TEST REPORT NUMBER CFR2407311

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

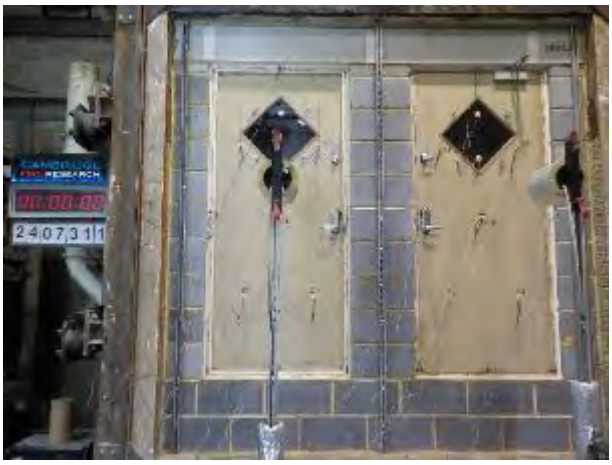
Sponsor:	Dixon International Group Ltd	Wood International Agency Limited
Address:	Brewery Road, Pampisford, Cambridgeshire, CB22 3HG	Wood House, 16 King Edward Road, Brentwood, Essex, CM14 4HL
Date of test:	31st July 2024	

Results:

Test duration: 47 minutes (discontinued at the request of the sponsor)

	Left hand specimen:	Right hand specimen:
Integrity:	40 minutes	36 minutes
Insulation:	40 minutes	36 minutes

[1] discontinued to maintain safety of personnel
[2] no failure, the test having been discontinued



Summary of test specimen (mm) :
Left hand specimen:
Latched single acting single leaf glazed timber doorset tested as partially insulated opening towards the heating conditions.
Right hand specimen:
Latched single acting single leaf glazed timber doorset tested as partially insulated opening away from the heating conditions.

Overall size (h x w x d):

Left hand specimen:
Frame: 2221 x 998 x 70
Leaf: 2156 x 932 x 44
Glazing pane size: 400** x 400** x 7**

Right hand specimen:
Frame: 2222 x 998 x 70
Leaf: 2155 x 932 x 44
Glazing pane size: 400** x 400** 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 24/07/2024.
The specimens were on site for a total period of 7 days and during this time the temperature and relative humidity were measured and recorded within the range of 17°C to 28°C and 39% to 77% respectively.

1.2 Associated construction

Cambridge Fire Research installed a low density blockwork associated construction as instructed by the sponsor using 140 mm thick aerated concrete blocks, density 600kg/m^3**, mortar and an autoclaved aerated concrete lintel, density 585 kg/m^3 **.

The aperture for the left hand specimen was 2233 mm high x 1018 mm wide.
The aperture for the right hand specimen was 2232 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 frame 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.
The left hand specimen was asymmetrical and installed such that it opened towards the heating conditions of the test at the request of the sponsor.
The right hand specimen was asymmetrical and install such that it opened away from the heating conditions of the test at the request of the sponsor.
Each specimen was latched prior to the start of the test.
Each leaf had more than one latch on the closing stile, the lower was latched.

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 2.1.18 and 2.1.36 show corresponding identification.

2 PRE-TEST MEASUREMENTS AND SETTING

2.1 Closer force measurement

The leaf opening and closing forces 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	47.1	35.3	66.9	50.2

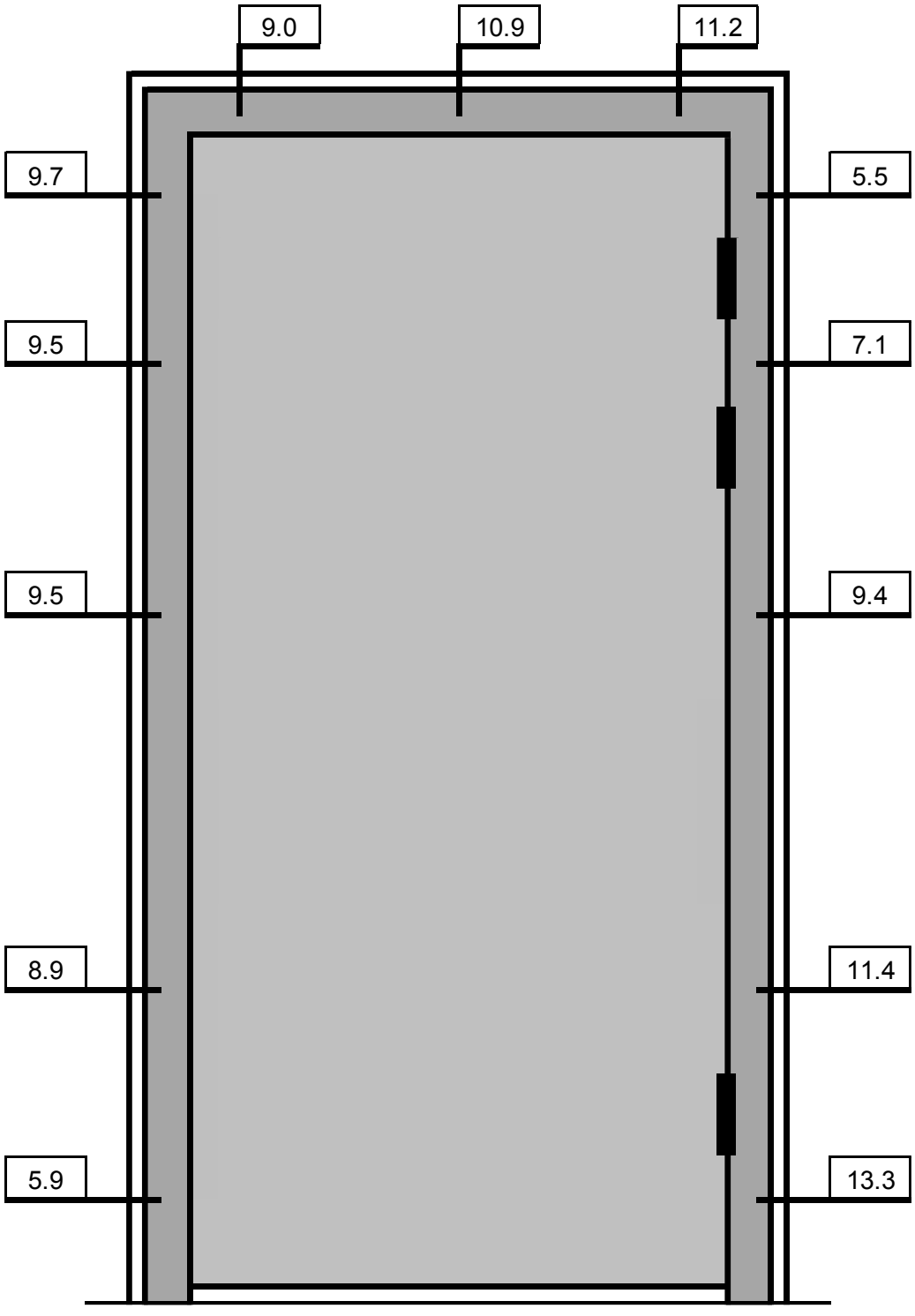
Right hand specimen

Direction	Closing force (N)	Closing moment (Nm)	Opening force (N)	Opening moment (Nm)
Opening away from heating conditions	42.7	32.0	67.9	50.9

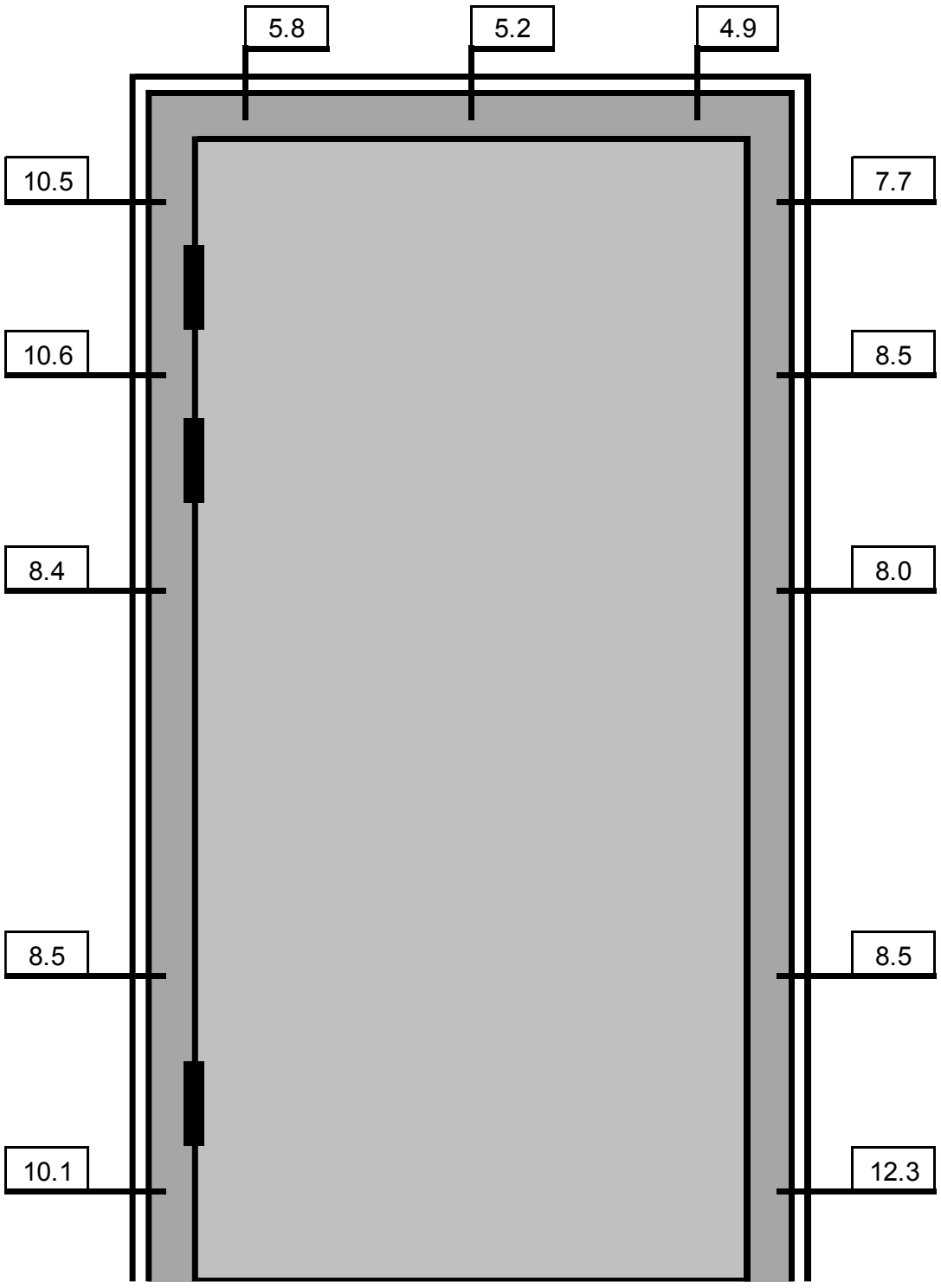
2.2 Gap measurements – Frame edge to associated construction aperture

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.



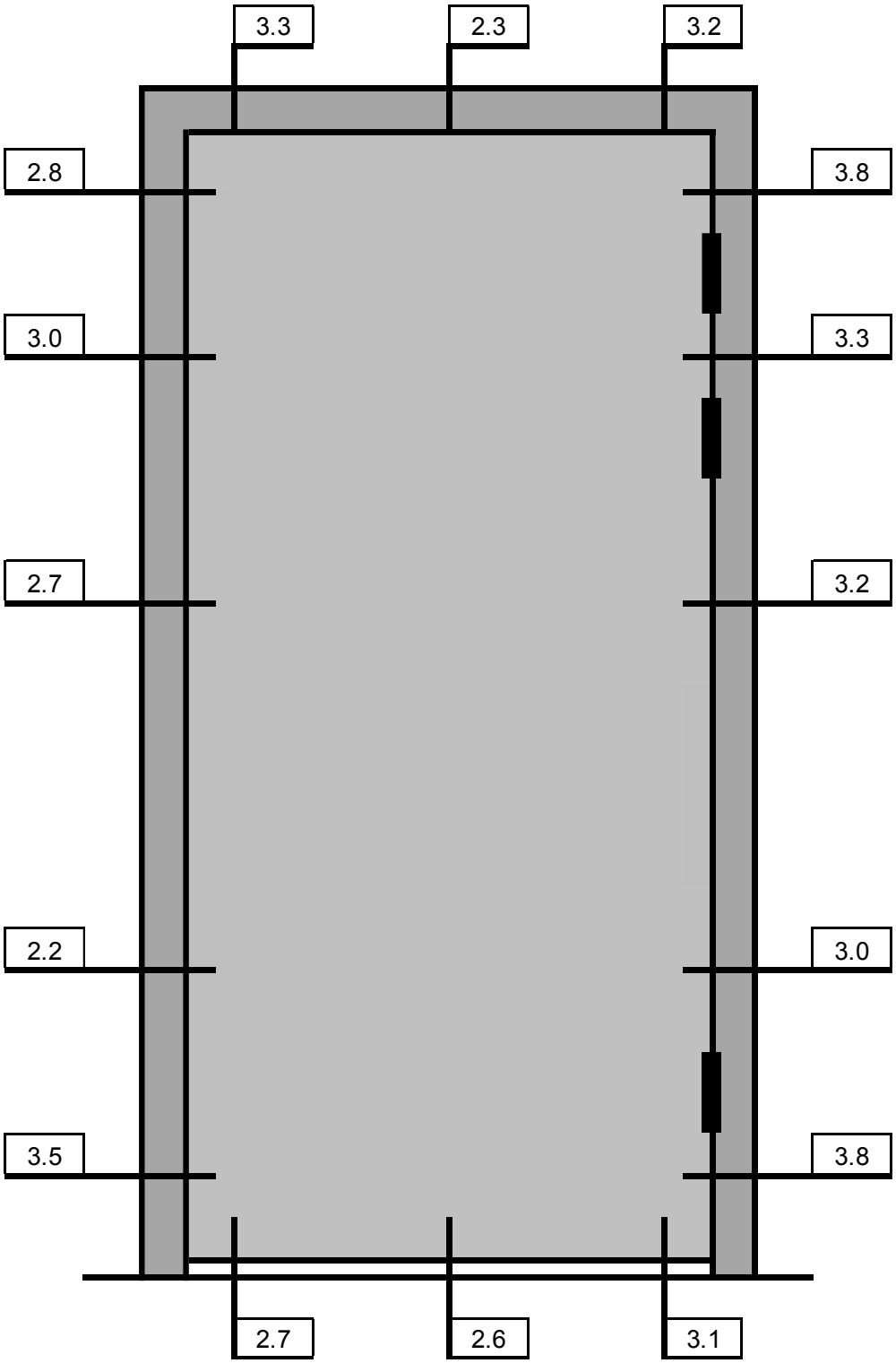
Right hand specimen viewed as measured from the exposed face.



