warringtonfire
Proud to be part of element

Fire resistance test report

Warringtonfire Testing and Certification Limited

Test standard:	EN 1634-1:2014+A1:2018
Test sponsor:	Vistamatic Limited
Product:	Two Single Leaf, Single Acting Timber Doorset With Vision Panels
Report number:	WF502390/Rev1
Test date:	16 December 2021
Version:	2

Revision:

The original WF502390 report and any previous reports are replaced by this revised report WF502390/Rev1.

The details of all the test reports are held on file by Warringtonfire.

Quality management

Version	Date	Information about the report		
2	9 September 2022	Description	Revision 1	
			Prepared by	Authorised by
		Name	Jamie Nelson	Fawaz Hashim
		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 doorsets in accordance with EN 1634-1:2014+A1:2018.

Warringtonfire Testing and Certification Limited (Warringtonfire) performed the test on 16 December 2021 at the request of Vistamatic Limited.

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	Single Leaf, Single Acting Timber Doorset with Vision Panel	Away from the furnace
Doorset B	Single Leaf, Single Acting Timber Doorset with Vision Panel	Away from the furnace

Table 2 Supporting construction

Item	Detail		
Supporting construction	A plasterboard clad steel stud supporting construction with steel 'C' studs.		
Nominal dimensions	Width	3000 mm	
	Height	3000 mm	
	Thickness	62.5 mm	
Aperture dimensions		**Width**	**Height**
	Doorset A	1020 mm	2160 mm
	Doorset B	1020 mm	2160 mm
Restraint conditions	Restrained on all edges		

Table 3 Summary of test results

Item	Criteria		Results
Doorset A	Integrity		38 minutes
	Insulation	I_2	18 minutes
	Radiation of 15 kW/m²		Radiation intensity of 15 kW/m² was not reached after 39 minutes
Doorset B	Integrity		37 minutes
	Insulation	I_2	21 minutes
	Radiation of 15 kW/m²		Radiation intensity of 15 kW/m² was not reached after 39 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 doorsets in accordance with EN 1634-1:2014+A1:2018.

Warringtonfire performed the test on 16 December 2021 at the request of the test sponsor listed in Table 4.

Table 4 Test sponsor(s) details

Test sponsor(s)	Address
Vistamatic Limited	51-55 Flower Road Hainault, Essex IG6 3XE

2. Test specimen and supporting construction

2.1 Drawings of test assembly

The leaders in the drawings (Figure 1 - Figure 3) represent the items listed in section 2.2. All measurements are in millimetres – unless indicated otherwise.

