

Title:

The Fire Resistance Performance Of 2 Specimens of Wall Mounted and 2 Specimens Of Floor Mounted Cavity Barrier Systems, When Tested In Accordance With EN 1366-4:2021

Date Of Test:

24 July 2024

Issue 1

27 November 2024

WF Report No:

545648/R



Prepared for:

Timloc Building Products

Timloc House
Ozone Park
Howden
East Riding of Yorkshire
DN14 7SD



0249

Test Specimens

Summary of Tested Specimens

For the purpose of the test the floor specimens were referenced B and C and the wall specimens were referenced E and F. Additional specimens were not subject of this test report at the request of the test sponsor.

The section of floor had overall nominal dimensions of 2250 mm long by 1750 mm wide by 600 mm thick and was made up of autoclaved aerated concrete lintels arranged to provide three cavities of varying widths and depths which were all 1200 mm in length. The section of wall had overall dimensions of 1800 mm high by 1800 mm wide by 600 mm thick and was made up of autoclaved aerated concrete lintels arranged to provide three cavities of varying widths and depths which were all 1200 mm in length.

Specific details of each of the seals are given in the tables below:

Specimens

Specimen	Substrate	Seal Details
B	Autoclaved aerated concrete to 15mm Orientated Strand board.	Sealed with a cavity barrier referenced 'TIMFRSTOP 100', stone mineral wool enclosed within a red polyethylene bag of dimensions 1200mm long x 120mm wide x 150mm deep friction fitted into the aperture 250mm from the exposed face with 20mm compression across the width.
C		Sealed with a cavity barrier referenced 'TIMFRSTOP 150', stone mineral wool enclosed within a red polyethylene bag of dimensions 1200mm long x 160mm wide x 150mm deep friction fitted into the aperture 250mm from the exposed face with 10mm compression across the width.
E		Sealed with a cavity barrier referenced 'TIMFRSTOP 100', stone mineral wool enclosed within a red polyethylene bag of dimensions 1200mm x 120mm wide x 150mm deep, friction fitted into the aperture 250mm from the exposed face with 20mm compression across the width.
F		Sealed with a cavity barrier referenced 'TIMFRSTOP 150', stone mineral wool enclosed within a red polyethylene bag of dimensions 1200mm x 160mm wide x 150mm deep, friction fitted into the aperture 250mm from the exposed face with 10mm compression across the width.

Detailed drawings of the test specimen(s) and a comprehensive description of the test construction based on a detailed survey of the specimen(s) and information supplied by the sponsor of the test are included in the Test Specimen and Schedule of Components sections of this report.

Performance Criteria and Test Results

Integrity	It is required that the specimen retains its separating function, without either causing ignition of a cotton pad when applied as specified in BS EN 1366-4: 2021 or resulting in sustained flaming on the unexposed surface.																								
Insulation	The requirements of the standard are that the maximum temperature rise shall not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1363-1: 2020.																								
Test Results	<table border="1"> <thead> <tr> <th rowspan="2">Specimen</th> <th colspan="2">Integrity (minutes)</th> <th rowspan="2">Insulation (minutes)</th> </tr> <tr> <th>Cotton Pad</th> <th>Sustained flaming</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>66*</td> <td>66*</td> <td>66*</td> </tr> <tr> <td>C</td> <td>66*</td> <td>66*</td> <td>66*</td> </tr> <tr> <td>E</td> <td>62</td> <td>62</td> <td>62</td> </tr> <tr> <td>F</td> <td>62</td> <td>62</td> <td>62</td> </tr> </tbody> </table>			Specimen	Integrity (minutes)		Insulation (minutes)	Cotton Pad	Sustained flaming	B	66*	66*	66*	C	66*	66*	66*	E	62	62	62	F	62	62	62
Specimen	Integrity (minutes)		Insulation (minutes)																						
	Cotton Pad	Sustained flaming																							
B	66*	66*	66*																						
C	66*	66*	66*																						
E	62	62	62																						
F	62	62	62																						
	*Test was discontinued after a period of 66 minutes.																								

Date of Test 24 July 2024

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Signatories



Responsible Officer

M. A. Rana*

Technical Officer



Approved

G. Edmonds*

Senior Technical Officer

* For and on behalf of **Warringtonfire**.

