warringtonfire
Proud to be part of element

BUILDING ASSURANCE
SOLUTIONS FOR A COMPLEX WORLD
TESTING
INSPECTION
CERTIFICATION
ADVISORY

Fire resistance test report

Issuing laboratory: Warringtonfire Testing and Certification Limited

Test standard:	BS 476-20:1987 and BS 476-22:1987 Clause 7
Test sponsor:	Wood International Agency Ltd
Product:	Marksman 44
Report number:	544269
Test date:	31 July 2024
Version:	1

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

egolf

ilac-MRA

UKAS TESTING 0249

Quality management

Version	Date	Information about the report		
1	21 August 2025	Description	Initial issue	
			Prepared by	Authorised by
		Name	Peter White	Kane Brennan
		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 7 determination of fire resistance of partially insulated doorsets and shutter assemblies with deviations as described in Table 3.

Warringtonfire Testing and Certification Limited (Warringtonfire) performed the test on 31 July 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 glazing	Towards the furnace
Latching conditions	Disengaged	

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	3035 mm	
	Thickness	150 mm	
Aperture dimensions		**Width**	**Height**
	Doorset	1895 mm	2242 mm
Restraint conditions	Restrained on all edges		

Table 3 Summary of test results

Item	Criteria	Results
Doorset A	Thermal insulation	47 minutes*
	Integrity	47 minutes
	Radiation of 15 kW/m²	Radiation intensity of 15 kW/m² was not reached after 48 minutes
Notes:		
The test results for the specimen only apply to the tested orientation. The test was discontinued after 48 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 7 determination of fire resistance of partially insulated doorsets and shutter assemblies.

Warringtonfire performed the test on 31 July 2024 at the request of the test sponsor listed in Table 4.

Table 4 Test sponsor(s) details

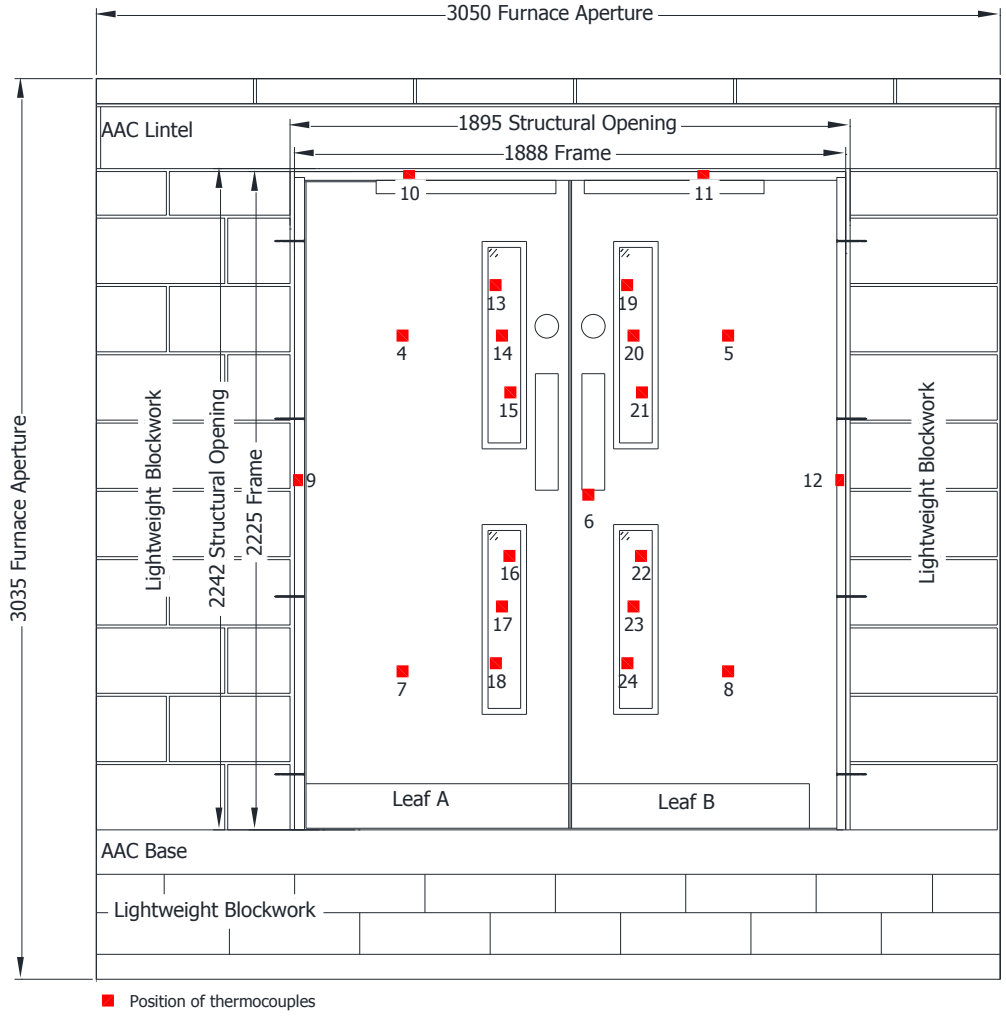
Test sponsor(s)	Address
Wood International Agency Ltd	16 King Edward Road Brentwood, Essex CM14 4HL United Kingdom

2. Test specimen and supporting construction

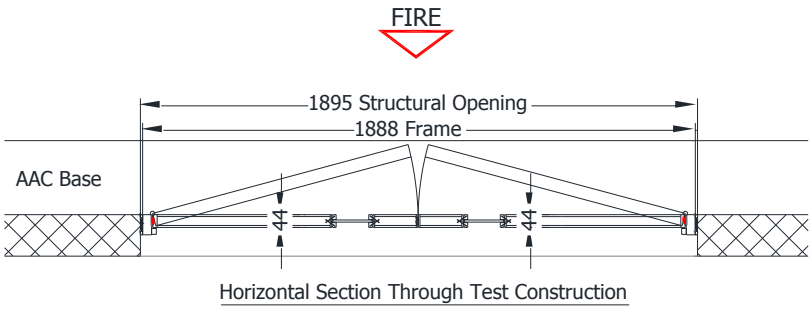
2.1 Drawings of test assembly

The leaders in the drawings (Figure1 – Figure 11) represent the items listed in section 2.2. All measurements are in millimetres – unless indicated otherwise.

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



General Elevation of Thermocouple Positions
Unexposed Face



Horizontal Section Through Test Construction

Figure 1 General elevation of test construction, unexposed face, showing thermocouple