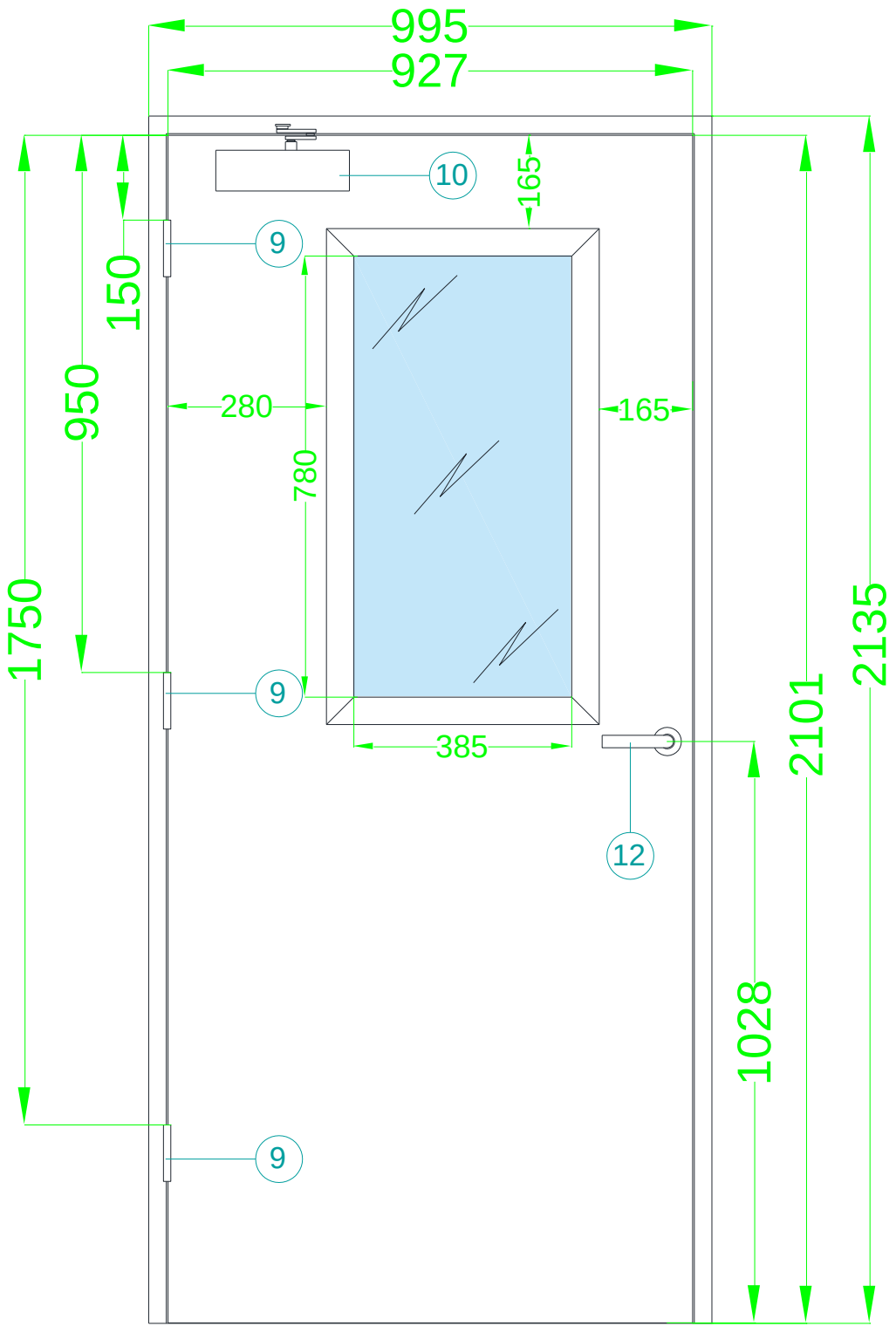


Figure 1 Unexposed Elevation of Doorset A

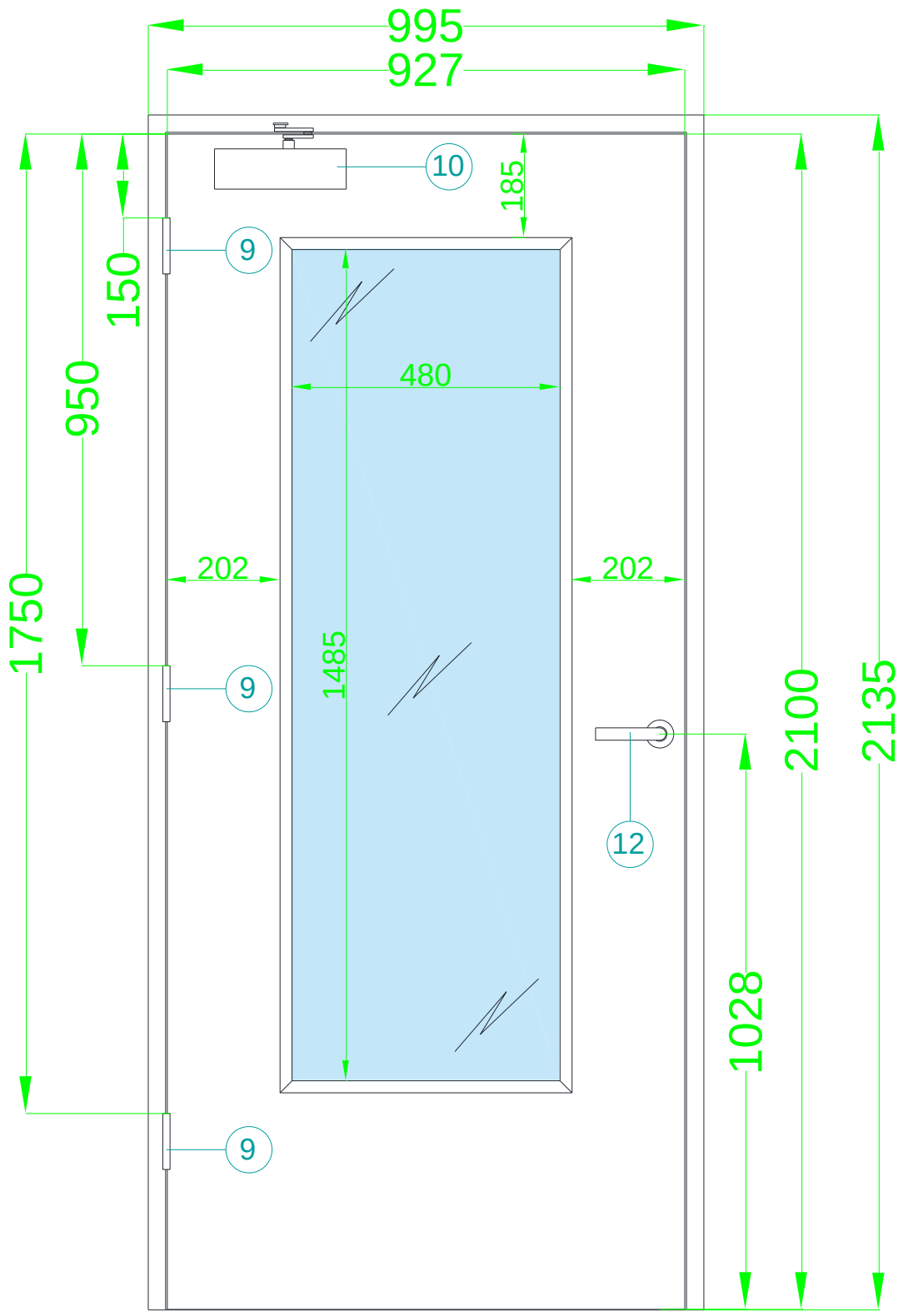


Figure 2 Unexposed Elevation of Doorset B

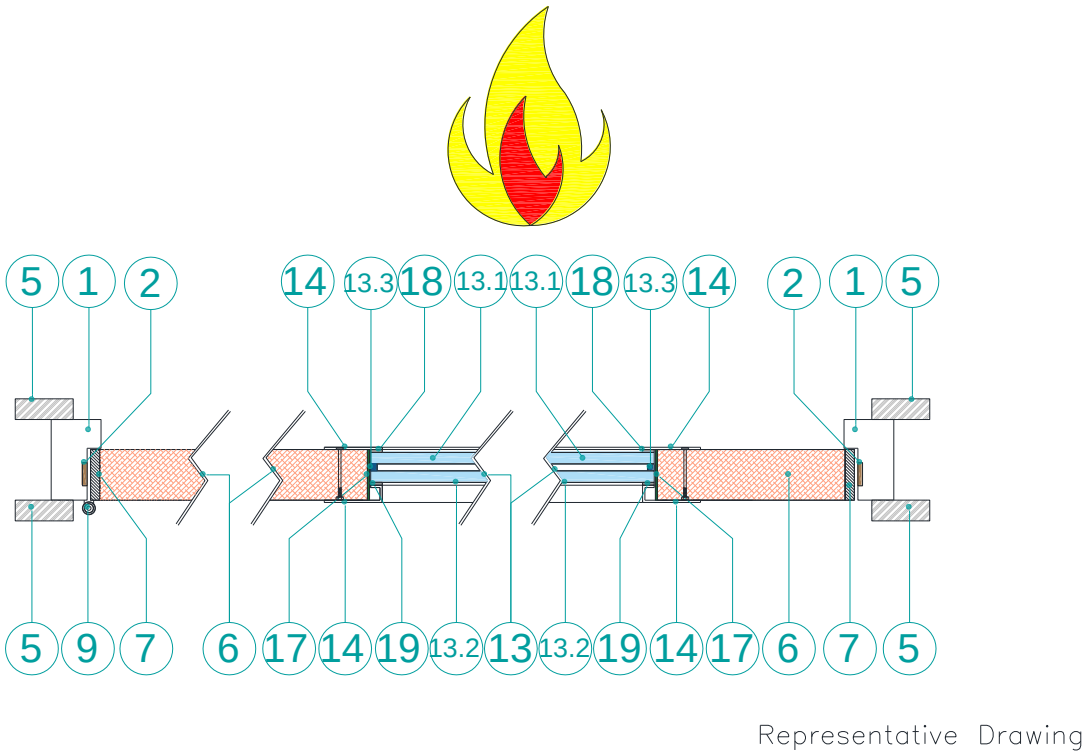


Figure 3 Horizontal Sectional View – Doorset A

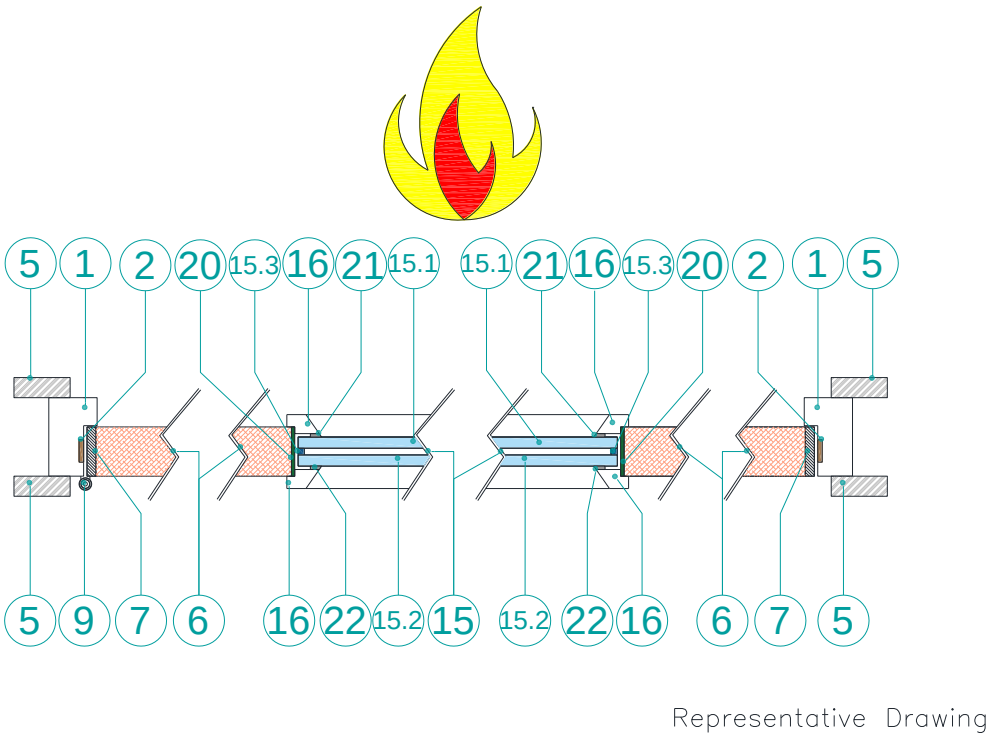
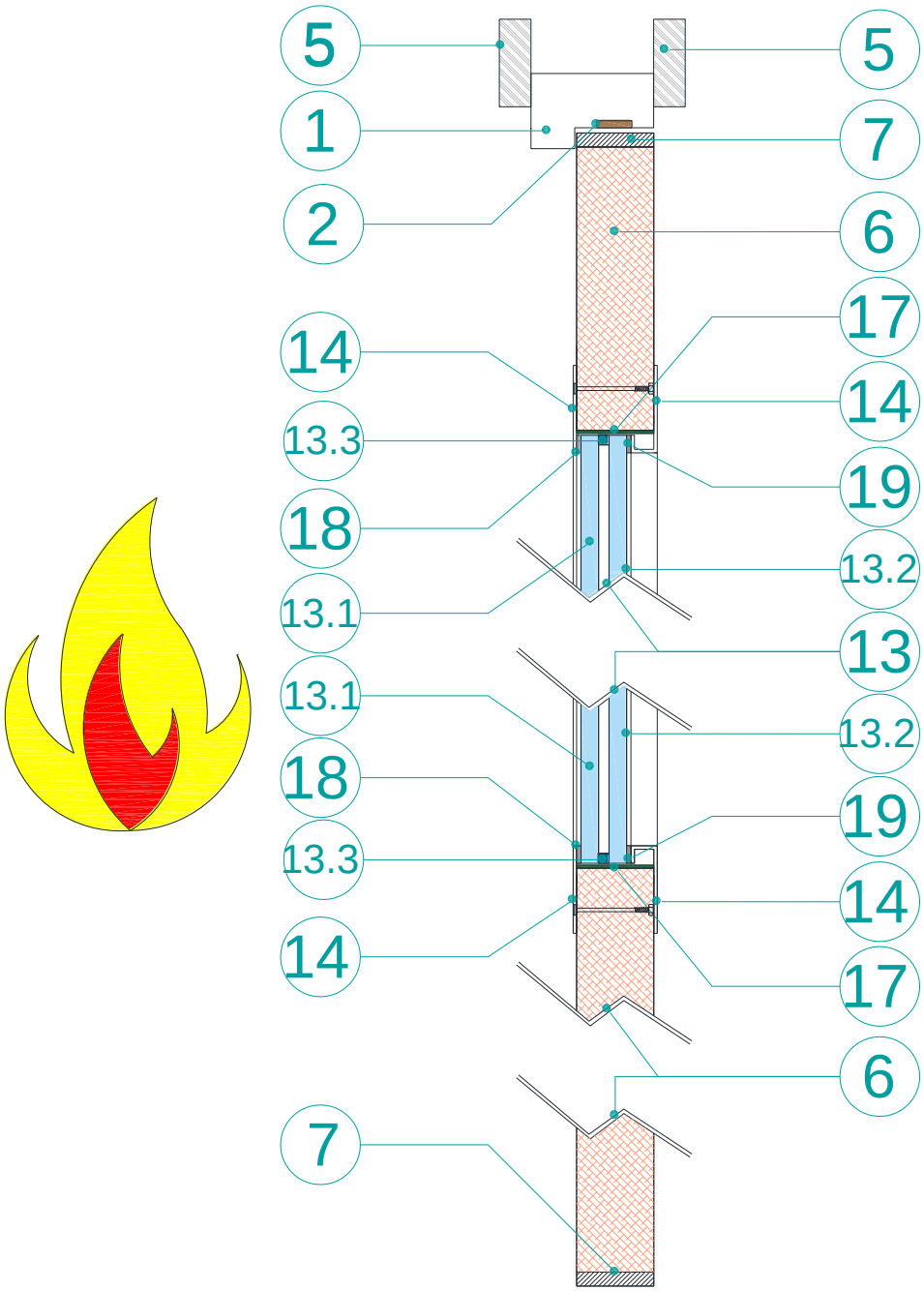


Figure 4 Horizontal Sectional View – Doorset B



Representative Drawing

Figure 5 Vertical Sectional View - Doorset A

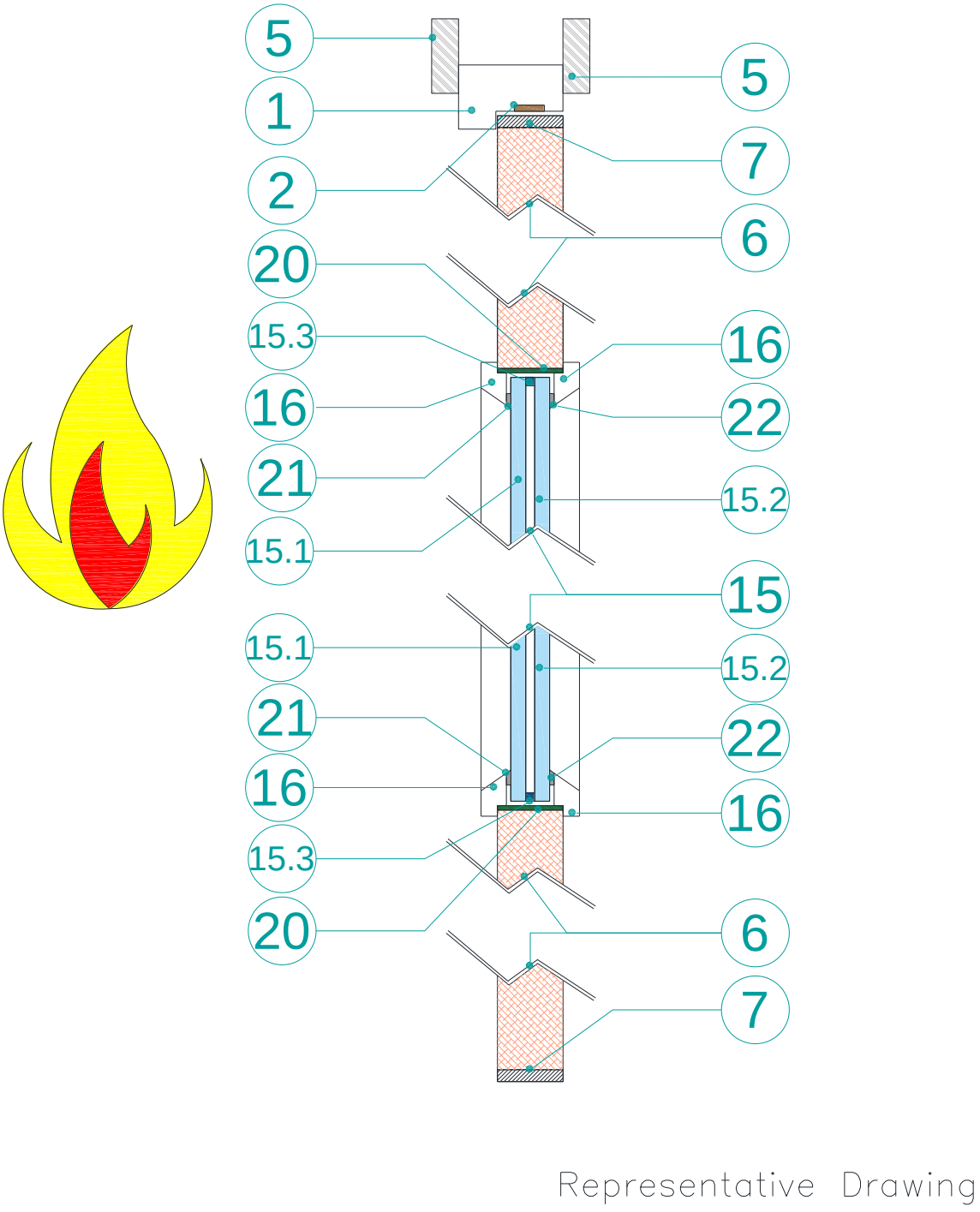


Figure 6 Vertical Sectional View - Doorset B

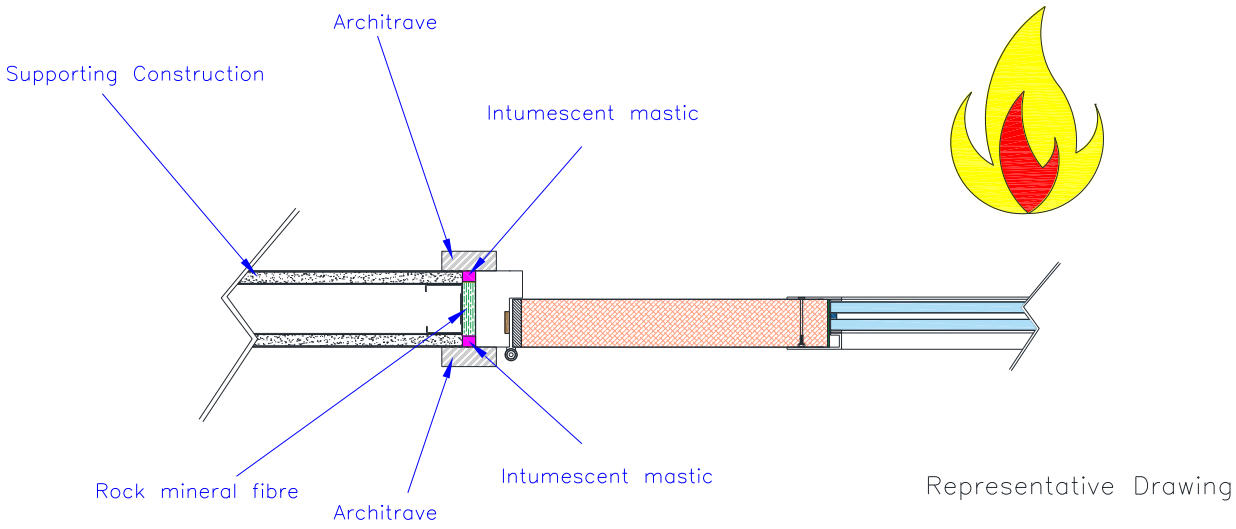


Figure 7 Details of Supporting Construction to Frame, Fire Stopping – Doorset A

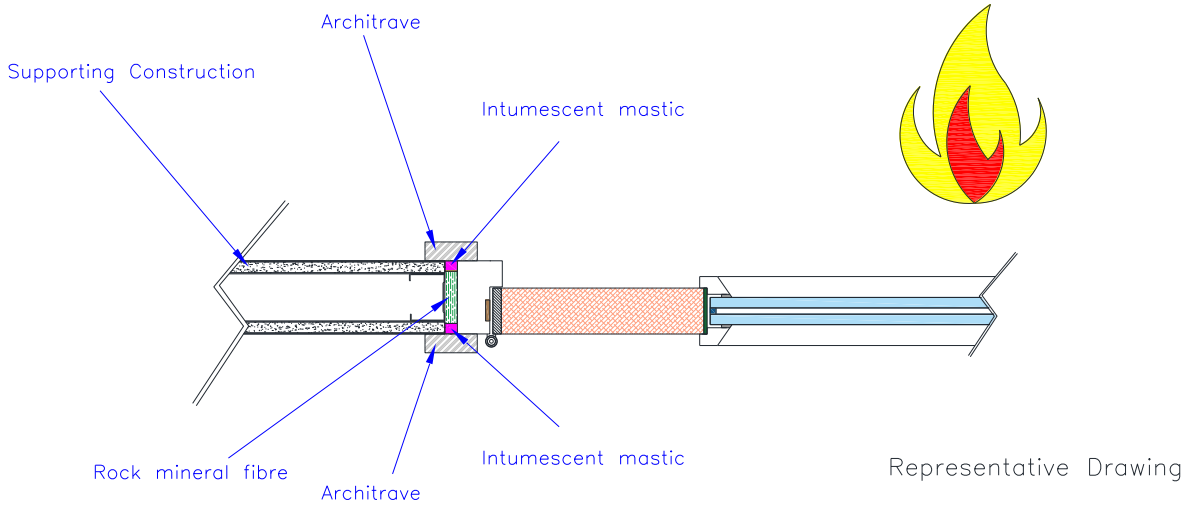


Figure 8 Details of Supporting Construction to Frame, Fire Stopping – Doorset B

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

Door Frame – Both Doorsets

1. Door frame	
Manufacturer	Integrated Doorsets Solutions Ltd*
Reference	Ovi 30*
Material	Finger Jointed European Redwood Head and Finger Jointed European Redwood Jambs*
Density	510 kg/m^{3*}
Moisture content	Sample A – 11.9%
	Sample B – 12.6%
Overall section size	
I. Frame (Head)	70mm wide x 32mm thick*
II. Frame (Jambs)	70mm wide x 32mm thick*
III. Stop	25mm wide x 12mm deep*
Jamb to Head jointing method, fixing detail and location	Mortice and Tenon – Screwed*
Stop to Frame jointing method, fixing detail and location	Mitred – Pinned *
Presence of Adhesives	No *
2. Intumescent to frame reveal (1)	
Quantity	1
Manufacturer	Lorient Polyproducts Ltd *
Reference	LP2004 *
Material	Type 617*
Overall section size	20mm wide x 4mm thick
Application method	Self-Adhesive
Location (relative to the opening face of the door leaf)	Fitted Central
Presence of Adhesives	No

Fire Stopping – Both Doorsets

3. Frame to supporting construction fire stopping detail	
Manufacturer	Rockwool
Reference	Flexi-slab
Material	Mineral Wool
Overall dimension	Full length of frame allowing for a 10mm mastic capping each side
Application method	Push fit

4. Sealant to fire stopping detail	
Manufacturer	Mann Mcgowan
Reference	Pyromas A
Material	Intumescent Mastic
Overall section size	6mm-15mm wide x 10mm deep
Application method	Gun applied
Location	Around perimeter of doorset between frame and supporting construction
5. Architrave	
Manufacturer	Integrated Doorsets Solutions Ltd *
Reference	Architrave*
Material	European Redwood *
Moisture Content	Sample A – 10.1%
	Sample B – 10.2%
Overall section size	50mm wide x 18mm Thick
Location	Frame/Wall
Application method, fixings and fixing frequency required	Pinned

Door Leaf – Both Doorsets

6. Door Leaf	
Manufacturer (blank)	Integrated Doorsets Solutions Ltd*
Reference	Halspan Optima Particleboard*
Quantity of leaves on doorset	1
Overall leaf size prior to trimming	926mm wide x 2100mm high x 44mm thick
Overall leaf size supplied for testing	927mm wide x 2100mm high x 44mm thick
7. Lippings / Edge banding	
Manufacturer	Integrated Doorsets Solutions Ltd *
Reference	Lippings*
Material	Sapele *
Density	640 kg/m^3*
Overall size	44mm wide x 8mm thick
Fixing method	Edge Bander*
Location	Vertical Edges Only
Adhesives	
Manufacturer	Henkel*
Type	PU Hotmelt*
Reference	Technomelt 270*
Curing method	Edge Bander*
Application method	Edge Bander*
Presence of Mechanical Fixings	No*

