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Fire resistance test report

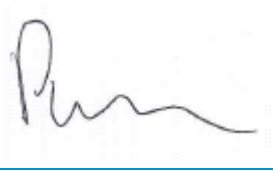
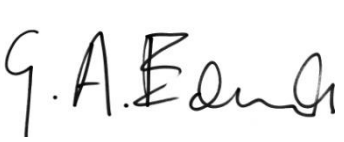
Issuing laboratory: Warringtonfire Testing and Certification Limited

Test standard:	BS 476-20:1987 and BS 476-22:1987 Clause 8
Test sponsor:	Wood International Agency Ltd
Product:	
Report number:	544267/R
Test date:	22 May 2024
Version:	1

Warringtonfire, accredited for compliance with ISO/IEC 17025:2017 – Testing

UKAS TESTING 0249

Quality management

Version	Date	Information about the report		
1	4 September 2024	Description	Initial issue	
			Prepared by	Authorised by
		Name	Peter White	Graham Edmonds
		Signature		

Signed for and on behalf of Warringtonfire Testing and Certification Limited

Executive summary

This report documents the findings of the fire resistance test of a doorset in accordance with BS 476-20:1987 and BS 476-22:1987 Clause 8 determination of fire resistance of Uninsulated doorsets and shutter assemblies with deviations as described in Table 3.

Warringtonfire Testing and Certification Limited (Warringtonfire) performed the test on 22 May 2024 at the request of Wood International Agency Ltd.

Table 1 provides a summary of the test specimen, Table 2 gives details of the supporting construction and Table 3 describes the summary of the test results.

Table 1 Test specimen

Item	Detail	Opening direction
Doorset A	Double leaf timber doorset with fitted glazing panels.	Towards the furnace
Latching conditions	Lock and latch disengaged. Flush bolts disengaged also	

Table 2 Supporting construction

Item	Detail		
Supporting construction	150 mm thick low-density concrete wall with a low-density concrete lintel at the head.		
Dimensions	Width	3050 mm	
	Height	3050 mm	
	Thickness	150 mm	
Aperture dimensions		**Width**	**Height**
	Doorset A	1920 mm	2242 mm
Restraint conditions	Restrained on all edges		

Table 3 Summary of test results

Item	Criteria	Results
Doorset A	Integrity	35 minutes
Notes:		
The test results for the specimen only apply to the tested orientation. The test was discontinued after 39 minutes. '*' indicates failure due to integrity failure.		

Contents

1. Introduction

This report documents the findings of the fire resistance test of a doorset in accordance with BS 476-20:1987 and BS 476-22:1987 Clause 8 determination of fire resistance of Uninsulated doorsets and shutter assemblies.

Warringtonfire performed the test on 22 May 2024 at the request of the test sponsor listed in Table 4.

Table 4 Test sponsor(s) details

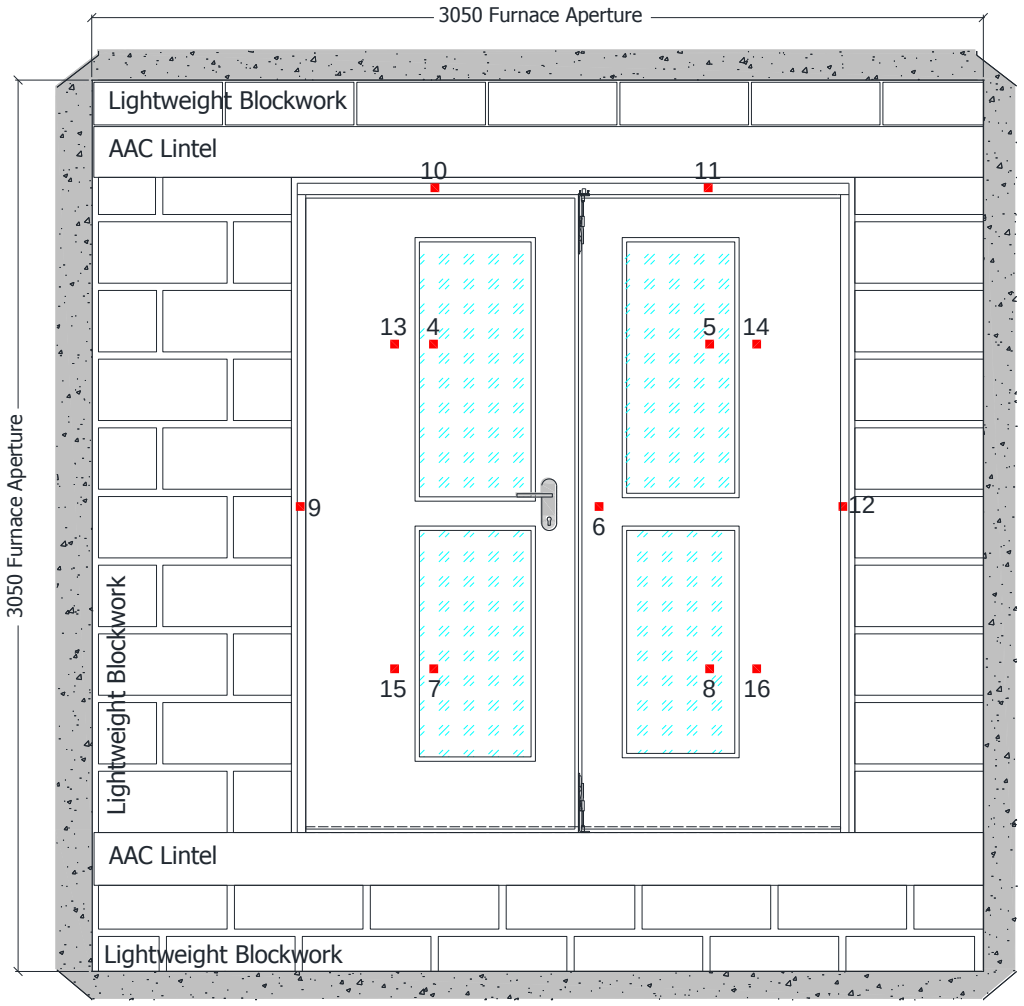
Test sponsor(s)	Address
Wood International Agency Ltd	16 King Edward Road Brentwood, Essex CM14 4HL United Kingdom

2. Test specimen and supporting construction

2.1 Drawings of test assembly

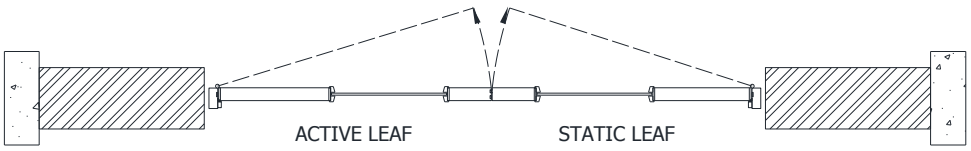
The description of the test specimen and supporting construction are detailed in Section 2.2 and illustrated in Figure 1 to Figure 19. All measurements are in millimetres – unless indicated otherwise.

The drawings were supplied by the test sponsor and verified by Warringtonfire (unless stated otherwise in Section 2.2).



	Reference Legend
Item	Description
■	Surface Thermocouple positions

GENERAL ELEVATION OF THERMOCOUPLE POSITIONS
UNEXPOSED FACE



HORIZONTAL SECTION THROUGH TEST CONSTRUCTION

Figure 1. General Elevation & Horizontal Section - Thermocouple Positions – Unexposed face