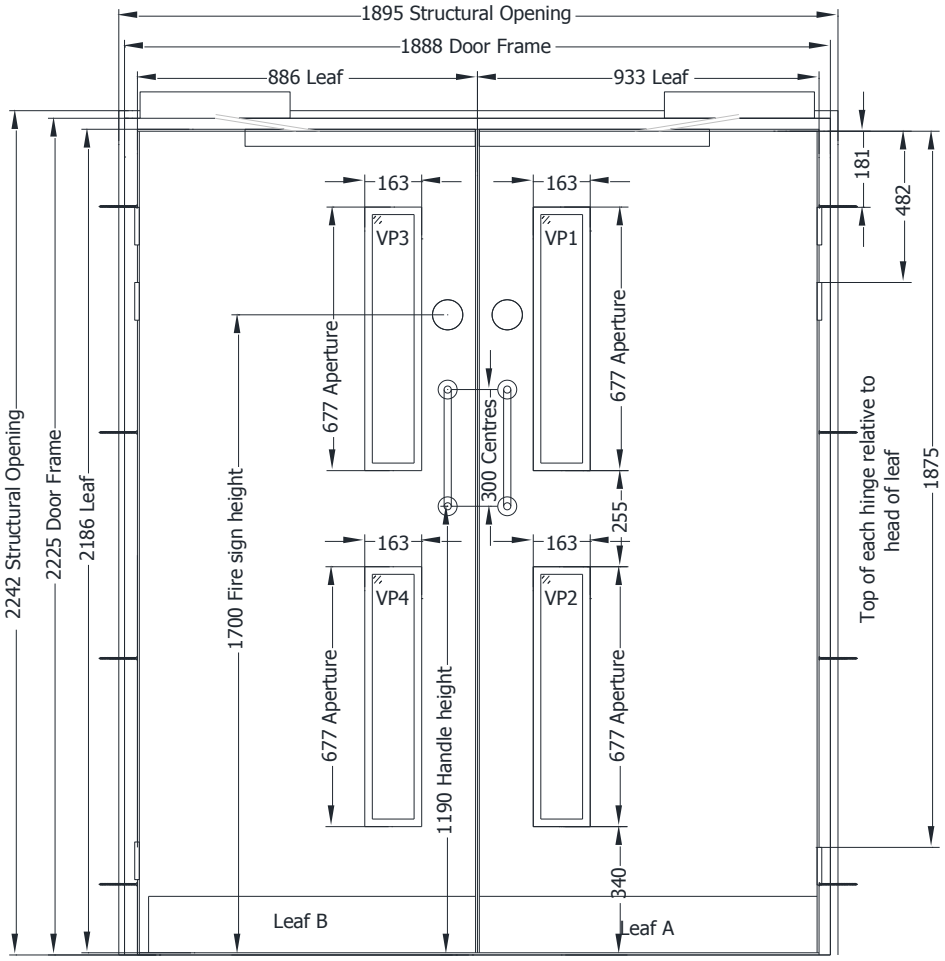


Figure 2 General Elevation of Doorset – Exposed Face

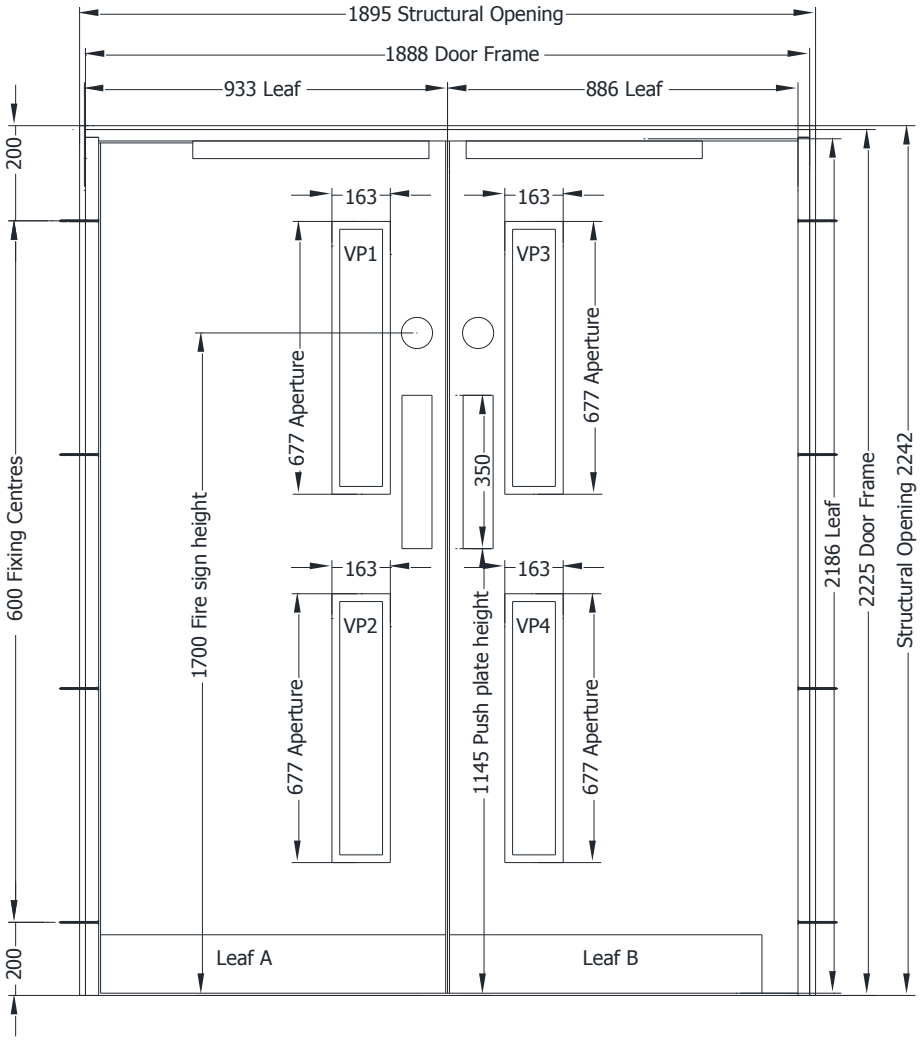


Figure 3 General Elevation of Doorset Unexposed Face

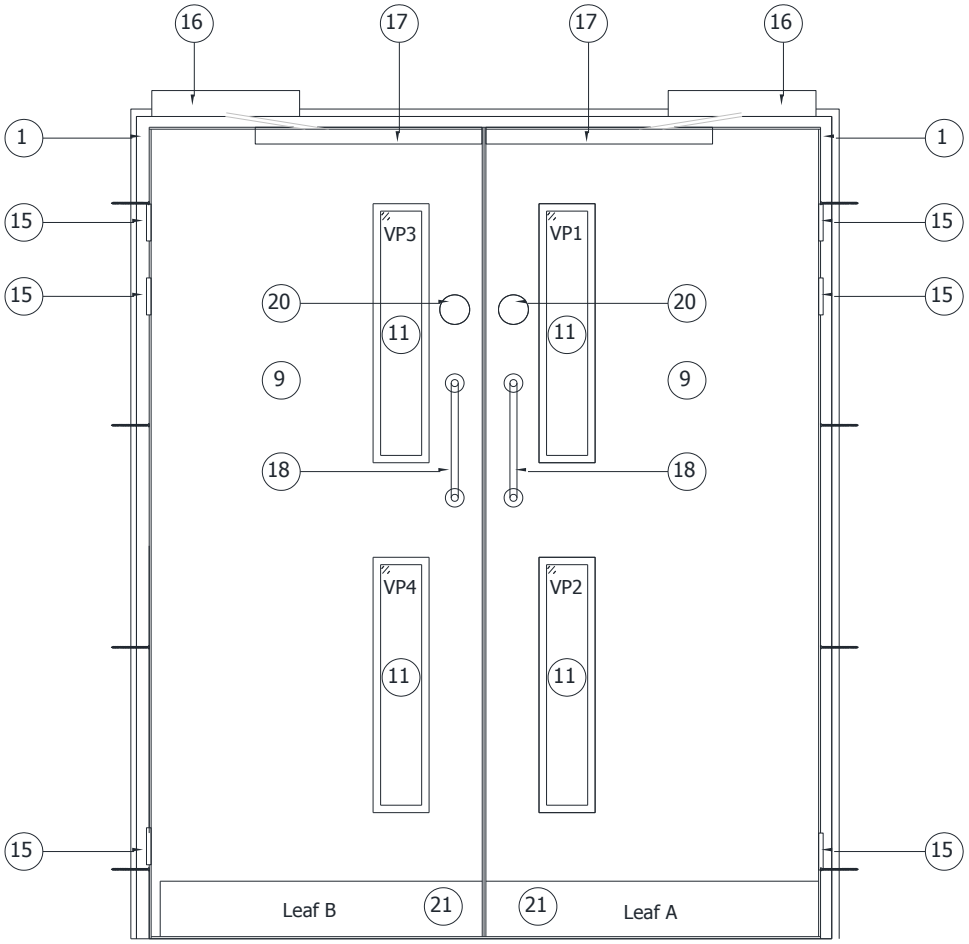


Figure 4 General elevation of Doorset exposed face

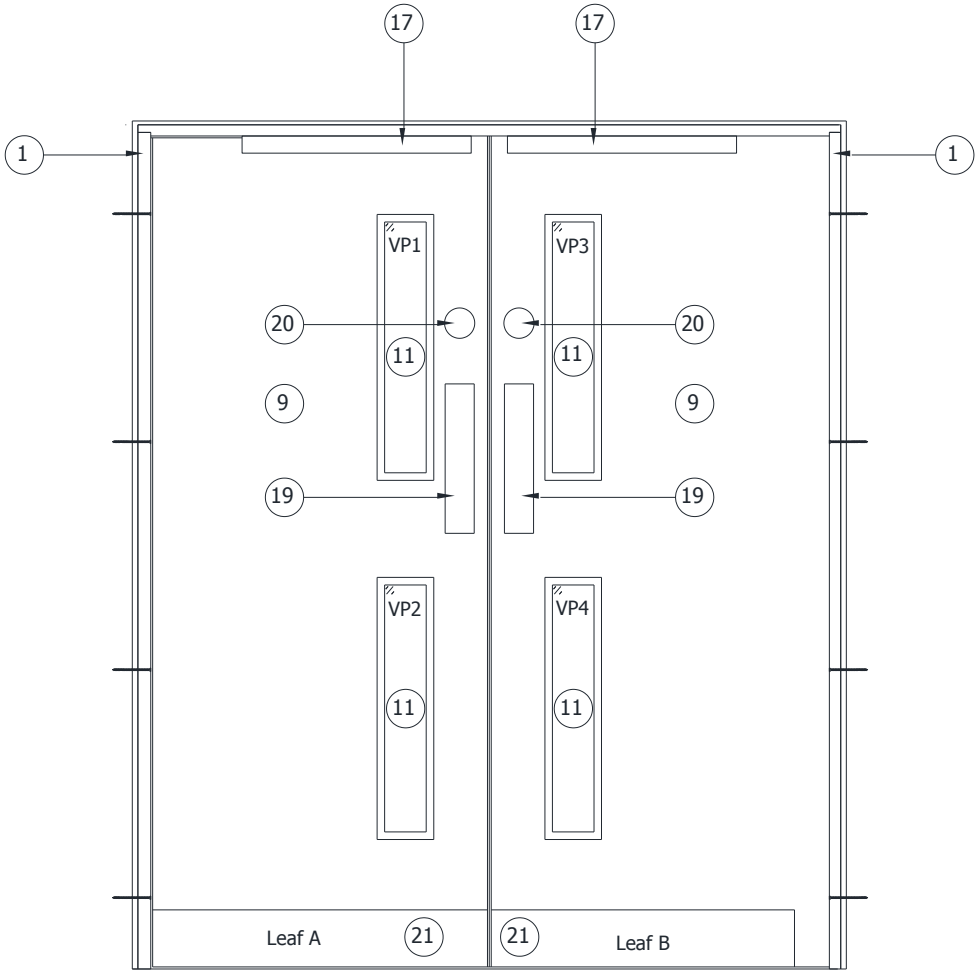


Figure 5 General elevation of Doorset unexposed face

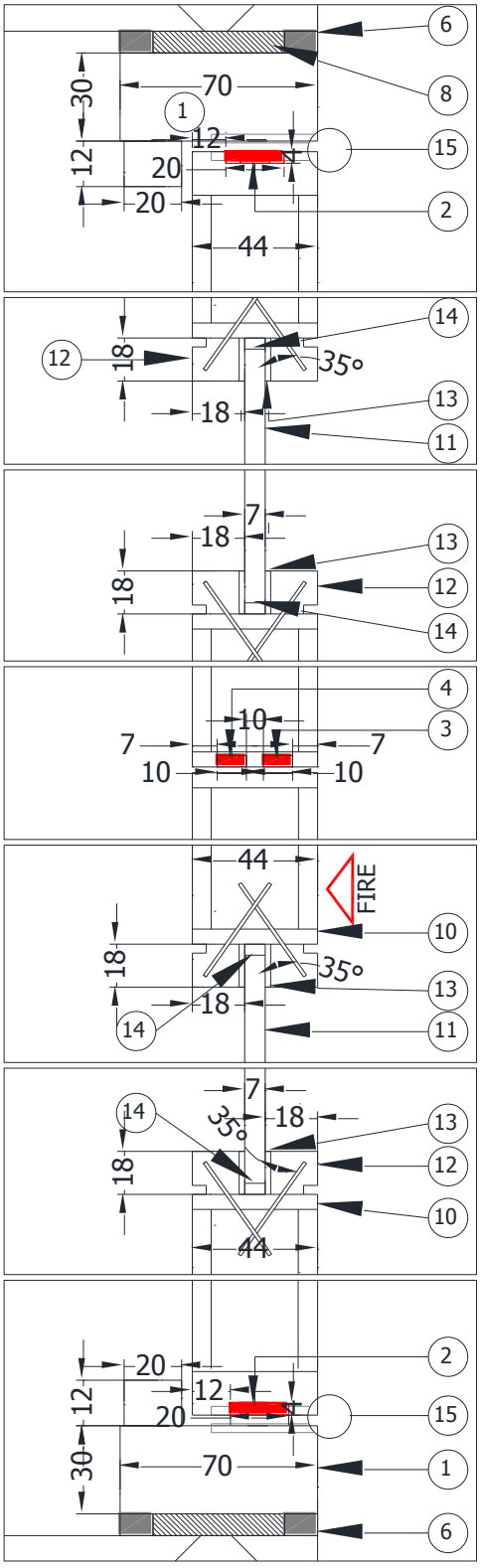


Figure 6 Typical Horizontal Section Through Doorset

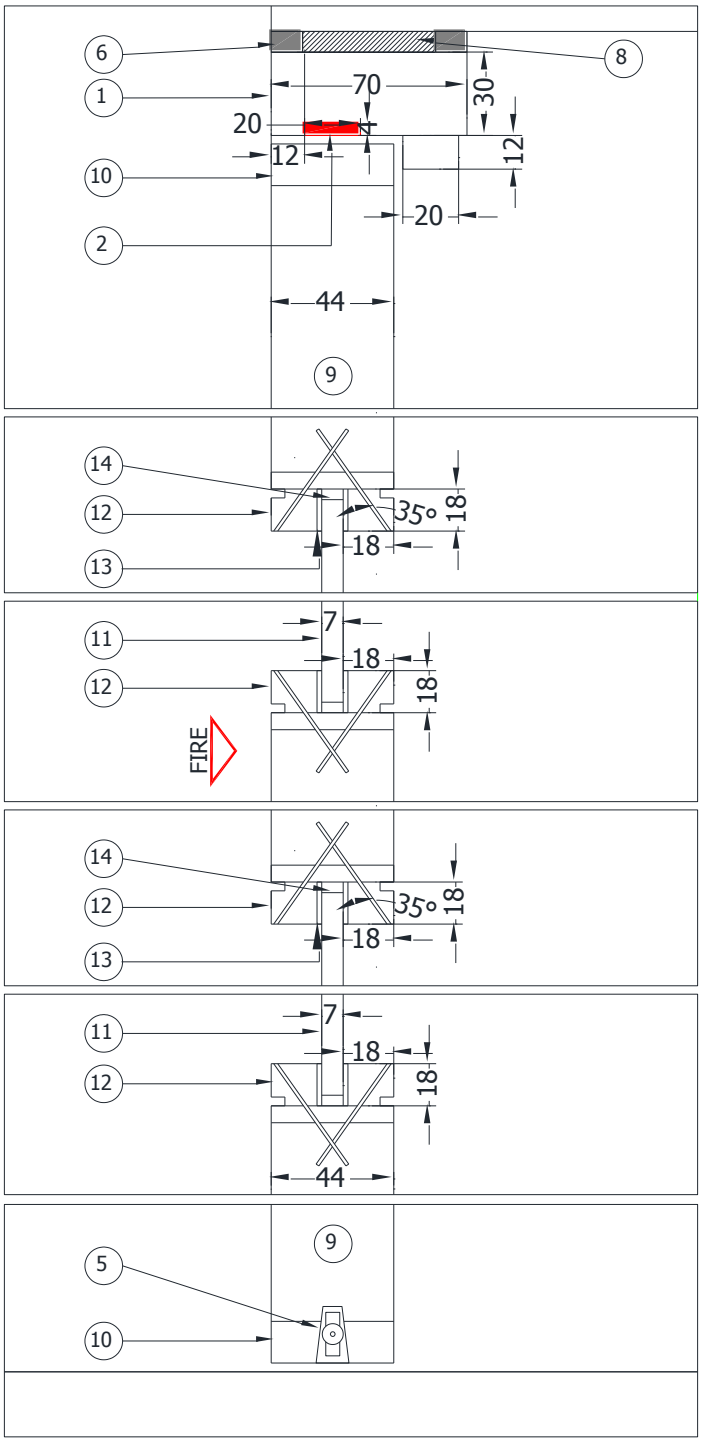


Figure 7 Typical Vertical Section Through Doorset

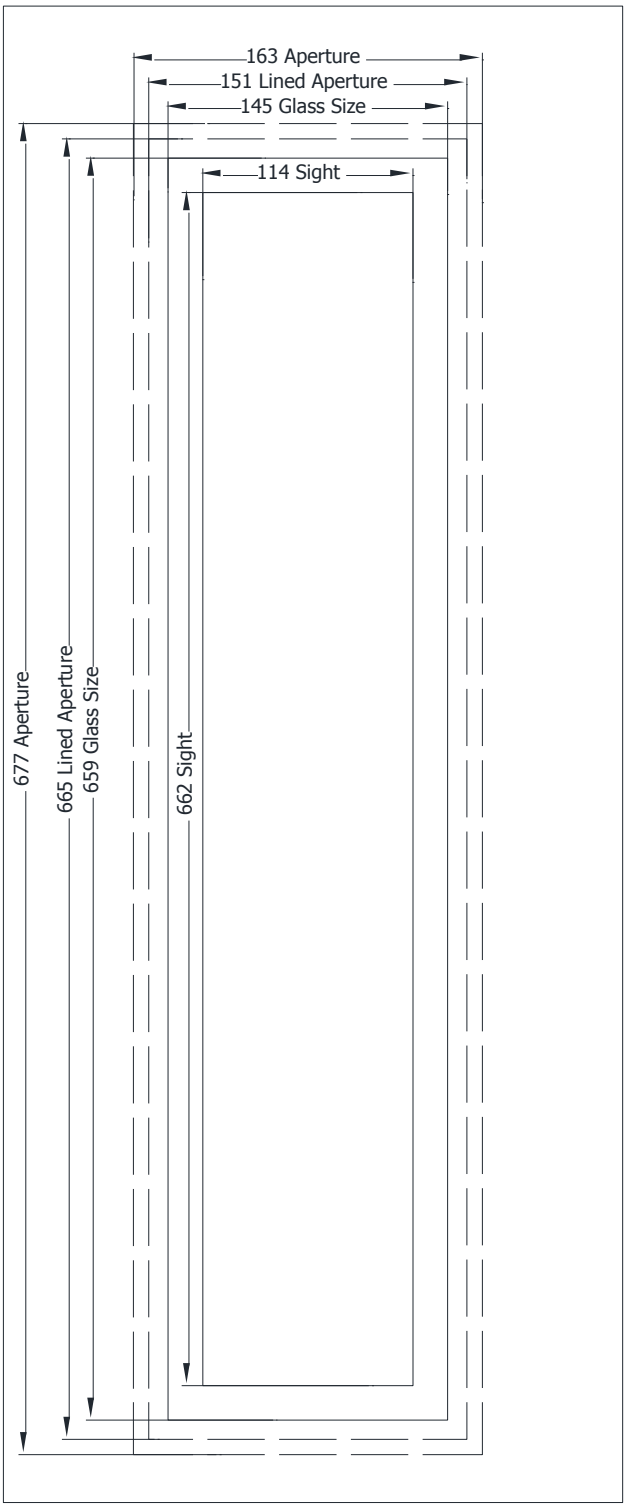


Figure 8 Door Glazing Diagram

DFA127

Heavy Duty Versatile Swing Door Operator

The Record DFA 127 is a universal drive system for the automation of swing doors and the market leading operator in the UK, with over 10,000 units sold each year. Its broad range of applications makes it suitable for widely differing requirements from Full Power, Low Energy for slow-moving traffic, people, inverse and fire.

Applications

Especially suitable for offices, corridors, care homes, hospital wards, educational facilities, libraries, restaurants and hotels.

- Market leading operator in the UK
- Tested to 1 million cycles - 500K more than the required testing
- Reliable Swiss quality - fit and forget
- Popular for a reason - robust, versatile and simple to install
- UK fire certification

Key benefits

- Automates existing and new swing doors quickly and economically.
- Adjustable spring force enables the DFA to be adjusted on the spot to operate a range of door sizes with a spring closing force from EN4 to EN6.
- Extremely versatile, can be set up as either FULL POWER for heavier doors or LOW ENERGY for slow-moving traffic.
- Compact design, aesthetically appealing to suit all building styles
- Silent in operation, making it suitable for quieter areas where low noise is essential.
- Robust and reliable, easier to maintain and service.
- Has been approved for use as a hold-open system for fire protection barriers
- Can be used with various fire-protection profile systems such as Jansen, Forster, Heroal and Schuco.

24

Product range

FULL POWER
LOW ENERGY
INVERSE
FIRE

25

Figure 9 Manufacturer data sheet of door closer item 16

ARRONE
The complete range.

Product data sheet
accessories
Perform

AR901

ARRONE aluminium information sign:
- with lettering
- 76 mm diameter

Article number	8511242
Product ref.	AR901-SAA
EAN-Code	5051358033689
Country of origin	United Kingdom
CN-Code	83100000
Material	aluminium
Door type	wooden door
Fixings	Timber door
Diameter	76 mm
Drill	2 screw holes countersunk
Icon	Fire door keep locked
Finish	SAA satin anodised aluminium
Range	ARRONE Range
Packing unit	500
Outer carton	500

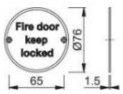


Figure 11 Manufacturer data sheet of item 20 metal sign

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

1. Frame	
Manufacturer	By Dezign Carpentry
Material	European Redwood
Density	Nominally 510kg/m3. Measured 559kg/m3 during sampling.
Moisture	14 % (stated)
Overall sizes	1888 mm wide x 2225 mm high
Overall frame size head	70 mm wide x 30 mm thick with 20 mm wide x 12 mm planted stop
Overall frame size jamb	70 mm wide x 30 mm thick with 20 mm wide x 12 mm planted stop
Jams to head fixing method	2 No. Ø 5.0 mm x 70 Long Wood Screw Fixings to each corner with PVA wood adhesive, Jambs located into 10mm halflap joint
Stop to frame fixing method	16g 38mm pneumatically fired pins, maximum 50mm from corners, maximum 300mm centres.
Fixing method to supporting construction	M8 x concrete bolt screws @ 600 mm centres x 200mm from top corner of jamb, 200mm from bottom corner of jamb

2. Firestopping

2. Intumescent seal 1	
Manufacturer	Reddiplex
Reference	Pyroplex 8600
Size	20 mm x 4 mm
Material	Graphite, PVC outer casing
Fixing Method	Adhesive backing pushed into groove
Location	1 No. centrally in frame reveal
3. Intumescent seal 2	
Manufacturer	Reddiplex
Reference	Pyroplex 8500
Size	10 mm x 4 mm
Material	Graphite PVC outer casing
Fixing Method	Adhesive backing pushed into groove
Location	7 mm from leading edge main leaf (leaf A) meeting stile only