Hardware – Both Doorsets

9. Hinges	
Supplier	Royde and Tucker *
Reference	H101 *
Quantity	3
Primary material	Stainless Steel*
Type	Lift Off
Size	100 x 88
i. knuckle	14Ømm
ii. blades	100mm high x 35mm wide x 3mm thick
Fixings	
i. type	Wood Screws
ii. material	Stainless Steel
iii. sizes	5Ømm x 32mm long
iv. number off per blade	5
Position of each hinge relative to the head of the leaf	Top hinge – 150mm from head Middle hinge – 950mm from head Bottom hinge – 1750mm from head
Details of intumescent protection	1mm Interdens
Interruptions to Intumescent within the frame reveal	Fully Interrupted
10. Door Closer	
Manufacturer	Rutland*
Reference	TS3204*
Material	
I. Body	Cast Aluminium*
II. Closer arm	Mild Steel*
III. Cover	Mild Steel*
Configuration	Overhead lever arm*
Overall size	
I. Body	220mm wide x 59mm high x 42mm projection
II. Cover	224mm wide x 68mm high x 44mm projection
Fixing method	As per manufacturer's instructions
Maximum opening moment	Doorset A 58 Newton metre (Nm) Doorset B 60 Newton metre (Nm)
Maximum closer moment	Doorset A 27 Newton metre (Nm) Doorset B 31 Newton metre (Nm)
11. Lockset / Latch	
Manufacturer	Hoppe *
Reference	AR911-R-60*
Material	Steel*
Lockcase	165mm x 85mm x 16mm
Forend plate	235mm x 24mm x 3mm
Details of intumescent protection	None
Location of centre of the spindle relative to the bottom of the leaf	Centre of the spindle measures 1028mm from the bottom of the leaf

12. Lever handles	
Manufacturer	Hoppe *
Reference	AR961/60-SP-SSS*
Material	Stainless Steel*
Overall size	Ø52mm rose with 140mm wide handle
Fixing method, fixing material, sizes, quantity and location	Screwed with 4No. Ø7.5mm x 20mm stainless steel screws
Details of intumescent protection	None

Glazing – Doorset A

13. Double glazed unit / Glass	
Manufacturer / Supplier	Vistamatic Ltd*
Reference (Declaration of Performance)	VS2*
Unit overall size	400mm high x 800mm wide x 22mm thick*
Aperture location relative to the head and closing edge of the leaf	185mm from the head of the leaf and 202mm from the closing edge of the leaf
Aperture size (prior to any lining)	408mm wide x 808mm high
Sight size	385mm wide x 780mm high
13.1 Glass to internal face	
Manufacturer	Vistamatic Ltd*
Reference	Toughened Glass*
Thickness	6mm thick*
13.2 Glass to external face	
Manufacturer	Vistamatic Ltd*
Reference	Pyor-EX Toughened Glass*
Thickness	10mm thick*
13.3 Glass spacer	
Manufacturer	Vistamatic Ltd*
Reference	N/A
Material	Aluminium Spacer*
Overall size	5.5mm*
Fixing method	Hot Melt*
Presence of Adhesives to seal unit	Yes*
Location	Hainault, Essex*
Manufacturer	Vistamatic Ltd*
Type	Bostik*
Reference	N/A*
Curing method	Hot Melt*
Application method	Cartridge gun*

14. Beading	
Manufacturer	Vistamatic Ltd*
Reference	Anti-Ligature Frame*
Material	Stainless Steel*
Density	7980kg/m^3*
Overall size	10.2%
Fixing method, fixing material and sizes	440mm x 840mm
Fixing distances from corners, centres and angle relative to the face of the glass	Both through screws
17. Glazing Lining / Intumescent liner / Wet mastic system	
Manufacturer	Norseal*
Reference	1.8-408x53/SA*
Material	Graphite intumescent liner*
Overall size	44mm x 1.8mm*
18. Sealant applied to glass on the internal face of the leaf	
Manufacturer	Norseal*
Reference	2.5390 x 10S/A*
Material	Graphite intumescent*
Overall size	10mm x 2.5mm*
Fixing method	Self-adhesive*
19. Sealant applied to glass on the external face of the leaf	
Manufacturer	Norseal*
Reference	2.5390 x 10S/A*
Material	Graphite intumescent*
Overall size	10mm x 2.5mm*
Fixing method	Self-adhesive*

Glazing – Doorset B

15. Double glazed unit / Glass	
Manufacturer / Supplier	Vistamatic Ltd*
Reference (Declaration of Performance)	VS2*
Unit overall size	1500mm high x 500mm wide x 26mm thick
Aperture location relative to the head and closing edge of the leaf	202mm from the head of the leaf and 200mm from the closing edge of the leaf
Aperture size (prior to any lining)	1508mm high x 508mm wide
Sight size	1485mm high x 480mm wide
Expansion allowance	4mm on all sides*
Presence of Timber aperture lining	No
Presence of Adhesives to Aperture lining	No
15.1 Glass to internal face	
Manufacturer	Vistamatic Ltd*
Reference	Toughened Glass*
Thickness	10mm thick*
15.2 Glass to external face	
Manufacturer	Vistamatic Ltd*
Reference	Pyor-EX Toughened Glass*
Thickness	10mm thick*

15.3 Glass spacer	
Manufacturer	Vistamatic Ltd*
Reference	N/A
Material	Aluminium Spacer*
Overall size	5.5mm*
Fixing method	Hot Melt*
Presence of Adhesives to seal unit	Yes*
Location	Hainault, Essex*
Manufacturer	Vistamatic Ltd*
Type	Bostik*
Reference	N/A*
Curing method	Hot Melt*
Application method	Cartridge gun*
16. Beading	
Manufacturer	Integrated Doorsets*
Reference	Bead *
Material	Sapele*
Density	640kg/m^3*
Moisture content	20mm high x 17mm deep including a 9mm x 9mm bolection return and a 15º chamfer
Overall size	Steel pins
Fixing method, fixing material and sizes	50mm from corners, 150mm centres
Fixing distances from corners, centres and angle relative to the face of the glass	Integrated Doorsets*
20. Glazing Lining / Intumescent liner / Wet mastic system	
Manufacturer	Norsound Ltd*
Reference	Firewizard intumescent mastic*
Material	Acrylic intumescent mastic*
Overall size	3mm thick & width of unit*
Application method	Sealant gun*
21. Sealant applied to glass on the internal face of the leaf	
Manufacturer	Mann Mcgowan*
Reference	Pyroglaze 30*
Material	PVC encapsulated graphite based core*
Overall size	10mm x 3mm
Fixing method	Self – adhesive
22. Sealant applied to glass on the external face of the leaf	
Manufacturer	Mann Mcgowan*
Reference	Pyroglaze 30*
Material	PVC encapsulated graphite based core*
Overall size	10mm x 3mm
Fixing method	Self – adhesive

2.3 Supporting construction

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

Table 6 Supporting construction

Item	Detail		
Supporting construction	A plasterboard clad steel stud supporting construction with steel 'C' studs		
Nominal dimensions	Width	3000 mm	
	Height	3000 mm	
	Thickness	62.5 mm	
Aperture dimensions		**Width**	**Height**
	Doorset A	1020 mm	2160 mm
	Doorset B	1020 mm	2160 mm
Restraint conditions	Restrained on horizontal 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 EN 1634-1:2014+A1:2018.		
Product standard and/or EAD	**According to the information provided by the test sponsor, there was no product standard for CE marking available at the time the test report for the tested material/product was drafted. When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for product certification.**		
EGOLF agreements and/or recommendations	Certain aspects of some fire test specifications are open to different interpretations. EGOLF 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 EN 1634-1:2014+A1:2018, EN 1363-1:2020, and where appropriate EN 1363-2:1999.		
Pre-test conditioning	The test specimen was subjected to normal laboratory temperatures and conditions between the completion of construction of the test specimen and the start of the test.		
Functionality test	Opening and closing cycles	The door(s) were subjected to a series of 25 opening and closing cycles of at least 90° for side-hung doorset(s).	
	Clearance gap measurements	These measurements were completed before the start of the fire test. They are shown in Figure and Tables Table 16 and Table 17 in Appendix C.	
Pre-test measurements		**Doorset A**	
	Opening force	58 N	
	Closing force	27 N	
	Closing speed	1.8 m/s	
		Doorset B	
	Opening force	60 N	
	Closing force	31 N	
	Closing speed	1.2 m/s	
Installation details	Start date for construction of supporting construction		14 December 2021
	Completion date for construction of supporting construction		14 December 2021
	Delivery date of the test specimen		13 December 2021
	Start date for installation of test specimen		15 December 2021
	Completion date for installation of test specimen		15 December 2021
	Supporting construction constructed by		Representatives of Warringtonfire
	Doorset installed by		Representatives of Warringtonfire

Item	Detail	
Symmetry	Asymmetrical: • Doorset A opened away from the furnace • Doorset B opened away from the furnace The direction of exposure was decided by the test sponsor.	
Ambient laboratory temperature	Start of the test Minimum temperature Maximum temperature	11.5 °C 11.4 °C 12.2 °C
Sampling / specimen selection	The doorsets supplied for testing were sampled by Chris Blount of BM TRADA on 28th September 2021 and 14th October 2021 under the contract reference of SC21134 See Appendix E for sampling report.	

4. Test measurements and results

Table 8 summarises the results achieved by the test specimen against the performance criteria listed in EN 1634-1:2014+A1:2018 for the following parameters:

- Integrity – The specimen must retain its separating function, without causing either ignition of a cotton pad when applied, or permitting the penetration of a gap gauge as specified in EN 1634-1: 2014 + A1:2018, or resulting in sustained flaming on the unexposed surface.
- Insulation (I_2) – 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, with the exception that the limit for temperature rise for any frame member or transom member adjacent to the leaf/leaves of the doorset or openable window must be 360°C. Insulation failure also occurs simultaneously with integrity failure as specified in EN 1634-1: 2014 + A1:2018.
- Radiation – Elements for which the radiation criteria is evaluated must be given by the time for the measured radiation to exceed the value of 5, 10, 15, 20, 25 kW/m².

If a measurement device is defective, or has detached from the test specimen, the data is no longer given. From that moment on, the temperature measurements are taken by means of the roving thermocouple.

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.

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

Table 8 Detailed test results

Criteria		Doorset A	Doorset B
Thermal insulation			
Normal procedure – I_2		17 minutes	8 minutes
Integrity		38 minutes	37 minutes
Spontaneous and sustained flaming		38 minutes	No integrity failure for this criteria at the termination of the test
Failure with gap gauge		No integrity failure for this criteria at the termination of the test	No integrity failure for this criteria at the termination of the test
Cotton pad failure		38 minutes	37 minutes
Radiation			
Radiation intensity	15 kW/m²	Radiation intensity of 15 kW/m² was not reached after 39 minutes	Radiation intensity of 15 kW/m² was not reached after 39 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.			

5. Application of test results

5.1 Field of direct application

EN 1634-1:2014+A1:2018 states that “The field of direct application may only be defined following the identification of classification(s)” and that “The field of application (direct and, where applicable, extended) application should be included in the classification report”. For these reasons, the field of direct application in is not covered by this test report.

5.2 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 EN 1634-1:2014+A1:2018, EN 1363-1:2020, and where appropriate EN 1363-2:1999.

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.

This report may only be reproduced in full. Extracts or abridgements shall not be published without the express written permission of Warringtonfire.

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.

5.3 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	System	Observation
00	00	Doorset A & B	Commencement of test
01	14	Doorset A	There is smoke issuing at the perimeter of the glass between the glass and frame
01	50	Doorset A	There is smoke issuing at the top hinge position, up to the top hanging corner, and at the top closing edge, top closing corner and latch position
02	30	Doorset B	There is smoke issuing at the top hinge position, above and below, the latch position, top closing corner and the top closing edge
03	37	Doorset A	There is smoke issuing at the centre of the head and there is discolouration at the top hinge position
03	45	Doorset B	The glazing at the exposed side has fallen away
05	10	Doorset B	There is an increase in smoke issuing and discolouration at the top hinge position
06	16	Doorset A & B	There is smoke issuing from the top hinge position, approximately 200mm down
08	00	Doorset A & B	There is smoke issuing at the middle hinge position, above and below
11	45	Doorset A	There is a gap in the intumescent at the bottom hinge position and below, down to the bottom hanging corner no failure
14	00	Doorset B	The glazing has cracked and there is discolouration at the perimeter of the glazing and the glazing is bowing
18	00	Doorset B	There is a gap in the intumescent at the bottom closing edge, approximately 150mm from the bottom closing corner no failure
18	28	Doorset B	A cotton pad test was performed below the bottom hinge position which did not result in the ignition of the cotton pad. No failure
19	25	Doorset B	A cotton pad test was performed at the bottom closing edge, approximately 150mm from the bottom closing corner, which did not result in the ignition of the cotton pad. No failure
21	10	Doorset A	There is smoke issuing at the top two corners of the glazing
24	00	Doorset A	The glazing has fallen away from the centre of the exposed face
25	53	Doorset B	There is a glow visible at the latch position
27	00	Doorset B	A cotton pad test was performed at the latch position which did not result in the ignition of the cotton pad. No failure
28	27	Doorset A	There is a glow visible at the latch position
29	05	Doorset A	A cotton pad test was performed at the latch position which did not result in the ignition of the cotton pad. No failure
32	12	Doorset A	A cotton pad test was performed at the latch position which did not result in the ignition of the cotton pad. No failure
33	22	Doorset A	A cotton pad test was performed at the threshold, approximately 50mm from the bottom closing corner, which did not result in the ignition of the cotton pad. No failure
35	02	Doorset A	A cotton pad test was performed at the latch position which did not result in the ignition of the cotton pad. No failure

Min	Sec	System	Observation
35	59	Doorset A & B	There is intermittent flaming at the threshold, approximately 50mm in from the bottom closing corner of doorset A, and 50mm in from the bottom hanging corner of doorset B
37	**20**	**Doorset B**	**A cotton pad test was performed at the threshold, at the left corner of the bottom hanging corner, which resulted in the ignition of the cotton pad, thereby constituting integrity failure**
38	**36**	**Doorset A**	**A cotton pad test was performed at the latch position which resulted in the ignition of the cotton pad, thereby constituting integrity failure**
38	**46**	**Doorset A**	**There is continuous flaming at the latch position, thereby constituting further integrity failure**
39	00	Doorset A & B	End of test

Appendix B Instrumentation locations

Figure shows the instrumentation locations for this fire resistance test.

