REPORT NUMBER CFR1608261

CAMBRIDGE FIRERESEARCH

FIRE RESISTANCE TEST IN ACCORDANCE WITH BS EN 1634-1:2014

Sponsor:	Exitex Limited
Address:	Mountpleasant Dundalk County Louth Ireland
Date of test:	26th August 2016

Results:

Test duration:	65 minutes (discontinued at the request of the sponsor)
Integrity:	
Cotton pad:	65 minutes no failure, the test having been discontinued
Gap gauge:	65 minutes no failure, the test having been discontinued
Sustained flaming:	54 minutes
Insulation:	54 minutes

Summary of test specimen:

Single acting timber based double leaf doorset, tested unlatched and the left hand leaf bolted.

Left hand leaf :
Leaf size (mm): 2100 high x 1000 wide x 54 thick

Right hand leaf :
Leaf size (mm): 2100 high x 1000 wide x 54 thick

Cambridge Fire Research Ltd Brewery Road Pampisford Cambridge CB22 3HG
Tel. +44 (0) 1223 834752 **Fax.** +44 (0) 1223 837208 **Email.** testing@cambridge-fire.co.uk

UKAS TESTING 4319

Registered in England No. 5602112 Registered Office 5 High Green, Great Shelford, Cambridge, CB22 5EG

CAMBRIDGE FIRERESEARCH

0 CONTENTS PAGE

1 PREPARATION FOR TESTING

1.1 Specimen conditioning

The specimen components were at Cambridge Fire Research and during the 3 days before the test they were stored, surveyed and prepared for testing. For this duration the temperature and relative humidity were measured and recorded within the range of 22 to 29°C and 33 to 76% respectively.

1.2 Supporting construction

Cambridge Fire Research installed a standard flexible wall supporting construction in accordance with EN1363-1:2012 (intended fire resistance EI60, Group B). This provided an aperture of 2162 mm high x 2120 mm wide to accommodate the specimen.

Both vertical edges of the supporting construction had a free edge. In accordance with the test standard, continuity of the floor was simulated by the installation of a solid non-combustible floor 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 specimen was constructed by the sponsor.

1.4 Specimen verification

Cambridge Fire Research carried out a detailed survey of the specimens 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 specimen into the supporting construction. The specimen was asymmetrical and fitted such that the leaves opened towards the heating conditions of the test. The right hand leaf was unlatched and the left hand leaf was bolted prior to the start of the test.

The specimen was affixed to the supporting construction as described in Appendix 1.

1.6 Specimen selection

Cambridge Fire Research was not involved in any selection or sampling procedures for the tested specimen.

2 PRE-TEST MEASUREMENTS AND SETTING

2.1 Mechanical pre-test conditioning

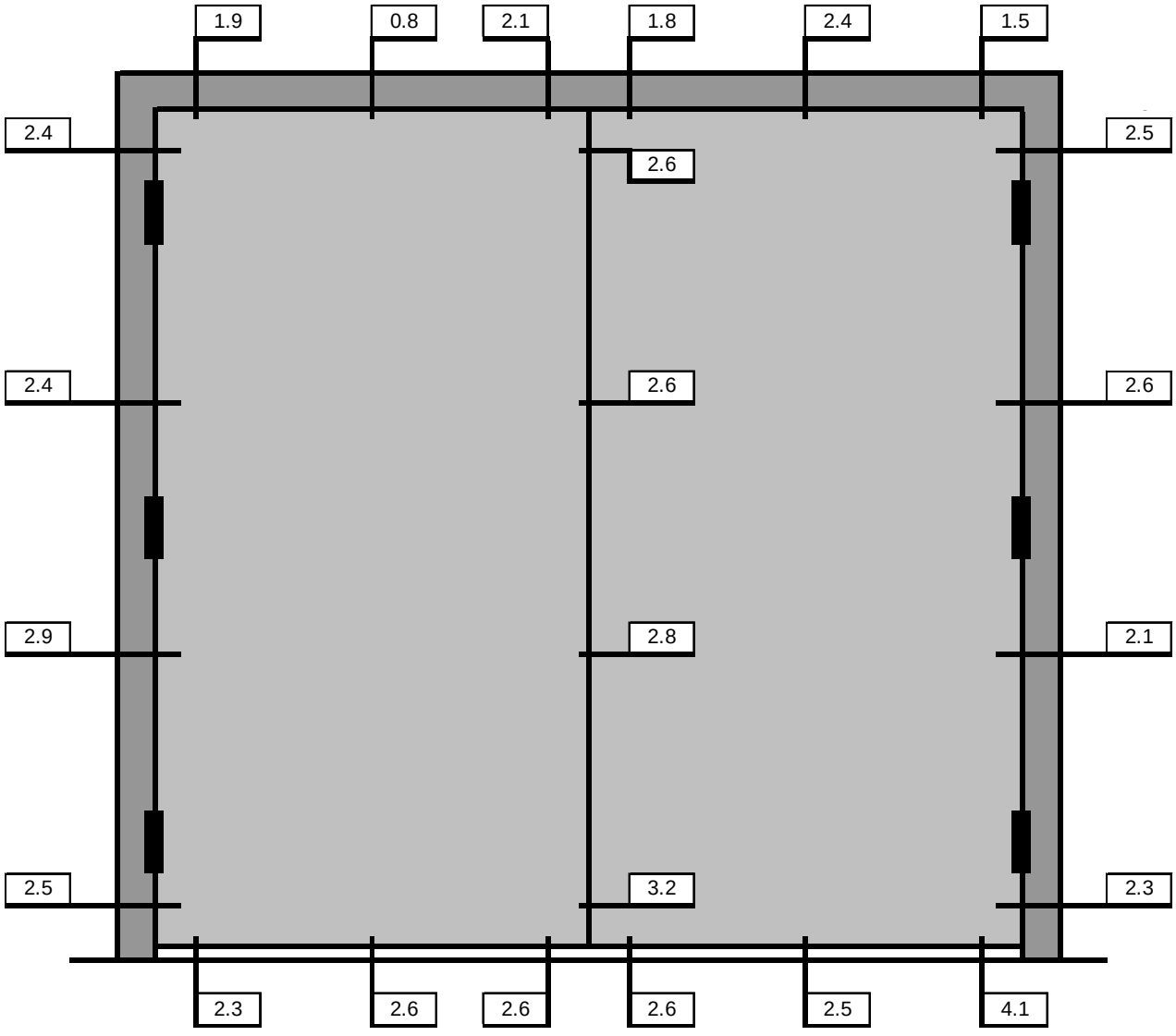
Mechanical pre-test conditioning was carried out in accordance with BS EN 14600:2005. This included fully opening each leaf for 25 cycles to check operability and checking that the closing speed was within the required parameters. It was also verified that the leaf would fully close from 10° open.

2.2 Gap measurements

Leaf edge to frame gap

The primary gaps between the leaf edges and the frame, between the meeting stiles and between the base of the leaf and the floor were measured on the exposed face prior to the start of the test.

The following figures show the position at which the measurements were made and the recorded gap (mm) at those positions.