Report Issued

Date: 27 November 2024

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Revision History

Issue No:	Re-issue Date:
Revised By:	Approved By:
Reason for Revision:	

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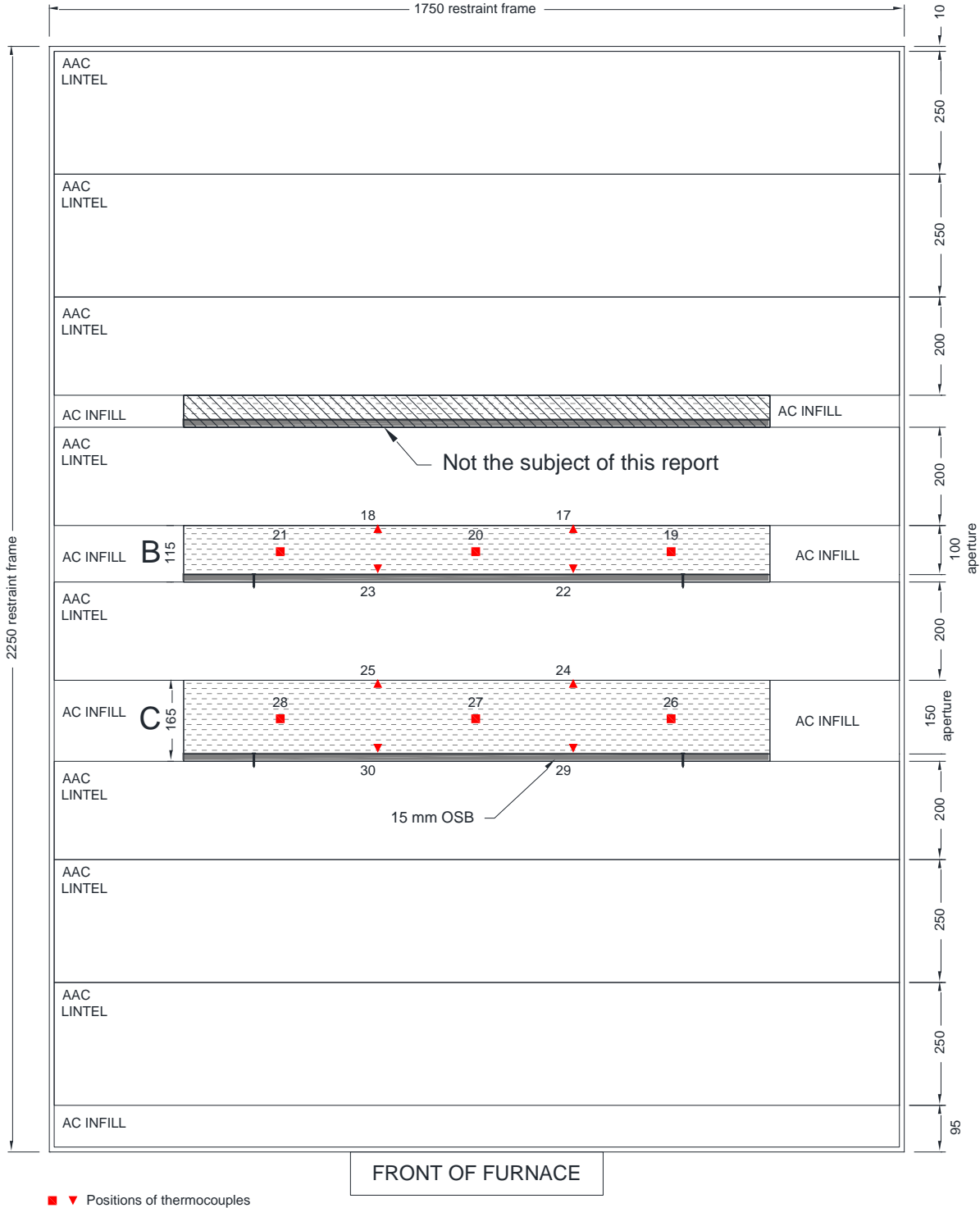
Test Conditions

Standard	<p>BS EN 1366-4: 2021 Fire resistance tests for service installations – Part 4: Linear joint seals.</p> <p>Clause 6.2 of BS EN 1366-4: 2021 specifies a typical length to width for a linear joint seal is 10:1. The length to width may be < 10:1 in case the heated length of the linear joint is ≥ 2600 mm. The requirement was met for Specimen B and E. This requirement was not satisfied for Specimens C and F due to the reduced length of Specimens; therefore, the test was conducted generally in accordance with the standard. Test results obtained are only valid to the Specimens as tested. .</p>
Sampling	<p>Warringtonfire was not involved in the sampling or selection of the tested specimen or any of the components.</p> <p>The results obtained during the test only apply to the test samples as received and tested by Warringtonfire.</p>
Installation	<p>The aerated concrete floor and wall were constructed by representatives of Warringtonfire between the 8 and 12 July 2024. The gap sealing systems were provided and installed by a representative of Timloc Building Products, on the 21 of July 2024.</p>
Conditioning	<p>The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 15 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 17°C to 35.5°C and 31% to 80.5% respectively.</p>
Instruction to Test	<p>The test was conducted on the 24 July 2024 at the request of Timloc Building Products, the test sponsor.</p> <p>No representative of the client witnessed the test.</p>
Ambient Temperature	<p>The ambient air temperature in the vicinity of the test construction was 24°C at the start of the test with a maximum variation of +3°C during the test.</p>
Furnace	<p>The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1366-4: 2021 Clause 5.1 using four plate thermometers, distributed over a plane 100 mm from the surface of the vertical test construction and four plate thermometers, distributed over a plane 100 mm from the surface of the horizontal test construction.</p>
Thermocouples	<p>Thermocouples were provided to monitor the unexposed surface of the specimens. The output of all instrumentation was recorded at no less than one minute intervals. The locations and reference numbers of the various unexposed surface thermocouples are shown in Figures 1 and 4.</p>
Furnace Pressure	<p>The requirements of BS EN 1363-1: 2020, clause 5.2 could not be satisfied due to simultaneous testing of wall and floor specimens. The floor specimens were tested under more onerous conditions, at position 100 mm below the underside of the floor assembly the differential pressure was calculated to be 25 (\pm 5) Pa between 5 and 10 minutes and 25 (\pm 3) Pa respectively thereafter. The wall specimens satisfied the requirements of BS EN 1363-1: 2020, clause 5.2. The calculated pressure differential relative to the laboratory atmosphere at mid height of the lowest mounted wall specimens was 15 (\pm 5) Pa between 5 and 10 minutes and 15 (\pm 3) Pa respectively thereafter.</p>

