

TEST REPORT NUMBER CFR2405291



FIRE RESISTANCE TEST IN ACCORDANCE WITH BS 476: PART 22: 1987

Sponsor:	Dixon International Group Ltd	Wood International Agency Limited
Address:	Brewery Road, Pampisford, Cambridgeshire, CB22 3HG	Wood House, 16 King Edward Road, Brentwood, Essex, CM14 4HL
Date of test:	29 th May 2024	

Results:	Left hand specimen:	Right hand specimen:
Test duration:	67 minutes ¹	41 minutes ¹
Integrity:	65 minutes	41 minutes ²
Insulation:	65 minutes	40 minutes
	¹ discontinued at the request of the sponsor	
	² no failure, the test having been discontinued	



Summary of test specimen (mm):

Two latched single acting single leaf timber doorsets with an aperture for glazing, each tested opening towards the heating conditions of test with the left hand doorset tested as insulated and the right hand doorset tested as partially insulated.

Overall size (h x w x d):

Left hand specimen:

Frame: 2227 x 1002 x 96

Leaf: 2184 x 932 x 54

Pane size: 1490** x 290** x 15**

Right hand specimen:

Frame: 2223 x 1002 x 96

Leaf: 2183 x 933 x 44

Pane size: 1490** x 290** x 15**

This report is only valid when presented in full.

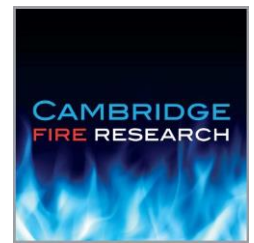
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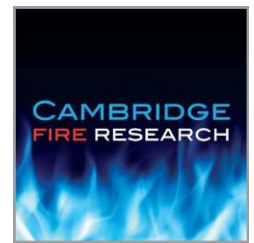


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0 CONTENTS PAGE

0 CONTENTS PAGE	2
1 PREPARATION FOR TESTING	4
1.1 Specimen conditioning	4
1.2 Associated construction	4
1.3 Specimen construction	4
1.4 Specimen verification	4
1.5 Specimen installation and fixity	4
1.6 Specimen selection	4
2 PRE-TEST MEASUREMENTS AND SETTING	5
2.1 Closer force measurement	5
2.2 Gap measurements – Frame edge to associated construction	6
2.3 Gap measurements - Leaf edge to frame	8
3 TEST CONDITIONS, INSTRUMENTATION AND MEASURING	10
3.1 Furnace temperature	10
3.2 Furnace pressure	11
3.3 Ambient temperature	11
3.4 Unexposed face specimen thermocouples	12
3.5 Irradiance	15
3.6 Deflection	17
4 TEST OBSERVATIONS	19
5 LIMITATIONS	21
APPENDIX 1 SPECIMEN CONSTRUCTION	22
Appendix 1 Table 1 – Left hand doorset	22
Appendix 1 Table 2 – Right hand doorset	27
Appendix 1 Figure 1 – Left hand doorset elevation (unexposed face view) incl. hidden detail	31
Appendix 1 Figure 2 – Section A – A	32
Appendix 1 Figure 3 – Section B – B	32
Appendix 1 Figure 4 – Section C – C	33
Appendix 1 Figure 5 – Right hand doorset elevation (unexposed face view) incl. hidden detail	34
Appendix 1 Figure 6 – Section D – D	35
Appendix 1 Figure 7 – Section E – E	35
Appendix 1 Figure 8 – Section F – F	36
APPENDIX 2 PHOTOGRAPHS	37
Appendix 2.1 Pre-test photos	37
Appendix 2.2 During test photos	42
Appendix 2.3 Post-test photos	46
APPENDIX 3 POSITIONING OF INSTRUMENTATION	47
APPENDIX 4 RECORDED THERMOCOUPLE DATA	48
APPENDIX 5 INDEPENDENT REPORT	51



Key to symbols used throughout report:

- * Nominal value
 - ** Declared value or detail, not verified by laboratory
 - *** Constructional details omitted at the request of the Sponsor. Full details are held on file by the laboratory
 - ‡ Identified post-test from remains of specimen
 - EX – exposed face of the specimen, subject to the heating conditions of the test.
 - UX – unexposed face of the specimen, not subject to the heating conditions of the test.
- All dimensions in mm unless stated otherwise.
Figures shown in Appendix 1 are not to scale.



1 PREPARATION FOR TESTING

1.1 Specimen conditioning

The specimens were received by Cambridge Fire Research on 23/05/2024. The specimens were on site for a total period of 6 days and during this time the temperature and relative humidity were measured and recorded within the range of 14°C to 20°C and 52% to 82% respectively.

1.2 Associated construction

Cambridge Fire Research constructed a timber stud partition with 1No. layer of 15 mm thick British Gypsum FireLine board to the exposed face and 1No. layer of 12.5 mm thick British Gypsum FireLine board to the unexposed face.

The aperture for the left hand specimen was 2225 mm high x 1020 mm wide
The aperture for the right hand specimen was 2225 mm high x 1018 mm wide

In accordance with Fire Test Study Group Resolution No. 51 continuity of the threshold was simulated by the installation of a solid non-combustible threshold extension by Cambridge Fire Research, such that the extension was flush with the threshold onto which the specimen was positioned.

1.3 Specimen construction

The specimens were received complete from the sponsor.

1.4 Specimen verification

Cambridge Fire Research carried out a detailed survey of the specimen(s) to verify the information provided by the sponsor. This included verifying the weight, densities, materials and dimensions of construction components wherever possible.

Details and drawings of the construction are shown in Appendix 1.

Photographs of details of the construction taken before the test are shown in Appendix 2.

1.5 Specimen installation and fixity

Cambridge Fire Research installed the specimens into the associated construction, affixed as described in Appendix 1.

Each specimen was asymmetrical and installed such that it opened towards the heating conditions of the test at the request of the sponsor.

Each specimen was latched prior to the start of the test.

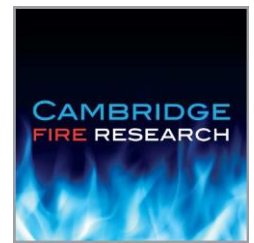
The multi-point latch engaged all latches.

1.6 Specimen selection

Cambridge Fire Research was not involved in any selection or sampling procedures.

The sponsor provided the independent report shown in Appendix 5.

Appendix 2, photos 2.1.21 and 2.1.22 show corresponding identification.



2 PRE-TEST MEASUREMENTS AND SETTING

2.1 Closer force measurement

The door opening and closing forces for both leaves were measured in accordance with Fire Test Study Group Resolution No. 63 and the calculated moments are shown in the following table.

Left hand doorset

Direction	Closing force (N)	Closing moment (Nm)	Opening force (N)	Opening moment (Nm)
Opening towards heating conditions	22.5	16.9	28.6	21.5

Right hand doorset

Direction	Closing force (N)	Closing moment (Nm)	Opening force (N)	Opening moment (Nm)
Opening towards heating conditions	21.9	16.4	35.8	26.9

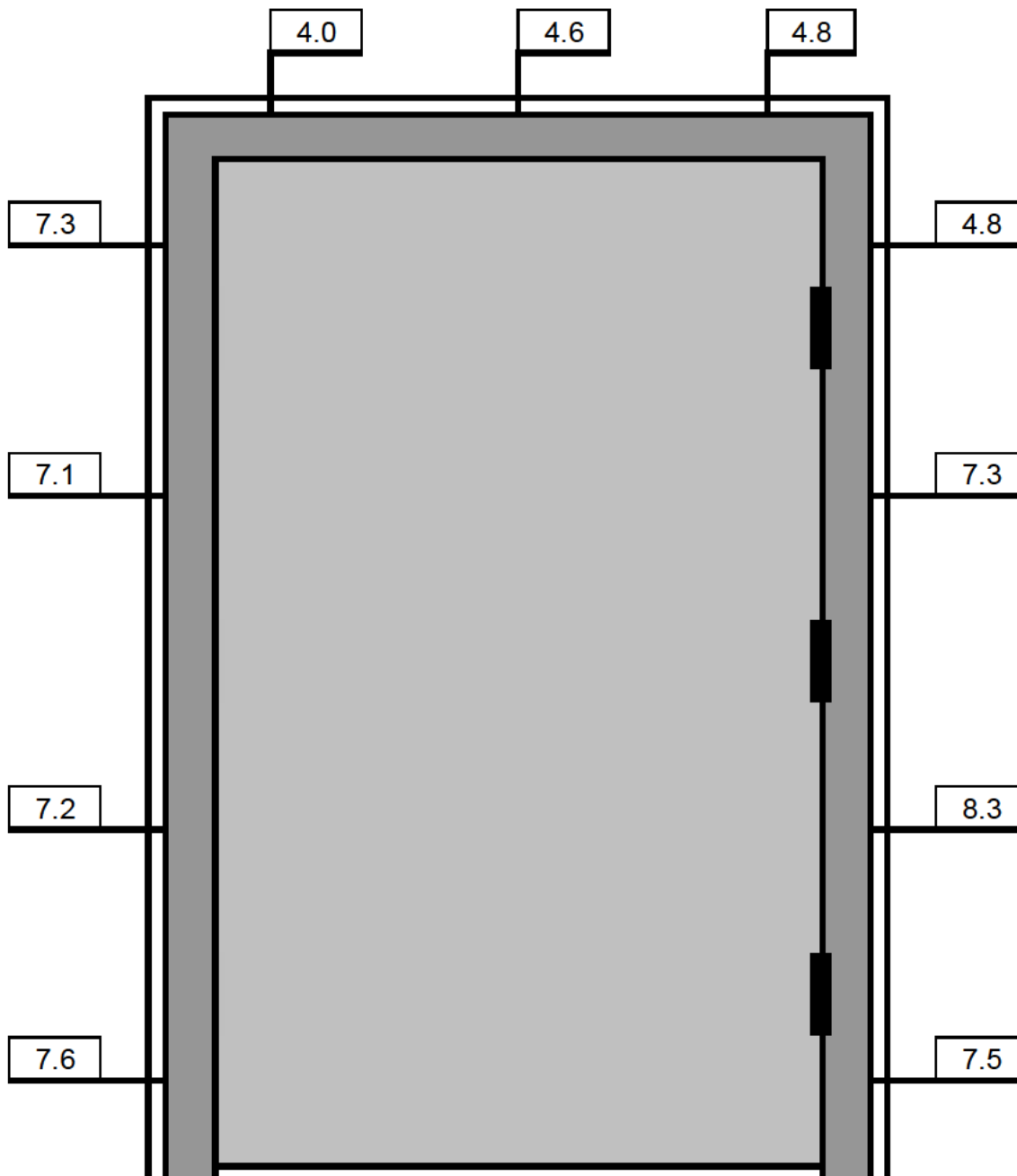


2.2 Gap measurements – Frame edge to associated construction

The gap between the specimen frame and the associated construction was measured prior to the start of the test.

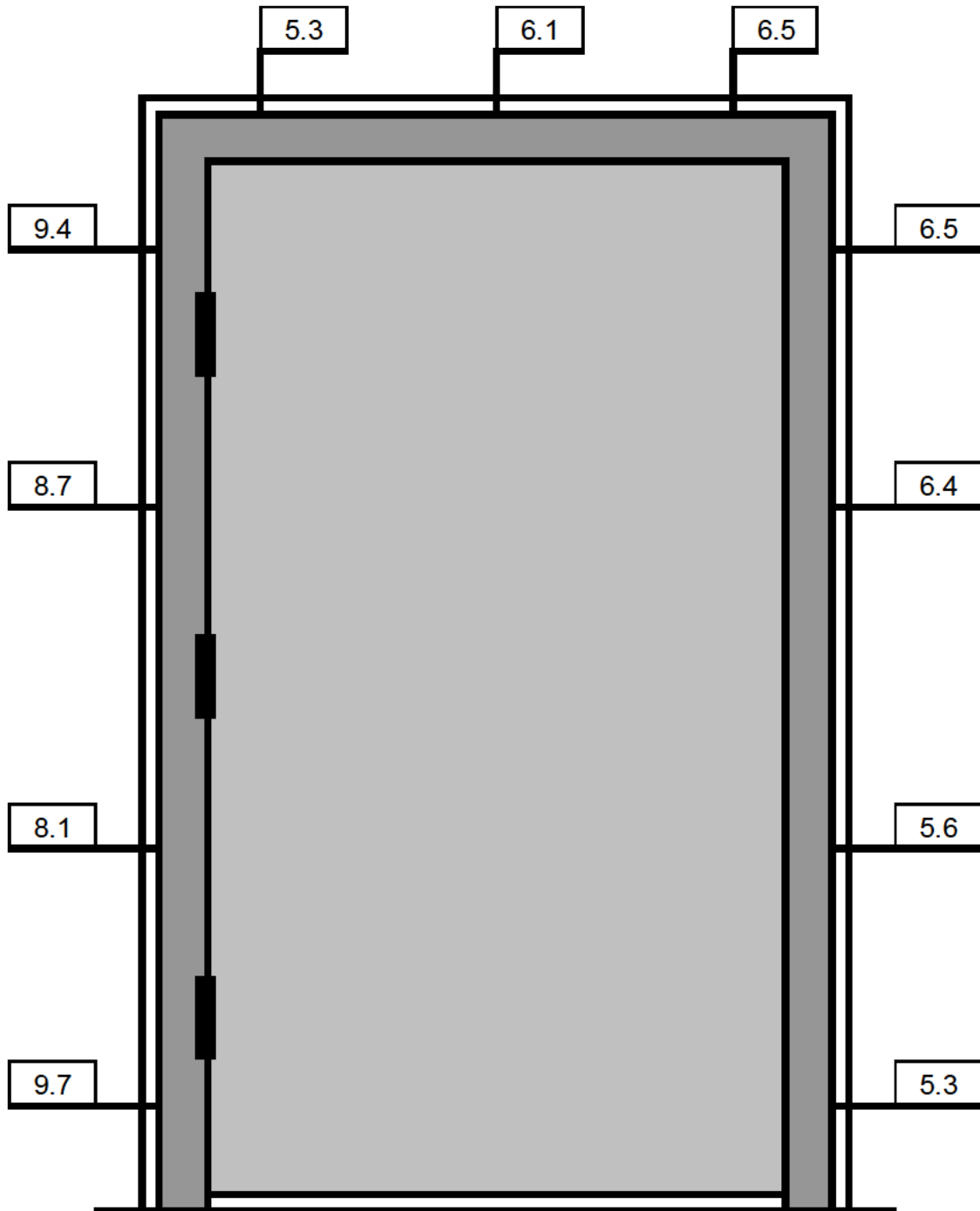
The position at which the measurements were made and the recorded gap at those positions are shown in the following figure(s).

Left hand specimen viewed as measured from the exposed face.





Right hand specimen viewed as measured from the exposed face.