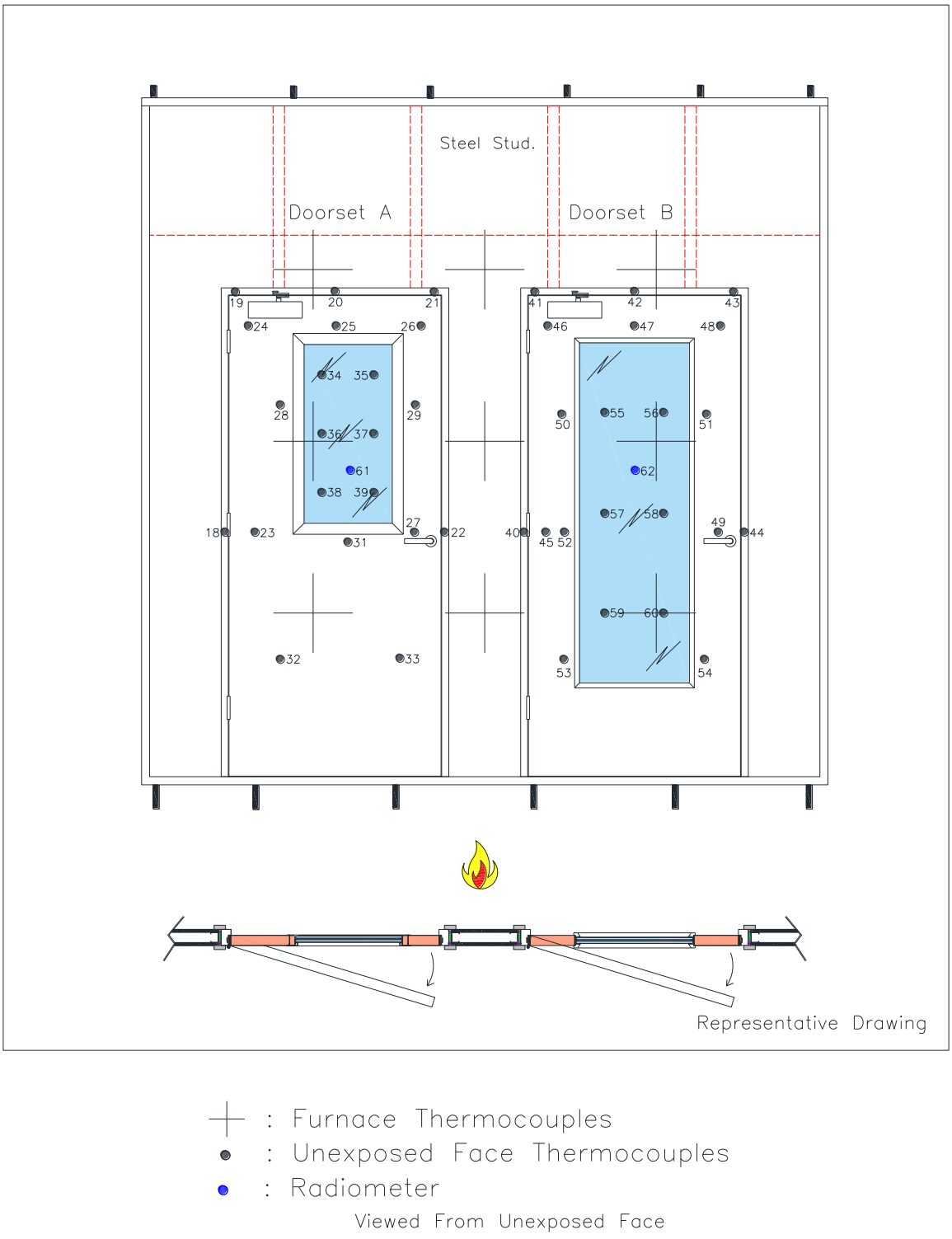


Figure 9 Instrumentation locations

Appendix C Test data

C.1 Furnace temperature and deviation

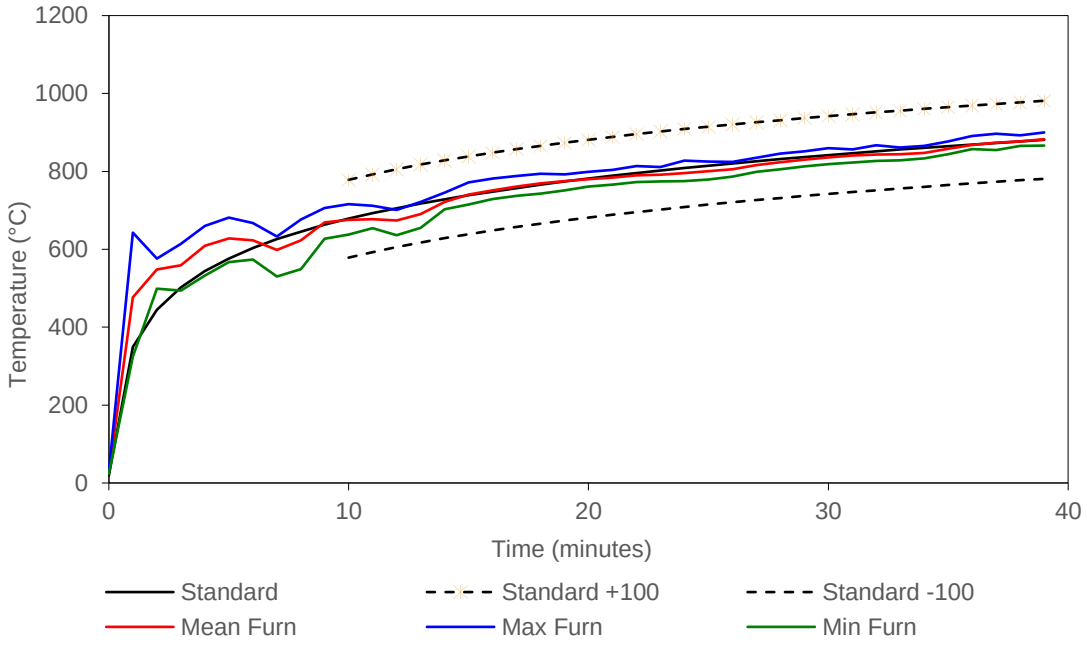


Figure 10 **Furnace thermocouple temperature vs time**

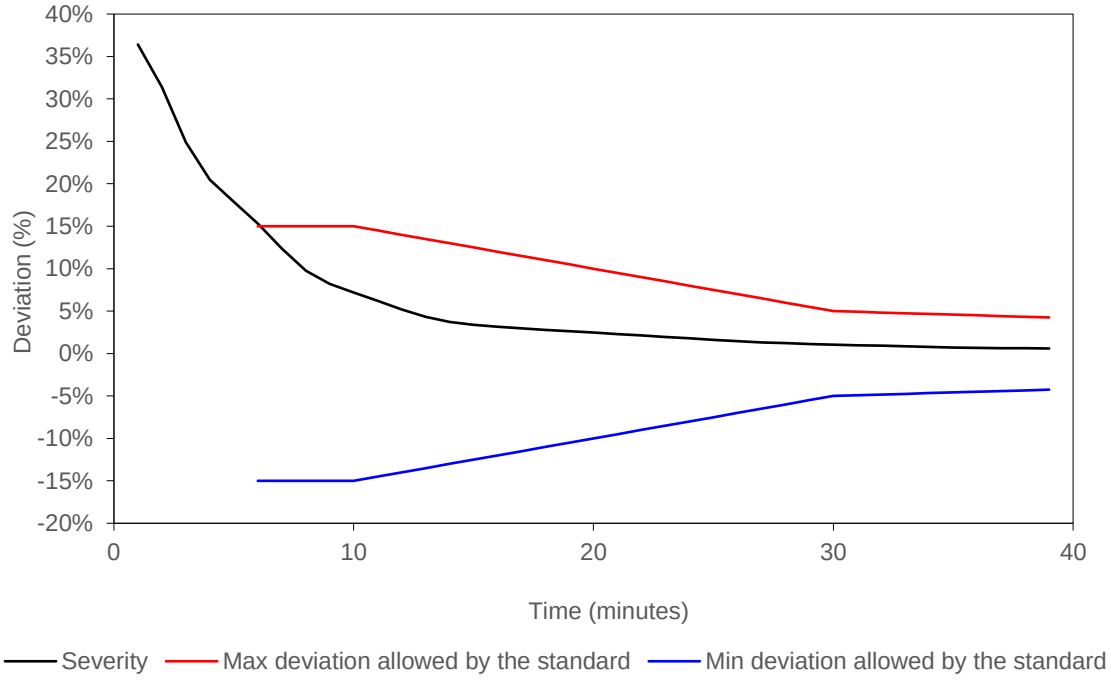


Figure 11 **Percentage deviation of exposure severity vs time**

C.2 Furnace pressure

The furnace pressure was taken at approximately 500 mm above the sill of the test specimen.

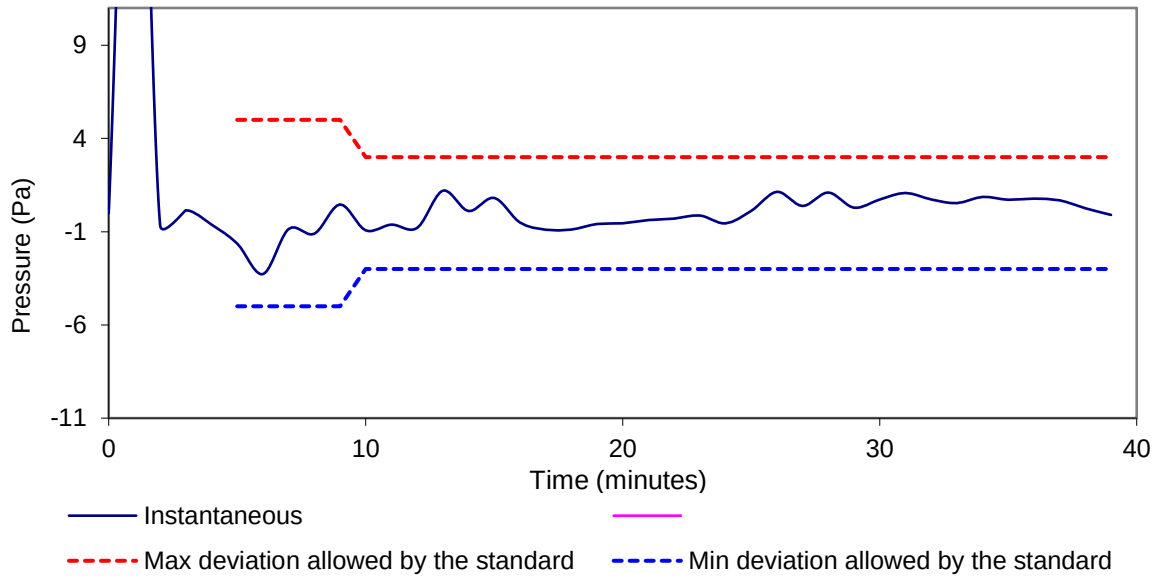


Figure 12 Furnace pressure

C.3 Specimen temperatures

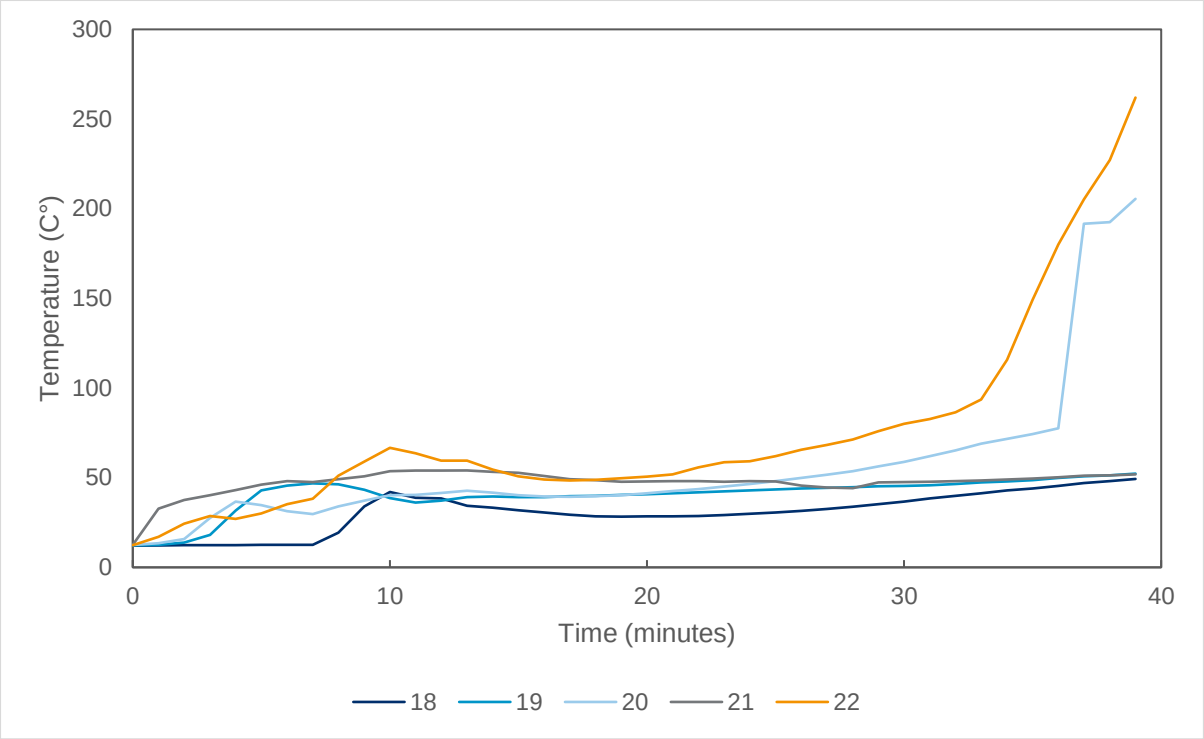


Figure 13 **Individual Temperatures Recorded on the Frame of Doorset A**

Table 104 **Individual Temperatures Recorded on the Frame of Doorset A**

Time (mins)	T/C 18 (°C)	T/C 19 (°C)	T/C 20 (°C)	T/C 21 (°C)	T/C 22 (°C)
0	12.1	12.3	12.5	12.6	12.4
1	12.2	12.5	13.5	32.8	17.1
2	12.4	13.7	15.8	37.6	24.3
3	12.5	18.0	27.5	40.2	28.6
4	12.3	31.6	36.6	43.0	27.0
5	12.5	43.0	34.8	46.2	30.0
6	12.5	45.6	31.2	48.2	35.3
7	12.6	46.8	29.8	47.5	38.3
8	19.4	46.3	34.0	49.2	51.2
9	34.0	43.3	37.1	50.8	59.0
10	42.1	38.7	40.3	53.6	66.6
11	38.8	36.2	40.4	54.0	63.5
12	38.4	37.2	41.4	53.9	59.6
13	34.3	39.2	42.7	54.0	59.6
14	33.4	39.5	41.7	53.3	54.5
15	31.9	39.2	40.3	52.7	50.9
16	30.5	39.2	39.6	50.9	48.9
17	29.3	39.7	39.4	49.2	48.4

Time (mins)	T/C 18 (°C)	T/C 19 (°C)	T/C 20 (°C)	T/C 21 (°C)	T/C 22 (°C)
18	28.5	39.9	39.8	48.6	48.7
19	28.3	40.5	40.2	47.7	49.6
20	28.4	40.8	41.4	48.0	50.6
21	28.5	41.2	42.5	48.0	51.8
22	28.6	41.8	43.6	48.0	55.8
23	29.1	42.4	45.0	47.8	58.6
24	29.9	42.9	46.4	48.0	59.2
25	30.6	43.4	48.2	48.0	62.1
26	31.6	43.9	49.8	45.7	65.6
27	32.5	44.4	51.7	44.5	68.3
28	33.8	44.7	53.7	44.2	71.3
29	35.2	45.2	56.2	47.3	75.9
30	36.7	45.4	58.8	47.6	80.0
31	38.5	45.8	62.0	47.7	82.8
32	39.9	46.5	65.3	48.2	86.4
33	41.3	47.4	69.0	48.5	93.6
34	42.9	47.8	71.7	48.9	115.7
35	44.0	48.6	74.3	49.5	149.3
36	45.5	49.9	77.6	50.3	180.1
37	47.1	50.7	191.6	51.0	205.2
38	48.2	51.4	192.4	51.4	227.1
39	49.3	52.3	205.5	51.8	261.9