Should the conditions of furnace temperature, furnace pressure or ambient temperature which are achieved during the test represent a more severe exposure to the test specimen, the test is still to be considered valid.

Test Construction

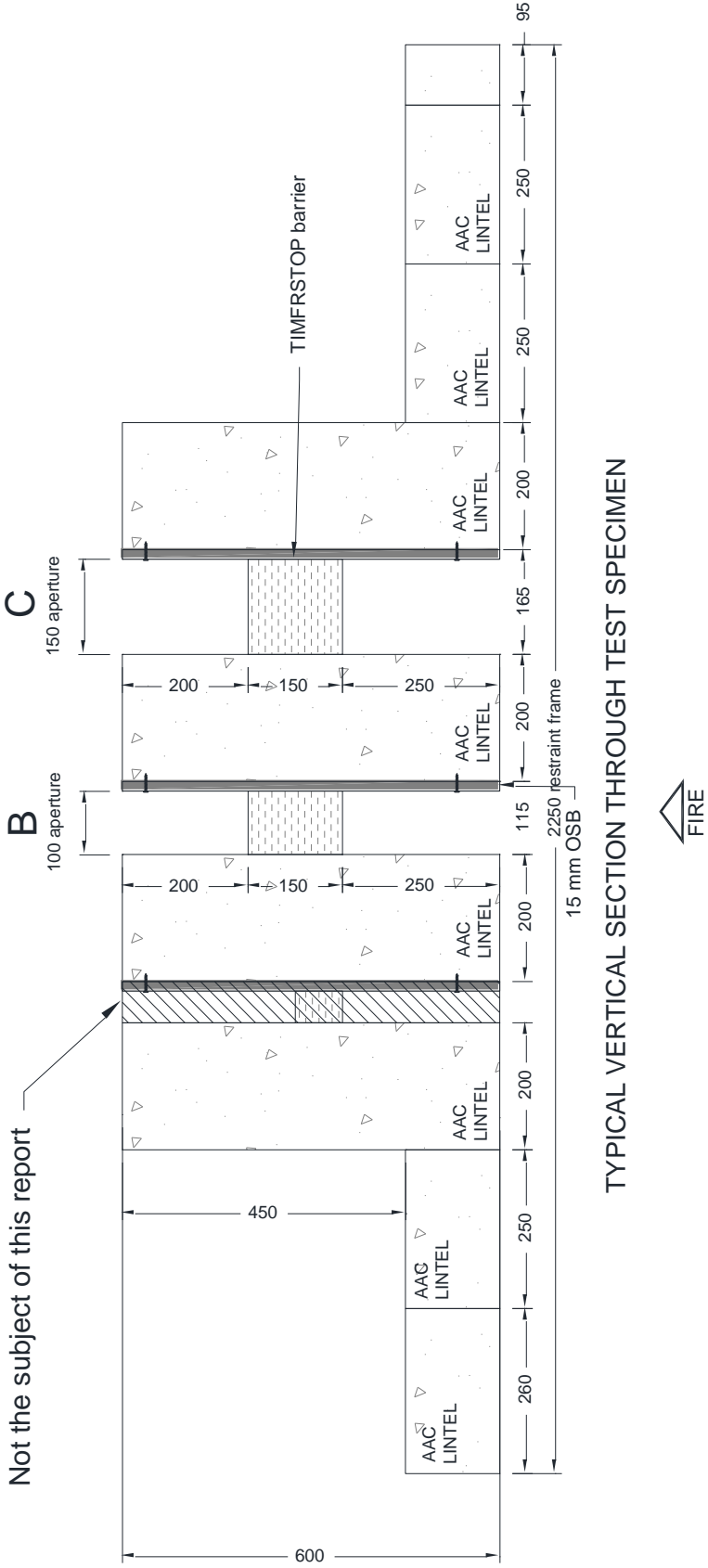
Figure 1. General Plan of unexposed face showing thermocouple positions