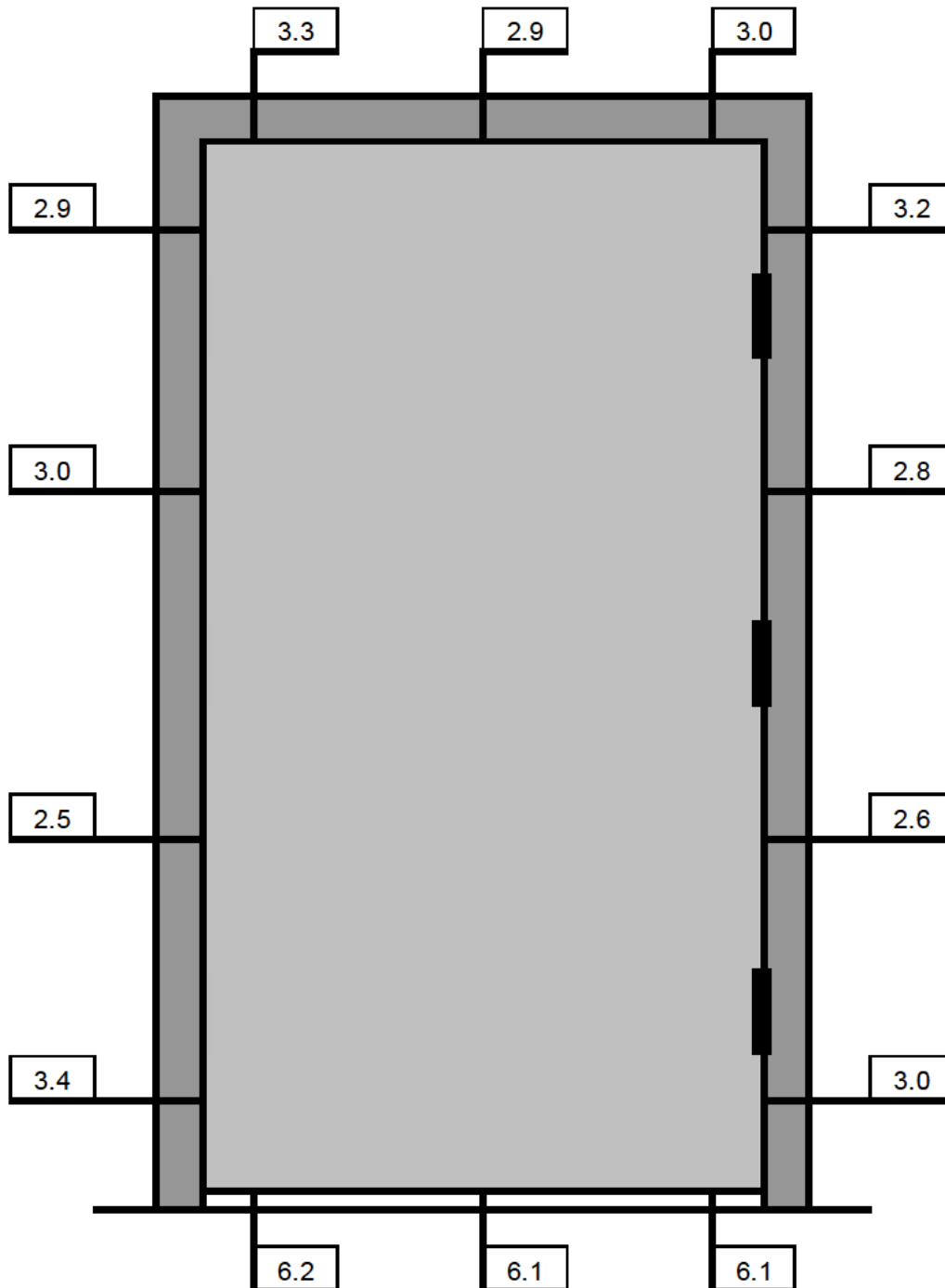


2.3 Gap measurements - Leaf edge to frame

The gaps between the leaf edges and the frame and between the base of the leaf and the threshold were measured prior to the start of the test.

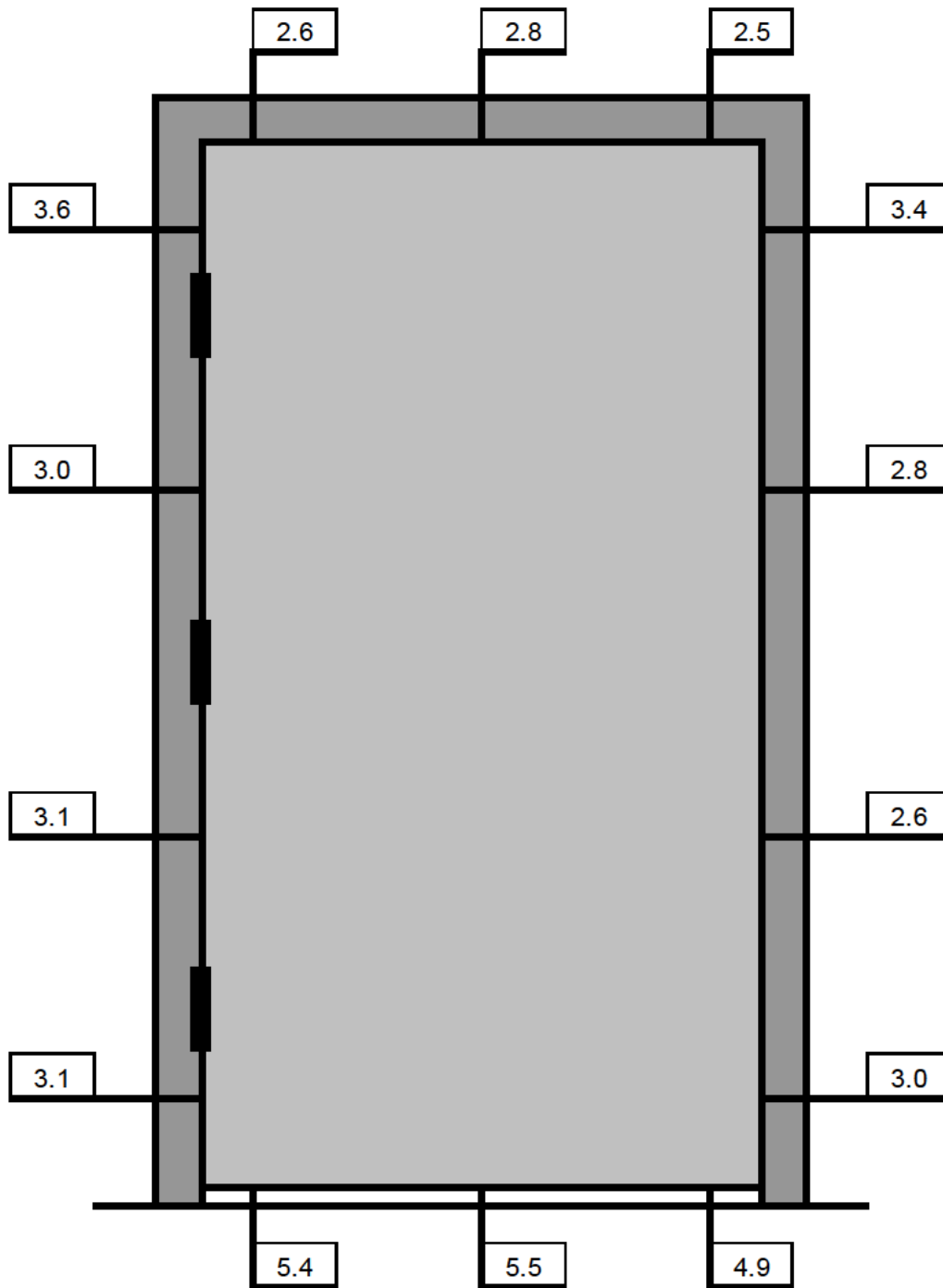
The position at which the measurements were made and the recorded gap at those positions are shown in the following figure(s).

Left hand specimen viewed as measured from the exposed face.





Right hand specimen viewed as measured from the exposed face.



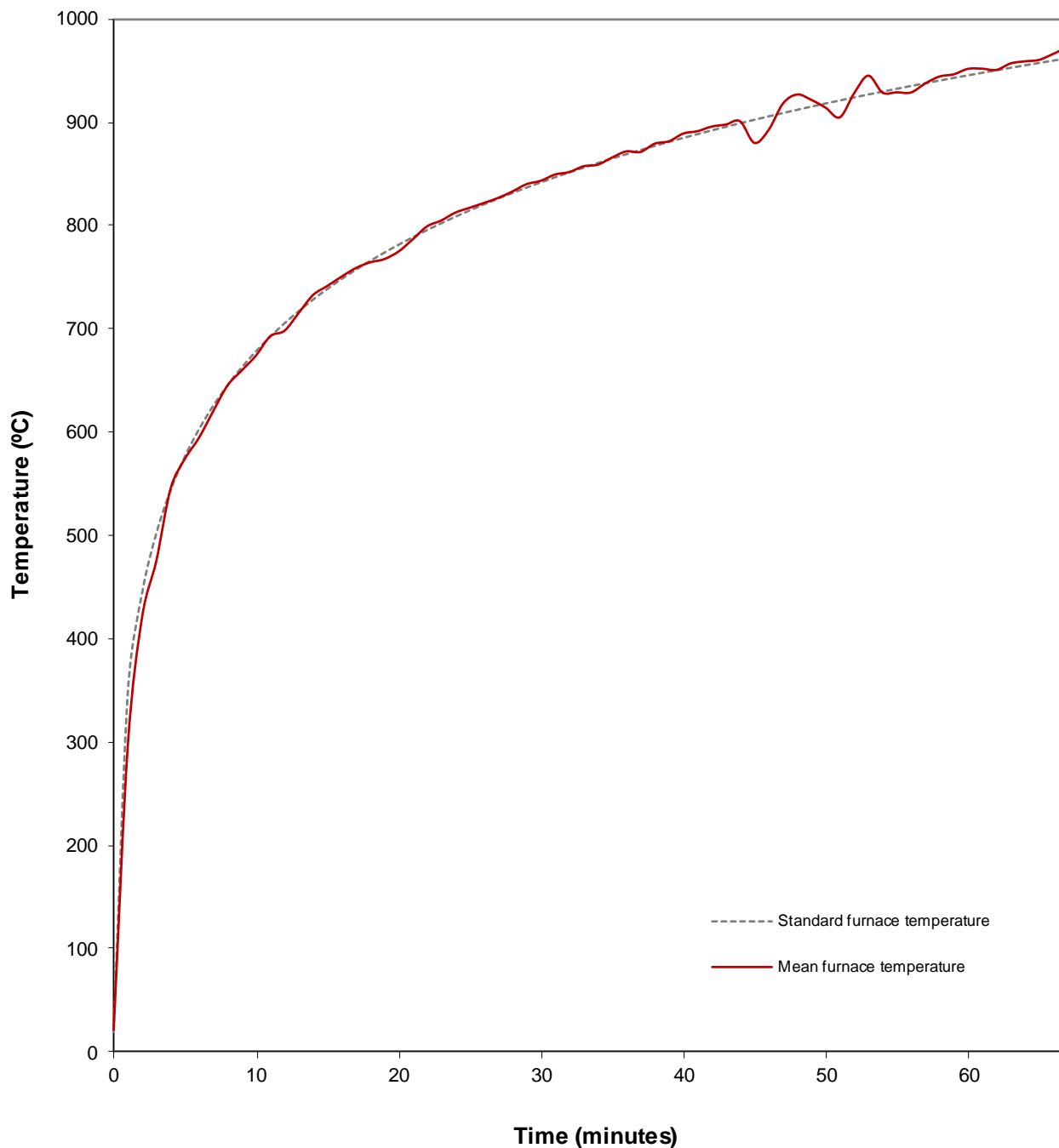


3 TEST CONDITIONS, INSTRUMENTATION AND MEASURING

3.1 Furnace temperature

Furnace temperature was controlled so as to follow the standard temperature/time curve defined in the test standard and within the tolerances permitted. The furnace mean temperature was calculated from the output recorded using nine furnace thermocouples of the design specified in the test standard.

The following graph shows the standard and mean furnace temperature/time data.

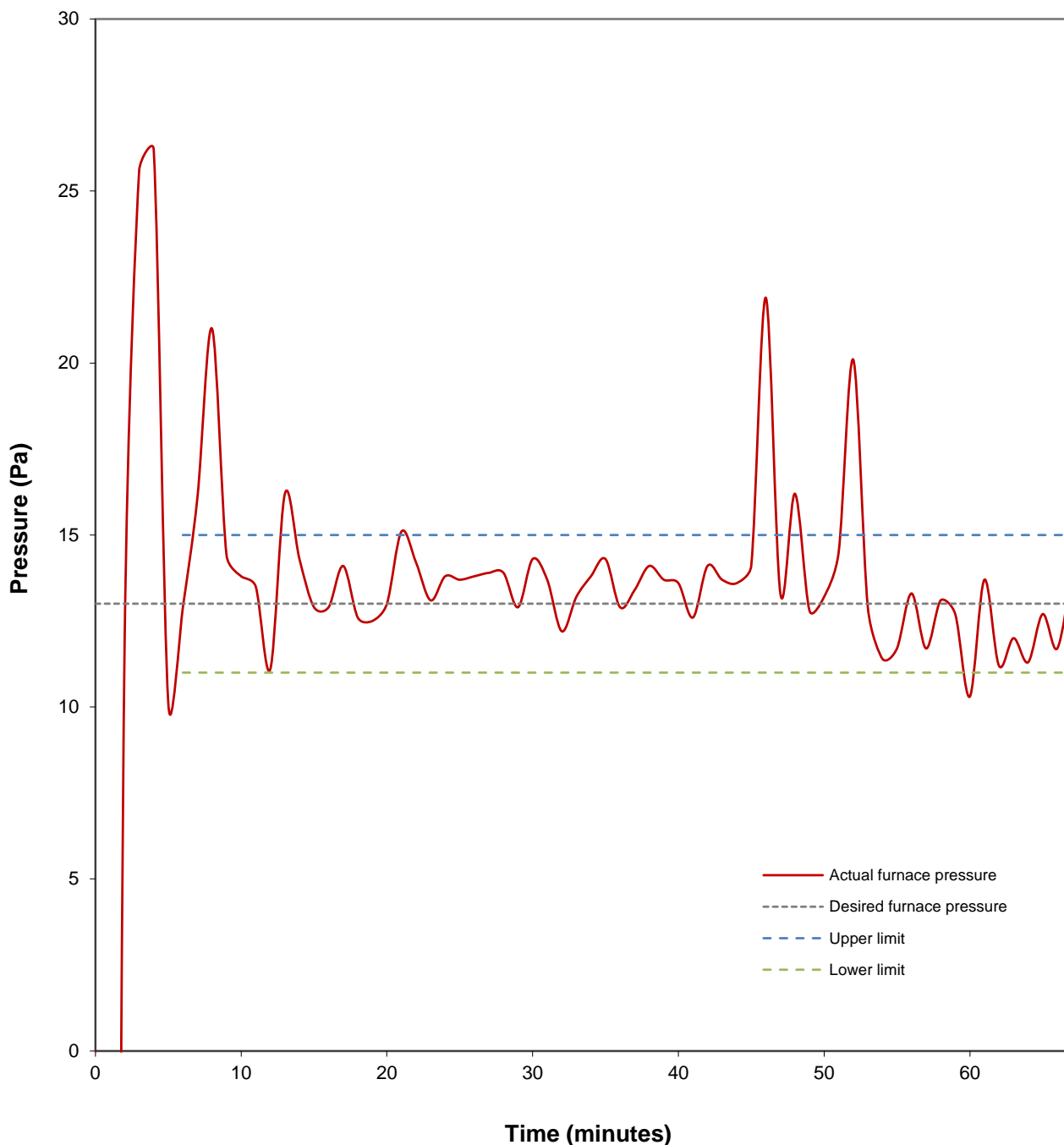




3.2 Furnace pressure

Furnace pressure was maintained for the duration of the test at a nominal + 13 Pa measured at the pressure sensing head. When a linear pressure gradient of 8.5 Pa/m is applied this equates to + 0 Pa at 1 m above the notional floor level. The furnace pressure was controlled within the tolerances permitted in the test standard, except for 9 instantaneous occasions which were transient events.

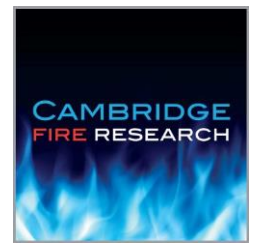
The following graph shows the actual and desired furnace pressure/time data.



3.3 Ambient temperature

Ambient temperature at the start of the test was 18°C.

Ambient temperature ranged between 18°C and 19°C during the test.