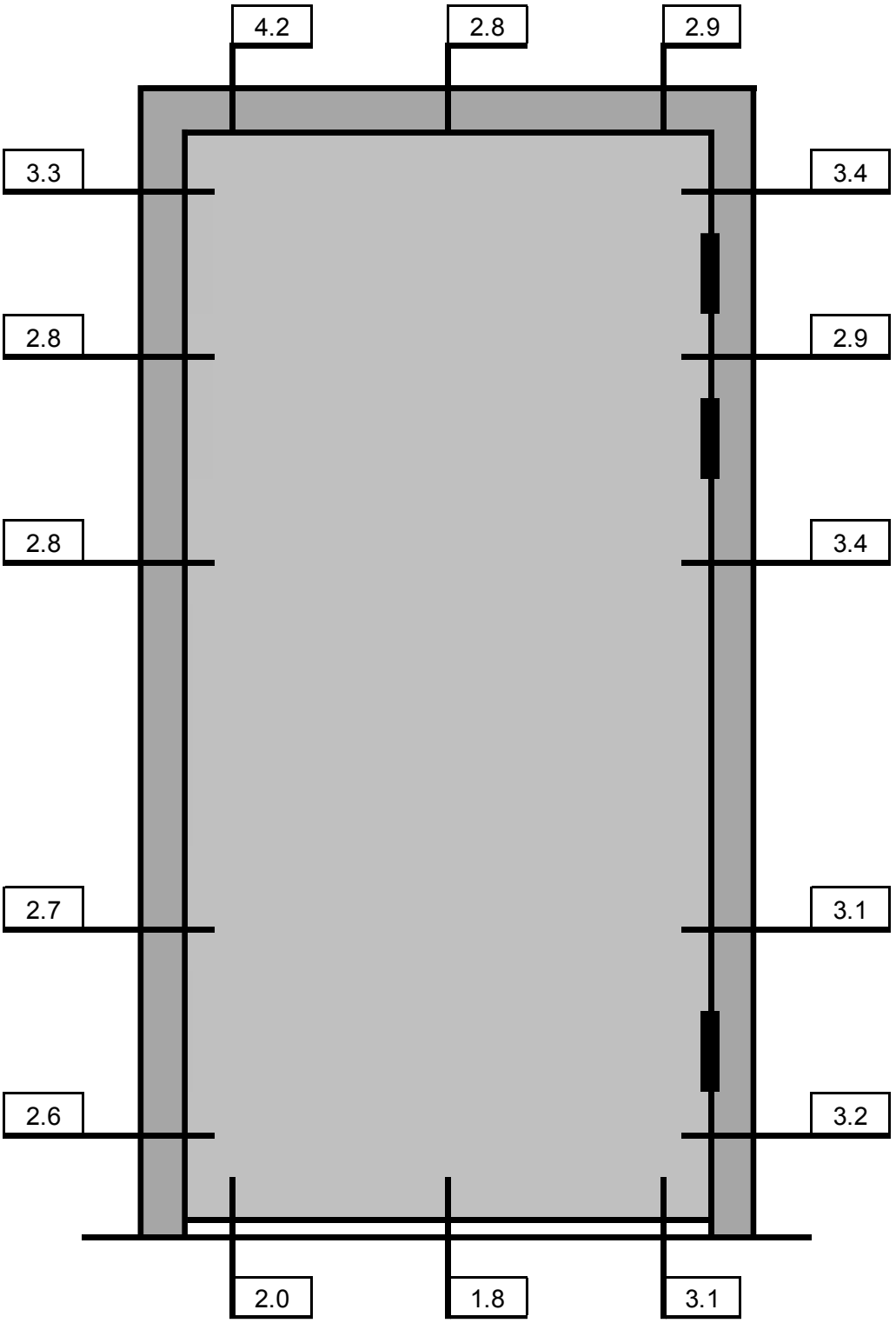
2.3 Gap measurements – Leaf edge to frame

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.



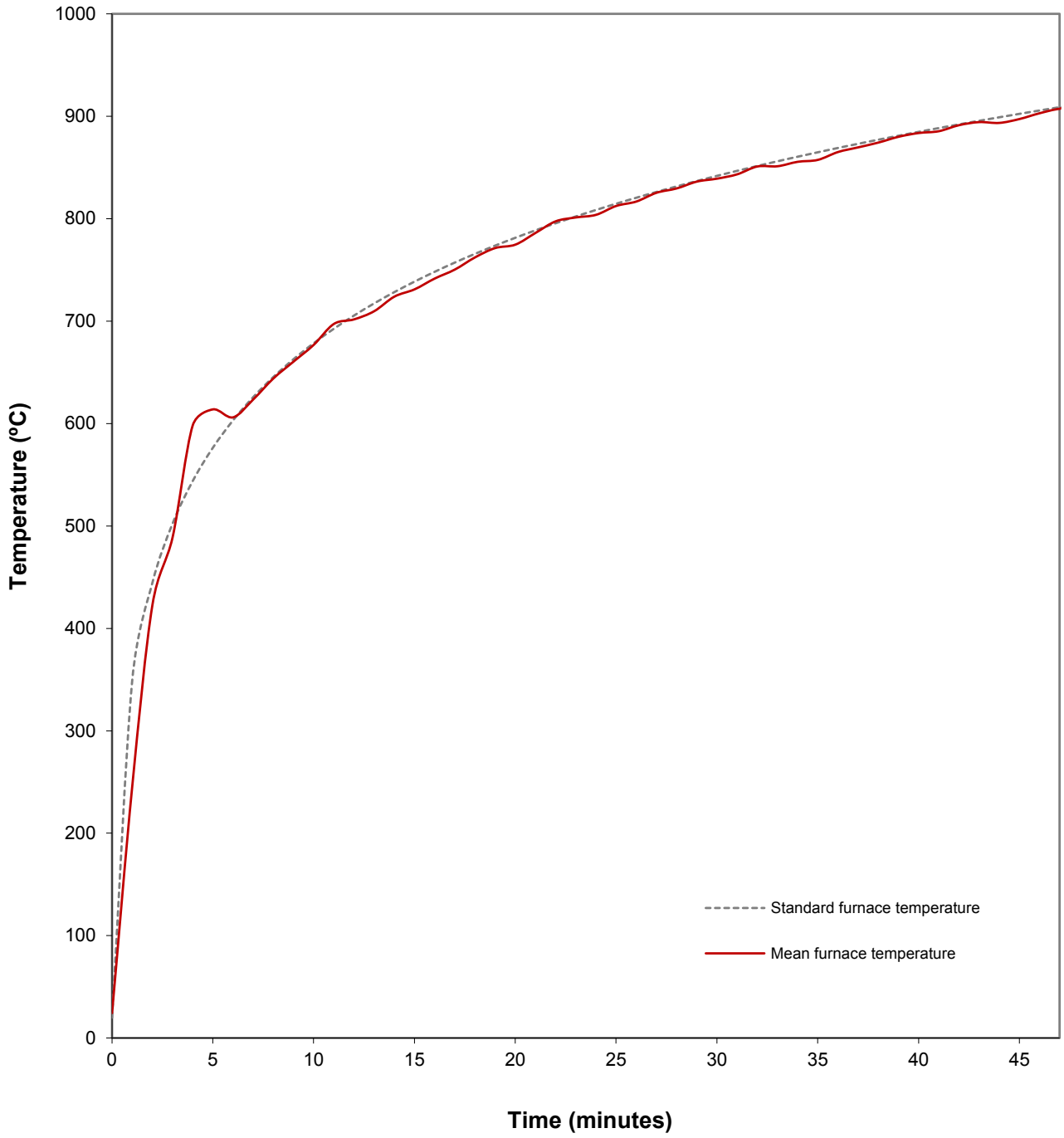
Right hand specimen viewed as measured from the unexposed face.



3 TEST CONDITIONS, INSTRUMENTATION AND MEASURING

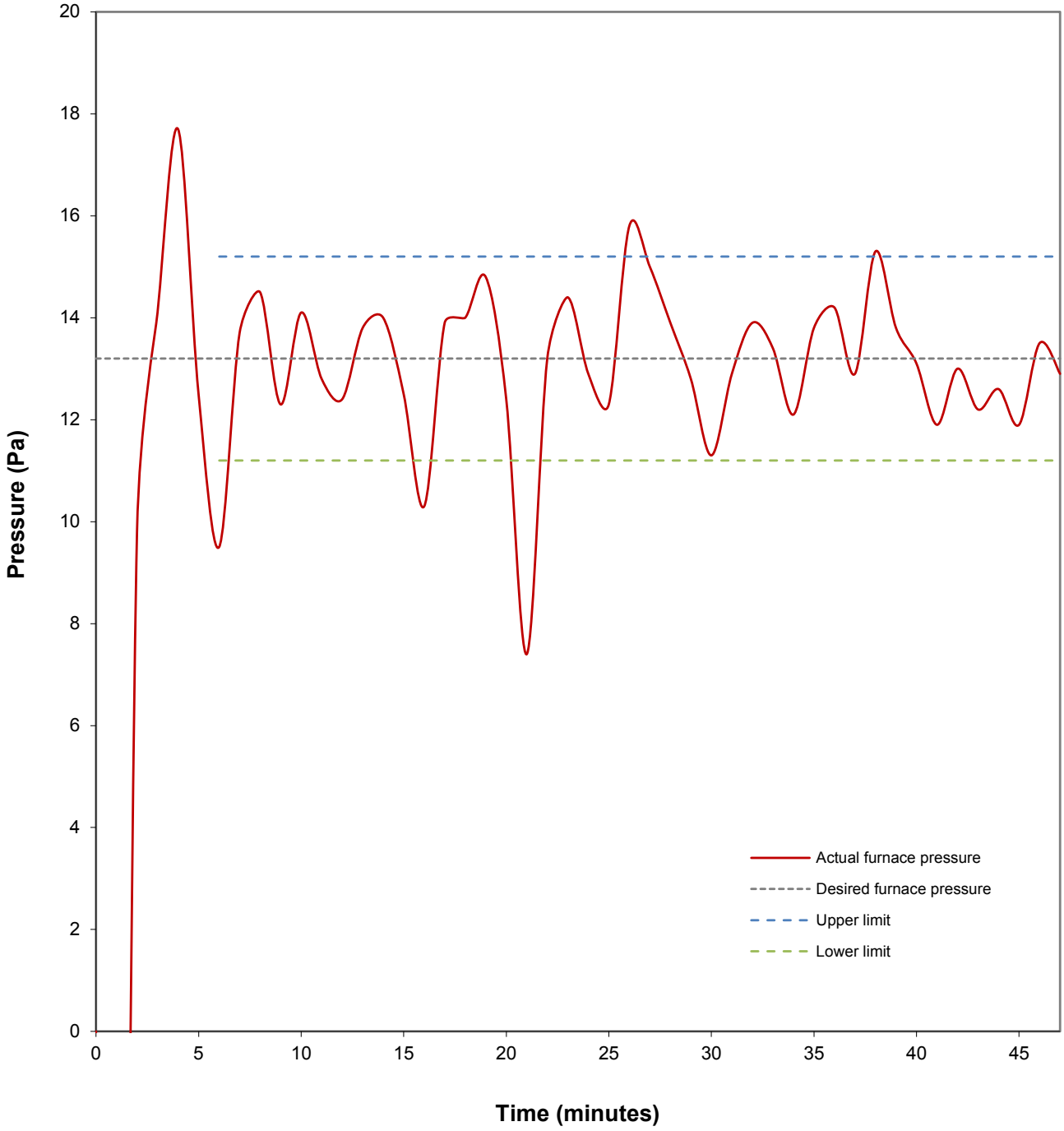
3.1 Furnace temperature

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 + 13.2 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 5 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 21°C.
Ambient temperature ranged between 21°C and 26°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