GENERAL PLAN OF UNEXPOSED FACE SHOWING THERMOCOUPLE POSITIONS

Do not scale. All dimensions are in mm

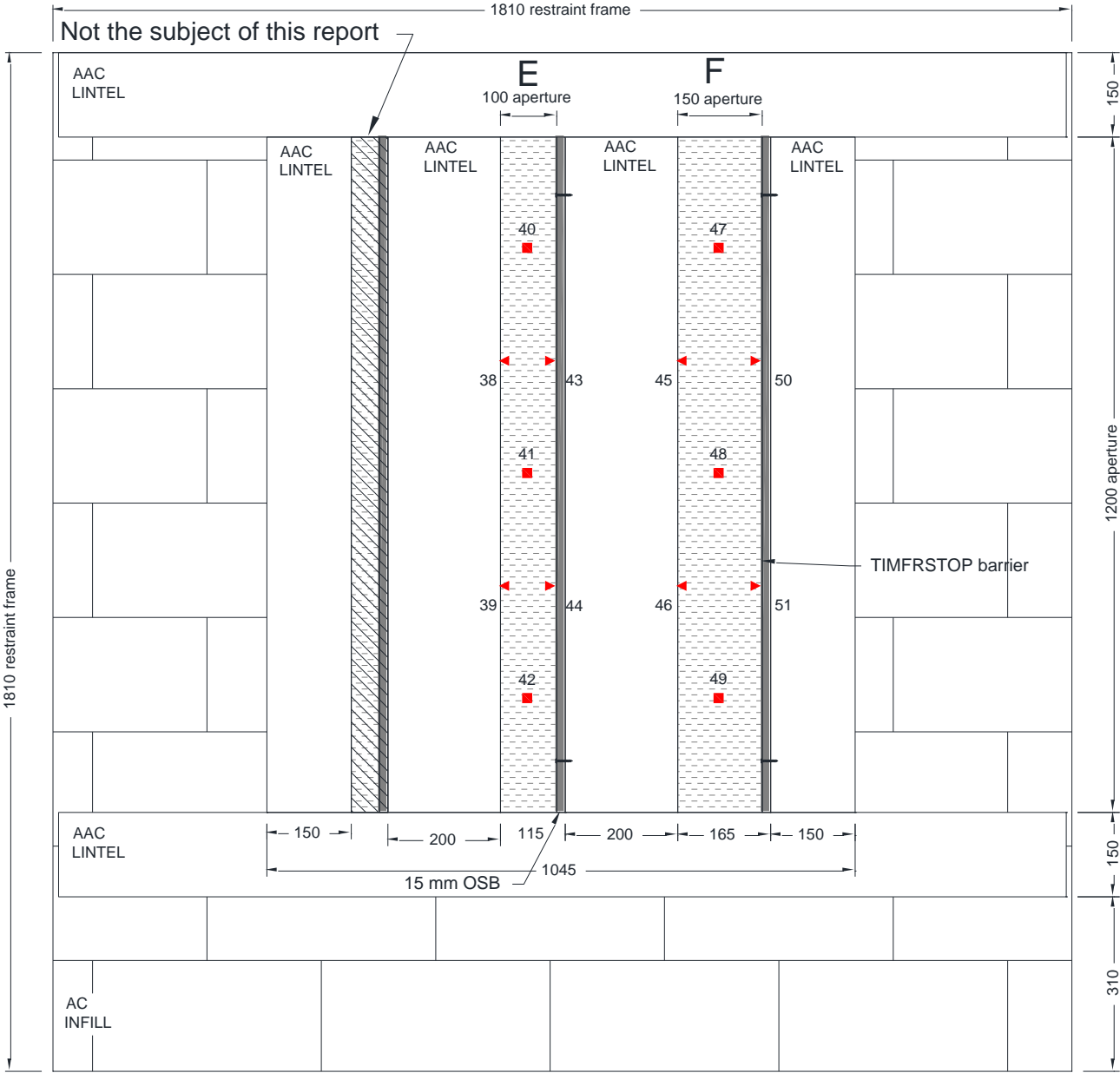
Figure 2. Typical vertical section through test specimen



