TEST REPORT NUMBER CFR2312151

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

Sponsor:	Wood International Agency Limited
Address:	Wood House 16 King Edward Road Brentwood Essex CM14 4HL
Date of test:	15th December 2023

Results:	Left-hand specimen:	Right-hand specimen:
Test duration:	42 minutes[1]	37 minutes[1]
Integrity:	40 minutes	37 minutes
Insulation:	40 minutes	

[1] discontinued at the request of the sponsor
[2] no failure, the test having been discontinued

Summary of test specimen (mm):
Two unlatched single acting single leaf timber doorsets, each with apertures for glazing. The left-hand doorset tested as partially insulated and the right-hand doorset tested as uninsulated, each opening towards the heating conditions of the test.

Overall size (h x w x d):

Left-hand specimen:
Frame: 2222 x 1000 x 70
Leaf: 2185 x 933 x 44
Upper glazing pane: 1494** x 244** x 7**
Lower glazing pane: 294** x 244** x 7**

Right-hand specimen:
Frame: 2444 x 1111 x 70
Leaf: 2405 x 1045 x 44
Glazing pane: 2199** x 839** x 7**

This report is only valid when presented in full.

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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 11/12/2023.
The specimens were on site for a total period of 4 days and during this time the temperature and relative humidity were measured and recorded within the range of 8°C to 15°C and 62% to 91% 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 2230 mm high x 1017 mm wide.
The aperture for the right-hand specimen was 2454 mm high x 1128 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

The sponsor 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 unlatched prior to the start of the test.

1.6 Specimen selection

Cambridge Fire Research was not involved in any selection or sampling procedures.
The sponsor provided the independent reports shown in Appendix 5.
Appendix 2, photos 2.1.25 and 2.1.26 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 tables.

Left-hand specimen

Direction	Closing force (N)	Closing moment (Nm)	Opening force (N)	Opening moment (Nm)
Opening towards heating conditions	29.0	21.8	41.1	30.8

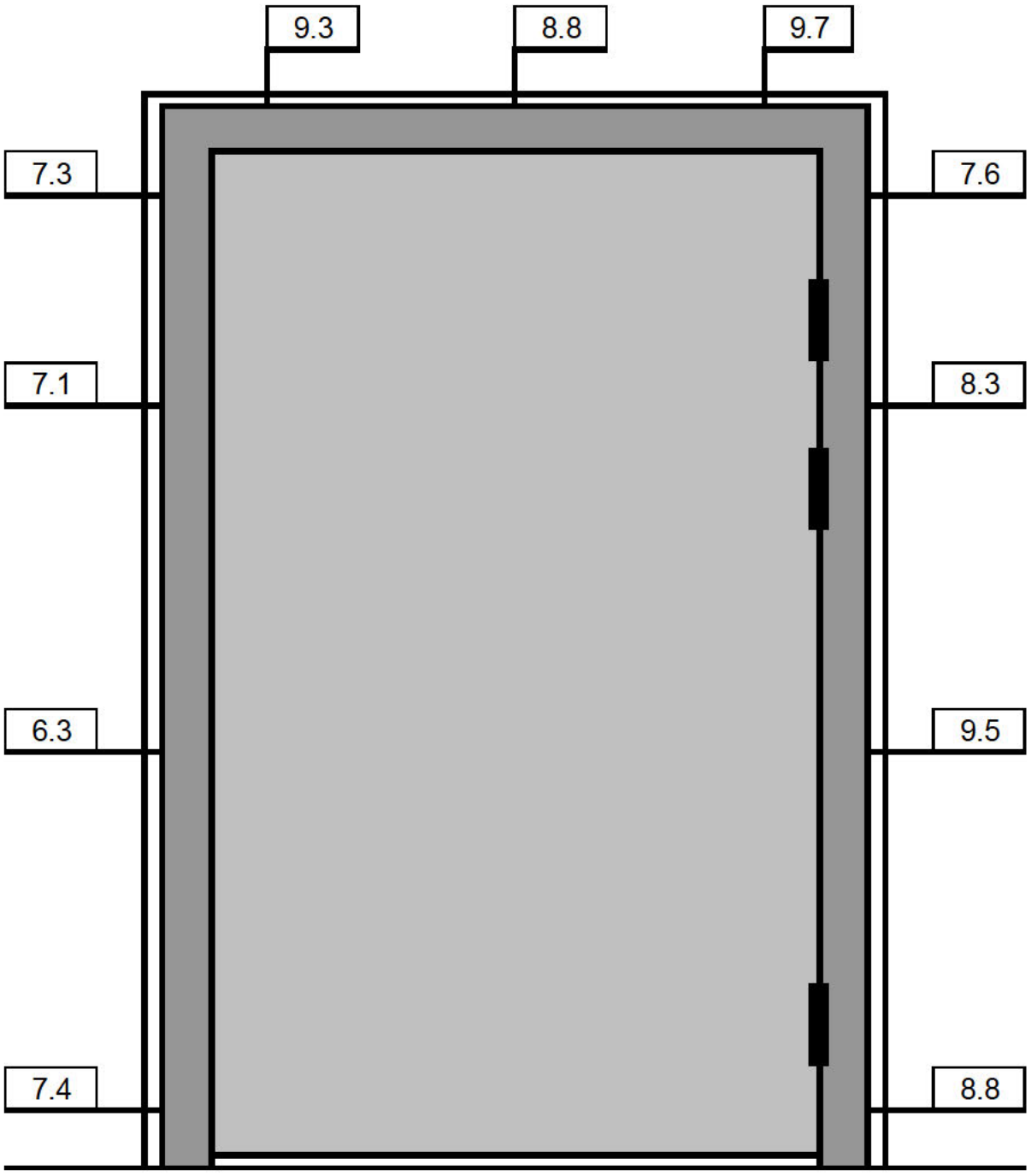
Right-hand specimen

Direction	Closing force (N)	Closing moment (Nm)	Opening force (N)	Opening moment (Nm)
Opening towards heating conditions	22.4	16.8	36.3	27.2

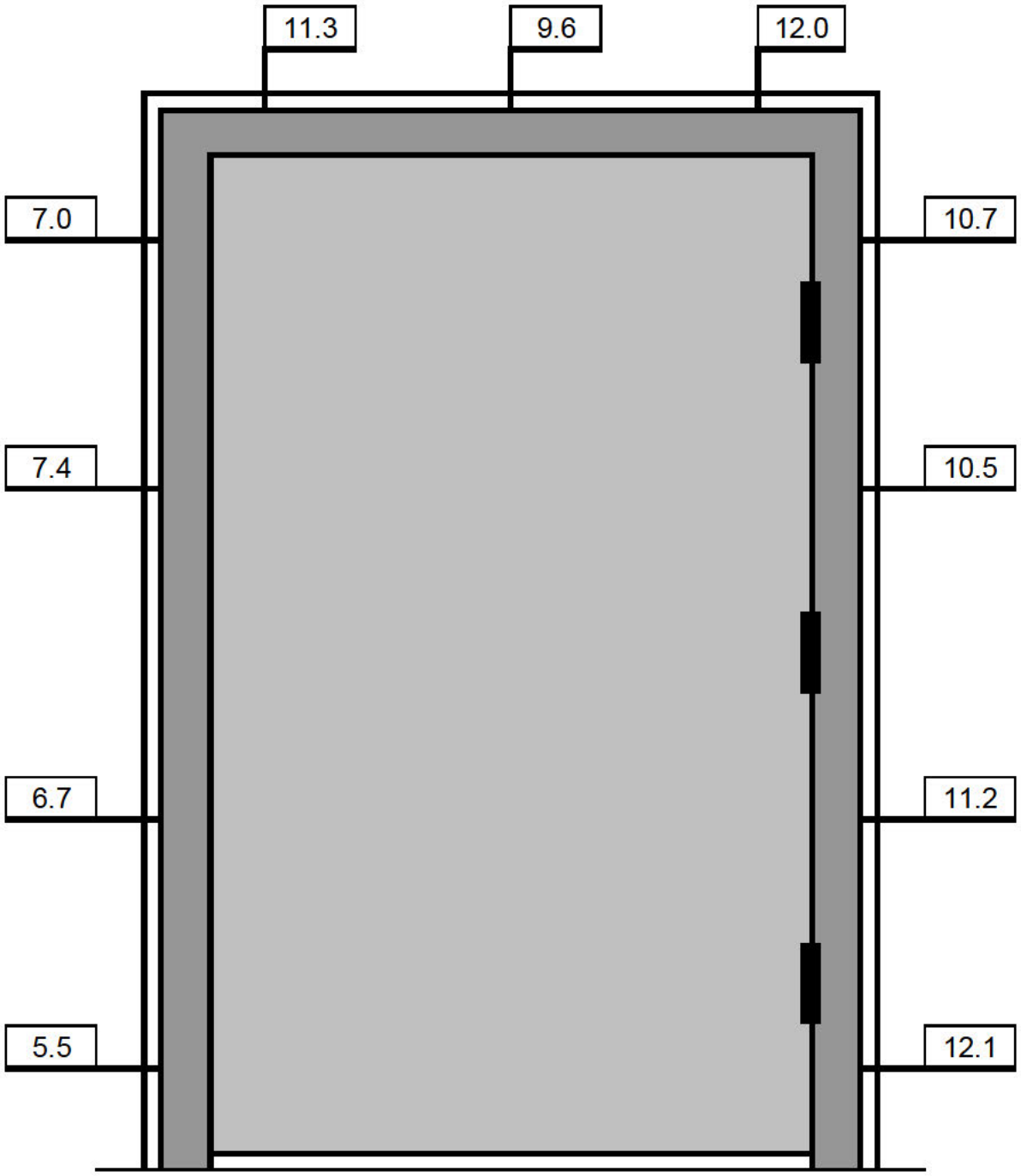
2.2 Gap measurements – Frame edge to associated construction aperture

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.



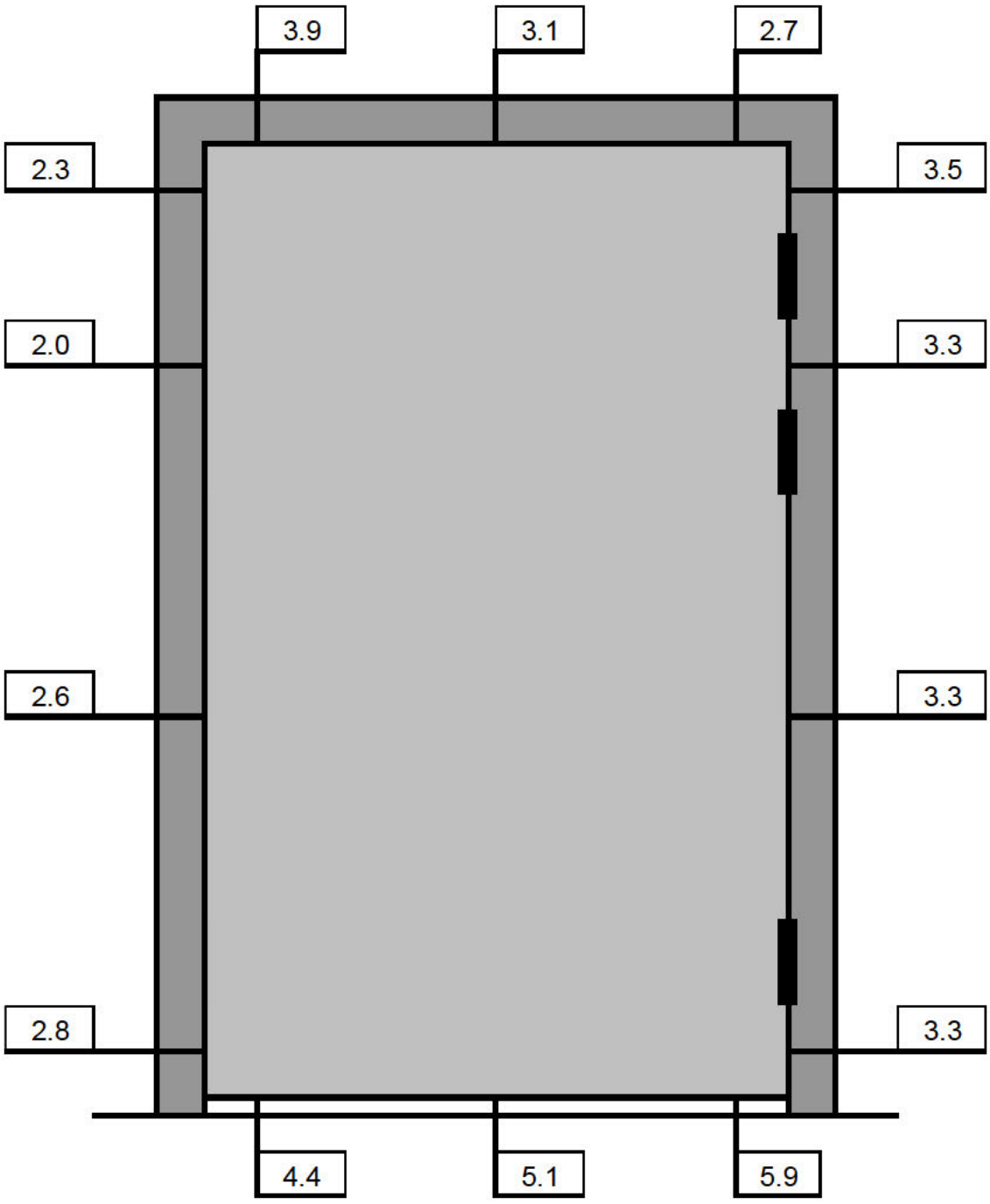
Right-hand specimen viewed as measured from the exposed face.