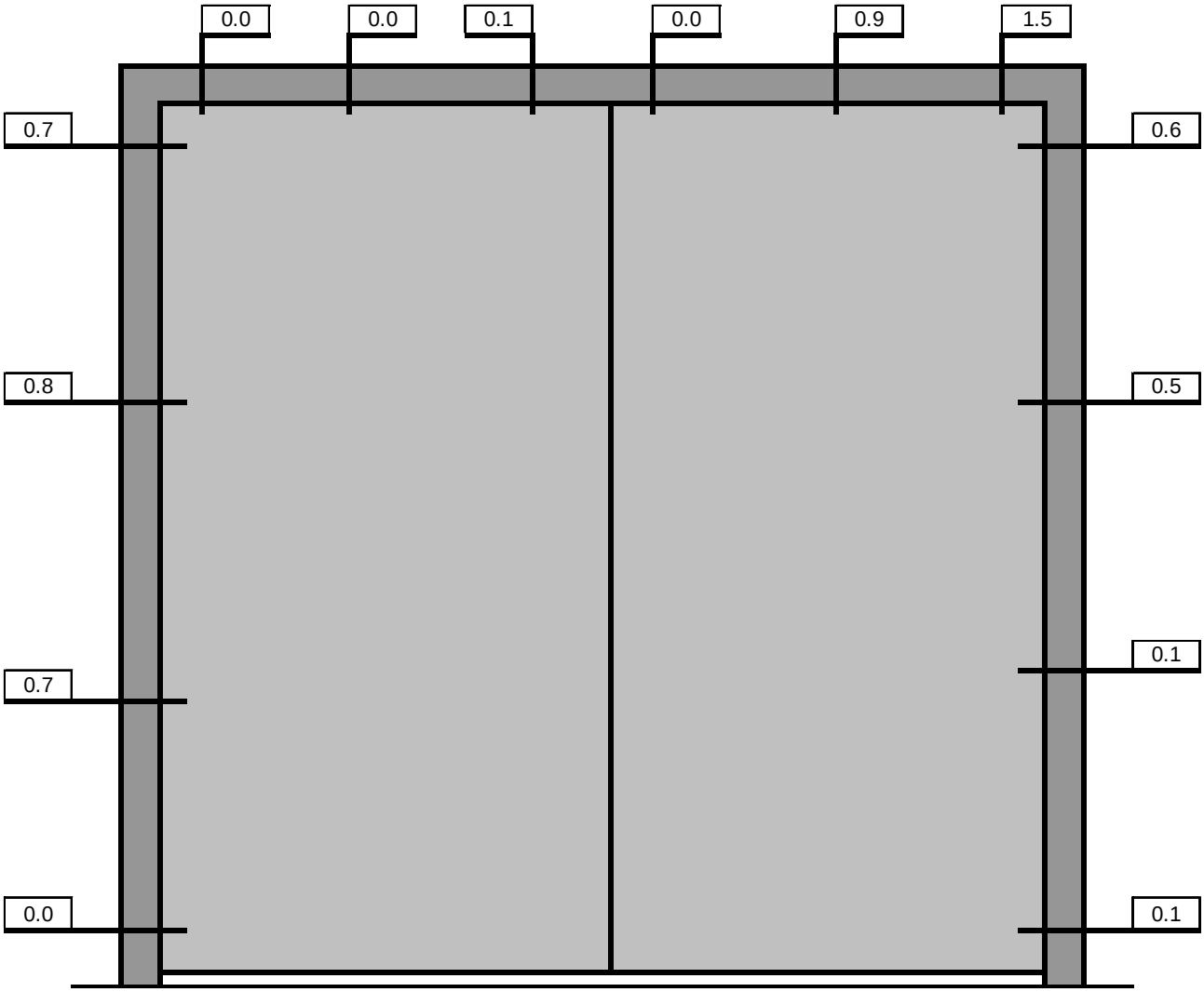


Maximum gaps in practice
The maximum permitted gaps in practice are (EN 1634-1:2014 sect 13.3.3.2.5):

Primary gap region	Gap width (mm)
Head	4
Jambs	4.5
Threshold	5.5
Meeting stiles	5

Leaf face to stop gap
The gap between the face of the leaves and the stop of the frame was also measured on the unexposed face prior to the start of the test.

The following figures show the position at which the measurements were made and the recorded gap (mm) at those positions.



2.3 Retention force measurement

The retention force was measured in accordance with the test standard. The measured force to open the left hand leaf with the force gauge operating against the direction of closing was 71.1 N. The measured force to open the right hand leaf with the force gauge operating against the direction of closing was 83.6 N. The handle position for both leaves was taken as 945mm from the centreline of the hinge

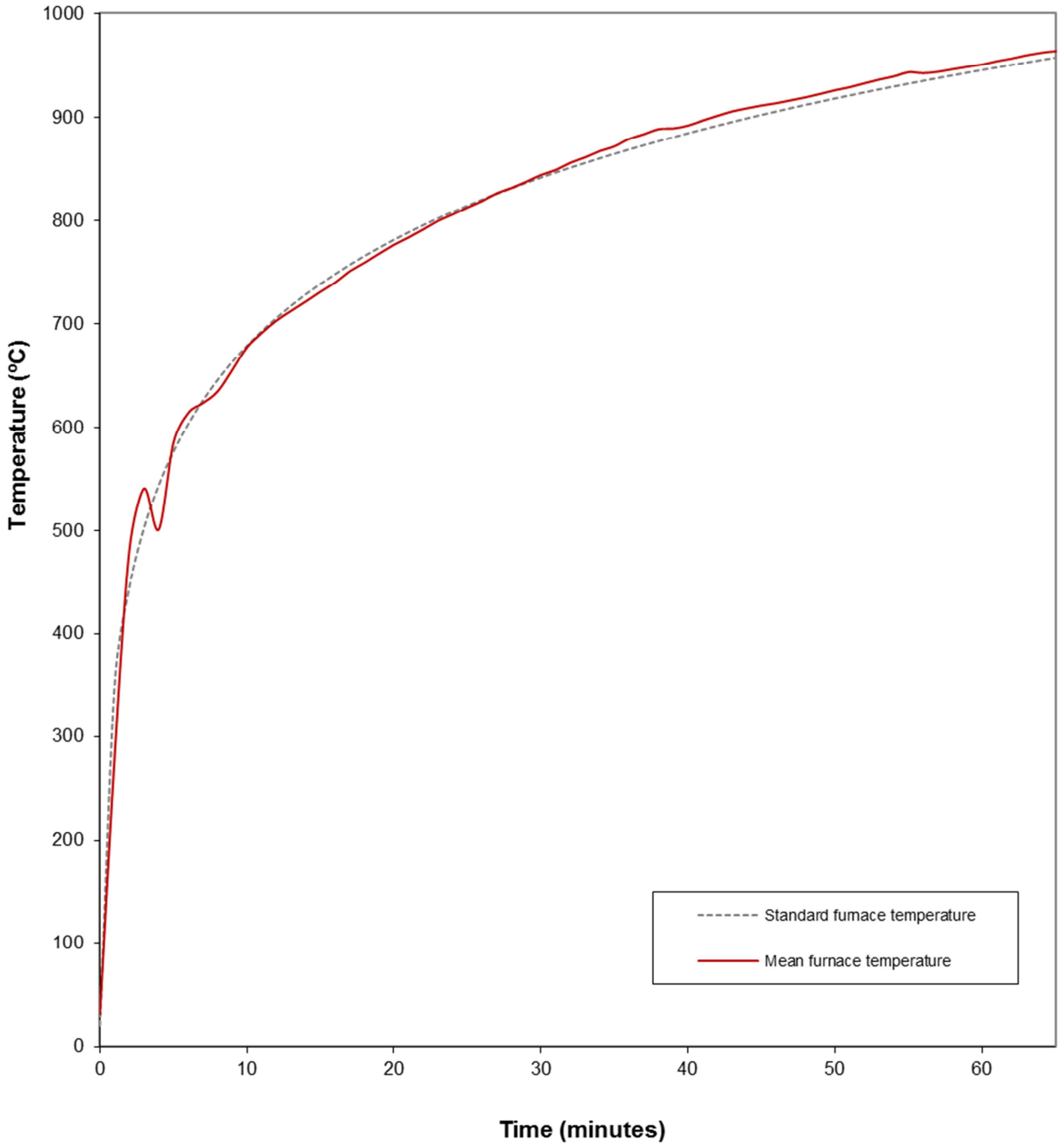
2.4 Final setting

Prior to the start of the fire test, the doorsets were subjected to a final closing involving opening the leaves to a distance of approximately 300 mm and allowing them to close by the closing devices.