Note	Intumescent is butt jointed 250 mm from top of leaf
4. Intumescent seal 3	
Manufacturer	Reddiplex
Reference	Pyroplex 30170
Size	10 mm x 4 mm
Material	Graphite, PVC outer casing
Fixing Method	Adhesive backing pushed into groove
Location	27mm from leading edge in main leaf only (Leaf A). **Note** - Intumescent is butt jointed 250 mm from bottom of leaf
5. Drop Seal	
Manufacturer	Norseal
Reference	NOR 810S
Size	20 mm x 12 mm
Material	Aluminium with TPE gasket
Fixing Method	Screw fixed
Location	Centrally in bottom of leaves

6. Sealant	
Manufacturer	Mann McGowan
Reference	Pyromas A
Size	10 mm nominal bead
Material	Acrylic sealant
Fixing Method	Cartridge gunned
Location	Around perimeter of specimen on both faces
7. Shim packer	
Manufacturer	Broadfix
Reference	Flat packer
Size	100 mm x 28 mm x various thicknesses 1-6 mm
Material	Plastic
Fixing Method	Hand applied
Location	Behind screw fixings, stacked where necessary
8. Fire Wool	
Manufacturer	Morgan Advanced Materials
Reference	Superwool Plus
Size	25 mm, uncompressed
Material	Alkaline Earth Silicate Fibre Based Insulation
Fixing Method	Hand applied
Location	Around perimeter of specimen

3. Door leaf

9. Door leaf	
Door Leaf A	
Manufacturer	Wood International Agency Limited
Reference	Marksman 44
Material	Graduated Density Particleboard
Density	Nominally 535kg/m^3. Measured 525-538kg/m^3
Moisture content	12% (stated)
Overall size	933 mm width x 2186 mm height x 44 mm deep
Fixing method	Hung into frame on 3 No. hinges, opening towards furnace
Door Leaf B	
Manufacturer	Wood International Agency Limited
Reference	Marksman 44
Material	Graduated Density Particleboard
Density	Nominally 535kg/m3. Measured 525-538kg/m3
Moisture content	12%(stated)
Overall size	886 mm width x 2186 mm height x 44 mm deep
Fixing method	Hung into frame on 3 No. hinges, opening towards furnace
10. Door leaf lipping/ Edge banding/Glazing liner	
Manufacturer	Wood International Agency Limited
Reference	8x44 lipping
Material	American White Ash
Density	Nominally 675kg/m^3, measured 658-762kg/m^3
Moisture content	10-13%(stated)
Overall size	44 mm x 8 mm
Fixing method	PU/Nozzle & cramped
Location	To all 4 edges of leaf

4. Glazing

11. Vision panels	
Manufacturer of fire glass	AGC
Reference	Pyrobelite 7
Location	Excluding Liner – 190 mm from top, 144 from lock edge, 184 mm between apertures Including Liner – 196 mm from top, 150 mm from lock edge, 196 mm between apertures
Glass Thickness	7 mm
Glass Type	Clear, laminated glass with single intumescent interlayer
Bead Density	Nominally 675kg/m^3. Measured 531-579 during sampling
Bead Fixings	16g x 38 mm pneumatically fired stainless steel pins at max 50 mm from corners and 200 mm centres. 35° to face of glass
Bead Type	Square, flush with quirk and rebate for tape
Glazing Tape	10mm x 2 mm Therm-A-Strip
Glass size	
Leaf A VP1	145 mm x 659 mm x 7 mm
Leaf A VP2	145 mm x 659 mm x 7 mm
Leaf B VP3	145 mm x 659 mm x 7 mm
Leaf B VP4	145 mm x 659 mm x 7 mm
Size of aperture = size of hole in door before liner is applied.	
Leaf A VP1	163 mm x 677 mm
Leaf A VP2	163 mm x 677 mm
Leaf B VP3	163 mm x 677 mm
Leaf B VP4	163 mm x 677 mm
Size of the glass you can see after beads have been installed	
Leaf A VP1	115 mm x 662 mm
Leaf A VP2	115 mm x 662 mm
Leaf B VP3	115 mm x 662 mm
Leaf B VP4	115 mm x 662 mm

Size of lined aperture = size of hole in door left after timber liners have been applied.	
Leaf A VP1	151 mm x 665 mm
Leaf A VP2	151 mm x 665 mm
Leaf B VP3	151 mm x 665 mm
Leaf B VP4	151 mm x 665 mm
12. Glazing Beads	
Material	American White Ash
Density	Nominally 675kg/m^3. Measured 531-579 during sampling
Moisture Content	12%(stated)
Overall size	18mm x 18mm incorporating 10 x 2 rebate for tape and 3 x 3 "quirk" rebate
Fixing Method	Pneumatically fired pins
Fixing sizes	16 g 38 mm pins
Fixing distances from corners centres and angle of face of glass	200 mm centres, 50 mm corners, 35° (±5°) to glass
13. Glazing Tape/System	
Manufacturer	Dixon International Limited
Reference	Therm-A-Strip
Material	Monoammonium Phosphate
Location	Into rebate in upstand of bead
Overall Size	10 mm x 2 mm
14. Setting out block	
Location	Perimeter of glazing
Material/Reference	Calcium Silicate Glazing packers