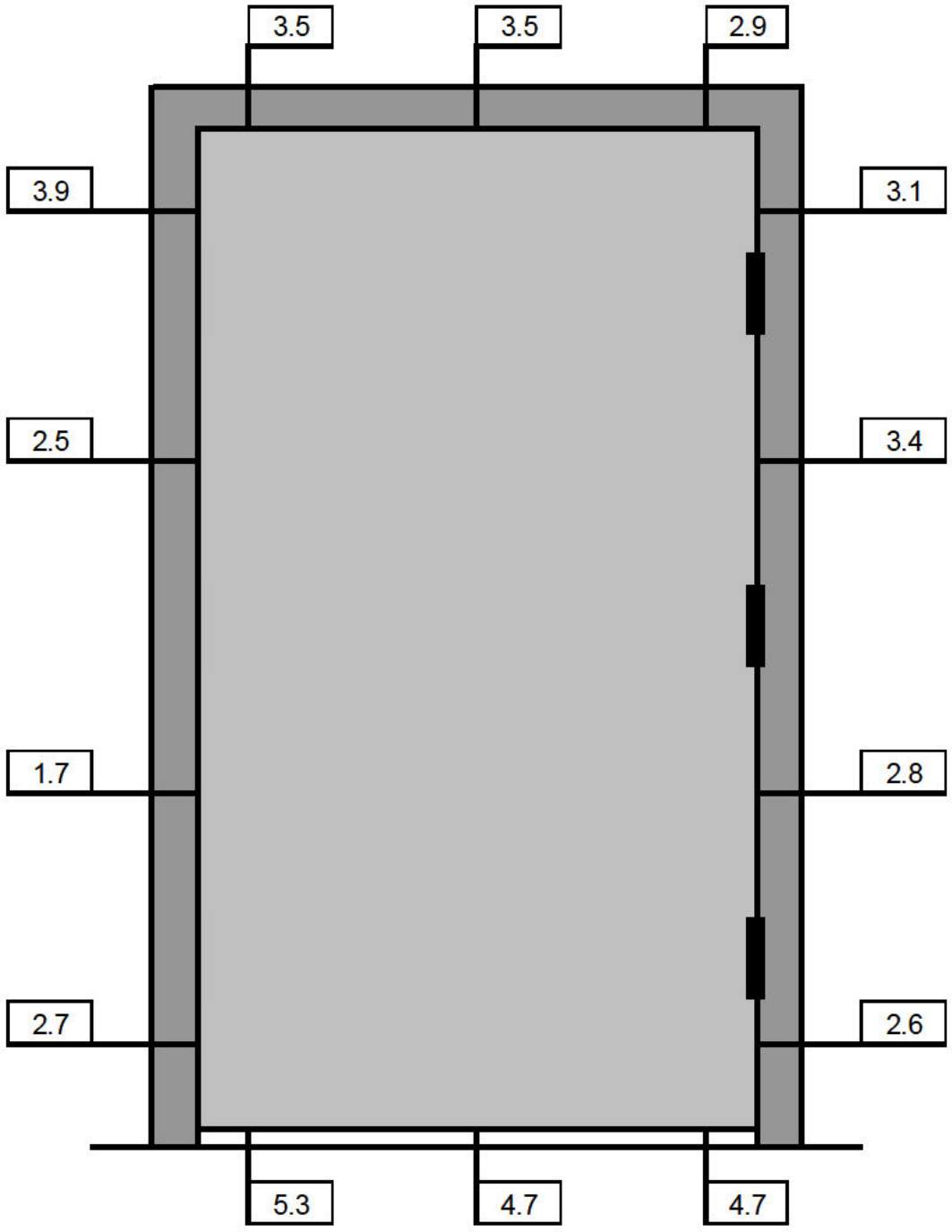
2.3 Gap measurements - Leaf edge to frame

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.



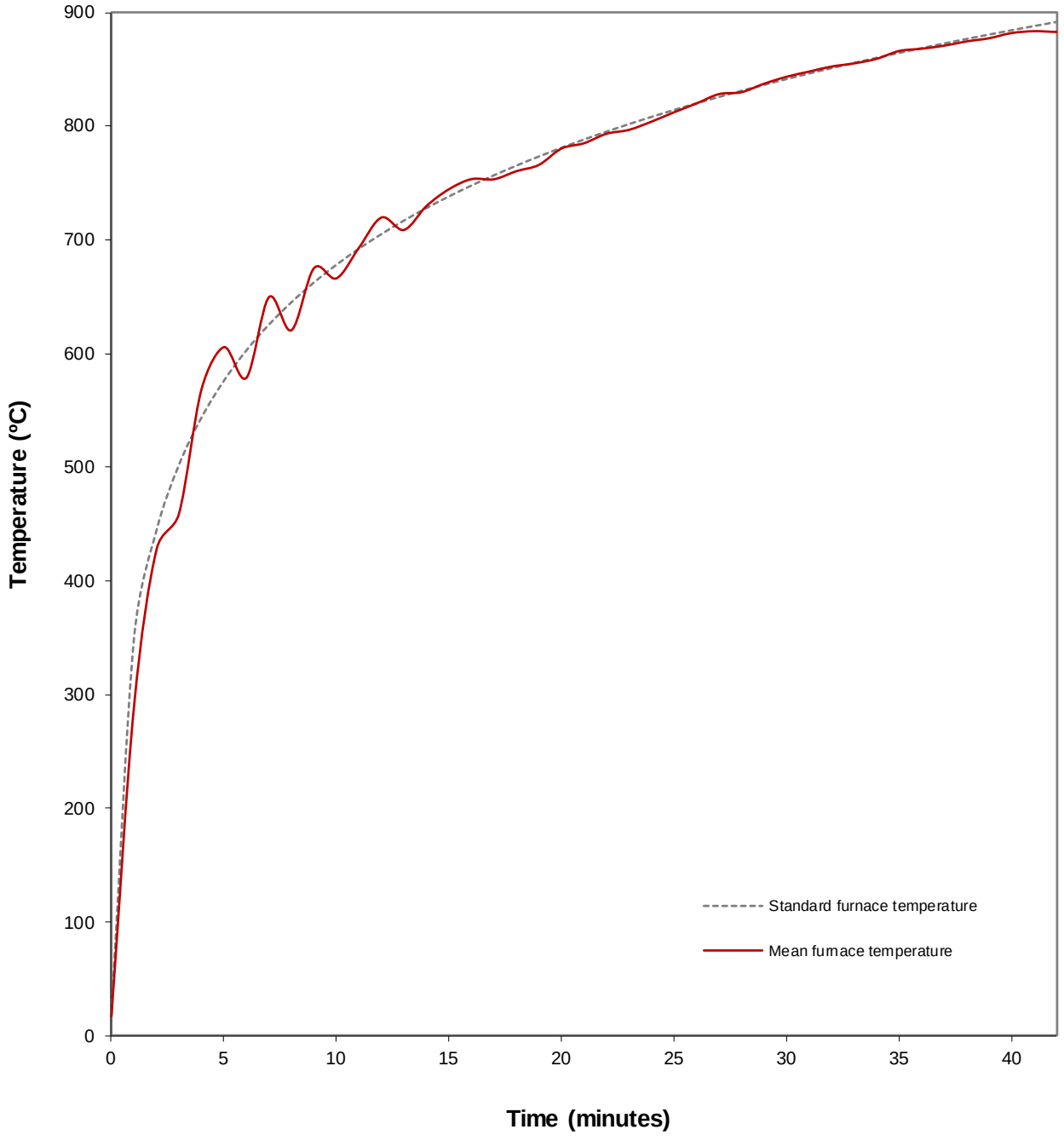
Right-hand specimen viewed as measured from the exposed face.



3 TEST CONDITIONS, INSTRUMENTATION AND MEASURING

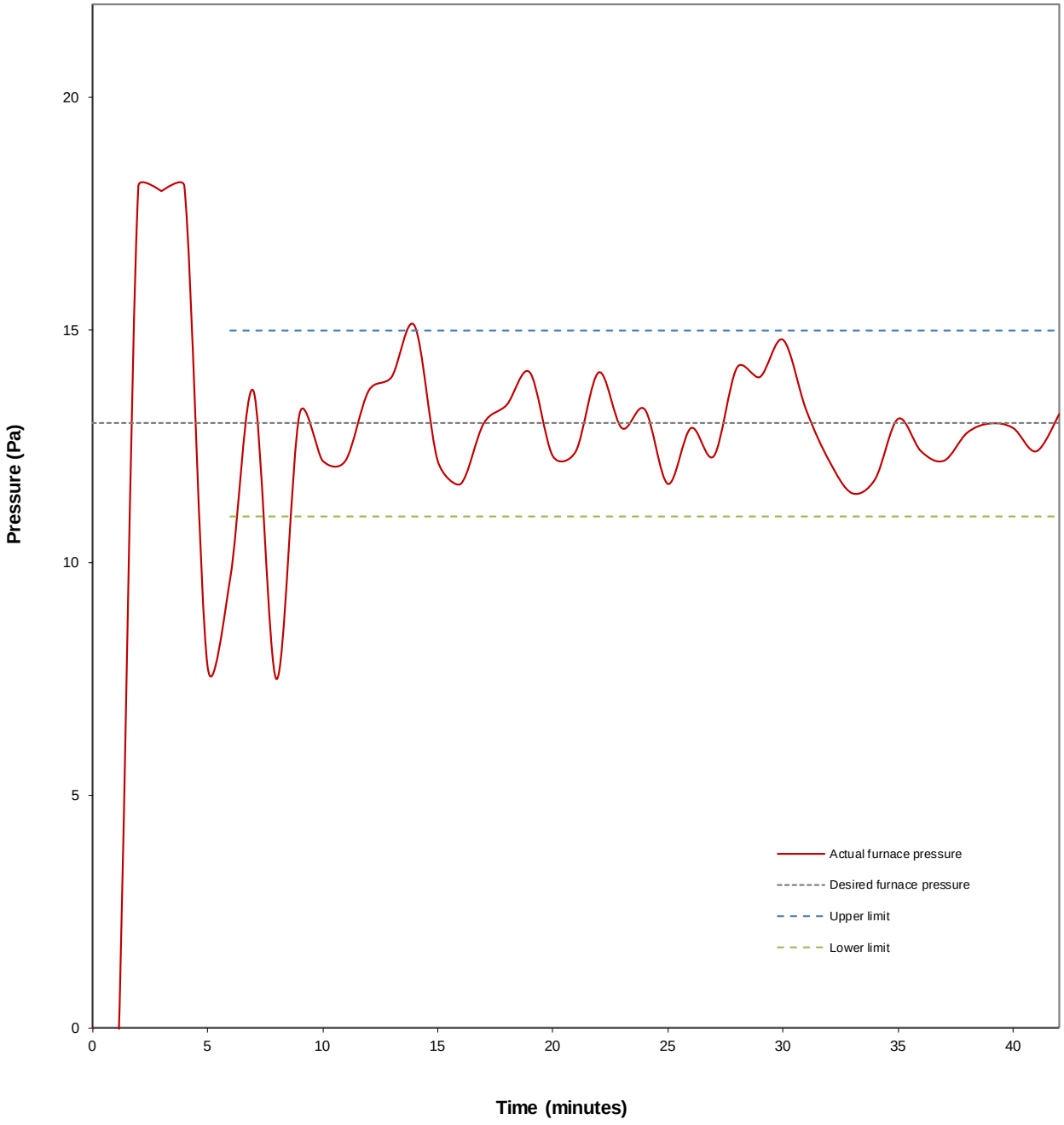
3.1 Furnace temperature

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 + 13.0 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 4 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 13°C.
Ambient temperature ranged between 11°C and 13°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 and maximum)
Frame	Channels 21 to 23	(Maximum only)
Glazing	Channels 24 to 26	(For information only)

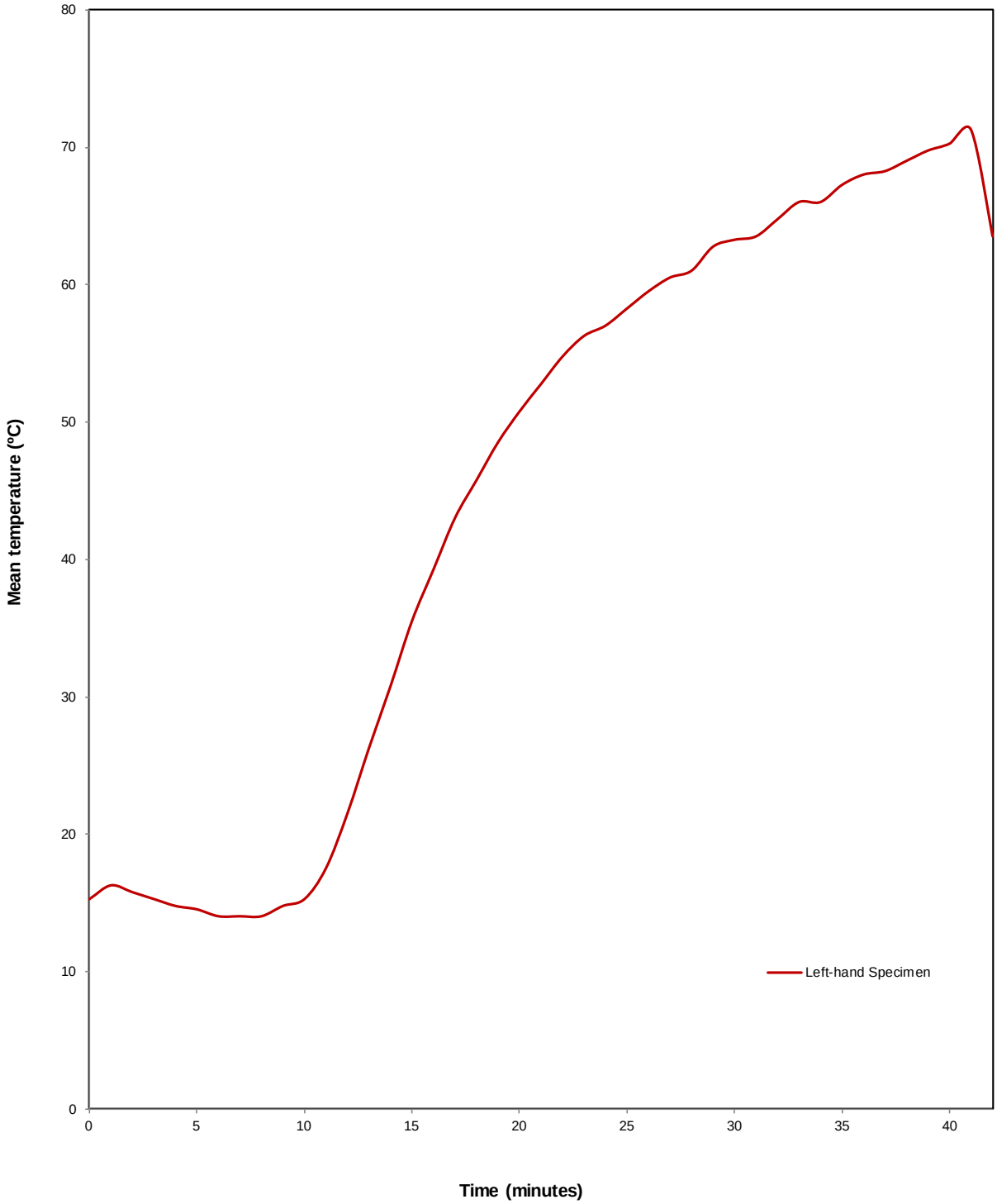
Right-hand specimen

Leaf	Channels 27 to 31	(Mean and maximum)
Frame	Channels 32 to 34	(Maximum only)