3 TEST CONDITIONS, INSTRUMENTATION AND MEASURING

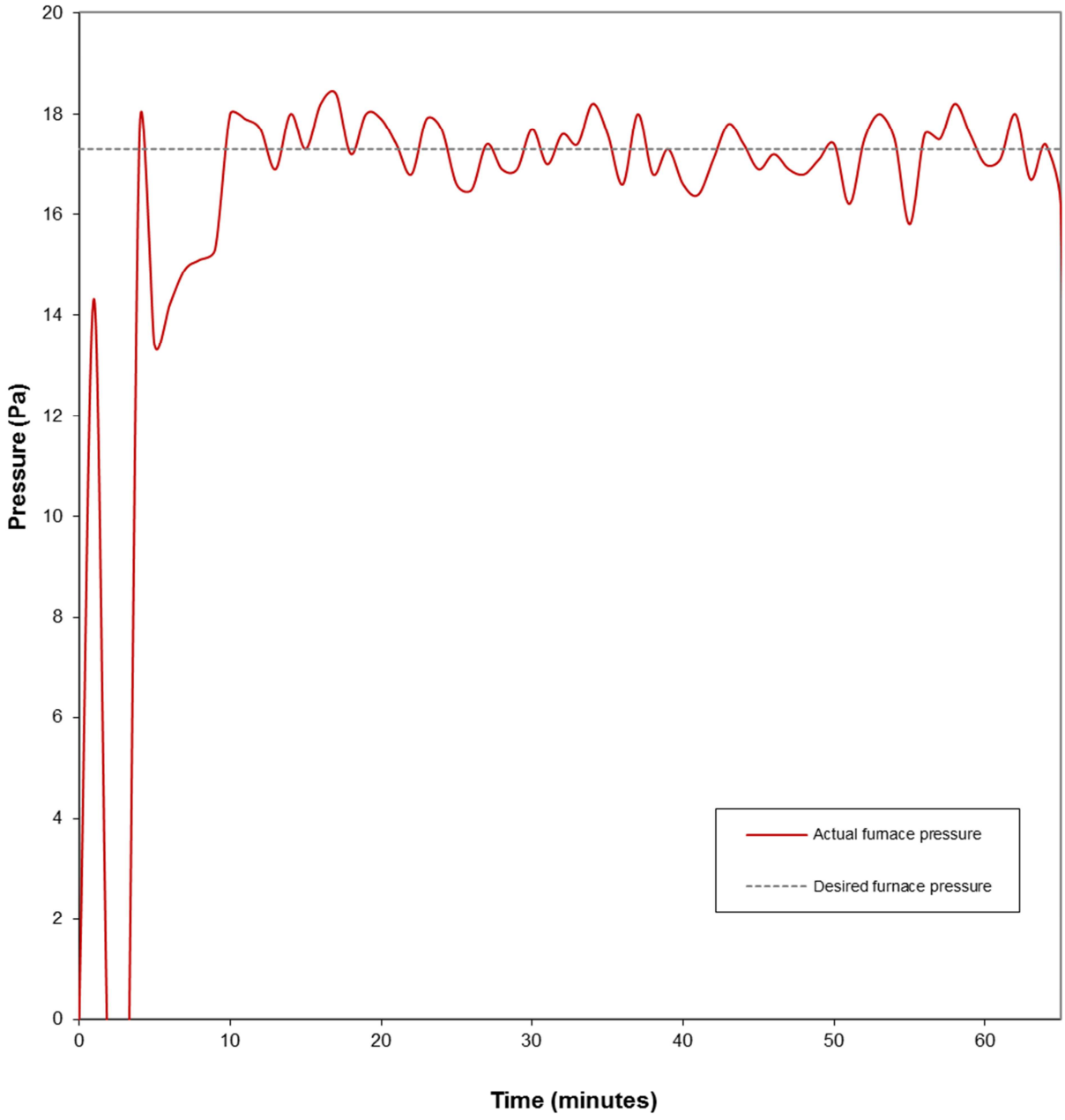
3.1 Furnace temperature

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 + 17.3 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 0.5 m above the notional floor level. The furnace pressure was controlled within the tolerances permitted in the test standard. 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 24°C.
Ambient temperature ranged between 24°C and 25°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 specimens to monitor the temperature rise as follows:

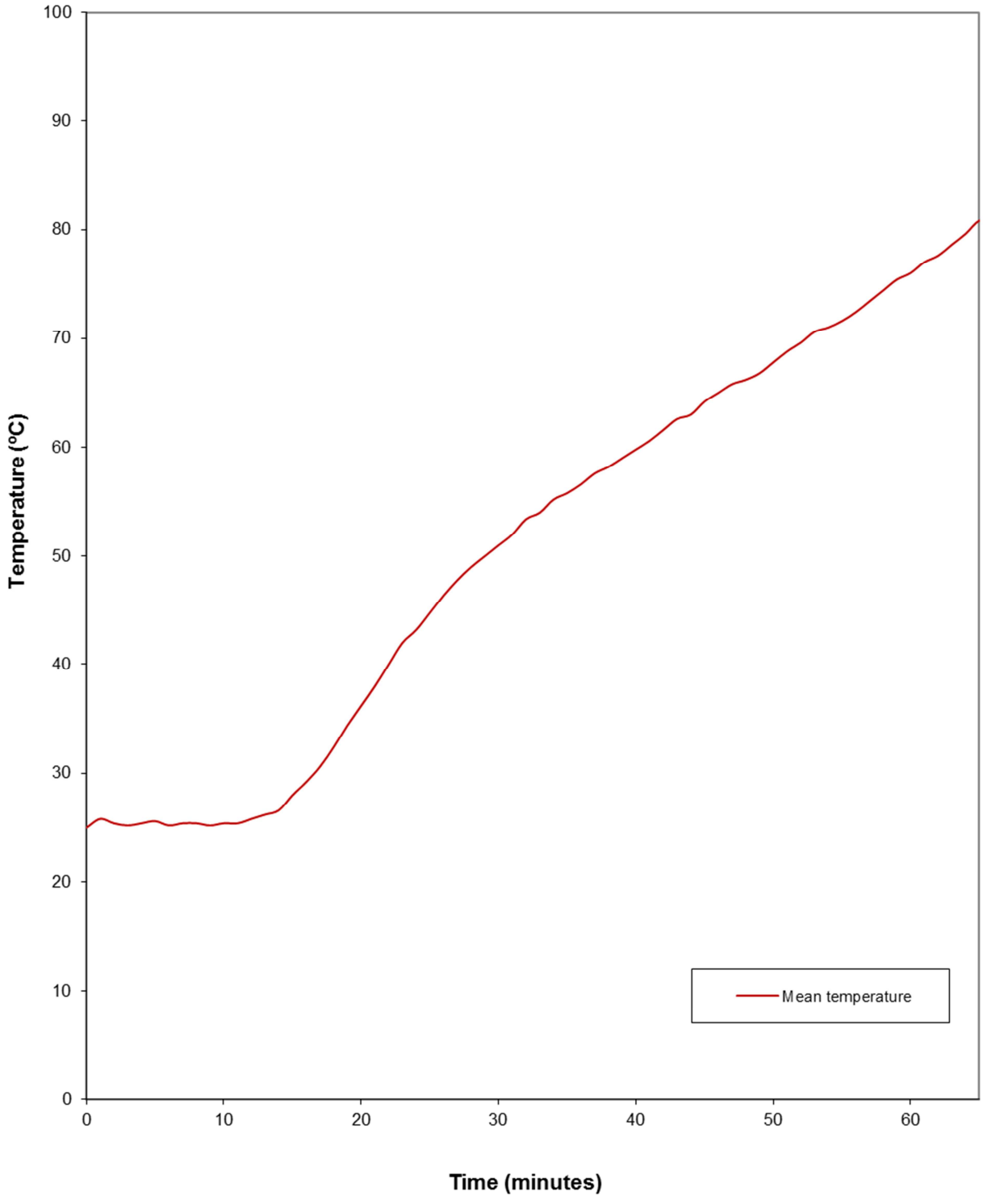
Doorset:		
Leaves	Channels 16 to 20	(mean and maximum)
Leaves	Channels 26 to 32	(maximum only)
Frame	Channels 21 to 25	(maximum only)

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 thermocouples is shown in the tables in Appendix 4.

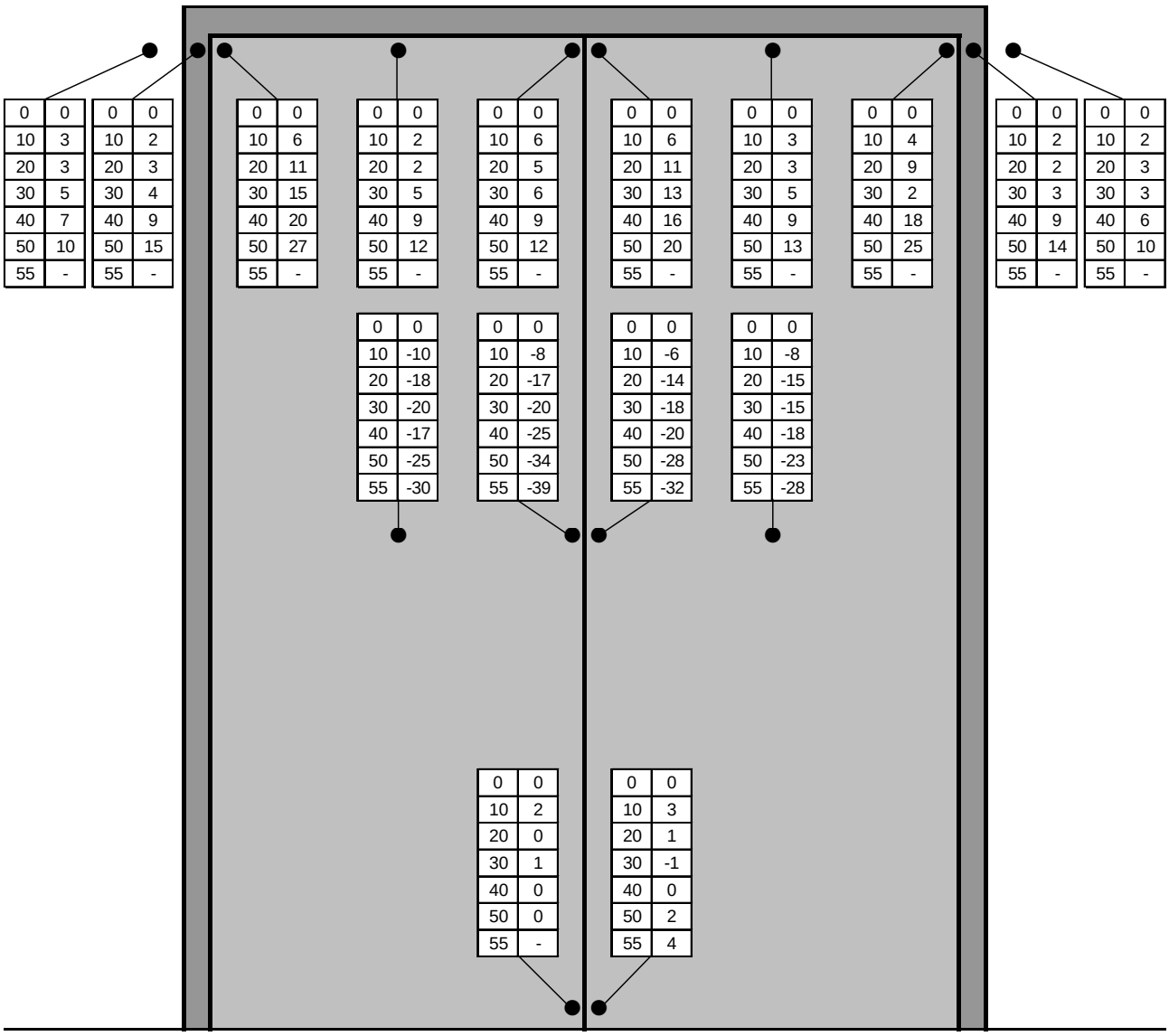
The following time/temperature graph shows the mean discrete areas' temperatures.