3.4 Unexposed face specimen thermocouples

Surface temperature measuring thermocouples of the design specified in the test standard were affixed to the unexposed face of the specimen(s) to monitor the temperature rise as follows:

Left hand specimen

Leaf	Channels 16 to 20	(mean & maximum)
Frame	Channels 21 to 23	(maximum only)
Glazing	Channels 32 to 33	(information only)

Right hand specimen

Leaf	Channels 24 to 28	(mean & maximum)
Frame	Channels 29 to 31	(maximum only)

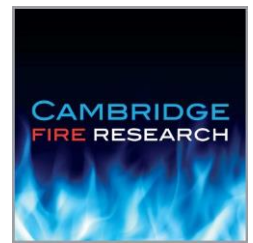
The positions of these thermocouples are shown in Appendix 3.

A roving thermocouple was available for measurement of any specific hotspots.

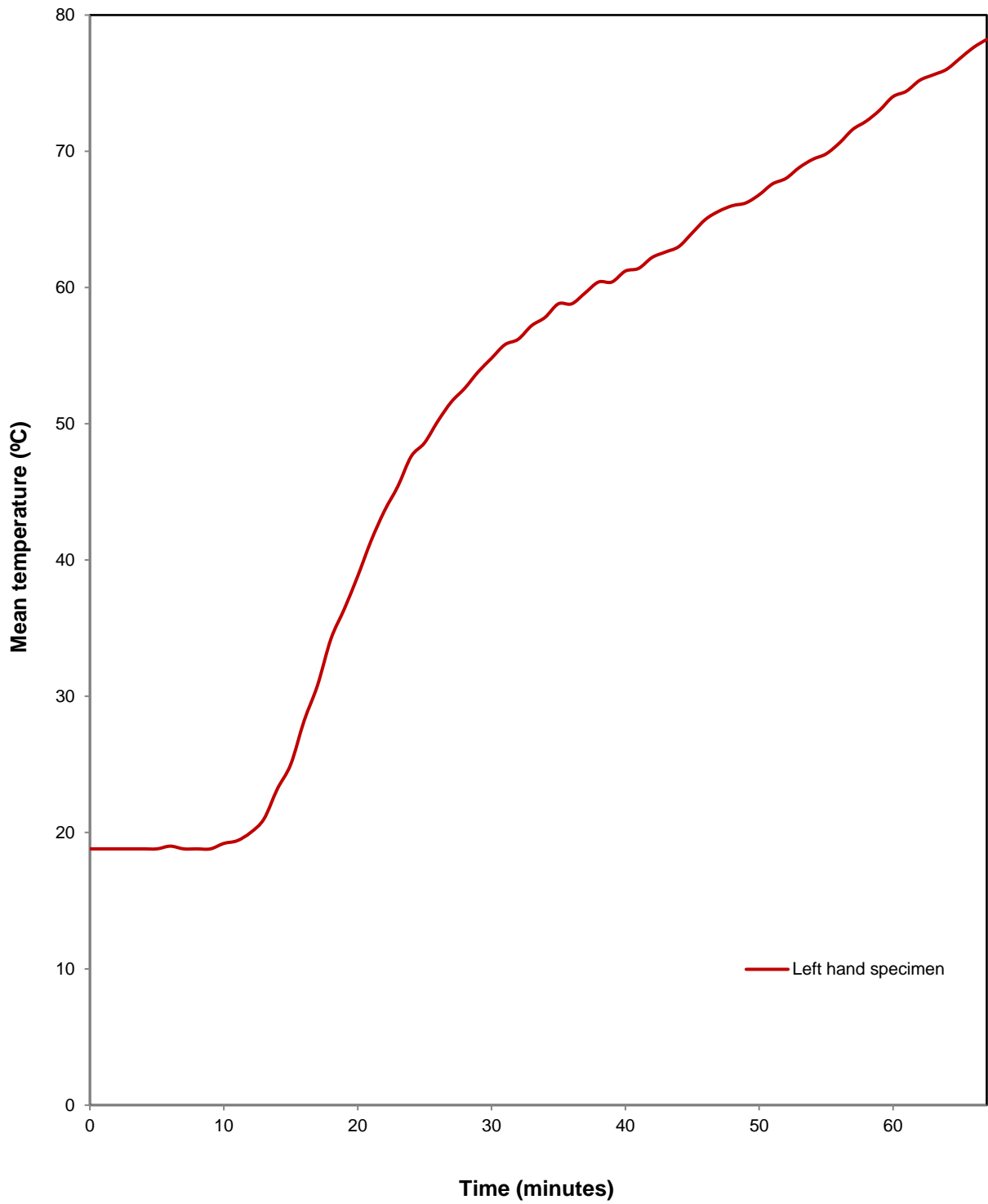
Any instances of the use of the roving thermocouple are noted in the observations in Section 4.

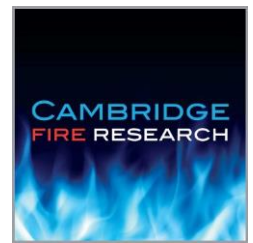
The recorded data of all individual fixed thermocouples is shown in Appendix 4.

The following time/temperature graph shows the mean temperature.

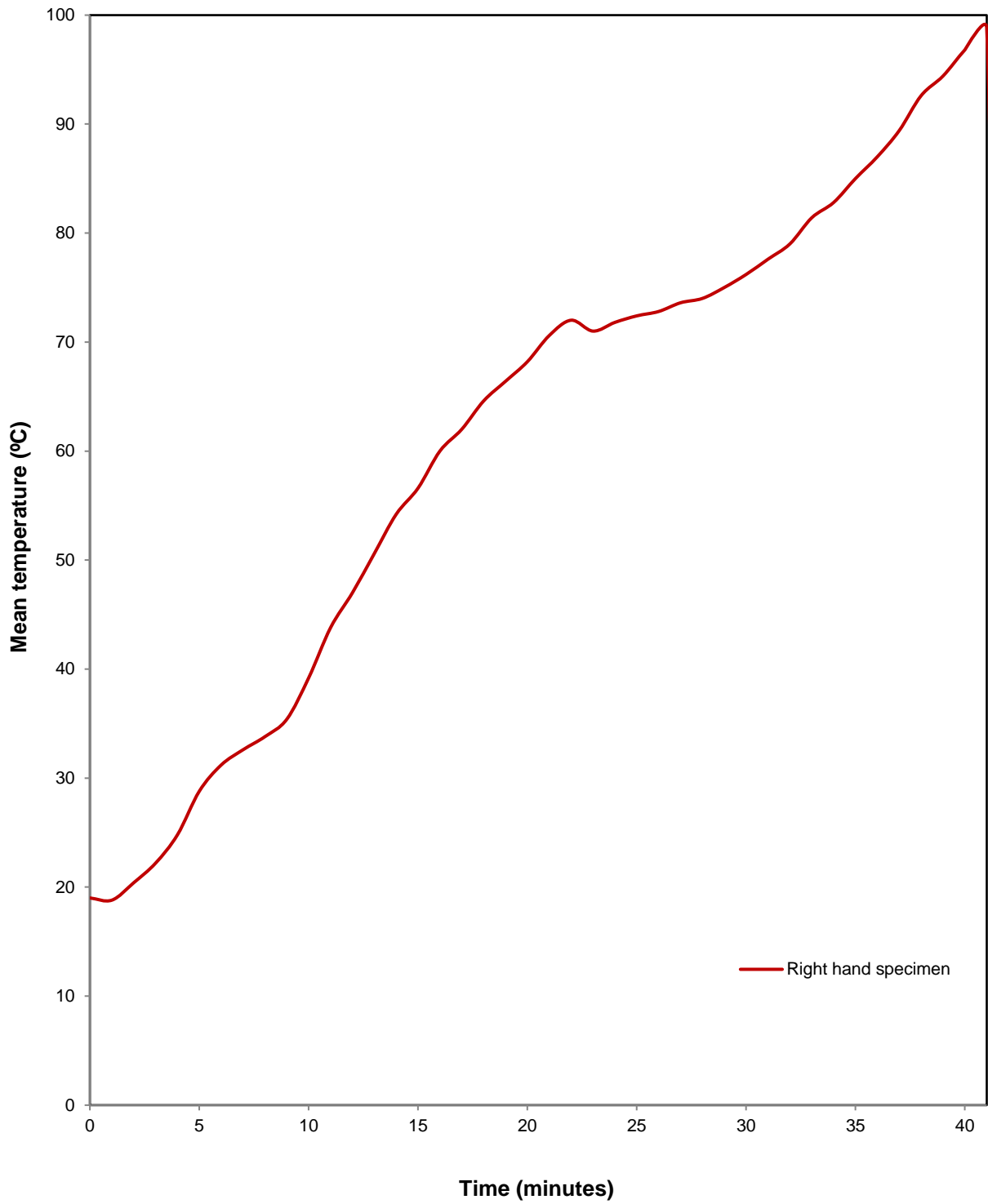


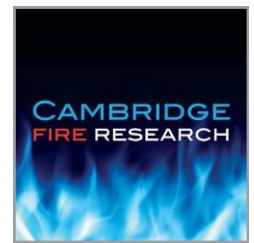
Left hand specimen





Right hand specimen

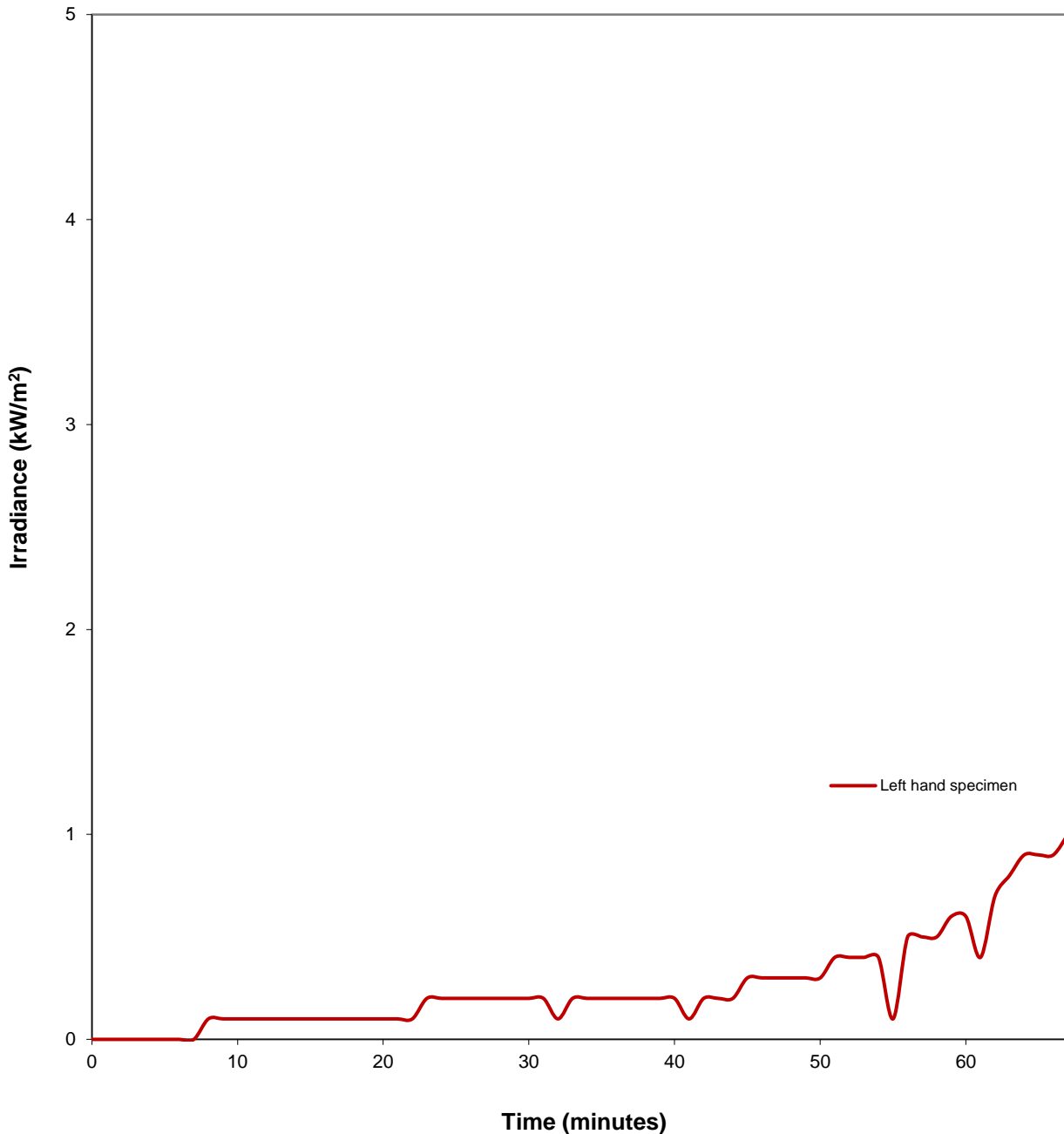




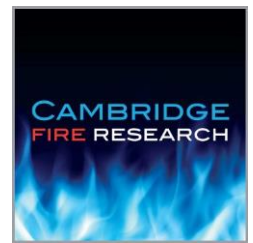
3.5 Irradiance

Irradiance from the unexposed face of each specimen was monitored during the test. A 180° field of view water cooled heat flux meter was positioned with its target 1 m from and parallel to the unexposed face of the specimen at the geometric centre. The following graphs shows the recorded irradiance/time data.

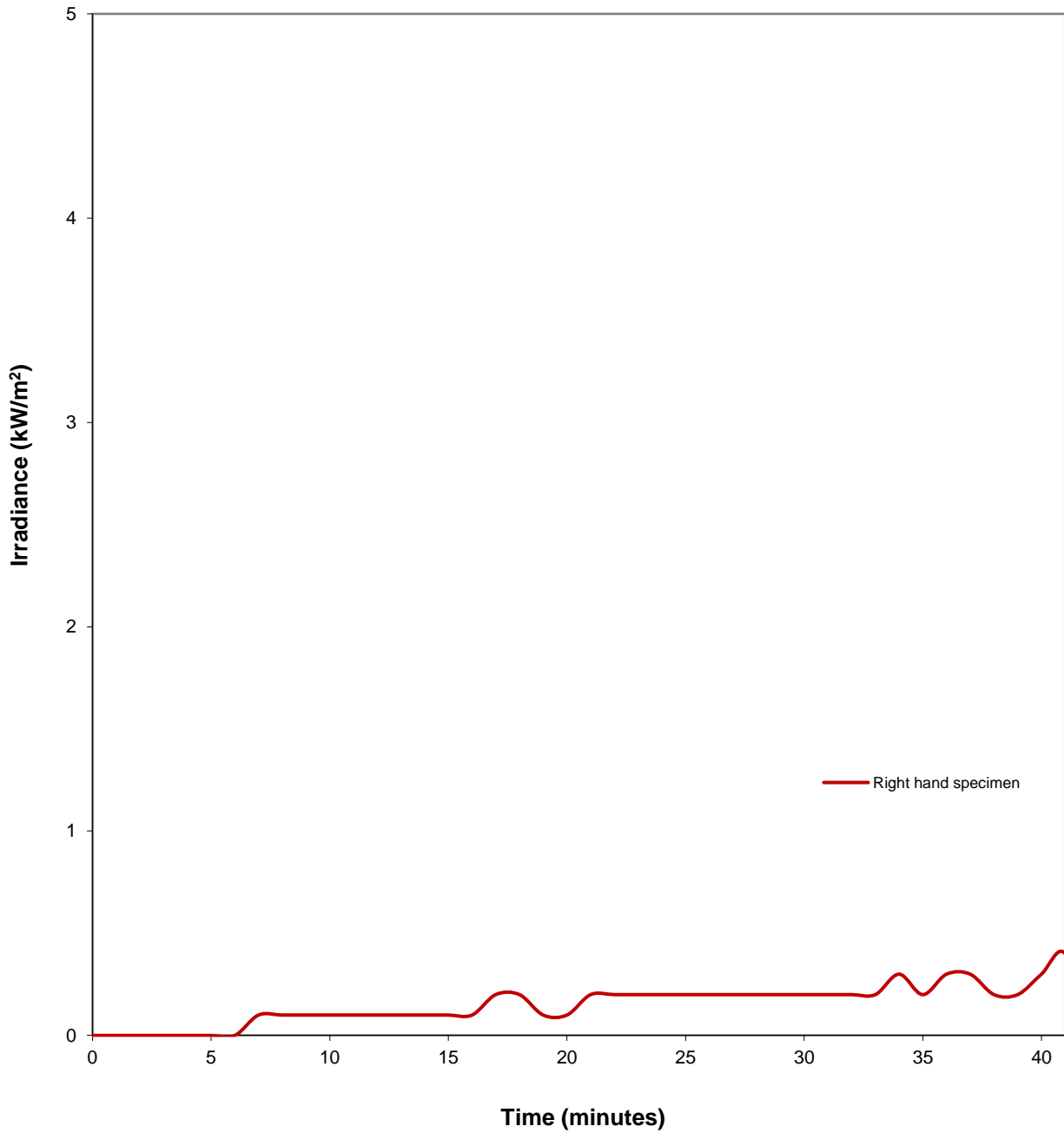
Left hand specimen



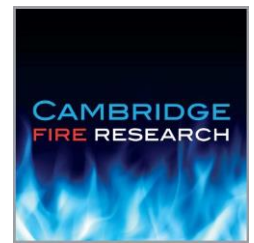
It should be noted that the recorded value of heat flux drops when the field of view is physically interrupted during the measurement of deflection.