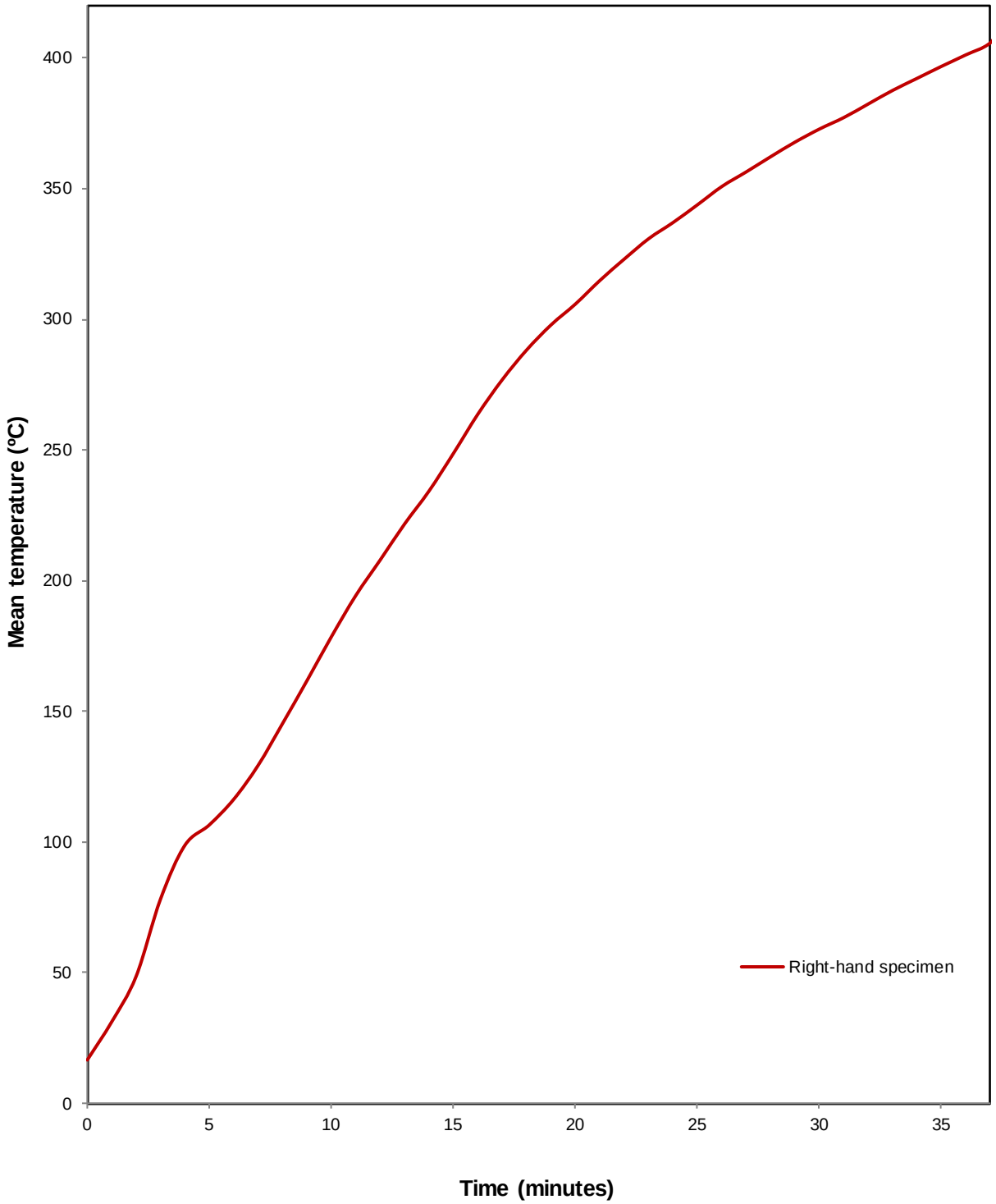
The positions of these thermocouples are shown in Appendix 3.
A roving thermocouple was available for measurement of any specific hotspots.
Any instances of the use of the roving thermocouple are noted in the observations in Section 4.
The recorded data of all individual fixed thermocouples is shown in Appendix 4.

The following time/temperature graphs show the mean temperatures.

Left-hand specimen



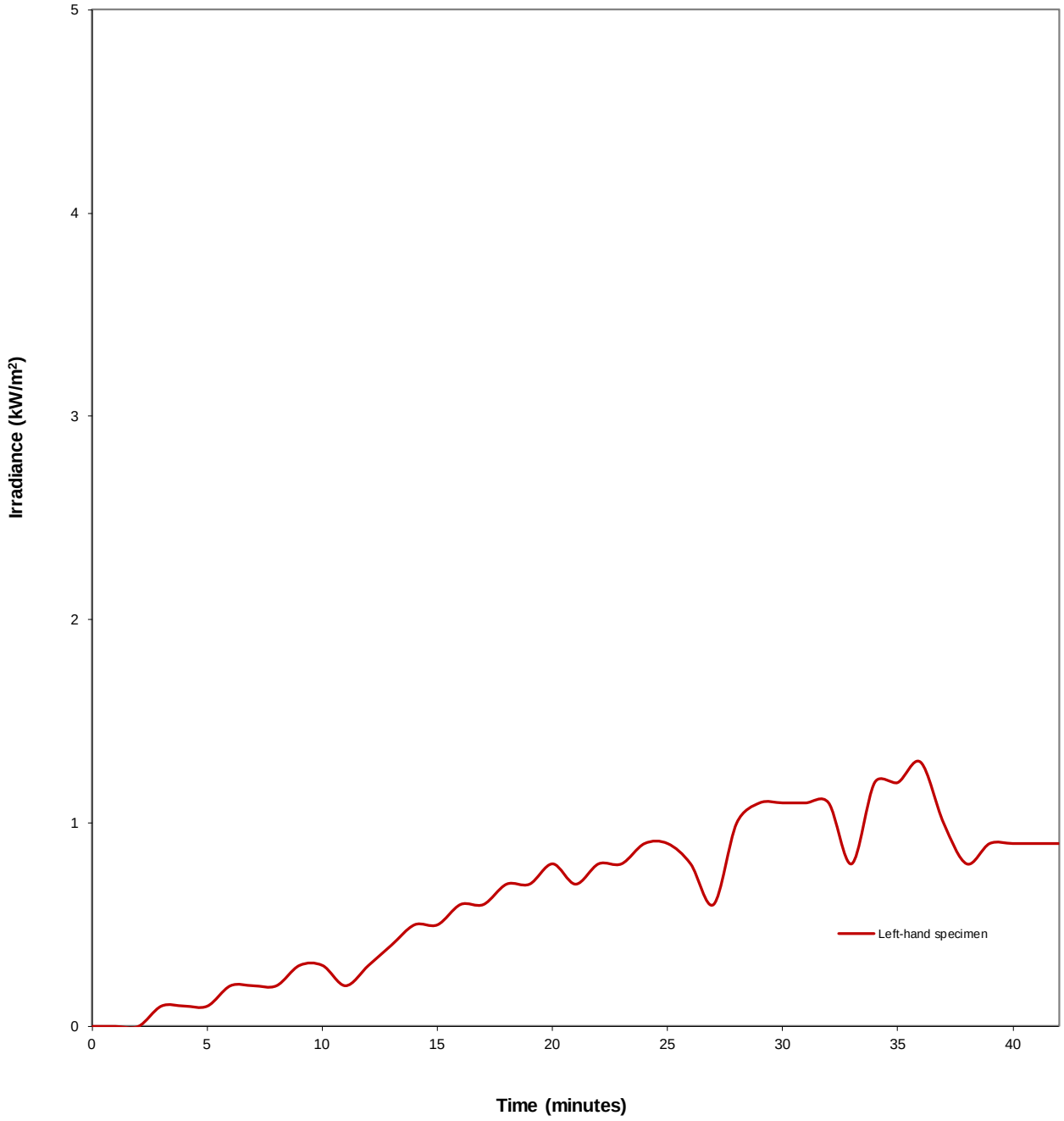
Right-hand specimen



3.5 Irradiance

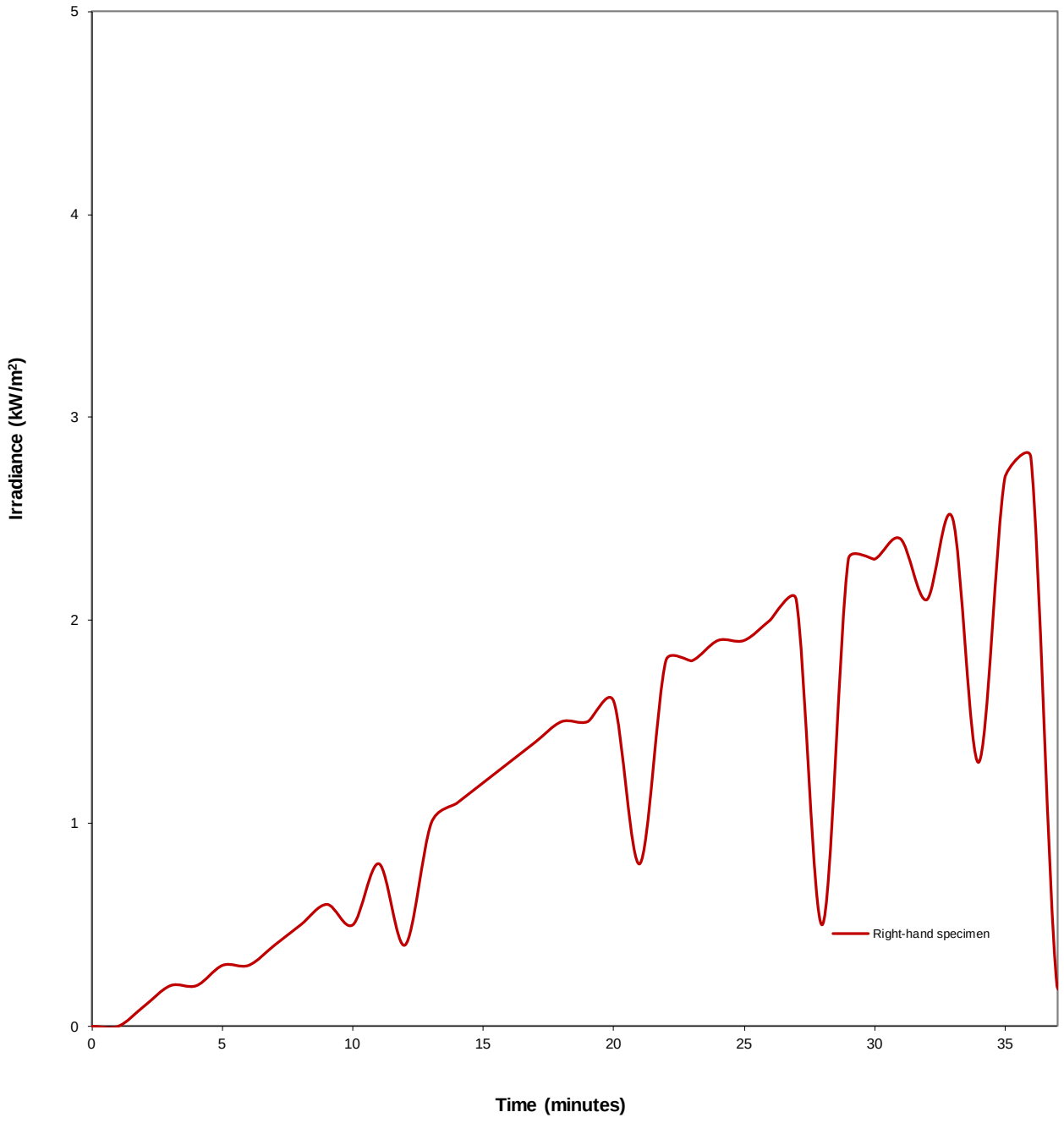
Irradiance from the unexposed face of each specimen was monitored during the test.
A 180° field of view water cooled heat flux meter was positioned with its target 1 m from and parallel to the unexposed face of the specimen at the geometric centre.
The following graphs shows the recorded irradiance/time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

Left-hand specimen



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

Right-hand specimen

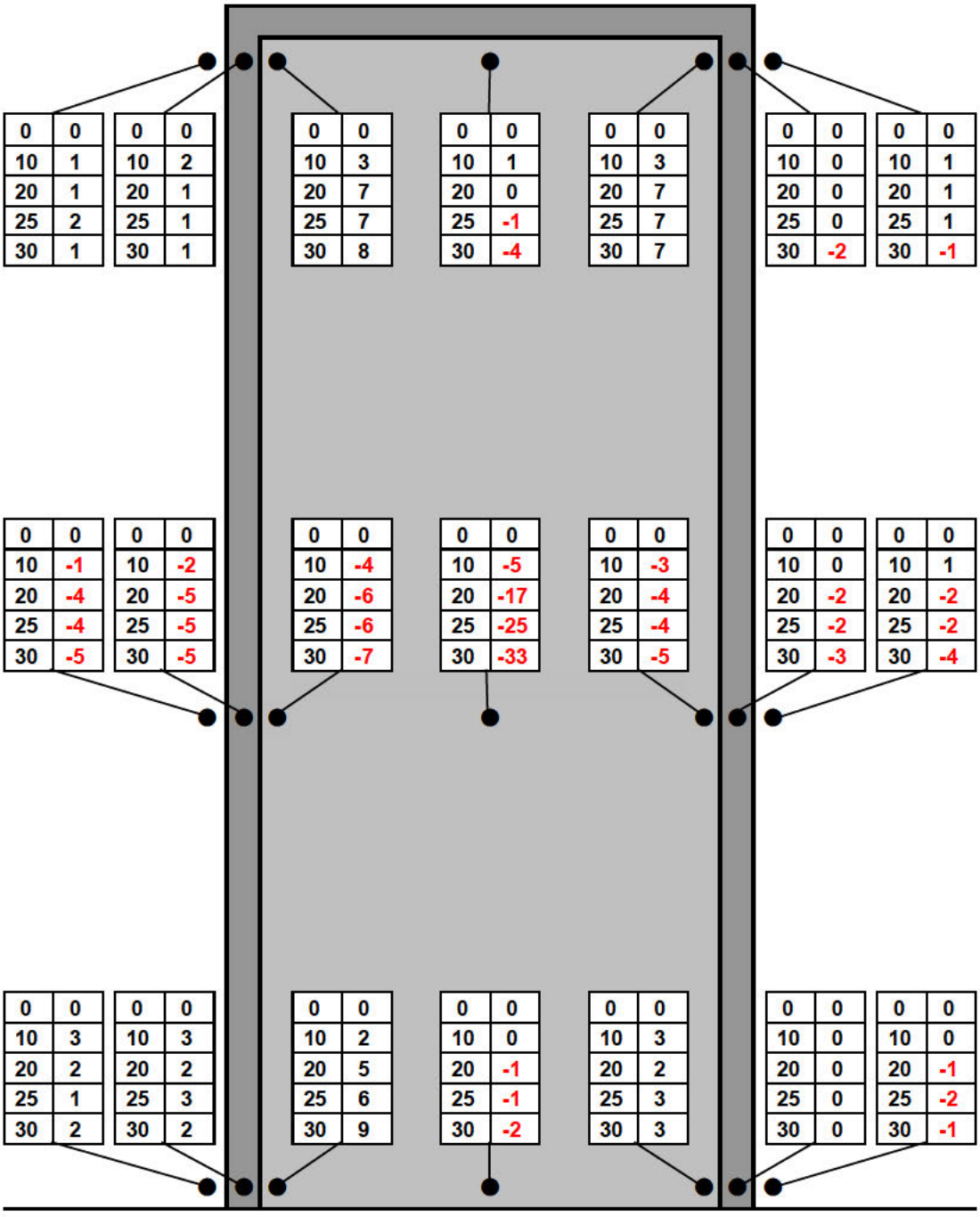


It should be noted that the recorded value of radiation drops when the field of view is physically interrupted during the measurement of deflection.