5. Hardware

15. Hinges	
Manufacturer	Hoppe (UK) Limited
Reference	Arrone AR8682-SSS
Quantity	3 per leaf
Primary material	Stainless Steel
Type	Ball bearing butt hinge
Size	
a. Knuckle	14 mm diameter
b. Blades	Each Blade = 102 mm x 35 mm x 3 mm Open Hinge = 102 mm x 89 mm x 3 mm
Fixings	
a. Type	4.5 x 30 mm countersunk screws
b. Material	Stainless Steel
a. Sizes	4.5 x 30 mm long
b. Number off per blade	4
Top of each hinge relative to the head of the leaf	181mm, 482mm, 1875mm
Details of intumescent protection	1mm MAP protection applied behind all hinge blades. Ref Arrone AR/INT-8680/8380/8780
Interruptions to Intumescent within the frame reveal	Fully interrupted

16. Closer	
Manufacturer	Record UK
Reference	DFA 127 Automatic swing door operator
Material	
Body	Cast Aluminium/steel
Unit	Aluminium/plastic
Closer arm	Stainless Steel
Cover	Stainless Steel
End cap	Plastic
Primary arm	Steel
Guide Rail	Aluminium
Hydraulic Fluid	None Present
Configuration	Pull
Overall size	
Body	550 mm high x 75mm wide x 115 mm deep
Cover	600mm high x 85 mm wide x 124 mm deep
Fixing method to slide arm to door	4 No. 4.5 x 50 mm Woodscrews into face of door, Fixed to AAC lintel on exposed side of door
Maximum opening force	
Leaf A	91.67 Newton (N)
Leaf B	119.43 Newton (N)
Maximum closer force	
Leaf A	57.53 Newton (N)
Leaf B	67.97 Newton (N)
Distance from hinge	0.8 meters

17. Automatic Swing door sensor	
Manufacturer	RC-Swing Safety Sensors
Reference	DFA 127
Material	
Base Profile	Aluminium
Cover, End caps and PCB	Plastic
Configuration	Exposed and Unexposed face infrared on-door safety sensors
Overall size	
Body	700 mm x 44.3 mm x 50.7 mm
Details of cable protection	
Manufacturer	BASF
Reference	Interdens
Intumescent Protection	MAP intumescent protection for the Ø10mm drill hole between the door facings, full thickness of the door

18. Handle	
Manufacturer	Hoppe
Reference	Arrone AR3616/300CF-SSS
Material	Stainless Steel
Overall size	
Handle	19 mm Dia, 300 mm Centres, 65 mm projection
Rose	52 mm x 8 mm - screw centres are 38 mm
Fixing method	4 No. 3.5x20 Woodscrews per rose
Details of intumescent protection	NA
19. Push plate	
Manufacturer	Hoppe
Reference	AR324C-SSS finger plate
Material	Stainless steel
Overall sizes	350 mm x 75 mm x 1.5 mm
Location	Bottom of plate 1175 mm from base of leaf
Fixing method	4 No 20 mm x 3 mm woodscrews

20. Metal Sign	
Manufacturer	Hoppe UK
Reference	Arrone AR901-SSS-A1
Material	Stainless Steel
Overall sizes	76 mm diameter x 1.5 mm thick
Location	1700 from bottom of leaf
Fixing method	2 No. 16mm x 3mm wood screws
21. Kick Plate	
Manufacturer	Locks & Fittings Ltd
Reference	JSC-KP-SSS 1.2mm Kick Plate Grade G430
Material	Stainless Steel
Overall sizes	1No. 800 mm x 200 mm x1.2, 1 No. 900 mmx200 mm x1.2 mm
Location	Bottom of door leaf
Fixing method	3 mm x 20 mm woodscrews

6. Supporting Construction

22. Lightweight Blockwork	
Manufacturer	THERMALITE
Reference	THERMALITE Shield
Material	Lightweight concrete blocks
Block Size	150 mm wide x 215 mm high x 440 mm long
Density	915 kg/m^3 (measured)
Fixing Method	Ordinary sand/cement mortar, mix 3:1
23. AAC Base Slab	
Type	AAC Lintel
Material	Steel reinforced autoclaved aerated concrete
Density	550 ~ 650 kg/m^3
Overall size	150 mm wide x 600 mm high x 3000 mm long
24. AAC Lintel	
Type	Steel reinforced concrete lintel
Material	AAC autoclaved aerated concrete
Density	550 ~ 650 kg/m^3
Overall size	200 mm wide x 250 mm high x 3000 mm long

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	3035 mm	
	Thickness	150 mm	
Aperture dimensions		**Width**	**Height**
	Doorset	1895 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 7 determination of fire resistance of partially insulated 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 19.0°C to 29.5°C and 37.0% to 62.5% respectively.		
Pre-test measurements		**Leaf A - left**	
	Opening force	73.4 Nm	
	Closing force	46.0 Nm	
	Distance from hinge	0.8 m	
		Leaf B - right	
	Opening force	95.5 Nm	
	Closing force	54.4 Nm	
	Distance from hinge	0.8 m	
Installation details	Delivery date of the test specimen		29 July 2024
	Start date for construction of supporting construction		26 July 2024
	Completion date for construction of supporting construction		30 July 2024
	Start date for installation of test specimen		30 July 2024
	Completion date for installation of test specimen		30 July 2024

Item	Detail		
	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	23.0 °C	
	Minimum temperature	22.0 °C	
	Maximum temperature	24.0 °C	
Sampling / specimen selection	Appendix E includes the sampling report. A representative of Warringtonfire sampled and selected the following components of the tested specimen:		
	Component	**Sampling date**	**Sampling report reference**
	Marksman 44	**11/06/2024**	**SC24124**
	Doorset	**17/07/2024**	**SC24153T**

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 7 determination of fire resistance of partially insulated 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 2442 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.

Appendix E includes the sampling report.

Table 8 Detailed test results

Criteria		Doorset A
Thermal insulation		**47 minutes***
Integrity		**47 minutes**
Sustained flaming		47 minutes
Failure with gap gauge		47 minutes
Cotton pad failure		47 minutes
Radiation		
Radiation intensity	15 kW/m²	Radiation intensity of 15 kW/m² was not reached after 48 minutes
Notes:		
The test results for the specimen only apply to the tested orientation. The test was discontinued after 48 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.

The report is issued for the benefit of Warringtonfire's direct customer only, and may not be relied upon by any third parties without Warringtonfire's express written consent.

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	20	Steam/Smoke release from head of Leaf B.
03	40	Steam/Smoke release from gap of meeting edge.
04	15	Glazing reacted. Glass has become opaque.
05	00	Doorsets unrestrained.
06	10	Steam/Smoke release from closing sensor on Leaf B.
06	40	Steam/Smoke release from hinge edge on Leaf B.
07	10	Glazing now fully opaque.
08	10	Audible cracking from the glazing.
08	20	Both glazing windows on leaf A start to discolour.
10	20	Discolouration at the top of the meeting edge.
11	50	Discolouration top left of Leaf A.
15	00	Steam/Smoke release from both bottom glazing panels.
22	50	Discolouration up the meeting edge.
34	50	Both glazing on Leaf B discoloured around the edges.
36	00	Discolouration top right of leaf B.
37	00	Discolouration above each glazing on both doors.
39	40	Increased Steam/Smoke release from all glazing.
40	30	Visible deflection. Bowing away from furnace.
45	25	Discolouration up both hinge edges.
47	00	Glowing at the head of the Specimen.
47	**45**	**Sustained flaming was present for greater than 10 seconds at the head of the specimen, therefore integrity failure has deemed to have occurred.**
48	**00**	**End of test due to health and safety reasons.**

Appendix B Instrumentation locations

Figure 10 shows the instrumentation locations for this fire resistance test.