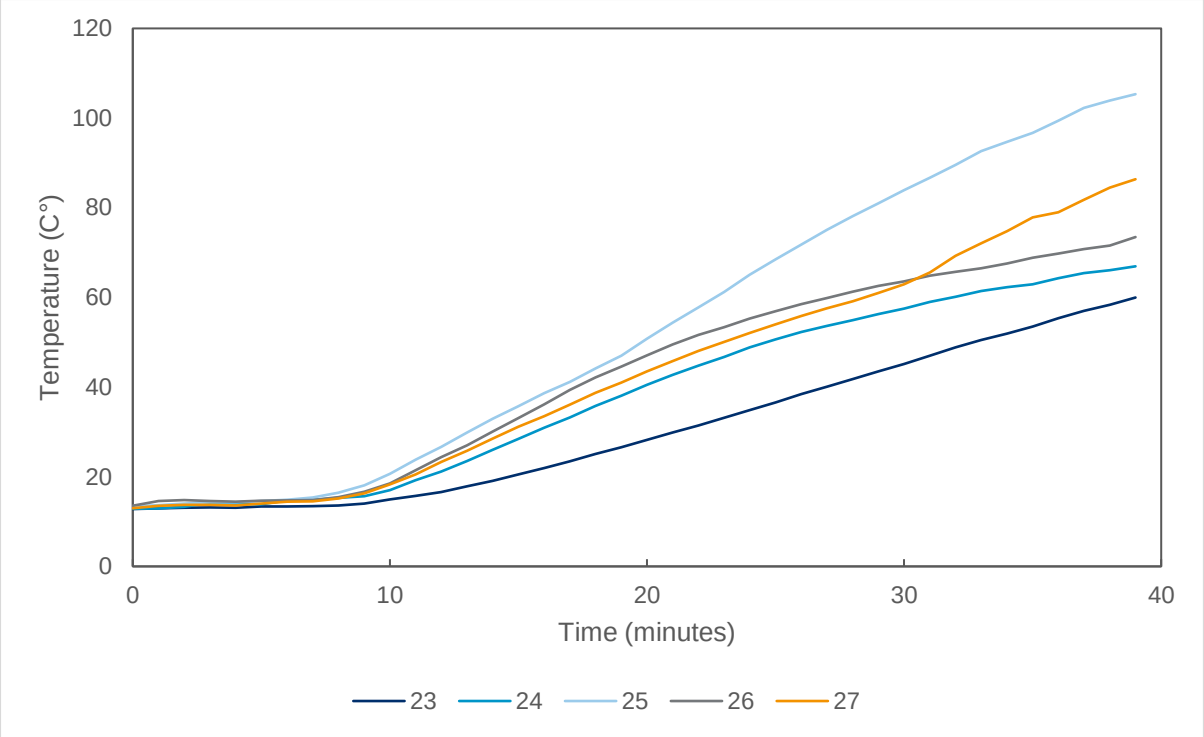


Figure 15 Individual Temperatures Recorded 100mm Away from Leaf Edges on Doorset A

Table 116 Individual Temperatures Recorded 100mm Away from Leaf Edges on Doorset A

Time (mins)	T/C 23 (°C)	T/C 24 (°C)	T/C 25 (°C)	T/C 26 (°C)	T/C 27 (°C)
0	12.8	12.9	13.4	13.5	13.0
1	13.0	12.9	13.7	14.6	13.5
2	13.1	13.3	14.0	14.8	13.7
3	13.1	14.2	14.3	14.6	13.7
4	13.1	13.9	14.3	14.4	13.6
5	13.4	13.9	14.6	14.6	14.0
6	13.4	14.8	14.9	14.7	14.4
7	13.4	14.8	15.4	14.8	14.5
8	13.6	15.3	16.5	15.5	15.1
9	14.0	15.6	18.1	16.7	16.3
10	14.9	17.0	20.6	18.5	18.3
11	15.8	19.2	23.8	21.4	20.5
12	16.6	21.1	26.6	24.4	23.3
13	17.8	23.5	29.8	27.0	25.8
14	19.1	26.0	32.9	30.1	28.5
15	20.5	28.5	35.7	33.1	31.1
16	22.0	30.9	38.7	36.2	33.5
17	23.4	33.2	41.2	39.3	36.1
18	25.1	35.8	44.1	42.2	38.7
19	26.6	38.1	47.0	44.6	41.0
20	28.2	40.5	50.8	47.1	43.5

Time (mins)	T/C 23 (°C)	T/C 24 (°C)	T/C 25 (°C)	T/C 26 (°C)	T/C 27 (°C)
21	29.9	42.7	54.4	49.5	45.8
22	31.5	44.8	57.8	51.6	48.1
23	33.2	46.7	61.2	53.4	50.1
24	34.9	48.9	65.1	55.3	52.1
25	36.6	50.7	68.5	56.9	54.0
26	38.4	52.3	71.8	58.5	55.9
27	40.1	53.7	75.1	59.9	57.6
28	41.8	54.9	78.1	61.3	59.2
29	43.5	56.3	81.0	62.6	61.0
30	45.2	57.5	83.9	63.6	63.0
31	47.0	59.0	86.7	64.8	65.6
32	48.9	60.2	89.6	65.7	69.3
33	50.5	61.4	92.6	66.5	72.1
34	51.9	62.3	94.7	67.6	74.8
35	53.5	62.9	96.7	68.9	77.8
36	55.4	64.3	99.4	69.8	79.0
37	57.0	65.4	102.3	70.8	81.7
38	58.4	66.0	103.9	71.6	84.5
39	60.0	66.9	105.3	73.5	123.0

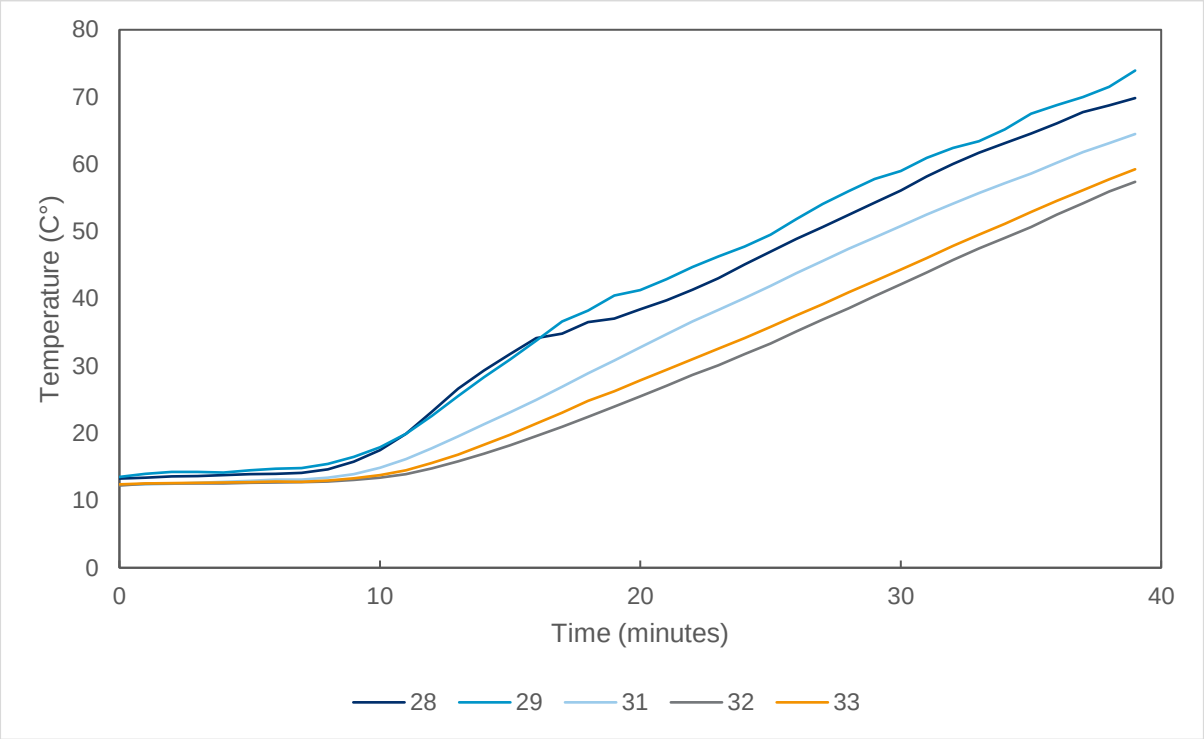


Figure 17 Individual and Mean Temperatures Recorded on the Unexposed Face of Doorset A

Table 18 Individual and Mean Temperatures Recorded on the Unexposed Face of Doorset A

Time (mins)	T/C 28 (°C)	T/C 29 (°C)	T/C 31 (°C)	T/C 32 (°C)	T/C 33 (°C)
0	13.3	13.5	12.3	12.2	12.4
1	13.4	14.0	12.4	12.5	12.6
2	13.6	14.3	12.5	12.5	12.6
3	13.7	14.3	12.6	12.5	12.6
4	13.8	14.2	12.8	12.5	12.7
5	13.9	14.5	12.9	12.7	12.7
6	14.0	14.7	13.1	12.7	12.8
7	14.1	14.8	13.1	12.7	12.8
8	14.6	15.4	13.4	12.8	13.0
9	15.8	16.5	13.9	13.1	13.3
10	17.5	17.9	14.9	13.4	13.8
11	19.9	19.9	16.2	13.9	14.5
12	23.2	22.6	17.8	14.8	15.6
13	26.6	25.5	19.5	15.8	16.8
14	29.3	28.3	21.3	17.0	18.3
15	31.8	31.0	23.1	18.2	19.8
16	34.1	33.8	25.0	19.6	21.4
17	34.8	36.6	26.9	20.9	23.1
18	36.5	38.2	28.9	22.4	24.8

Time (mins)	T/C 28 (°C)	T/C 29 (°C)	T/C 31 (°C)	T/C 32 (°C)	T/C 33 (°C)
19	37.1	40.5	30.8	23.9	26.3
20	38.4	41.3	32.8	25.5	27.9
21	39.8	42.9	34.7	27.1	29.4
22	41.3	44.7	36.6	28.7	31.0
23	43.0	46.3	38.3	30.1	32.6
24	45.1	47.8	40.1	31.8	34.1
25	47.0	49.5	41.9	33.4	35.8
26	48.9	51.9	43.8	35.2	37.5
27	50.7	54.1	45.6	36.9	39.2
28	52.5	56.0	47.4	38.6	41.0
29	54.3	57.8	49.1	40.4	42.6
30	56.1	59.0	50.8	42.1	44.3
31	58.2	61.0	52.5	43.9	46.0
32	60.0	62.4	54.1	45.7	47.8
33	61.7	63.4	55.7	47.5	49.5
34	63.1	65.2	57.2	49.1	51.1
35	64.5	67.5	58.6	50.7	52.9
36	66.1	68.8	60.2	52.5	54.6
37	67.7	70.0	61.8	54.2	56.2
38	68.8	71.5	63.2	56.0	57.8
39	69.8	73.9	64.5	57.4	59.3

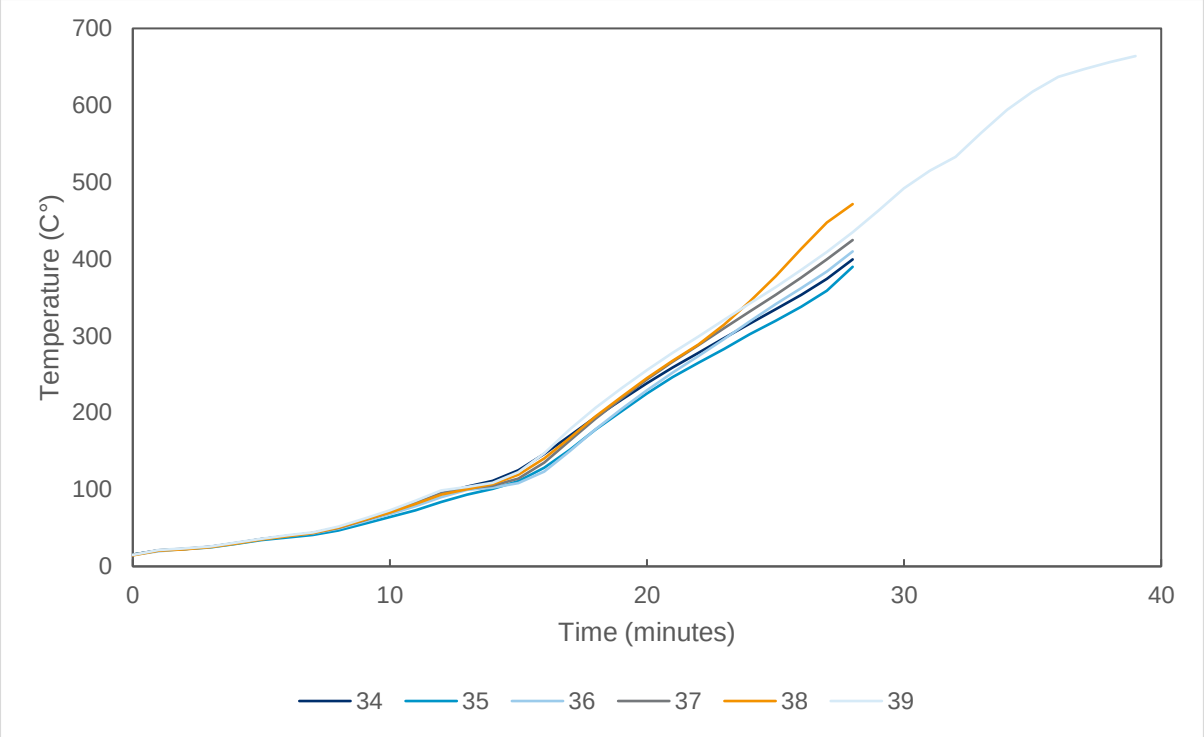


Figure 18 Individual Temperatures Recorded on the Glazing on Doorset A

Table 19 Individual Temperatures Recorded on the Glazing on Doorset A

Time (mins)	T/C 34 (°C)	T/C 35 (°C)	T/C 36 (°C)	T/C 37 (°C)	T/C 38 (°C)	T/C 39 (°C)
0	15.2	15.4	14.9	15.3	14.4	14.9
1	20.9	20.4	19.9	20.7	20.5	21.6
2	22.7	22.8	22.7	22.9	22.3	23.5
3	25.4	24.9	25.3	25.6	25.0	26.1
4	30.3	29.3	30.2	30.4	29.7	30.8
5	35.7	34.1	35.5	35.7	35.0	36.1
6	39.4	37.5	39.5	39.6	39.4	40.4
7	43.6	40.9	43.2	43.4	43.4	44.2
8	50.5	46.8	49.2	49.9	50.6	51.6
9	60.2	55.5	58.4	59.9	60.6	62.1
10	70.3	64.1	67.9	70.7	70.3	73.0
11	81.7	73.2	78.4	82.6	81.3	85.3
12	94.4	83.8	89.9	95.4	93.4	98.9
13	104.0	93.6	99.6	101.3	100.4	103.4
14	111.2	101.1	102.7	104.9	107.3	108.6
15	125.0	110.8	108.2	114.2	119.4	122.5
16	146.4	128.2	123.5	135.0	140.5	147.3
17	170.0	151.7	150.0	163.9	167.3	178.2
18	194.0	178.0	178.3	192.2	195.1	206.4
19	216.5	201.5	204.5	218.5	220.6	231.6
20	238.3	225.2	229.3	243.2	245.0	255.6