CAMBRIDGE FIRERESEARCH

3.5 Deflection

Taut stainless steel wires were anchored horizontally across the unexposed face of the specimens such that any deflection experienced by the test construction could be measured. One wire was positioned 10 mm vertically below the head of the leaves, the second at mid-height and the third 10 mm vertically above the floor. The following figures show 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**.**



4 TEST OBSERVATIONS

Photographs taken during the test are shown in Appendix 2.

TEST OBSERVATIONS (E = Exposed face: U = Unexposed face)		
Time	Face	Observation
(min:sec)		
00:00		Start of the test.
10:00	U	Meeting stiles gap tightened at head and increased at the bottom. Intumescent activated from top to 250mm from bottom of meeting stiles.
15:00	E	Hinge intumescent activating. All timber fissured.
17:30	E	Handle missing.
21:40	E	Gap between lipping and core.
22:00	U	Meeting stiles sealed over full height.
26:00	U	Foam between frame and supporting construction cracking.
26:50	E	Left hand closer detached.
27:15	E	Right hand closer detached.
32:10	U	Unexposed intumescent protruding from meeting stiles adjacent to latch. Leaves resting on threshold at meeting stiles.
35:00	U	Activated leaf edge intumescent visible.
40:20	U	Segments of intumescent detached adjacent to latch.
42:30	U	Activated intumescent visible at top corners.
49:00	U	Left hand leaf lipping at the meeting stile has slipped 1mm relative to core at mid height.
50:48	U	Glow at top right hand corner,
52:40	U	Glow at top of meeting stiles between lipping and core.
54:16	U	Flaming commences at meeting stiles.
54:26	U	**INTEGRITY FAILURE** due to sustained flaming. **INSULATION FAILURE** due to integrity failure. Flames extinguished at the request of the sponsor. Lipping of right hand leaf at meeting stile is fissured.
56:15	U	Flaming restarts at meeting stiles and is extinguished.
58:36	U	Intermittent flaming at bottom of meeting stiles.
59:00	U	Left hand leaf eroded at threshold 100mm from meeting stiles.
59:40	U	Glow at top right hand hinge.
62:00	U	Meeting stiles sealed at the request of the sponsor.
62:35	U	Glow through foam seal between head of frame and supporting construction.
63:22	U	Flashes at bottom left hand hinge position.
64:11	U	A cotton pad is applied at the bottom left hand hinge position, no failure.
64:52	U	Flashes at bottom right hand hinge.
65:34		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 following the procedure outlined in EN 1363-1, and where appropriate EN 1363-2. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

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 specimen was asymmetrical and was tested such that the door leaves opened towards the heating conditions of the test. The test results may not be appropriate to situations where the heating conditions are from the other side.

Report prepared by: 

E Southern

Report checked by: 

E Wilson

Report issued: **30th September 2016**

APPENDIX 1 SPECIMEN CONSTRUCTION

The item numbers listed in Appendix 1 Table 1 and shown in the figures in Appendix 1 refer to the components of the specimen construction. Any photo numbers refer to those in Appendix 2.

Please note that unless otherwise indicated the following applies:

a) All dimensions and materials of construction were verified by the laboratory.
b) Figures are not to scale.
c) All dimensions are given in mm.

Appendix 1 Table 1

Item	Component	Information
1	**Door frame**	
	Supplier:	Exitex Limited.
	Description:	A 3 sided sapele** frame with horizontal butt joints at the top corners fixed with 2 No. No.10 x 3" countersunk steel woodscrews at 60 centres.The frame had integral stops 12mm wide.
	Fixing to supporting construction:	5 No. No.10 x 4" countersunk steel woodscrews set at 125 down and 200 up with 2No. equispaced at the jambs and 1 No. at mid point of head.
	Overall size (h x w x d x t):	2138 x 2073 x 102 x 44
	Cross section size (h x d):	32/44 x 102
	Density (kg/m^3):	640**
2	**Left Hand Leaf**	
	Supplier:	Halspan Ltd.**
	Description:	Timber based particleboard core with lipping on the vertical edges.
	Overall size (h x w x t):	2100 x 1000 x 54
	Weight (kg):	70.6
	Sub-components:	
	Core:	
	Type:	Halspan Optima GDC**
	Overall size((h x w x t):	2100 x 980 x 54
	Lipping:	
	Description:	Sapele** lipping adhered to vertical edges of the leaf using Acrobond 3050** PU adhesive.
	Overall size (w x t):	54 x 10
	Density (kg/m^3):	640**
3	**Right Hand Leaf**	
	Supplier:	Halspan Ltd.**
	Description:	Timber based particleboard core with lipping on the vertical edges.
	Overall size (h x w x t):	2100 x 1000 x 54
	Weight (kg):	70.7
	Sub-components:	
	Core:	

Item	Component	Information
3 cont	Type:	Halspan Optima GDC**
	Overall size((h x w x t):	2100 x 980 x 54
	Lipping:	
	Description:	Sapele lipping adhered to vertical edges of the leaf using Acrobond 3050** PU adhesive.
	Overall size (w x t):	54 x 10
	Density (kg/m^3):	640**
4	**Hinges**	
	Manufacturer:	Hoppe (UK) Ltd
	Reference:	Arrone butt hinge with bearings Grade 13 AR8187.
	Material:	Stainless steel.
	Number:	3
	Location:	Set at 152, 963 and 1773 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):	14.2
	Fixings to frame (Ø x l):	4 No Ø4.6 x 31 countersunk stainless steel wood screws per blade.
	Fixings to door (Ø x l):	4 No Ø4.6 x 31 countersunk stainless steel wood screws per blade.
5	**Closer**	
	Manufacturer:	Arrow Architectural
	Reference:	325 VP
	Description:	A scissor arm closer with steel arms and cover and aluminium body incorporating steel components fitted to the exposed face of both leaves positioned in accordance with the manufacturer's instructions using 2No. No.10 x 1" long steel pan head screws to the frame and 4No.No.10 x 2½" long steel countersunk screws to the leaf.
	Body size (l x h x d):	230 x 50 x 40
	Cover size (l x h x d):	255 x 70 x 45
6	**Latch**	
	Manufacturer:	Hoppe (UK) Ltd
	Part number:	Arrone AR8019-76-SC/EB
	Description:	A mainly steel cylinder mortice latch with stainless steel forend cover and strike fitted central to the leaf thickness such that the centreline of the spindle is 1000 above the base of the right hand leaf, affixed using 2 No. Ø4 x 25 long steel countersunk screws at the forend and strike.
	Overall size:	
	Body (h x d x w):	23 x 15 x 74
	Forend (h x d x t):	60 x 25 x 1.9
	Forend cover (h x d x t):	60 x 25 x 1.0
	Strike (h x d x t):	65 x 41 x 1.3 including a 31 x 16 tongue.