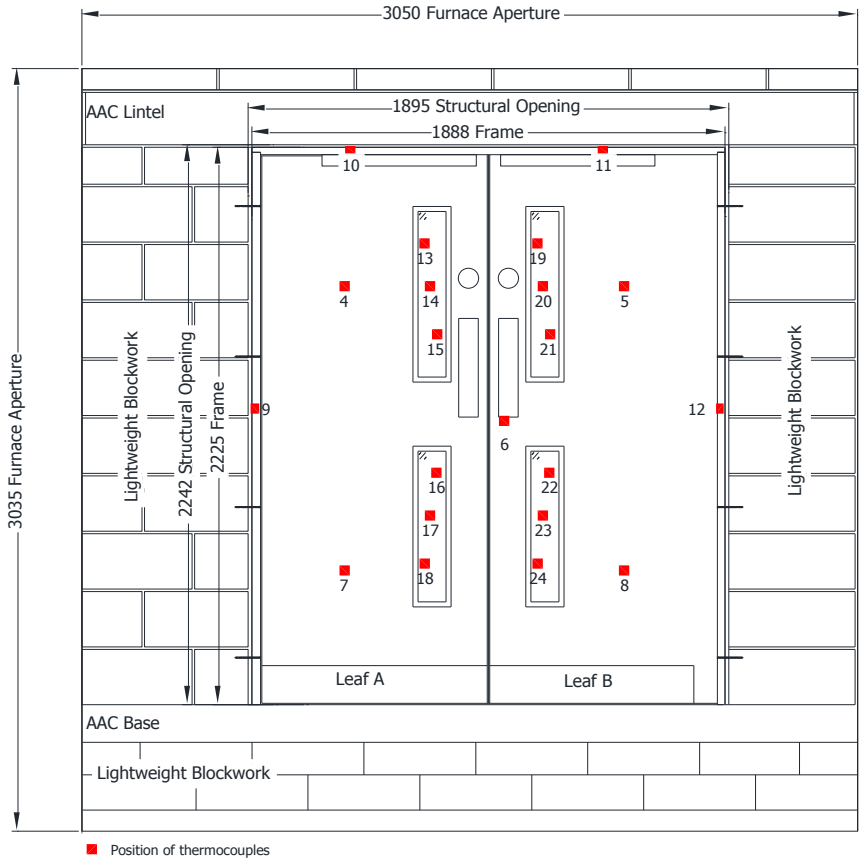


Figure 10 Instrumentation locations

Appendix C Test data

C.1 Furnace temperature and deviation

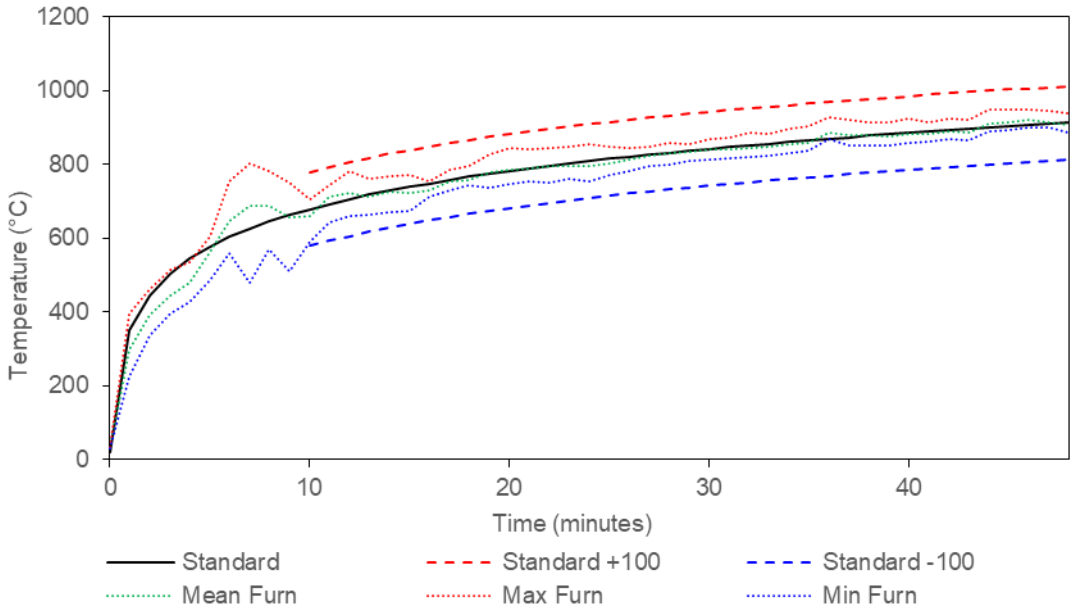


Figure 11 Furnace thermocouple temperature vs time

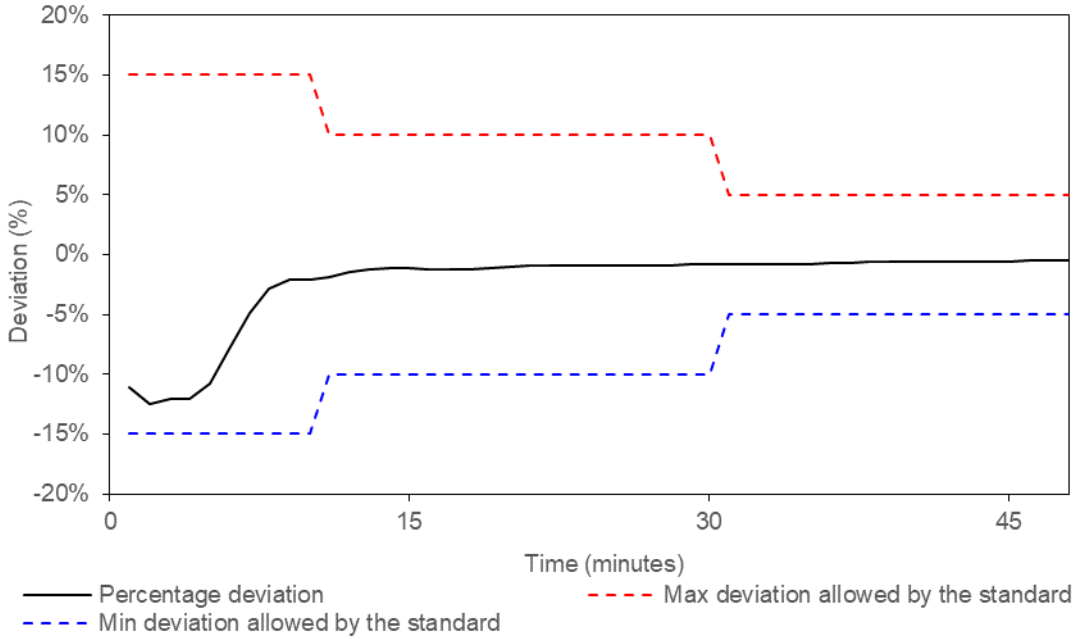


Figure 12 Percentage deviation of exposure severity vs time

C.2 Furnace pressure

The furnace pressure was taken at 2250 mm above the sill of the test specimen.

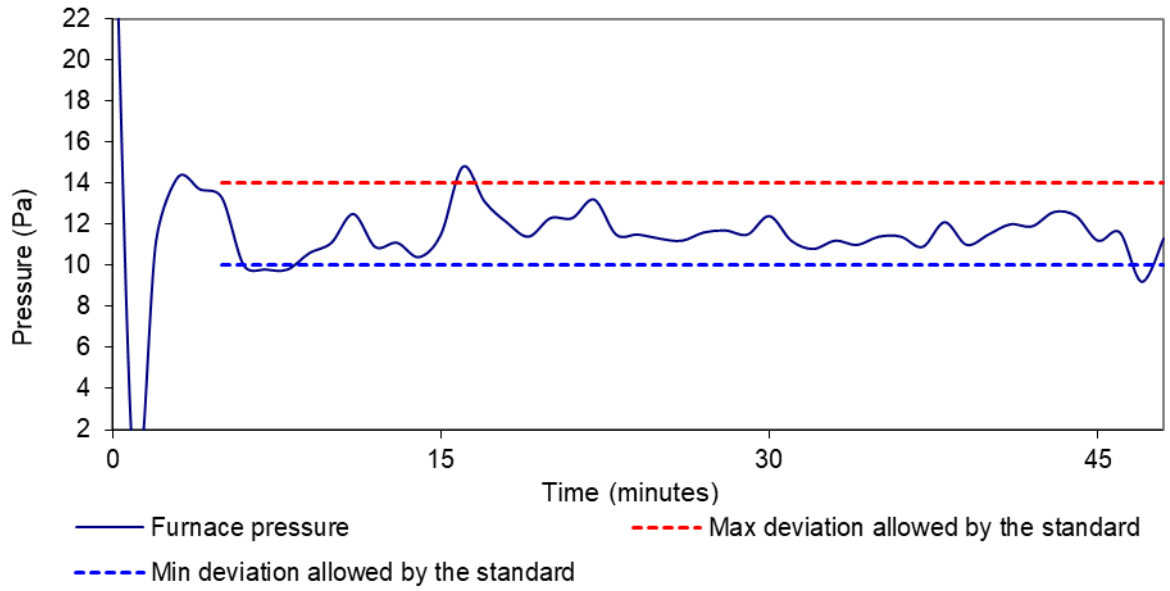


Figure 13 Furnace pressure

C.3 Specimen temperatures

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

Time (mins)	Tc 004 (°C)	Tc 005 (°C)	Tc 006 (°C)	Tc 007 (°C)	Tc 008 (°C)	Average (°C)
0	26.0	26.0	26.0	26.0	26.0	26.0
2	26.0	26.0	26.0	26.0	26.0	26.0
4	26.0	26.0	26.0	26.0	26.0	26.0
6	27.0	26.0	26.0	26.0	26.0	26.2
8	27.0	27.0	26.0	27.0	26.0	26.6
10	27.0	27.0	27.0	27.0	26.0	26.8
12	30.0	29.0	28.0	28.0	*	28.8
14	38.0	33.0	31.0	33.0	*	33.8
16	46.0	38.0	35.0	40.0	*	39.8
18	53.0	44.0	40.0	46.0	*	45.8
20	57.0	49.0	45.0	51.0	44.0	49.2
22	61.0	53.0	50.0	55.0	46.0	53.0
24	63.0	57.0	54.0	58.0	47.0	55.8
26	65.0	60.0	58.0	60.0	48.0	58.2
28	66.0	62.0	61.0	62.0	49.0	60.0
30	67.0	64.0	63.0	63.0	50.0	61.4
32	68.0	66.0	66.0	65.0	51.0	63.2
34	70.0	68.0	68.0	66.0	53.0	65.0
36	70.0	70.0	70.0	67.0	53.0	66.0
38	71.0	71.0	72.0	68.0	55.0	67.4
40	73.0	73.0	74.0	69.0	56.0	69.0
42	74.0	75.0	75.0	71.0	57.0	70.4
44	75.0	76.0	76.0	72.0	58.0	71.4
46	76.0	78.0	78.0	74.0	58.0	72.8
48	78.0	80.0	80.0	75.0	59.0	74.4

* Indicates thermocouple malfunction

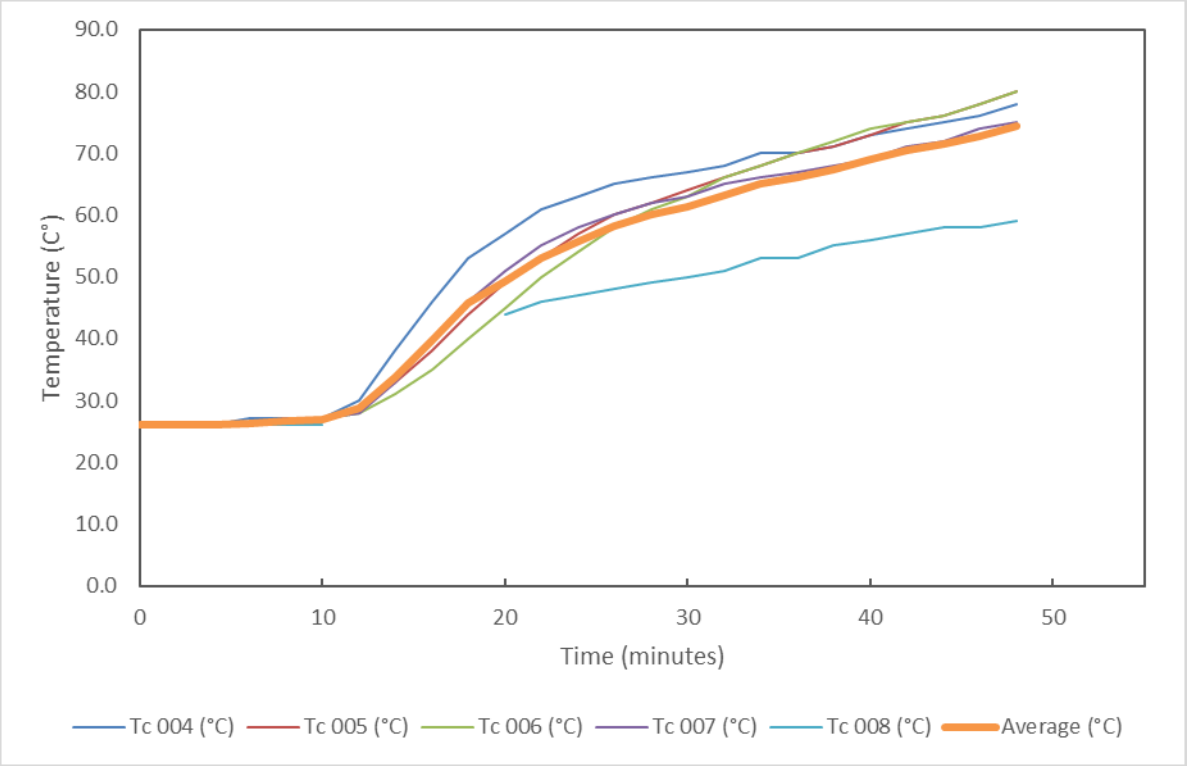


Figure 14 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Doorset

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	28.0	29.0	29.0	29.0
2	28.0	29.0	29.0	29.0
4	28.0	29.0	29.0	29.0
6	28.0	29.0	29.0	29.0
8	28.0	30.0	30.0	29.0
10	28.0	30.0	30.0	29.0
12	28.0	31.0	30.0	29.0
14	28.0	31.0	30.0	29.0
16	29.0	31.0	31.0	30.0
18	30.0	32.0	31.0	31.0
20	32.0	33.0	32.0	33.0
22	33.0	34.0	33.0	36.0
24	35.0	35.0	34.0	39.0
26	37.0	36.0	35.0	43.0
28	39.0	38.0	37.0	47.0
30	41.0	39.0	38.0	50.0
32	44.0	42.0	40.0	54.0
34	46.0	47.0	43.0	57.0
36	48.0	50.0	46.0	60.0
38	50.0	55.0	51.0	63.0
40	52.0	58.0	56.0	65.0
42	54.0	58.0	58.0	68.0
44	56.0	58.0	60.0	69.0
46	58.0	62.0	66.0	71.0
48	60.0	106.0	94.0	72.0