Time (mins)	T/C 34 (°C)	T/C 35 (°C)	T/C 36 (°C)	T/C 37 (°C)	T/C 38 (°C)	T/C 39 (°C)
21	258.6	246.2	252.2	266.1	267.4	277.8
22	277.9	264.8	273.8	287.9	289.0	299.4
23	297.0	283.1	296.0	309.8	314.6	320.7
24	316.0	301.9	318.9	331.5	344.8	341.9
25	334.5	319.8	341.1	353.3	377.6	363.3
26	353.2	338.0	362.1	376.0	413.2	385.7
27	374.3	358.6	383.9	399.7	447.5	409.1
28	399.4	389.8	409.8	424.6	471.4	434.8
29	-	-	-	-	-	463.0
30	-	-	-	-	-	492.0
31	-	-	-	-	-	515.0
32	-	-	-	-	-	533.0
33	-	-	-	-	-	564.0
34	-	-	-	-	-	594.0
35	-	-	-	-	-	618.0
36	-	-	-	-	-	637.0
37	-	-	-	-	-	647.0
38	-	-	-	-	-	656.0
39	-	-	-	-	-	664.0

After 28 minutes thermocouples 34-38 malfunctioned

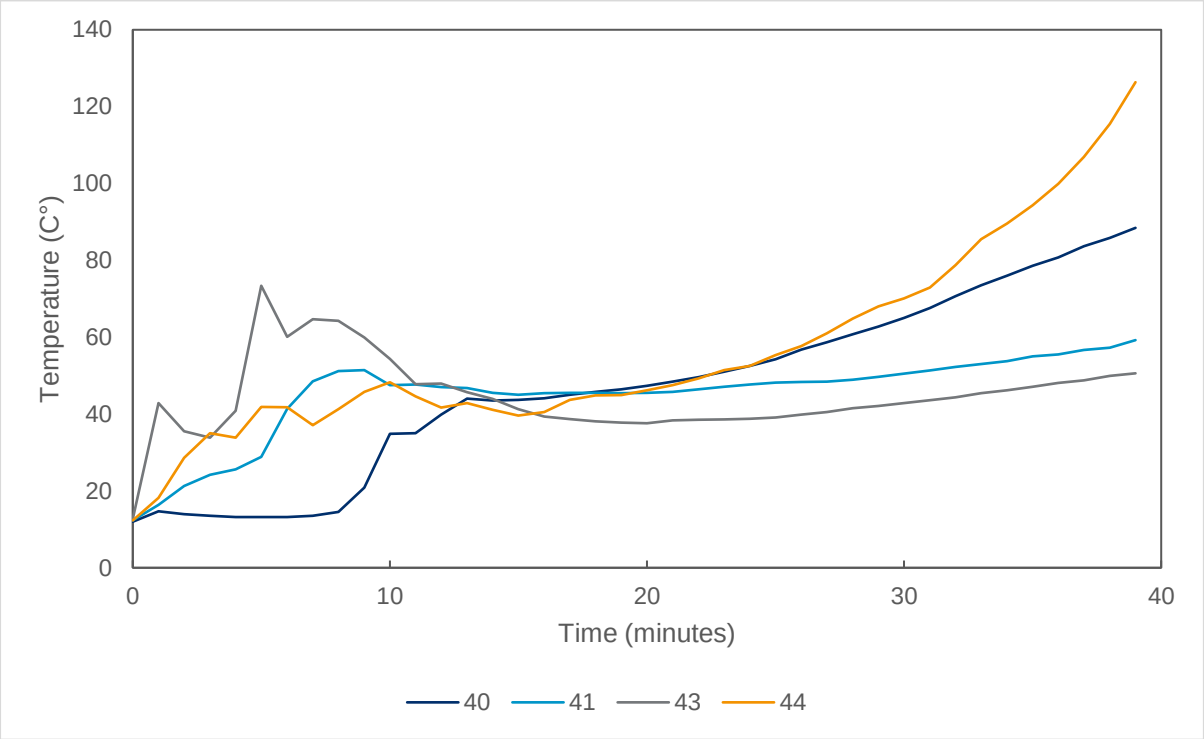


Figure 20 Individual Temperatures Recorded on the Frame of Doorset B

Table 21 Individual Temperatures Recorded on the Frame of Doorset B

Time (mins)	T/C 40 (°C)	T/C 41 (°C)	T/C 43 (°C)	T/C 44 (°C)
0	12.0	12.3	12.7	12.3
1	14.7	16.3	42.8	18.2
2	14.0	21.3	35.6	28.6
3	13.5	24.2	33.8	35.0
4	13.2	25.6	40.9	33.9
5	13.2	28.9	73.4	41.8
6	13.2	41.4	60.1	41.8
7	13.5	48.5	64.7	37.1
8	14.5	51.2	64.3	41.3
9	20.9	51.4	59.9	45.8
10	34.8	47.5	54.3	48.3
11	35.0	47.7	47.8	44.6
12	39.9	47.1	47.9	41.7
13	44.0	46.8	45.7	42.8
14	43.5	45.5	43.9	41.1
15	43.7	45.0	41.3	39.6
16	44.1	45.4	39.3	40.5
17	45.0	45.6	38.7	43.7
18	45.8	45.5	38.1	44.9

Time (mins)	T/C 40 (°C)	T/C 41 (°C)	T/C 43 (°C)	T/C 44 (°C)
19	46.5	45.4	37.8	45.0
20	47.3	45.5	37.6	46.2
21	48.4	45.8	38.3	47.5
22	49.6	46.4	38.5	49.3
23	51.0	47.1	38.6	51.4
24	52.6	47.7	38.8	52.5
25	54.3	48.2	39.1	55.3
26	56.8	48.3	39.9	57.7
27	58.7	48.4	40.6	61.0
28	60.7	48.9	41.5	64.9
29	62.8	49.7	42.1	68.0
30	65.0	50.5	42.8	70.1
31	67.6	51.4	43.6	72.9
32	70.7	52.3	44.4	78.8
33	73.5	53.0	45.4	85.5
34	76.0	53.8	46.2	89.6
35	78.6	55.1	47.1	94.3
36	80.8	55.5	48.1	99.9
37	83.7	56.7	48.8	106.9
38	85.9	57.3	50.0	115.5
39	88.4	59.2	50.6	126.3

Thermocouple 42 was removed due to malfunction

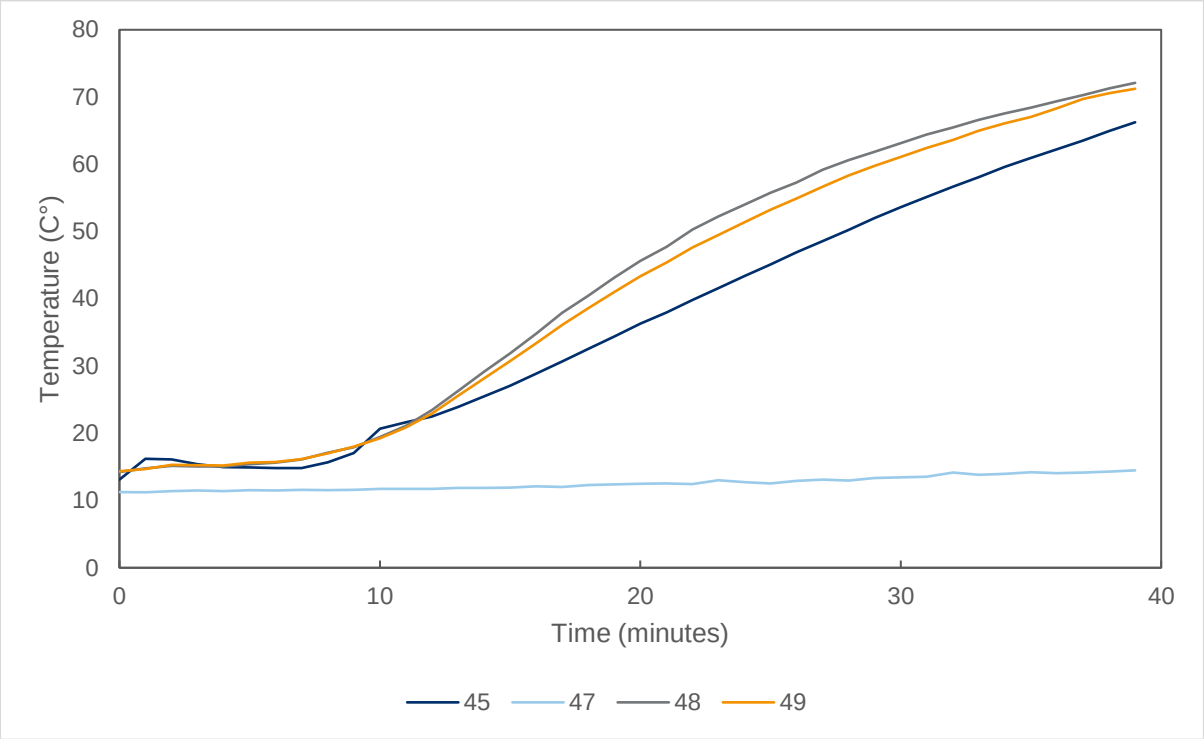


Figure 22 Individual Temperatures Recorded 100mm Away from Leaf Edges on Doorset B

Table 23 Individual Temperatures Recorded 100mm Away from Leaf Edges on Doorset B

Time (mins)	T/C 45 (°C)	T/C 47 (°C)	T/C 48 (°C)	T/C 49 (°C)
0	13.1	11.2	14.2	14.3
1	16.2	11.2	14.8	14.7
2	16.1	11.4	15.2	15.3
3	15.4	11.5	15.1	15.2
4	15.0	11.4	15.0	15.2
5	14.9	11.5	15.4	15.6
6	14.8	11.5	15.7	15.7
7	14.8	11.6	16.1	16.2
8	15.7	11.6	17.1	17.0
9	17.0	11.6	17.9	18.0
10	20.7	11.7	19.5	19.3
11	21.6	11.8	21.1	20.9
12	22.5	11.7	23.5	22.9
13	23.9	11.8	26.3	25.6
14	25.5	11.9	29.1	28.1
15	27.0	11.9	31.9	30.7
16	28.9	12.1	34.8	33.4
17	30.7	12.0	37.9	36.1
18	32.5	12.3	40.4	38.6

Time (mins)	T/C 45 (°C)	T/C 47 (°C)	T/C 48 (°C)	T/C 49 (°C)
19	34.4	12.4	43.2	41.0
20	36.3	12.5	45.6	43.3
21	38.0	12.5	47.7	45.4
22	39.8	12.4	50.3	47.6
23	41.6	13.0	52.2	49.5
24	43.4	12.7	54.0	51.4
25	45.1	12.5	55.7	53.2
26	46.9	12.9	57.3	54.9
27	48.6	13.1	59.2	56.7
28	50.3	13.0	60.6	58.3
29	52.0	13.4	61.9	59.7
30	53.6	13.5	63.1	61.1
31	55.2	13.5	64.4	62.4
32	56.7	14.1	65.5	63.6
33	58.1	13.8	66.6	65.0
34	59.6	14.0	67.6	66.1
35	61.0	14.2	68.4	67.0
36	62.2	14.1	69.4	68.3
37	63.5	14.2	70.3	69.7
38	65.0	14.3	71.3	70.6
39	66.2	14.5	72.1	71.2

Thermocouple 46 has been removed due to malfunction

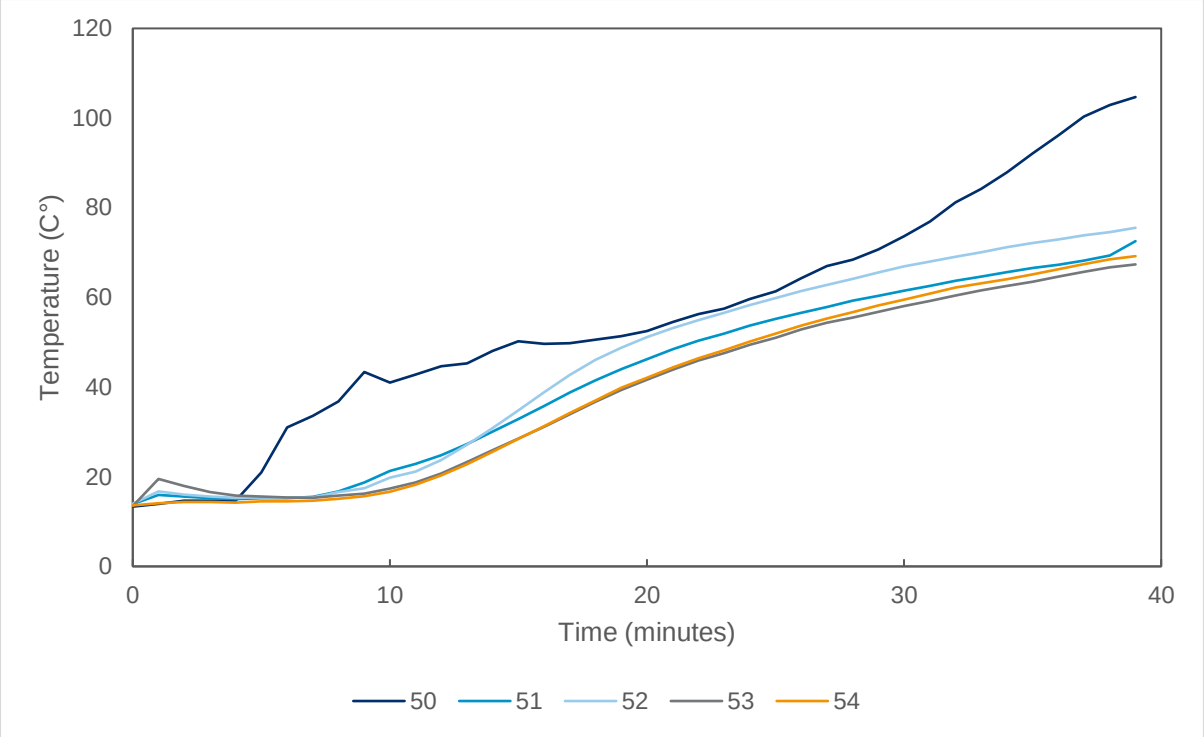


Figure 9 **Individual and Mean Temperatures Recorded on the Unexposed Face of Doorset B**