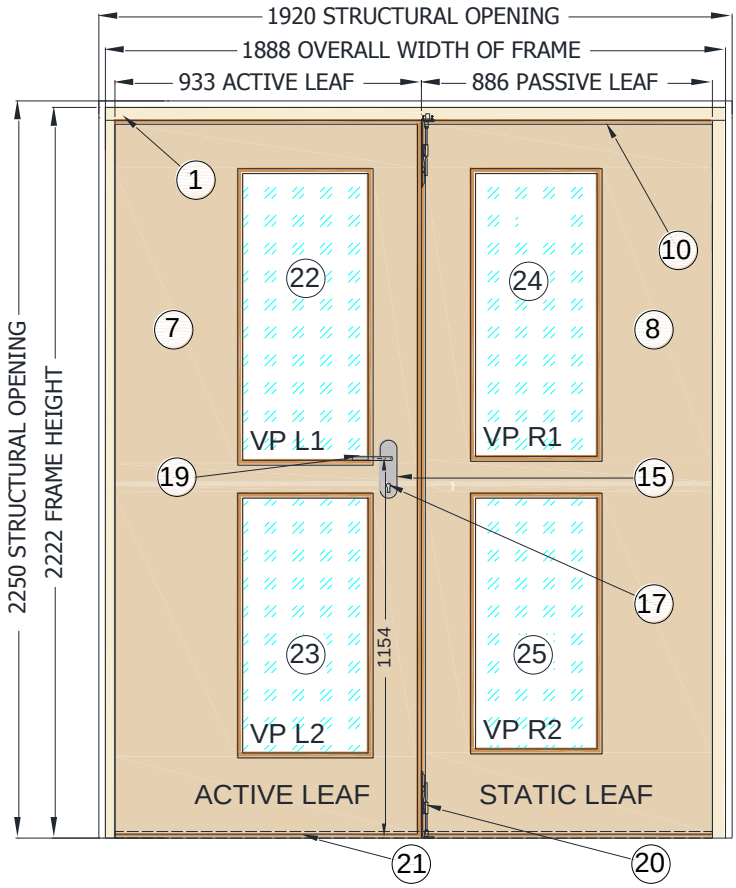


Figure 2. General Elevation of Doorset – Unexposed Face

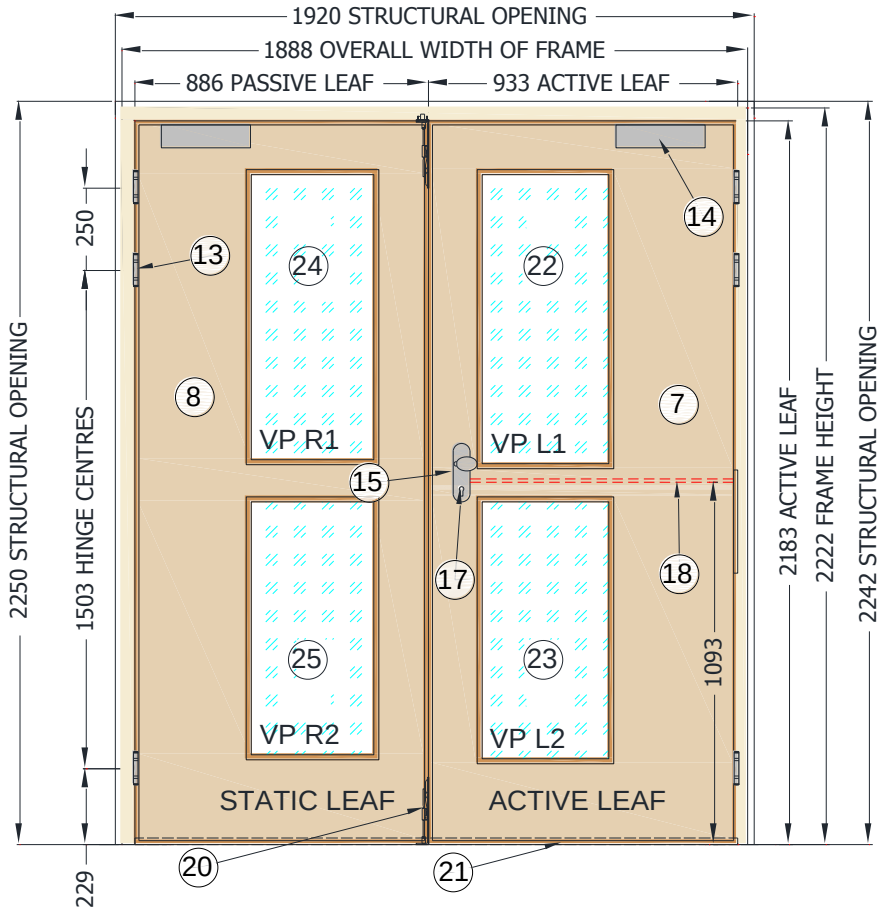


Figure 3. General Elevation of Doorset – Exposed Face

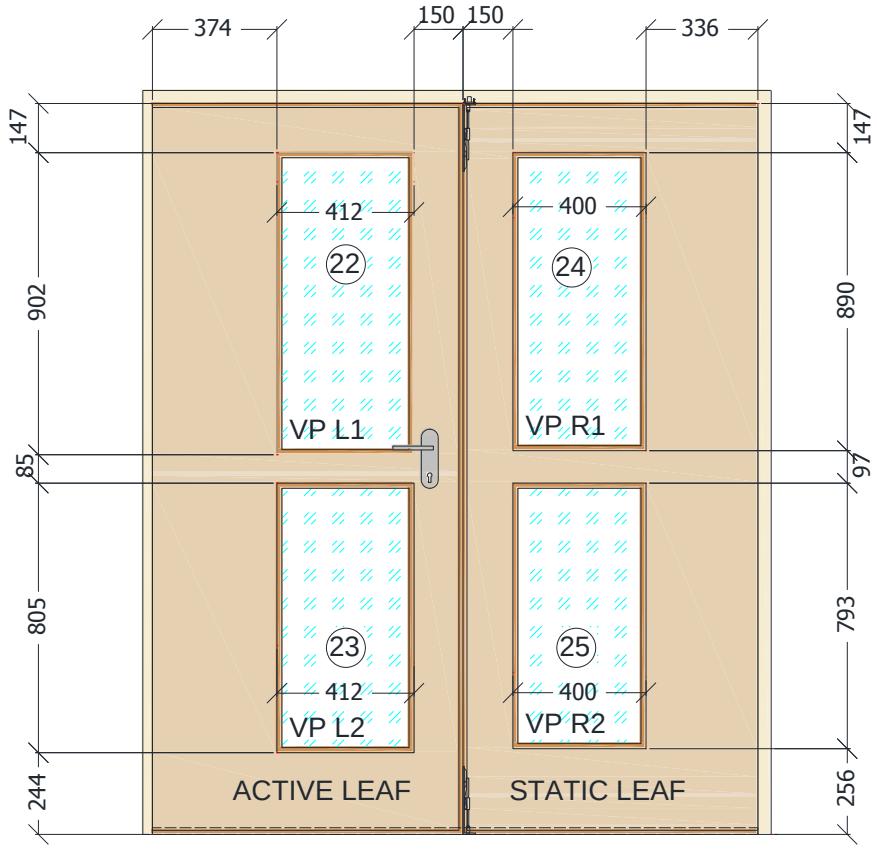


Figure 4. General Arrangement of Glazing positions

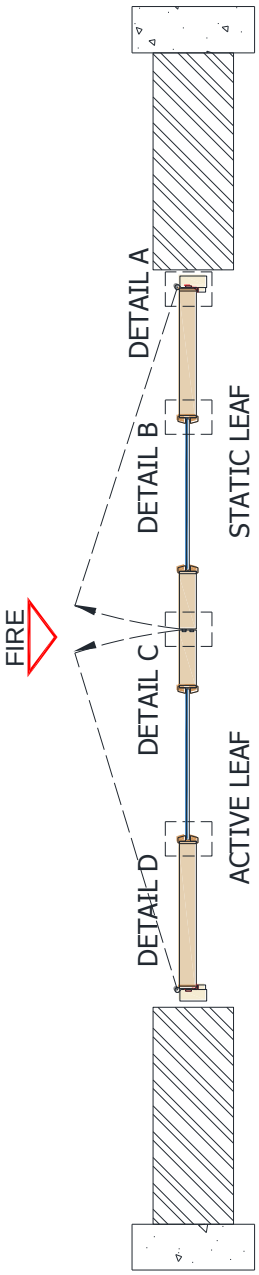


Figure 5. Typical horizontal section through Doorset

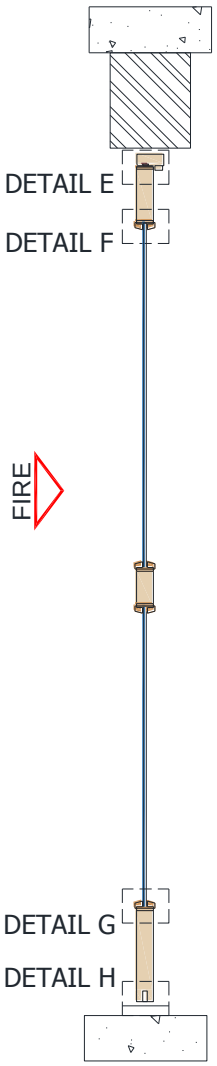


Figure 6. Typical vertical section through Doorset

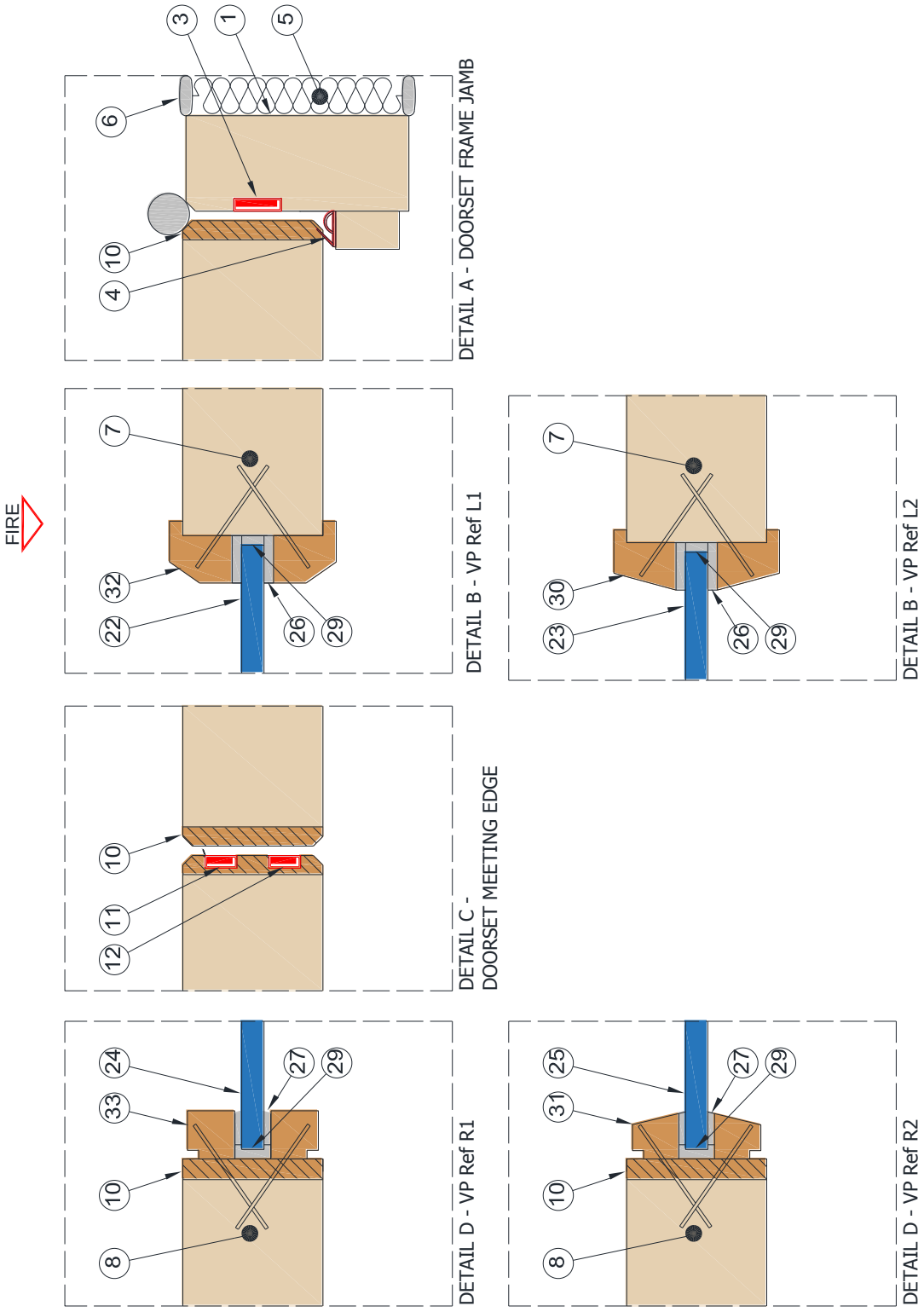


Figure 7. Typical horizontal cross sectional detail views - A-D

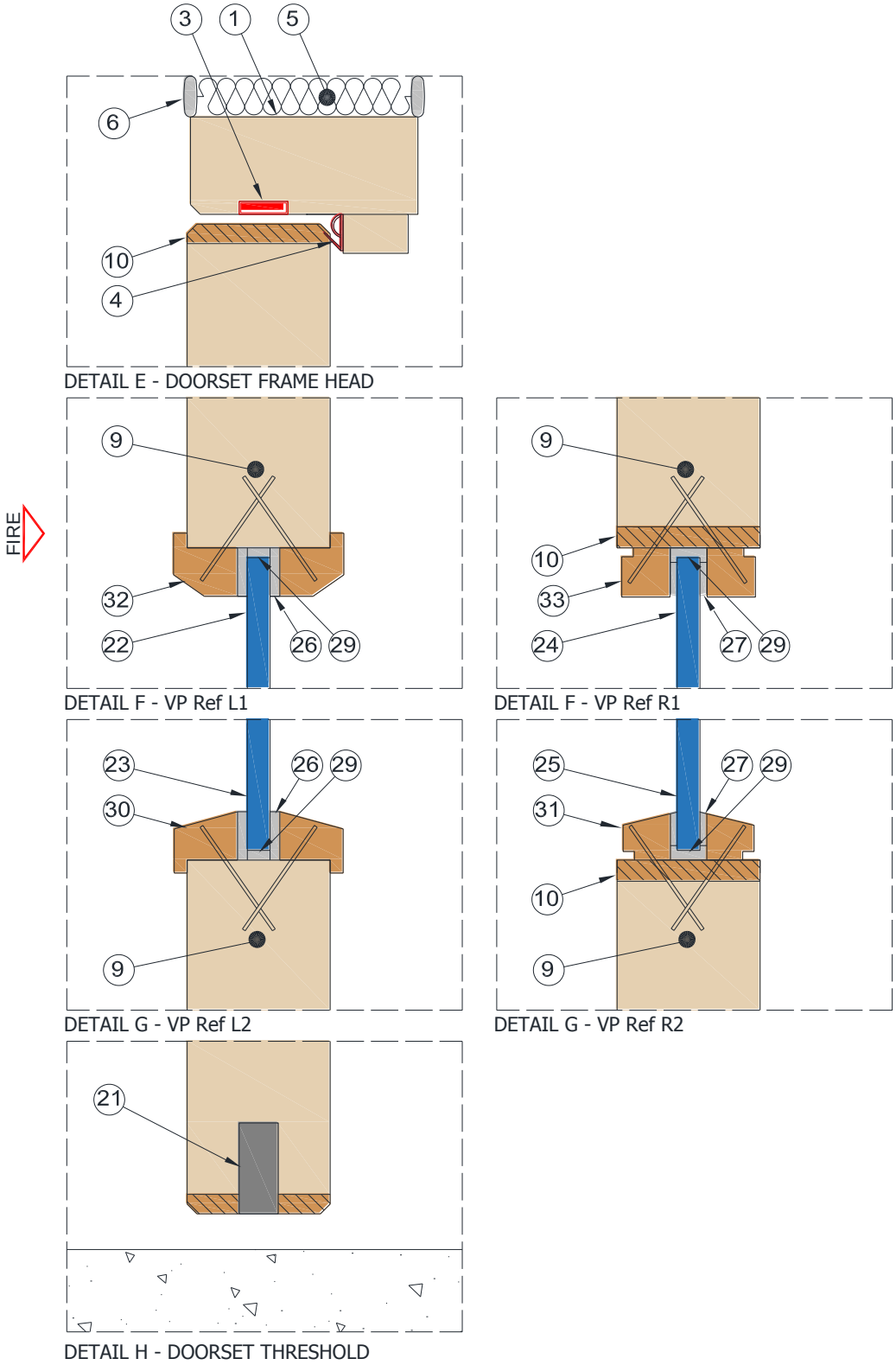


Figure 8. Typical vertical cross sectional detail views - E-G

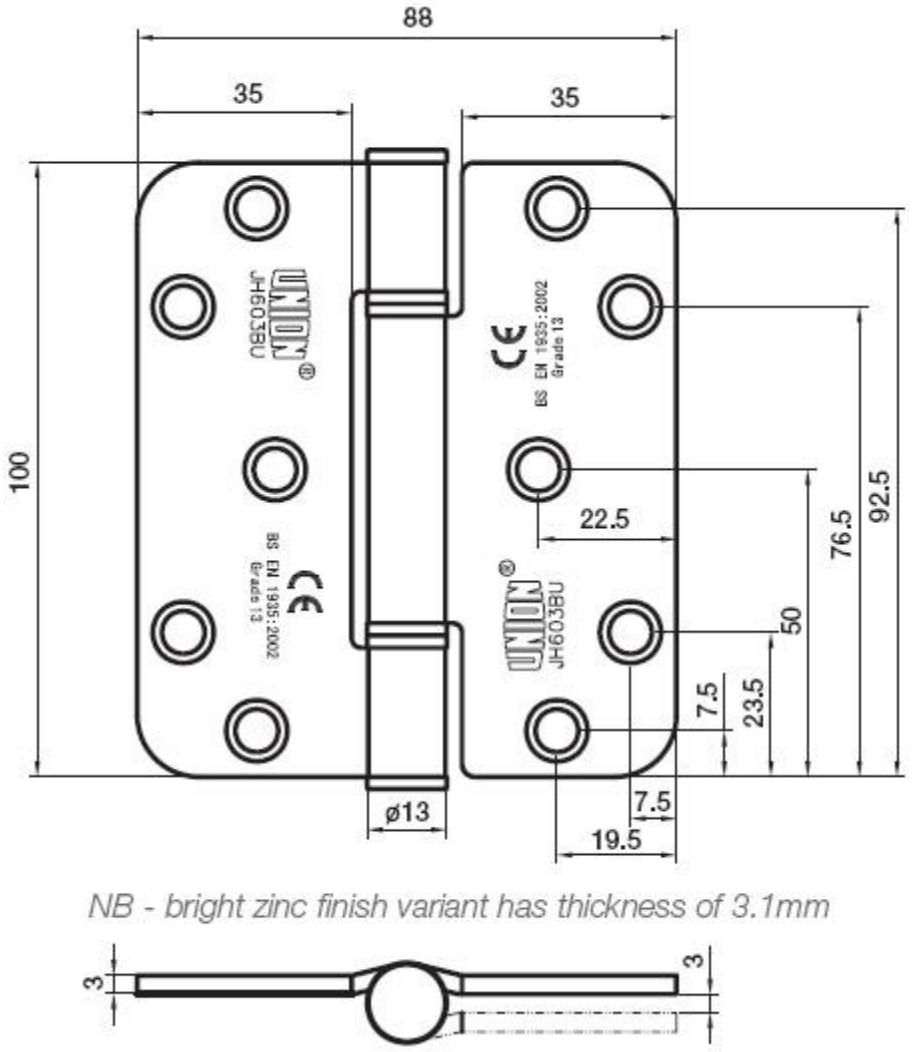


Figure 9. Details of item 13

SCISSOR ARM DOOR CLOSERS

TS.9205

Designed to last, the TS.9205 is a popular and highly efficient door closer with both optional back check and delayed action, and assisting BS8300.

- Power Adjustable EN2-5.
- 16 finishes available for next day delivery, including an anti-corrosion Marine 316.
- Slimline body & cover with only 40mm projection.
- EN2-5 parallel arm an optional using short parallel arm backet (Product Code: PAB.1)

FD30 to FD120 Timber Doors

Opening Angle 180°

Two-Stage Speed Regulation

35 YEARS Guarantee

1250mm Max Door Width

110Kg Max Door Weight

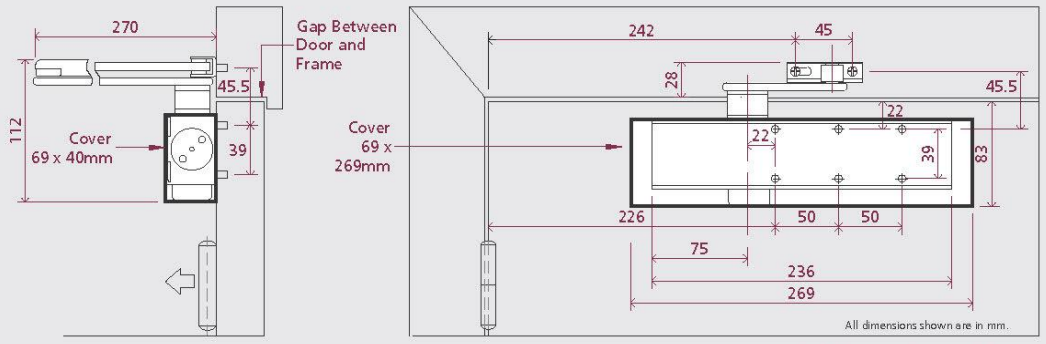
Finishes See page 96 for more detail

SE Silver	SNP Satin Nickel	PNP Polished Nickel	PVD Polished Brass	SSS Satin Stainless
PSS Polished Stainless	BK Black	AB Antique Brass	AC Antique Copper	SB Satin Brass
LB Light Bronze	MB Medium Bronze	DB Dark Bronze	WB Weathered Bronze	M Marine 316

UK CA 1720 · Approved Product CF 6144 · CE 1812 · cULus · Secured by Design SBD

Product Features	TS.9205
Delayed Action	✓
Back Check	✓
Opening Angle	180° (Fig.1)
Fig.1 Pull Side Door Width	390-1250mm
Fig.66 Push Side Door Width	390-1100mm
Fig.1 BS8300 Min Door Width	835mm
Fig.66 BS8300 Min Door Width	728mm
Max Door Weight	<110kg
Power Adjustment	By Spring
Hold Open (not for fire doors)	○
Dimensions (including cover)	W269 x H69 x D40mm
Certification Compliance	
Certifire	✓
UKCA	✓
CE	✓
BS EN 1154	✓
BS EN 1634	✓
UL10C	-
UL228	✓
ANSI BHMA	-
EPD 3.09E+01 kg CO_2 eq	✓