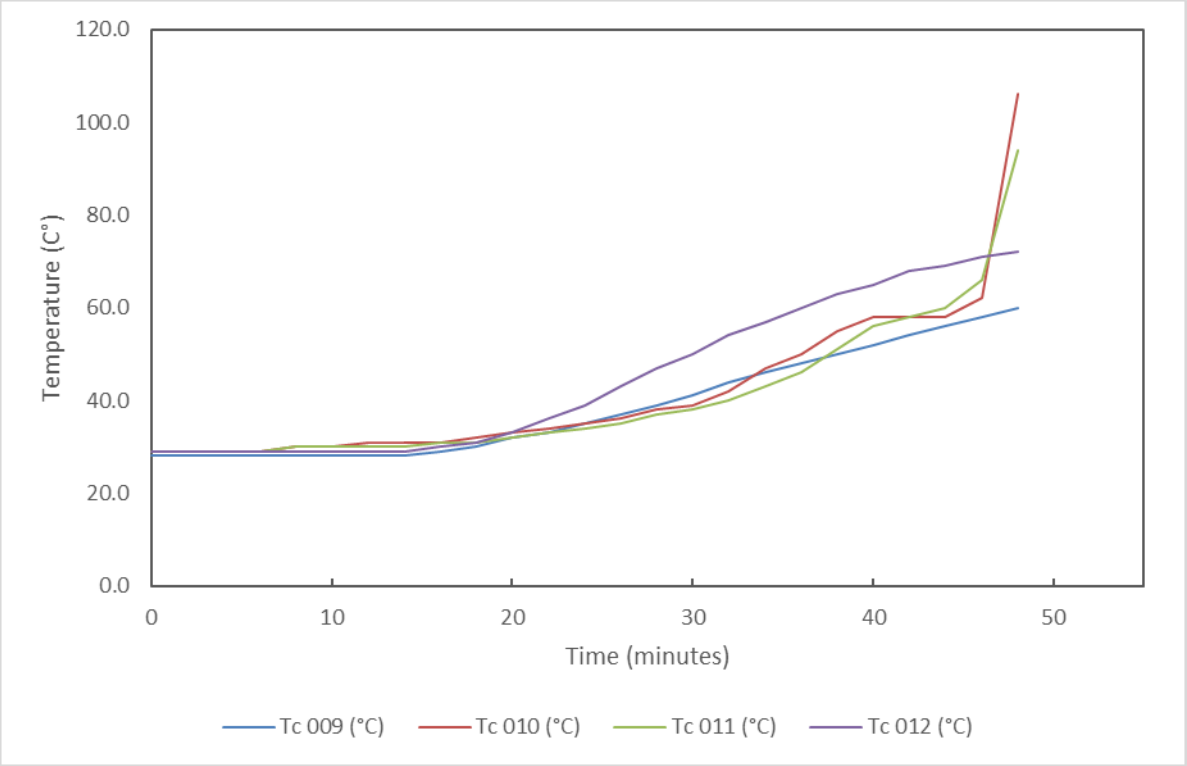


Figure 15 Individual Temperatures Recorded On The Unexposed Surface Of The Door Frame

Table 12 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Upper Glazing On Leaf A. Additional information only

Time (mins)	Tc 013 (°C)	Tc 014 (°C)	Tc 015 (°C)	Average (°C)
0	33.0	34.0	32.0	33.0
2	47.0	48.0	45.0	46.7
4	79.0	82.0	77.0	79.3
6	123.0	128.0	122.0	124.3
8	132.0	131.0	130.0	131.0
10	145.0	144.0	134.0	141.0
12	159.0	156.0	148.0	154.3
14	177.0	171.0	165.0	171.0
16	201.0	195.0	193.0	196.3
18	229.0	226.0	226.0	227.0
20	259.0	258.0	259.0	258.7
22	288.0	289.0	288.0	288.3
24	315.0	315.0	313.0	314.3
26	339.0	336.0	335.0	336.7
28	363.0	357.0	362.0	360.7
30	392.0	381.0	390.0	387.7
32	418.0	400.0	413.0	410.3
34	440.0	410.0	439.0	429.7
36	457.0	417.0	470.0	448.0
38	480.0	430.0	501.0	470.3
40	495.0	439.0	525.0	486.3
42	501.0	447.0	543.0	497.0
44	506.0	451.0	552.0	503.0
46	516.0	463.0	559.0	512.7
48	527.0	474.0	568.0	523.0

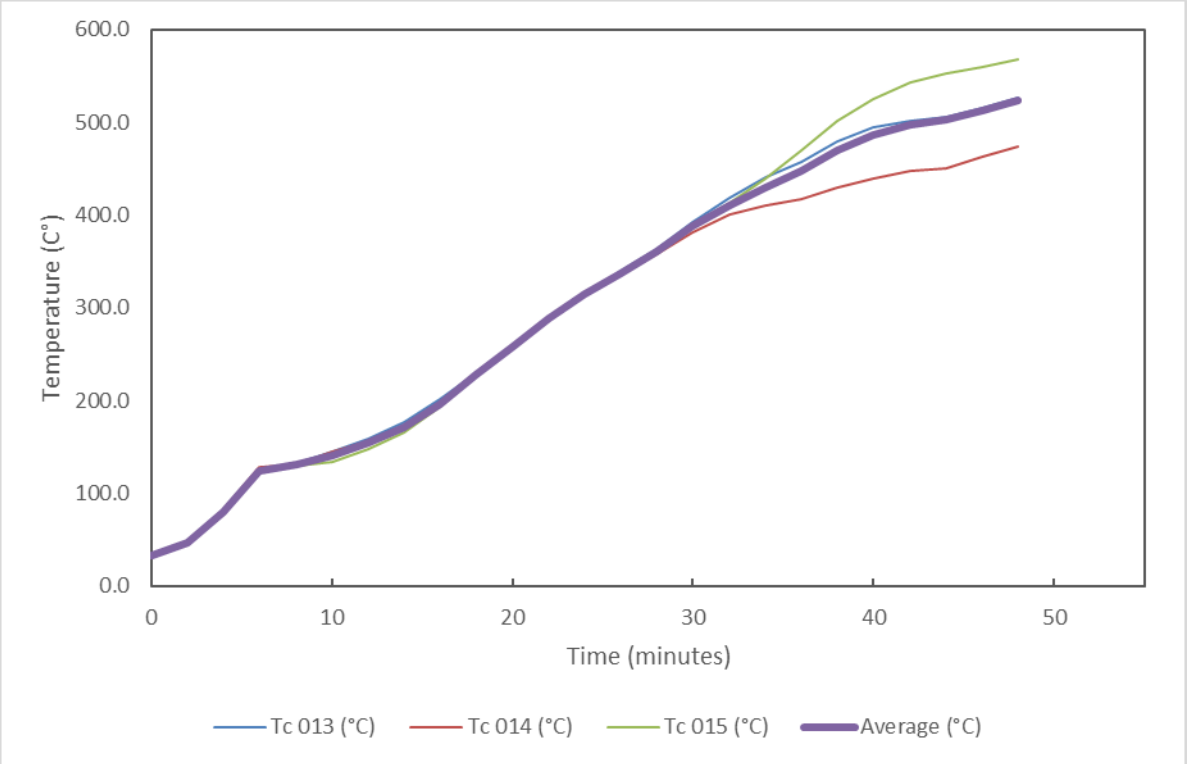


Figure 16 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Upper Glazing On Leaf A. Additional information only

Table 13 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Lower Glazing On Leaf A. Additional information only

Time (mins)	Tc 016 (°C)	Tc 017 (°C)	Tc 018 (°C)	Average (°C)
0	32.0	32.0	32.0	32.0
2	45.0	46.0	43.0	44.7
4	81.0	83.0	74.0	79.3
6	129.0	121.0	122.0	124.0
8	124.0	122.0	127.0	124.3
10	132.0	134.0	134.0	133.3
12	154.0	149.0	154.0	152.3
14	184.0	162.0	180.0	175.3
16	215.0	186.0	209.0	203.3
18	246.0	223.0	239.0	236.0
20	277.0	262.0	267.0	268.7
22	304.0	296.0	292.0	297.3
24	328.0	324.0	316.0	322.7
26	350.0	346.0	338.0	344.7
28	382.0	371.0	364.0	372.3
30	408.0	401.0	397.0	402.0
32	423.0	408.0	413.0	414.7
34	441.0	413.0	441.0	431.7
36	461.0	419.0	472.0	450.7
38	484.0	433.0	496.0	471.0
40	504.0	439.0	507.0	483.3
42	518.0	444.0	500.0	487.3
44	522.0	449.0	496.0	489.0
46	526.0	459.0	495.0	493.3
48	532.0	468.0	500.0	500.0

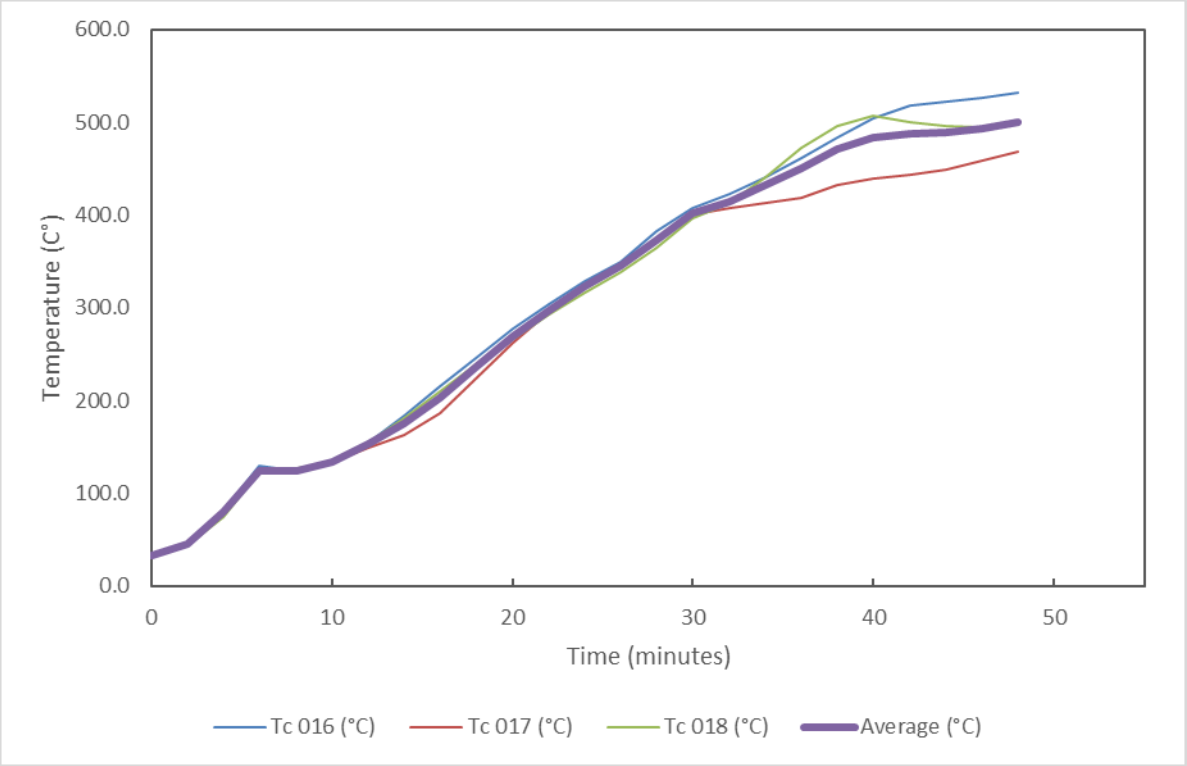


Figure 17 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Lower Glazing On Leaf A. Additional information only

Table 14 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Upper Glazing On Leaf B. Additional information only

Time (mins)	Tc 019 (°C)	Tc 020 (°C)	Tc 021 (°C)	Average (°C)
0	32.0	32.0	32.0	32.0
2	48.0	45.0	46.0	46.3
4	83.0	78.0	83.0	81.3
6	121.0	112.0	122.0	118.3
8	127.0	116.0	130.0	124.3
10	134.0	124.0	143.0	133.7
12	154.0	143.0	158.0	151.7
14	169.0	158.0	172.0	166.3
16	180.0	167.0	188.0	178.3
18	201.0	187.0	210.0	199.3
20	227.0	215.0	236.0	226.0
22	257.0	246.0	264.0	255.7
24	286.0	275.0	287.0	282.7
26	310.0	298.0	308.0	305.3
28	332.0	318.0	327.0	325.7
30	352.0	336.0	347.0	345.0
32	373.0	352.0	366.0	363.7
34	393.0	369.0	386.0	382.7
36	413.0	380.0	404.0	399.0
38	429.0	392.0	422.0	414.3
40	439.0	398.0	433.0	423.3
42	446.0	401.0	439.0	428.7
44	451.0	403.0	443.0	432.3
46	458.0	409.0	450.0	439.0
48	467.0	417.0	457.0	447.0