Not the subject of this report

Do not scale. All dimensions are in mm

Figure 3. General elevation of unexposed face showing thermocouple positions

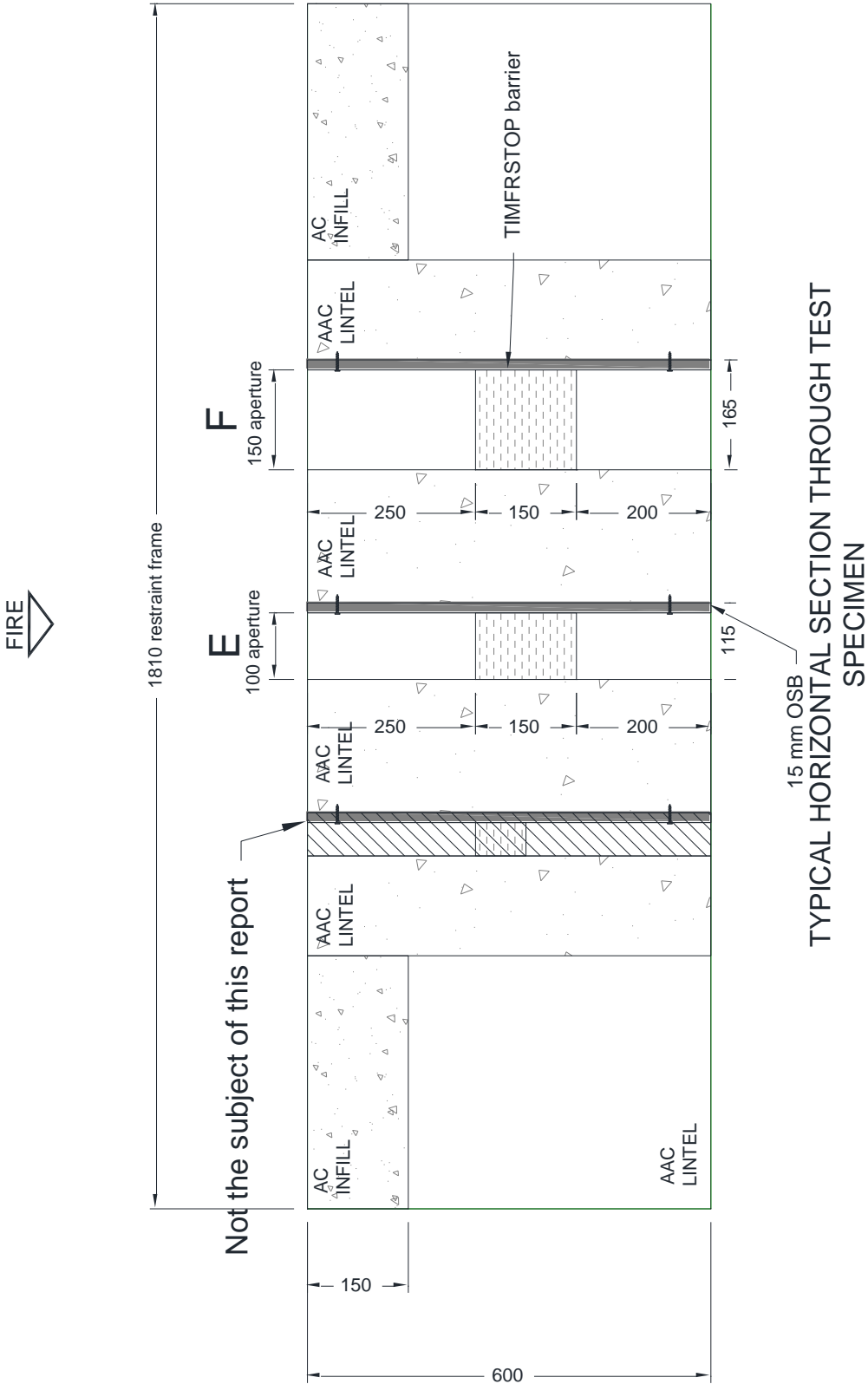


■ ▼ Positions of thermocouples

GENERAL ELEVATION OF UNEXPOSED FACE SHOWING THERMOCOUPLE POSITIONS

Do not scale. All dimensions are in mm

Figure 4. Typical horizontal section through test specimen



Do not scale. All dimensions are in mm

Schedule of Components

The schedule of components describes the test specimen and lists the components used in the construction of the test specimen. These were provided by the test sponsor and surveyed by Warringtonfire.

All measurements were verified by Warringtonfire unless stated otherwise in the schedule of components. All components marked with an “*” have not been verified by Warringtonfire.

