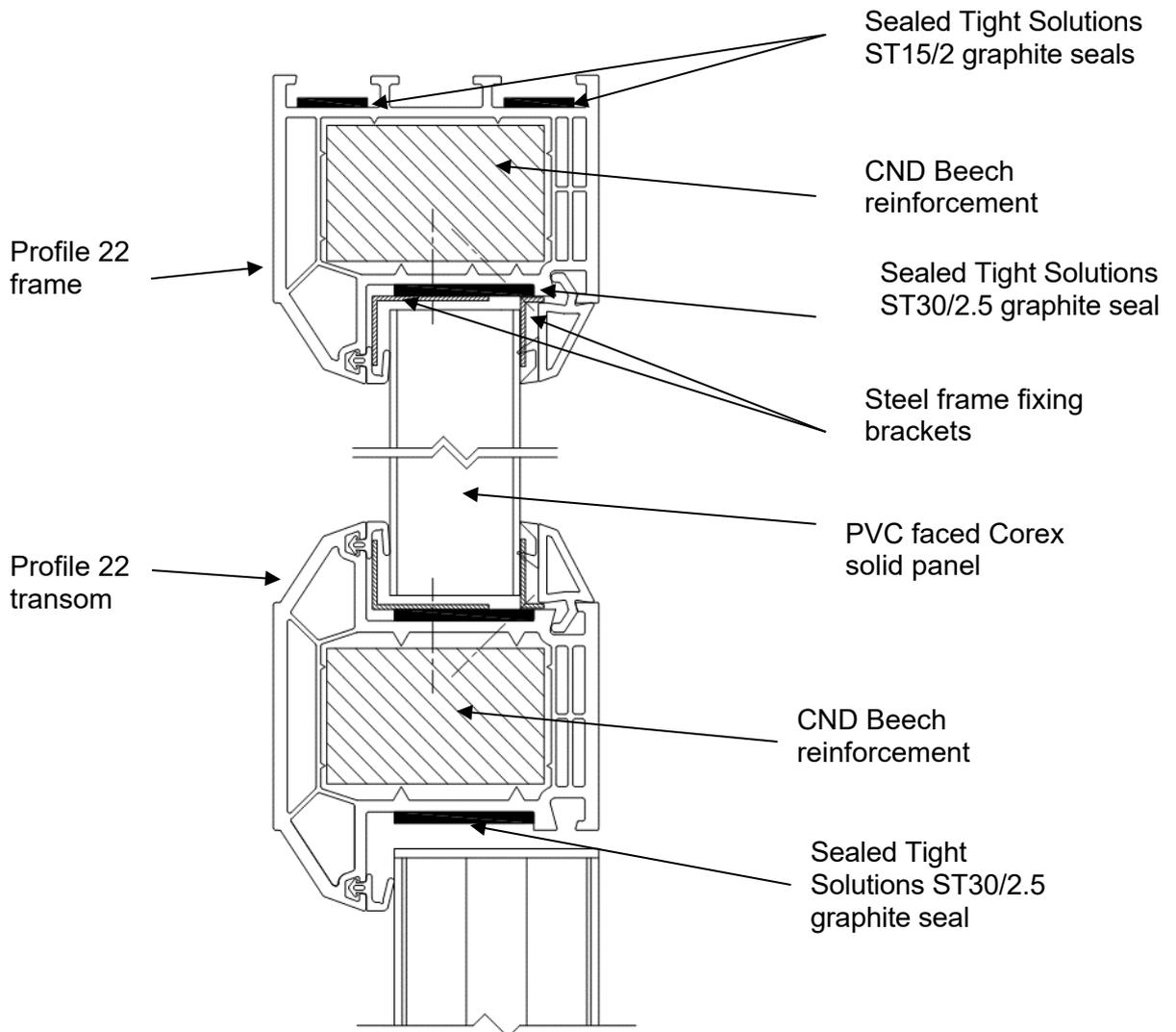


Steel L Brackets



Steel L Brackets fixed at maximum 240mm centres and 100mm from corners in pairs to secure the glazing in place. Large brackets measuring 80mm long x 20mm deep x 15mm high must be fitted between the frame stop and glazing, with the small bracket measuring 80mm long x 5mm deep x 15mm high fitted between the glazing and the bead.

Solid Overpanel – Vertical Section



Notes:

PVC Packers measuring 100mm long x 24mm wide x 4mm thick must be inserted at the bottom of the aperture at 200mm from the corners to prevent the panel from dropping.