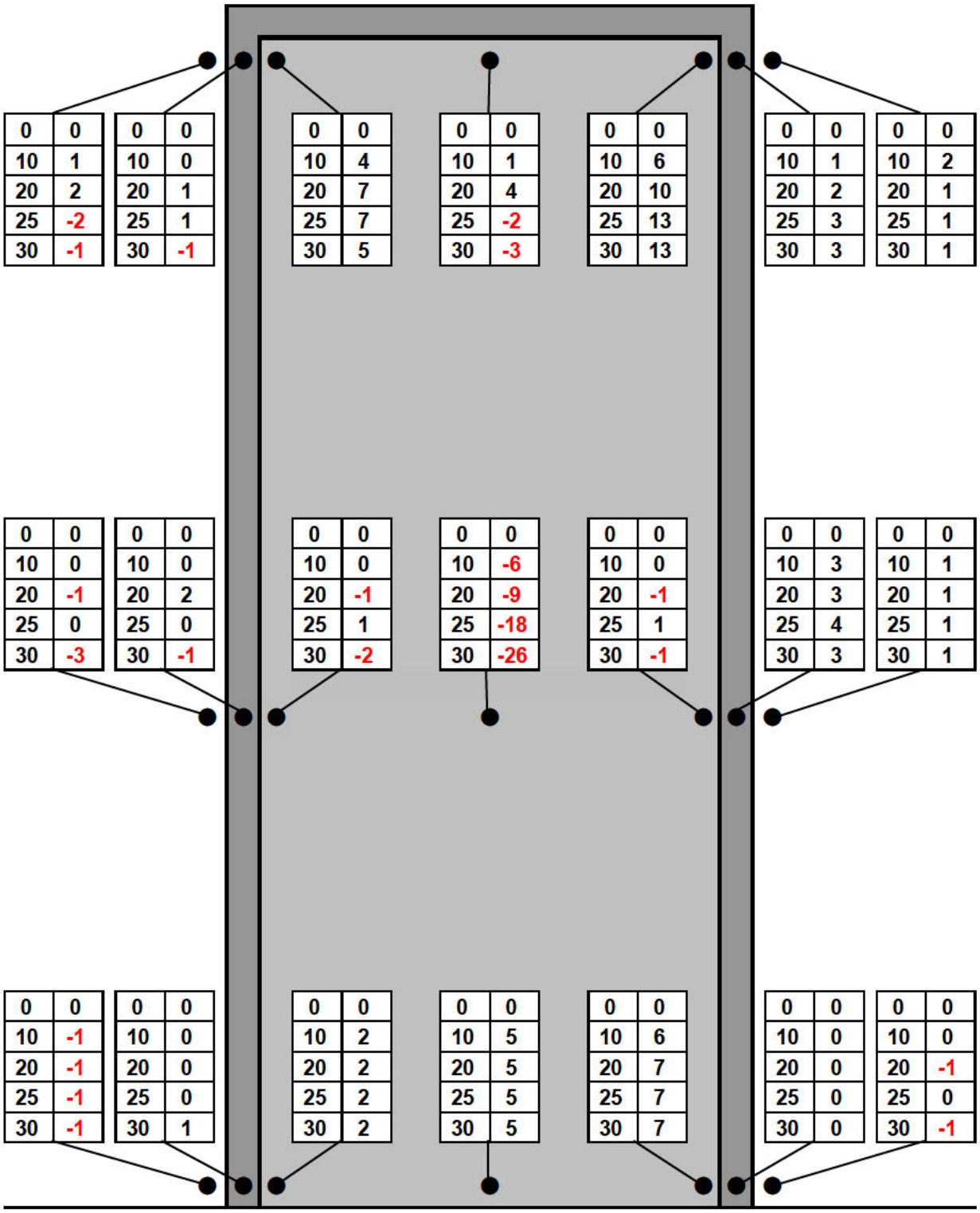
3.6 Deflection

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	Face	Observation
(min:sec)		
00:00		Start of the test.
02:01	U	Upper glazing pane cracked.
02:56	U	Lower glazing pane cracked.
03:07	U	Upper glazing pane interlayer activated.
03:44	U	Lower glazing pane interlayer activated.
05:36	U	Smoke/steam issues through cracks in the upper and lower glazing panes and at both stiles at mid height and above.
07:40	U	Section of unexposed glazing detached, nominally 900 above the base of the leaf and 200 from the closing stile.
11:00	E	All timber fissured.
14:36	U	Smoke/steam issues at top glazing bead of upper glazing pane.
16:00	U	Glazing seal on upper glazing pane activated.
17:52	E	Handleset missing.
19:39	U	Smoke/steam issues at the closing stile, adjacent to latch position.
23:40	U	Nominally 80% of glazing beads missing at the upper glazing pane and nominally 50% of glazing beads missing at the lower glazing pane.
24:13	U	Glazing seal activated at lower glazing pane.
31:25	U	Glowing is apparent at the top right-hand corner of the upper glazing pane.
33:30	U	Smoke/steam issues at the bottom hinge position.
35:03	U	Flash flaming occurs at the closing stile, adjacent to the latch position. Smoke/steam issues at the handleset rose.
40:32	U	Flaming commences at the top bead of the upper glazing pane..
40:42	U	**INTEGRITY FAILURE** due to sustained flaming. **INSULATION FAILURE** automatically occurs due to integrity failure.
42:07		The test is terminated.

Right-hand specimen

TEST OBSERVATIONS (E = Exposed face: U = Unexposed face)		
Time	Face	Observation
(min:sec)		
01:50	U	Glazing cracked.
02:59	U	Glazing interlayer activated.
06:50	U	Smoke/steam issues through cracks in the glazing pane, at the hanging stile/head corner and across the head of the leaf.
07:36	U	Smoke/steam issues at closing stile/head corner.
08:18	U	Smoke/steam issues at the hanging stile, full height.
13:28	U	Smoke/steam issues at the hanging stile/threshold corner.
16:13	E	All timber fissured.
17:24	U	Smoke/steam issues at the right-hand glazing bead, nominally 1800 above the base of the leaf and at the top glazing bead, nominally 300 from hanging stile.
23:11	U	Smoke/steam issues at the right hand glazing bead, nominally 900 above the base of the leaf.
28:45	U	Glowing is apparent through cracks in the glazing pane at various positions.
30:52	U	Smoke/steam issues at the latch position.
35:14	E	All glazing beads missing.
37:20		The specimen is boarded at the request of the sponsor. The test is terminated.

5 LIMITATIONS

1. The test results relate only to the specimen(s) 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 elements 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) as received from the sponsor.

5. 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.

6. Cambridge Fire Research is not responsible for the content of this report where information has been identified (using **) as supplied by the sponsor.

Report prepared by:

D Littlewood
Test Engineer

Report checked by:

Dianne Jackson
Test Engineer

Tom Smith
Senior Test Engineer

Report issued: **12th July 2024**

APPENDIX 1 SPECIMEN CONSTRUCTION

Appendix 1 Table 1 Left-hand specimen

Item	Component	Information
1L	**Frame**	
	Manufacturer:	By Dezign Carpentry**
	Description:	A 3-sided rebated European redwood** frame with 10h rebated joints, planted stops and chamfered edge to the exposed face. Corner joints affixed using 2No. Ø5 x 70 steel countersunk screws, set vertically at 35 centres and 1No. Ø5 x 70 countersunk steel screw, set horizontally 27 below the head of the frame and 36 from the exposed face, per jamb.
	Fixing to associated construction:	Ø5 x 100 steel countersunk screws, set 175 above the base of the frame and at 450 to 460 centres.
	Overall size (h x w x d):	2222 x 1000 x 70
	Cross section size (w x d):	30 x 70
	Density (kg/m^3):	510* ** Measured during sampling 451** – 602**
2L	**Stops**	
	Manufacturer:	By Dezign Carpentry**
	Description:	European redwood** stops affixed to the frame using 16swg‡ x 38‡ pneumatically fired steel pins, set 12 to 40 from the head corners and at 75 to 540 centres.
	Density (kg/m^3):	510* **
	Section size (w x d):	12 x 20
3L	**Leaf**	
	Manufacturer:	By Dezign Carpentry**
	Reference:	MMN44 – ITT – 664 - Aos**
	Description:	A particleboard core with Edgeman engineered hardwood** lippings to all edges and 2No. apertures for glazing.
	Overall size (h x w x t):	2185 x 933 x 44
	Weight (kg):	51.0 including ironmongery
	Sub-components:	
	Core:	
	Manufacturer:	Wood International Agency Ltd**
	Reference:	Marksman**
	Description:	A particleboard core.
	Density (kg/m^3):	535* ** Measured during sampling 528** - 543**
	Overall size (t):	44
	Lippings:	
	Manufacturer:	Wood International Agency Ltd**
	Reference:	Edgeman**
	Description:	Engineered hardwood** lippings adhered to all

Item	Component	Information
3L cont.	Density (kg/m^3):	edges of the core using Wurth D4 PU adhesive??**. 650* **
	Overall size (d x t):	Measured during sampling 665** - 675** 44 x 6, with 3 x 3 chamfered edges
	Glazing aperture:	
	Description:	2No. glazing apertures set 98 and 1681 below the head of the leaf and 98 from the closing stile.
	Overall size (h x w):	
	Upper pane:	1504‡ x 254‡
	Lower pane:	304‡ x 254‡
4L	**Glazing**	
	Manufacturer:	Pyroguard
	Reference:	Advance 2-EW30/7-1
	Pane size (h x w x t):	
	Upper pane:	1494** x 244** x 7**
	Lower pane:	294** x 244** x 7**
	Sight size (h x w):	
	Upper pane:	1470 x 220
	Lower pane:	270 x 220
5L	**Glazing beads**	
	Manufacturer:	By Dezign Carpentry**
	Reference:	CB1**
	Description:	Sapele** glazing beads, affixed to the leaf using 16swg‡ x 38‡ pneumatically fired steel pins, set at 47 to 50 from the internal corners and at 120 to 195 centres.
	Density (kg/m^3):	640* ** Measured during sampling 766**
	Overall size (h x w):	
	Upper pane:	1508 x 258
	Lower pane:	308 x 258
	Section size (w x d):	19 x 19
	Splay angle (°):	15
6L	**Hinges**	
	Manufacturer:	Arrone
	Reference:	AR8180**
	Description:	3No. stainless steel butt hinges with bearings set 151, 351 and 1901 from the top of the leaf to the top of the blade.
	Blade size (h x w x t):	102 x 30 x 3
	Knuckle size (Ø):	14
	Fixings to frame:	4No. Ø5 x 30 steel countersunk screws.
	Fixings to leaf:	4No. Ø5 x 30 stainless steel countersunk screws.

Item	Component	Information
7L	**Closer**	
	Manufacturer:	Arrone
	Reference:	AR7383-SE
	Description:	A cast alloy concealed door closer with an aluminium track, set 6 below the head of the leaf and 75 from the hanging stile.
	Body size (h x w x d):	50‡ x 340‡ x 33‡
	Track (h x w x d):	15 x 440 x 23
	Fixings to leaf:	6No. Ø4** x 25** steel** wood** screws.
	Fixings to frame:	2No. Ø5 x 25 steel countersunk screws.
8L	**Latch/lock**	
	Manufacturer:	Arrone
	Reference:	AR810/ADJ-OEM-R-60-SSS**
	Description:	A mainly steel mortice latch with stainless steel forend, strike and polymeric dust boxes, set with the vertical centreline of the latch bolt 998 above the base of the leaf and affixed using 2No. Ø5 x 25 stainless steel countersunk screws. Strike affixed using 3No. Ø3.5 x 25 steel countersunk screws.
	Overall size:	
	Forend (h x d x t):	235 x 24 x 3
	Latch body (h x w x d):	165 x 86 x 16
	Strike (h x d x t):	170 x 24 x 1.4 including a 126h x 15d tongue
9L	**Handleset**	
	Manufacturer:	Arrone**
	Reference:	AR200S/10-SP-SAA**
	Description:	A mainly aluminium lever on rose handleset comprising polymeric rose, stainless steel cover and aluminium handle, affixed using 2No. Ø3 x 15 stainless steel countersunk screws.
	Overall size:	
	Rose (Ø x d x t):	49 x 5 x 1
	Rose cover (Ø x w x t):	52 x 9 x 1
	Handle (Ø x w):	22 x 141
10L	**Euro cylinder**	
	Manufacturer:	Arrone
	Reference:	AR-KD-5130-BB-NP**
	Description:	A nickel plated** brass euro cylinder.
	Overall size:	35/35
11L	**Escutcheon**	
	Manufacturer:	Arrone**
	Reference:	AR200/27**
	Description:	A Stainless steel escutcheon with stainless steel cover, affixed to the leaf using 2No. Ø4 x 20 stainless steel countersunk screws.
	Overall size:	
	Body (Ø x d x t):	51 x 5 x 1.2
	Cover (Ø x d x t):	53 x 6 x 1

Item	Component	Information
12L	**Automatic door bottom** Manufacturer: Reference: Description: Overall size (h x w x d):	 Mann McGowan** 1703ACU** A mainly aluminium automatic door bottom with elastomeric sub components and polymeric end cap to the closing stile, set in a 30h x 16d rebate 14 from the exposed face, affixed to the leaf using 2No. Ø3.5 x 25 steel countersunk pan head screws. 28.5** x 926 x 12.5**
13L	**Intumescent – Frame** Manufacturer: Reference: Description: Overall size (w x d):	 Mann McGowan Pyrostrip 500P/PSS A graphite based intumescent strip in a PVC holder with self-adhesive on one side, set 15 from the exposed face, fully interrupted at the hinges, strike and closer track. 15 x 4
14L	**Intumescent – Glazing Seal** Manufacturer: Reference: Description: Overall size (w x d):	 Mann McGowan Pyroglaze 30 A graphite based intumescent strip in a PVC holder with self adhesive on one side, adhered at the interface of the glazing and beads. 10 x 3
15L	**Intumescent – Hinges** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrohinge** An ammonium phosphate based intumescent pad with self-adhesive on one side, set beneath all blades. 1
16L	**Intumescent – Latch/lock** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrolock** An ammonium phosphate based intumescent pad with self-adhesive on one side, encasing the latch body and beneath the latch forend. 1
17L	**Intumescent – Closer** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrostrip 400CGSA** A graphite based intumescent pad with self adhesive on one side, over the top of the closer and beneath the track. 2

Item	Component	Information
18L	**Intumescent – Strike** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrolock** An ammonium phosphate based intumescent pad with self-adhesive on one side, set beneath the strike and encasing both dust boxes. 1
19L	**Intumescent – Automatic door bottom** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrostrip Interdens** An ammonium phosphate based intumescent pad with self-adhesive on one side, encasing the automatic door bottom body. 1
20L	**Fire stopping detail** Description:	 Gaps between the frame and the supporting construction were filled with Unifrax Insulfrax LTX blanket and capped with Firewise Intumescent & Acoustic Acrylic Sealant.