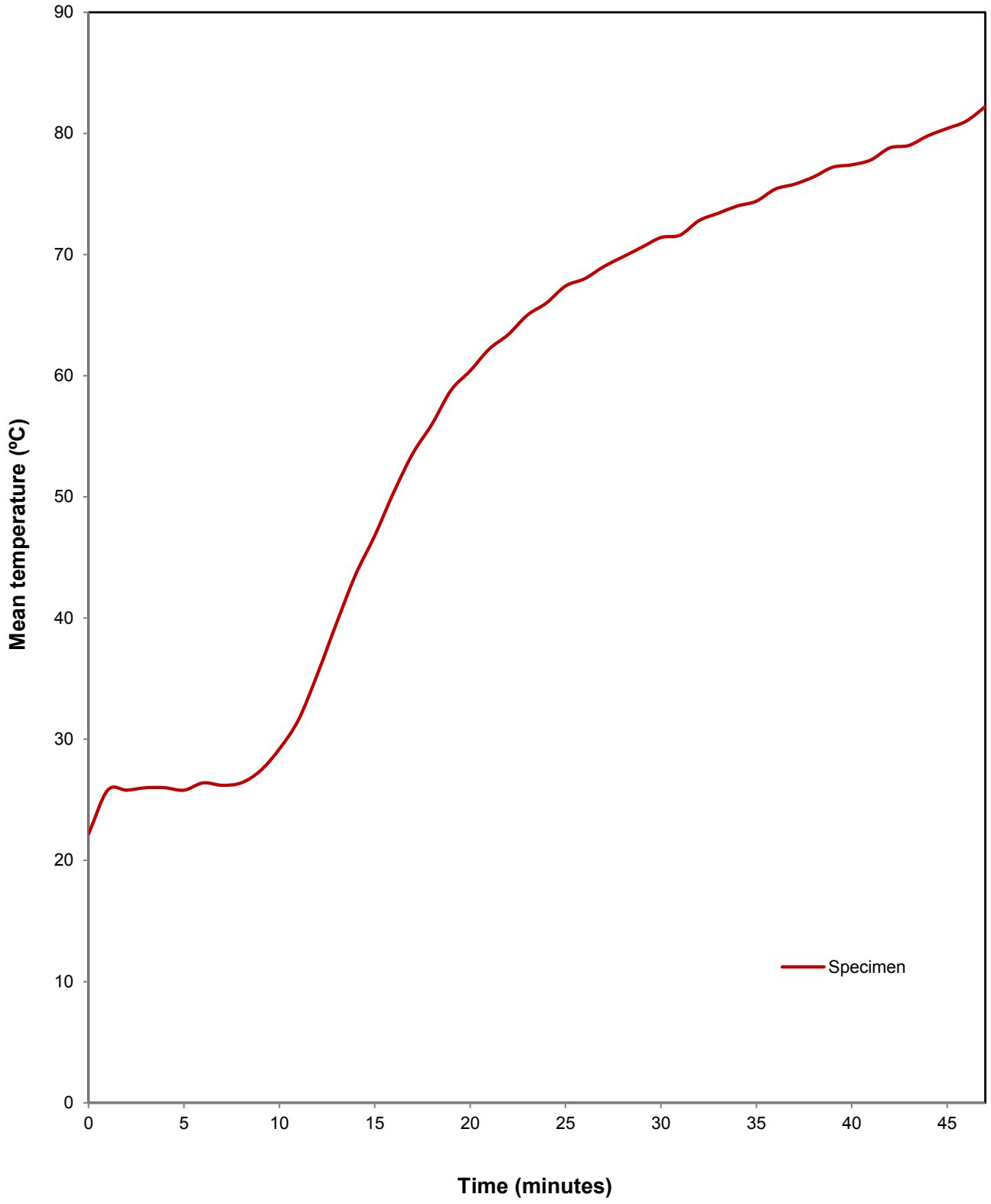
Leaf	Channels 16 to 20	(mean & maximum)
Frame	Channels 21 to 23	(maximum only)
Glazing	Channels 24 to 25	(information only)

Right hand specimen

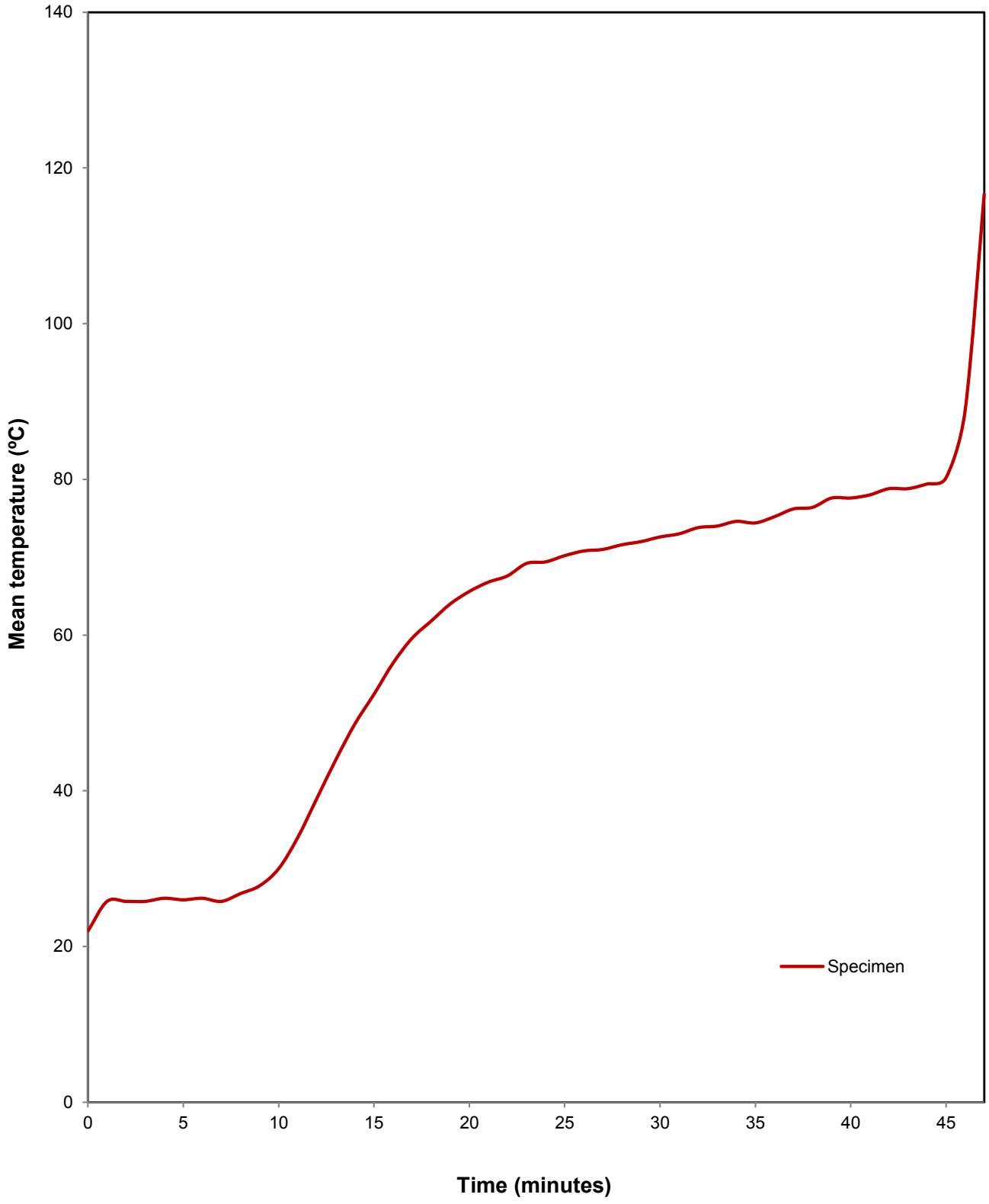
Leaf	Channels 26 to 30	(mean & maximum)
Frame	Channels 31 to 33	(maximum only)
Glazing	Channels 34 to 35	(information only)

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



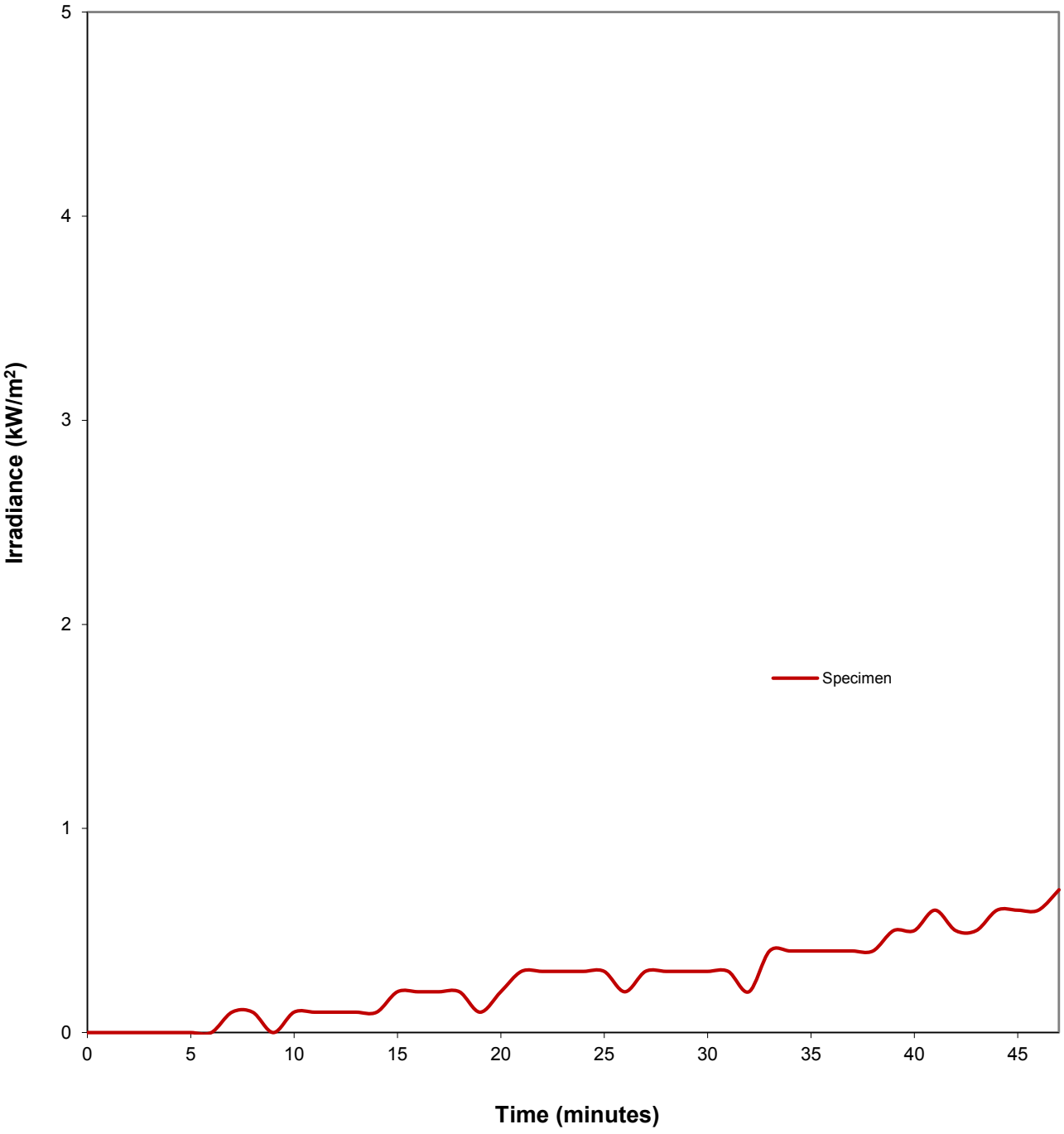
Right hand specimen



3.5 Irradiance

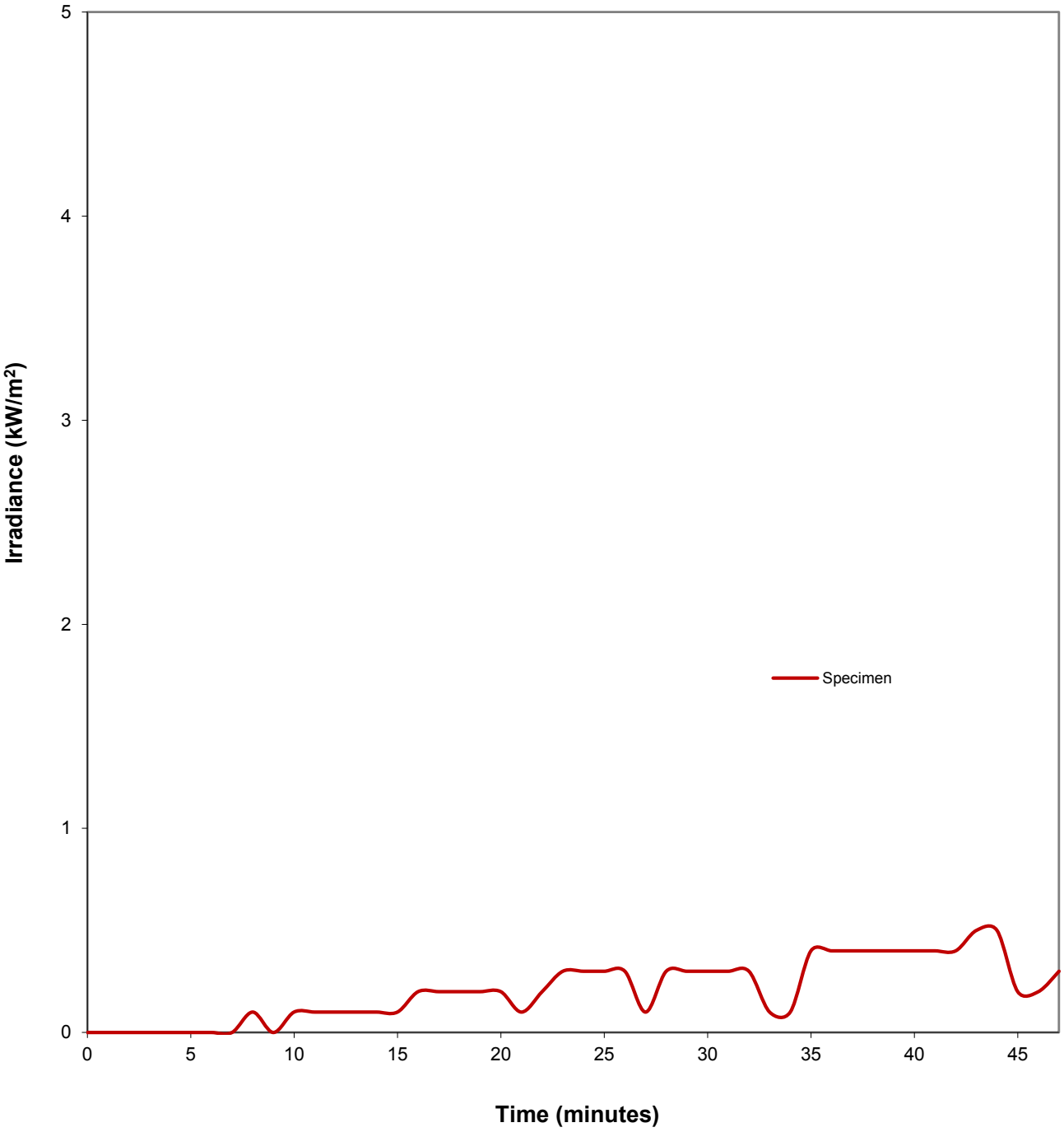
Irradiance from the unexposed face of each specimen was monitored during the test.
A 180° field of view water cooled heat flux meter was positioned with its target 1 m from and parallel to the unexposed face of the specimen at the geometric centre.
The following graphs shows the recorded irradiance/time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