Key: ✓ Yes - No ○ Option



For fitting instructions see website

rutlanduk.co.uk t. +44 (0)1246 261491 | e. sales@rutlanduk.co.uk

Figure 10. Details of item 14

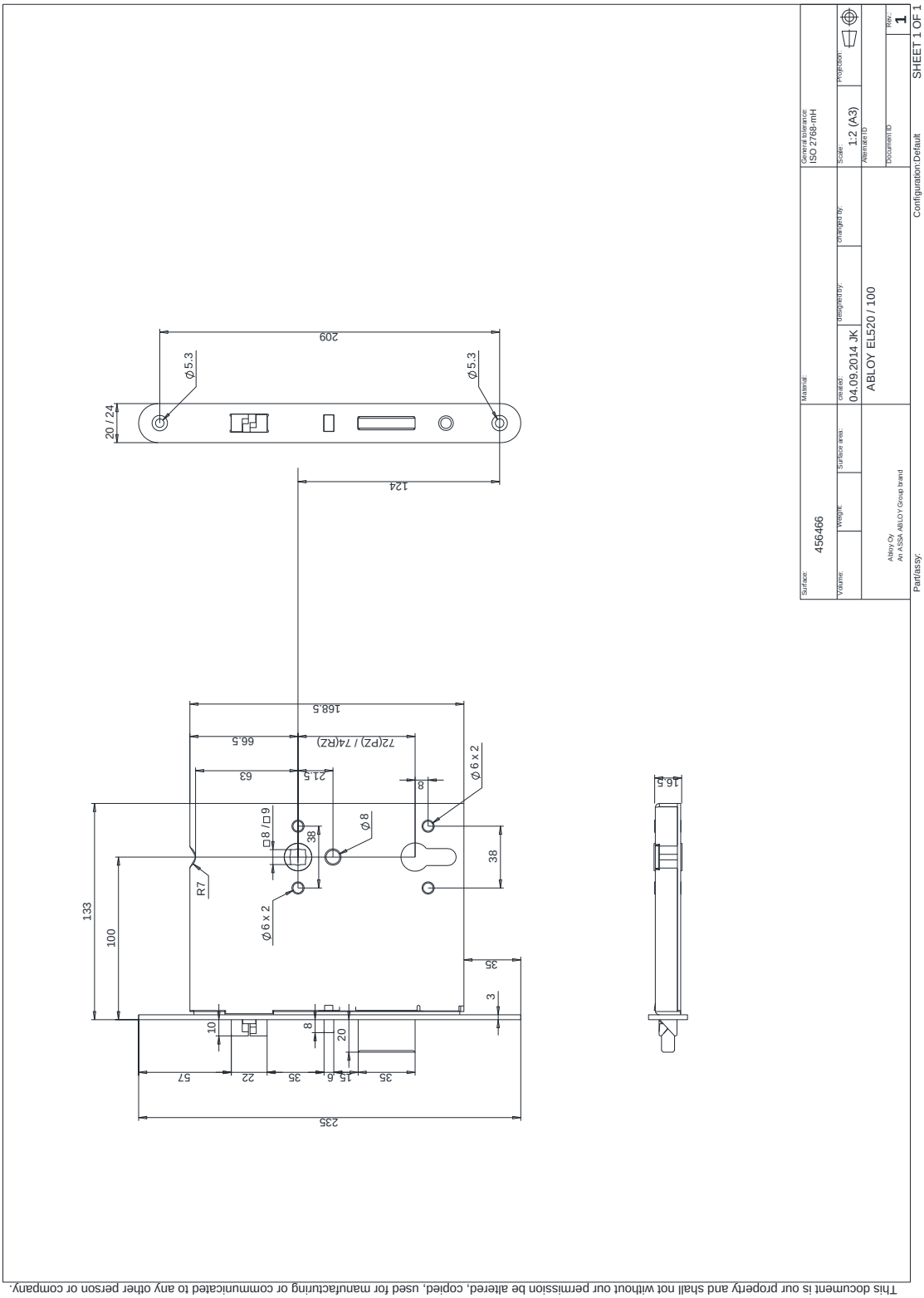


Figure 11. Details of item 15

ABLOY-EA280

CONCEALED DOOR LOOP

This product provides a neat way to conceal the transfer of cables from the frame to the door leaf. Ideal for use with motorised locks.

FEATURES

- Steel housing and flexible tube
- Invisible when door is closed
- Can be fitted to the door frame
- Reduces the risk of tampering
- Maximum cable bundle: 7.5mm dia
- Door opening up to 120°

TECHNICAL INFORMATION

- Dimensions: 323mm(H) x 24mm(W)
- Material: Steel
- Finish: Bright chrome
- For doors opening greater than 120° use product EA281

RELATED PRODUCTS

ABLOY-351-U80

ABLOY-EL561DK

SPDL03-WIRED

Figure 12. Details of item 18

Figure 13. Details of item 19

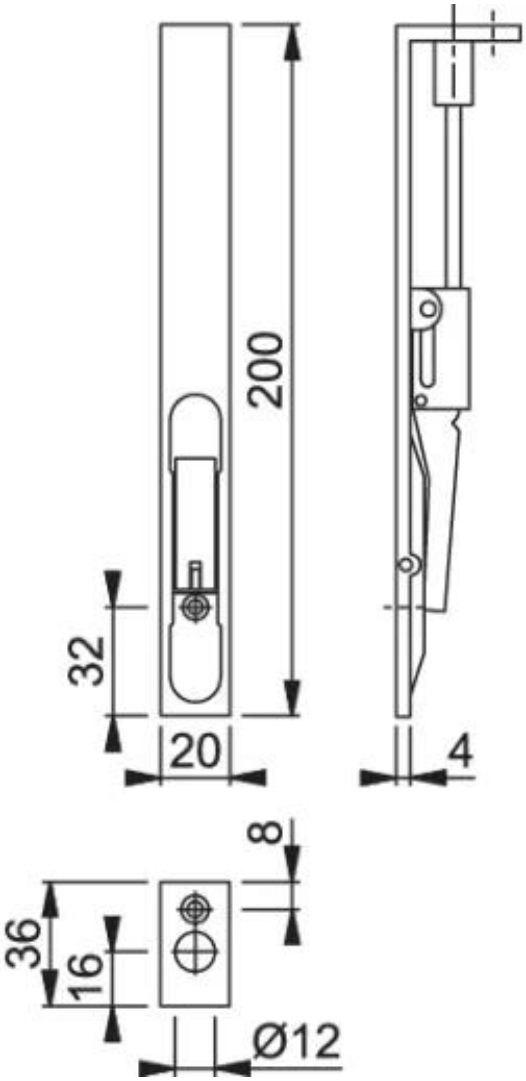


Figure 14. Details of item 20

STS 422 Door-bottom seal :16

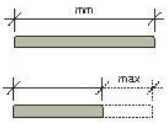
Characteristics / features

Product code	Size / Length	Colour(s)	Performance
STS 422 - "SIZE" See table below	VARIOUS See table below	N / A	ACOUSTIC - See STS data sheets :01 - :16

Characteristics / features

Protects against / Resisits	Fitting / installation	Material(s)
FIRE	See STS data sheet :17	Casing: ALUMINIUM (T60/60)
SMOKE		Seal: NEOPRENE/BUTYL
SOUND		Mechanism: STEEL/NYLON
DRAUGHT		
DUST		
INFESTATION		

Sizes

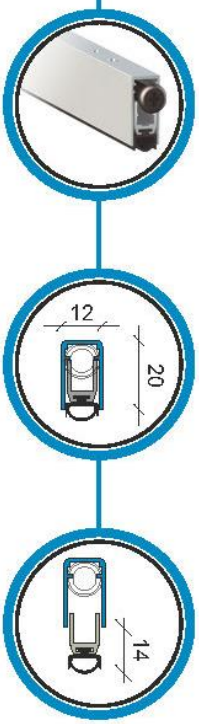


Product size (pre-cut) mm							
330	530	730	830	930	1030	1130	1330
70	200	200	200	200	200	200	200

Product cuts back by (maximum) mm

Please note

Pre-cut sizes are available at **925**mm, **825**mm & **725**mm to suit standard width doorsets.



Derwent House, Station Industrial Estate, Prudhoe, NE42 6NP. +44 (0)1661 830101 +44 (0)1661 897454 info@sealedlightsolutions.com www.sealedlightsolutions.com