Appendix 1 Table 2 Right-hand specimen

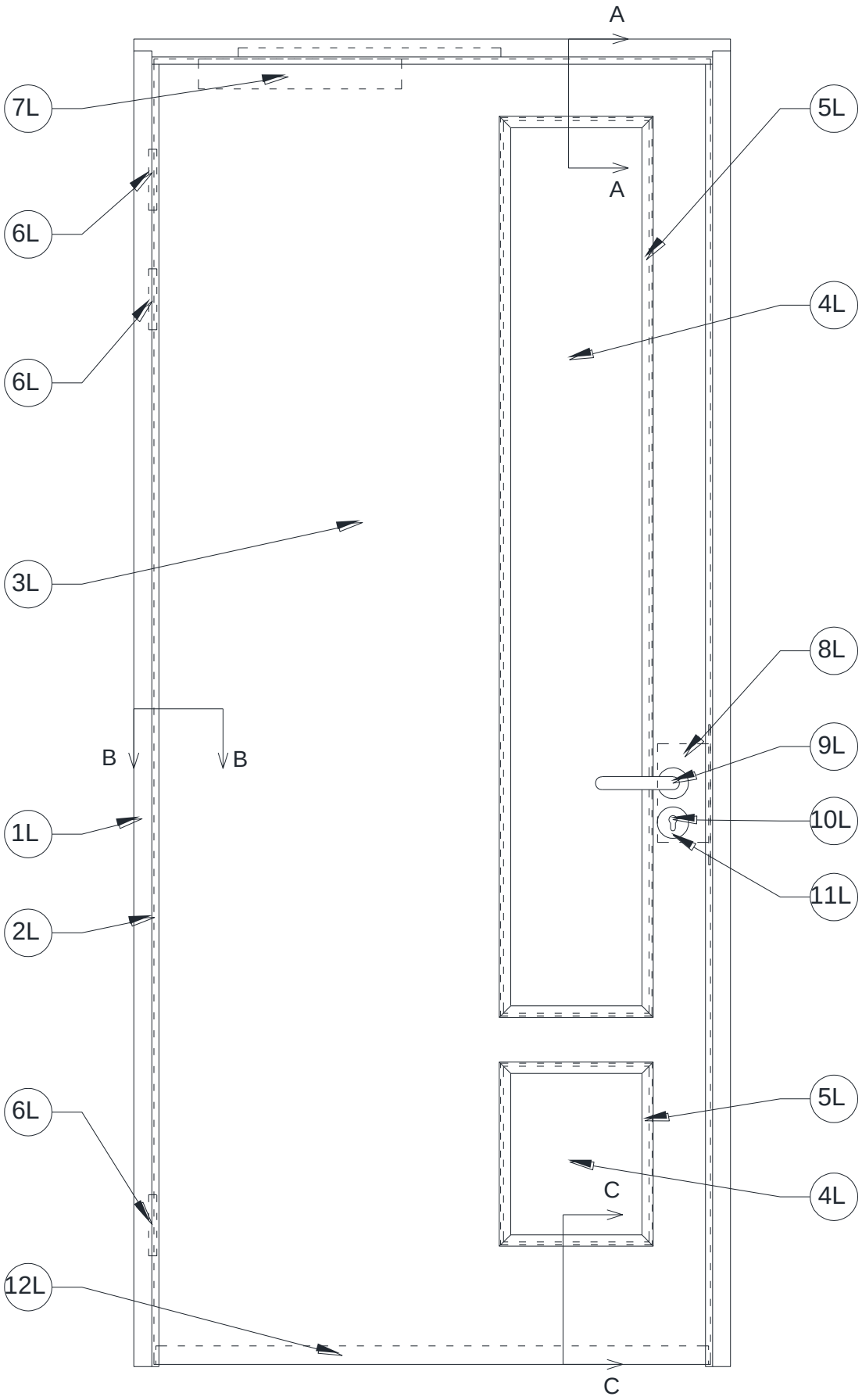
Item	Component	Information
1R	**Frame**	
	Manufacturer:	By Dezign Carpentry**
	Description:	A 3-sided European redwood??** frame with 10h rebated joints, planted stops and a chamfered edge to the exposed face. Corner joints affixed using 2No. Ø5 x 70 steel countersunk screws, set vertically at 38 centres and 1No. Ø5 x 70 steel countersunk screw, set horizontally 28 below the head of the frame and nominally central to the depth, per jamb.
	Fixing to associated construction:	Ø5 x 100 steel countersunk screws, set 140 to 220 above the base of the frame and at 355 to 640 centres.
	Overall size (h x w x d):	2444 x 1111 x 70
	Cross section size (w x d):	30 x 70
	Density (kg/m^3):	510* ** Measured during sampling 603** - 612**
2R	**Stops**	
	Manufacturer:	By Dezign carpentry**
	Description:	European redwood** stops affixed to the frame using 16swg‡ x 38‡ pneumatically fired steel pins, set 13 to 35 from the head corners and at 80 to 415 centres.
	Density (kg/m^3):	510* **
	Section size (w x d):	12 x 21
3R	**Leaf**	
	Manufacturer:	By Dezign carpentry**
	Reference:	MMN44 – ITT – 344 – A15**
	Description:	A particleboard core with sapele** lippings to all edges and an aperture for glazing.
	Overall size (h x w x t):	2405 x 1045 x 44
	Weight (kg):	51.3 including ironmongery.
	Sub-components:	
	Core:	
	Manufacturer:	Wood International Agency Ltd**
	Reference:	Marksman 44**
	Description:	A particleboard core.
	Density (kg/m^3):	535* ** Measured during sampling 515**
	Overall size (t):	44
	Lippings:	
	Manufacturer:	By Dezign carpentry**
	Description:	Sapele** lippings adhered to all edges of the core using Caberfix D4 PU adhesive**.
	Density (kg/m^3):	640* ** Measured during sampling 710**

Item	Component	Information
3R cont.	Overall size (d x t) Glazing aperture: Description: Overall size (h x w):	44 x 6, with 3 x 3 chamfered edges 1No. aperture for glazing set 98 below the head of the leaf and 97 from the closing stile. 2210‡ x 849‡
4R	**Glazing** Manufacturer: Reference: Pane size (h x w x t): Sight size (h x w):	 Pyroguard Advance 2-EW30/7-1 2199** x 839** x 7** 2175 x 815
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** CB1** Sapele** glazing beads, affixed to the leaf using 16swg‡ x 38‡ pneumatically fire steel pins, set at 45 from the internal corners and at 150 centres. 640* ** Measured during sampling 569** - 695** 2214 x 853 19 x 19 15
6R	**Hinges** Manufacturer: Reference: Description: Blade size (h x w x t): Knuckle size (Ø): Fixings to frame: Fixings to leaf:	 Arrone AR8180** 3No. stainless steel butt hinges with bearings set 150, 1137 and 2124 from the top of the leaf to the top of the blade. 101 x 30 x 3 14 4No. Ø4.5 x 30 stainless steel countersunk screws. 4No. Ø4.5 x 30 stainless steel countersunk screws.
7R	**Closer** Manufacturer: Reference: Description: Body size (h x w x d): Track (h x w x d): Fixings to leaf: Fixings to frame:	 Arrone AR7383-SE A cast alloy concealed door closer with an aluminium track, set 6 below the head of the leaf and 75 from the hanging stile. 50‡ x 340‡ x 33‡ 15 x 440 x 23 6No. Ø4** x 25** steel** wood** screws. 2No. Ø5 x 25 steel countersunk screws.
8R	**Latch/lock** Manufacturer: Reference: Description:	 Arrone AR812DL** A mainly steel mortice latch with stainless steel forend, strike and polymeric dust boxes, set with the vertical centreline of the latch bolt 920 above the base of the leaf and affixed using 2No. Ø5 x 25 stainless steel countersunk screws. Strike affixed

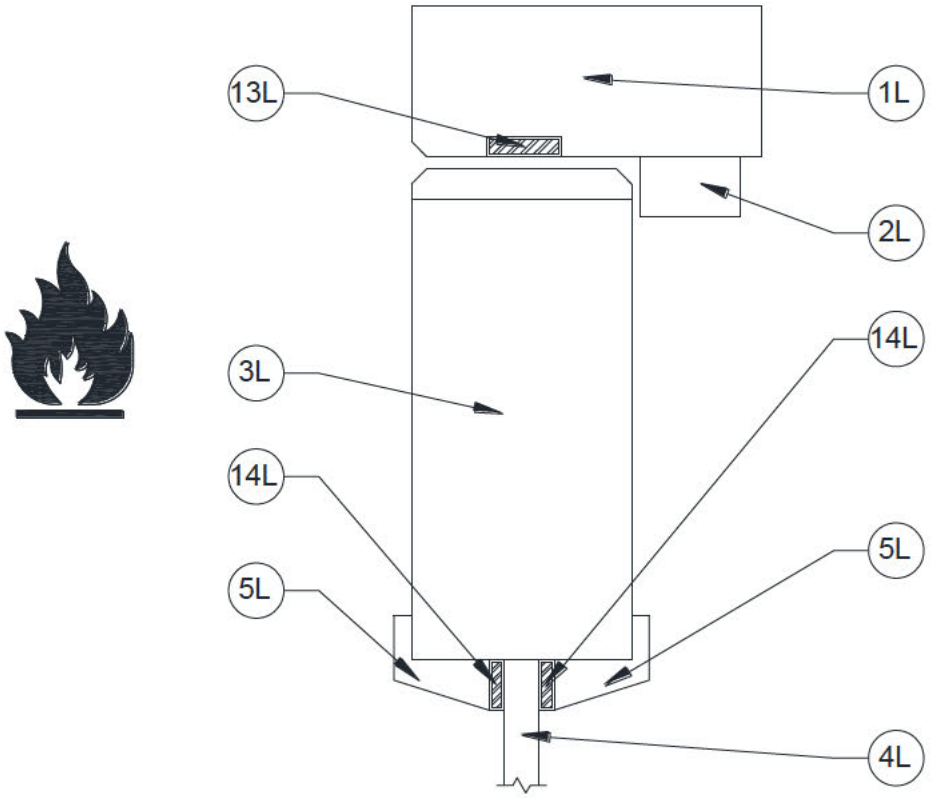
Item	Component	Information
		using 2No. Ø3.5 x 16 stainless steel countersunk screws.
	Overall size: Forend (h x d x t): Latch body (h x w x d): Strike (h x d x t):	 235 x 24 x 3 165 x 85 x 16 88 x 25** x 1.6
9R	**Euro cylinder** Manufacturer: Reference: Description: Overall size:	 Arrone AR-KD-5130-BB-NP** A mainly brass euro cylinder. 35/35
10R	**Escutcheon** Manufacturer: Reference: Description: Overall size: Body (Ø x d x t) Cover (Ø x d x t):	 Arrone** NB321/67 SSS** A Stainless steel escutcheon with stainless steel cover affixed to the leaf using 2No. Ø4 x 20 stainless steel countersunk screws. 52 x 6 x 1 54 x 6 x 1
11R	**Automatic door bottom** Manufacturer: Reference: Description: Overall size (h x w x d):	 Mann McGowan** 1703ACU** A mainly aluminium automatic door bottom with elastomeric sub components and polymeric end cap to the closing stile, set in a 30h x 16d rebate 14 from the exposed face, affixed to the leaf using 2No. Ø3.5 x 25 steel countersunk pan head screws. 31 x 1035 x 14
12R	**Intumescent – Frame** Manufacturer: Reference: Description: Overall size (d x t):	 Mann McGowan Pyrostrip 500P/PSS A graphite based intumescent strip in a PVC holder with self-adhesive on one side, set 15 from the exposed face, fully interrupted at the hinges, strike and closer track. 15 x 4
13R	**Intumescent – Glazing seal** Manufacturer: Reference: Description: Overall size (w x d):	 Mann McGowan Pyroglaze 30 A graphite based intumescent strip in a PVC holder with self-adhesive on one side, adhered at the interface of the glazing and beads. 10 x 3
14R	**Intumescent – Hinges** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrohinge** A graphite based intumescent pad with self-adhesive on one side, set beneath all blades. 1

Item	Component	Information
15R	**Intumescent – Latch/lock** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrolock** A graphite based intumescent pad with self-adhesive on one side, encasing the latch body and beneath the latch forend. 1
16R	**Intumescent – Closer** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrostrip 400CGSA** A graphite based intumescent pad with self adhesive on one side, over the top of the closer and beneath the track. 2
17R	**Intumescent – Strike** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrolock** A graphite based intumescent pad with self-adhesive on one side, set beneath the strike and encasing the dust box. 1
18R	**Intumescent – Automatic door bottom** Manufacturer: Reference: Description: Overall size (t):	 Mann McGowan** Pyrostrip** A graphite based intumescent pad with self-adhesive on one side, encasing automatic door bottom body. 1
19R	**Fire stopping detail** Description:	 Gaps between the frame and the supporting construction were filled with Unifrax Insulfrax LTX blanket and capped with Firewise Intumescent & Acoustic Acrylic Sealant.