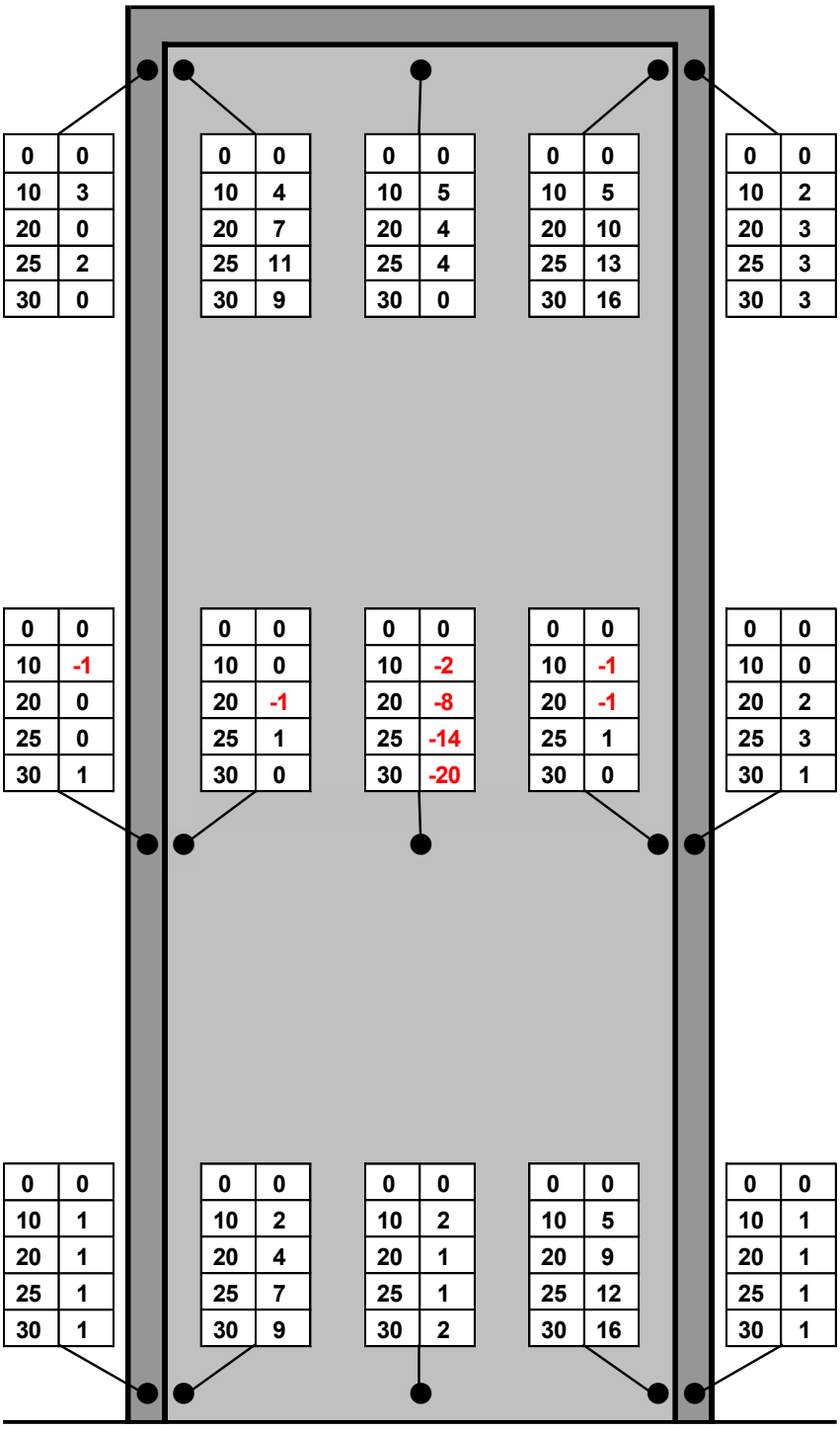


It should be noted that the recorded value of heat flux drops when the field of view is physically interrupted during the measurement of deflection.

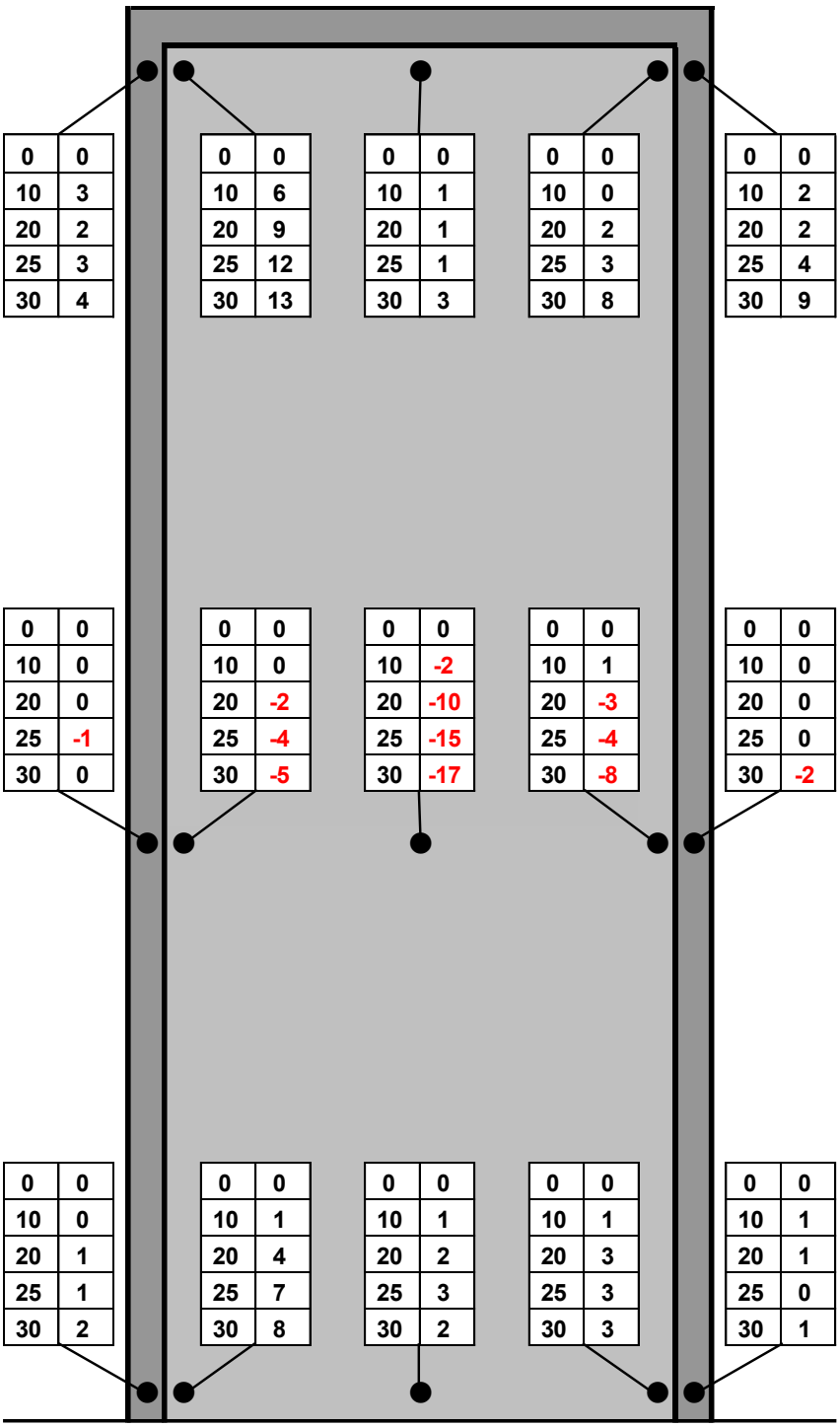
3.6 Deflection

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	Face	Observation
(min:sec)		
00:00		Start of the test.
02:04	U	Cracking is apparent at glazing pane.
03:30	U	Interlayer activated at glazing pane.
05:20	U	Smoke/steam issues at both corners at head of the leaf.
06:10	U	Smoke/steam issues at the bottom corner of the glazing bead.
07:00	U	Smoke/steam issues at the left hand corner of the glazing bead.
10:30	U	Smoke/steam issues at the upper handleset.
13:23	U	Smoke/steam issues at the lower handleset.
14:30	E	Lower handleset missing. All timber fissured.
20:20	U	Upper handleset partially detached.
23:32	U	Smoke/steam issues across the left hand upper glazing bead.
26:55	U	Smoke/steam issues across the left hand lower glazing bead and at the right hand corner of the glazing bead.
28:45	U	Smoke/steam issues across the right hand lower glazing bead.
34:47	U	Smoke/steam issues across the right hand upper glazing bead.
38:20	U	Glowing is apparent at left hand upper glazing bead at mid width.
38:45	U	Glowing is apparent at the top corner of the glazing bead.
39:37	U	Smoke/steam issues at the closing stile/threshold corner of the leaf.
39:42	U	Flash flaming occurs at the closing stile/threshold corner of the leaf.
39:50	U	Glowing is apparent at the closing stile/threshold corner of the leaf.
40:13	U	A cotton pad is applied at the closing stile/threshold corner of the leaf. No failure.
40:25	U	Flaming commences at the right hand upper glazing bead.
40:35	U	**INTEGRITY FAILURE** due to sustained flaming. **INSULATION FAILURE** automatically occurs due to integrity failure.
42:00	U	Failure point sealed at the request of the sponsor.
42:35	U	Glowing is apparent at the closing stile/head corner of the leaf.
42:53	U	A cotton pad is applied at the closing stile/threshold corner of the leaf. No failure.
46:30	U	A cotton pad is applied at the closing stile/head corner of the leaf.
46:45	U	**Further integrity failure** due to ignition of the cotton pad.
47:02	U	Flaming commences at the closing stile/head corner of the leaf.
47:12	U	**Further integrity failure** due to sustained flaming.
47:43		The test is terminated.

Right hand specimen

TEST OBSERVATIONS (E = Exposed face: U = Unexposed face)		
Time	Face	Observation
(min:sec)		
00:00		Start of the test.
01:58	U	Cracking is apparent at the glazing pane.
02:20	U	Interlayer activated at the glazing pane.
06:23	U	Smoke/steam issues through cracks in the glazing pane, at all corners of the glazing beads and at the hanging stile full height.
08:51	U	Smoke/steam issues across the head of the leaf.
13:37	E	All timber fissured.
13:49	U	Smoke/steam issues at both strikes and at the lower handleset.
14:24	U	Smoke/steam issues at the upper handleset.
17:22	U	Lower handleset partially detached.
18:33	E	Lower handleset missing.
28:51	U	Glowing is apparent at the top corner of the glazing pane.
32:50	U	Glowing is apparent above the top corner of the glazing bead.
33:23	U	Flash flaming occurs at the bottom hinge position.
34:00	U	A cotton pad is applied at above the top corner of the glazing bead. No failure.
36:38	U	A cotton pad is applied at above the top corner of the glazing bead.
36:39	U	**INTEGRITY FAILURE** due to ignition of the cotton pad. **INSULATION FAILURE** occurs automatically due to integrity failure.
37:27	U	Failure point sealed at the request of the sponsor.
39:05	U	Flash flaming occurs at the hanging stile/threshold corner.
44:27	U	Glowing is apparent at the closing stile adjacent to the upper latch/lock.
45:11	U	Glowing is apparent at the closing stile adjacent to the lower latch/lock.
47:43		The test is terminated.

5 LIMITATIONS

1. This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested. 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) 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:

M Wadeson
Test Engineer

Report checked by:

Tom Smith
Business Improvement Engineer

Report issued: **5th March 2025**

APPENDIX 1 SPECIMEN CONSTRUCTION

Appendix 1 Table 1 – Left hand specimen

Item	Component	Information
1L	**Frame**	
	Manufacturer:	Wood International Agency Limited
	Reference:	SC24152T
	Description:	A 4-sided finger jointed laminated frame with 10h rebated joints and planted stops. Corner joints affixed using Ø5 x 70 countersunk steel screws, 1No. horizontally through each jamb into the head and 2No. vertically through head to each jamb at 37 centres.
	Fixing to associated construction:	Ø8 x 100 countersunk steel frame fixings, set 140 below head, 200 above base and at 455 centres.
	Density (kg/m^3)	439 to 456**
	Overall size (h x w x d):	2221 x 998 x 70
	Cross section size (w x d):	30 x 70
2L	**Stops**	
	Manufacturer:	Wood International Agency Limited
	Reference:	Standard Frame Stop**
	Description:	European Redwood** stops affixed using 16swg x 32 pneumatically fired steel pins set 30 to 50 from the head corners and at 200 centres.
	Density (kg/ m^3):	584 to 588**
	Overall size (w x d):	12 x 20
3L	**Leaf**	
	Manufacturer:	Wood International Agency Limited
	Reference:	Marksman 44**
	Description:	A particleboard core with lippings and an aperture for glazing.
	Overall size (h x w x t):	2156 x 932 x 44
	Weight (kg):	52.1 including ironmongery
	Sub-components:	
	Core:	
	Manufacturer:	Wood International Agency Limited
	Reference:	Marksman 44**
	Description:	A particleboard core.
	Density (kg/m^3):	515 to 534**
	Overall size (t):	44
	Lippings:	
	Manufacturer:	Wood International Agency Limited
	Reference:	Edgeman EU 550**
	Description:	Eucalyptus Grandis** lippings adhered to all edges of the core using Caberfix D4 Polyurethane adhesive**. Vertical lippings oversail the horizontals.
	Density (kg/m^3):	568 to 587**
	Overall size (w x d):	8 x 44
	Glazing aperture:	
	Description:	Glazing aperture set 180** below the head of the leaf and 180** from the closing stile.