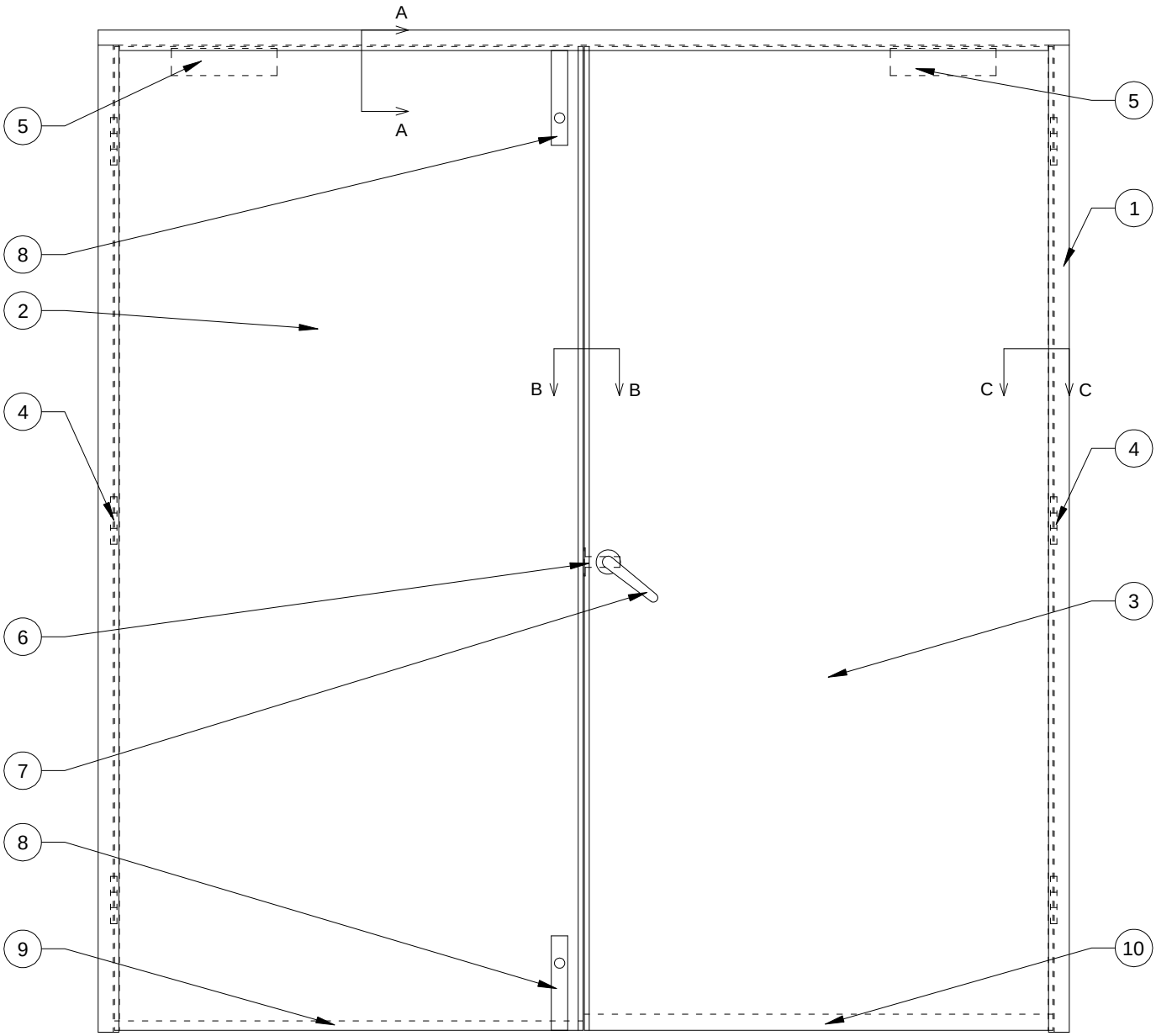
Item	Component	Information
7	**Handleset** Manufacturer: Reference: Description: Overall Size: Handle (Ø x l): Rose (Ø x d): Rose cover (Ø x d x t):	 Hoppe (UK) Ltd. Paris 138S/42K Aluminium lever handle and rose cover with plastic rose. Affixed to leaf with 4No. countersunk steel screws. 19 x 145 49.8 x 7 52 x 8.8 x 1.0
8	**Surface bolts** Manufacturer: Reference: Description: Overall Size (h x w x d):	 Carlisle Brass Ltd. AQ83-PB. 2 No. brass slide bolts face fixed to the unexposed side of left hand leaf, using 4No. raised countersunk screws, set 55 from the meeting stile to the centre of the bolt. 202 x 35 x 12
9	**Automatic Door Bottom left hand leaf** Supplier: Reference: Description: Size (h x d x l)	 Exitex Limited Concealex A8100 1026 Aluminium body with brass and steel components and a polymeric seal affixed using 1No. Ø3.4 x 20 long countersunk woodscrew set 150 from the hanging edge and 190 from the meeting stile. 20 x 12.3 x 1000
10	**Automatic Door Bottom right hand leaf** Supplier: Reference: Description: Size (h x d x l)	 Exitex Limited Concealex A8100 Superior 1026 Aluminium body with brass and steel components and a polymeric seal and 2No. stainless steel end caps. End caps fitted to hanging stile and meeting stile screw fixed to the stiles. 35 x 14 x 998
11	**Intumescent – frame** Manufacturer: Reference: Description: Location: Overall Size:	 Exitex Limited FO154** Two strips of graphite-based intumescent in a PVC casing with self-adhesive tape on one side. The strip nearest the exposed face is fully interrupted at the hinges and the other is uninterrupted. Set 6.3 and 30.3 from the exposed face of the head and jambs. 15 x 4

Item	Component	Information
12	**Intumescent – leaf meeting stiles** Manufacturer: Reference: Description: Location: Overall Size:	 Exitex Limited FO154** Two strips of graphite-based intumescent in a PVC casing with self-adhesive tape on one side fitted to the right hand leaf. The strip nearest the exposed face is fully interrupted at the strike and the other is 50% interrupted. Set 7 from each face of the left hand leaf. 15 x 4
13	**Intumescent – hinge** Supplier: Reference: Description: Overall size (t):	 Exitex Limited Interdens** A phosphate based intumescent fitted beneath each blade. 1
14	**Intumescent – latch** Supplier: Reference: Description: Overall size (t):	 Exitex Limited Interdens** A phosphate based intumescent applied to the faces of latch body. 1
15	**Intumescent – strike and forend** Supplier: Reference: Description: Thickness (t):	 Exitex Limited. Interdens** A phosphate based intumescent applied to the faces of latch body. 1
16	**Intumescent – door closer** Supplier: Reference: Description: Thickness (t):	 Exitex Limited. Exi-Fire A graphite based intumescent applied to the rear face of the closer body. 1
17	**Fire stopping installation detail** Supplier: Reference: Description: Gap width (t):	 Craylon Limited Blue 60** The gaps between the frame and the associated construction were filled with Craylon Blue 60 Expanding foam in conjunction withCraylon Blue 60 fire rated packers.. 30/20* at left and right jambs respectively. 20* at head

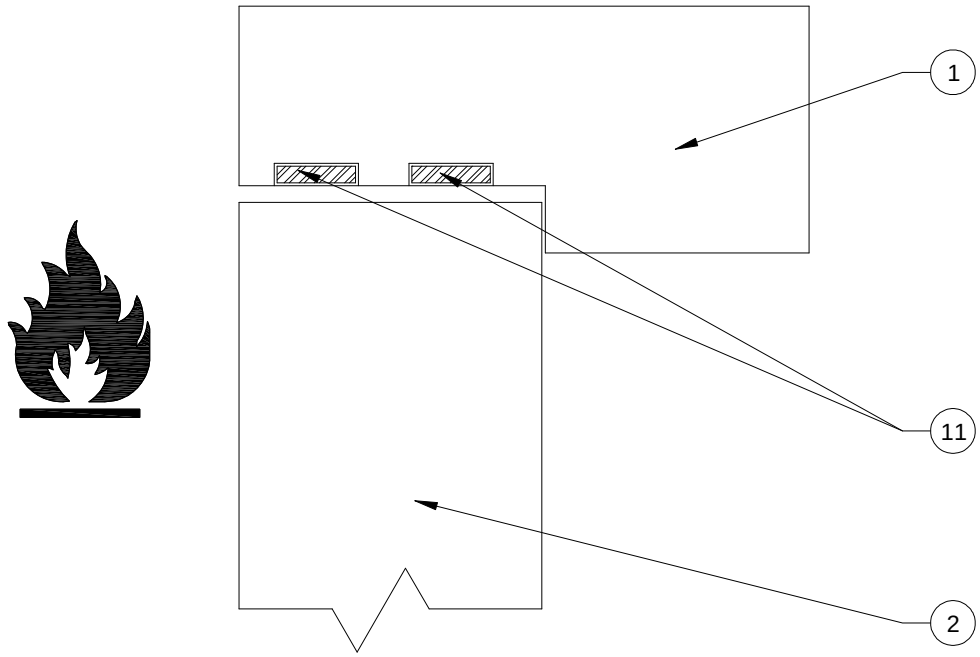
Key:
* Nominal value

** Sponsor declared value or detail, not verified by laboratory

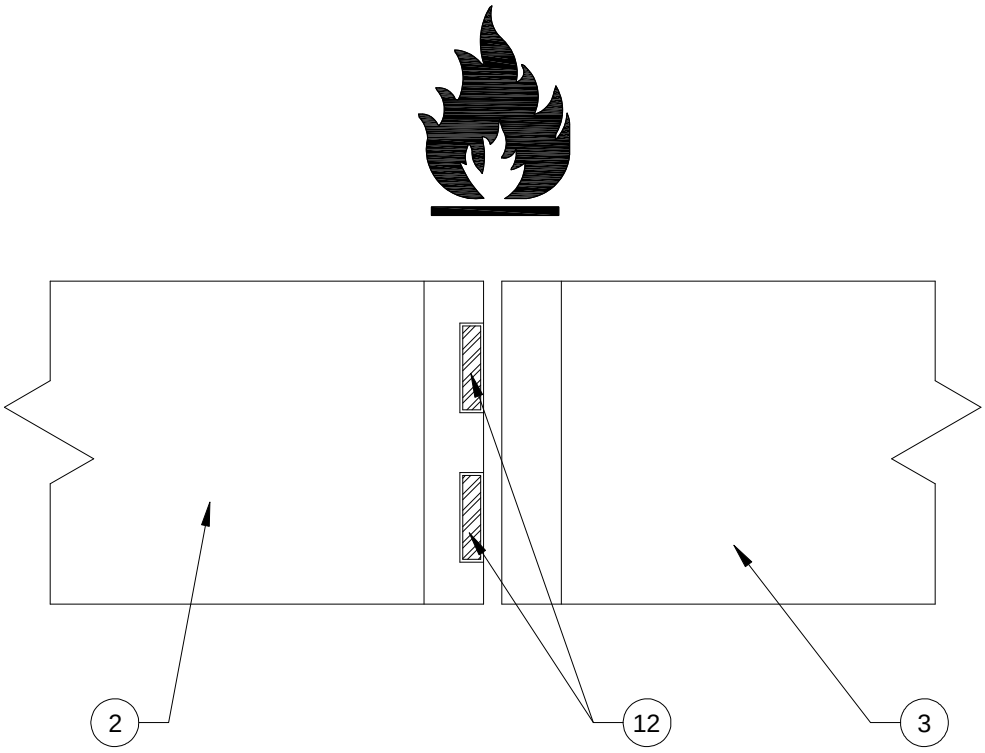
Appendix 1 Figure 1 – Doorset elevation – unexposed face including hidden detail