Figure 15. Details of item 21

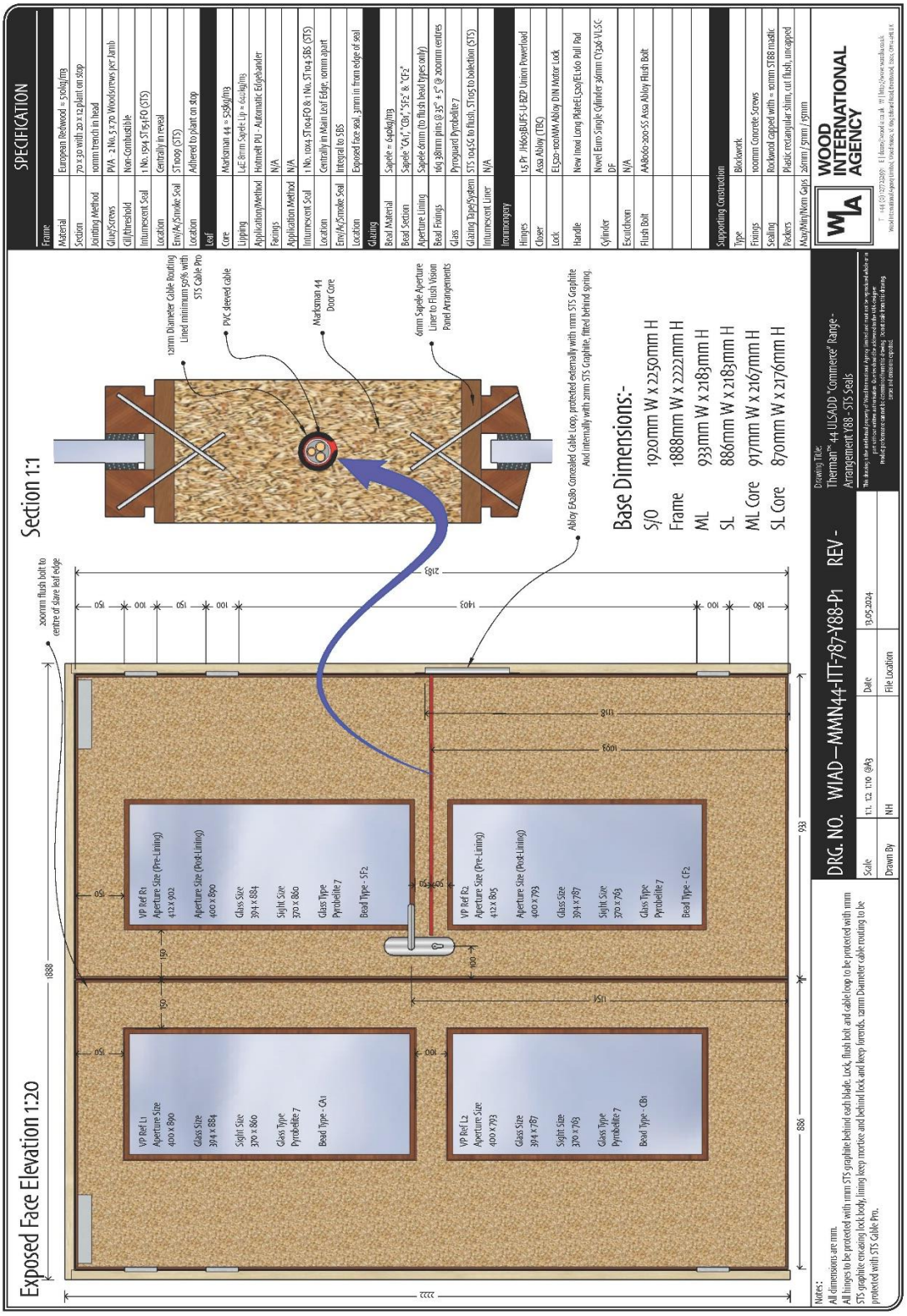


Figure 16. Client drawing WIAD-MMN44-ITT-787-Y88-P1

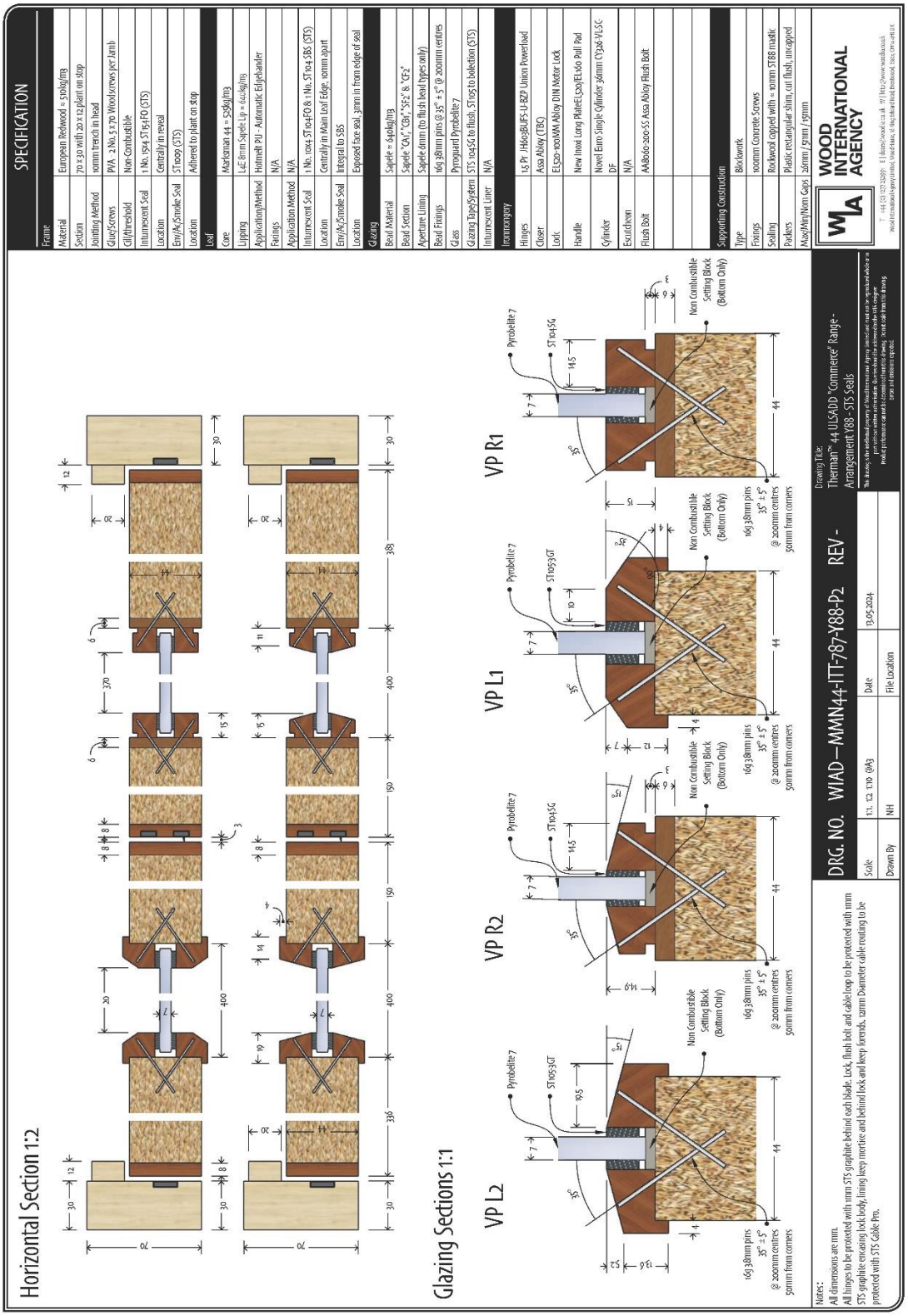


Figure 17. Client drawing WIAD-MMN44-ITT-787-Y88-P2

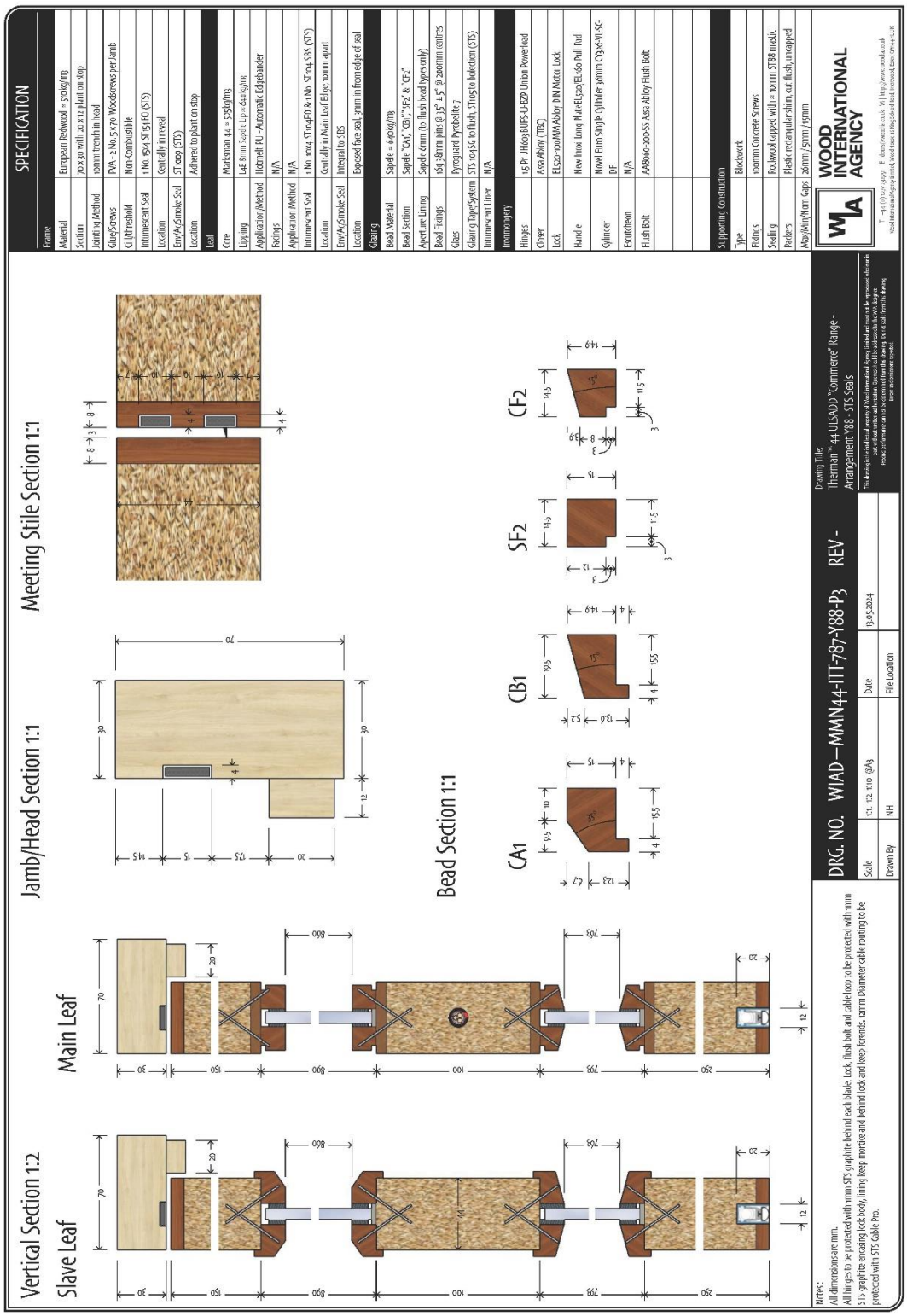


Figure 18. Client drawing WIAD-MMN44-ITT-787-Y88-P3

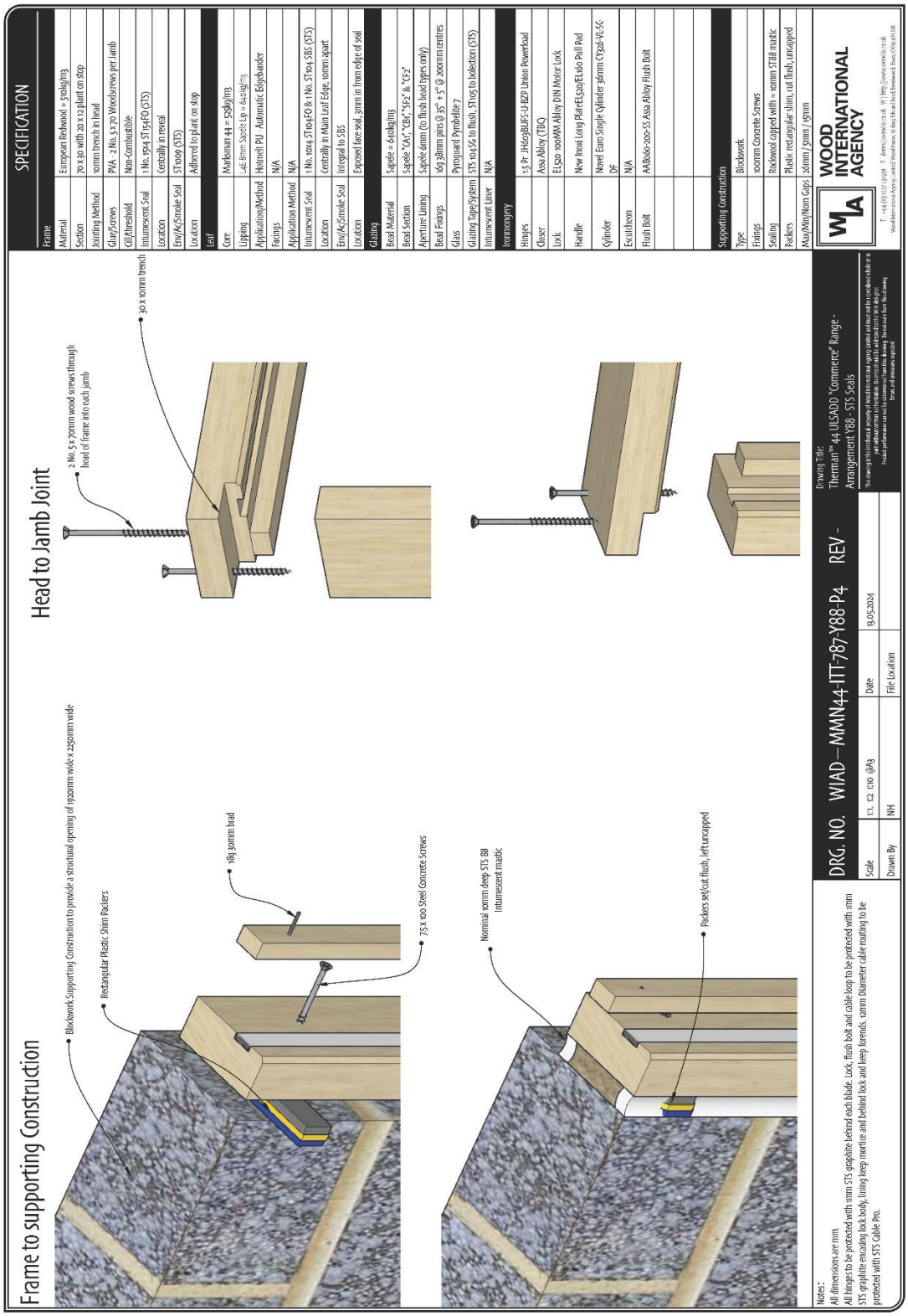


Figure 19. Client drawing WIAD-MMN44-ITT-787-Y88-P4

2.2 Schedule of components

Table 5 details the schedule of components which describes the test specimen and lists the components used in the construction of the test specimen. These were provided by the test sponsor and surveyed by Warringtonfire.

All measurements were verified by Warringtonfire unless stated otherwise in the schedule of components. All components marked with an "*" have not been verified by Warringtonfire.

Table 5 Schedule of components

1. Door frame (Door Assembly A)	
Supplier	Dezign Carpentry
Reference	Standard internal door casing
Material	European Redwood
Density	nominally (Measured 481kg/m3 during sampling)
Moisture content	9.6 %
Overall size	2222 mm x 1888 mm x 70 mm
Frame Head & Jambs	70 mm x 30 mm
Planted Stop	20 mm wide x 12 mm deep
Jamb to Head jointing method, fixing detail and location	Trench, using 70 mm long x 5 mm diameter countersunk head wood screws, through screwed and plugged
Stop fixing method, detail and location	Through fixed, using 18g 30 mm brad nails, 300 mm centres
2. **Frame Fixing Method to Supporting Construction**	
Manufacturer	RAWLPLUG
Reference	R-S1-FF-08100/12
Type & material	Zinc plated with Nylon Plug
Plug size	8 mm diameter x 100 mm
Screw size	4.8 mm diameter x 105 mm long
Spacing	
Location	150 mm from top of corner of jamb, no more than 600 mm centres
Packing Material	Rectangular plastic shim packer
Packing Material Dimensions	28 mm wide x various thicknesses to suit
Does the fixing penetrate intumescent seal within frame reveal	No
Frame to structural opening gaps	16 mm at jambs, 28 mm at head
Packing Material	
Door Head	Alkaline Earth Silicate Fibre Based Insulation
Door Jambs	Sealed Tight Solutions Intumescent Mastic

3. **Intumescent to frame reveal**	
Manufacturer	Sealed Tight Solutions
Reference	ST 154 FO
Material	PVC Encased Graphite
Overall section size	15 mm x 4 mm
Application method	Self-adhered into grooves within rebate of frame. Strips were interrupted at Hinges positions
Location (relative to the opening face of the door leaf)	15 mm In from Opening Face
Presence of Adhesives	Self-Adhesive
4. Smoke Seal	
Manufacturer	Sealed Tight Solutions
Reference	ST 1009
Material	Neoprene/Butyl
Overall section size	11 x 5
Application method	By hand- Self-adhesive tape applied to back of seal
Location	Affixed to stop upstand

Fire stopping

5. Frame to supporting construction fire stopping detail	
Manufacturer	Morgan Advanced Materials
Reference	Superwool Plus, Alkaline Earth Silicate Fibre Based Insulation
Material	High temperature insulation wool
Overall dimension	25 mm, uncompressed
Density	96 kg/m3 (stated)
Location	Door Head
6. **Sealant to fire stopping detail**	
Manufacturer	Sealed Tight Solutions
Reference	ST88
Material	Intumescent Mastic
Application method	Cartridge gunned around perimeter of the door frame to both faces
Location	Door Jambs

Door leaf

7. Active leaf	
Manufacturer	By Dezign Carpentry
Reference	Marksman 44
Glazing location relative to the head and closing edge	150 mm from the head of the leaf and 160 mm from the closing edge of the leaf
Overall leaf size supplied for testing	933 mm x 2183 mm x 44 mm, Operation: Opening towards furnace
8. **Static leaf**	
Manufacturer	By Dezign Carpentry
Reference	Marksman 44
Glazing location relative to the head and closing edge	150 mm from the head of the leaf and 160 mm from the closing edge of the leaf
Overall leaf size supplied for testing	886 mm x 2183 mm x 44 mm, Operation: opening towards furnace
9. **Core element**	
Manufacturer	Wood International Agency Limited
Reference	Marksman 44
Material	Graduated Density Particleboard
Thickness	44 mm
Density	Nominally 535 kg/m^3 Measured 518 - 543kg/m3 during sampling
Location	Centre of door leaf
Manufacturer	Wood International Agency Limited
10. **Lippings / Aperture Liner**	
Manufacturer	Lewis Aldridge Joinery Limited
Reference	Standard Lipping
Material	Sapele
Density	Nominally 640 kg/m^3 Measured 641-667kg/m3 during sampling
Moisture content	12-15%
Size - Lipping	44 mm wide x 8 mm thick
Size – Aperture lining	6 mm thick
Fixing method	Hotmelt PU – Automatic Edgebander
Location	Along the perimeter of both leaves
11. **Intumescent Seal to Door Leaf meeting edge [1]**	
Quantity	1no.
Manufacturer	Sealed Tight Solutions
Reference	ST 104 FL
Material	PVC encased graphite with butyl fin
Overall section size	10 mm x 4 mm
Application method	By hand- Self-adhesive tape applied to back of seal by supplier
Location	7mm from unexposed face, main leaf meeting stile only

12. **Intumescent Seal 2**	
Quantity	1no.
Manufacturer	Sealed Tight Solutions
Reference	ST 104 FO
Material	PVC encased graphite
Overall section size	10 mm x 4mm
Application method	By hand- Self-adhesive tape applied to back of seal by supplier
Location	27mm from unexposed face, main leaf meeting stile only

Hardware

13. Hinges	
Supplier	Union
Reference	Powerload JH603BUFS-U-BZP
Quantity	6
Primary material	Stainless Steel
Type	Grade 13 brushed bearing hinge.
Size	
a. knuckle	13mm diameter x 102mm high
b. blades	100 mm high x 88 mm wide (overall) x 3 mm thick
Fixings	
a. type	Countersunk head wood screws
b. material	Stainless Steel
c. sizes	4.6Ømm x 30mm long
d. number off per blade	5
Position of each hinge relative to the head of the leaf	150 mm, 400 mm, 1904
Details of intumescent protection	All hinges protected with 1mm Sealed Tight Solutions graphite behind each blade
Interruptions to Intumescent within the frame reveal	Union
14. **Door Closer**	
Manufacturer	Rutland
Reference	TS.9205BC.SRFB.SESE
Material	
Body	Cast Aluminium
Closer arm	Stainless Steel
Cover	Stainless Steel
Configuration	Scissor Arm Overhead Closer
Overall size	
Body	55mm high x 236mm wide x 39mm deep

Cover	69mm high x 269mm wide x 40mm deep
Fixing method	4 No. 4.5 x 50mm Woodscrews into face of door, 2 No. woodscrews into head of frame
15. **Lockset**	
Manufacturer	Abloy
Reference	EL520-100MM
Material	
Lockcase	Stainless Steel
Forend plate	Stainless Steel
Latch bolt	Stainless Steel
Lock bolt	Stainless Steel
Overall sizes	
Central Lockcase	168.5 mm high x 16.5mm wide x 133 mm deep
Forend plate	235mm high x 24mm wide x 3mm thick
Latch bolt	22mm high x 10.5 mm wide x 10mm projection
Lock bolt	35 mm high x 8mm wide x 20mm projection
Latch and lock operation	Unlatched and disengaged
Top and bottom lock case	N/A
Fixing method	2 No. 29mm long x 4mm Diameter Woodscrews
Operation of latch bolt	Passive Double Action Latch Bolt - Internal Handle/Forend Trigger
Operation of lock bolt	Cylinder/Motor
Intumescent protection	Sealed Tight Solutions
Thickness/material	1 mm graphite sheet, wrapped around lock case body and behind forend plate
16. **Keeps**	
Manufacturer	Abloy
Reference	EA322
Material	Stainless Steel
Overall sizes	
Centre Strike Plate	231mm high x 24mm wide x 3mm thick with 175mm x 17.5mm x 3mm strike
Fixing method	2 No. 25mm x 3.5mm Stainless Steel Woodscrews
Interruptions to Intumescent within the frame reveal	No seals present (seals are in main leaf meeting stile which leave ≈2.5mm seal either side of forend).
Intumescent protection	Sealed Tight Solutions
Thickness/material	1 mm graphite sheet lining morticed keeps
17. **Cylinder**	
Manufacturer	Abloy
Reference	Novel CY326-VL-SC-DF Euro single cylinder
Material	Stainless Steel
Overall size	33mm high x 17mm wide