Item	Component	Information
3L Cont	Overall size (h x w):	405** x 405**
4L	**Glazing** Manufacturer: Reference: Overall size (h x w x t): Sight size (h x w):	 Pyroguard UK** Pyroguard 2 EW30/7-1** 400** x 400** x 7** 375 x 375
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 Glazing Bead** Mitred bolection Sapele** beads, set 171 below the head of the leaf and 172 from the closing stile, affixed using 16swg‡ x 38‡ pneumatically fired steel pins set 53 to 57 from internal corners and at 132 to 142 centres. 659 to 683** 415 x 415 18‡ x 20‡ 15
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 Grade 13** 3No. stainless steel butt hinges with bearings set 150, 352 and 1873 from top of leaf to top of blade. 101 x 30 x 3 14 4No. Ø5 x 31 countersunk stainless steel screws. 4No. Ø5 x 31 countersunk stainless steel screws.
7L	**Closer** Manufacturer: Reference: Description: Overall size: Body (h x w x d): Cover (h x w x t): Fixings to leaf: Fixings to frame:	 Arrone AR5200-SE An overhead closer with a mainly stainless steel body with steel sub components and aluminium cover, set 9 below the head of the leaf and at 111 from the hanging stile. 60 x 236 x 38 54.5 x 235 x 0.5 4No. Ø5 x 50 countersunk steel screws. 2No. Ø5 x 25 countersunk steel screws.

Item	Component	Information
8L	**Upper Latch/lock**	
	Manufacturer:	Arrone
	Reference:	AR195-MC
	Description:	A mainly steel tubular latch with steel body, forend, stainless steel forend cover, strike and polymeric dustbox, set with the centreline of the latch bolt 1501 above the base of the leaf.
	Overall size:	
	Forend (h x d x t):	55 x 25 x 2.3
	Body (Ø x w):	22 x 77
	Cover (h x d x t):	56 x 25 x 0.6
	Strike (h x d x t):	70 x 40 x 1.1 including a 34h x 12d tongue.
	Fixings to leaf:	2No. Ø4 x 25 countersunk steel screws.
	Strike fixings:	2No. Ø4 x 25 countersunk steel screws.
9L	**Lower Latch/lock**	
	Manufacturer:	Arrone
	Reference:	AR525-MC
	Description:	A mainly steel tubular latch with steel body, forend, stainless steel forend cover, strike and polymeric dustbox, set with the centreline of the latch bolt 1001 above the base of the leaf.
	Overall size:	
	Forend (h x d x t):	57 x 28 x 2.5
	Body (Ø x w):	24 x 79
	Cover (h x d x t):	58 x 30 x 0.6
	Strike (h x d x t):	70 x 40 x 1.1 including a 34h x 12d tongue.
	Fixings to leaf:	2No. Ø4 x 25 countersunk steel screws.
	Strike fixings:	2No. Ø3 x 15 countersunk steel screws.
10L	**Code lock 1**	
	Manufacturer:	Arrrone
	Reference:	AR195-MC
	Description:	A mainly alloy code lock comprising alloy body with steel sub-components, alloy handle and elastomeric gasket.
	Overall size:	
	Body (h x w x d x t):	
	Exposed face:	141 x 40 x 17 x 1.6
	Unexposed face:	141 x 40 x 21 x 1.6
	Handle (h x w):	
	Exposed face:	75 x 31
	Unexposed face:	45 x 31
	Gasket (h x w x d x t):	151 x 51 x 5 x 1.6
	Fixings to leaf:	2No. M5 x 58 countersunk steel through screws.

Item	Component	Information
11L	**Code lock 2** Manufacturer: Reference: Description: Overall size: Body (h x w x d x t): Exposed face: Unexposed face: Handle (Ø x w): Exposed face: Unexposed face: Gasket (h x w x d x t): Fixings to leaf:	 Arrone AR525-MC A mainly alloy code lock comprising alloy body with steel sub-components, alloy handle and elastomeric gasket. 177 x 48 x 18 x 1.8 177 x 48 x 37 x 1.8 31 x 125 31 x 125 187 x 58 x 5 x 1.8 2No. M5 x 73 countersunk steel through screws.
12L	**Intumescent – Frame** Manufacturer: Reference: Description: Overall size (d x t):	 Intumescent Seals Ltd Therm-A-Seal** A graphite based intumescent strip in PVC holder with self-adhesive on one side, set 15 from the exposed face, fully interrupted at the hinges and both strikes. 15 x 4
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. 10** x 5** (compressed to 3**)
14L	**Intumescent – Hinges** Manufacturer: Reference: Description: Overall size (t):	 Intumescent Seals Ltd** Therm-A-Strip** A monoammonium 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** A monoammonium phosphate based intumescent with self-adhesive on one side, encasing both latch bodies, beneath forends, strikes and encasing the dust boxes. 1
16L	**Smoke seal** Manufacturer: Reference: Description: Overall size (w x d x t):	 Sealmaster** Delta** An elastomeric batwing seal with self-adhesive on one side, adhered to the stops and frame. 12 x 12 x 1
17L	**Fire stopping detail** Description:	 Gaps between the frame and the associated construction were filled with Unifrax Insulfrax LTX and capped using Firewise Intumescent & Acoustic Acrylic Sealant.

Appendix 1 Table 2 – Right hand specimen

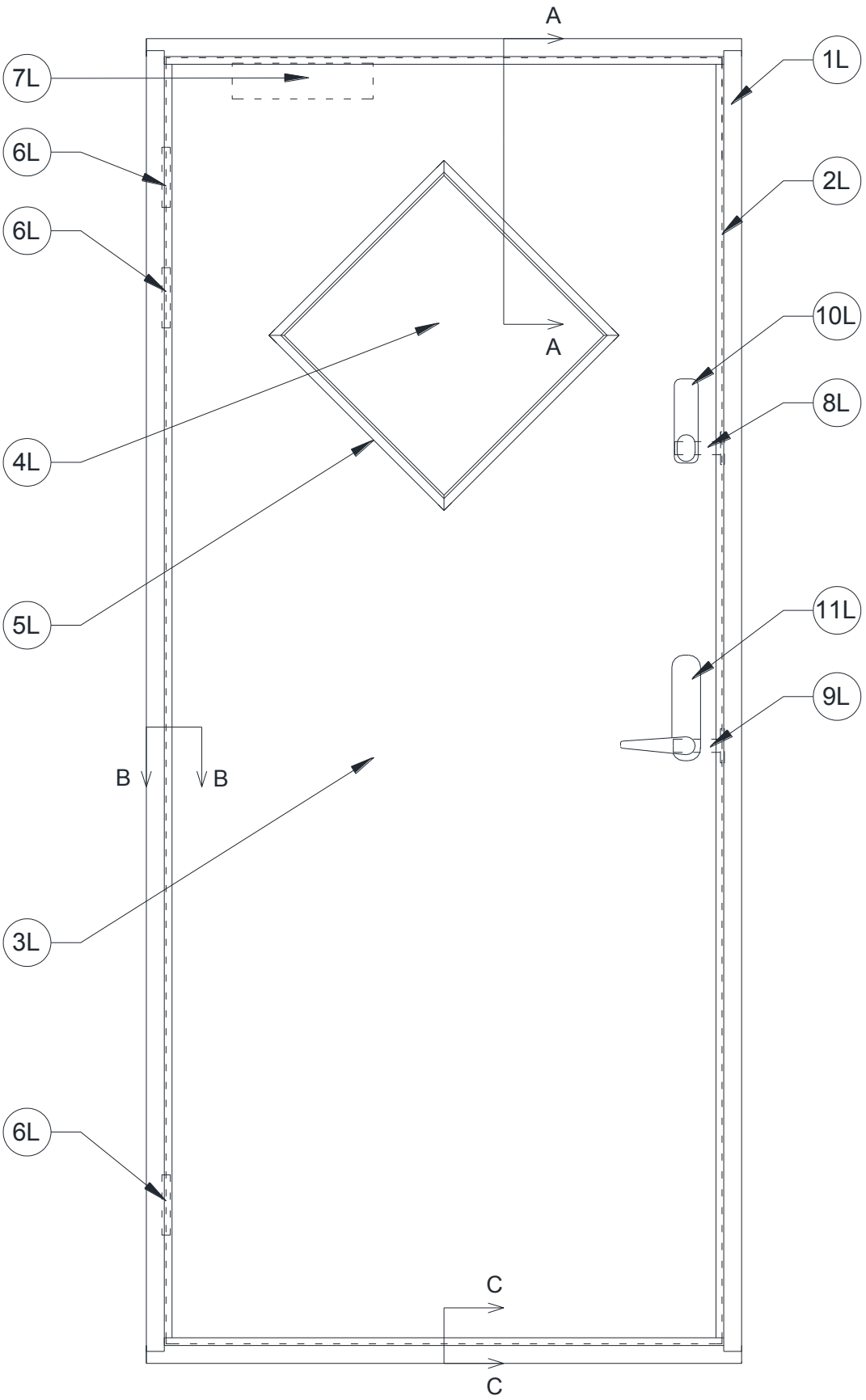
Item	Component	Information
1R	**Frame**	
	Manufacturer:	Wood International Agency Limited
	Reference:	SC24152T
	Description:	A 4-sided finger jointed laminated frame with 10h rebated joints and planted stops. Corner joints affixed using Ø5 x 70 countersunk steel screws, 1No. horizontally through each jamb into the head and 2No. vertically through head to each jamb at 36 centres.
	Fixing to associated construction:	Ø8 x 100 countersunk steel frame fixings, set 140 below head, 200 above base and at 455 centres.
	Density (kg/m^3)	439 to 456**
	Overall size (h x w x d):	2222 x 998 x 70
	Cross section size (w x d):	30 x 70
2R	**Stops**	
	Manufacturer:	Wood International Agency Limited
	Reference:	Standard Frame Stop**
	Description:	European Redwood** stops affixed using 16swg x 32 pneumatically fired steel pins set 30 to 50 from the head corners and at 200 centres.
	Density (kg/ m^3):	584 to 588**
	Overall size (w x d):	12 x 20
3R	**Leaf**	
	Manufacturer:	Wood International Agency Limited
	Reference:	Marksman 44**
	Description:	A particleboard core with lippings and an aperture for glazing.
	Overall size (h x w x t):	2155 x 932 x 44
	Weight (kg):	53.0 including ironmongery
	Sub-components:	
	Core:	
	Manufacturer:	Wood International Agency Limited
	Reference:	Marksman 44**
	Description:	A particleboard core.
	Density (kg/m^3):	515 to 534**
	Overall size (t):	44
	Lippings:	
	Manufacturer:	Wood International Agency Limited
	Reference:	Edgeman EU 550**
	Description:	Eucalyptus Grandis** lippings adhered to all edges of the core using Caberfix D4 Polyurethane adhesive**. Vertical lippings oversail the horizontals.
	Density (kg/m^3):	568 to 587**
	Overall size (w x d):	8 x 44
	Glazing aperture:	
	Description:	Glazing aperture set 188 below the head of the leaf and 178 from the closing stile.
	Overall size (h x w):	405** x 405**

Item	Component	Information
4R	**Glazing**	
	Manufacturer:	Pyroguard UK**
	Reference:	Pyroguard 2 EW30/7-1**
	Overall size (h x w x t):	400** x 400** x 7**
	Sight size (h x w):	375 x 375
5R	**Glazing beads**	
	Manufacturer:	By Dezign Carpentry**
	Reference:	Bolection Glazing Bead**
	Description:	Mitred bolection Sapele** beads, set 173 below the head of the leaf and 170 from the closing stile, affixed using 16swg‡ x 38‡ pneumatically fired steel pins set 53 to 62 from internal corners and at 128 to 132 centres.
	Density (kg/m^3):	659 to 683**
	Overall size (h x w):	415 x 415
	Section size (w x d):	18‡ x 20‡
	Splay angle (°):	15
6R	**Hinges**	
	Manufacturer:	Arrone
	Reference:	AR8182-SSS Grade 13**
	Description:	3No. stainless steel butt hinges with bearings set 150, 351 and 1873 from top of leaf to top of blade.
	Overall size:	
	Blade size (h x w x t):	101 x 30 x 3
	Knuckle size (Ø):	14
	Fixings to frame:	4No. Ø5 x 31 countersunk stainless steel screws.
	Fixings to leaf :	4No. Ø5 x 31 countersunk stainless steel screws.
7R	**Closer**	
	Manufacturer:	Arrone
	Reference:	AR5200-SE
	Description:	An overhead closer with a mainly stainless steel body with steel sub components and aluminium cover, set 5 below the head of the leaf and at 112 from the hanging stile.
	Overall size:	
	Body (h x w x d):	60 x 236 x 38
	Cover (h x w x t):	54.5 x 235 x 0.5
	Fixings to leaf:	4No. Ø5 x 50 countersunk steel screws.
	Fixings to frame:	2No. Ø5 x 25 countersunk steel screws.