Steel L Brackets

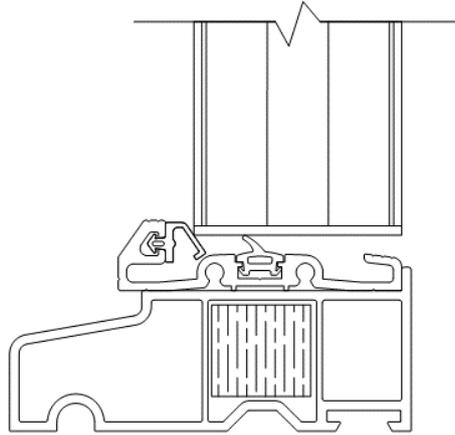


Steel L Brackets must be fixed at maximum 240mm centres and 100mm from corners in pairs to secure the panel in place. Large brackets measuring 80mm long x 20mm deep x 15mm high must be fitted between the frames stop and panel with the small bracket measuring 80mm long x 5mm deep x 15mm high fitted between the panel and the bead.

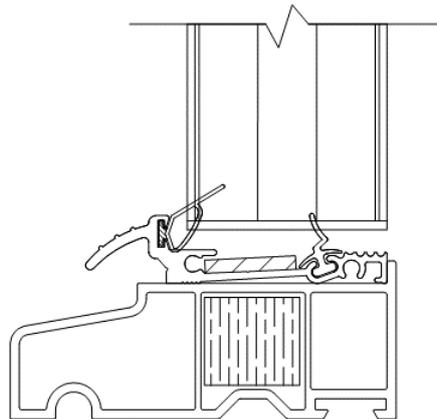
Appendix D

Thresholds and Cills

Tested Thresholds and Cills



Profile 22 Threshold with C085 Cill



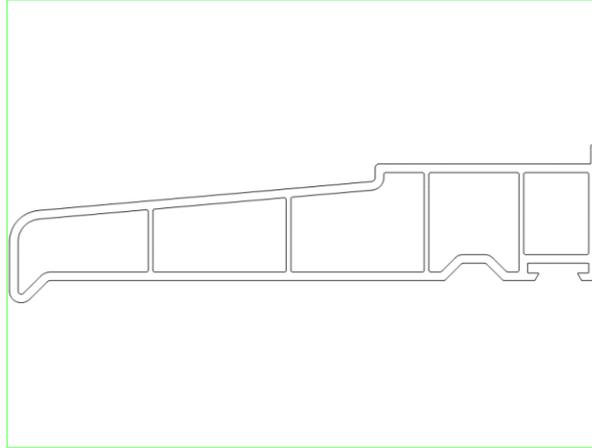
Exitex MXS 15/67 Threshold with C085 Cill

Notes:

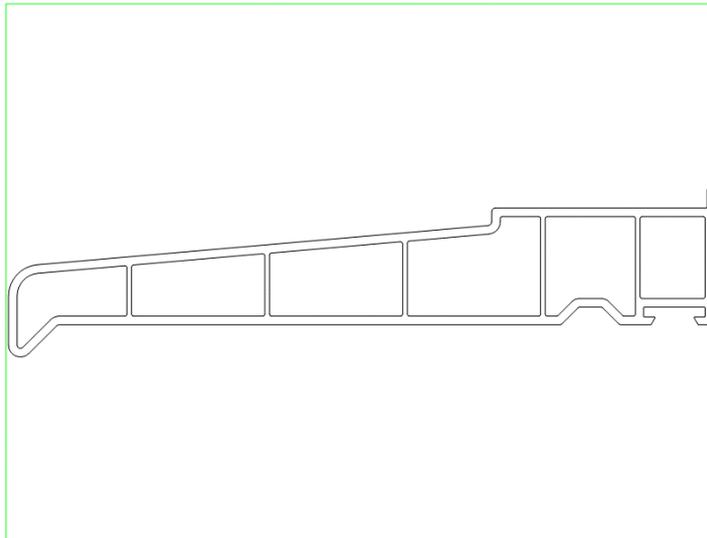
A 3 mm thick x 20mm wide Exitex graphite intumescent strip must be fitted to the threshold platform.