18. **Concealed Cable Loop with Electrical Cable**	
Manufacturer	Abloy
Reference	EA280 Concealed Loop
Material	Stainless Steel body
Overall sizes	323mm high x 17mm deep x 24mm wide with 12 mm diameter hole for cable through door leaf
Location	Recessed into frame with 12mm diameter hole drilled Internally mid left hand leaf
Fixing method	2 No. 15x3.5 woodscrews
Details of intumescent protection	Abloy EA280 Concealed Cable Loop, casing protected externally with 1mm STS Graphite on all sides and behind forend plates. Casing protected internally with 2mm STS Graphite, fitted behind spring. 12mm Diameter Cable Routing Lined minimum 50% with STS Cable Pro
19. **Handle**	
Manufacturer	Abloy
Reference	INOXI Long Plate 3-19/242/115 PZBL
Material	Stainless Steel
Overall sizes	56 mm x 215 mm high x 6-11 mm thick
Location	1029 mm from head
Fixing method	4 No. bolt-through fixings 4.7 mm diameter
20. **Flush Bolt**	
Manufacturer	Hoppe UK
Reference	Arrone AR326B-200-R-SSS
Material	Stainless Steel
Overall sizes	203mm high x 35mm return x 20mm face
Location	Centrally in top of slave leaf meeting stile
Fixing method	2 No. 30mm x 3.5mm woodscrews
Latch and lock operation	Disengaged
Intumescent protection	Sealed Tight Solutions
Thickness/material	1 mm graphite lining mortice for flush bolt and keep, not visible once installed.
21. **Drop Down Seal**	
Manufacturer	Sealed Tight Solutions
Reference	ST 422
Material	Casing - Aluminium, Seal - Neoprene/Butyl, Mechanism - Steel/Nylon
Overall size	12 mm wide x 20 mm high
Fixing method	Casing is screwed into groove and mechanism is slid into casing

Glazing

22. **Vison Panel Ref L1**	
Manufacturer	AGC
Location	150 mm from the head of the Active Leaf and 150 mm from meeting edge of the Leaf
Reference	Pyrobelite 7
Thickness	7 mm
Bead Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Bead Fixings	16g 38 mm pins @ 200 mm centres
Bead Type	SF2
Aperture Lining	Sapele 6 mm
Glazing Tape	ST104 SG
Overall size glazing	394 mm x 884 mm
Overall Size of aperture	400 mm x 890 mm
Overall Size of sight	370 mm x 860 mm
23. **Vison Panel Ref L2**	
Manufacturer	AGC
Reference	Pyrobelite 7
Location	250 mm from the base of the passive leaf and 150 mm from the meeting edge of the leaf
Thickness	7 mm
Bead Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Bead Fixings	16g 38 mm pins @ 200 mm centres
Bead Type	CB1
Glazing Tape 2	ST105GT(3)
Overall glazing size	394 mm x 787 mm
Overall aperture size	400 mm x 793 mm
Overall Size of sight	370 mm x 763 mm

24. **Vison Panel Ref R1**	
Manufacturer	AGC
Location	150 mm from the head of the passive leaf and 150 mm from edge of the leaf
Reference	Pyrobelite 7
Thickness	7 mm
Bead Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Bead Fixings	16g 38 mm pins @ 200 mm centres
Bead type	CA1
Aperture Lining	None
Glazing Tape	ST105GT(3)
Overall size glazing	394 mm x 884 mm
Overall Size of aperture	400 mm x 890 mm
Overall Size of sight	370 mm x 860 mm
25. **Vison Panel Ref R2**	
Manufacturer	AGC
Reference	Pyrobelite 7
Location	250 mm from the base of the active leaf and 150 mm from meeting edge of the leaf
Thickness	7 mm
Bead Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Bead Fixings	16g 38 mm pins @ 200 mm centres
Bead Type	CF2
Aperture Lining	Sapele 6 mm
Glazing Tape	ST104 SG
Overall size glazing	394 mm x 787 mm
Overall Size of aperture	400 mm x 793 mm
Overall Size of sight	370 mm x 763 mm
26. **Glazing Tape 105**	
Manufacturer	Sealed Tight Solutions
Reference	ST105GT(3)
Material	Closed cell foam
Overall sizes	9 x 3
Location	Between bead and face of glass
27. **Glazing Tape 104**	
Manufacturer	Sealed Tight Solutions
Reference	ST104SG
Material	Graphite with Nitrile carrier and cap
Overall sizes	16.5x5
Location	Glazing cavity

28. **Pins**	
Manufacturer	Montana
Reference	FN14X38GF
Material	Stainless steel
Overall sizes	16g x 38 mm
Location	200 mm centres, 50 mm from corners
29. **Non-combustible setting out block**	
Type	Non-combustible setting out block
Material	Calcium Silicate
Overall sizes	50 mm x 10 mm x 3 mm
Location	As required, generally to bottom and sides of glass
30. **Bead Profile 1**	
Reference	CB1
Material	Sapele
Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Moisture Content	8 – 12 nominal
Overall size	19.5 mm wide 18.8 mm deep
Fixing Method	Pneumatically fired steel brads
Fixing distances from corners centres and angle of face of glass	50 mm from corners, 200 mm centres and at 35 degrees to face of glass
31. **Bead Profile 2**	
Reference	CF2
Material	Sapele
Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Moisture Content	8 – 12 nominal
Overall size	14.5 mm wide 14.9 mm deep
Fixing Method	Pneumatically fired steel brads
Fixing distances from corners centres and angle of face of glass	50 mm from corners, 200 mm centres and at 35 degrees to face of glass
32. **Bead Profile 3**	
Reference	CA1
Material	Sapele
Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Moisture Content	8 – 12 nominal
Overall size	19.0 mm wide 20 mm deep
Fixing Method	Pneumatically fired steel brads
Fixing distances from corners centres and angle of face of glass	50 mm from corners, 200 mm centres and at 35 degrees to face of glass
33. **Bead Profile 4**	
Reference	SF2
Material	Sapele

Density	Nominally 640 kg/m3 Measured 549-706kg/m3
Moisture Content	8 – 12 nominal
Overall size	15 mm wide 14.5 mm deep
Fixing Method	Pneumatically fired steel brads
Fixing distances from corners centres and angle of face of glass	50 mm from corners, 200 mm centres and at 35 degrees to face of glass

Supporting Construction

34. **AAC Concrete Lintel**	
Type	Steel reinforced concrete lintel
Material	Steel reinforced autoclaved aerated concrete
Density	670 kg/m3
Thickness	150 mm
Overall size	
Size 1	150 mm wide x 250 mm high x 3000 mm long
35. **Lightweight Blockwork**	
Manufacturer	THERMALITE
Reference	THERMALITE Shield
Material	Lightweight concrete blocks
Thickness	150 mm wide x 215 mm high x 440 mm long
Density	946 ~ 960 kg/m^3 (measured)
Fixing method	Ordinary sand/cement mortar, mix 3:1

2.3 Supporting construction

Table 6 details the supporting construction used for this fire resistance test.

Table 6 Supporting construction

Item	Detail		
Supporting construction	150 mm thick low-density concrete wall with a low-density concrete lintel at the head.		
Dimensions	Width	3050 mm	
	Height	3050 mm	
	Thickness	150 mm	
Aperture dimensions		**Width**	**Height**
	Doorset A	1920 mm	2242 mm
Restraint conditions	Restrained on all edges		

3. Test procedure

Table 7 details the test procedure for this fire resistance test.

Table 7 Test procedure

Item	Detail		
Test standard	The test was performed in accordance with BS 476-20:1987 and BS 476-22:1987 Clause 8 determination of fire resistance of Uninsulated doorsets and shutter assemblies.		
Fire Test Study Group (FTSG) resolutions	Certain aspects of some fire test specifications are open to different interpretations. FTSG have identified a number of these areas and have agreed on resolutions which define a common agreement of interpretations between fire test laboratories that are members of the group. If such resolutions apply to this test, they have been followed.		
Deviations from test method	None		
Instrumentation and equipment	The instrumentation was provided in accordance with BS 476-20:1987 and BS 476-22:1987 as follows: • The specimen temperature was measured by nine mineral insulated metal sheathed (MIMS) Type K thermocouples – with wire diameters not greater than 0.5 mm, an overall diameter of 1.5 mm, and the measuring junction insulated from the sheath. The thermocouples protruded a minimum of 25 mm from steel supporting tubes. • The unexposed side specimen temperatures were measured by Type K thermocouples with wire diameters less than 0.5 mm soldered to 12 mm diameter × 0.2 mm thick copper discs covered by 30 mm × 30 mm × 2.0 mm thick inorganic insulating pads.		
Pre-test conditioning	The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 6 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 18°C to 29°C and 25% to 68.5% respectively.		
Pre-test measurements		**Doorset A - left**	
	Opening force	69.2 N	
	Closing force	20.9 N	
	Latching force	15.9 N	
	Distance from hinge	830 m	
		Doorset A - right	
	Opening force	70.9 N	
	Closing force	19.6 N	
	Distance from hinge	830 m	
Installation details	Delivery date of the test specimen		21 May 2024
	Start date for construction of supporting construction		17 May 2024
	Completion date for construction of supporting construction		20 May 2024
	Start date for installation of test specimen		21 May 2024

Item	Detail		
	Completion date for installation of test specimen	21 May 2024	
	Supporting construction constructed by	Representatives of Warringtonfire	
	Doorset installed by	Representatives of the test sponsor	
Symmetry	Asymmetrical: • Doorset A opened into the furnace. The direction of exposure was decided by the test sponsor.		
Ambient laboratory temperature	Start of the test	22.0 °C	
	Minimum temperature	21.0 °C	
	Maximum temperature	22.0 °C	
Sampling / specimen selection	Warringtonfire was not involved in the sampling of the tested specimen or any of the components. The results obtained during the test only apply to the test samples as provided by the test sponsor.		
	Component	Sampling date	Sampling Number
	Doorset	SC24097T	14/5/2024-21/05/2024

4. Test measurements and results

Table 8 summarises the results achieved by the test specimen against the performance criteria listed in BS 476-20:1987 and BS 476-22:1987 Clause 8 determination of fire resistance of Uninsulated doorsets and shutter assemblies for the following parameters:

- Integrity – It is required that there is no collapse of the specimen, no sustained flaming on the unexposed surface and no loss of impermeability.
- Insulation – The mean temperature rise of the unexposed surface must not be greater than 140°C and the maximum temperature rise must not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure.
- Radiation – A water-cooled foil heat flux meter was used to record the heat radiation from the doorset, the heat flux meter was positioned at a distance of 2445 mm from the doorset, so that the angle of view circumscribed the diagonal of the doorset.

Appendix A includes observations of any significant behaviour of the specimen and details of the occurrence of the relevant performance criteria.

Appendix B details the location of the instrumentation used during the test.

Appendix C includes details of the measurements taken during the test, including the radiation measurements.

Appendix D includes photographs of the test specimen before, during and after the test.

Table 8 Detailed test results

Criteria	Doorset A
Integrity	**35 minutes**
Sustained flaming	35 minutes
Failure with gap gauge	No integrity failure for this criteria at the termination of the test
Cotton pad failure	No integrity failure for this criteria at the termination of the test
Notes:	
The test results for the specimen only apply to the tested orientation. The test was discontinued after 39 minutes. '*' indicates failure due to integrity failure.	

5. Application of test results

5.1 Validity

This document is the original version of this test report and is written in English. In case of doubt, the original version prevails over a translation. This document is issued subject to Warringtonfire's standard terms and conditions, which are available at: *Terms and Conditions | Element*.

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criteria for assessing the potential fire hazard of the product in use, nor can the results be extrapolated and applied to other products.

Reports are statements of fact(s) prepared in accordance with the referenced version of the standard(s) stated in Section 3 of this report. Reports are based upon the information provided to Warringtonfire. Warringtonfire takes no responsibility for the accuracy or completeness of such information.

The results stated in this report apply to the test specimens as received.

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS 476-20: 1987 and BS 476-22: 1987.

Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

Any differences in relation to the aforementioned characteristics may significantly affect the performance and will therefore invalidate the application of the test results to the variant product. It is recommended that any proposed variation to the tested configuration or product should be referred to the test sponsor. The test sponsor should then obtain appropriate documentary evidence of compliance from Warringtonfire or another accredited testing authority. The supplier of the product is responsible for ensuring that the product which is supplied for use is identical to the test specimens that were tested.

The specification and the interpretation of fire test methods are both the subject of ongoing development and refinement. Changes in the applicability of the results of tests in relation to associated legislation may also occur. For these reasons the currency and the relevance of test reports should be considered by the user.

The test report also relates only to the sample(s) of the product submitted to the test. The laboratory accepts no responsibility for the representativeness of the test specimens unless so stated in the test report.

Confidence that the product that is supplied to the market will have the performance indicated in the test report can be supported by use of third-party certification schemes.

5.2 Uncertainty of measurement

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

Appendix A Test observations

Table 9 shows the observations of any significant behaviour of the specimen during the test.

Table 9 Test observations

Min	Sec	Observation
00	**00**	**Commencement of test**
03	58	Audible cracking can be heard from glazing.
04	10	Glazing is turning opaque.
05	00	Doorset unrestrained
05	15	Glazing bubbling and reacting.
13	15	Smoke releasing has worsened across whole specimen. Top meeting edge discoloured black
29	30	Glazing head of the meeting edge.
34	40	Flicker of flame at head of meeting edge.
35	**00**	**Sustained flaming top meeting edge.**
36	00	Flicker of flame at the top right glazing panel.
39	**00**	**End of test**

Appendix B Instrumentation locations

Figure 1 shows the instrumentation locations for this fire resistance test.