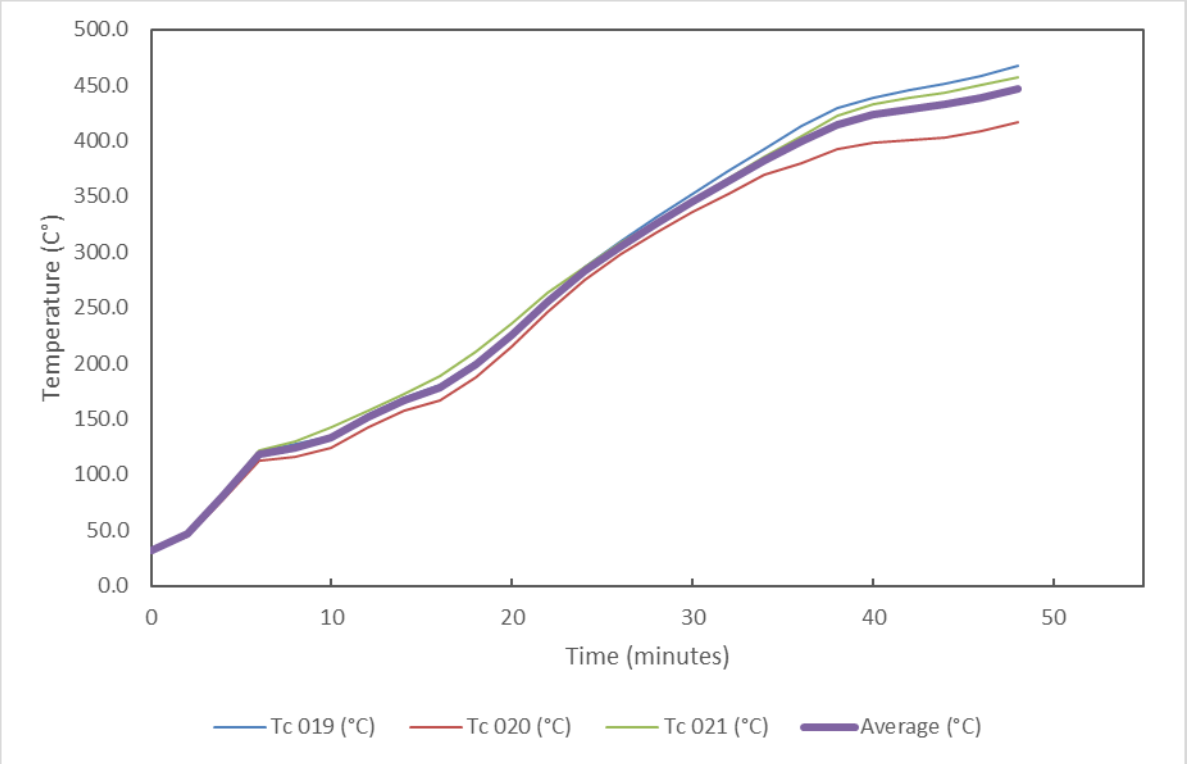


Figure 18 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Upper Glazing On Leaf B. Additional information only

Table 15 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Lower Glazing On Leaf B. Additional information only

Time (mins)	Tc 022 (°C)	Tc 023 (°C)	Tc 024 (°C)	Average (°C)
0	28.0	28.0	28.0	28.0
2	44.0	41.0	41.0	42.0
4	85.0	80.0	77.0	80.7
6	122.0	121.0	122.0	121.7
8	136.0	135.0	124.0	131.7
10	143.0	142.0	139.0	141.3
12	154.0	154.0	163.0	157.0
14	168.0	169.0	173.0	170.0
16	185.0	182.0	188.0	185.0
18	207.0	204.0	211.0	207.3
20	235.0	234.0	236.0	235.0
22	264.0	263.0	263.0	263.3
24	290.0	290.0	288.0	289.3
26	311.0	313.0	310.0	311.3
28	332.0	334.0	332.0	332.7
30	354.0	358.0	356.0	356.0
32	377.0	385.0	381.0	381.0
34	395.0	396.0	397.0	396.0
36	414.0	401.0	411.0	408.7
38	436.0	411.0	432.0	426.3
40	451.0	419.0	449.0	439.7
42	456.0	423.0	461.0	446.7
44	458.0	427.0	469.0	451.3
46	461.0	432.0	477.0	456.7
48	465.0	438.0	481.0	461.3

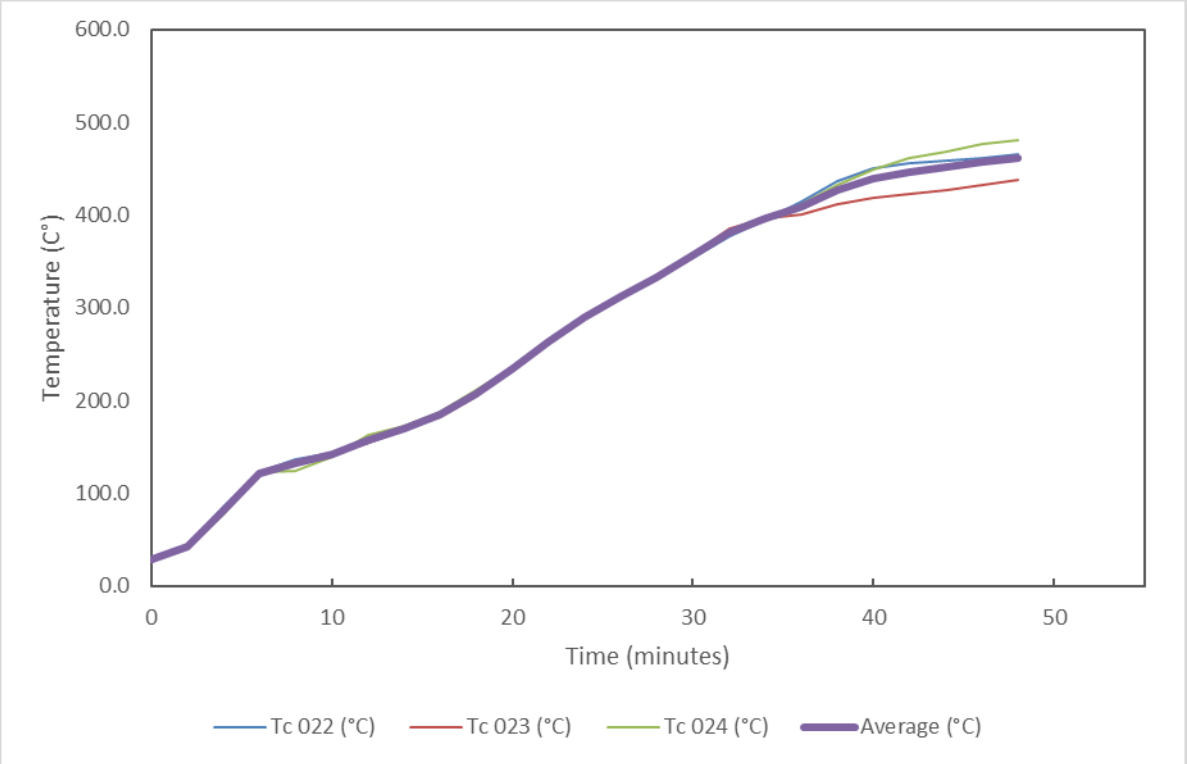


Figure 19 Individual And Mean Temperatures Recorded On The Unexposed Surface Of The Lower Glazing On Leaf B. Additional information only

C.4 Specimen Deflections

Table 16 details the deflection measurements of the test specimen at locations given in Figure 22.

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

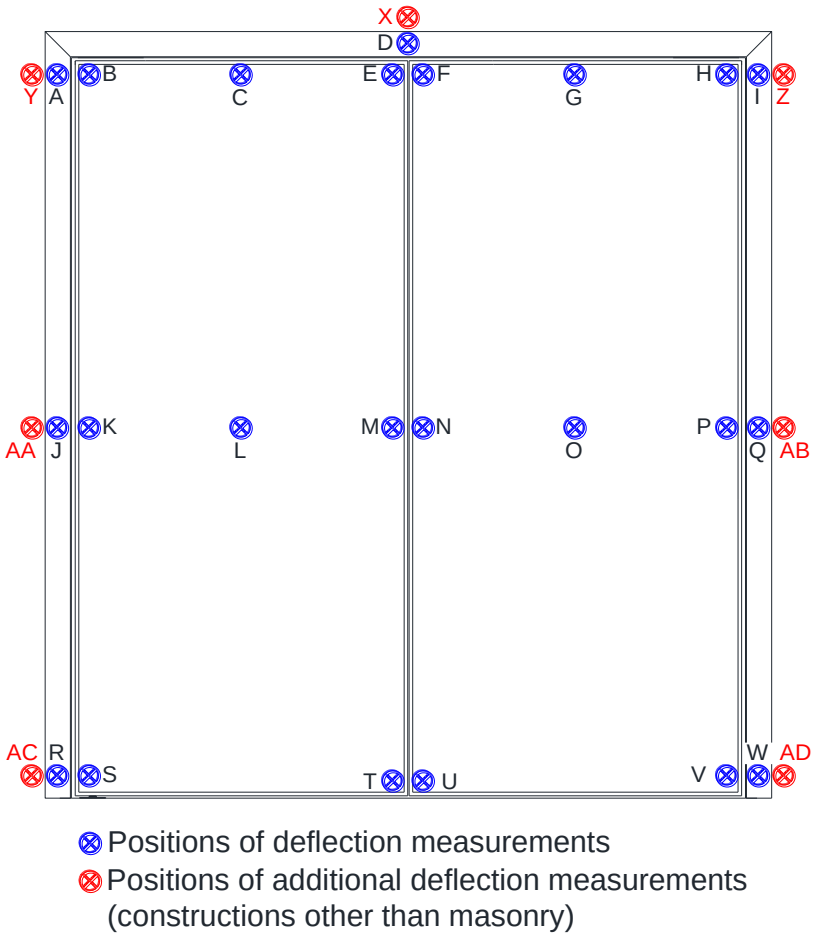


Figure 20 Position of deflection measurements

Table 16 Deflections – Doorset

Deflections (mm)												
Time (mins)	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
0	0	0	0	0	0	0	0	0	0	0	0	0
5	3	3	1	4	9	8	3	3	-1	19	22	26
10	3	8	9	7	9	6	9	13	-1	22	19	20
15	8	3	9	7	2	8	9	9	2	17	22	15
20	4	4	4	4	2	8	4	21	5	32	28	24
25	9	5	8	5	3	5	9	26	17	42	42	25
30	5	5	9	9	4	5	9	21	20	41	38	10
35	5	5	4	7	7	5	6	27	18	47	36	2
40	6	7	5	7	8	4	6	33	25	52	42	-7
Max	8	8	9	9	9	8	9	33	25	52	42	26

Deflections (mm)											
Time (mins)	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**
0	0	0	0	0	0	0	0	0	0	0	0
5	2	2	4	3	6	-1	-3	8	9	6	8
10	1	4	6	5	6	2	-2	6	7	9	4
15	-9	-6	-3	13	1	3	5	5	2	5	4
20	-1	5	7	15	9	3	7	4	3	5	2
25	-2	4	5	13	7	1	8	7	3	5	4
30	-0	-1	-2	13	8	5	3	3	9	3	2
35	-1	-4	-17	14	9	10	9	-5	8	8	8
40	-6	-4	-24	14	6	9	5	8	2	9	9
Max	-6	-6	-24	15	9	10	9	8	9	9	9

C.5 Heat flux measurements

The heat flux was measured 2442 mm away from the specimen and is based on the maximum levels.