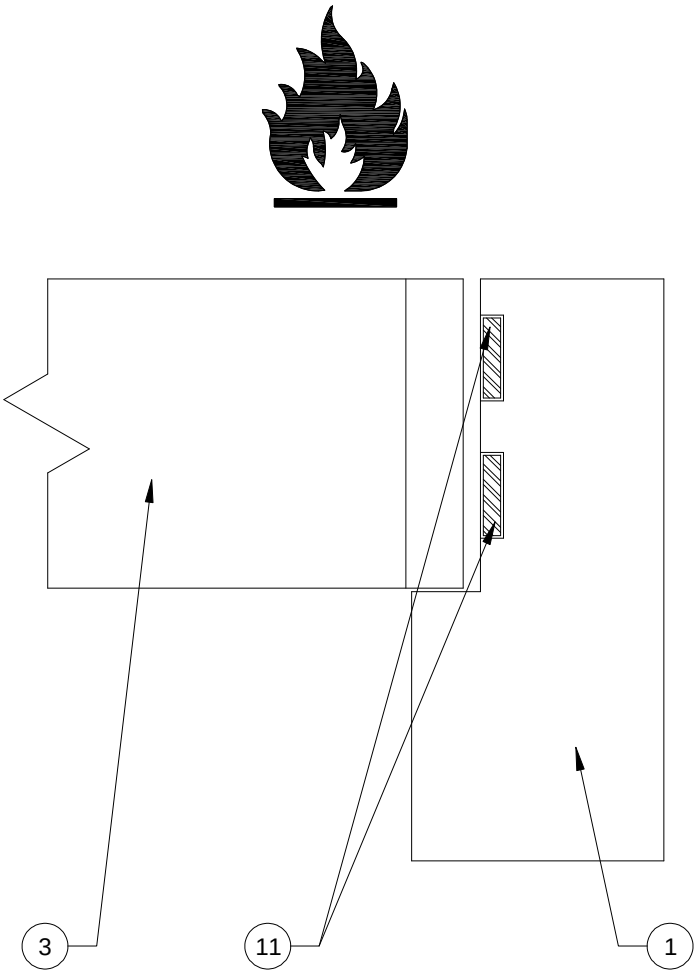
Appendix 1 Figure 2 – Section A – A



Appendix 1 Figure 3 – Section B – B



Appendix 1 Figure 4 – Section C – C



APPENDIX 2 PHOTOGRAPHS

Appendix 2.1 Pre-test photos

Photo 2.1.1 - Left hand leaf

Photo 2.1.2 - Left hand leaf

Photo 2.1.3 - Left hand leaf

Photo 2.1.4 - Left hand leaf

Photo 2.1.5 - Left hand leaf

Photo 2.1.6

Photo 2.1.7 - right hand leaf

Photo 2.1.8 - right hand leaf

Photo 2.1.9 - right hand leaf

Photo 2.1.10 - right hand leaf

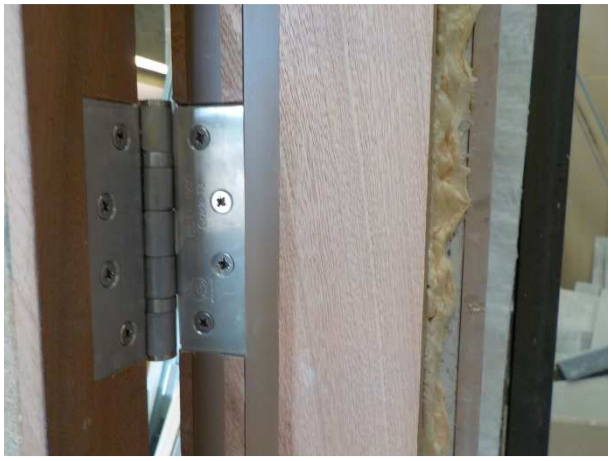


Photo 2.1.11 - right hand leaf

Photo 2.1.12 - right hand leaf

Photo 2.1.13

Appendix 2.2 During test photos

Photo 2.2.1

Photo 2.2.2

Photo 2.2.3 – after 53 minutes

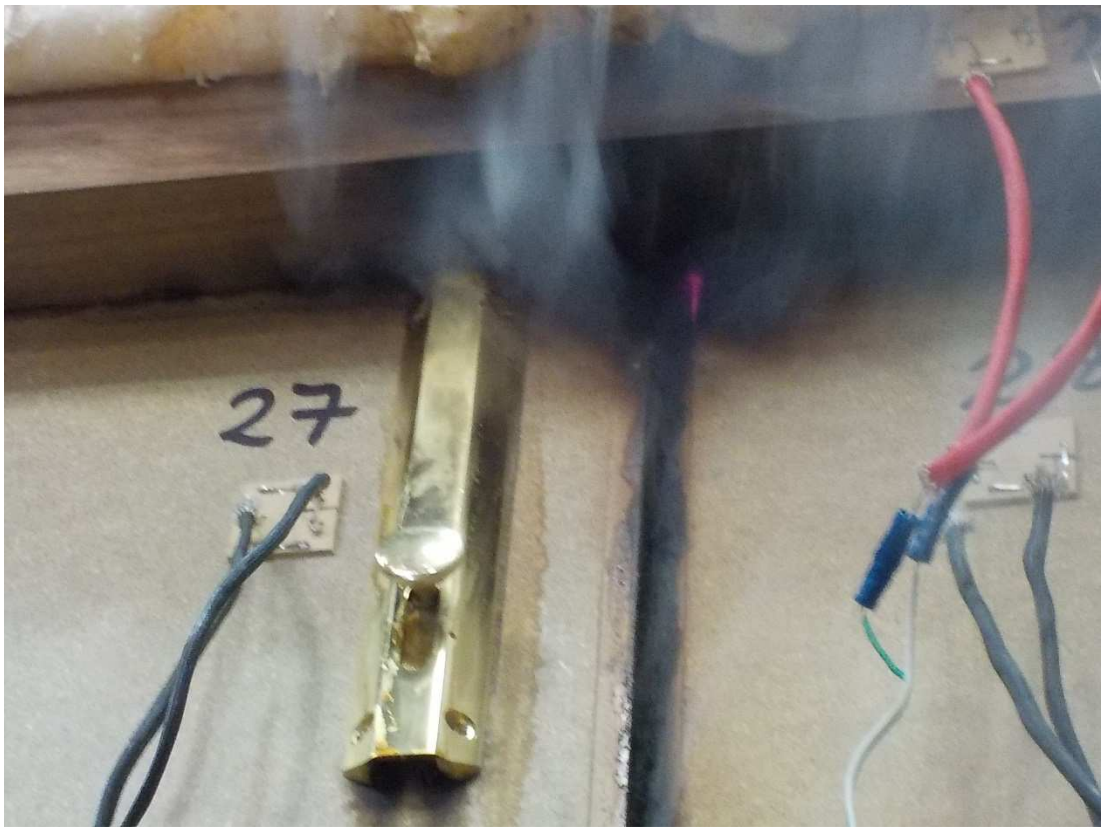


Photo 2.2.4 – after 53 minutes

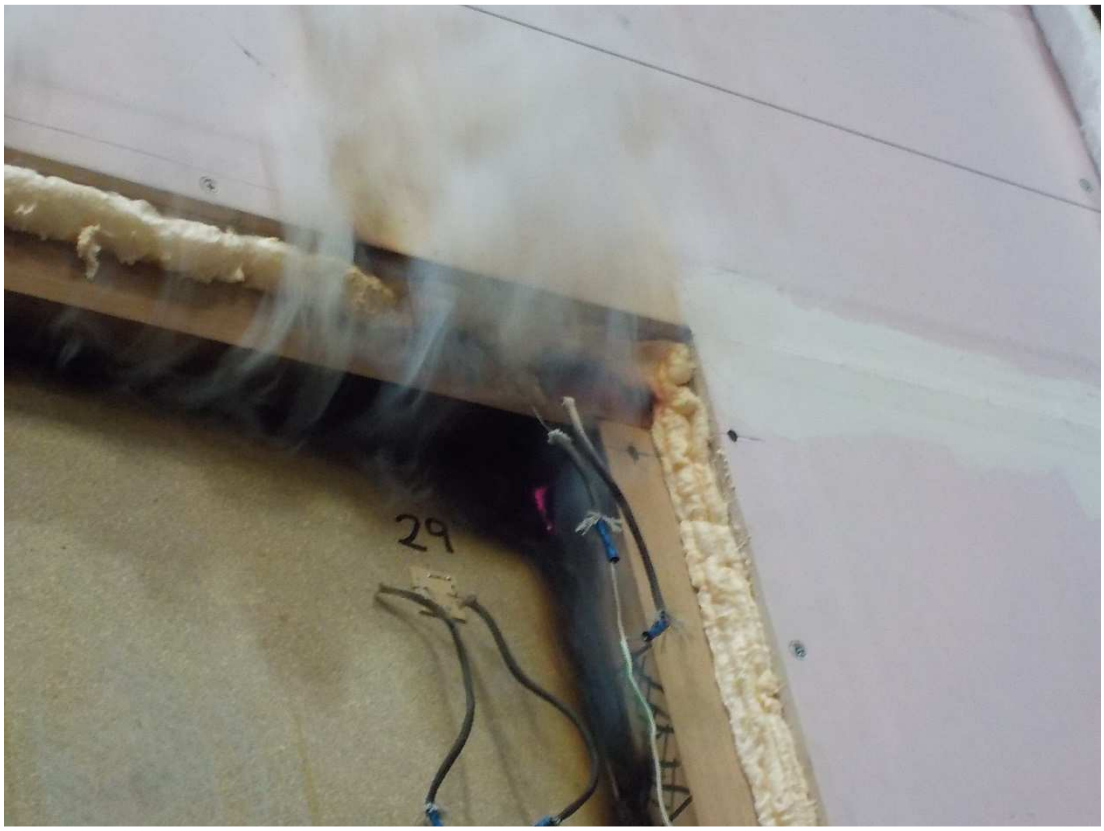


Photo 2.2.5

Photo 2.2.6 - after 59 minutes

Photo 2.2.7 – after 59 minutes

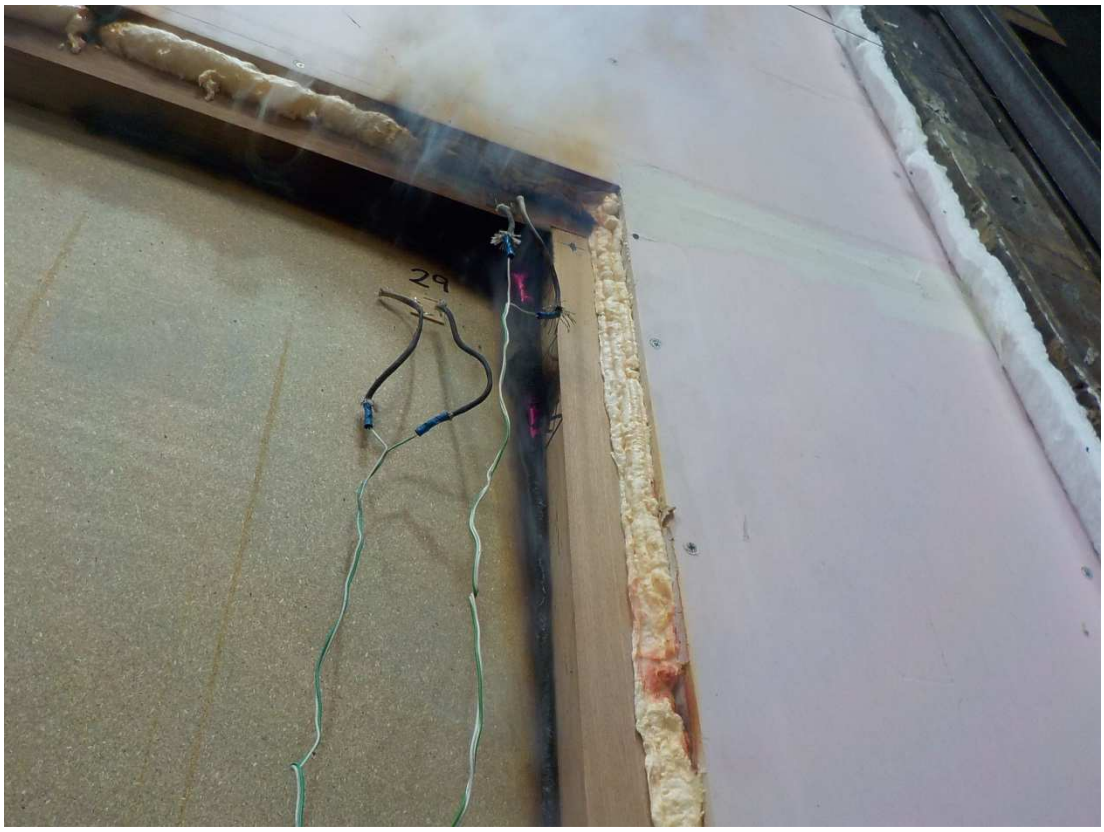


Photo 2.2.8

Photo 2.2.9 – after 63 minutes

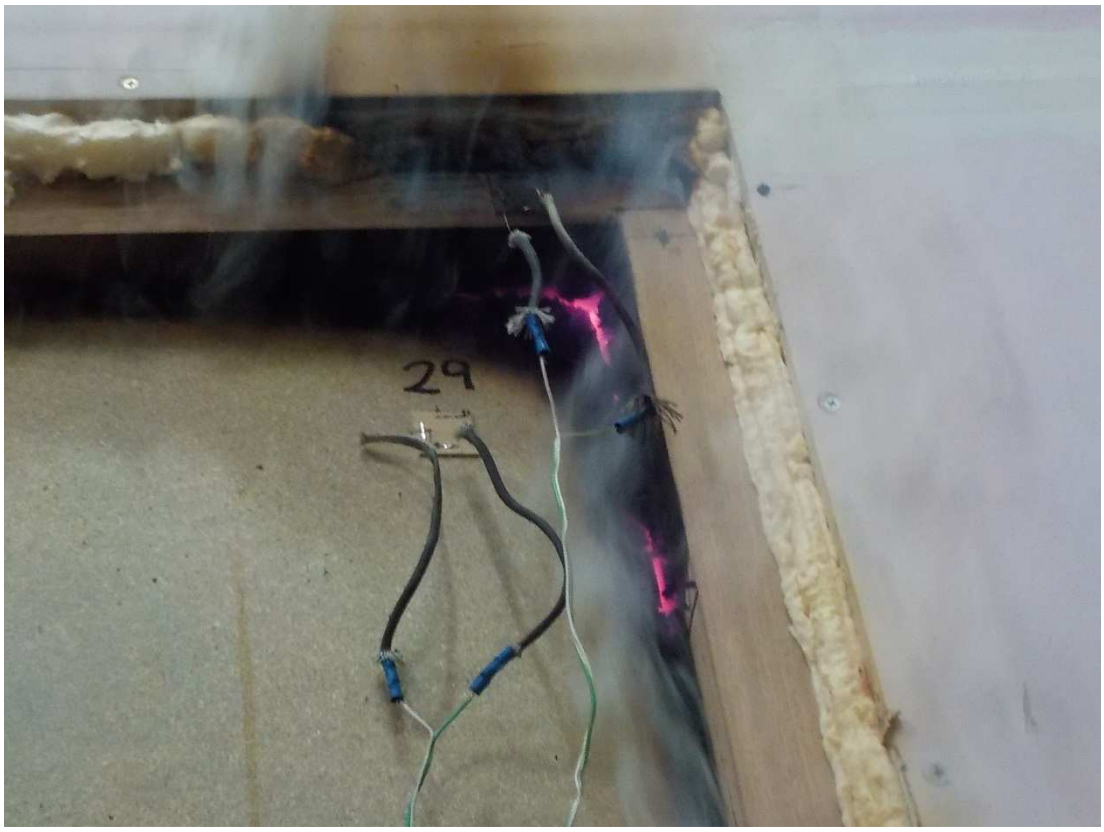


Photo 2.2.10 – after 63 minutes

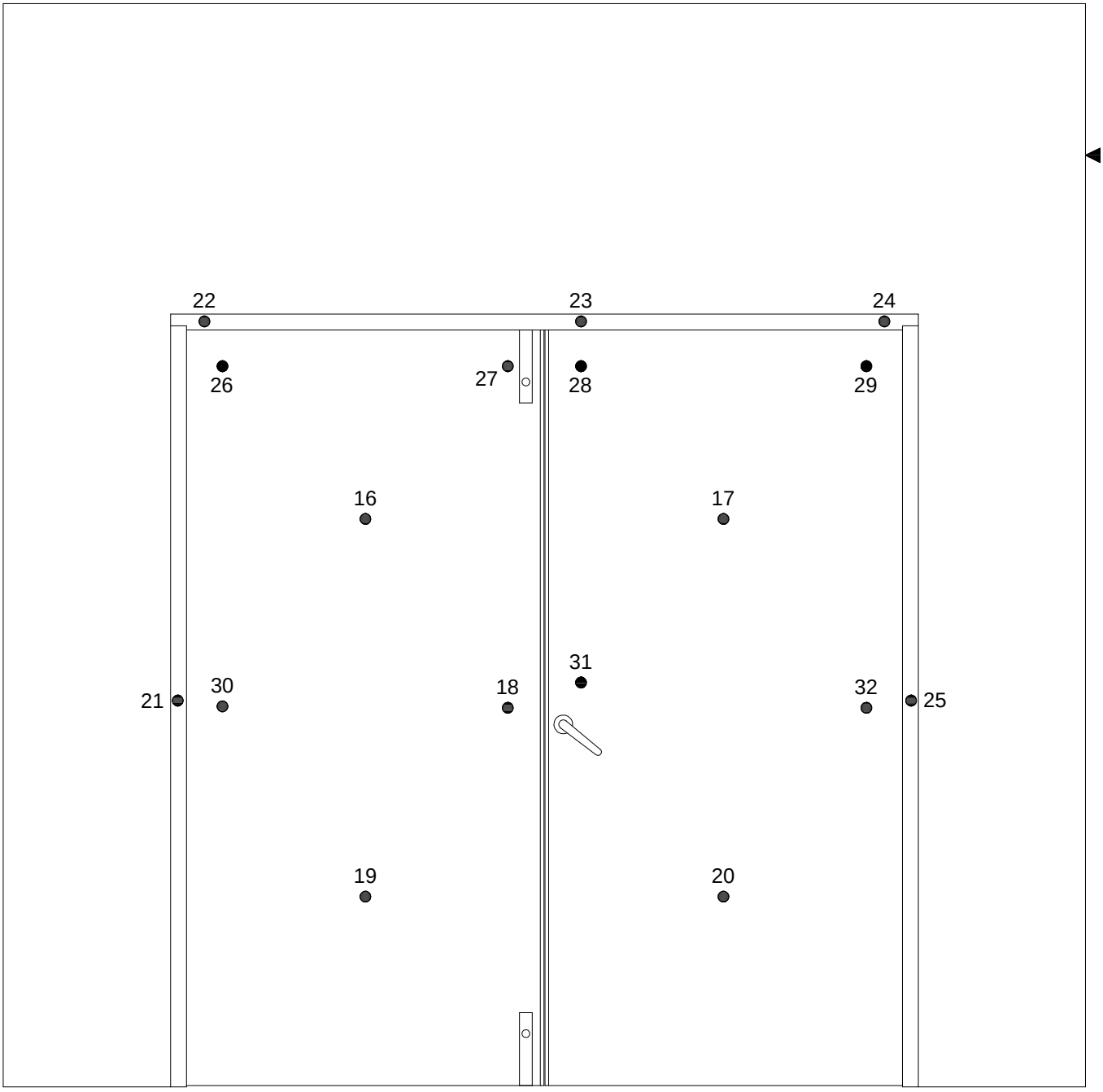
CAMBRIDGE FIRERESEARCH

Photo 2.2.11 – after 64 minutes

Appendix 2.3 Post test photos

Photo 2.3.1

APPENDIX 3 POSITIONING OF INSTRUMENTATION



● Unexposed face specimen thermocouple
◀ Furnace pressure measurement position

CAMBRIDGE FIRERESEARCH

APPENDIX 4 RECORDED THERMOCOUPLE DATA

Time	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24
min	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	25	25	25	25	25	25	25	25	25
1	26	27	25	25	26	25	28	29	31
2	26	26	25	25	25	25	26	27	28
3	25	26	25	25	25	24	26	26	27
4	26	26	25	25	25	25	26	27	29
5	26	26	25	25	26	25	33	32	32
6	25	26	25	25	25	24	35	32	31
7	26	26	25	25	25	25	35	33	31
8	26	26	25	25	25	25	34	32	31
9	25	26	25	25	25	25	34	33	31
10	26	26	25	25	25	25	34	36	31
11	26	26	25	25	25	25	33	37	31