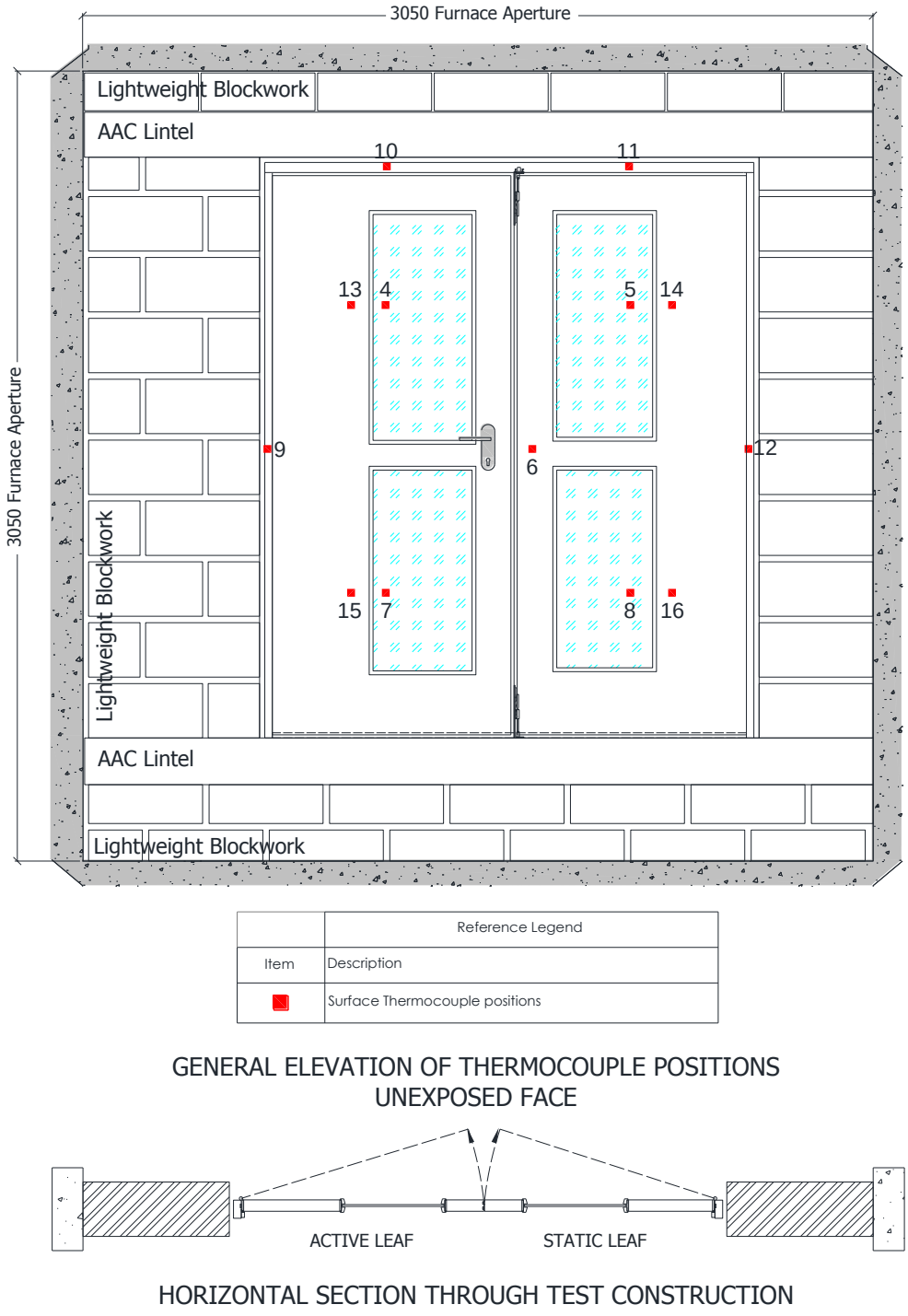


Figure 1 Instrumentation locations

Appendix C Test data

C.1 Furnace temperature and deviation

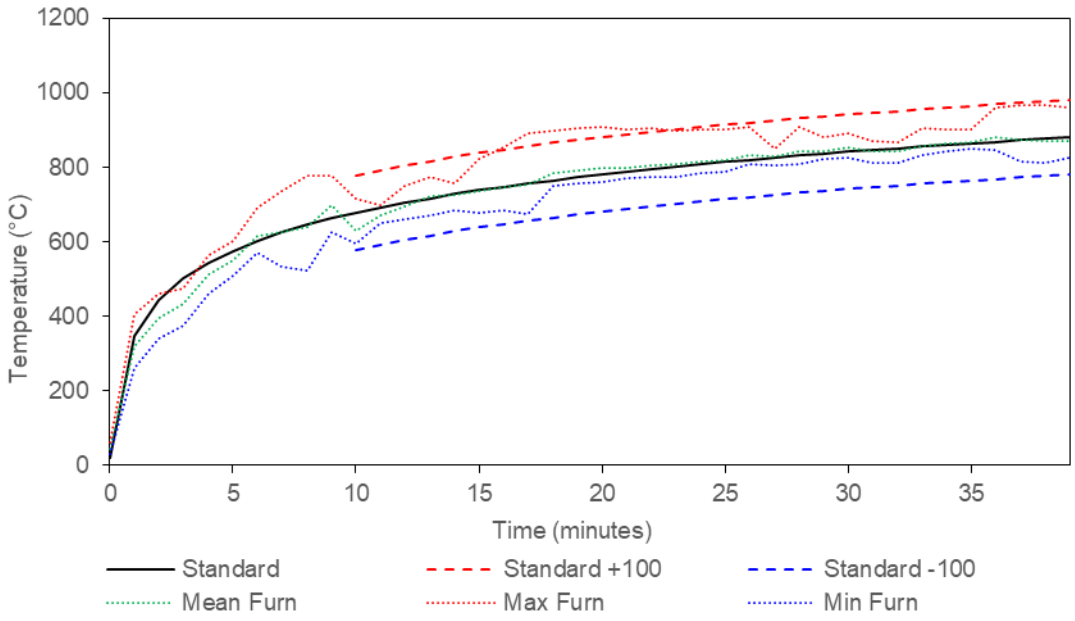


Figure Furnace thermocouple temperature vs time

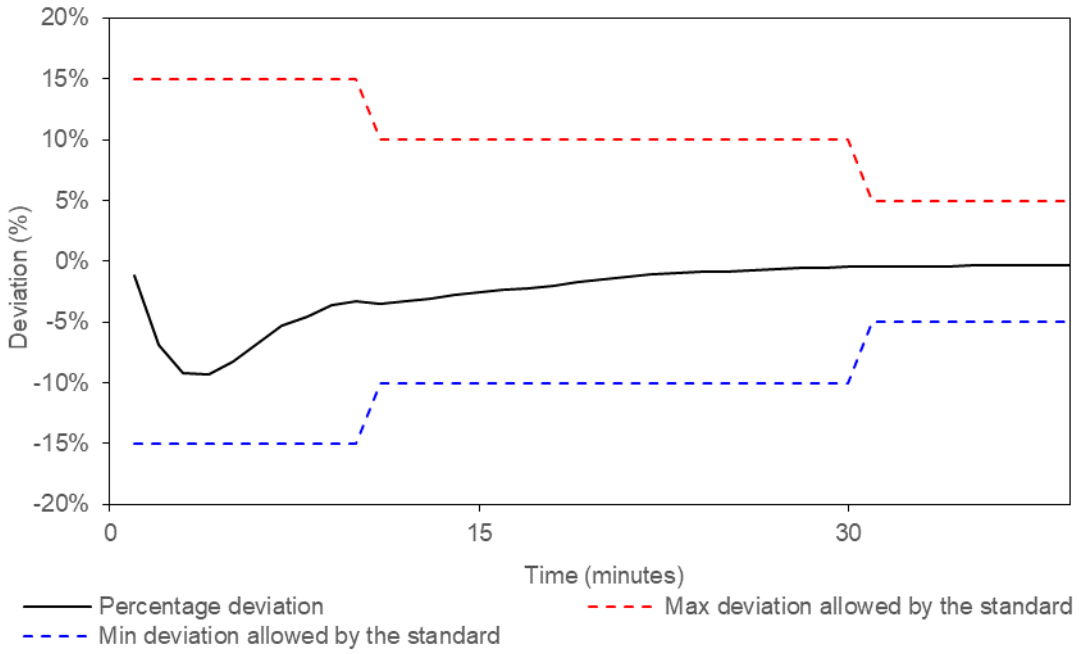


Figure 2 **Percentage deviation of exposure severity vs time**

C.2 Furnace pressure

The furnace pressure was taken at 2150 mm above the sill of the test specimen.

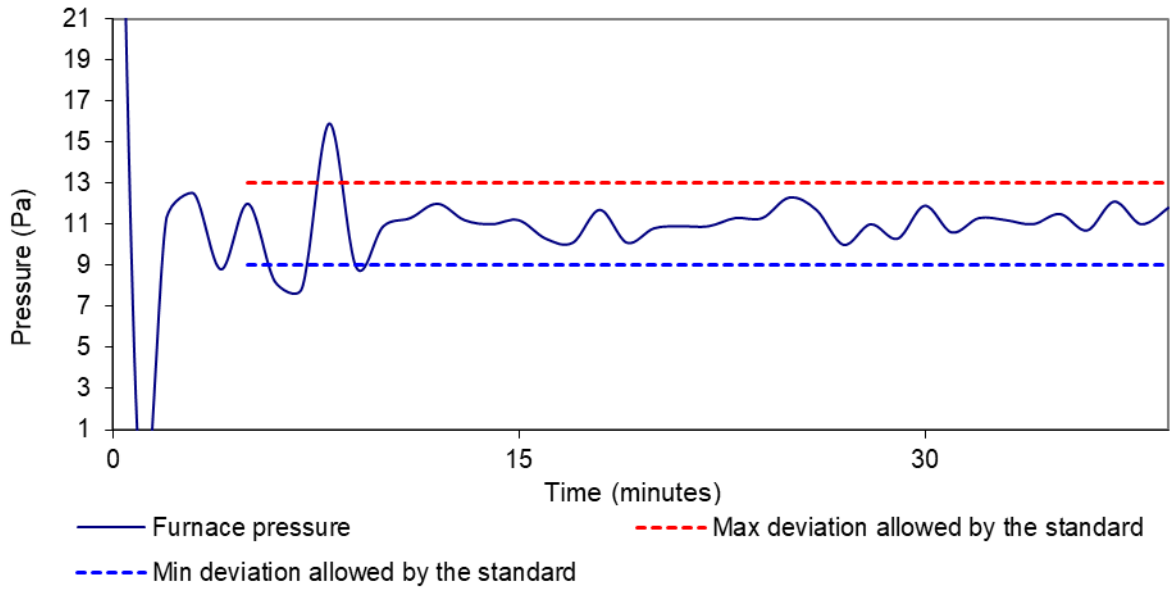


Figure 3 Furnace pressure

C.3 Specimen temperatures

Table 10 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Doorset

Time (mins)	Tc 006 (°C)	Tc 013 (°C)	Tc 014 (°C)	Tc 015 (°C)	Tc 016 (°C)	Average (°C)
0	26.0	32.0	32.0	24.0	28.0	28.4
2	26.0	32.0	32.0	24.0	28.0	28.4
4	26.0	32.0	32.0	24.0	28.0	28.4
6	27.0	32.0	34.0	26.0	29.0	29.6
8	28.0	34.0	34.0	28.0	29.0	30.6
10	29.0	34.0	35.0	26.0	30.0	30.8
12	36.0	36.0	41.0	25.0	36.0	34.8
14	43.0	40.0	50.0	29.0	45.0	41.4
16	44.0	47.0	58.0	31.0	53.0	46.6
18	47.0	53.0	64.0	34.0	58.0	51.2
20	50.0	58.0	69.0	34.0	63.0	54.8
22	54.0	62.0	72.0	32.0	66.0	57.2
24	59.0	66.0	74.0	39.0	68.0	61.2
26	66.0	69.0	75.0	36.0	70.0	63.2
28	74.0	72.0	76.0	45.0	71.0	67.6
30	83.0	75.0	76.0	50.0	72.0	71.2
32	86.0	76.0	77.0	45.0	73.0	71.4
34	86.0	78.0	78.0	47.0	74.0	72.6
36	88.0	79.0	79.0	46.0	75.0	73.4
38	91.0	80.0	80.0	42.0	76.0	73.8
39	91.0	81.0	81.0	45.0	77.0	75.0

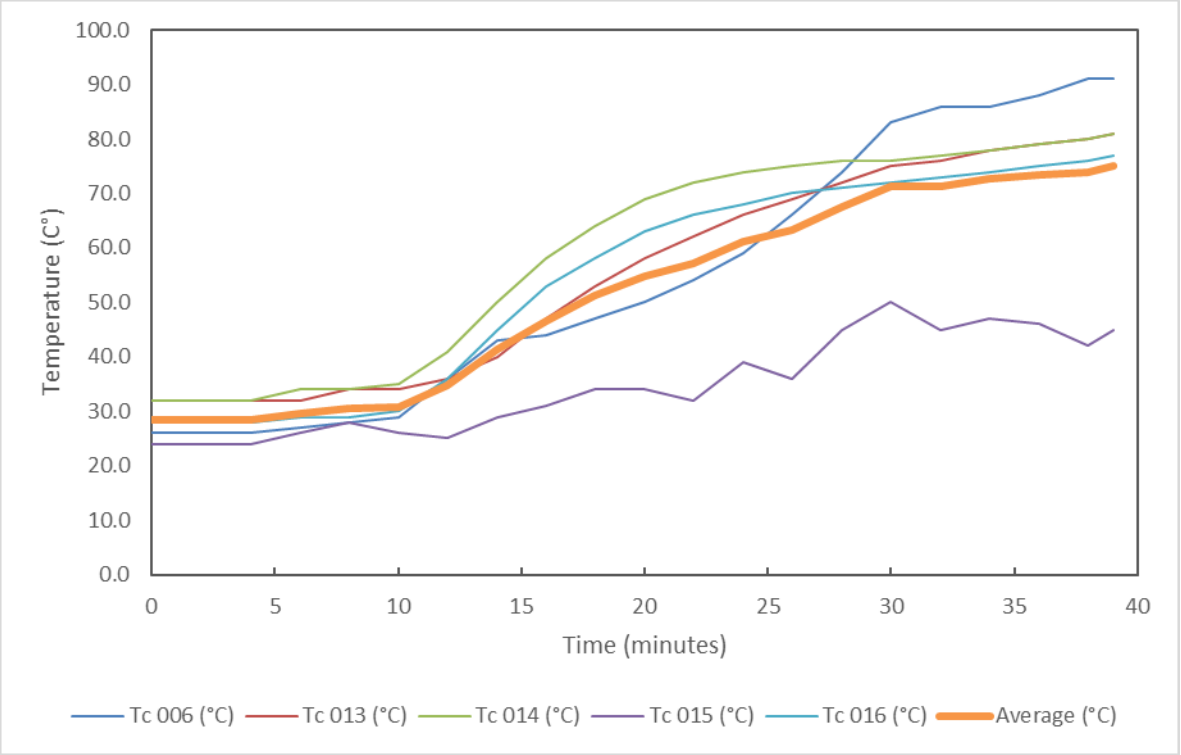


Figure 4 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Doorset

Table 11 Individual Temperatures Recorded On The Unexposed Surface Of The Door Frame

Time (mins)	Tc 009 (°C)	Tc 010 (°C)	Tc 011 (°C)	Tc 012 (°C)
0	27.0	29.0	30.0	28.0
2	27.0	30.0	30.0	28.0
4	27.0	30.0	31.0	28.0
6	27.0	39.0	36.0	28.0
8	27.0	44.0	38.0	28.0
10	27.0	45.0	39.0	28.0
12	28.0	44.0	40.0	29.0
14	28.0	46.0	42.0	29.0
16	29.0	48.0	43.0	30.0
18	29.0	51.0	46.0	32.0
20	31.0	54.0	49.0	33.0
22	32.0	57.0	54.0	36.0
24	34.0	62.0	57.0	38.0
26	37.0	66.0	61.0	41.0
28	40.0	70.0	64.0	43.0
30	43.0	74.0	67.0	46.0
32	45.0	78.0	72.0	48.0
34	48.0	81.0	82.0	51.0
36	50.0	84.0	93.0	52.0
38	53.0	82.0	105.0	54.0
39	54.0	79.0	112.0	55.0