Table 25 **Individual and Mean Temperatures Recorded on the Unexposed Face of Doorset B**

Time (mins)	T/C 50 (°C)	T/C 51 (°C)	T/C 52 (°C)	T/C 53 (°C)	T/C 54 (°C)
0	13.3	13.9	14.0	13.5	13.6
1	13.9	16.0	16.7	19.5	14.1
2	14.6	15.6	16.0	18.0	14.4
3	14.7	15.2	15.6	16.6	14.4
4	14.6	15.0	15.3	15.8	14.3
5	21.0	15.2	15.4	15.6	14.5
6	31.0	15.2	15.3	15.4	14.5
7	33.6	15.5	15.4	15.3	14.6
8	36.8	16.7	16.6	15.8	15.1
9	43.4	18.7	17.5	16.2	15.7
10	41.0	21.3	19.8	17.4	16.7
11	42.8	22.9	21.1	18.8	18.2
12	44.7	24.8	23.7	20.7	20.3
13	45.3	27.3	27.2	23.3	22.8
14	48.0	30.1	30.9	25.9	25.6
15	50.2	32.8	34.8	28.5	28.4
16	49.7	35.8	38.9	31.2	31.3
17	49.8	38.8	42.7	33.9	34.2
18	50.6	41.5	46.1	36.7	37.0
19	51.3	44.0	48.8	39.3	39.8
20	52.5	46.2	51.1	41.7	42.1

Time (mins)	T/C 50 (°C)	T/C 51 (°C)	T/C 52 (°C)	T/C 53 (°C)	T/C 54 (°C)
21	54.5	48.4	53.2	43.9	44.3
22	56.3	50.3	54.9	45.9	46.4
23	57.5	51.9	56.6	47.6	48.2
24	59.6	53.7	58.3	49.4	50.2
25	61.3	55.2	59.9	51.0	51.9
26	64.3	56.6	61.4	52.9	53.7
27	67.0	57.9	62.8	54.3	55.3
28	68.4	59.3	64.1	55.5	56.7
29	70.7	60.4	65.6	56.8	58.2
30	73.7	61.5	66.9	58.1	59.5
31	76.9	62.6	68.0	59.2	60.9
32	81.2	63.7	69.0	60.5	62.2
33	84.2	64.6	70.1	61.6	63.1
34	87.9	65.6	71.2	62.6	64.1
35	92.1	66.5	72.1	63.5	65.2
36	96.1	67.3	72.9	64.6	66.3
37	100.3	68.2	73.8	65.7	67.4
38	102.9	69.3	74.6	66.7	68.5
39	104.7	72.5	75.5	67.4	69.2

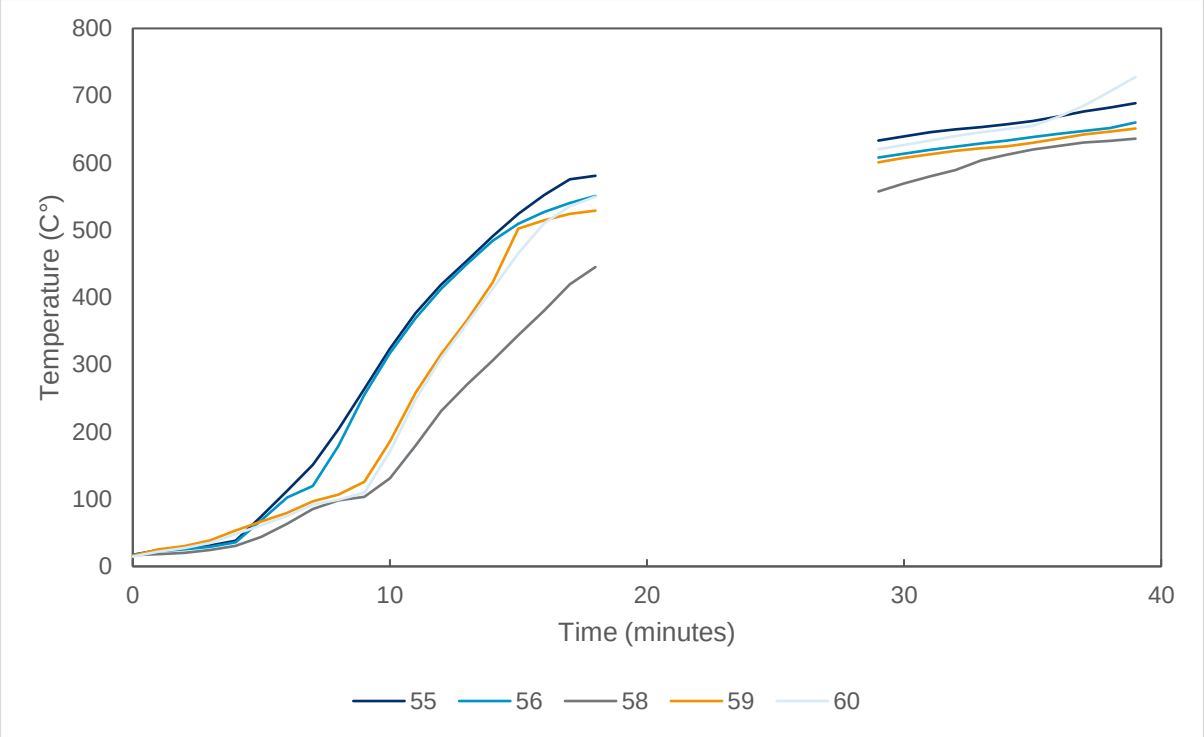


Figure 26 Individual Temperatures Recorded on the Glazing on Doorset B

Table 27 Individual Temperatures Recorded on the Glazing on Doorset B

Time (mins)	T/C 55 (°C)	T/C 56 (°C)	T/C 58 (°C)	T/C 59 (°C)	T/C 60 (°C)
0	17.2	17.3	16.7	15.8	14.6
1	24.5	22.3	18.2	25.3	21.8
2	26.8	25.3	20.3	30.3	27.0
3	30.9	29.1	24.3	38.8	34.6
4	38.1	35.6	30.8	53.3	48.0
5	74.2	68.8	44.1	66.9	61.1
6	112.4	102.3	63.3	79.5	75.3
7	150.8	119.4	85.4	96.9	92.2
8	203.9	179.1	98.3	106.9	99.3
9	264.0	255.3	103.3	125.7	109.4
10	323.9	317.1	131.2	185.8	170.8
11	376.9	369.2	179.8	258.2	248.0
12	418.8	412.8	231.0	315.9	309.3
13	454.6	450.2	270.6	366.0	361.4
14	490.7	484.4	306.4	422.2	412.9
15	524.2	509.4	343.6	502.1	465.9
16	552.5	527.3	380.6	514.6	510.2
17	575.4	540.3	419.6	524.5	535.8
18	580.7	550.9	445.1	528.9	549.8
19	-	-	-	-	-
20	-	-	-	-	-

Time (mins)	T/C 55 (°C)	T/C 56 (°C)	T/C 58 (°C)	T/C 59 (°C)	T/C 60 (°C)
21	-	-	-	-	-
22	-	-	-	-	-
23	-	-	-	-	-
24	-	-	-	-	-
25	-	-	-	-	-
26	-	-	-	-	-
27	-	-	-	-	-
28	-	-	-	-	-
29	633.5	608.2	557.7	600.9	620.2
30	639.6	613.8	569.3	607.5	626.5
31	645.6	619.4	579.7	612.6	633.2
32	649.7	624.3	589.5	618.0	639.8
33	653.3	628.8	603.8	621.9	645.5
34	657.3	633.3	612.1	624.7	650.4
35	662.2	638.3	619.9	630.0	655.3
36	668.9	643.1	625.4	636.1	668.4
37	676.4	647.3	630.2	642.5	685.1
38	682.5	652.0	632.6	646.6	706.1
39	688.8	660.1	636.1	651.1	727.8

Thermocouple 57 has been removed due to malfunction and all thermocouples malfunctioned between 19 and 28 minutes

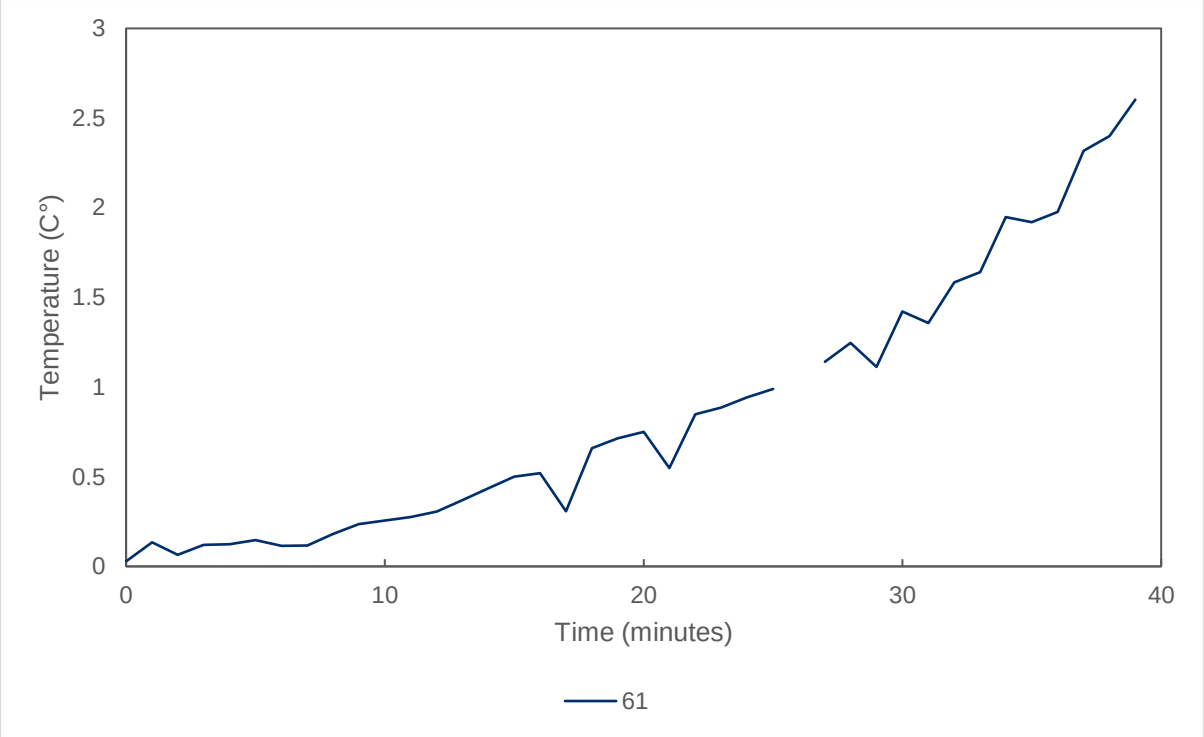


Figure 28 Recorded Radiation Intensity from Doorset A

Table 29 Recorded Radiation Intensity from Doorset A

Time (mins)	T/C 61 (°C)
0	0.0
1	0.1
2	0.1
3	0.1
4	0.1
5	0.1
6	0.1
7	0.1
8	0.2
9	0.2
10	0.3
11	0.3
12	0.3
13	0.4
14	0.4
15	0.5
16	0.5
17	0.3
18	0.7
19	0.7
20	0.7

Time (mins)	T/C 61 (°C)
21	0.5
22	0.8
23	0.9
24	0.9
25	1.0
26	-
27	1.1
28	1.2
29	1.1
30	1.4
31	1.4
32	1.6
33	1.6
34	1.9
35	1.9
36	2.0
37	2.3
38	2.4
39	2.6

Radiometer malfunctioned at 26 minutes for 1 minute only

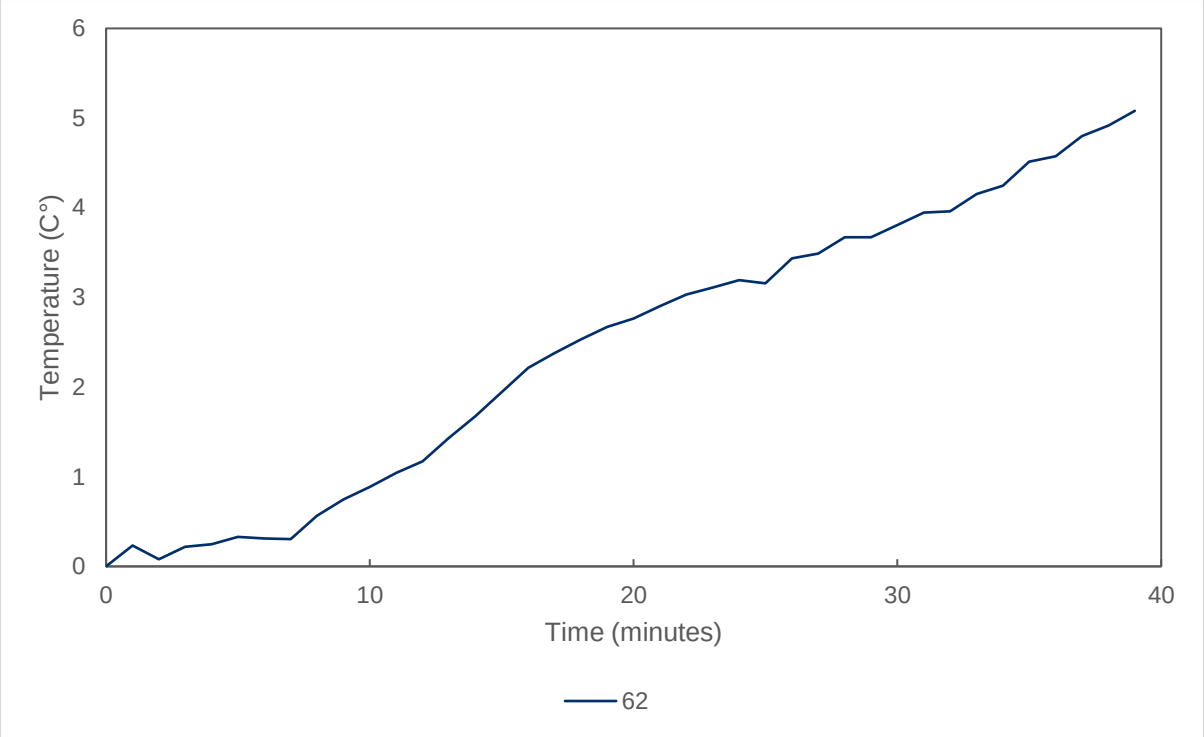


Figure 29 **Recorded Radiation Intensity from Doorset B**

Table 30 **Recorded Radiation Intensity from Doorset B**

Time (mins)	T/C 62 (°C)
0	0.0
1	0.2
2	0.1
3	0.2
4	0.2
5	0.3
6	0.3
7	0.3
8	0.6
9	0.7
10	0.9
11	1.0
12	1.2
13	1.4
14	1.7
15	1.9
16	2.2
17	2.4
18	2.5
19	2.7
20	2.8

Time (mins)	T/C 62 (°C)
21	2.9
22	3.0
23	3.1
24	3.2
25	3.2
26	3.4
27	3.5
28	3.7
29	3.7
30	3.8
31	3.9
32	4.0
33	4.2
34	4.2
35	4.5
36	4.6
37	4.8
38	4.9
39	5.1

C.4 Specimen deflections

Figure shows the locations of the specimen deflection measurements used for this fire resistance test.