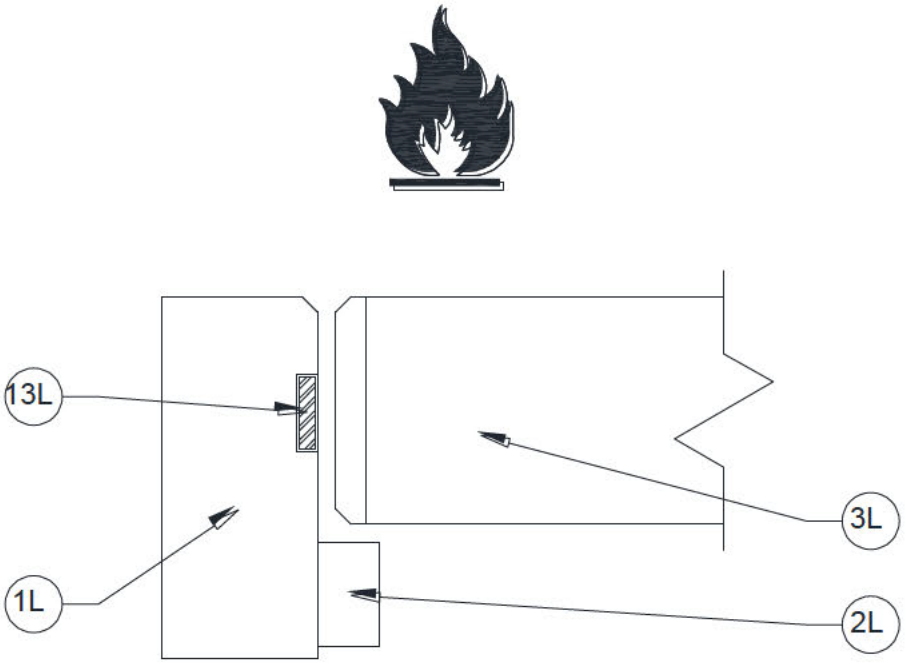
Appendix 1 Figure 1 – Left-hand doorset elevation (unexposed face view) inc. hidden detail



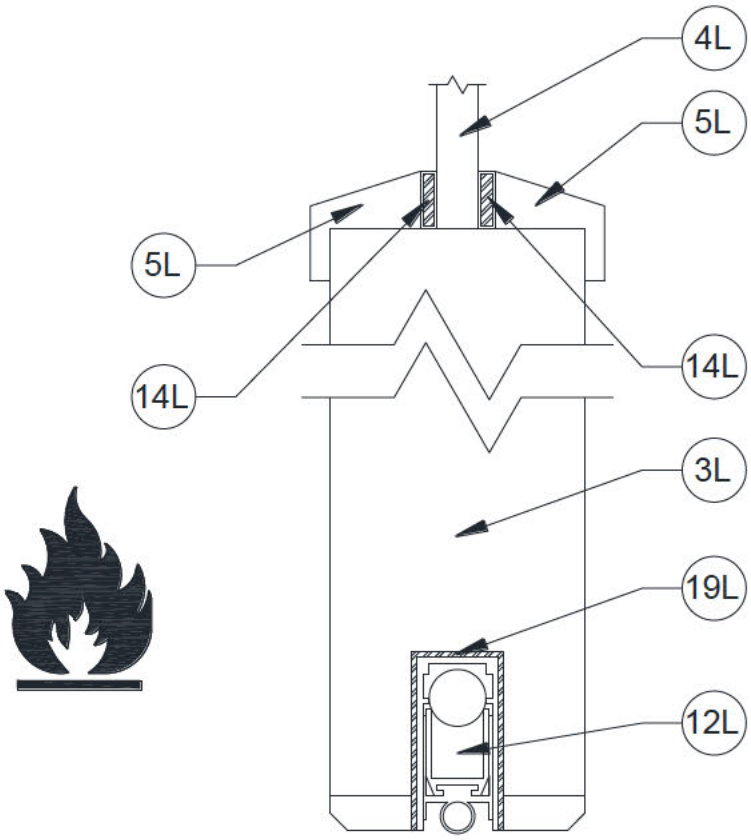
Appendix 1 Figure 2 – Section A – A



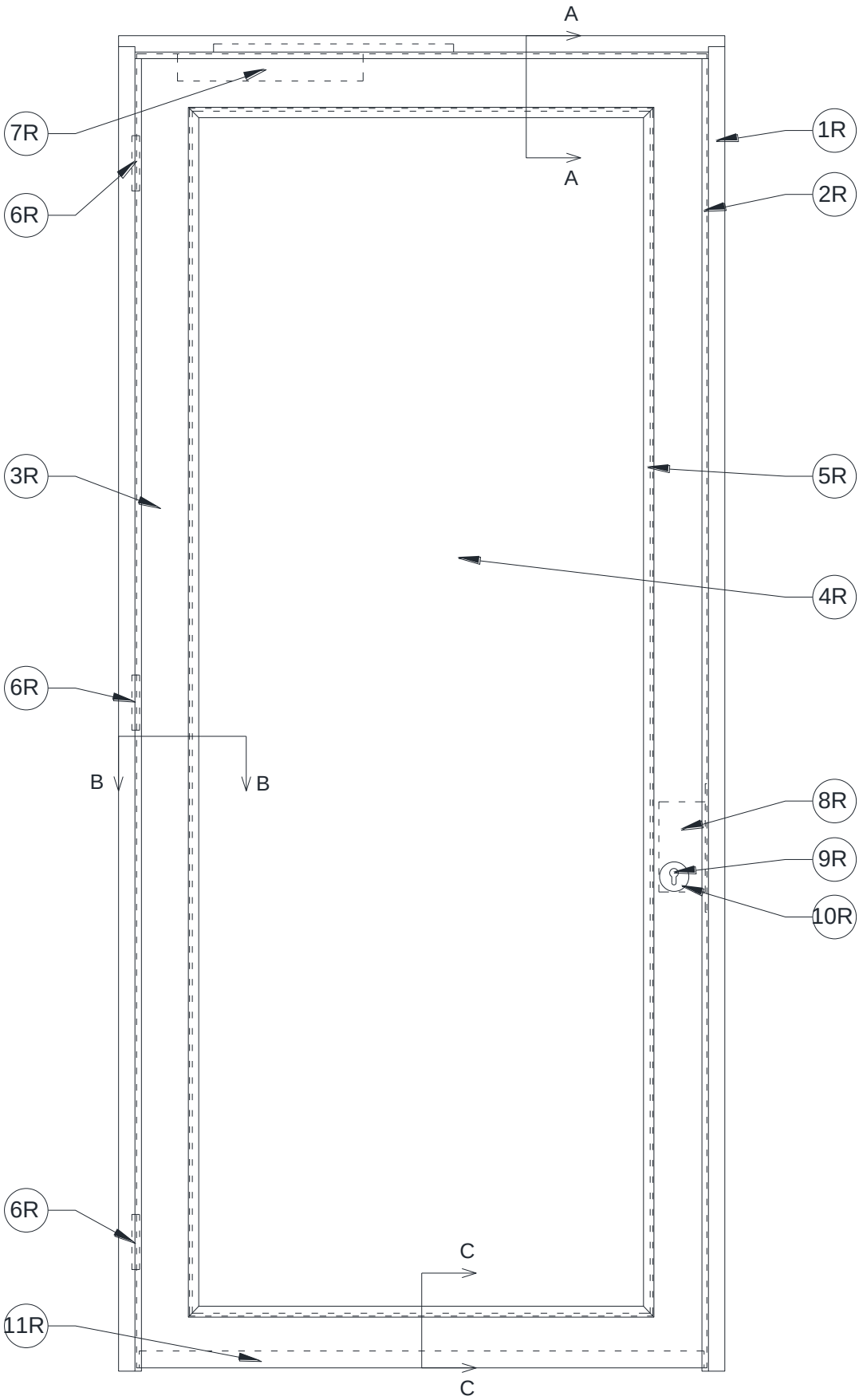
Appendix 1 Figure 3 – Section B – B



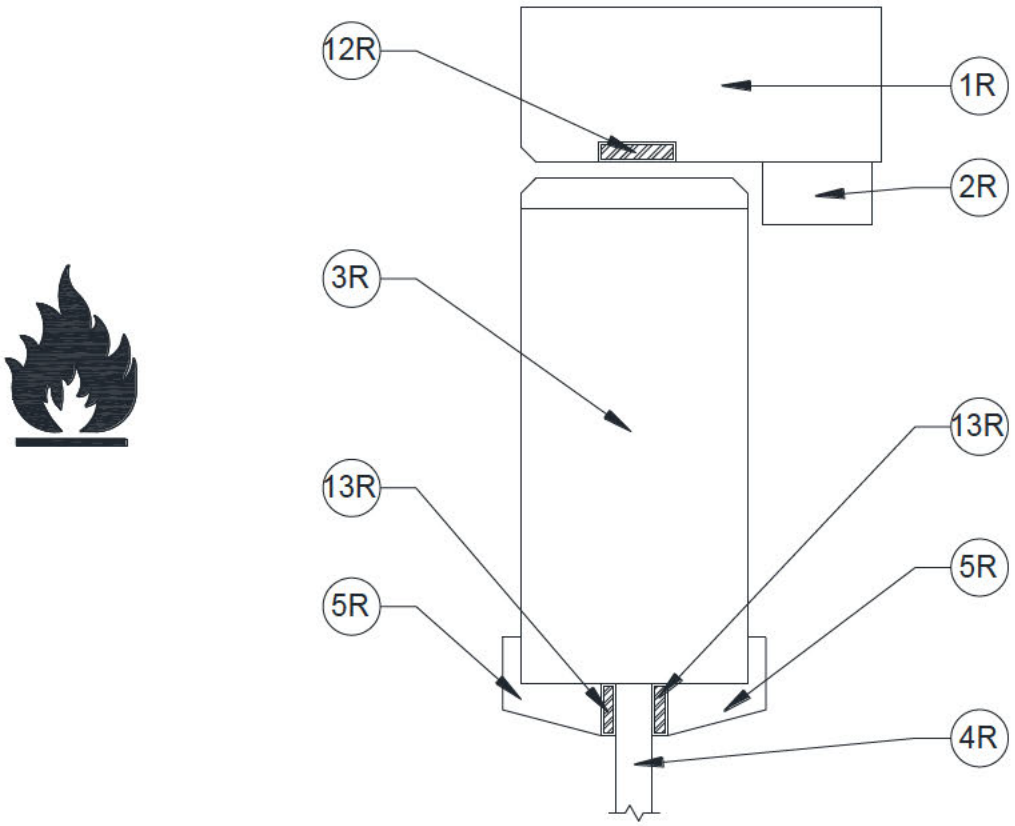
Appendix 1 Figure 4 – Section C – C



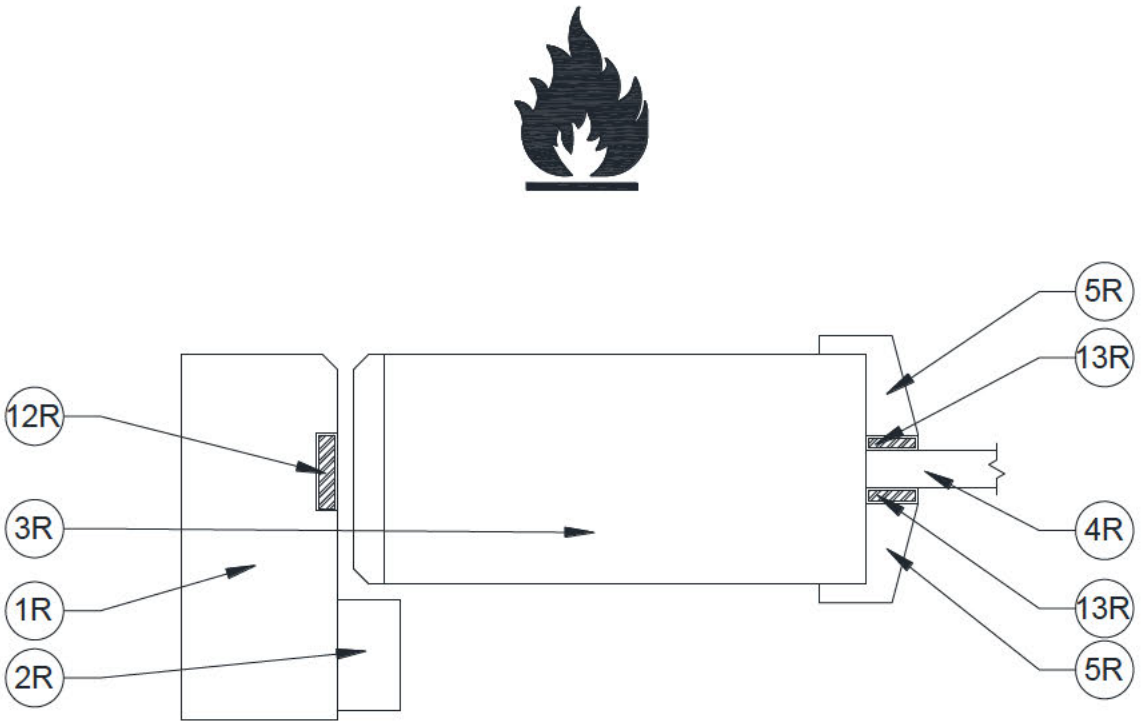
Appendix 1 Figure 5 – Right-hand doorset elevation (unexposed face view) inc. hidden detail