<u>Item</u>	<u>Description</u>
Floor test	
1. Specimen B	
Details of aperture	: 1200 mm long x 100 mm wide x 600 mm deep
Details of barrier	
Manufacturer	: Timloc
Reference	: TIMFRSTOP 100
Material	: Stone mineral wool enclosed within a red polyethylene bag.
Overall size	: 1200 mm long x 120 mm wide x 150 mm deep
Density	: 40 kg/m ³ (stated)
Fixing method	: Compression fitted within the aperture with a 20 mm compression across the width. The barrier was pushed into the aperture 250 mm from the exposed face.
2. Specimen C	
Details of aperture	: 1200 mm long x 150 mm wide x 600 mm deep
Details of barrier	
Manufacturer	: Timloc
Reference	: TIMFRSTOP 150
Material	: Stone mineral wool enclosed within a red polyethylene bag.
Overall size	: 1200 mm long x 160 mm wide x 150 mm deep
Density	: 40 kg/m ³ (stated)
Fixing method	: Compression fitted within the aperture with a 10 mm compression across the width. The barrier was pushed into the aperture 250 mm from the exposed face.
Wall test	
3. Specimen E	
Details of aperture	: 1200 mm long x 100 mm wide x 600 mm deep
Details of barrier	
Manufacturer	: Timloc
Reference	: TIMFRSTOP 100
Material	: Stone mineral wool enclosed within a red polyethylene bag.
Overall size	: 1200 mm long x 120 mm wide x 150 mm deep
Density	: 40 kg/m ³ (stated)
Fixing method	: Compression fitted within the aperture with a 20 mm compression across the width. The barrier was pushed into the aperture 250 mm from the exposed face.

<u>Item</u>	<u>Description</u>
4. Specimen F	
Details of aperture	: 1200 mm long x 150 mm wide x 600 mm deep
Details of barrier	
Manufacturer	: Timloc
Reference	: TIMFRSTOP 150
Material	: Stone mineral wool enclosed within a red polyethylene bag.
Overall size	: 1200 mm long x 160 mm wide x 150 mm deep
Density	: 40 kg/m ³ (stated)
Fixing method	: Compression fitted within the aperture with a 10 mm compression across the width. The barrier was pushed into the aperture 250 mm from the exposed face.
Supporting construction (comprising items 5-8)	
5. OSB	
Manufacturer	: Kingfisher
Material	: Oriented Strand Board, comprised of compressed wood strands.
Overall size	: 1200 mm long x 600 mm wide
Thickness	: 15 mm
Fixing method	: Through fixed to the concrete lintels with screws.
Fixings (screws)	
i. type	: Zinc plated screws
ii. size	: 50 mm long x 3.0 mm diameter
iii. centres	: 500 mm
6. Concrete wall lintels (supplied by Warringtonfire)	
Material	: Autoclaved aerated concrete lintels
Density	: 670 kg/m ³
Overall size	: 1800/1200 mm long x 600 mm deep x 150/200 mm wide
7. Concrete floor lintels (supplied by Warringtonfire)	
Material	: Autoclaved aerated concrete lintels
Density	: 670 kg/m ³
Overall size	: 1680 mm long x 150/600 mm deep x 200/250 mm wide
8. Masonry infill (supplied by WarringtonFire)	
Material	: Aerated concrete blockwork
Density	: 760 kg/m ³

Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	
00	00	The Test Commences.
05	30	Smoke release from the top of Specimen E at the AAC and barrier interface.
07	20	Smoke release from Specimens B and C along the length of barrier and OSB interface.
12	50	Smoke release at the base of Specimen E along the length of the AAC and barrier interface.
22	20	Slight glowing visible at the head of both Specimen E, near the AAC and barrier interface. The glowing is not due to the OSB.
29	30	Darkening of OSB at the heads of Specimen E where the glowing is.
38	30	There is darkening at the OSB at the head of Specimen E near the glowing.
46	20	Considerable darkening of the OSB at the head of Specimen E.
47	10	Moisture is visible underneath the bag and above the Stone mineral wool.
62	10	Flaming and embers visible at the head of Specimen E, integrity failure is deemed to occur.
63	00	Glowing is visible at the head of Specimen F.
66	00	Test discontinued.