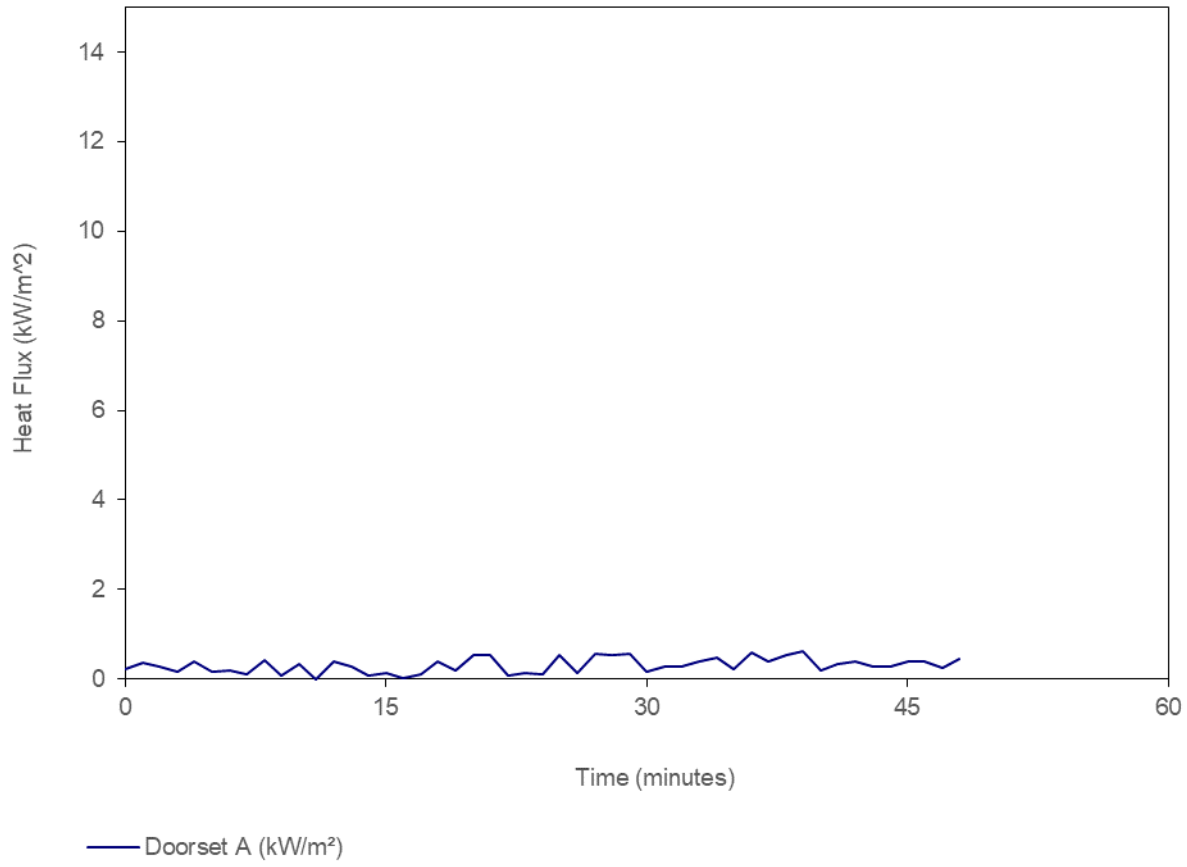


Figure 21 **Heat flux measurements of the test specimen vs time**

Table 17 Heat flux measurements of the test specimen vs time

Time (mins)	Doorset A (kW/m²)
0	0.000
2	0.293
4	0.391
6	0.196
8	0.424
10	0.326
12	0.391
14	0.065
16	0.033
18	0.391
20	0.522
22	0.065
24	0.098
26	0.130
28	0.522
30	0.163
32	0.293
34	0.489
36	0.587
38	0.522
40	0.196
42	0.391
44	0.293
46	0.391
48	0.456

Table 18 Heat flux thresholds vs time

Radiation intensity	Doorset A
5 kW/m²	Radiation intensity not reached
10 kW/m²	Radiation intensity not reached
15 kW/m²	Radiation intensity not reached
20 kW/m²	Radiation intensity not reached
25 kW/m²	Radiation intensity not reached

C.6 Gap measurements

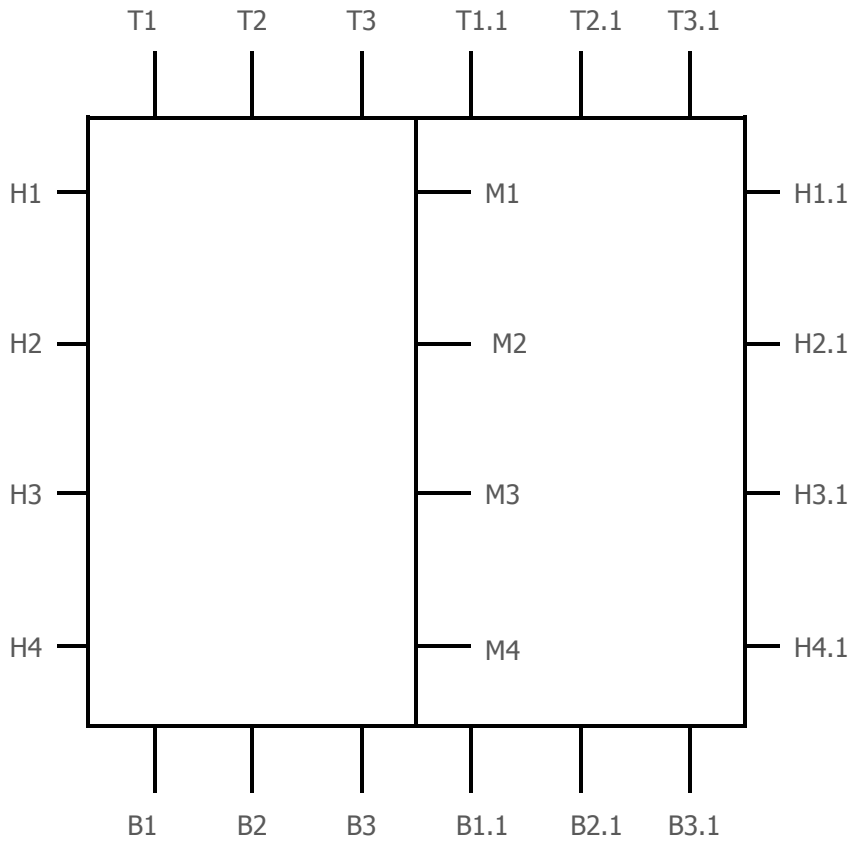


Figure 22 Gap measurements, Doorset (unexposed side shown)

Table 19 Measured and calculated gap sizes for Doorset

Doorset A (mm)							
Left hinge side	**Primary**	**Leaf to stop**	**Right hinge side**	**Primary**	**Leaf to stop**	**Meeting edge**	**Primary**
LH1	3.63	0.08	RH1	3.13	0.27	M1	2.39
LH2	3.47	0.14	RH2	3.37	0.05	M2	3.00
LH3	2.65	0.11	RH3	3.29	0.08	M3	2.32
LH4	2.87	0.30	RH4	2.60	0.15	M4	2.18
Mean	3.16		**Mean**	3.10		**Mean**	2.47
Max	3.63		**Max**	3.37		**Max**	3.00
Min	2.65		**Min**	2.60		**Min**	2.18
Top edge	**Primary**	**Leaf to stop**	**Threshold**	**Primary**			
T1	2.50	0.32	B1	7.03			
T2	*	*	B2	8.14			
T3	2.13	0.33	B3	7.69			
T4	2.90	0.05	B4	7.25			
T5	*	*	B5	7.63			
T6	2.84	0.30	B6	8.86			
Mean	2.59		**Mean**	7.77			
Max	2.90		**Max**	8.86			
Min	2.13		**Min**	7.03			

* Indicates measurement was inaccessible

Appendix D Photographs

Figure 23 Unexposed face of the specimen before the start of the test

Figure 24 Exposed face of the specimen before the start of the test

Figure 25 Unexposed face of the specimen at 10 minutes of testing

Figure 26 Unexposed face of the specimen at 30 minutes of testing

Figure 27 Unexposed face of the specimen at 40 minutes of testing

Figure 28 Unexposed face of the specimen at 47 minutes 55 minutes of testing displaying sustained flaming before the test was discontinued

Figure 29 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	
Establishment No.	
BM TRADA Approved Body ID: 1224	

Company Head Office Address	Wood International Agency Ltd Woods House 16 King Edward Road Brentwood Essex CM5 0RQ	Contact Name	Mr Neil Harrison
		Telephone	
		Email Address	neil@woodia.co.uk

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
W3 - Linex Panneaux, ZI Alouville-Bellefose, BP222 – 76197 Yvetot, Cedex France	11/06/24	Mike Chorlton

Requirement	Evidence / Comments
Opening Meeting (names of those present)	Neil Harrison, Xavier Demailly, Mike Chorlton
Contract Reference	SC24124 B-2
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Linex Normapan recipe specification.
Description of product(s) sampled	44mm Particleboard - Linex Normapan E1
Product identification / reference numbers / codes	Linex Normapan E1 (Wood Int'l name Melamine)
Batch number(s)	Batch Ref 925668/001 (930173/001)
Date of manufacture	Masterboard wk 21 2023, Cut to size 11/06/24
Quantity of stock and size of sample(s) taken	24 Nº Blanks at 2440 x 1220 x 44
Traceability of material records ie Purchase Orders and delivery notes	Board recipe, production inspection & test. All materials purchased in raw form & processed
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	Each blank marked SC24124 B-2 + sequential number 1, 2, 3 etc
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	Quality management system in place with defined stages for each process and individual records and methods defined.
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity	Density nominal 535 kg/m³ Raw material processing, cleaning, drying and grading. Glue recipe and dosing rate. Layer forming, pre-pressing and pressing. Board cooling, cutting and sanding. Packing and labelling. Q.C checks made throughout production
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***	NONE
Closing Meeting (names of those present)	Neil Harrison, Xavier Demailly

Declaration	I declare that the product/s witnessed during this sampling visit are representative of normal production.
Company Representative Name (Print)	**Company Representative Position**
Xavier Demailly	Quality manager
BM TRADA Representative Signature	**Company Representative Signature**

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

Company Head Office Address	**Wood International Agency Ltd** **Wood 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**
By Dezign Carpentry, Unit 11B ERW Las, Colomendy Ind Est, Denbigh LL16 5TA	20/08/2024	Michael Chorlton

Requirement	**Evidence / Comments**
Opening Meeting (names of those present)	Mr Neil Harrison / Mr Shaun Harrison
Contract Reference	SC24153T
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Technical Drawing: N/A Technical Specification: WIAD- MMN44-ITT-779-CM01 Rev - 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 double leaf doorset incorporating Marksman 44 door cores, lipped on 4 edges with hardwood timber and hung on 3No. butt hinges in a softwood frame, operated by Automatic swing door operators with proximity sensors to both sides and finished with upper and lower offset vision panels and D-Handles, push plates and kick plates.
Product identification / reference numbers / codes	N/A
Batch number(s)	N/A
Date of manufacture	In stages between 22/07/24 and 01/08/24 with final review 20/08/24
Quantity of stock and size of sample(s) taken	1No. Double Doorset
Traceability of material records ie Purchase Orders and delivery notes	Items with traceability: Door blank Sampled SC24124B-2. Door frame materials and properties. Frame and leaf intumescent seals. Hinges, fixings and intumescent. Door swing operators and sensors. Frame to supporting construction fixings. Drop seals. Signage. Pull Handles. Glass manuf and type. Door stop fixings. Frame joint fixings. Lipping species. Glazing intumescent manuf and type. Push plates and fixings. Kick plates and fixings. Glazing bead species, density & MC. Items with limited or no traceability: Smoke seal to frame. Frame fire stopping and sealing. **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.	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, intumescents and fixings.
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***	Sampler Notes: Areas in Green = verified during sampling Areas in Blue = Additional sampler notes or corrections Areas in Yellow = Areas without verification or if additional evidence may be required. Areas in yellow with Asterisk * = Will be reported "As stated by customer" Areas in Red = To be conducted in or by the lab.
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**

warringtonfire
Proud to be part of element

Registered office:

Warringtonfire Testing and Certification Limited
3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA, United Kingdom
Registered Company No. 11371436

Name & address of issuing laboratory:

Warringtonfire Testing and Certification Limited
Holmesfield Road, Warrington WA1 2DS, United Kingdom

Location of performance of laboratory activities:

Warringtonfire Testing and Certification Limited
Holmesfield Road, Warrington WA1 2DS, United Kingdom

Fire resistance laboratory locations:

High Wycombe, United Kingdom
a UKAS accredited testing laboratory No.1762
T - +44 (0) 1494 840 780

Warrington, United Kingdom
a UKAS accredited testing laboratory No.0249
T: +44 (0) 1925 655 116

Ghent, Belgium
BELAC accredited laboratory 196-TEST
T: +32 9 243 77 50

Tisselt, Belgium
BELAC accredited laboratory 196-TEST
T: +32 9 243 77 50

Heywood, United Kingdom
a UKAS accredited testing laboratory No.0249
T - +44 (0) 1925 655 116

General conditions of use