12	26	26	26	25	26	25	33	41	32
13	26	27	26	26	26	25	35	43	33
14	27	27	27	26	26	25	35	44	33
15	28	29	28	28	27	25	34	43	33
16	29	30	29	29	29	25	33	45	35
17	30	32	30	31	30	25	32	45	34
18	32	34	32	32	32	25	32	46	34
19	34	36	34	34	34	25	32	46	34
20	36	38	35	36	36	25	32	43	33
21	38	39	37	38	38	26	32	41	33
22	40	41	39	40	40	26	32	41	33
23	42	43	41	42	42	26	32	40	33
24	43	45	42	43	43	26	32	39	33
25	45	46	44	44	45	26	32	38	34
26	47	48	45	46	46	26	33	37	34
27	48	49	47	47	48	27	33	37	35
28	49	50	48	49	49	27	33	36	35
29	51	51	49	49	50	27	33	35	35
30	52	52	50	50	51	27	34	35	35
31	53	53	51	51	52	27	34	35	35
32	54	55	53	52	53	28	35	35	35
33	55	55	53	53	54	28	35	35	35
34	56	57	54	54	55	28	35	35	36
35	57	57	55	55	55	29	35	35	36
36	58	58	56	55	56	29	36	35	37
37	59	59	57	56	57	29	36	35	38
38	59	60	58	57	57	30	37	35	38
39	60	60	59	58	58	30	37	36	39
40	61	61	60	58	59	31	38	36	40
41	62	62	61	59	59	31	38	37	41
42	63	63	62	60	60	32	39	37	42
43	64	64	63	61	61	32	40	38	43
44	65	64	63	61	62	32	41	39	44
45	66	65	65	62	63	33	42	40	46

Time	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24
min	°C	°C	°C	°C	°C	°C	°C	°C	°C
46	67	66	65	63	64	34	44	41	48
47	68	67	66	64	64	34	45	43	49
48	68	67	67	64	65	35	46	44	51
49	69	68	67	65	65	35	47	45	53
50	70	69	68	66	66	36	48	46	56
51	71	70	69	67	67	36	48	47	60
52	72	70	70	68	68	37	49	48	63
53	73	71	71	69	69	37	50	49	66
54	73	72	72	69	69	38	52	52	71
55	74	72	72	70	70	38	54	57	76
56	75	73	73	71	70	39	56	64	81
57	76	74	74	72	71	39	58	69	84
58	77	75	75	73	72	39	61	74	88
59	78	76	76	74	73	40	64	87	93
60	78	77	76	75	74	41	68	114	97
61	79	78	77	76	75	41	71	129	104
62	80	79	78	76	75	42	75	131	109
63	81	80	79	77	76	43	79	130	120
64	82	81	80	78	77	43	84	134	129
65	83	83	81	79	78	43	90	142	136

CAMBRIDGE FIRERESEARCH

Time	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32
min	°C	°C	°C	°C	°C	°C	°C	°C
0	25	25	26	26	26	25	25	25