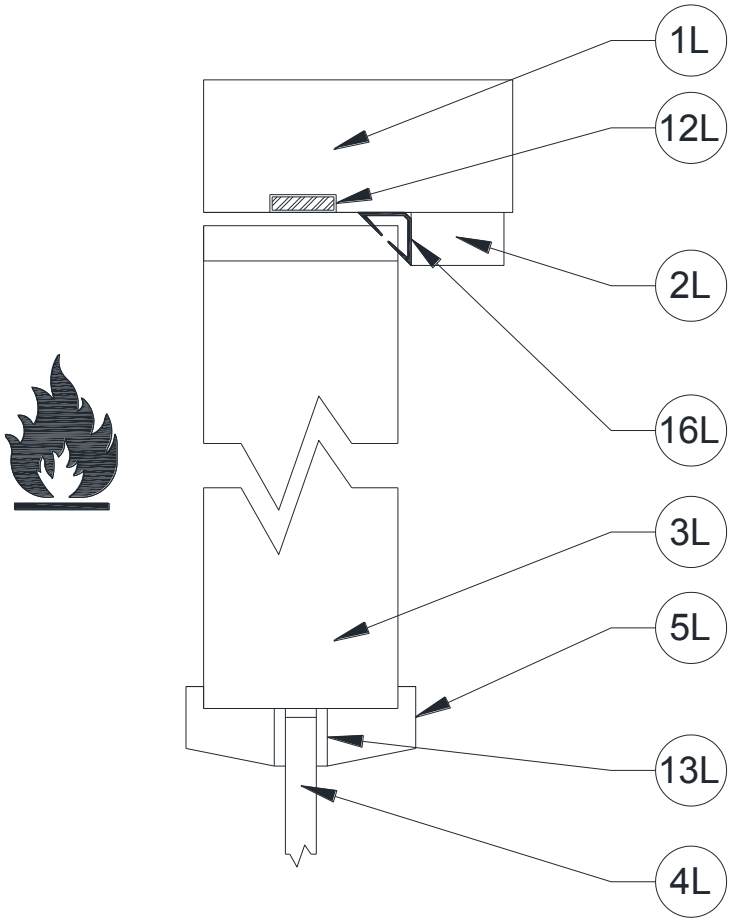
Item	Component	Information
8R	**Upper Latch/lock**	
	Manufacturer:	Arrone
	Reference:	AR195-MC
	Description:	A mainly steel tubular latch with steel body, forend, stainless steel forend cover, strike and polymeric dustbox, set with the centreline of the latch bolt 1502 above the base of the leaf.
	Overall size:	
	Forend (h x d x t):	55 x 25 x 2.3
	Body (Ø x w):	22 x 77
	Cover (h x d x t):	56 x 25 x 0.6
	Strike (h x d x t):	70 x 40 x 1.1 including a 34h x 12d tongue.
	Fixings to leaf:	2No. Ø4 x 25 countersunk steel screws.
	Strike fixings:	2No. Ø4 x 25 countersunk steel screws.
9R	**Lower Latch/lock**	
	Manufacturer:	Arrone
	Reference:	AR525-MC
	Description:	A mainly steel tubular latch with steel body, forend, stainless steel forend cover, strike and polymeric dustbox, set with the centreline of the latch bolt 1001 above the base of the leaf.
	Overall size:	
	Forend (h x d x t):	57 x 28 x 2.5
	Body (Ø x w):	24 x 79
	Cover (h x d x t):	58 x 30 x 0.6
	Strike (h x d x t):	70 x 40 x 1.1 including a 34h x 12d tongue.
	Fixings to leaf:	2No. Ø4 x 25 countersunk steel screws.
	Strike fixings:	2No. Ø4 x 25 countersunk steel screws.
10R	**Code lock 1**	
	Manufacturer:	Arrrone
	Reference:	AR195-MC
	Description:	A mainly alloy code lock comprising alloy body with steel
	Overall size:	sub-components, alloy handle and elastomeric gasket.
	Body (h x w x d x t):	
	Exposed face:	141 x 40 x 21 x 1.6
	Unexposed face:	141 x 40 x 17 x 1.6
	Handle (h x w):	
	Exposed face:	45 x 31
	Unexposed face:	75 x 31
	Gasket (h x w x d x t):	151 x 51 x 5 x 1.6
	Fixings to leaf:	2No. M5 x 58 countersunk steel through screws.

Item	Component	Information
11R	**Code lock 2**	
	Manufacturer:	Arrone
	Reference:	AR525-MC
	Description:	A mainly alloy code lock comprising alloy body with steel sub-components, alloy handle and elastomeric gasket.
	Overall size:	
	Body (h x w x d x t):	
	Exposed face:	177 x 48 x 37 x 1.8
	Unexposed face:	177 x 48 x 18 x 1.8
	Handle (Ø x w):	
	Exposed face:	31 x 125
	Unexposed face:	31 x 125
	Gasket (h x w x d x t):	187 x 58 x 5 x 1.8
	Fixings to leaf:	2No. M5 x 73 countersunk steel through screws.
12R	**Intumescent – Frame**	
	Manufacturer:	Intumescent Seals Ltd
	Reference:	Therm-A-Seal**
	Description:	A graphite based intumescent strip in PVC holder with self-adhesive on one side, set 15 from the unexposed face, fully interrupted at the hinges and both strikes.
	Overall size (d x t):	15 x 4
13R	**Glazing seal**	
	Manufacturer:	Sealmaster**
	Reference:	Intumescent Foam Glazing Tape**
	Description:	An open cell** foam seal with self-adhesive on one side, adhered at the interface of the glazing and beads.
	Overall size (w x t):	10** x 5** (compressed to 3**)
14R	**Intumescent – Hinges**	
	Manufacturer:	Intumescent Seals Ltd**
	Reference:	Therm-A-Strip**
	Description:	A monoammonium phosphate based intumescent with self-adhesive on one side, set beneath all hinge blades.
	Overall size (t):	1
15R	**Intumescent – Latch**	
	Manufacturer:	Intumescent Seals Ltd**
	Reference:	Therm-A-Strip**
	Description:	A monoammonium phosphate based intumescent with self-adhesive on one side, encasing both latch bodies, beneath forends, strikes and encasing the dust boxes.
	Overall size (t):	1
16R	**Smoke seal**	
	Manufacturer:	Sealmaster**
	Reference:	Delta**
	Description:	An elastomeric batwing seal with self-adhesive on one side, adhered to the stops and frame.
	Overall size (w x d x t):	12 x 12 x 1
17R	**Fire stopping detail**	
	Description:	Gaps between the frame and the associated construction were filled with Unifrax Insulfrax LTX and capped using Firewise Intumescent & Acoustic Acrylic Sealant.

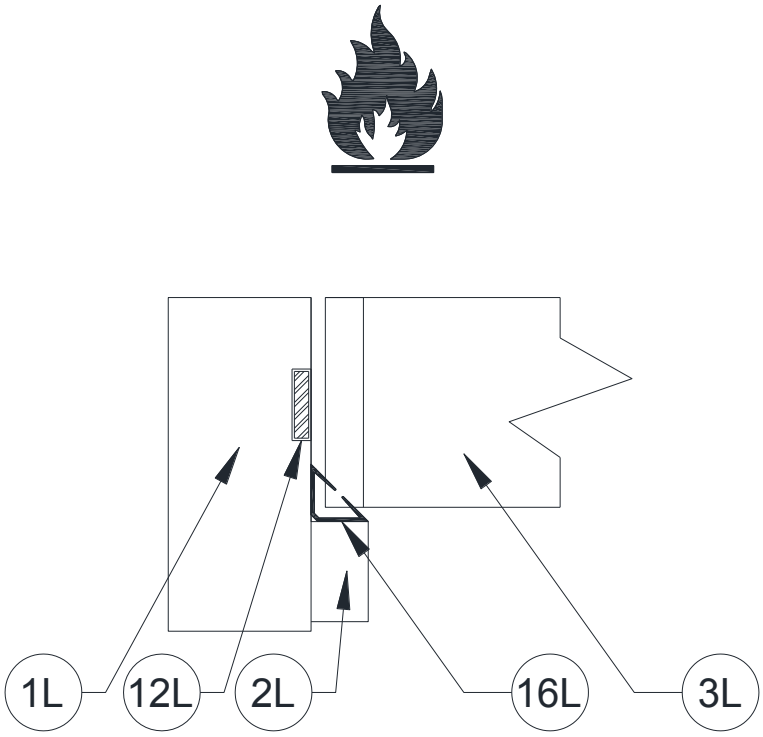
Appendix 1 Figure 1 – Left hand specimen elevation (unexposed face view) incl. hidden detail



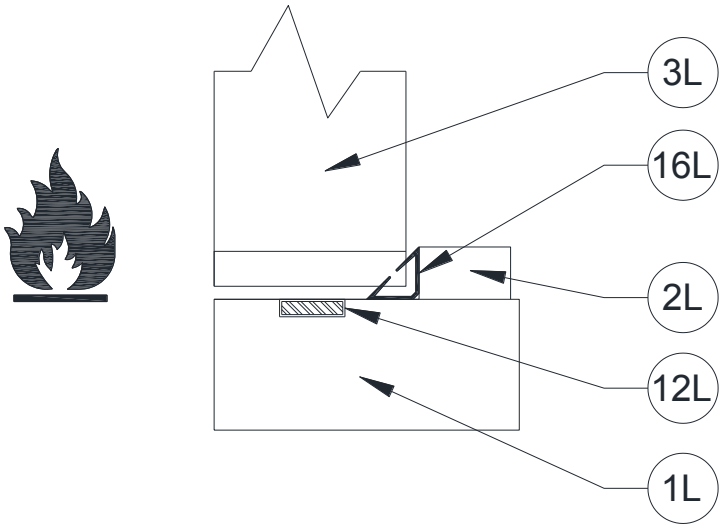
Appendix 1 Figure 2 – Section A – A



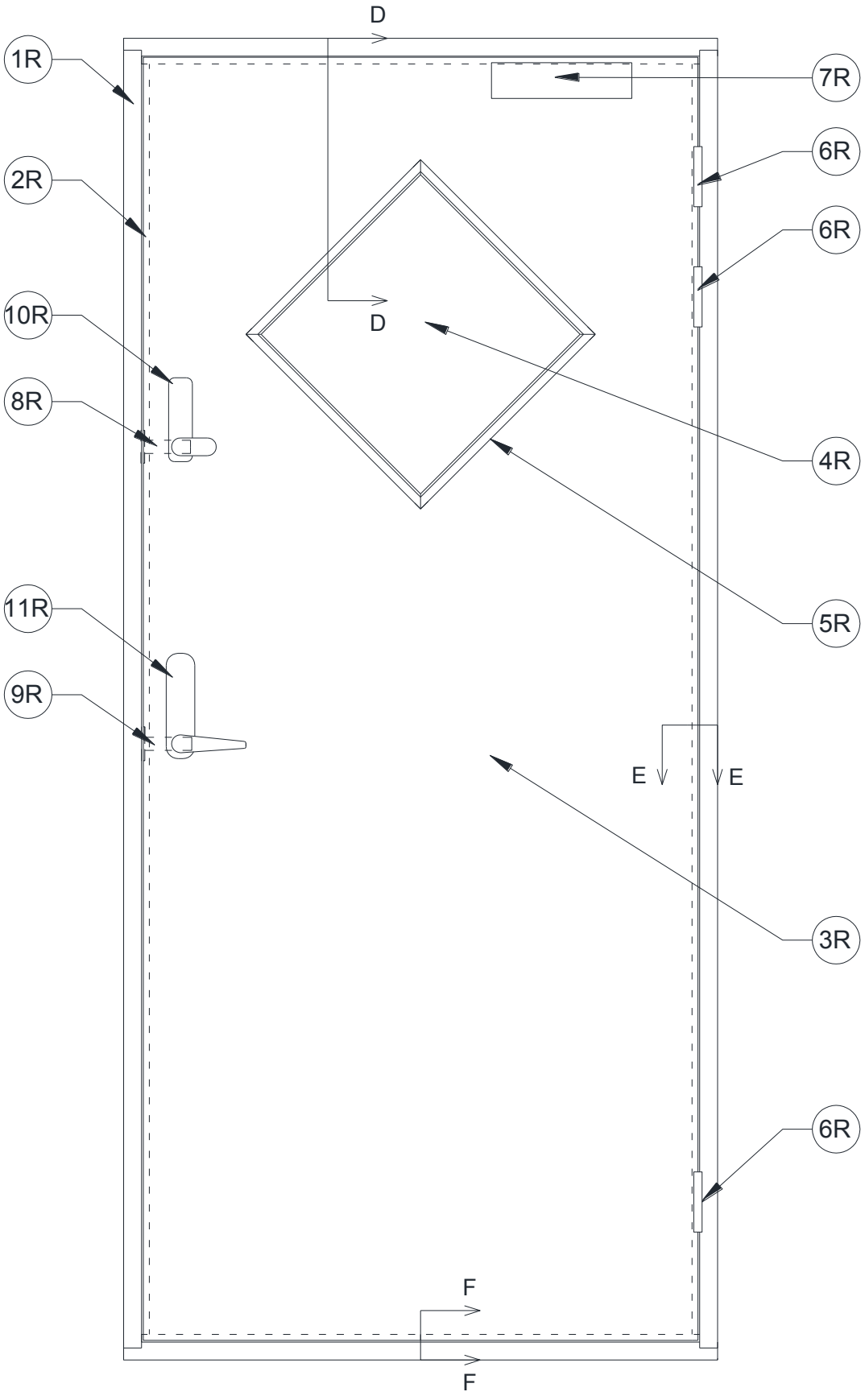
Appendix 1 Figure 3 – Section B – B



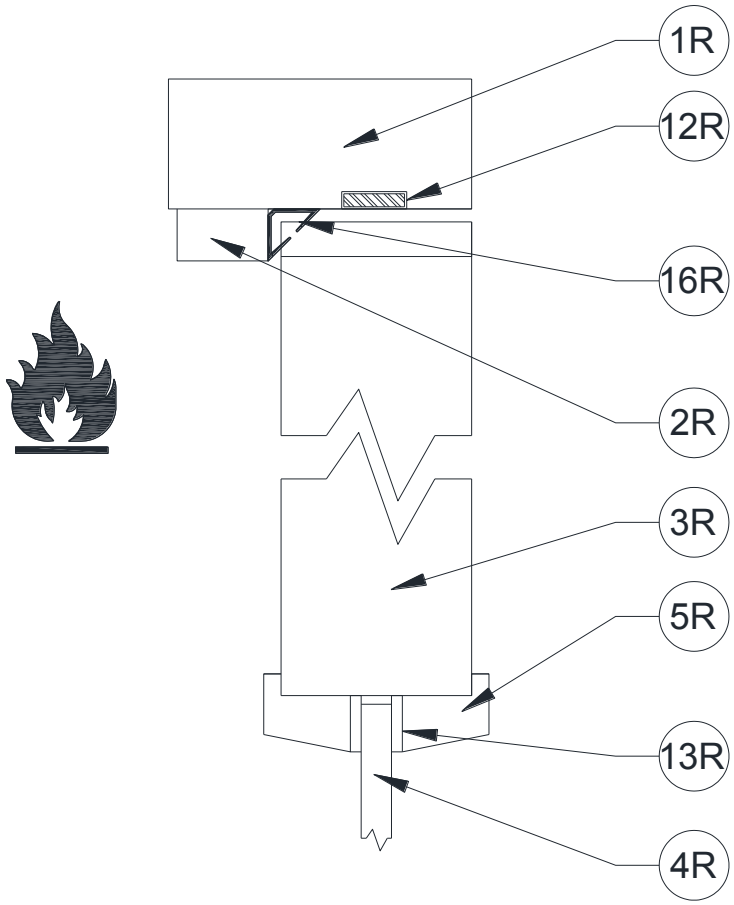
Appendix 1 Figure 4 – Section C – C



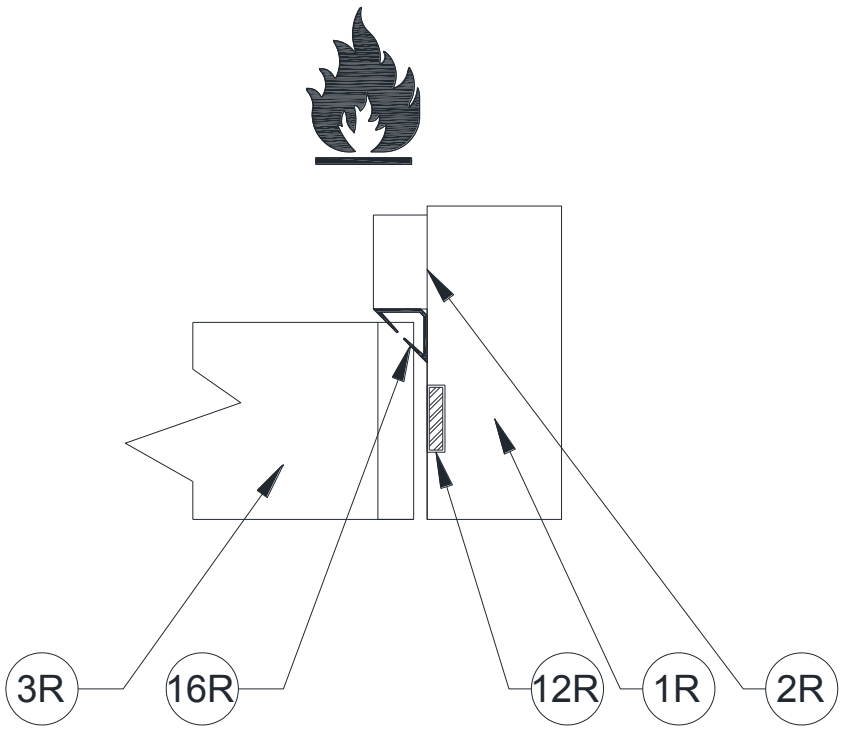
Appendix 1 Figure 5 – Right hand specimen elevation (unexposed face view) incl. hidden detail