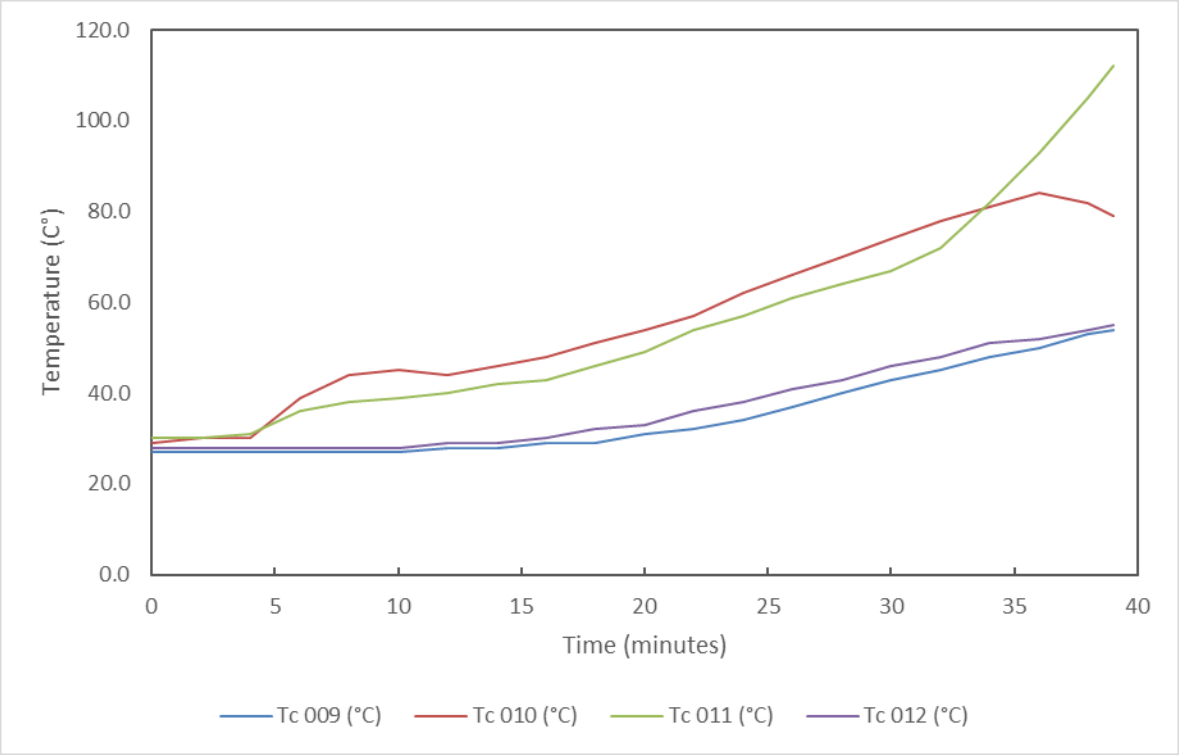


Figure 5 Individual Temperatures Recorded On The Unexposed Surface Of The Door Frame

Table 12 Individual Temperatures Recorded On The Unexposed Surface Of The Glazing

Time (mins)	Tc 004 (°C)	Tc 005 (°C)	Tc 007 (°C)	Tc 008 (°C)
0	32.0	33.0	30.0	34.0
2	51.0	54.0	47.0	52.0
4	88.0	93.0	86.0	95.0
6	110.0	118.0	118.0	115.0
8	112.0	129.0	126.0	117.0
10	122.0	150.0	141.0	133.0
12	135.0	164.0	158.0	155.0
14	146.0	179.0	175.0	163.0
16	160.0	206.0	195.0	180.0
18	180.0	241.0	222.0	207.0
20	206.0	280.0	256.0	241.0
22	236.0	318.0	290.0	276.0
24	260.0	347.0	319.0	307.0
26	280.0	375.0	341.0	331.0
28	296.0	393.0	363.0	354.0
30	310.0	398.0	385.0	378.0
32	320.0	403.0	395.0	388.0
34	326.0	406.0	397.0	392.0
36	334.0	415.0	403.0	397.0
38	342.0	424.0	407.0	400.0
39	343.0	426.0	408.0	400.0

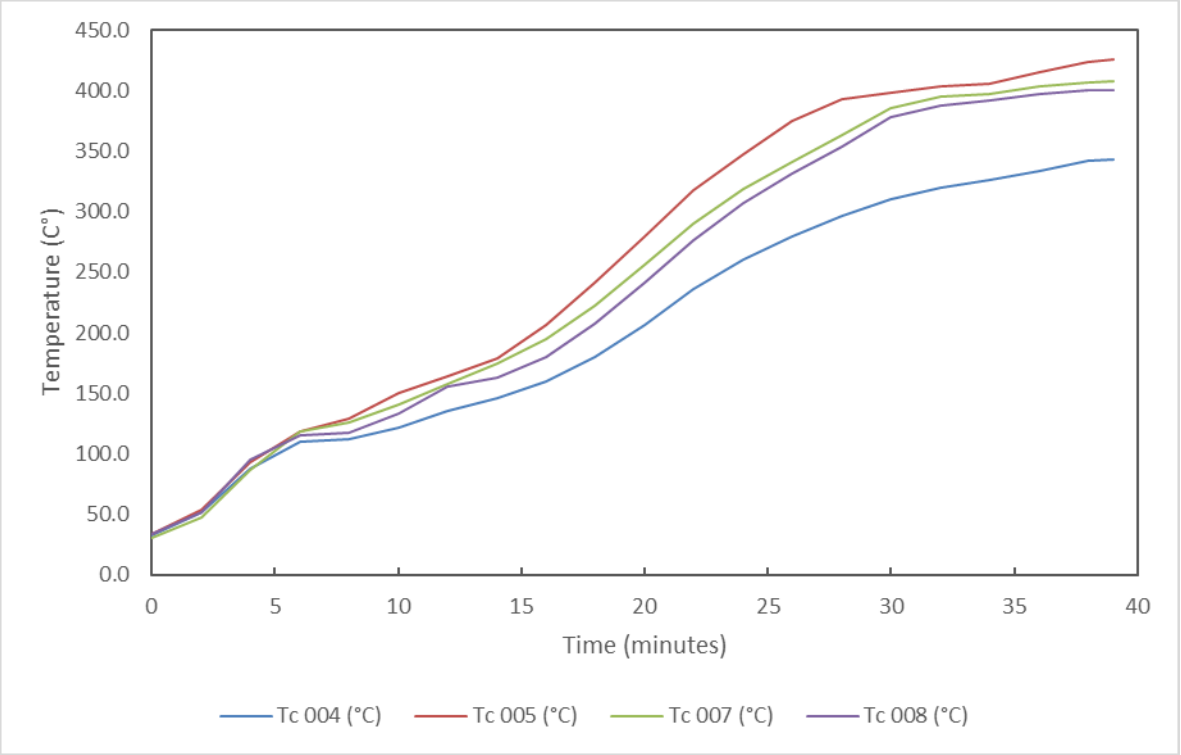


Figure 6 Individual Temperatures Recorded On The Unexposed Surface Of The Glazing

C.4 Specimen deflections

Table 13 details the deflection measurements of the test specimen at locations given in Figure 7.

Negative measurements show movement of the test specimen away from the furnace. Positive measurements show movement of the test specimen towards the furnace.

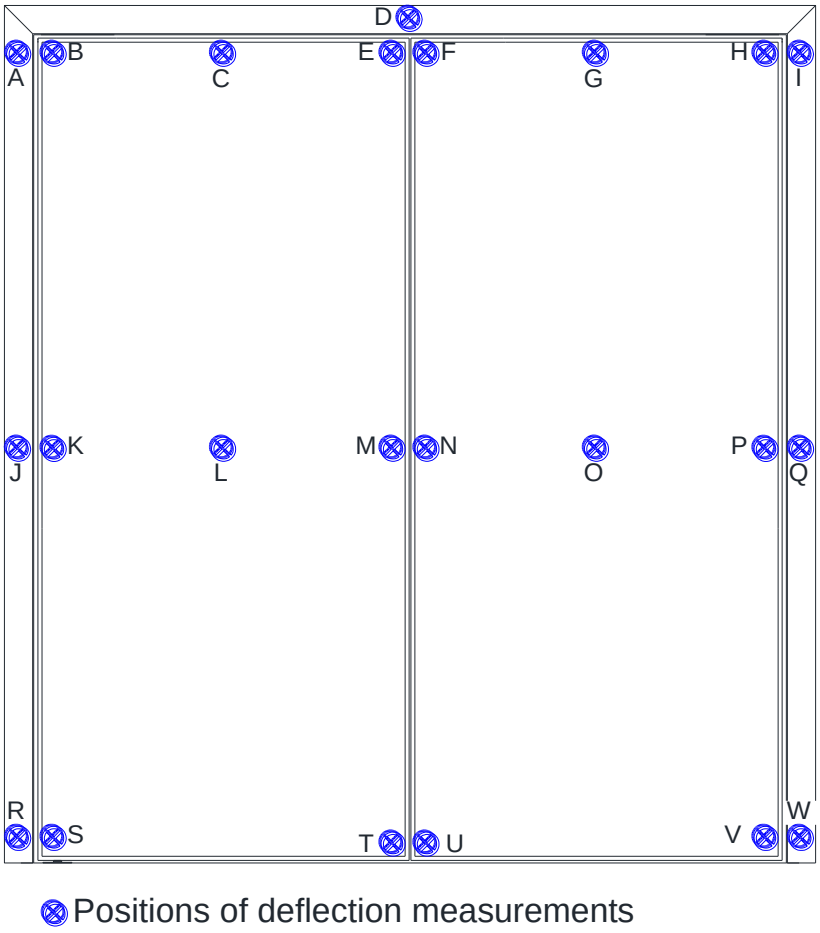


Figure 7 Position of deflection measurements

Table 13 Deflections – Doorset A

Deflections (mm)																
Time (mins)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	3	0	-2	10	4	2	-1	4	-2	0	-3	-2	-4	-6	-7	-7
10	2	-1	-4	3	11	2	-1	2	-6	-2	-6	-7	-9	-13	-16	-5
15	5	0	-4	6	6	7	-2	5	-1	-3	-3	-11	-6	-14	-8	-7
20	5	0	-4	12	5	10	4	-1	-3	-4	-3	-15	-14	-11	-5	-2
25	11	1	-2	13	3	7	2	16	-3	-5	-3	-15	-16	-14	-11	-5
30	10	-15	-5	10	5	-3	-2	17	-4	-5	-6	-24	-21	-21	-17	3
35	8	3	-7	-19	-29	4	6	20	-7	-5	-8	-22	-39	-35	-31	*
Max	11	-15	-7	-19	-29	10	6	20	-7	-5	-8	-24	-39	-11	-31	-7

Deflections (mm)							
Time (mins)	Q	R	S	T	U	V	W
0	0	0	0	0	0	0	0
5	-1	-3	1	10	-4	5	-2
10	0	-1	1	5	-3	2	1
15	-6	-3	2	5	-5	1	-3
20	0	-2	2	14	0	14	-1
25	0	-2	5	0	-3	5	3
30	-1	12	2	0	6	14	2
35	*	*	*	*	*	*	*
Max	-6	12	5	-14	6	14	3

C.5 Heat flux measurements

The heat flux was measured 2445 mm away from the specimen and is based on the maximum levels.

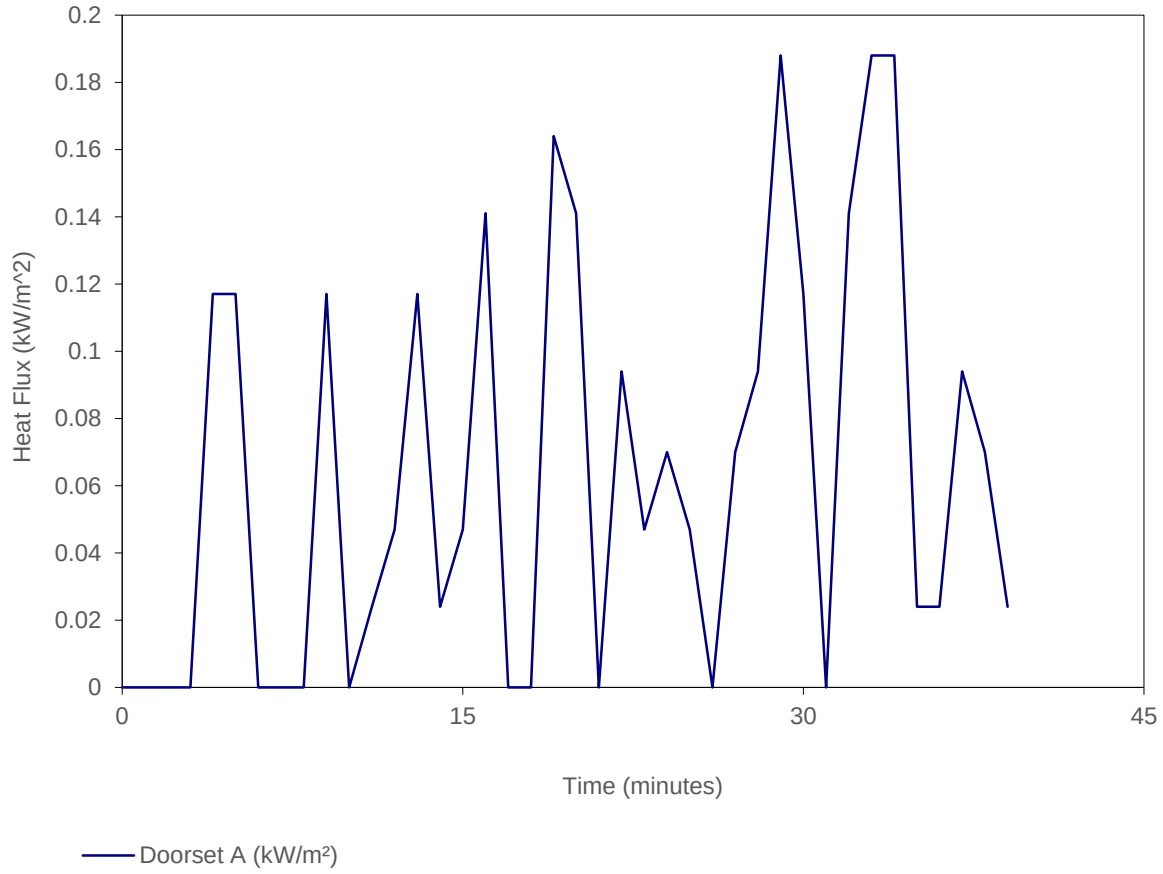


Figure 8 Heat flux measurements of the test specimen vs time

Table 14 Heat flux measurements of the test specimen vs time

Time (mins)	Doorset A (kW/m²)
0	0
2	0
4	0.117
6	0
8	0
10	0
12	0.047
14	0.024
16	0.141
18	0
20	0.141
22	0.094
24	0.07
26	0
28	0.094
30	0.117
32	0.141
34	0.188
36	0.024
38	0.07
39	0.024