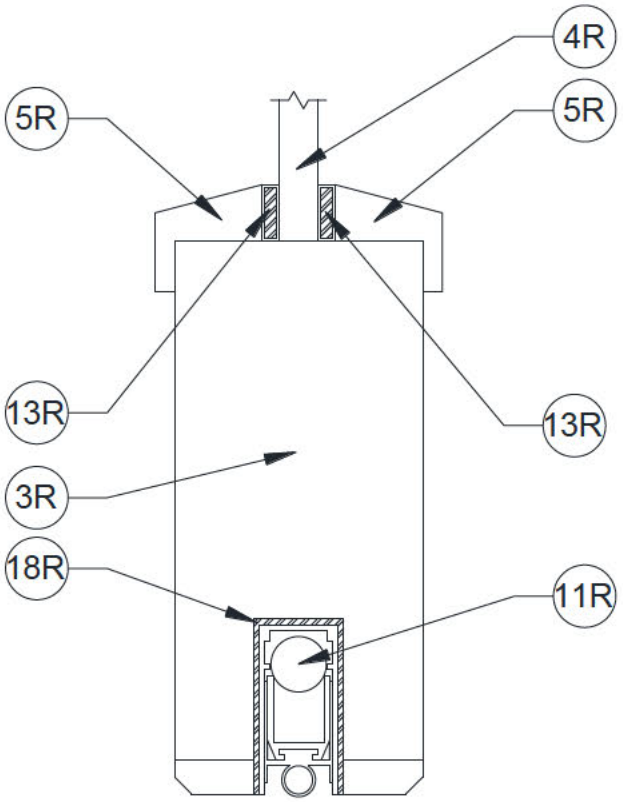
Appendix 1 Figure 6 – Section A – A



Appendix 1 Figure 7 – Section B – B



Appendix 1 Figure 8 – Section C - C



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

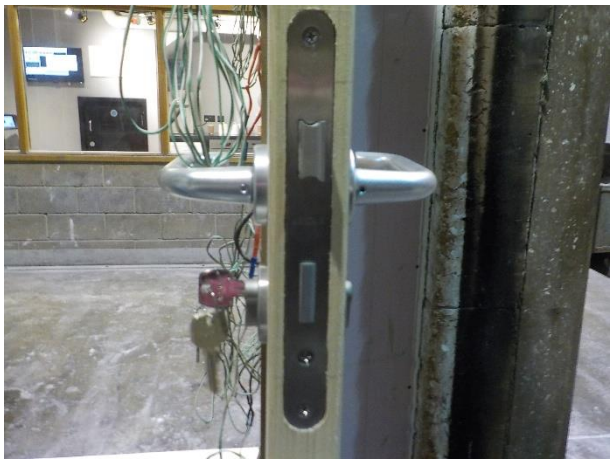


Photo 2.1.4 Left-hand specimen

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

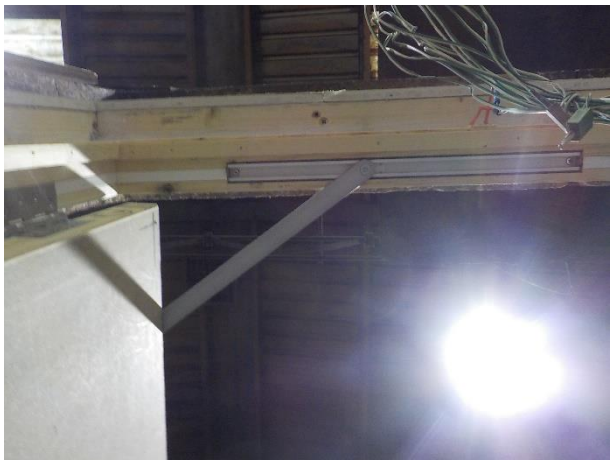


Photo 2.1.10 Left-hand specimen

Photo 2.1.11 Left-hand specimen

Photo 2.1.12 Left-hand specimen

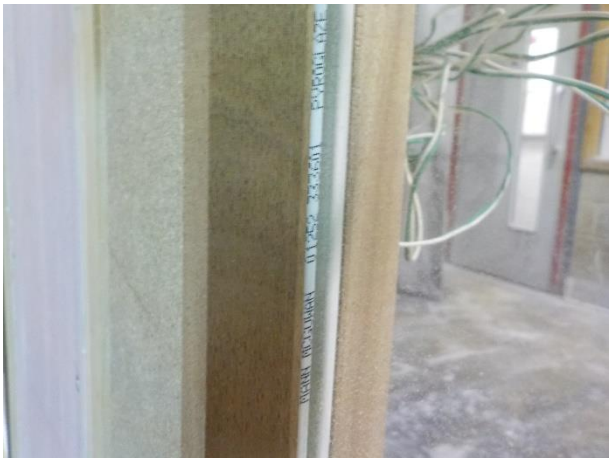


Photo 2.1.13 Right-hand specimen

Photo 2.1.14 Right-hand specimen

Photo 2.1.15 Right-hand specimen

Photo 2.1.16 Right-hand specimen

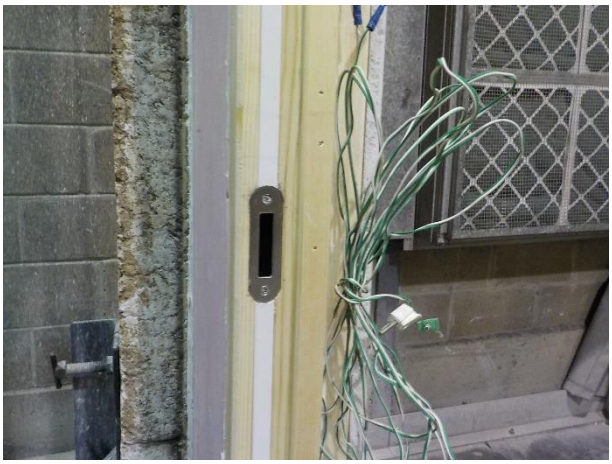


Photo 2.1.17 Right-hand specimen

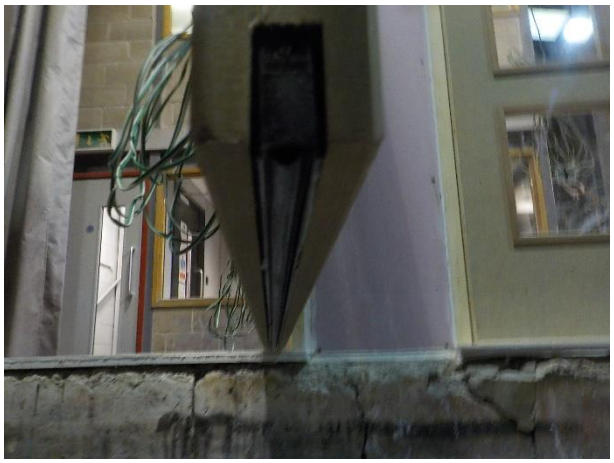


Photo 2.1.18 Right-hand specimen

Photo 2.1.19 Right-hand specimen

Photo 2.1.20 Right-hand specimen

Photo 2.1.21 Right-hand specimen

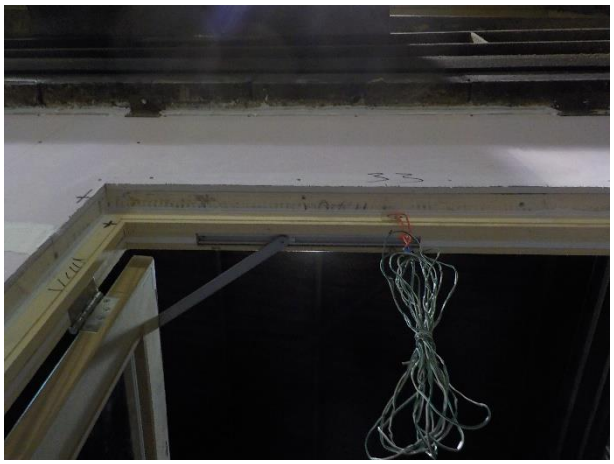


Photo 2.1.22 Right-hand specimen

Photo 2.1.23 Right-hand specimen

Photo 2.1.24 Right-hand specimen

Photo 2.1.25 Left-hand specimen

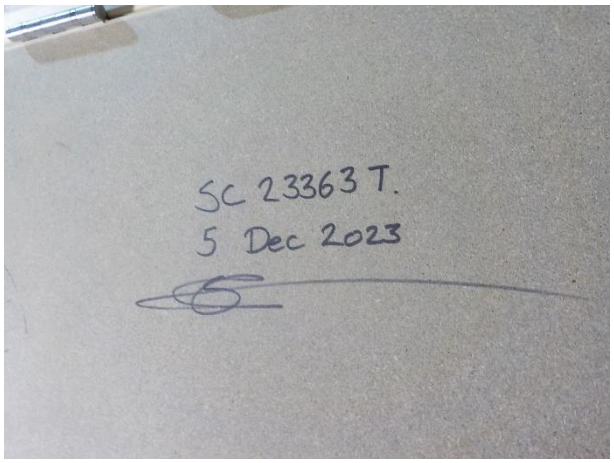


Photo 2.1.26 Right-hand specimen

Photo 2.1.27

Appendix 2.2 During test photos

Photo 2.2.1

Photo 2.2.2 Left-hand specimen after 7 minutes

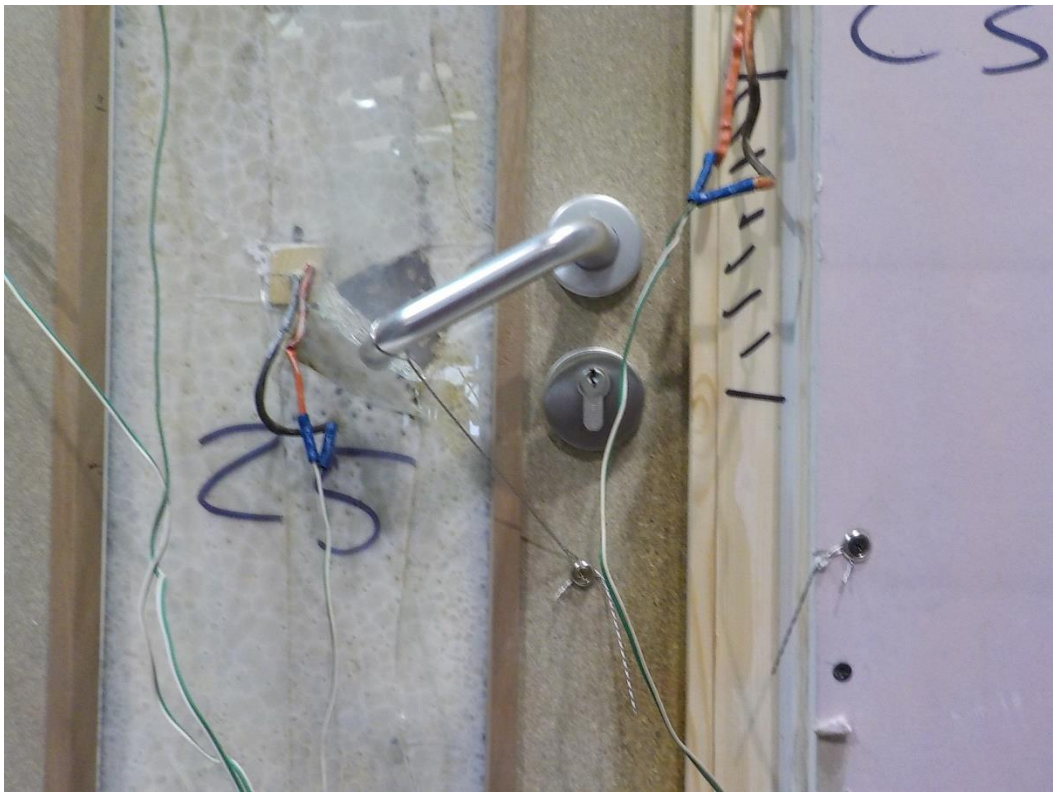


Photo 2.2.3

Photo 2.2.4

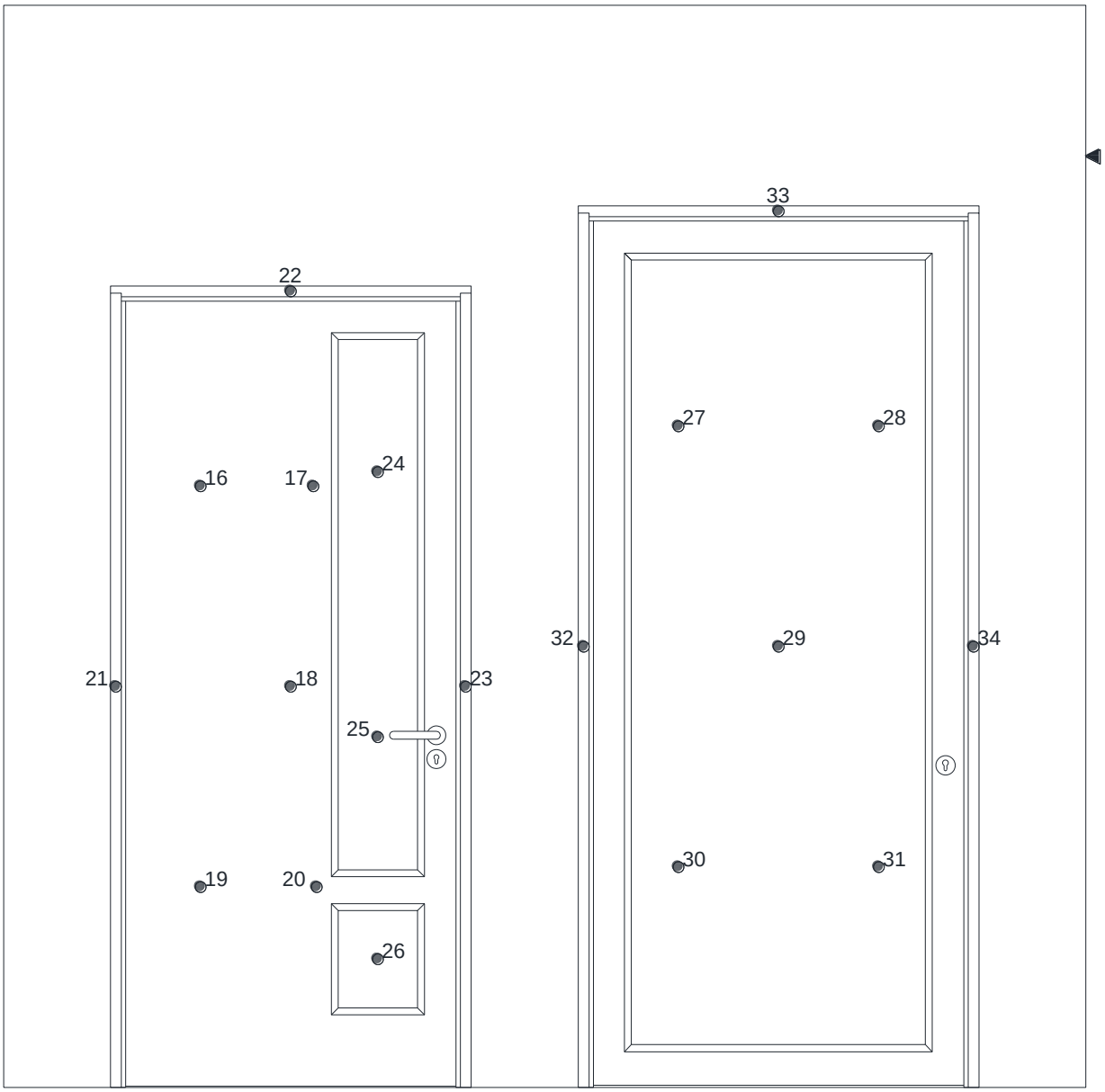
Photo 2.2.5

Photo 2.2.6

Appendix 2.3 Post-test photos

Photo 2.3.1

APPENDIX 3 POSITIONING OF INSTRUMENTATION



● Unexposed face specimen thermocouple
◀ Furnace pressure measurement position

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 24	T/C 25	T/C 26
min	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C
0	x	16	15	15	15	14	15	14	17	16	16
1	x	17	16	17	15	13	14	14	32	27	24
2	x	17	15	17	14	13	17	14	50	41	34
3	x	16	15	16	14	14	19	14	79	66	51
4	x	16	14	15	14	15	19	15	97	94	81
5	x	15	14	15	14	15	17	14	100	98	95
6	x	15	14	14	13	15	18	14	109	103	98
7	x	15	14	14	13	16	18	14	127	111	101
8	x	15	14	14	13	16	18	14	147	126	105
9	x	16	14	15	14	18	18	16	162	144	113
10	x	17	15	15	14	17	19	15	177	160	125
11	x	20	17	17	16	17	20	15	193	172	138
12	x	25	21	20	20	18	20	15	211	185	146
13	x	30	26	24	25	18	22	16	230	203	153
14	x	35	30	28	30	18	24	16	246	221	160
15	x	40	35	32	35	19	27	17	261	239	170
16	x	44	39	35	39	20	28	17	275	255	181
17	x	48	43	38	43	20	30	18	288	269	195
18	x	51	45	41	46	21	32	18	299	280	208
19	x	54	48	43	49	22	34	19	309	292	222
20	x	57	50	45	51	23	35	20	316	301	235
21	x	59	52	47	53	25	38	21	324	311	248
22	x	61	54	49	55	26	40	22	332	320	260
23	x	63	56	50	56	27	42	23	340	327	271
24	x	64	56	51	57	28	44	24	346	334	281
25	x	65	58	52	58	29	46	25	354	342	291
26	x	66	59	54	59	30	49	26	362	351	300
27	x	67	60	55	60	32	51	27	370	362	310
28	x	68	60	56	60	33	52	28	377	369	319
29	x	69	62	58	62	35	54	29	384	374	327
30	x	70	62	59	62	36	57	30	389	379	334
31	x	70	63	59	62	37	58	31	393	383	342
32	x	71	64	61	63	39	60	32	398	389	349
33	x	72	65	62	65	40	62	33	402	395	357
34	x	72	65	62	65	41	63	34	405	398	363
35	x	73	66	64	66	42	65	35	408	403	369
36	x	74	67	64	67	44	66	36	410	408	374
37	x	74	67	65	67	45	67	38	412	411	378
38	x	74	68	66	68	45	69	38	414	415	382
39	x	75	68	67	69	47	70	39	416	421	387
40	x	75	69	68	69	47	72	40	418	428	393
41	x	76	70	69	70	49	75	42	419	434	399
42	x	57	56	70	71	50	55	40	404	438	407