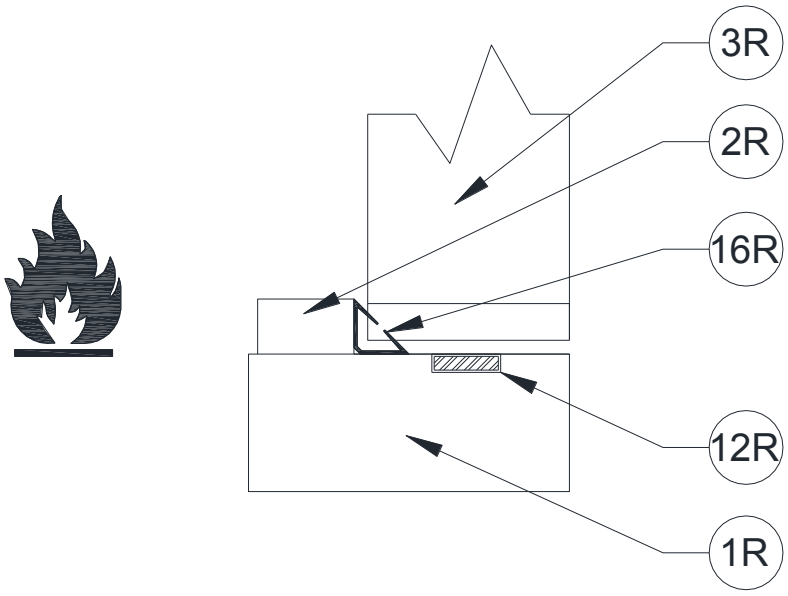
Appendix 1 Figure 6 – Section D – D



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

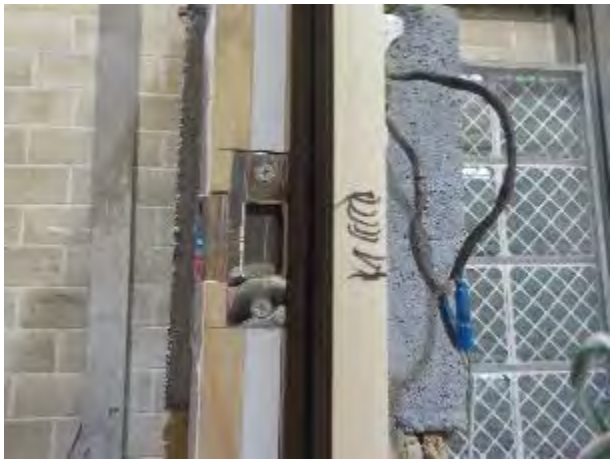


Photo 2.1.7 Left hand specimen

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 Left hand specimen

Photo 2.1.14 Left hand specimen

Photo 2.1.15 Left hand specimen

Photo 2.1.16 Left hand specimen

Photo 2.1.17 Left hand specimen

Photo 2.1.18 Left 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 Right hand specimen