C.6 Gap measurements

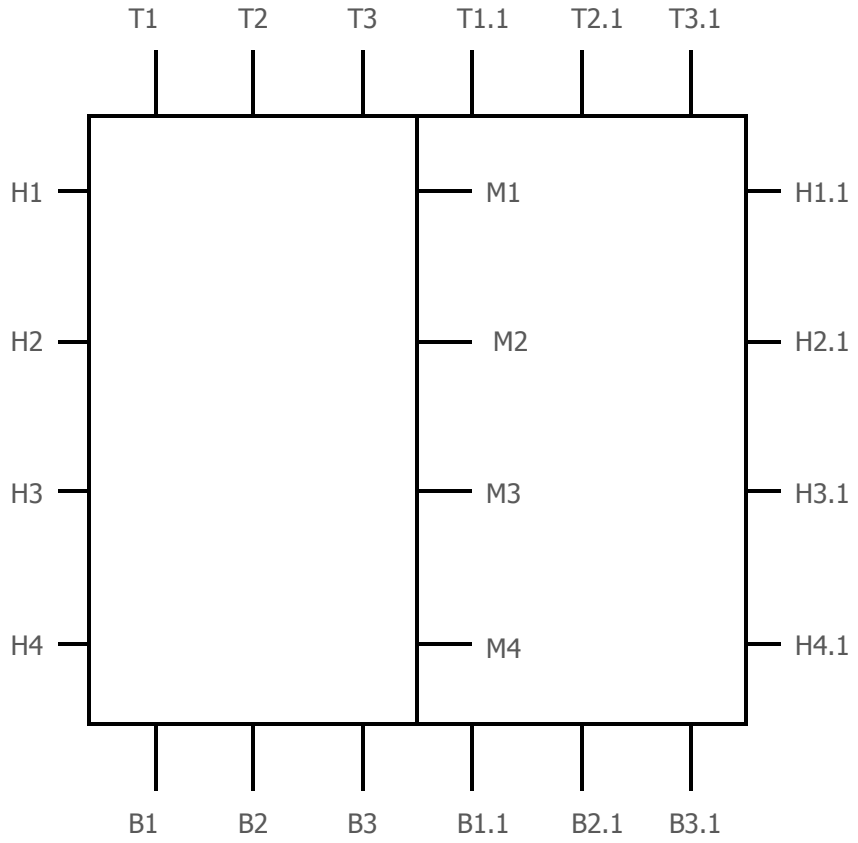


Figure 9 Gap measurements, Doorset A (unexposed side shown)

Table 15 Measured and calculated gap sizes for Doorset A

Doorset A (mm)							
Left hinge side	**Primary**	**Leaf to stop**	**Right hinge side**	**Primary**	**Leaf to stop**	**Meeting edge**	**Primary**
LH1	2.99	1.30	RH1	3.51	0.97	M1	2.73
LH2	2.94	1.41	RH2	2.56	1.80	M2	2.96
LH3	3.05	2.00	RH3	3.11	1.04	M3	2.99
LH4	2.25	1.50	RH4	2.21	1.52	M4	2.79
Mean	2.8		**Mean**	2.8		**Mean**	2.9
Max	3.1		**Max**	3.5		**Max**	3.0
Min	2.3		**Min**	2.2		**Min**	2.7
Top edge	**Primary**	**Leaf to stop**	**Threshold**	**Primary**			
T1	4.10	1.12	B1	3.83			
T2	3.06	1.47	B2	4.02			
T3	2.74	1.50	B3	2.69			
T4	1.95	1.70	B4	3.71			
T5	2.07	1.81	B5	3.57			
T6	3.52	1.03	B6	3.65			
Mean	2.9		**Mean**	3.6			
Max	4.1		**Max**	4.0			
Min	2.0		**Min**	2.7			

Appendix D Photographs

Figure 10 Unexposed face of the specimen before the start of the test

Figure 11 Exposed face of the specimen before the start of the test

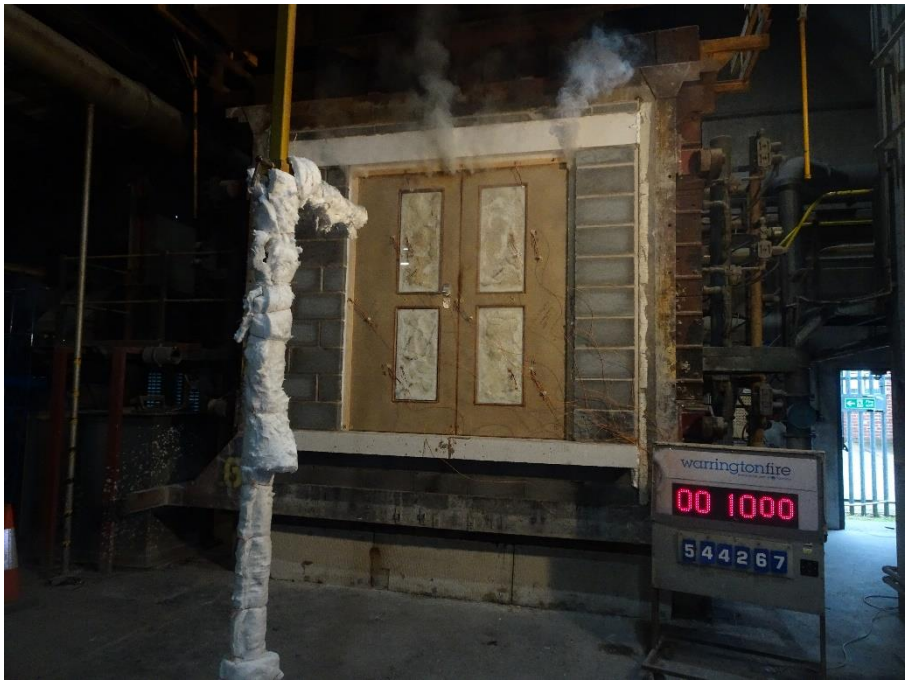


Figure 12 Unexposed face of the specimen at 10 minutes of testing

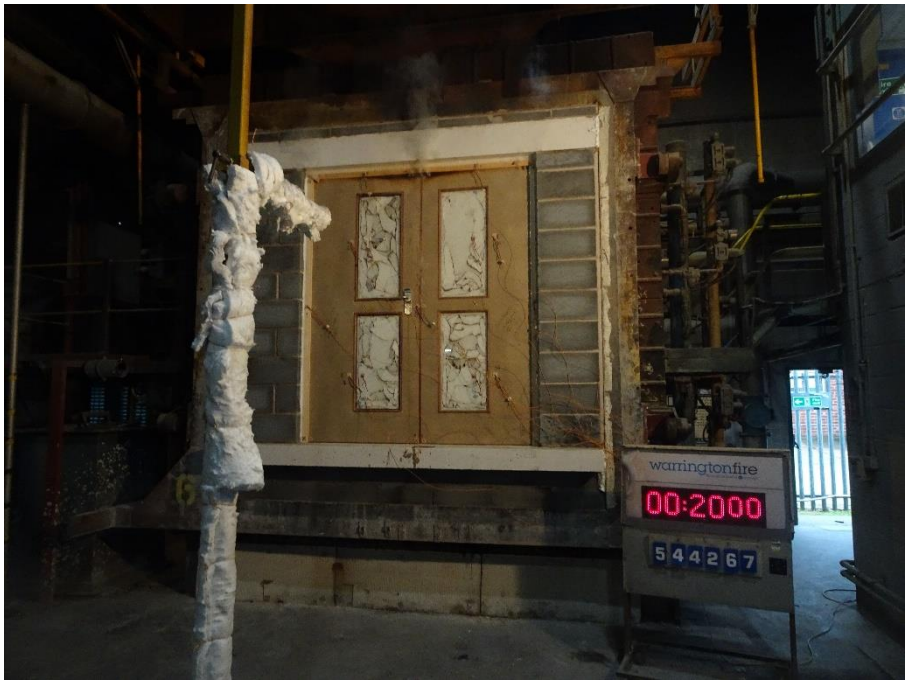


Figure 13 Unexposed face of the specimen at 20 minutes of testing

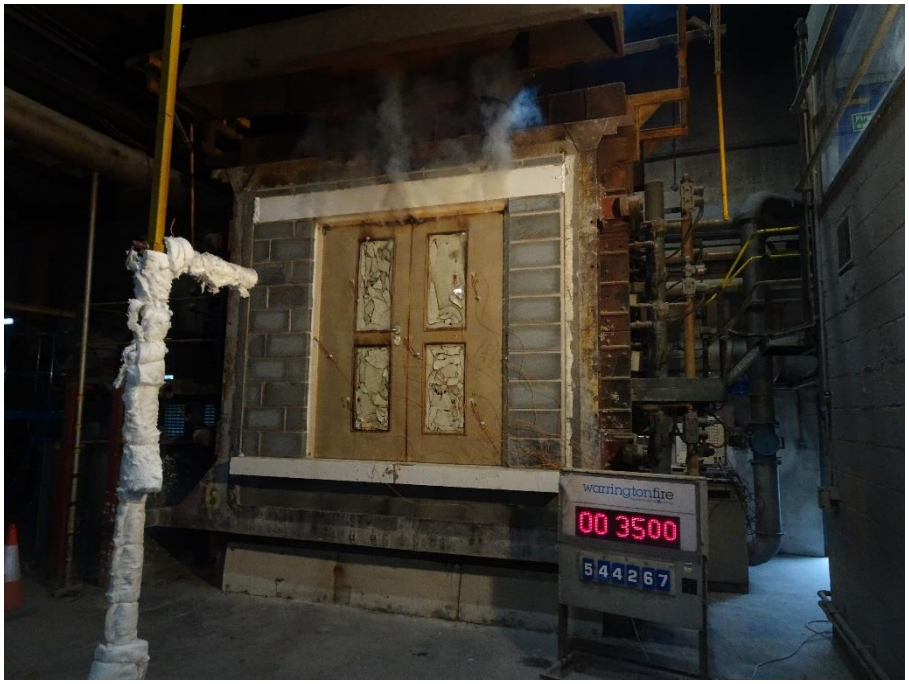


Figure 14 **Unexposed face of the specimen at 35 minutes of testing when sustained flaming had occurred at the meeting edge**

Figure 15 **Unexposed face of the specimen at the termination of the test**

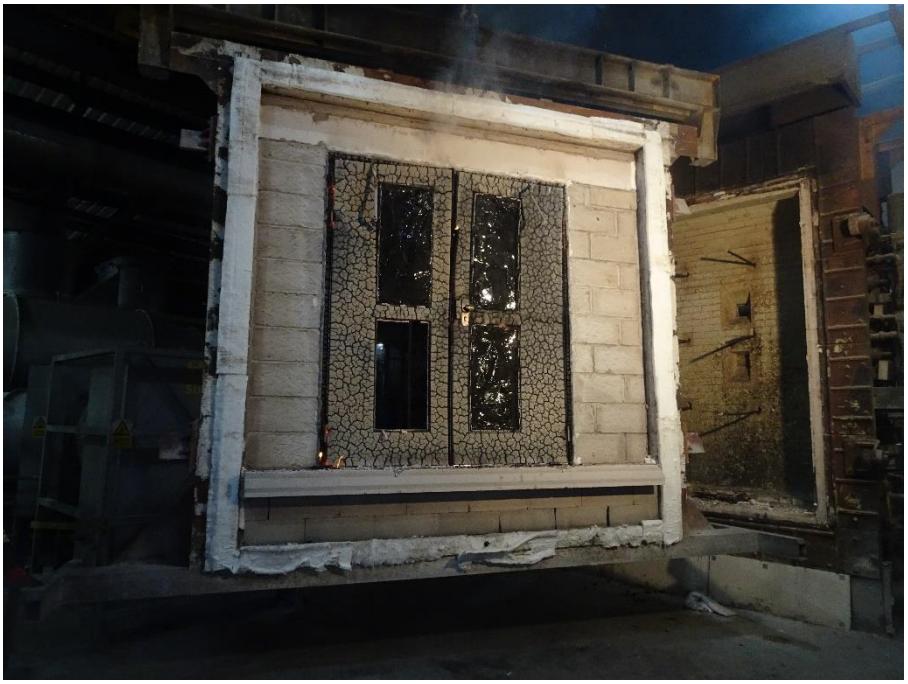


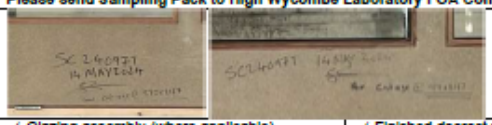
Figure 16 Exposed face of the specimen at the end of the test

Appendix E Sampling report

bmtrada Proud to be part of element	SAMPLING VISIT REPORT	Company Name	Wood International Agency Ltd
		Establishment No.	047/E003760
		BM TRADA Aassessment Body ID: 1224	

Company Head Office Address	Wood International Agency Ltd Woods House 16 King Edward Road Brentwood Essex CM5 0RQ	Contact Name	Neil Harrison
		Telephone	+44 (0) 1277 232991
		Email Address	doors@woodia.co.uk

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
Lipping: Lewi Aldridge Joinery Ltd, Units 5-8 Redhouse Ind Est, Middlemore lane, Aldridge WS9 8DL Remaining manufacture: By Dezign Carpentry, Unit 11B ERW Las, Colomendy Ind Est, Denbigh LL16 5TA with assembly at test lab.	07/06/2024	Michael Chorlton

Requirement	Evidence / Comments
Opening Meeting (names of those present)	Mr Neil Harrison / Mr Shaun Harrison
Contract Reference	SC24097T
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Technical Drawing: WIAD-MMN44-ITT-787-Y88-P1 Technical Specification: WIAD- MMN44-ITT-787-Y88-P1 Marked up technical specification made by the sampler and must be read in conjunction with this sampling report.
Description of product(s) sampled	Single acting, twin glazed double leaf doorset incorporating WIA marksman 44 door leaves lipped on four edges and hung on 3No. butt hinges in softwood frame and operated by overhead surface mounted closers and secured with DIN Sashlock c/w cableway and cable transit and sealed with smoke seals and drop seals. Note: four separate glazing systems.
Product identification / reference numbers / codes	N/A
Batch number(s)	N/A
Date of manufacture	In stages between 14/05/2024 and 20/05/2024 with installation 21/05/24 and final review 07/06/2024
Quantity of stock and size of sample(s) taken	1No. Doorsets at 1888mm wide x 2183mm high.
Traceability of material records ie Purchase Orders and delivery notes	Items with traceability: Frame, lipping, bead and door blank density & MC. Door blank sampled SC23282B. Frame, firestopping and sealing to supporting structure. Frame and leaf intumescent strips. Smoke seal to frame stops. Hinges and fixings. Door closer and fixings. Lockset, keep, wirway and cable transit. Cylinder. Escutcheon. Handleset. Flushbolt. Glazing units and intumescent systems. Hardware intumescent. **Please send Sampling Pack to High Wycombe Laboratory FOA Connor Payne.**
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	
Confirmation of minimum mandatory video/live checks undertaken	✓ Glazing assembly (where applicable) ✓ Finished doorset with markings ✓ Hardware prep and fitting (where applicable) ✓ Sampling pack discussion
Details of any further FPC processes witnessed during the visit.	Lewis Aldridge are Q-Mark certified for fire door manufacture with audited FPC in place. By Dezign do not have a formalised FPC in place. All manufacture made against the technical specification utilising traditional joinery tools and methods. Dimensional checks made throughout manufacture.
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity.	Door leaf specification. Hardware selection, preparation, intumescent protection and fixings. Glazing selection, preparation, intumescent protection and bead fixings. DIN latch with cableway and transit.
State any items from the Technical Specification / FoA that were not witnessed and require further lab sampling	☐ Side screen / overpanel ☐ Handles ✓ Other (see tech spec marked with 'not seen') ✓ Door closer ✓ Frame re-assembly
Confirm any clauses within the Technical Specification that were found to be different on the sampled product/s. ***Non-conformances may be raised for pre-cert and audit test sampling***	Refer to marked up technical specification. Areas in Green = verified during sampling Areas in Blue = Additional sampler notes Areas in yellow with Asterisk * = Will be reported "As stated by customer"
Closing Meeting (names of those present)	No formalised closing meeting possible. Marked up TST and draft sampling report sent for approval and signing.

Declaration	I declare that the product/s witnessed during this sampling visit are representative of normal production.
Company Representative Name (Print)	Company Representative Position
Neil Harrison	Director
BM TRADA Representative Signature	Company Representative Signature

This sampling report remains the property of BM TRADA. BM TRADA shall keep confidential all information relating to the sampling process and your organisation and shall not disclose such information to any third party except as required by law or by BM TRADA's Accreditation Bodies. This sampling report will be shared with others within Warringtonfire Testing and Certification Ltd.

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