Right hand specimen



It should be noted that the recorded value of heat flux drops when the field of view is physically interrupted during the measurement of deflection.

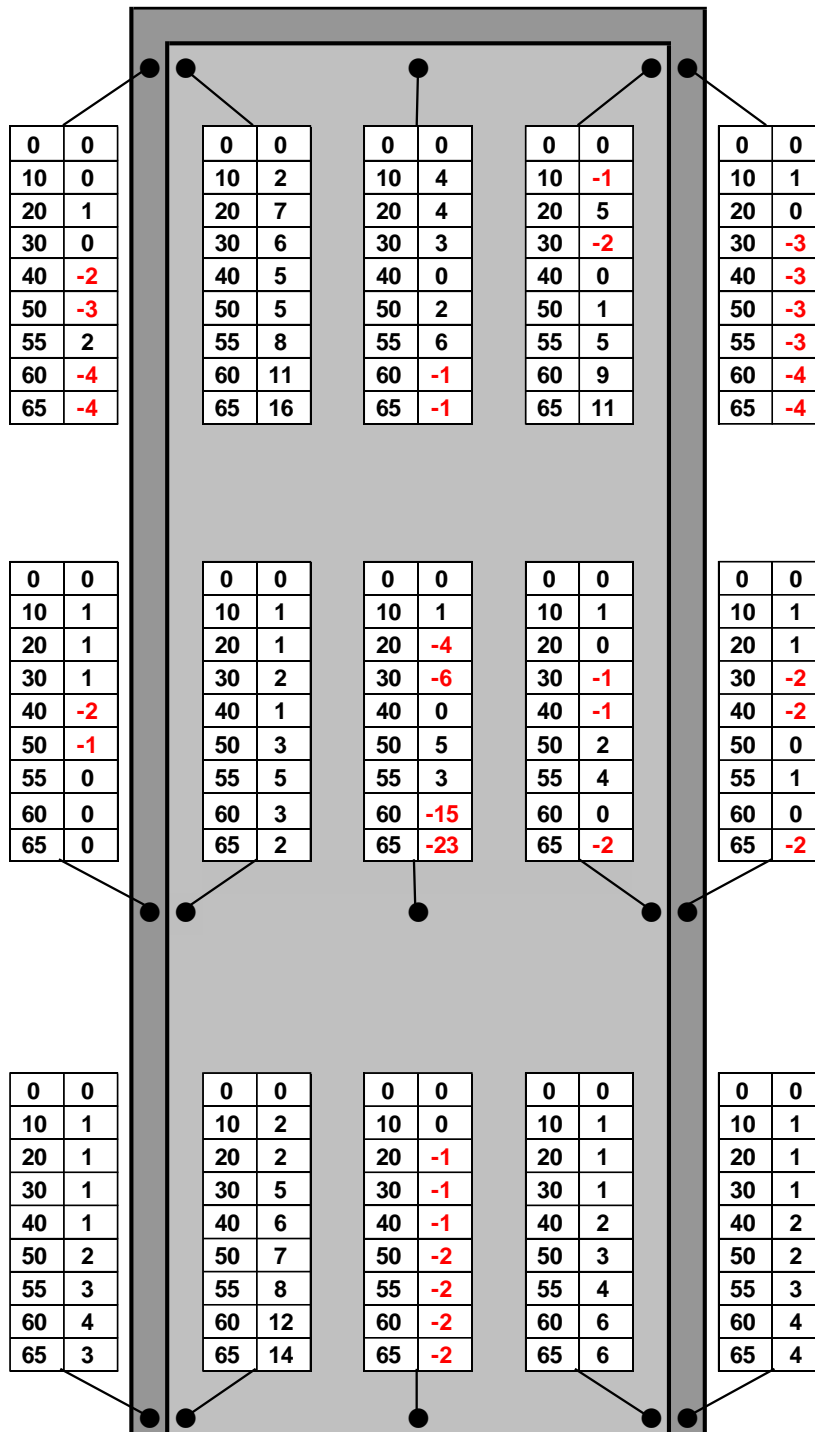


3.6 Deflection

Taut stainless steel wires anchored horizontally across the unexposed face of the restraint frame, such that any deflection experienced by the test construction could be measured, were positioned at mid-height and at 10 mm vertically from the head and base within the visible area of the leaf/leaves.

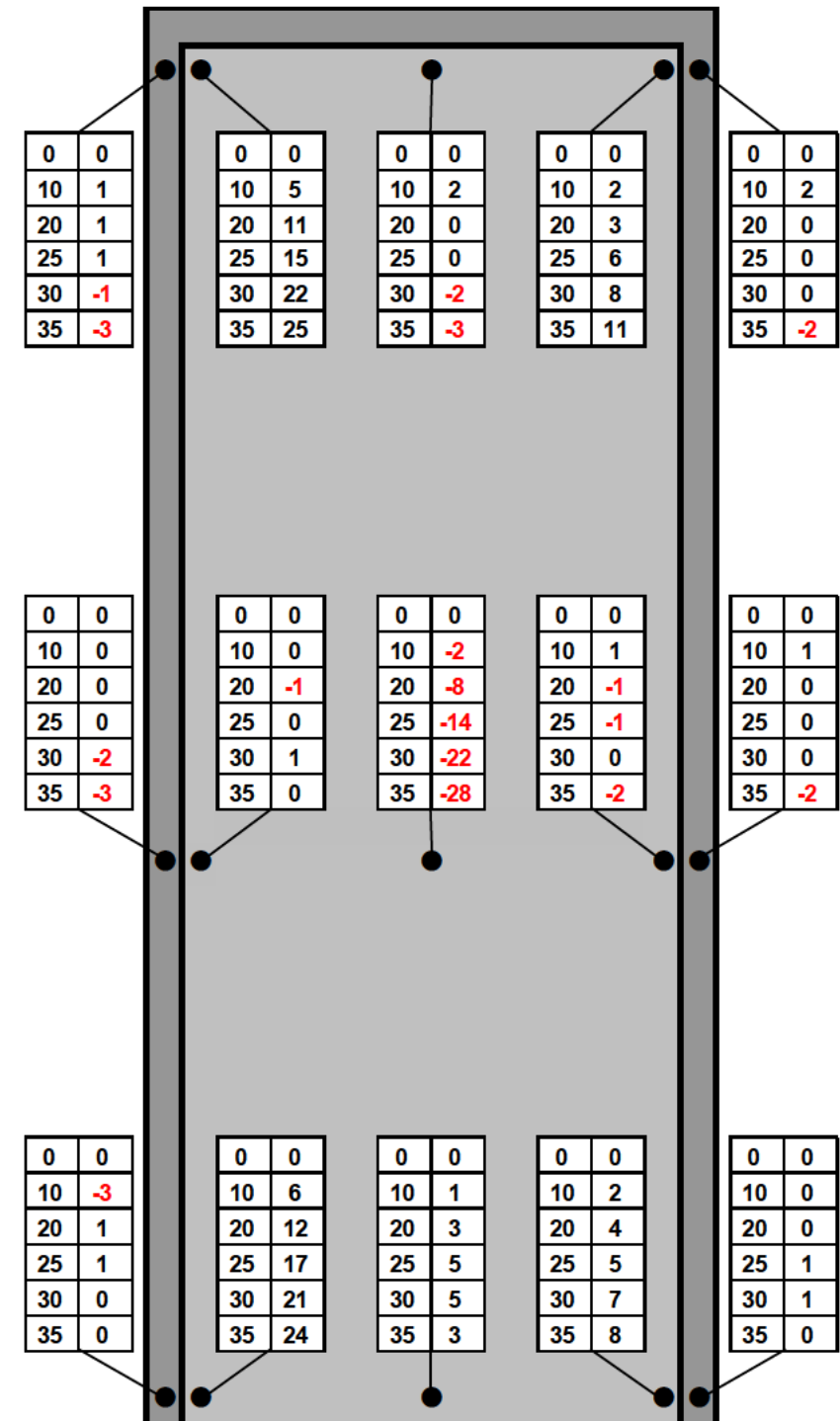
The following figure(s) shows these positions with the elapsed time (minutes) in the left hand column and the recorded deflection (mm) in the right hand column. Positive values indicate deflection towards the heating conditions of the test.

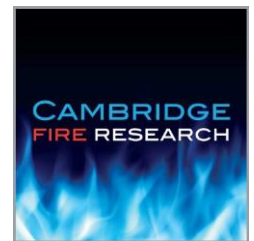
Left hand specimen





Right hand specimen



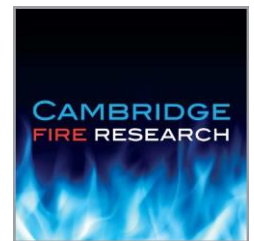


4 TEST OBSERVATIONS

Photographs taken during the test are shown in Appendix 2.

Left hand specimen

TEST OBSERVATIONS (E = Exposed face: U = Unexposed face)		
Time (min:sec)	Face	Observation
00:00		Start of the test.
01:53	U	Glazing pane cracked.
03:44	U	Glazing pane interlayer activated.
05:53	U	Smoke/steam issues at the top of both stiles.
09:15	E	All timber fissured.
10:08	U	Smoke/steam issues at all bead corners.
13:00	U	Smoke/steam issues at the hanging stile/threshold corner.
14:46	E	Handle rotated.
25:40	U	Smoke/steam issues through cracks in the glazing pane.
26:42	U	Smoke/steam issues at the centre hinge position.
30:00	U	Leaf rests on the threshold.
45:47	U	Smoke/steam issues at the handleset.
47:16	E	Closer missing.
55:12	U	Smoke/steam issues at the closing stile, nominally 400 above the base and adjacent to the latch position.
61:15	U	Glowing is apparent at the hanging stile/head corner.
62:46	U	Flash flaming occurs at the hanging stile, nominally 300 above the base.
63:29	U	A cotton pad is applied at the hanging stile, nominally 300 above the base. No failure.
65:30	U	A cotton pad is applied at the hanging stile, nominally 300 above the base. No failure.
65:43	U	Flaming commences at the hanging stile/head corner.
65:53	U	INTEGRITY FAILURE due to sustained flaming. INSULATION FAILURE automatically occurs due to integrity failure.
67:13		The test is terminated.



Right hand specimen

TEST OBSERVATIONS (E = Exposed face: U = Unexposed face)		
Time (min:sec)	Face	Observation
00:00		Start of the test.
01:44	U	Glazing pane cracked.
03:25	U	Glazing pane interlayer activated.
06:15	U	Smoke/steam issues at the closing stile/head corner.
06:50	U	Smoke/steam issues at the hanging stile/head corner.
07:11	U	Smoke/steam issues across the threshold.
07:47	U	Smoke/steam issues at the top right hand corner of the glazing pane.
09:44	E	All timber fissured.
12:00	E	Handle rotated.
16:31	U	Smoke/steam issues across the head of the leaf.
17:31	E	Nominally 20% of glazing beads missing.
22:02	U	Smoke/steam issues at the euro cylinder.
26:05	U	Smoke/steam issues at the latch position and through cracks in the glazing pane, nominally 1000 above leaf base.
28:11	E	Nominally 50% of glazing beads missing.
29:50	U	Leaf rests on the threshold.
32:00	U	Smoke/steam issues at hanging stile at mid height and above.
34:12	U	Glowing is apparent at the closing stile/head corner.
36:17	U	A cotton pad is applied at the closing stile/head corner. No failure.
38:42	U	A cotton pad is applied at the closing stile/head corner. No failure.
40:00	U	INSULATION FAILURE due to thermocouple 26 exceeding the maximum temperature rise criteria.
40:29	U	Flash flaming occurs at the closing stile/head corner.
41:48	U	Specimen boarded over at the request of the sponsor. The test is terminated.



5 LIMITATIONS

1. The test results relate only to the specimens tested. Appendix A of BS476: Part 22: 1987 provides guidance information on the application of fire resistance tests and the interpretation of test data. Application of the results to specimens of different dimensions, orientation or incorporating different components should be the subject of a design appraisal or further testing.
2. 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.
3. The results relate only to the behaviour of the specimen of the element of construction under the particular conditions of test. They are not intended to be the sole criteria for assessing the potential fire performance of the element in use, nor do they reflect the actual behaviour in fires.
4. The results apply to the specimen(s) tested with orientation and symmetry as described in Section 1.5 of this report. The test results may not be appropriate to situations where the heating conditions are from the opposite direction.
5. The results apply to the specimen(s) as received from the sponsor.
6. Cambridge Fire Research is not responsible for the content of this report where information has been identified (using **) as supplied by the sponsor.