Time	T/C 27	T/C 28	T/C 29	T/C 30	T/C 31	T/C 32	T/C 33	T/C 34
min	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C
0	17	17	17	16	16	15	15	15
1	37	32	34	27	26	14	16	14
2	59	53	53	39	39	15	19	14
3	93	84	87	63	64	16	21	14
4	111	97	99	94	93	19	25	14
5	132	102	102	98	99	17	25	15
6	158	111	113	100	100	16	26	15
7	187	120	134	104	102	17	27	15
8	217	129	157	116	108	17	28	15
9	245	141	173	131	119	19	29	15
10	272	154	190	146	131	18	30	15
11	297	166	208	157	144	18	32	15
12	319	177	226	164	154	18	34	15
13	340	189	245	174	161	19	36	15
14	356	202	261	185	168	19	38	15
15	376	215	276	199	178	20	41	15
16	396	229	290	214	190	21	42	16
17	409	241	302	228	205	22	45	16
18	419	252	312	241	218	24	47	17
19	423	261	322	254	230	25	50	18
20	426	269	330	264	241	26	53	18
21	432	277	338	275	253	28	55	19
22	437	284	346	285	264	29	58	19
23	442	290	354	295	274	30	61	21
24	445	296	361	302	282	31	62	21
25	450	301	369	310	290	33	65	21
26	457	306	376	318	298	34	68	22
27	462	310	382	325	304	34	70	22
28	467	315	387	332	311	36	73	23
29	472	320	391	339	318	38	76	24
30	477	324	394	346	324	39	78	24
31	481	327	396	353	330	39	79	24
32	486	331	399	361	336	41	81	25
33	492	335	401	368	343	42	83	26
34	497	338	403	375	349	44	85	26
35	502	341	406	381	355	45	87	27
36	506	344	408	387	362	46	88	27
37	511	347	410	393	369	48	91	28

x Thermocouple malfunction

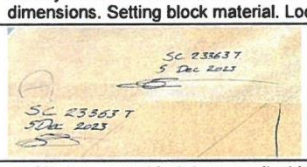
APPENDIX 5 INDEPENDENT REPORT

Left hand specimen

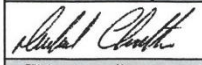
bmtrada Proud to be part of element	SAMPLING VISIT REPORT	Company Name	Wood International Agency Ltd
		Establishment No.	E003760
		BM TRADA Approved Body ID: 1224	

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

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
By Dezign Carpentry, Unit 11B ERW Las, Colomendy Ind Est, Denbigh LL16 5TA	20/03/2024	Michael Chorlton

Requirement	Evidence / Comments
Opening Meeting (names of those present)	Mr Neil Harrison / Mr Shaun Harrison
Contract Reference	SC23363T
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Technical Drawing: WIAD-MMN44-ITT-644-A05-P1 Technical Specification: WIAD-MMN44-ITT-644-A05 Marked up technical specification made by the sampler and must be read in conjunction with this sampling report.
Description of product(s) sampled	Single leaf glazed doorset incorporating WIAL Marksman 44 core, Lipped on 4 edges and hung in an timber frame on 3No. Butt hinges. Operated by surface mounted overhead closer and secured with DIN latch operated by handle and Eurocylinder.
Product identification / reference numbers / codes	N/A
Batch number(s)	N/A
Date of manufacture	In stages between 05/12/2023 and 11/12/2023 with final review 20/03/2024
Quantity of stock and size of sample(s) taken	1No. Doorset
Traceability of material records ie Purchase Orders and delivery notes	Items with traceability: Door cores under BM TRADA Sampling SC23282B. Hinges. Lipping adhesives. Glazing. Glazing intumescent seals. Hardware intumescent protection. Drop seal. Lipping, frame and bead density & MC. **Please send Sampling Pack to High Wycombe Laboratory FOA Connor Payne.** Items with limited or no traceability: Frame jointing. Fire stopping and sealing details and materials. Stop and fixings. Frame smoke seal. Door closers. DIN Latch and Keep. Eurocylinder. Handleset. Frame intumescent strips. Frame smoke seal. Glazing bead dimensions. Setting block material. Lockset and keep traceability. Signage. Escutcheon.
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	
Confirmation of minimum mandatory video/live checks undertaken	✓ Glazing assembly (where applicable) ✓ Finished doorset with markings ✓ Hardware prep and fitting (where applicable) ✓ Sampling pack discussion
Details of any further FPC processes witnessed during the visit.	By Dezign do not have a formalised FPC in place. All manufacture made against the technical specification utilising traditional jonery tools and methods. Dimensional checks made throughout manufacture.
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity.	Door core selection, trimming and lipping application. Hardware selection, preparation, intumescent protection and fixings. Glazing selection, preparation, intumescent protection and bead fixings.
State any items from the Technical Specification / FoA that were **not** witnessed and require further lab sampling	☐ Side screen / overpanel ✓ Handles ✓ Other (see tech spec marked with 'not seen') ✓ Door closer ☐ Frame re-assembly
Confirm any clauses within the Technical Specification that were found to be different on the sampled product/s. ***Non-conformances may be raised for pre-cert and audit test sampling***	Refer to marked up technical specification. Areas in Green = verified during sampling Areas in Blue = Additional sampler notes Areas in Yellow = Areas without verification or additional evidence may be required. Areas in yellow with Asterisk * = Will be reported "As stated by customer"
Closing Meeting (names of those present)	No formalised closing meeting possible. Marked up TST and draft sampling report sent for approval and signing.

Declaration	I declare that the product/s witnessed during this sampling visit are representative of normal production.

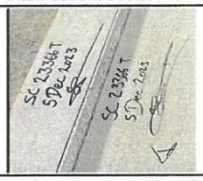
Company Representative Name (Print)	Company Representative Position
Sent to Wood International for approval. Neil Harrison	Director
BM TRADA Representative Signature	**Company Representative Signature**
	

Right-hand specimen

bmtrada Proud to be part of element	SAMPLING VISIT REPORT	Company Name	Wood International Agency Ltd
		Establishment No.	047/21200. CO
		BM TRADA Approved Body ID: 1224	

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

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
By Dezign Carpentry, Unit 11B ERW Las, Colomendy Ind Est, Denbigh LL16 5TA	10/07/2024	Michael Chorlton

Requirement	Evidence / Comments
Opening Meeting (names of those present)	Mr Neil Harrison / Mr Shaun Harrison
Contract Reference	SC23366T
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Technical Drawing: WIAD-MMN44-ITT-344-A15-P1 Rev A Technical Specification: WIAD-MMN44-ITT-344-A15 Marked up technical specification made by the sampler and must be read in conjunction with this sampling report.
Description of product(s) sampled	Single leaf pattern 10 glazed doorset incorporating WIAL Marksman 44 core, Lipped on 4 edges with sapele and hung in an softwood frame on 3No. Butt hinges. Operated by concealed overhead closer and secured with DIN mortice deadlock operated by Eurocylinder and finished with dropseal.
Product identification / reference numbers / codes	N/A
Batch number(s)	N/A
Date of manufacture	In stages between 05/12/2023 and 11/12/2023 with final review and reporting 10/07/2024
Quantity of stock and size of sample(s) taken	1No. Doorset at 111mm wide x 2444mm high.
Traceability of material records ie Purchase Orders and delivery notes	Items with traceability: Door cores under BM TRADA Sampling SC23282B. Hinges. Cylinder. Escutcheon. Closer. Lipping adhesives. Glazing. Glazing intumescent gaskets. Drop seal. **Please send Sampling Pack to High Wycombe Laboratory FOA Connor Payne.** Items with limited or no traceability: Frame to supporting construction fixings, Fire stopping and sealing details and materials. Door frame joint and stop fixings. Frame intumescent seals. Frame smoke seal.
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	
Confirmation of minimum mandatory video/live checks undertaken	✓ Glazing assembly (where applicable) ✓ Hardware prep and fitting (where applicable) ✓ Finished doorset with markings ✓ Sampling pack discussion
Details of any further FPC processes witnessed during the visit.	By Dezign do not have a formalised FPC in place. All manufacture made against the technical specification utilising traditional jonery tools and methods. Dimensional checks made throughout manufacture.
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity.	Door core selection, trimming and lipping application. Hardware selection, preparation, intumescent protection and fixings. Glazing selection, preparation, intumescent protection and bead fixings.
State any items from the Technical Specification / FoA that were **not** witnessed and require further lab sampling	☐ ~~Side screen / overpanel~~ ☐ ~~Door closer~~ ☐ ~~Handles~~ ☐ ~~Frame re-assembly~~ ✓ Other (see tech spec marked with 'not seen')
Confirm any clauses within the Technical Specification that were found to be different on the sampled product/s. ***Non-conformances may be raised for pre-cert and audit test sampling***	Refer to marked up technical specification. Areas in Green = verified during sampling Areas in Blue = Additional sampler notes Areas in yellow with Asterisk * = Will be reported "As stated by customer"
Closing Meeting (names of those present)	No formalised closing meeting possible. Marked up TST and draft sampling report sent for approval and signing.

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

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

Specimen batch

bmtrada Proud to be part of element	SAMPLING VISIT REPORT	Company Name	Wood International Agency Ltd
		Establishment No.	047/21200. CO
		BM TRADA Notified Body ID: 1224	

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

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
[redacted]	27/10/2023	Michael Chorlton

Requirement	Evidence / Comments
Opening Meeting (names of those present)	Neil Harrison (WIAL, Partial) [redacted]
Contract Reference	SC23282B
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Basic system recipe & DoP available. WIAL technical datasheet (Draft version) WIAD-MMN44-SPA-002-A1-P1 Rev B. A specification has also been drafted in BM TRADA "Scope" format which must be read in conjunction with this report.
Description of product(s) sampled	44mm Particleboard door blanks [redacted]
Product identification / reference numbers / codes	[redacted] Wood International product will be referenced as MARKSMAN
Batch number(s)	927170 main batch translated to works order 927258.
Date of manufacture	Boards run 27 October 2023. Cut 07 November 2023
Quantity of stock and size of sample(s) taken	24No. [redacted] 220mm wide x 2440mm high x 44mm thick
Traceability of material records ie Purchase Orders and delivery notes	Works order detail: 927170 (Line 16) of current press plan & Works order 927258. Recipe confirmed and added to Specification for use under Q-Mark. Inspection / Laboratory report: 08/11/23 23.267 for 927258 on file.
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	[redacted]
Confirmation of minimum mandatory video/live checks undertaken	☐ ~~Glazing assembly (where applicable)~~ ☐ ~~Finished doorset with markings~~ ☐ ~~Hardware prep and fitting (where applicable)~~ ☐ ~~Sampling pack discussion~~
Details of any further FPC processes witnessed during the visit.	In-Process controls verified on control room monitors. Laboratory tests to EN312.
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity.	Manufacturing recipe (held on file), FPC manual, in process inspection and final laboratory testing [redacted]
State any items from the Technical Specification / FoA that were **not** witnessed and require further lab sampling	☐ ~~Side screen / overpanel~~ ☐ ~~Handles~~ ☐ ~~Other (see tech spec marked with 'not seen')~~ ☐ ~~Door closer~~ ☐ ~~Frame re-assembly~~
Confirm any clauses within the Technical Specification that were found to be different on the sampled product/s. ***Non-conformances may be raised for pre-cert and audit test sampling***	None
Closing Meeting (names of those present)	[redacted]

Declaration	I declare that the product/s witnessed during this sampling visit are representative of normal production.

Company Representative Name (Print)	Company Representative Position
[redacted] Neil Harrison	Director
BM TRADA Representative Signature	**Company Representative Signature**
Michael Chorlton	

Intumescent

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Sample Report

This report provides a record of the information relating to samples taken by Warringtonfire Testing and Certification Limited trading, or its agent, for certification of the products detailed below.

Job No.	FM528727
Manufacturer	Mann McGowan Ltd
Manufacturing site	Intumescent House, 4 Brook Trading Estate, Aldershot, GU12 4XB
Place of sampling	Selected at Warehouse Section
Traceability information	Date/time of production: Various Production unit/line: Various Batch number: Various – See below. Shift: Day
Product number/ description	100 x Pyrostrip 15 x 4 500PSA – Batch 500F2308 25 x Pyrostrip 20 x 4 500PSA – Batch 500F2305 25 x 10 x 4 500PSA – Batch 500F2306 25 x Pyroglaze 60 – Batch 500F602010 25 x Pyroglaze 30 – Batch 500F2307 2 x Pyrotape CF at 15mm x 3mm, 4mm, 5mm & 6mm 2 x Pyrotape CF at 20mm x 3mm, 4mm, 5mm & 6mm 2 x sheets of Palusol 100 – Batch A8360 1 x sheets of Interdens (Palusol & Graphite – Batch 16-2001986999 2 x sheets 1 mm Interdens – Batch 06-1000894064 2 x sheets 2 mm Interdens – Batch 07-1000908038 2 x sheets 1mm 400CG – Batch RM640012202 2 x sheets 2mm 400 CG – Batch RM640022202 2 x sheets 1mm Heatseal – Batch 15-1000532296 2 x sheets 2 mm Heatseal – Batch 18-1000909073 100 x Pyromas A – Batch 04102 25 x ACS-1 – DOM 20/4/22. 10 x 1703 ACU at 1130mm 10 x 1703 ACU at 1030 10 x 1703 ACU at 930 10 x 420-S at 1130 10 x 420-S at 930
Marking of the product by the manufacturer e.g. label, batch number and date of manufacture	FM528727 / 1121 / Gavin Gunn / 25-10-23
Marking of the samples by Warringtonfire Testing and Certification Limited	Job No: FM528727 Date: 25th October 2023 Signature or initials: Gavin Gunn
Stock/batch quantity from which samples selected and sample quantity	Selected from produced stock
Results of tests and/or inspections during manufacture	Expansion testing / In process QC checks / Final QC checks - Pass
Essential characteristics to be tested i.e. Test Reference	To be consumed within various tests – Tests to be determined.

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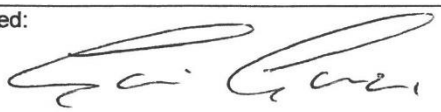
Sample Report

Samples to be dispatched by manufacturer to *** within *** weeks/month(s)	Tests to be Determined. None planned to date.
Date of sampling	25TH OCTOBER 2023
Warringtonfire Testing and Certification Limited UK Approved Body Number	1121
Signed:  (for and on behalf of Manufacturer)	Signed:  (for and on behalf of Warringtonfire Testing and Certification Limited)
Print: RUSSELL SMITH	Print: GAVIN GUNN
Date: 25TH OCTOBER 2023	Date: 25TH OCTOBER 2023