Photo 2.1.26 Right hand specimen

Photo 2.1.27 Right hand specimen

Photo 2.1.28 Right hand specimen

Photo 2.1.29 Right hand specimen

Photo 2.1.30 Right hand specimen

Photo 2.1.31 Right hand specimen

Photo 2.1.32 Right hand specimen

Photo 2.1.33 Right hand specimen

Photo 2.1.34 Right hand specimen

Photo 2.1.35 Right hand specimen

Photo 2.1.36 Right hand specimen

Photo 2.1.37

Appendix 2.2 During test photos

Photo 2.2.1

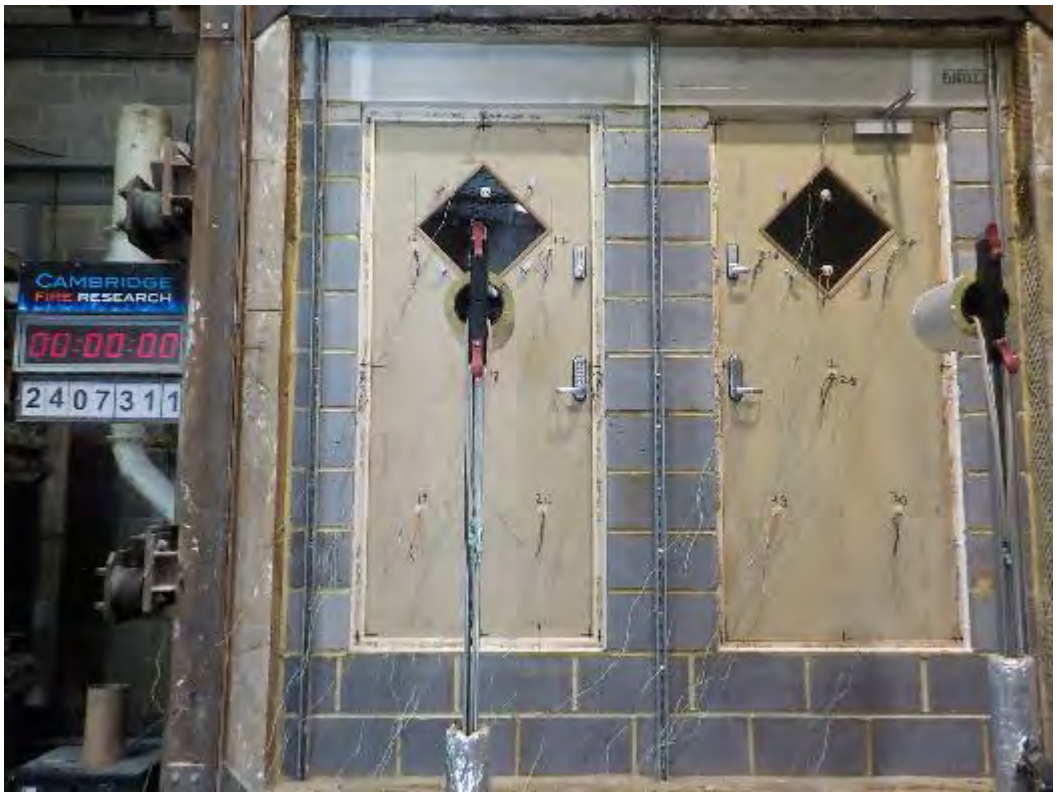


Photo 2.2.2

Photo 2.2.3

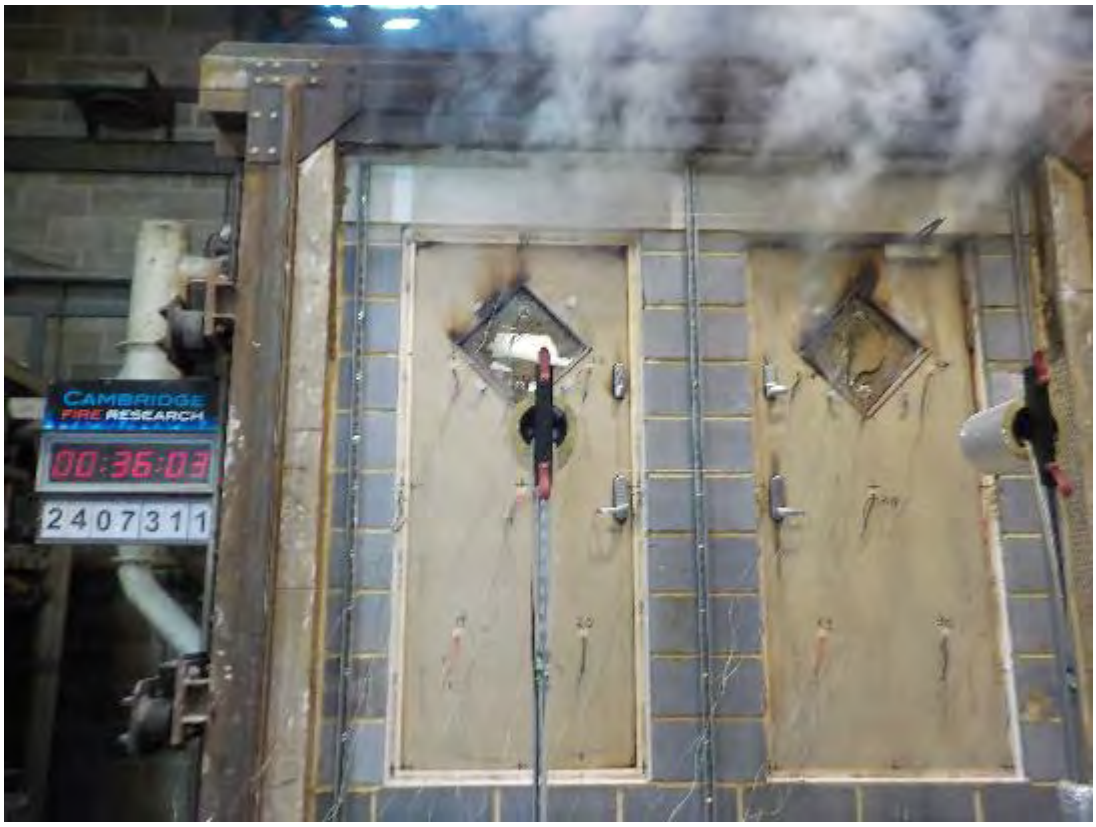


Photo 2.2.4

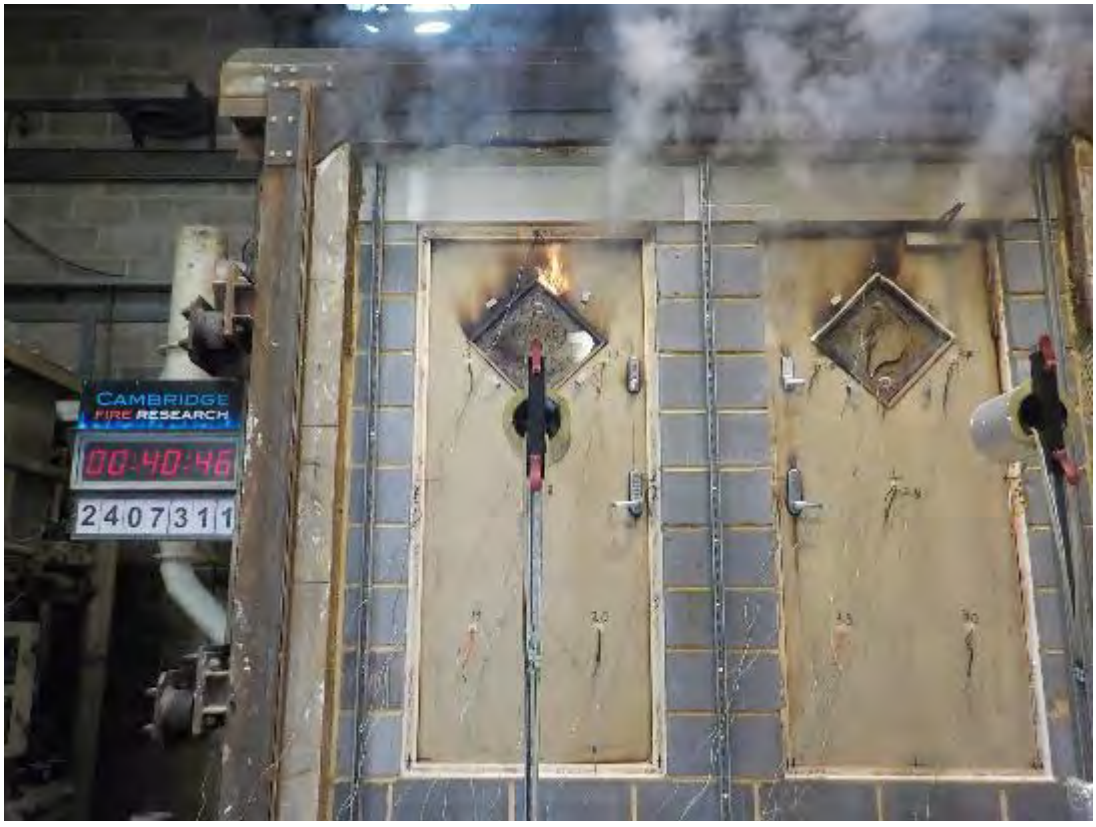
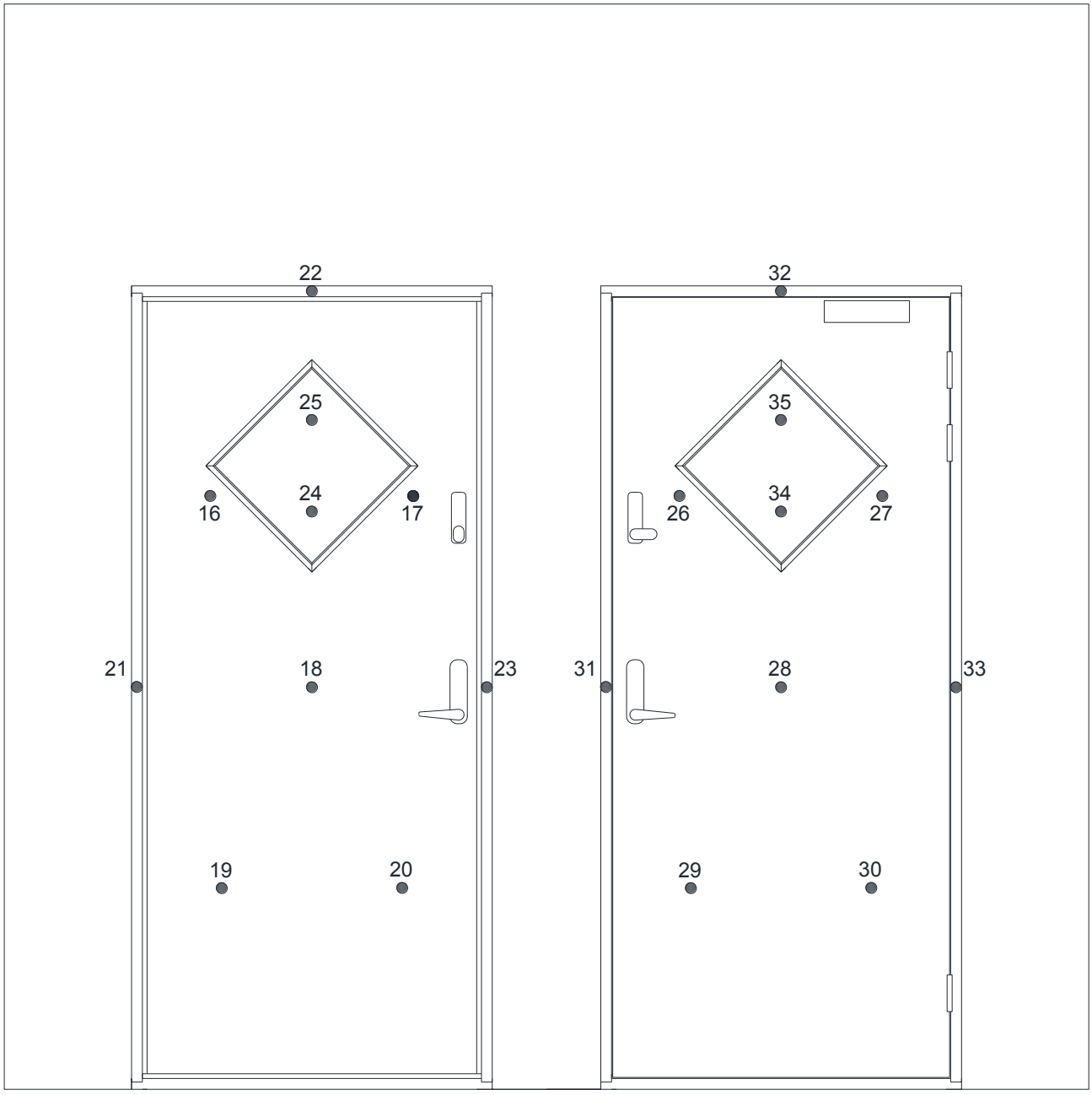


Photo 2.2.5

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 24	T/C 25	T/C 26	T/C 27	T/C 28
min	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C	˚C
0	22	23	22	22	22	21	21	20	24	24	22	22	22
1	26	26	26	26	25	24	25	24	47	48	26	26	26
2	26	26	26	26	25	24	25	24	65	68	26	26	26
3	26	26	26	26	26	24	26	24	99	97	26	26	26
4	26	26	26	26	26	25	26	25	103	108	26	27	26
5	26	26	26	26	25	24	26	24	121	123	26	27	26
6	27	27	26	26	26	25	28	24	138	131	26	27	26
7	26	27	26	26	26	24	27	24	153	144	26	26	26
8	27	27	26	26	26	25	29	25	173	159	27	27	27
9	28	28	27	27	27	25	31	25	192	174	29	29	27
10	31	31	27	29	28	25	31	24	211	188	32	32	29
11	34	34	29	31	30	25	31	24	227	203	38	38	31
12	38	39	31	35	34	25	32	25	248	218	44	43	36
13	43	44	34	39	38	25	34	25	269	234	50	49	40
14	47	49	37	43	42	25	36	25	285	252	54	54	45
15	50	53	40	46	45	25	37	26	299	268	58	58	49
16	54	56	43	50	49	26	39	27	317	283	62	61	54
17	57	60	46	53	52	26	42	28	333	297	65	64	57
18	59	62	49	56	54	26	44	29	349	309	67	66	60
19	62	65	52	58	57	27	46	30	365	321	69	68	63
20	63	67	54	60	58	28	48	31	381	331	70	69	65
21	65	68	56	62	60	29	50	33	398	340	71	70	67
22	66	69	58	63	61	29	52	34	410	350	72	70	68
23	67	70	60	65	63	31	54	35	420	360	73	71	70
24	68	71	61	66	64	32	56	37	426	370	73	71	70
25	69	72	63	67	66	34	57	38	433	378	74	72	71
26	70	72	64	68	66	35	59	39	440	383	74	72	72
27	70	73	66	69	67	36	60	41	447	387	74	73	72
28	71	74	67	69	68	38	62	42	455	389	74	73	73
29	72	74	68	70	69	39	64	44	462	390	75	73	73
30	72	75	69	71	70	40	66	45	471	392	75	74	74
31	72	75	70	71	70	42	68	46	477	394	75	74	74
32	73	75	71	73	72	44	71	48	483	396	76	74	75
33	74	76	72	73	72	45	75	49	489	399	76	75	75
34	74	77	73	73	73	46	79	51	497	401	77	75	76
35	74	77	74	74	73	47	84	52	503	404	77	75	76
36	75	78	75	75	74	49	91	54	507	407	78	76	76
37	76	78	76	75	74	50	98	56	512	410	79	77	77
38	76	78	77	76	75	51	102	57	518	413	80	77	77
39	77	79	77	77	76	53	106	59	525	417	82	78	78
40	77	79	78	77	76	54	108	60	533	422	82	78	78
41	77	80	79	77	76	55	112	62	539	428	82	78	78
42	78	80	80	79	77	56	104	63	544	438	83	79	79
43	78	81	80	79	77	57	101	64	550	445	83	79	79
44	79	81	81	80	78	58	100	66	559	453	84	79	80
45	80	82	81	80	79	60	103	68	566	465	85	80	80
46	80	83	82	81	79	61	109	69	573	499	110	95	81
47	81	85	83	82	80	62	111	71	582	547	188	155	82

Time	T/C 29	T/C 30	T/C 31	T/C 32	T/C 33	T/C 34	T/C 35
min	˚C	˚C	˚C	˚C	˚C	˚C	˚C
0	22	22	21	21	21	24	25
1	26	25	24	25	24	49	47
2	26	25	24	25	24	71	67
3	26	25	24	26	24	98	99
4	26	26	25	28	25	109	103
5	26	25	24	31	25	124	112
6	26	26	25	32	25	133	125
7	26	25	24	31	24	146	132
8	27	26	25	34	25	163	140
9	27	27	25	36	25	180	150
10	29	28	25	38	25	198	161
11	32	31	25	36	25	216	172
12	36	36	31	35	26	233	184
13	40	41	34	38	27	252	198
14	45	45	36	38	28	268	213
15	48	49	37	39	30	283	228
16	52	53	36	41	32	295	244
17	56	56	37	42	35	308	259
18	58	58	38	44	37	318	272
19	60	60	41	46	40	328	285
20	62	62	41	48	42	336	298
21	63	63	44	51	44	344	308
22	64	64	45	53	47	352	316
23	66	66	48	56	52	361	325
24	67	66	49	60	55	368	332
25	67	67	51	65	60	374	339
26	68	68	54	70	65	378	345
27	68	68	57	71	68	381	352
28	69	69	59	74	77	384	358
29	70	69	60	75	81	385	363
30	70	70	62	77	81	388	368
31	71	71	63	80	83	390	371
32	72	72	64	83	86	392	374
33	72	72	65	86	87	394	377
34	72	73	67	91	88	396	379
35	72	72	68	97	88	398	380
36	73	73	70	104	87	402	383
37	74	74	72	109	86	404	384
38	74	74	74	110	84	406	386
39	75	75	77	109	84	409	388
40	75	75	80	105	84	412	391
41	76	76	84	105	83	413	395
42	76	77	88	112	84	415	400
43	76	77	91	71	84	417	400
44	77	77	93	60	86	423	406
45	78	78	95	68	87	433	432
46	79	79	96	96	88	467	517
47	79	79	97	507	90	528	609

x Thermocouple malfunction

CAMBRIDGE FIRE RESEARCH

APPENDIX 5 INDEPENDENT REPORT

bmtrada
Proud to be part of element

SAMPLING VISIT REPORT

Company Name	
Establishment No.	
BM TRADA Approved Body ID: **1224**	

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

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

Requirement	**Evidence / Comments**
Opening Meeting (names of those present)	Neil Harrison, Xavier Damailly, Mike Chorlton
Contract Reference	SC24124 B-2
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Linex Normapan recipe " " specification.
Description of product(s) sampled	44mm Particleboard - Linex Normapan E1
Product identification / reference numbers / codes	Linex Normapan E1 (Wood Int'l name Marksman)
Batch number(s)	Batch Ref 925668/001 (930173/001)
Date of manufacture	Masterboard wk 21 2023, Cut to size 11/06/24
Quantity of stock and size of sample(s) taken	24 N° Blanks at 2440 x 1220 x 44
Traceability of material records ie Purchase Orders and delivery notes	Board recipe, production inspection & test. All materials purchased in raw form & processed
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	Each blank marked SC24124 B-2 + Sequential number 1, 2, 3 etc
Confirmation of minimum mandatory video/live checks undertaken	☐ Glazing assembly (where applicable) ☐ Finished doorset with markings ☑ Hardware prep and fitting (where applicable) ☑ Sampling pack discussion
Details of any further FPC processes witnessed during the visit.	Quality management system in place with defined stages for each process and individual records and methods defined.
Density nominal 535 kg/m³ Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity. Specification held on file by BM TRADA	Raw material processing, cleaning, drying and grading. Glue recipe and dosing rate. Layer forming, pre-pressing and pressing. Board cooling, cutting and sanding. Packing and labelling. Q.C checks made throughout production
State any items from the Technical Specification / FoA that were **not** witnessed and require further lab sampling	☐ Side screen / overpanel ☐ Handles ☐ Other (see tech spec marked with 'not seen') ☑ Door closer ☑ Frame re-assembly
Confirm any clauses within the Technical Specification that were found to be different on the sampled product/s. ***Non-conformances may be raised for pre-cert and audit test sampling***	NONE
Closing Meeting (names of those present)	Neil Harrison, Xavier Damailly

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

Company Representative Name (Print)	**Company Representative Position**
XAVIER DEMAILLY	Quality manager
BM TRADA Representative Signature	**Company Representative Signature**

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

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

Location where sampling was conducted if different from Head Office Address	Visit Date	BMT Representative
By Dezign Carpentry, Unit 11B ERW Las, Colomendy Ind Est, Denbigh LL16 5TA	20/08/2024	Michael Chorlton

Requirement	Evidence / Comments
Opening Meeting (names of those present)	Mr Neil Harrison / Mr Shaun Harrison
Contract Reference	SC24152T
Technical Specification document / FoA reference Photographs to be taken of all critical areas highlighted in the Technical Specification	Technical Drawing: No drawing provided Technical Specification: WIAD- MMN44-ITT-344-RD01 Rev - Marked up technical specification made by the sampler and must be read in conjunction with this sampling report.
Description of product(s) sampled	Single acting single leaf doorset incorporating Marksman 44 door cores, lipped on 4 edges with hardwood timber and hung on 3No butt hinges in an engineered softwood frame, operated by overhead face fixed closer and secured with 2 different Digital Pad locking systems and finished with diamond orientation vision panel.
Product identification / reference numbers / codes	N/A
Batch number(s)	N/A
Date of manufacture	In stages between 17/07/24 and 24/07/24 with final review 20/08/24
Quantity of stock and size of sample(s) taken	2No. Doorsets at 999mm wide x 2222mm high.
Traceability of material records ie Purchase Orders and delivery notes	Items with traceability: Door blank Sampled SC24124B. Frame intumescent seals. Hinges, fixings and intumescent. Door closers. Mechanical push button lock 1 & 2. Glass manuf and type. Items with limited or no traceability: Door stop fixings. Frame joint fixings. Frame to supporting construction fixings. Smoke seal to frame type. Frame fire stopping and sealing. Lipping and frame tradename and material properties. Glazing intumescent manuf and type. **Please send Sampling Pack to High Wycombe Laboratory FOA Connor Payne.**
Example of sampler's markings applied to the product(s) (contract reference, signature of client, date of manufacture)	
Confirmation of minimum mandatory video/live checks undertaken	✓ Glazing assembly (where applicable) ✓ 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 joinery tools and methods. Dimensional checks made throughout manufacture.
Determine the essential characteristics of the product and confirm the details of in-process checks conducted on the sample to ensure conformity.	Door leaf specification. Hardware selection, preparation, intumescent protection and fixings. Glazing selection, preparation, intumescents and fixings.
State any items from the Technical Specification / FoA that were **not** witnessed and require further lab sampling	~~☐ Side screen / overpanel~~ ✓ 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***	Sampler Notes: Areas in Green = verified during sampling Areas in Blue = Additional sampler notes or corrections Areas in Yellow = Areas without verification or if additional evidence may be required. Areas in yellow with Asterisk * = Will be reported "As stated by customer" Areas in Red = To be conducted in or by the lab.
Closing Meeting (names of those present)	No formalised closing meeting possible. Marked up TST and draft sampling report sent for approval and signing.

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

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.