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Report issued:

22nd August 2024



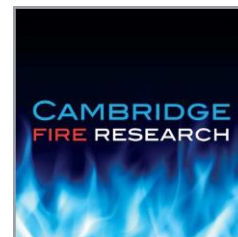
APPENDIX 1 SPECIMEN CONSTRUCTION

Appendix 1 Table 1 – Left hand doorset

Item	Component	Information
1L	<p>Frame Manufacturer: Reference: Description: Fixing to associated construction: Density (kg/m³) Overall size (h x w x d): Cross section size (w x d):</p>	<p>By Deziign Carpentry** Framebreak EU 550 from Wood International Agency Limited - Standard Frame with Plant on Stop** A 3-sided finger jointed laminated frame with 11h rebated joints and planted stops. Corner joints affixed using Ø4.7 x 79 countersunk steel screws, 1No. horizontally through each jamb into the head set at mid depth and 28 below the head, and 2No. vertically through head to each jamb at 62 centres. Joints adhered using Gorilla Wood Glue PVAc D3 adhesive**. Ø5 x 90 countersunk steel screws per jamb set 90 to 205 above the base and at 460 centres. 470 to 651** 2227 x 1002 x 96 32 x 96</p>
2L	<p>Stops Manufacturer: Reference: Description: Density (kg/ m³): Overall size (w x d):</p>	<p>By Deziign Carpentry** Framebreak EU 550 from Wood International Agency Limited** Finger jointed laminated stops affixed using 16#swg x 32# pneumatically fired steel pins set 50 to 70 above the base of the frame and at 145 to 200 centres. 470 to 651** 13 x 33</p>
3L	<p>Leaf Manufacturer: Reference: Description: Overall size (h x w x t): Weight (kg): Sub-components: Core: Manufacturer: Reference: Description: Density (kg/m³): Overall size (t): Lippings: Manufacturer: Reference:</p>	<p>By Deziign Carpentry** WIAD-MMN54-ITT-344-M1** A particleboard core with lippings and an aperture for glazing. 2184 x 932 x 54 68.1 including ironmongery Wood International Agency Limited** Marksman 54** A particleboard core. 529** 54 Wood International Agency Limited** Edgeman EV – Engineered Hardwood Lipping**</p>



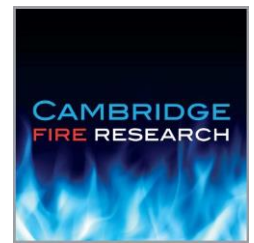
Item	Component	Information
3L Cont.	Description: Density (kg/m ³): Overall size (w x d): Glazing aperture: Description: Overall size (h x w):	Engineered lippings adhered to all edges of the core using Wurth Rapid MCPU adhesive**. 726** 8 x 54 Glazing aperture set 198± below the head of the leaf and 313± from the closing stile. 1498± x 300±
4L	Glazing Manufacturer: Reference: Overall size (h x w x t): Sight size (h x w):	Fire Glass UK 15mm Pyroguard EI30-1(B)1-38dB 1490** x 290** x 15** 1450 x 250
5L	Glazing beads Manufacturer: Reference: Description: Density (kg/m ³): Overall size (h x w): Section size (w x d): Splay angle (°):	By Dezign Carpentry** Bolection Bead** Mitred bolected Sapele** beads, set 196 below the head of the leaf and 316 from the closing stile, affixed using 16±swg x 50± pneumatically fired steel pins set 50 from internal corners and at 148 to 150 centres. Mitred corners adhered using Mitrebond adhesive**. 704 to 782** 1506 x 305 28 x 22 16
6L	Hinges Manufacturer: Reference: Description: Overall size: Blade size (h x w x t): Knuckle size (Ø): Fixings to frame: Fixings to leaf :	Arrone AR8182-SSS** 3No. stainless steel butt hinges set 150, 1025 and 1900 from top of leaf to top of blade. 101 x 30 x 3 14 4No. Ø4.6 x 30 countersunk stainless steel screws. 4No. Ø4.6 x 30 countersunk stainless steel screws.
7L	Closer Manufacturer: Reference: Description: Overall size: Body (h x w x d): Case (h x w x d x t): Track (h x w x d): Fixings to leaf: Fixings to frame:	Rutland TS11205 An overhead closer with an alloy body, stainless steel track and steel case. 60 x 212 x 40 67 x 258 x 43 x 1.2 19 x 460 x 29 3No. Ø4.8 x 67 countersunk steel screws. 4No. Ø4.8 x 15 countersunk steel screws.



Item	Component	Information
8L	<p>Latch/lock Manufacturer: Reference: Description:</p> <p>Overall size: Forend (h x d x t): Centre latch/lock: Body (h x w x d): Strike (h x w x d x t): Upper/lower latch: Body (h x w x d): Keeps (h x w x d x t): Fixings to leaf: Strike fixings: Keep fixings:</p>	<p>Maco A-TS** A 3-point steel latch comprising steel forend, body, hook boxes, strike and keeps, set with the centreline of the latch bolt 978 above the base of the leaf.</p> <p>1750 x 20 x 3</p> <p>198 x 59 x 16 250 x 17 x 25 x 3 including a 64h x 16d tongue</p> <p>150 x 38 x 16 190 x 28 x 25 x 3 including a 64h x 16d tongue</p> <p>10No. Ø3.9 x 39 countersunk stainless steel screws 3No. Ø3.9 x 29 countersunk stainless steel screws 4No. Ø3.9 x 29 countersunk stainless steel screws</p>
9L	<p>Handleset Manufacturer: Reference: Description:</p> <p>Overall size: Rose (Ø x d x t): Rose cover (Ø x d x t): Handle (Ø x w): Fixings:</p>	<p>Hoppe** Paris EX138Z/42** A stainless steel lever on rose handleset comprising stainless steel body and cover.</p> <p>50 x 5 x 1 52 x 8 x 1 20 x 140 4No. Ø3.9 x 19 countersunk stainless steel screws</p>
10L	<p>Automatic door bottom Manufacturer: Reference: Description:</p> <p>Overall size Body (h x w x d): Fixing plates (h x d x t): Rebate (h x d): Fixings:</p>	<p>Sealmaster** Dropseal DRP2712E** A mainly aluminium body with elastomeric seal and stainless steel fixing plates set within a rebate central to leaf depth.</p> <p>27 x 922 x 12 45 x 16 x 1.3 27 x 13 1No. Ø3.5 x 29 countersunk steel screws</p>



Item	Component	Information
11L	Intumescent – Frame Manufacturer: Reference: Description: Overall size (d x t):	Intumescent Seals Ltd Therm-A-Seal** 2No. graphite based intumescent strips in PVC holders with self-adhesive on one side, set 6 from the exposed face, fully interrupted at the hinges, strike and keeps and 32 from the exposed face, partially interrupted at the strike and keeps with nominally 20% remaining. 15 x 4
12L	Intumescent – Glazing liner Manufacturer: Reference: Description: Overall size (w x t):	Intumescent Seals Ltd** Therm-A-Sol** An sodium silicate** based intumescent with self-adhesive on one side, lining the glazing aperture. 52** x 2
13L	Glazing seal Manufacturer: Reference: Description: Overall size (w x t):	Sealmaster** Intumescent Foam Glazing Tape** An open cell** foam seal with self-adhesive on one side, adhered at the interface of the glazing and beads. 20** x 5** (3** compressed)
14L	Intumescent – Hinges Manufacturer: Reference: Description: Overall size (t):	Intumescent Seals Ltd** Therm-A-Strip** An ammonium phosphate based intumescent with self-adhesive on one side, set beneath all hinge blades. 1
15L	Intumescent – Latch Manufacturer: Reference: Description: Overall size (t):	Intumescent Seals Ltd** Therm-A-Strip** An ammonium phosphate based intumescent with self-adhesive on one side, encasing the body and hook boxes, beneath forend above top hook box and below the bottom hook box, and beneath the strike and keeps. 1
16L	Intumescent – Latch 2 Manufacturer: Reference: Description: Overall size (w x t):	Intumescent Seals Ltd** Therm-A-Flex** A graphite based intumescent with self-adhesive on one side, set within the forend rebate between the hook boxes and body, bottom of the top hook box and top of bottom hook box. 10 x 1



Item	Component	Information
17L	Smoke seal Manufacturer: Reference: Description: Overall size (w x d x t):	Sealmaster** Delta** An elastomeric seal with self-adhesive on one side, adhered to the stops and frame. 12 x 12 x 1
18L	Fire stopping detail Description:	Gaps between the frame and the associated construction were filled with Unifrax Insulfrax paper then capped using Firewise Intumescent & Acoustic Acrylic Sealant.



Appendix 1 Table 2 – Right hand doorset

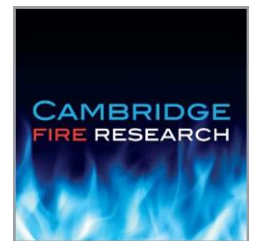
Item	Component	Information
1R	<p>Frame Manufacturer: Reference: Description: Fixing to associated construction: Density (kg/m³) Overall size (h x w x d): Cross section size (w x d):</p>	<p>By Dezign Carpentry** Framebreak JA 380 from Wood International Agency Limited - Standard Frame with Plant on Stop** A 3-sided finger jointed laminated frame with 10h rebated joints and planted stops. Corner joints affixed using Ø4.8 x 79 countersunk steel screws, 1No. horizontally through each jamb into the head set at mid depth and 30 below the head, and 2No. vertically through head to each jamb at 58 centres. Joints adhered using Gorilla Wood Glue PVAc D3 adhesive**.</p> <p>Ø5 x 90 steel countersunk screws per jamb set 200 to 210 above the base at 460 centres.</p> <p>378 to 400** 2223 x 1002 x 96 31 x 96</p>
2R	<p>Stops Manufacturer: Reference: Description: Density (kg/ m³): Overall size (w x d):</p>	<p>By Dezign Carpentry** Framebreak JA 380 from Wood International Agency Limited** Finger jointed laminated stops affixed using 16#swg x 32# pneumatically fired steek pins set 50 to 70 above the base of the frame and at 145 to 200 centres.</p> <p>378 to 400** 12 x 33</p>
3R	<p>Leaf Manufacturer: Reference: Description: Overall size (h x w x t): Weight (kg): Sub-components: Core: Manufacturer: Reference: Description: Density (kg/m³): Overall size (t): Lippings: Manufacturer: Reference: Description:</p>	<p>By Dezign Carpentry** WIAD-MMN44-ITT-344-TL1** A particleboard core leaf with lippings and glazing aperture. 2183 x 933 x 44 56.8 including hardware</p> <p>Wood International Agency Limited** Marksman 44** A particleboard core. 515** 44</p> <p>By Dezign Carpentry** Std Square Lipping** Sapele** lipping adhered to all edges of the core using Wurth Rapid MCPU adhesive**.</p>



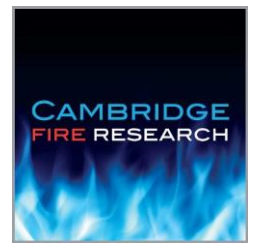
Item	Component	Information
3R Cont	Density (kg/m ³): Overall size (w x d): Glazing aperture: Description: Overall size (h x w):	669 to 672** 8 x 44 Glazing aperture set 200** below the head of the leaf and nominally centrally**. 1496** x 296**
4R	Glazing Manufacturer: Reference: Pane size (h x w x t): Sight size (h x w):	Fire Glass UK 15mm Pyroguard EI30-1(B)1-38dB 1490** x 290** x 15** 1470 x 270
5R	Glazing beads Manufacturer: Reference: Description: Density (kg/m ³): Overall size (h x w): Section size (w x d): Splay angle (°):	By Dezign Carpentry** CB2** Mitred bolected Sapele** beads, set 195 below the head of the leaf and 312 from the closing stile, affixed using 16swg** x 50** pneumatically fired steel pins**, set 47 to 51 from internal corners and at 153 to 202 centres. Mitred corners adhered using Mitrebond adhesive**. 649** 1505 x 305 20 x 15 14
6R	Hinges Manufacturer: Reference: Description: Overall size: Blade size (h x w x t): Knuckle size (Ø): Fixings to frame: Fixings to leaf:	Arrone AR8182-SSS** 3No. stainless steel butt hinges set 150, 1024 and 1900 from top of leaf to top of blade. 101 x 30 x 3 14 4No. Ø4.6 x 30 countersunk stainless steel screws. 4No. Ø4.6 x 30 countersunk stainless steel screws.
7R	Closer Manufacturer: Reference: Description: Overall size: Body (h x w x d): Case (h x w x d x t): Track (h x w x d): Fixings to leaf: Fixings to frame:	Rutland TS11205 An overhead closer with an alloy body, stainless steel track and steel case. 60 x 212 x 40 67 x 258 x 43 x 1.2 19 x 460 x 29 3No. Ø4.8 x 67 countersunk steel screws. 4No. Ø4.8 x 15 countersunk steel screws.



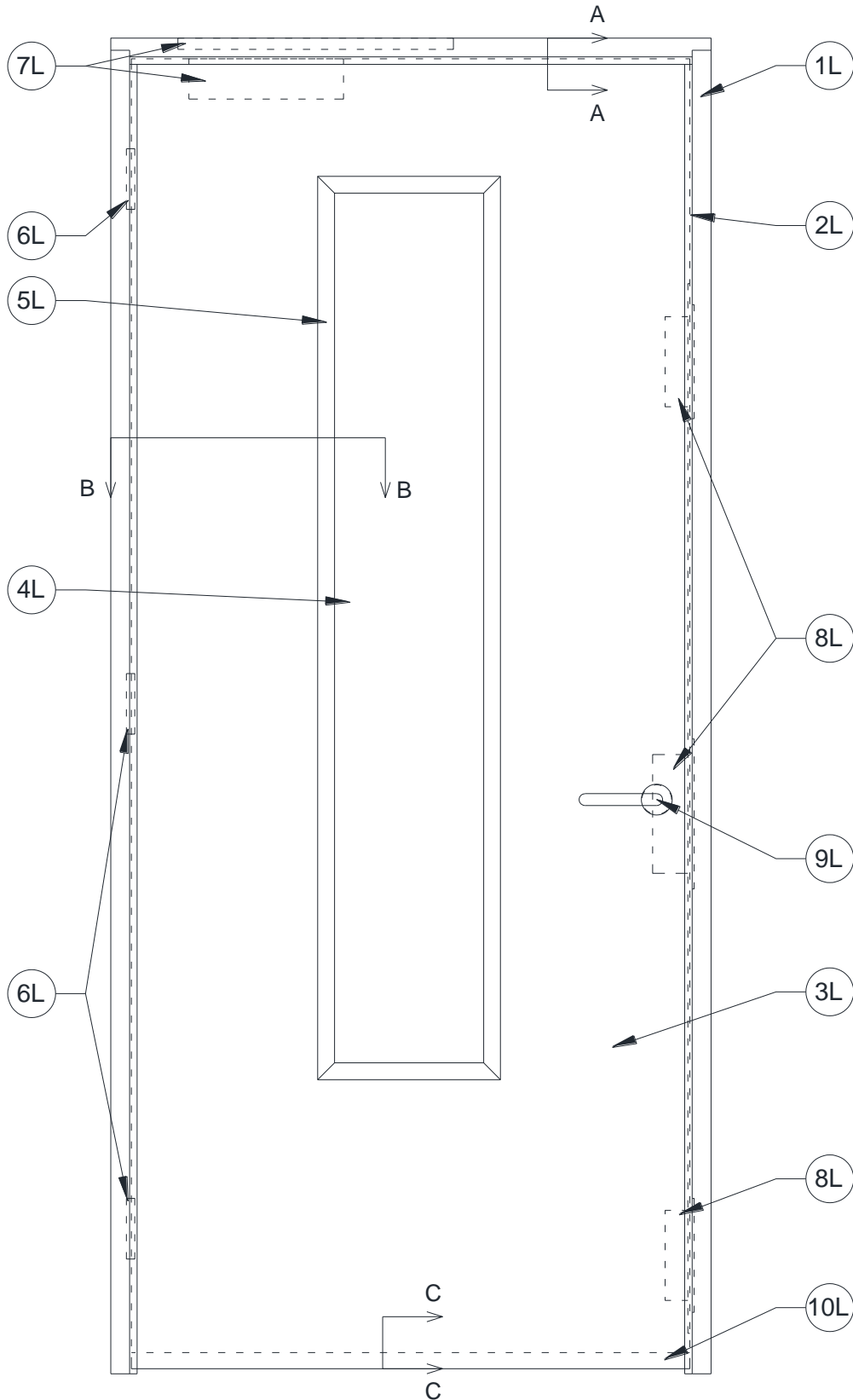
Item	Component	Information
8R	<p>Latch/lock Manufacturer: Reference: Description:</p> <p>Overall size: Forend (h x d x t): Body (h x w x d): Strike (h x d x t):</p> <p>Fixings to leaf: Fixings to frame:</p>	<p>Arrone AR910-R-60-SSS** A steel mortice latch comprising steel forend and strike, set with the centreline of the latch bolt 972 above the base of the leaf.</p> <p>235 x 24 x 3 165 x 84 x 15 170 x 24 x 1.5 including a 54h** x 16d** tongue 2No. Ø4.4 x 24 countersunk stainless steel screws 3No. Ø3.4 x 19 countersunk stainless steel screws</p>
9R	<p>Handleset Manufacturer: Reference: Description:</p> <p>Overall size: Rose (Ø x d x t): Rose cover (Ø x d x t): Handle (Ø x w): Fixings:</p>	<p>Hoppe** Paris EX138Z/42** A stainless steel lever on rose handleset comprising stainless steel body and cover.</p> <p>50 x 5 x 1 52 x 8 x 1 20 x 140 4No. Ø3.8 x 19 countersunk stainless steel screws</p>
10R	<p>Euro cylinder Manufacturer: Reference: Description: Overall size:</p>	<p>Arrone AR-KD-5130-BB-NP** A mainly brass keyed eurocylinder. 35/35</p>
11R	<p>Escutcheon Manufacturer: Reference: Description:</p> <p>Overall size: Body (Ø x d x t): Cover (Ø x d x t): Fixings:</p>	<p>Hoppe** EX425** A stainless steel escutcheon with stainless steel cover.</p> <p>50 x 5 x 1 52 x 8 x 1 2No. Ø3.8 x 19 countersunk stainless steel screws.</p>
12R	<p>Automatic door bottom Manufacturer: Reference: Description:</p> <p>Body (h x w x d): Fixing plates (h x d x t): Rebate (h x d): Fixings:</p>	<p>Sealmaster** Dropseal DRP2712E** A mainly aluminium body with elastomeric seal and stainless steel fixing plates set within a rebate 17 from the exposed face.</p> <p>27 x 922 x 12 45 x 16 x 1.3 27 x 13 1No. Ø3.5 x 29 countersunk steel screws</p>



Item	Component	Information
13R	Intumescent – Frame Manufacturer: Reference: Description: Overall size (d x t):	Intumescent Seals Ltd Therm-A-Seal** A graphite based intumescent in a PVC holder with self-adhesive on one side, set 14 from the exposed face, fully interrupted at the hinges and strike. 15 x 4
14R	Glazing seal Manufacturer: Reference: Description: Overall size (w x t):	Sealmaster** Intumescent Foam Glazing Tape** An open cell** foam seal with self-adhesive on one side, adhered at the interface of the glazing and beads. 10** x 5**
15R	Intumescent – Latch Manufacturer: Reference: Description: Overall size (t):	Intumescent Seals Ltd** Therm-A-Strip** An ammonium phosphate based intumescent with self-adhesive on one side encasing the latch body, dust boxes, beneath the forend and strike. 1
16R	Intumescent – Hinges Manufacturer: Reference: Description: Overall size (t):	Intumescent Seals Ltd** Therm-A-Strip** An ammonium phosphate based intumescent pad with self-adhesive on one side, set beneath all hinge blades. 1
17R	Smoke seal Manufacturer: Reference: Description: Overall size (w x d x t):	Sealmaster** Delta** An elastomeric seal with self-adhesive on one side, adhered to the stops and frame. 12 x 12 x 1
18R	Fire stopping detail Description:	Gaps between the frame and the associated construction were filled with Unifrax Insulfrax paper then capped using Firewise Intumescent & Acoustic Acrylic Sealant.