Test Photographs

The exposed face of the wall assembly prior to testing



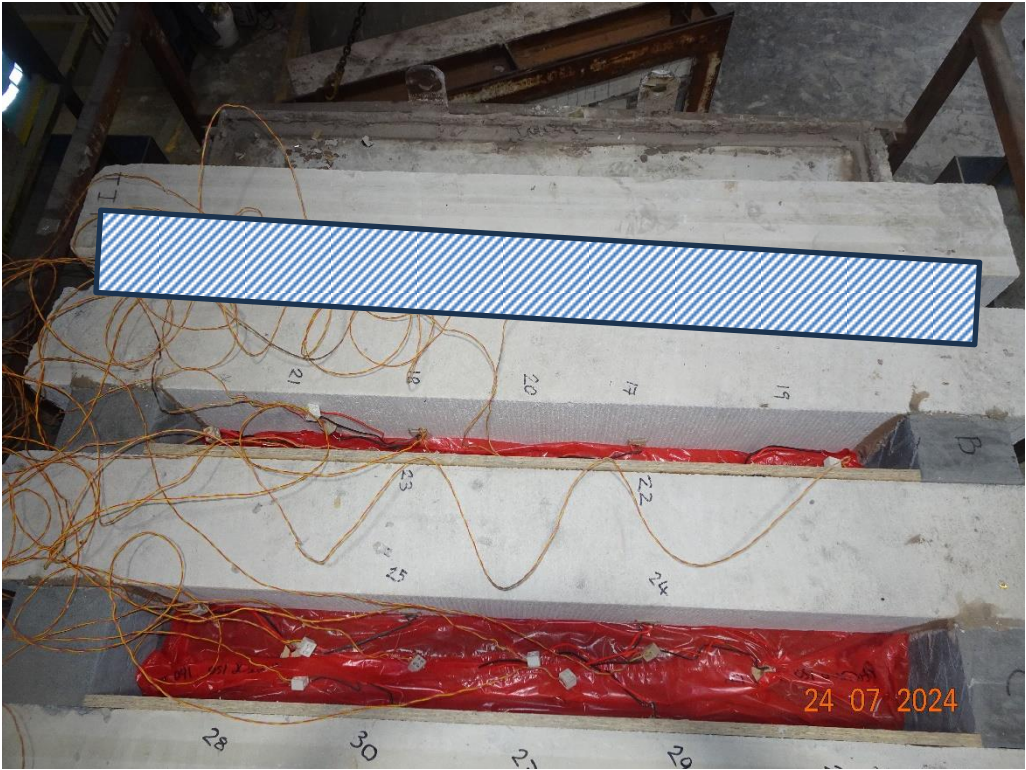
The exposed face of the floor assembly prior to testing



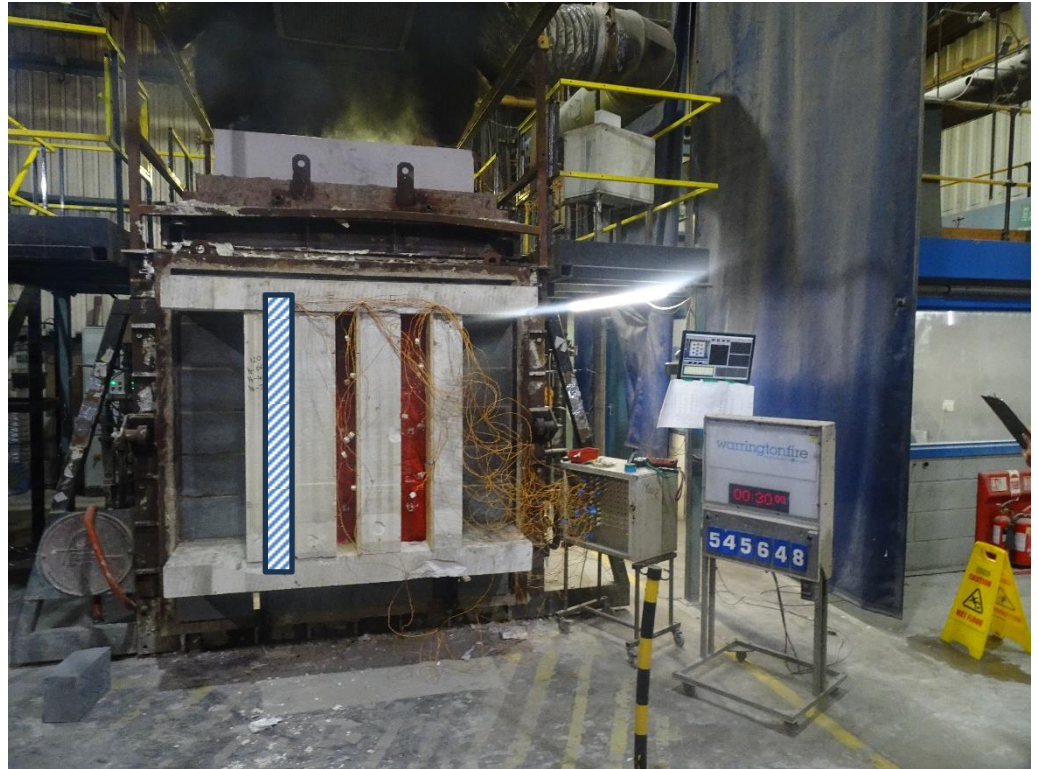
The unexposed face of the wall assembly prior to the start of the test