1	25	30	26	29	32	28	29	25
2	25	27	26	27	29	26	27	25
3	25	27	26	26	28	26	26	25
4	25	29	28	28	29	26	27	26
5	25	31	27	28	29	26	30	26
6	25	29	27	27	28	26	28	25
7	25	28	27	27	28	25	28	25
8	25	27	27	27	28	25	29	25
9	25	27	26	27	27	25	29	25
10	25	27	26	27	27	26	30	25
11	25	27	26	27	27	25	30	25
12	25	28	27	28	28	26	30	26
13	25	28	28	28	29	26	30	26
14	25	30	29	29	30	27	31	27
15	25	32	31	30	32	28	32	28
16	25	34	33	32	35	30	33	30
17	25	37	34	34	37	31	35	32
18	25	40	36	36	40	33	36	34
19	26	44	39	38	43	36	37	37
20	26	47	41	41	46	37	39	40
21	26	50	42	43	49	39	41	42
22	26	52	44	44	51	41	42	44
23	26	54	46	46	53	43	45	46
24	27	57	47	48	54	45	46	48
25	27	58	49	49	56	47	48	50
26	27	60	50	51	57	48	49	51
27	27	61	51	52	59	50	51	53
28	27	63	52	54	59	51	52	54
29	27	63	53	55	60	52	53	55
30	28	64	55	56	61	53	55	56
31	28	64	55	57	62	54	56	57
32	28	65	56	59	63	55	57	58
33	29	65	57	59	63	56	58	59
34	29	66	58	60	64	57	59	60
35	29	66	59	61	64	57	59	60
36	29	66	59	62	65	57	60	61
37	30	66	60	62	65	58	61	62
38	30	67	61	63	66	58	62	62
39	30	67	61	63	66	59	63	63
40	31	67	62	64	67	60	64	64
41	31	67	63	64	67	60	64	64
42	32	68	64	65	68	61	65	65
43	32	68	65	66	68	62	66	66
44	32	68	65	66	68	62	66	66
45	33	69	66	67	69	63	68	67

Time	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32
min	°C	°C	°C	°C	°C	°C	°C	°C
46	34	70	67	68	70	64	69	68
47	34	70	68	68	71	64	69	68
48	34	70	68	69	71	65	70	69
49	34	71	68	70	71	65	70	70
50	35	71	69	71	72	66	71	70
51	35	72	70	72	73	67	72	71
52	36	72	70	73	73	67	73	71
53	36	73	71	74	74	69	74	72
54	37	73	71	75	75	69	74	73
55	37	74	72	77	76	69	74	73
56	38	75	73	77	77	70	75	74
57	38	76	74	74	78	71	74	75
58	38	77	74	75	79	72	73	75
59	40	78	75	76	80	73	75	76
60	40	79	76	78	81	74	76	77
61	41	79	77	85	83	75	78	77
62	42	81	78	85	84	75	79	78
63	42	83	79	84	86	77	81	79
64	43	84	80	84	89	77	81	80
65	45	85	82	85	92	78	82	81

* Thermocouple malfunction