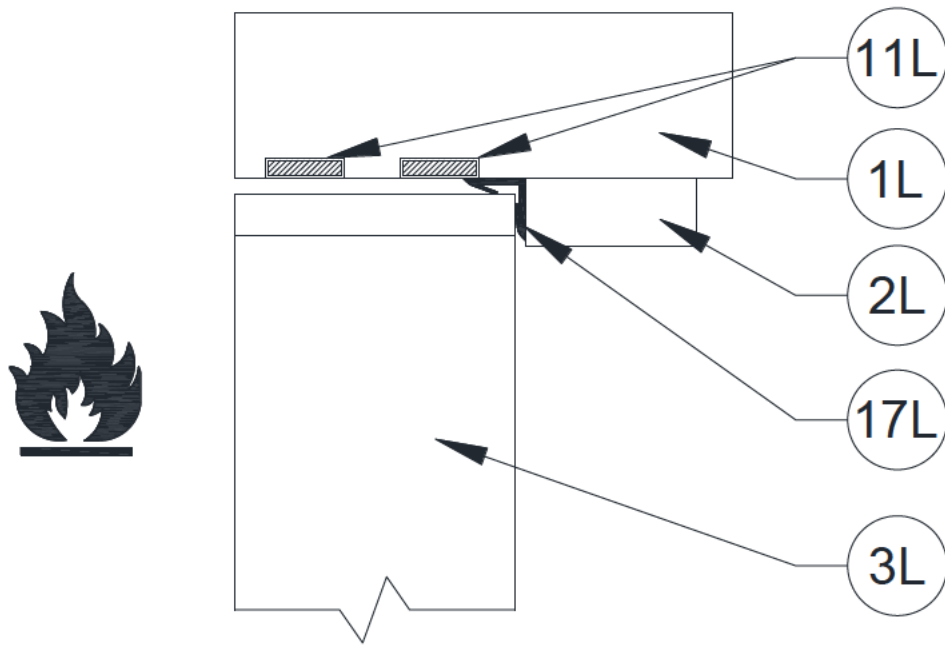


Appendix 1 Figure 1 – Left hand doorset elevation (unexposed face view) incl. hidden detail

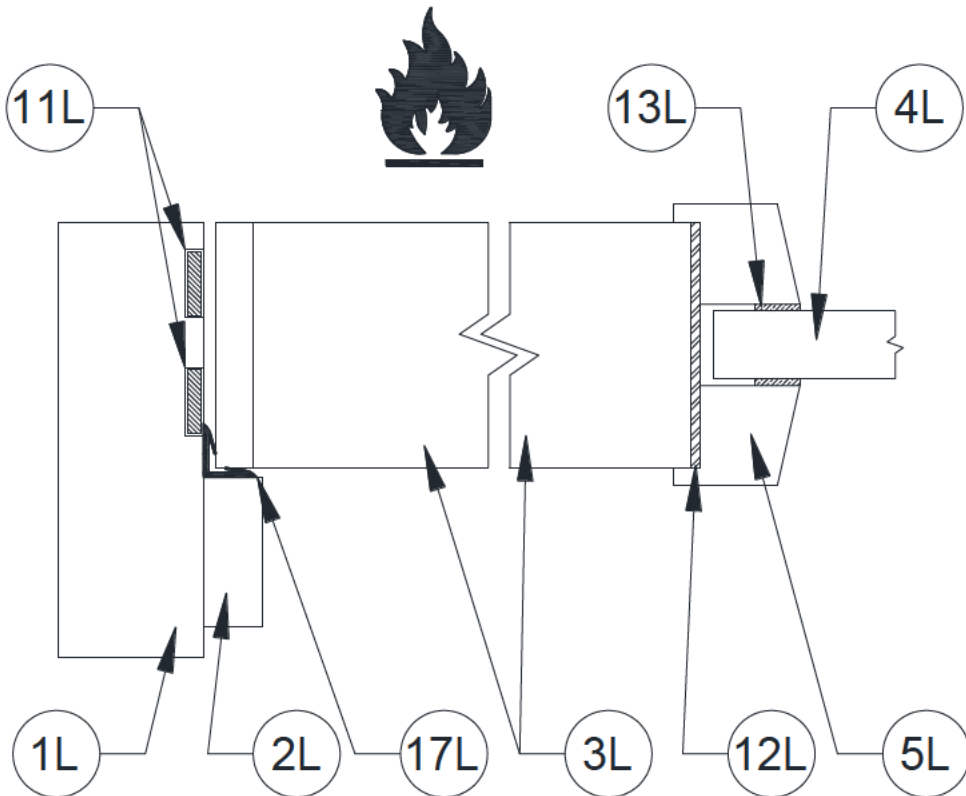




Appendix 1 Figure 2 – Section A – A

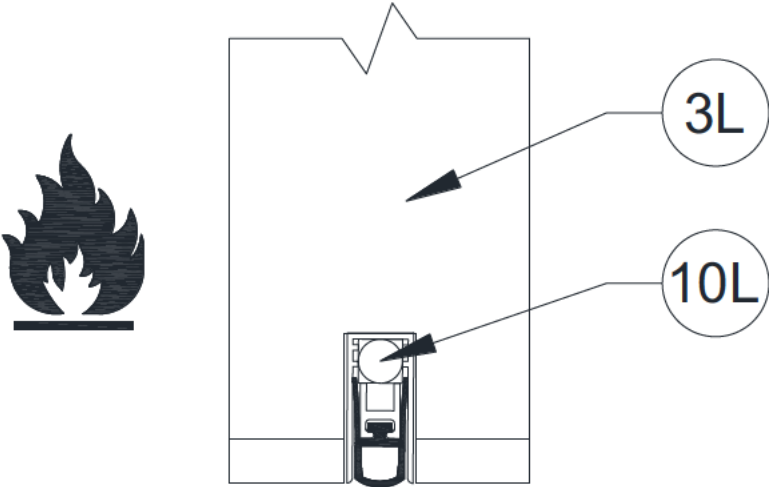


Appendix 1 Figure 3 – Section B – B



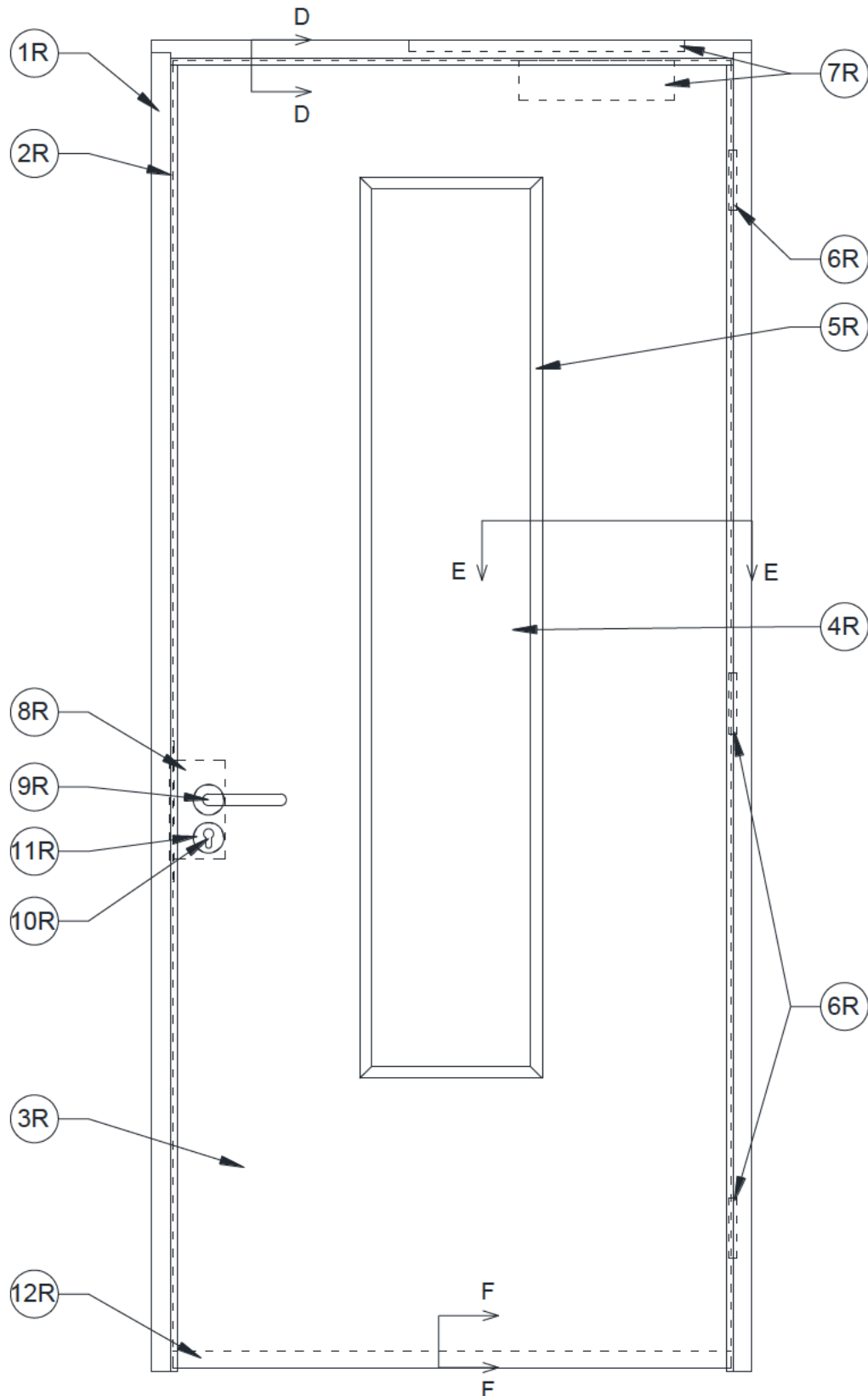


Appendix 1 Figure 4 – Section C – C



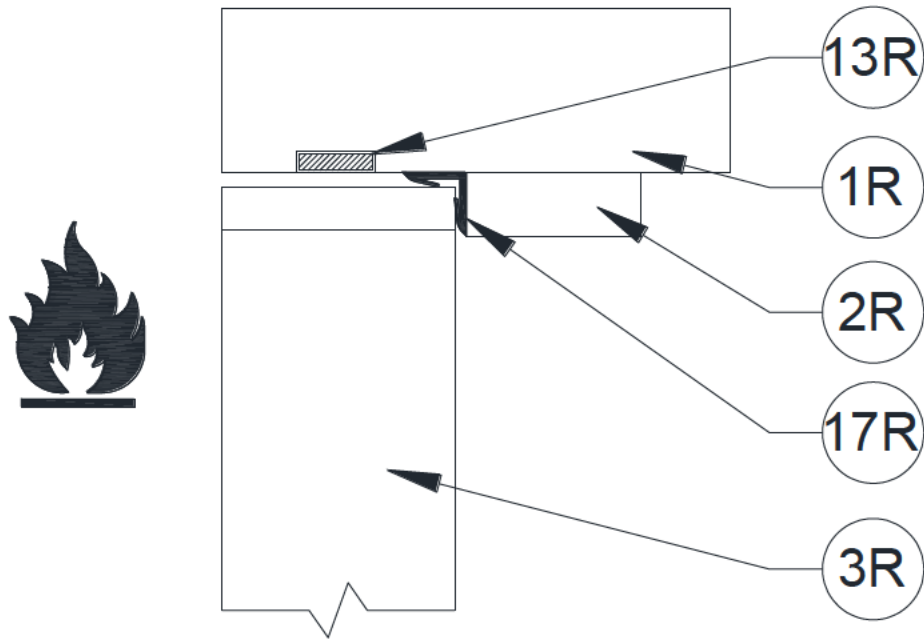


Appendix 1 Figure 5 – Right hand doorset elevation (unexposed face view) incl. hidden detail