Table 12 and Table 13 detail the deflection measurements of the test specimen at locations given in **Error! Reference source not found.** and **Error! Reference source not found.**.

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

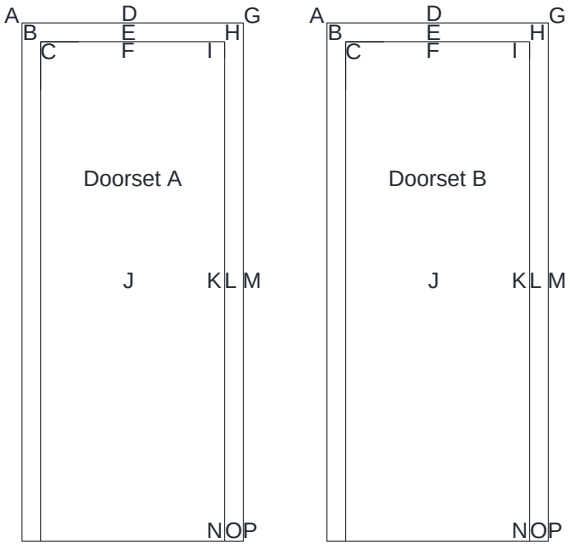


Figure 31 Position of deflection measurements

Table 12 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	1	2	2	3	3	2	2	2	2	-2	-4	-1	7	3	-1	-1
15	-1	0	3	-1	0	-1	-2	0	6	-7	-2	-2	-2	5	-2	1
20	1	3	6	6	6	7	7	7	8	-4	5	6	6	7	-2	1
25	11	11	15	16	15	21	17	22	24	5	19	18	18	11	-1	0
30	17	20	26	40	26	26	28	-25	36	15	36	32	30	15	2	1
Maximum deflection reading	17	20	26	40	26	26	28	-25	36	15	36	32	30	15	-2	-1

Table 13 Deflections – Doorset B

	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	-1	-1	-10	0	0	-3	0	-1	-3	4	0	1	-1	-5	-2	-4
Maximum deflection reading	-1	-1	-10	0	0	-3	0	-1	-3	4	0	1	-1	-5	-2	-4

C.5 Heat flux measurements

The heat flux was measured 1000 mm away from the specimen and is based on the maximum levels.

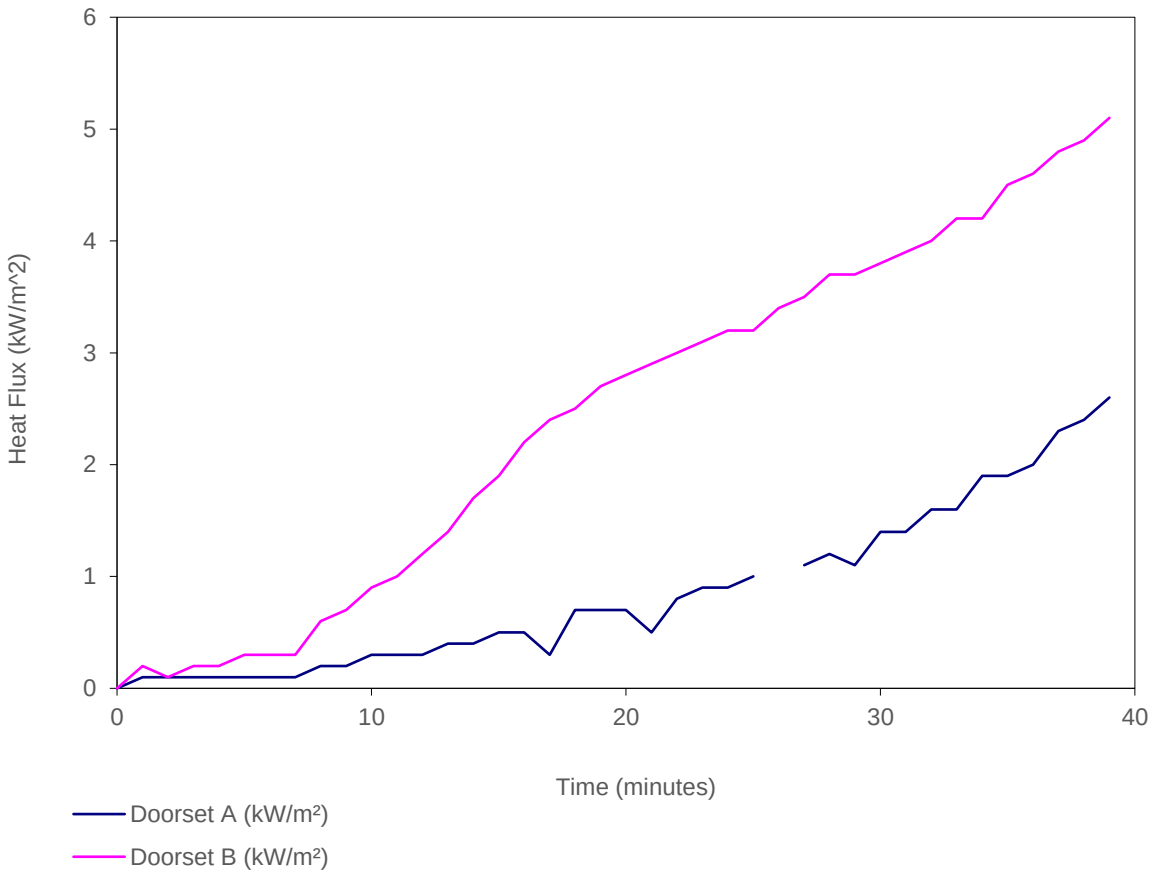


Figure 32 Heat flux measurements of the test specimen vs time

Table 14 Heat flux measurements of the test specimen vs time

Time (mins)	Doorset A (kW/m²)	Doorset B (kW/m²)
0	0	0
1	0.1	0.2
2	0.1	0.1
3	0.1	0.2
4	0.1	0.2
5	0.1	0.3
6	0.1	0.3
7	0.1	0.3
8	0.2	0.6
9	0.2	0.7
10	0.3	0.9
11	0.3	1
12	0.3	1.2

Time (mins)	Doorset A (kW/m²)	Doorset B (kW/m²)
13	0.4	1.4
14	0.4	1.7
15	0.5	1.9
16	0.5	2.2
17	0.3	2.4
18	0.7	2.5
19	0.7	2.7
20	0.7	2.8
21	0.5	2.9
22	0.8	3
23	0.9	3.1
24	0.9	3.2
25	1	3.2
26	-	3.4
27	1.1	3.5
28	1.2	3.7
29	1.1	3.7
30	1.4	3.8
31	1.4	3.9
32	1.6	4
33	1.6	4.2
34	1.9	4.2
35	1.9	4.5
36	2	4.6
37	2.3	4.8
38	2.4	4.9
39	2.6	5.1

Table 15 Heat flux thresholds vs time

Radiation intensity	Doorset A	Doorset B
5 kW/m²	Radiation intensity not reached	39 minute(s)
10 kW/m²	Radiation intensity not reached	Radiation intensity not reached
15 kW/m²	Radiation intensity not reached	Radiation intensity not reached
20 kW/m²	Radiation intensity not reached	Radiation intensity not reached
25 kW/m²	Radiation intensity not reached	Radiation intensity not reached

C.6 Clearance measurements

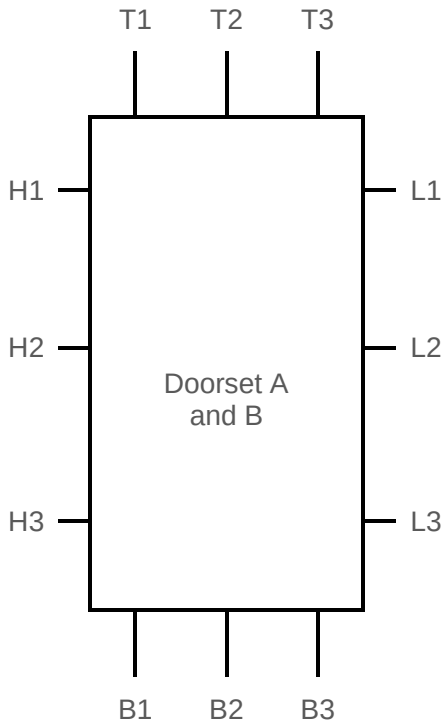


Figure 33 Clearance measurements, Doorset A and B (unexposed side shown)

Table 16 Measured and calculated gap sizes for Doorset A

Doorset A (mm)					
Hinge side	**Primary**	**Leaf to stop**	**Leading edge**	**Primary**	**Leaf to stop**
H1	3.4	N/A	L1	2.3	N/A
H2	2.9	N/A	L2	2.8	N/A
H3	3.0	N/A	L3	3.0	N/A
Mean	3.1		**Mean**	2.7	
Max	3.4		**Max**	3.0	
Min	2.9		**Min**	2.3	
Max permitted	5.3		**Max permitted**	4.9	
Top edge	**Primary**	**Leaf to stop**	**Threshold**	**Primary**	
T1	3.2	N/A	B1	2.0	
T2	2.5	N/A	B2	3.0	
T3	2.7	N/A	B3	4.4	
Mean	2.8		**Mean**	3.1	
Max	3.2		**Max**	4.4	
Min	2.5		**Min**	2.0	
Max permitted	5.0		**Max permitted**	5.8	

Table 17 Measured and calculated gap sizes for Doorset B

Doorset B (mm)					
Hinge side	**Primary**	**Leaf to stop**	**Leading edge**	**Primary**	**Leaf to stop**
H1	3.6	N/A	L1	2.6	N/A
H2	3.3	N/A	L2	2.0	N/A
H3	3.2	N/A	L3	2.9	N/A
Mean	3.4		**Mean**	2.5	
Max	3.6		**Max**	2.9	
Min	3.2		**Min**	2.0	
Max permitted	5.5		**Max permitted**	4.7	
Top edge	**Primary**	**Leaf to stop**	**Threshold**	**Primary**	
T1	2.8	N/A	B1	4.5	
T2	2.3	N/A	B2	2.0	
T3	3.6	N/A	B3	2.0	
Mean	2.9		**Mean**	2.8	
Max	3.6		**Max**	4.5	
Min	2.3		**Min**	2.0	
Max permitted	5.3		**Max permitted**	5.7	

Appendix D Photographs

Figure 34 Unexposed face of the specimen before the start of the test

Figure 35 Unexposed face of the specimen after a test duration of 10 minutes

Figure 36 Unexposed face of the specimen after a test duration of 20 minutes

Figure 37 Unexposed face of the specimen after a test duration of 30 minutes

Figure 38 Exposed face of the specimen after the test

Appendix E Sampling Report

bmtrada	SAMPLING VISIT REPORT	Company Name	Vistamatic Ltd
Proud to be part of element		Establishment No	05C/20593
		BM TRADA Notified Body ID: 1224	

Company Head Office Address	Vistamatic Ltd 62-70 Fowler Road Hainault London IG6 3UT	Contact Name	Mark Nash
		Telephone	020 8500 2200
		Email Address	mark@vistamatic.com

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
Vistamatic (address as above) – Glass Units Only Integrated Doorset Solutions Limited, Millennium Business Park, Concorde Way, Mansfield, NG19 7JZ	28/09/2021 14/10/2021	Chris Blount Chris Blount

Requirement	Evidence / Comments		
Opening Meeting (names of those present)	28/09/21-Mark Nash (Vistamatic) / Chris Blount (BM TRADA) 14/10/21-Robert Ryan (Integrated Doorset Solutions Limited) / Chris Blount (BM TRADA)		
Contract Reference	SC21134		
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Vistamatic Vision Panel VS2		
Description of product(s) sampled	Door A - Halspan Optima 44mm door leaf glazed with 1500mm x 500mm 22mm vistamtic glazing unit with sapele beading hung in a redwood fingerjointed frame Door B - Halspan Optima 44mm door leaf glazed with 800mm x 400mm 26mm vistamtic glazing unit with stainless steel beading hung in a redwood fingerjointed frame		
Product identification / reference numbers / codes	Door A – Drawing number A001_014F_002 / Door B - Drawing number A001_014F_001		
Batch number(s)	N/A		
Date of manufacture	28/09/2021 – Vistamatic Glazing Units A & B / 14/10/2021 – Doorsets A & B		
Quantity of stock and size of sample(s) taken	2 doorsets – Door A & B - 926mm x 2130mm x 44mm leaf / 996mm x 2138mm Frame		
Traceability of material records ie Purchase Orders and delivery notes	POR074138 – Halpsan – Halspan Optima door blanks – 06/08/2021 POR073464 – Noberbe Seals – Lorient LP2004 Black – 21/07/2021 POR072829 – Hoppe UK – AR911 Latchlock – 09/07/2021 Remaining PO's held on file by BM TRADA		
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)			
Confirmation of minimum mandatory videofive 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	28/09/2021 – Video link to witness the construction of the glass units 14/10/21 - Video link to witness the components being used, fitting of hinges & lock, door glazing and hanging of door leaf into frame.		
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity.	2no. Pre-hung Door set comprising of Halspan Optima 44mm door leaf, sapele hardwood lippings (vertical edges) as supplied door facings, vistamatic glazing units hung within a 70mm x 32mm softwood frame. The 25mm x 12mm planted stop, handles and door closer to be fitted by test lab.Photographic evidence provided at each stage of the manufacturing process held on file by BM TRADA.		
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 planted stops	
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***	A number of sections were highlighted as being different to the original specification – refer to sections; Door A & B - 1, 16, 16.9, 21, 22 Door A - 45, 46.1, 46.2, 47, 48, 49, 50 Door B - 45, 46.1, 46.2, 47, 48, 49, 50		
Closing Meeting (names of those present)	Mark Nash (Vistamatic) (via phone) / Robert Ryan (IDSL) / Chris Blount (BM TRADA)		

Declaration	I declare that the product/s witnessed during this sampling visit are representative of normal production	
Company Representative Name (Print)		Company Representative Position
MARK NASH		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.

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
Chiltern House, Stocking Lane, Hughenden Valley, High Wycombe, Buckinghamshire, HP14 4ND, United Kingdom

Location of performance of laboratory activities:

Warringtonfire Testing and Certification Limited
Chiltern House, Stocking Lane, Hughenden Valley, High Wycombe, Buckinghamshire, HP14 4ND, United Kingdom

Fire resistance laboratory locations:

High Wycombe, United Kingdom
UKAS accredited laboratory 1762
T - +44 (0) 1494 840 780

Warrington, United Kingdom
UKAS accredited laboratory 0249
T: +44 (0) 1925 655 116

Melbourne, Australia
NATA accredited laboratory 3277
T: +61 3 9767 1000

Gent, 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
UKAS accredited laboratory 0249
T - +44 (0) 1925 655 116

General conditions of use