Assessed cills

C150

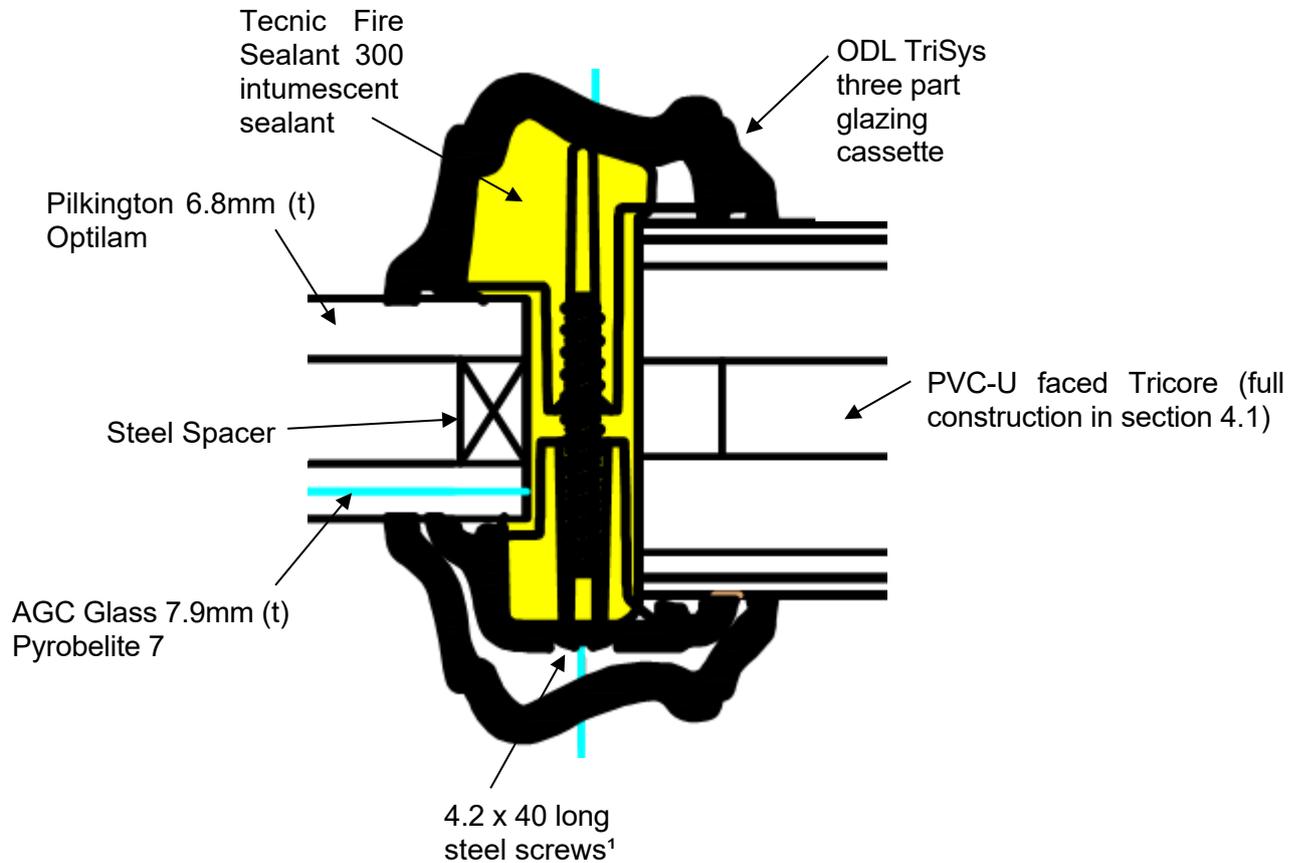


C180



Appendix E

Glazing System Construction



Notes:

¹ Fitted according to the glazing design, as specified below:

- Larkin – cassette ref: 0836. 1 screw in each corner; 1 centrally in each short side; 4 equally spaced in each long side.
- Causley H – cassette ref: 0718 1 screw in each corner; 1 centrally in each short side; 2 equally spaced in each long side.
- Chaucer – cassette ref: HR01. 1 screw in each corner; 2 equally spaced along the straight side, 5 equally spaced around the arc at maximum 150 centres.
- Byron– cassette ref: 0806. 1 screw in each corner.

The glazing system must incorporate:

1. A continuous bead of Alansons Aro-Seal clear hybrid polymer sealant (Ref: 1101) adhering the cassette outer frame to the door leaf face.
2. UK Industrial Glazing Tapes Ltd ProLINK Ref. 1000R acrylic glazing tape 9mm wide x 1mm thick adhering the cassette outer frame to the glazed unit on the door external face.
3. Everbuild Building Products Ltd FireSeal 300 intumescent sealant must be used to fully fill the void between the double glazed unit cassette and the glazing aperture, as illustrated in the diagram above.
4. UK Industrial Glazing Tapes Ltd PVC Foam, 9mm (w) x 2mm (t) adhering the cassette inner frame to the glazed unit on the door internal face

Appendix F

Revisions

| Revision | Warringtonfire Reference | Date | Description |
|----------|--------------------------|------------|---|
| A | 418706 | 27/09/2019 | Increased scope to include leaf and fanlight glazing, and solid overpanels based on additional test evidence. |
| | | | |
| | | | |