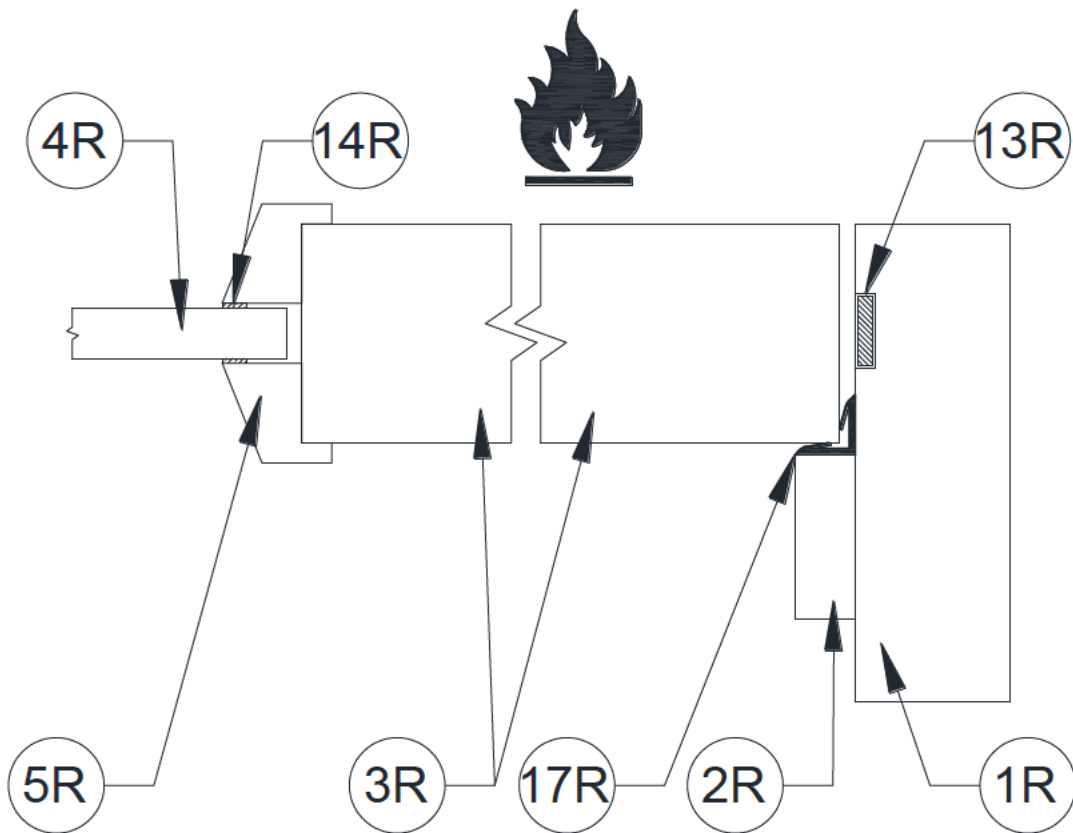




Appendix 1 Figure 6 – Section D – D

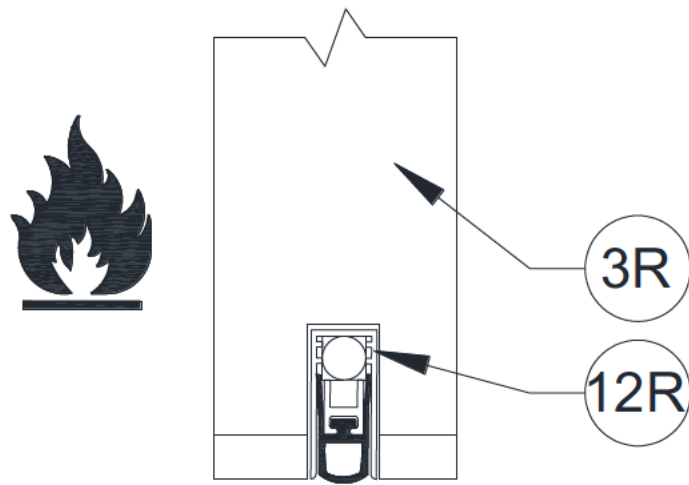


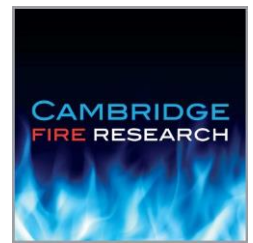
Appendix 1 Figure 7 – Section E – E





Appendix 1 Figure 8 – Section F – F





APPENDIX 2 PHOTOGRAPHS

Appendix 2.1 Pre-test photos

Photo 2.1.1 Left hand specimen



Photo 2.1.2 Left hand specimen



Photo 2.1.3 Left hand specimen



Photo 2.1.4 Left hand specimen



Photo 2.1.5 Left hand specimen



Photo 2.1.6 Left hand specimen



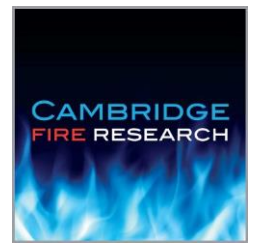


Photo 2.1.7 Left hand specimen

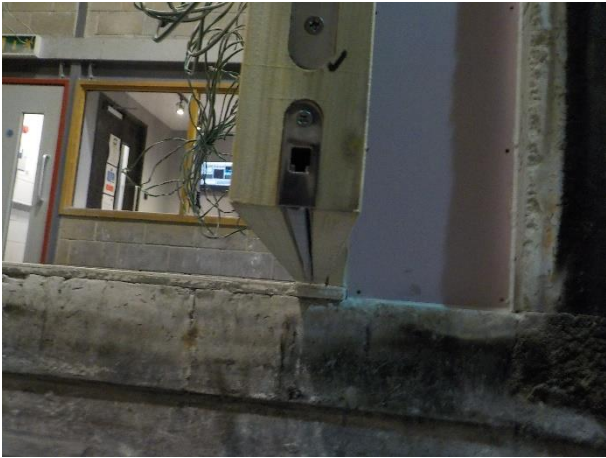


Photo 2.1.8 Left hand specimen



Photo 2.1.9 Left hand specimen



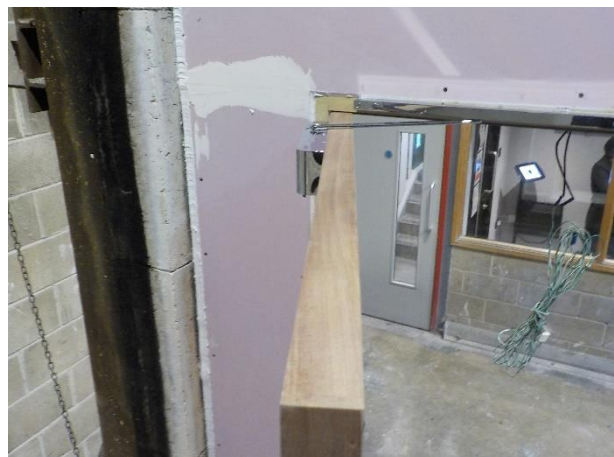
Photo 2.1.10 Left hand specimen



Photo 2.1.11 Left hand specimen



Photo 2.1.12 Right hand specimen



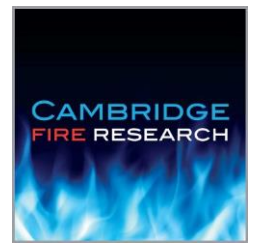


Photo 2.1.13 Right hand specimen



Photo 2.1.14 Right hand specimen

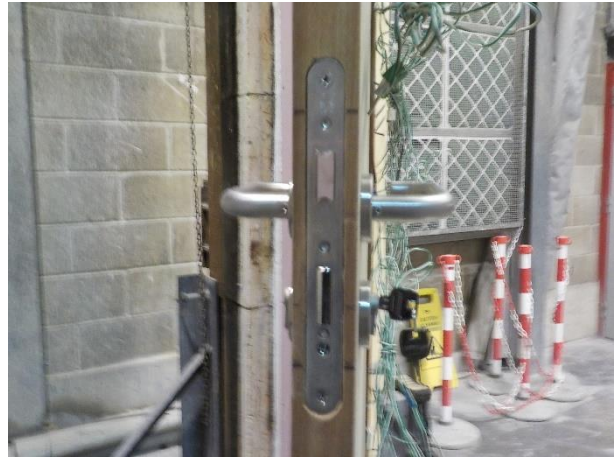


Photo 2.1.15 Right hand specimen



Photo 2.1.16 Right hand specimen

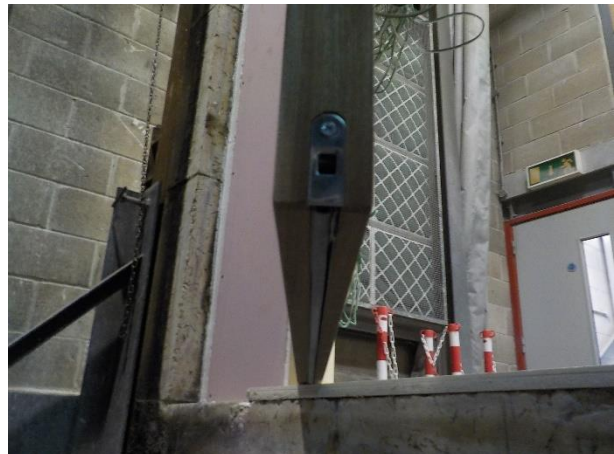
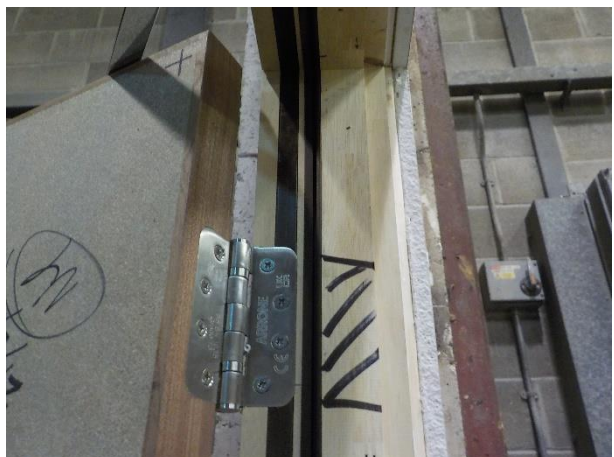


Photo 2.1.17 Right hand specimen



Photo 2.1.18 Right hand specimen



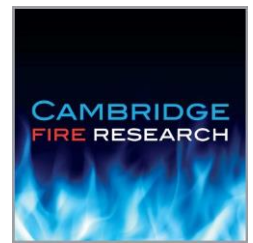


Photo 2.1.19 Right hand specimen



Photo 2.1.20 Left hand specimen



Photo 2.1.21 Left hand specimen

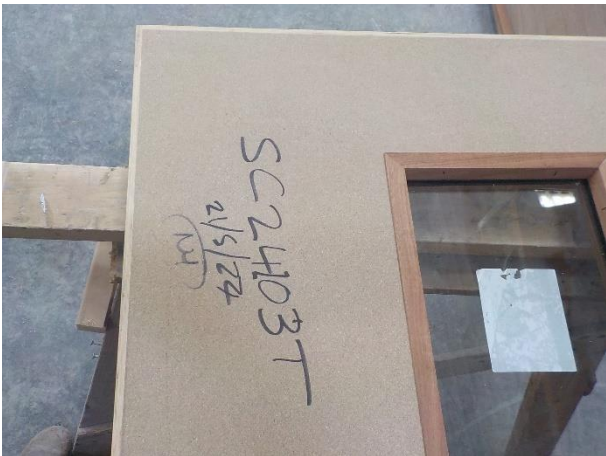
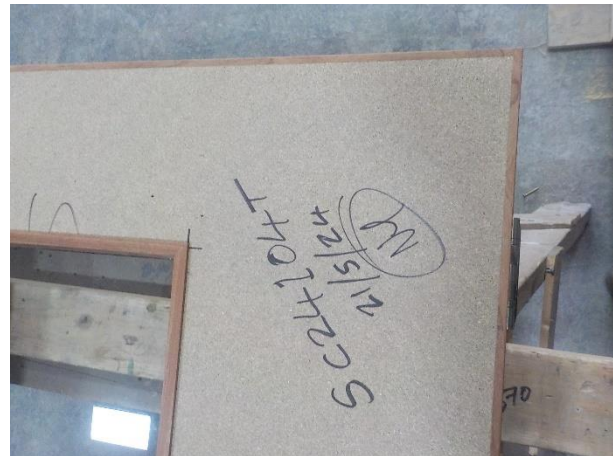


Photo 2.1.22 Right hand specimen



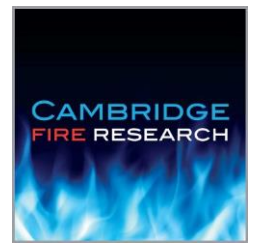
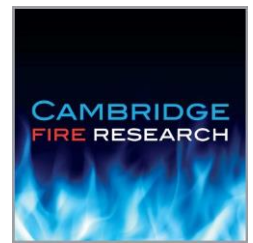


Photo 2.1.23





Appendix 2.2 During test photos

Photo 2.2.1



Photo 2.2.2



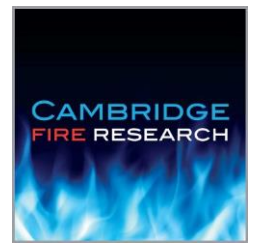
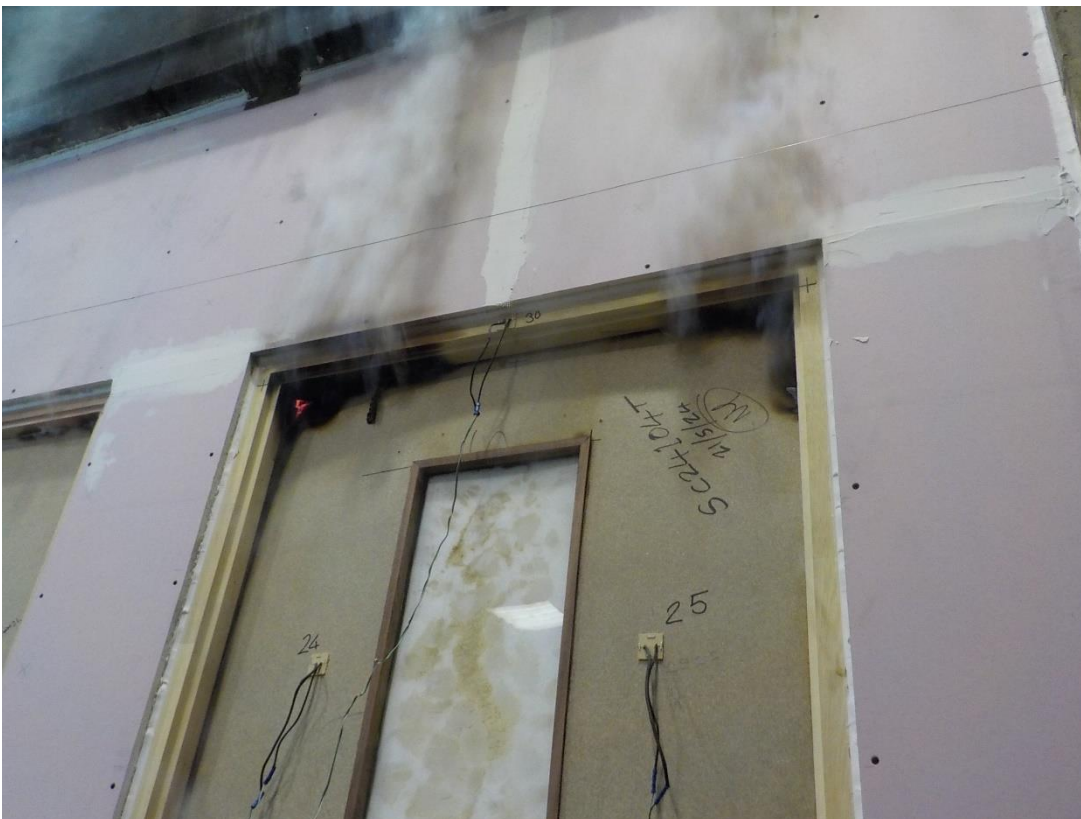


Photo 2.2.3



Photo 2.2.4 Right hand specimen after 39 minutes



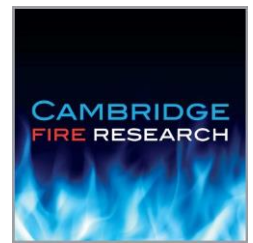
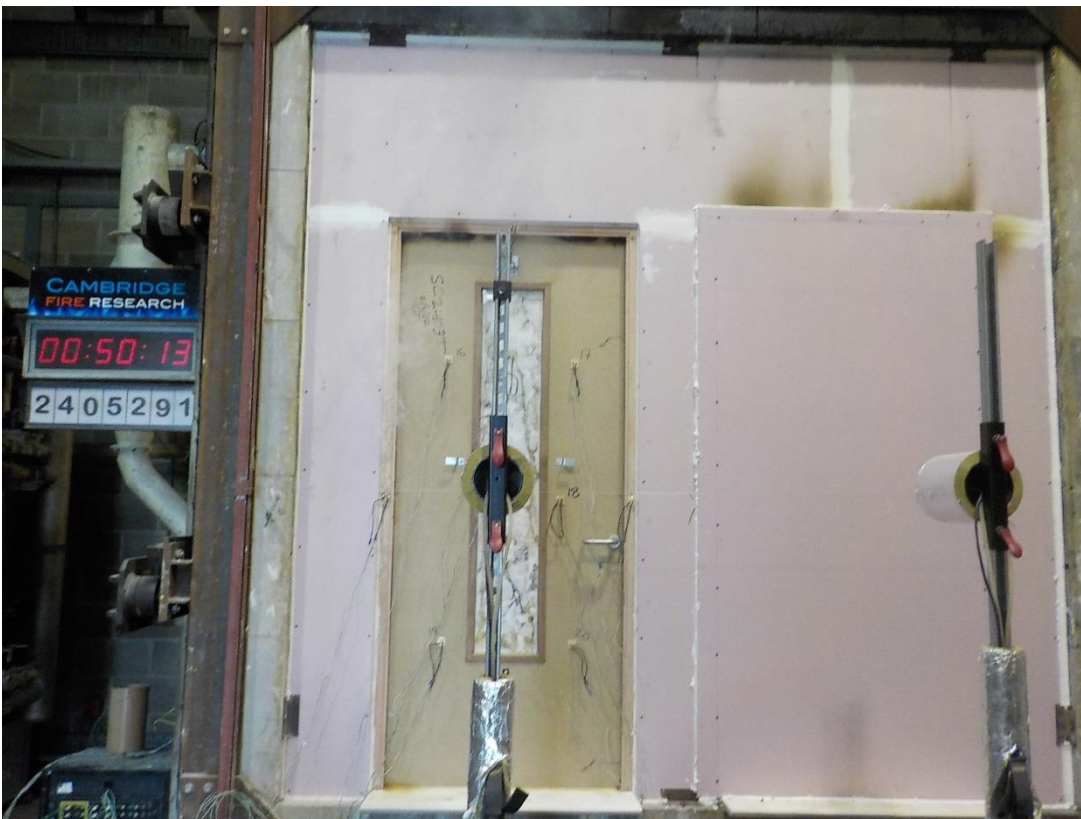


Photo 2.2.5



Photo 2.2.6



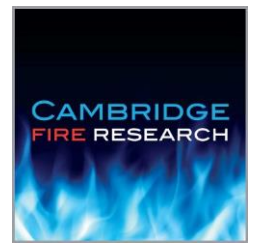


Photo 2.2.7 Left hand specimen after 64 minutes

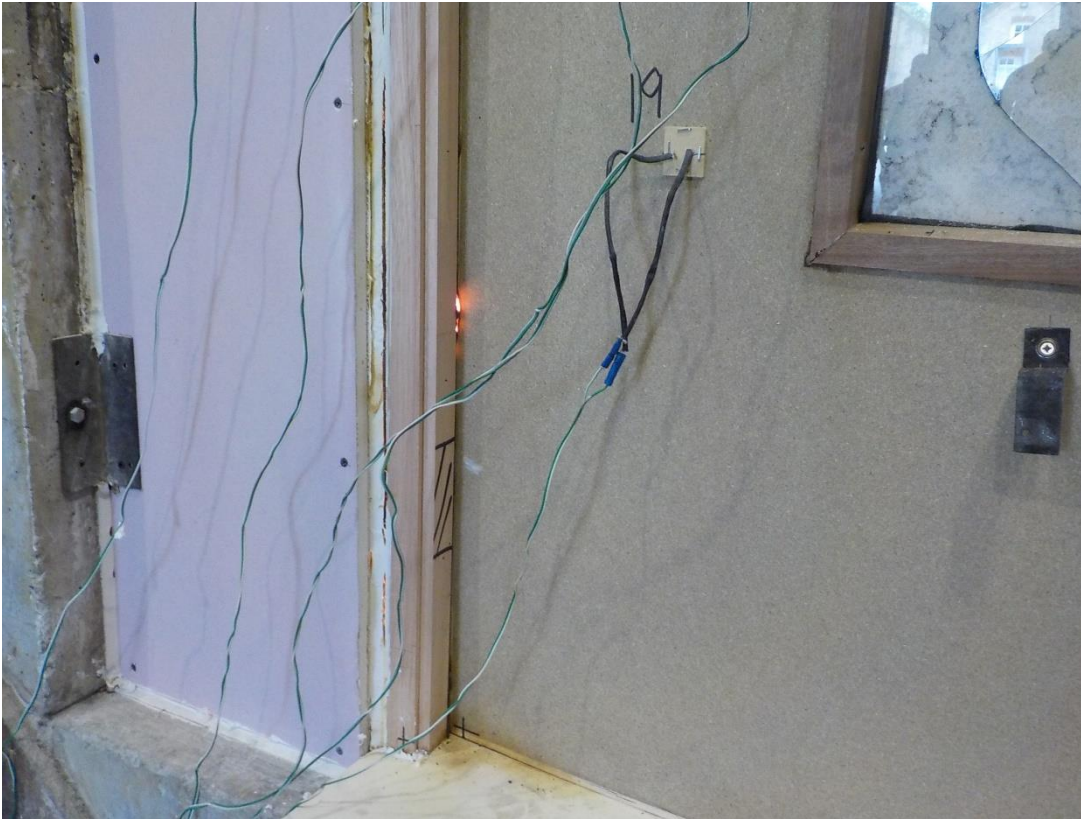
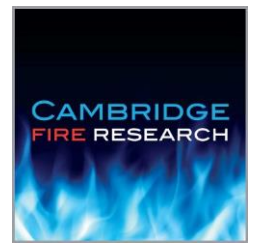


Photo 2.2.8

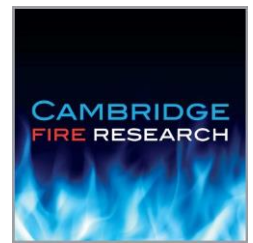




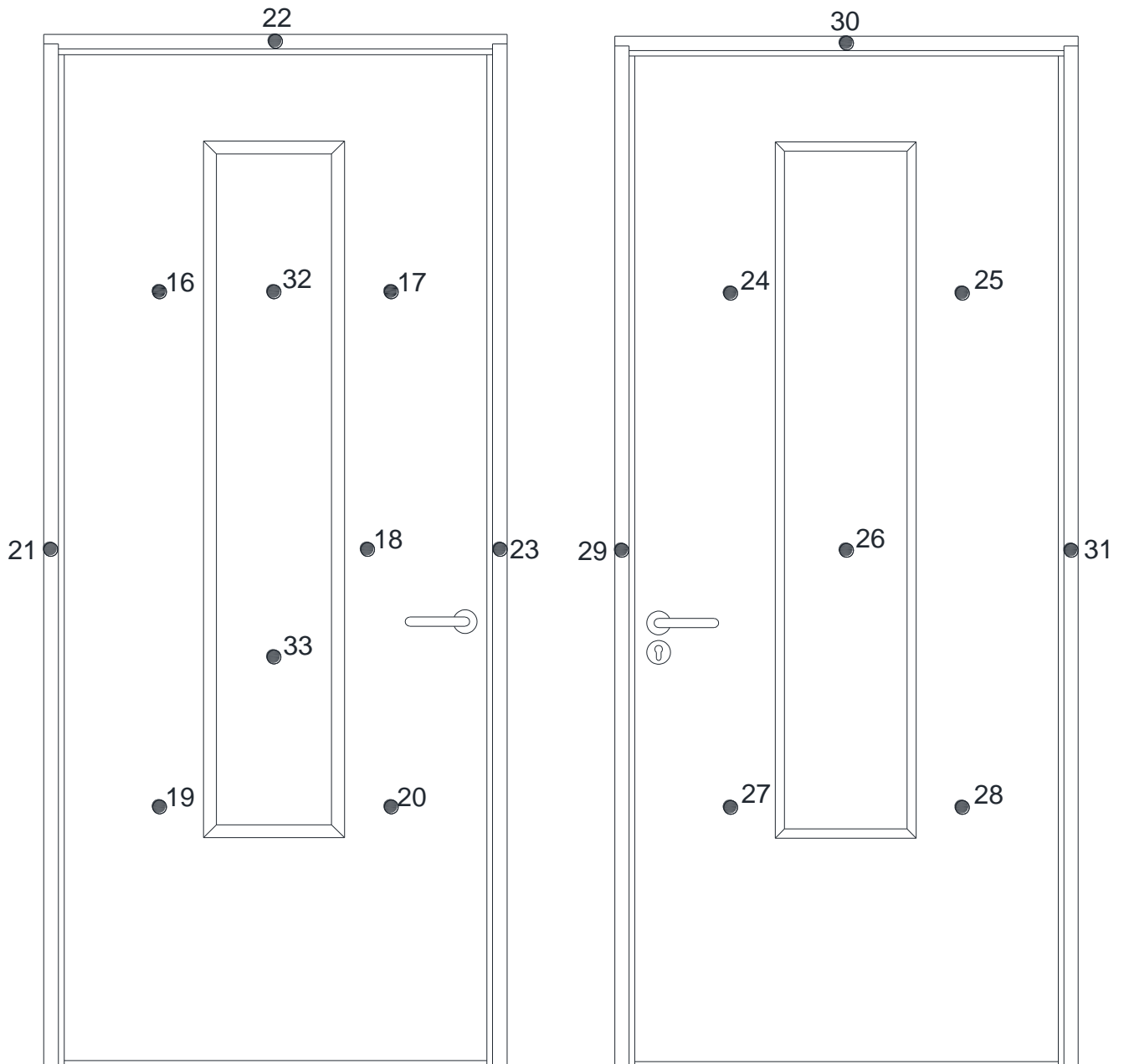
Appendix 2.3 Post-test photos

Photo 2.3.1

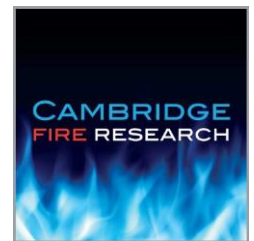




APPENDIX 3 POSITIONING OF INSTRUMENTATION

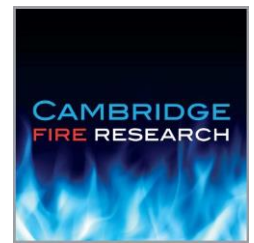


● Unexposed face specimen thermocouple

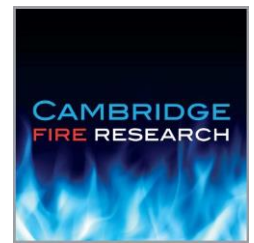


APPENDIX 4 RECORDED THERMOCOUPLE DATA

Time	T/C 16	T/C 17	T/C 18	T/C 19	T/C 20	T/C 21	T/C 22	T/C 23	T/C 32	T/C 33
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	19	19	19	19	18	18	19	19	19	18
1	19	19	19	19	18	18	18	18	19	19
2	19	19	19	19	18	18	18	18	25	25
3	19	19	19	19	18	18	18	18	33	32
4	19	19	19	19	18	18	18	18	43	43
5	19	19	19	19	18	18	19	18	59	60
6	19	19	19	19	19	18	19	19	74	77
7	19	19	19	19	18	18	20	18	81	86
8	19	19	19	19	18	18	20	19	86	94
9	19	19	19	19	18	18	21	18	90	99
10	19	20	19	19	19	18	21	19	96	103
11	19	20	20	19	19	19	22	19	102	107
12	20	21	20	20	19	19	23	19	108	109
13	21	22	21	21	20	20	23	19	112	109
14	24	24	23	23	22	21	24	20	114	109
15	26	26	24	25	24	22	24	19	113	109
16	29	30	27	28	27	23	25	20	112	109
17	32	32	30	30	30	24	25	19	111	108
18	35	36	33	34	33	26	26	20	111	109
19	37	39	36	35	35	27	25	20	112	110
20	39	41	38	38	38	28	25	20	113	111
21	42	44	41	40	40	29	26	21	116	114
22	44	46	44	42	42	30	27	21	118	118
23	46	48	45	44	44	31	27	21	122	121
24	48	50	48	46	46	31	28	21	126	123
25	49	51	49	47	47	32	29	21	125	121
26	50	53	51	48	49	33	30	21	121	120
27	52	54	53	49	50	35	30	22	118	118
28	53	55	54	50	51	37	31	22	116	116
29	54	56	56	51	52	39	32	22	115	115
30	55	57	57	52	53	38	32	22	116	114
31	56	58	58	53	54	38	33	23	118	114
32	56	58	59	53	55	37	33	23	120	114
33	57	59	60	54	56	38	34	23	124	115
34	58	59	61	55	56	38	34	23	129	117
35	59	60	62	56	57	37	34	24	135	119
36	59	60	62	56	57	38	34	24	140	122
37	59	61	63	57	58	39	35	24	144	127
38	60	62	64	57	59	38	35	25	146	132
39	60	62	64	57	59	38	36	25	147	138
40	61	62	65	58	60	37	36	26	149	144
41	61	63	65	58	60	37	37	26	153	150
42	62	63	66	59	61	37	38	27	160	156
43	62	64	66	59	62	37	38	27	167	163
44	63	64	66	60	62	37	39	27	175	169
45	64	65	67	61	63	36	41	28	182	174
46	65	66	68	62	64	38	43	29	191	179
47	65	67	69	63	64	38	43	30	200	187
48	66	67	69	63	65	38	43	31	210	195
49	66	67	69	64	65	36	44	31	219	204



Time	T/C 16	T/C 17	T/C 18	T/C 19	T/C 20	T/C 21	T/C 22	T/C 23	T/C 32	T/C 33
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
50	66	68	70	64	66	34	46	32	230	213
51	67	69	70	65	67	34	47	33	241	223
52	67	69	71	65	68	35	48	34	251	233
53	68	70	72	66	68	39	49	35	261	244
54	69	70	72	67	69	36	50	36	270	254
55	69	71	72	67	70	35	52	36	279	264
56	70	72	73	68	70	33	54	37	287	273
57	71	73	74	69	71	34	56	38	295	282
58	72	73	74	70	72	34	58	38	303	290
59	72	74	75	71	73	33	60	39	310	297
60	73	75	76	72	74	33	61	40	316	304
61	74	76	76	72	74	33	63	40	321	310
62	75	76	77	73	75	32	64	41	326	316
63	75	77	77	74	75	32	66	41	331	321
64	76	77	77	74	76	32	66	42	336	326
65	76	78	78	75	77	32	67	43	341	330
66	77	78	79	76	78	32	69	43	347	335
67	78	79	79	76	79	31	70	43	352	339



Time	T/C 24	T/C 25	T/C 26	T/C 27	T/C 28	T/C 29	T/C 30	T/C 31
min	°C	°C	°C	°C	°C	°C	°C	°C
0	19	19	19	19	19	19	18	19
1	19	19	20	18	18	19	18	18
2	19	19	26	19	19	19	18	18
3	19	19	35	19	19	19	18	18
4	19	19	49	19	18	19	18	18
5	19	19	68	19	19	19	19	18
6	19	19	80	19	19	19	20	19
7	19	19	87	19	19	19	20	18
8	19	20	92	19	19	19	22	19
9	22	20	97	19	19	19	23	18
10	28	23	104	21	20	19	24	19
11	36	27	110	24	22	20	25	19
12	42	31	110	27	25	20	26	19
13	48	36	109	31	29	20	27	19
14	52	42	109	35	33	20	28	19
15	55	45	108	38	37	20	28	19
16	58	50	109	42	41	21	29	19
17	60	52	109	45	44	21	29	20
18	62	55	111	48	47	22	30	20
19	63	57	114	49	49	22	30	20
20	63	59	117	51	51	23	30	21
21	64	61	122	53	53	23	30	21
22	65	62	125	54	54	24	30	21
23	65	63	117	55	55	24	31	21
24	66	63	116	57	57	24	31	22
25	67	64	115	58	58	24	31	22
26	67	65	114	59	59	25	32	22
27	68	66	114	60	60	25	32	23
28	68	66	114	61	61	25	33	23
29	69	67	115	62	62	26	33	24
30	69	68	118	63	63	26	33	24
31	70	68	122	64	64	27	34	25
32	70	69	127	65	64	27	34	25
33	71	70	134	66	66	28	35	26
34	71	70	140	67	66	28	35	26
35	72	71	148	67	67	29	36	27
36	72	71	156	68	68	29	37	28
37	73	72	165	69	68	29	38	29
38	74	73	176	70	70	30	39	30
39	74	73	185	70	70	30	40	31
40	75	74	193	71	71	31	41	32
41	75	74	201	72	72	31	43	33

x Thermocouple malfunction