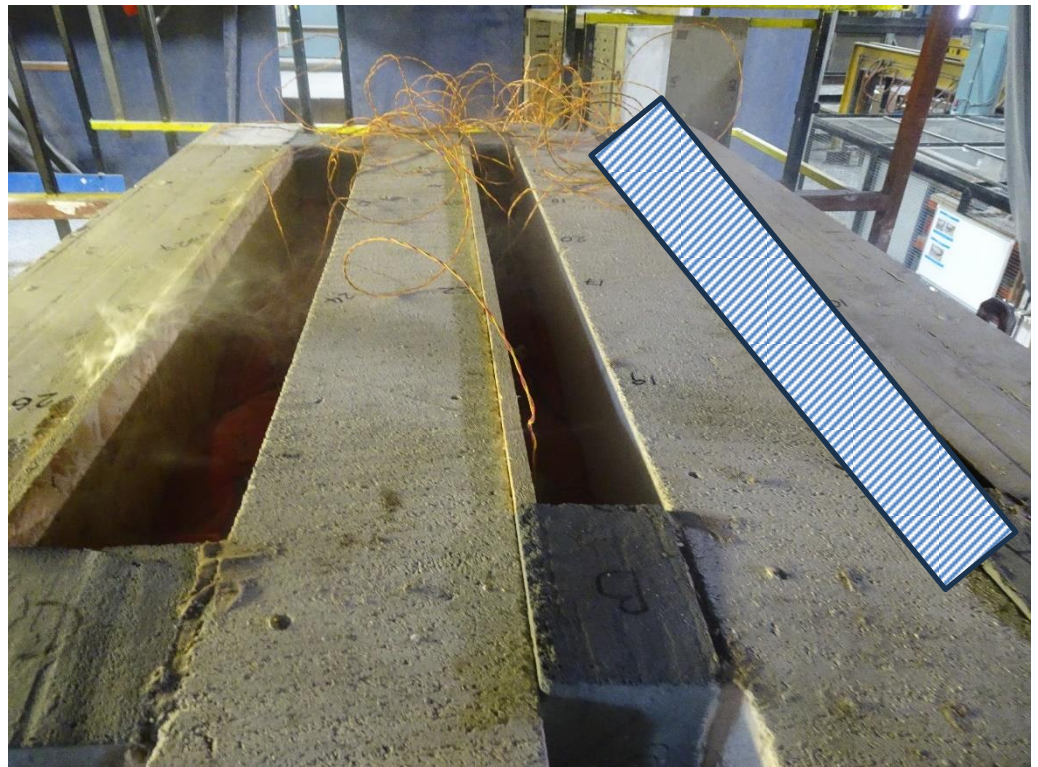
The unexposed face of the floor assembly prior to the start of the test



The unexposed face of the wall assembly after a test duration of 30 minutes



The unexposed face of the floor assembly after a test duration of 30 minutes



The unexposed face of the wall assembly after a test duration of 60 minutes



The unexposed face of the floor assembly after a test duration of 60 minutes



Temperature and Pressure Data

Mean furnace temperature, together with the temperature/time relationship specified in BS EN 1363-1: 2020

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	20
2	445	256
4	544	389
6	603	533
8	645	649
10	678	695
12	705	691
14	728	727
16	748	757
18	766	764
20	781	789
22	796	800
24	809	809
26	820	813
28	831	829
30	842	840
32	851	855
34	860	856
36	869	872
38	877	881
40	885	887
42	892	895
44	899	902
46	906	908
48	912	915
50	918	922
52	924	927
54	930	929
56	935	936
58	940	942
60	945	947
62	950	952
64	955	957
66	960	963

Individual temperatures recorded on the unexposed surface of Specimen B and adjacent to Specimen B

Time Minutes	T/C Number 17 Deg. C	T/C Number 18 Deg. C	T/C Number 19 Deg. C	T/C Number 20 Deg. C	T/C Number 21 Deg. C	T/C Number 22 Deg. C	T/C Number 23 Deg. C
0	21	21	22	20	21	21	22
2	21	21	22	21	21	22	22
4	22	21	23	21	21	22	22
6	22	22	23	22	22	22	23
8	22	21	23	22	22	22	23
10	22	22	23	22	23	22	23
12	22	22	23	22	23	22	23
14	22	22	24	23	24	23	23
16	22	22	24	24	25	23	23
18	22	22	25	24	26	23	24
20	23	22	26	25	28	23	24
22	23	22	27	26	29	24	25
24	23	23	28	27	30	24	25
26	23	23	29	28	32	25	26
28	24	23	31	29	33	25	26
30	24	24	32	30	34	26	27
32	24	24	33	32	36	26	28
34	25	24	35	33	37	27	28
36	25	25	36	33	39	28	29
38	25	25	37	34	40	29	30
40	26	26	38	36	42	30	31
42	26	26	39	37	43	31	32
44	27	26	40	38	44	32	33
46	28	27	41	38	46	33	34
48	28	27	43	40	47	34	35
50	29	28	44	41	49	36	37
52	29	29	45	42	50	37	38
54	30	29	46	44	51	39	39
56	31	30	47	45	52	41	40
58	31	31	48	46	54	43	41
60	32	32	49	47	56	45	43
62	33	33	50	49	57	48	45
64	33	34	51	50	58	50	47
66	34	35	52	52	59	53	48

Individual temperatures recorded on the unexposed surface of Specimen C and adjacent to Specimen C

Time Minutes	T/C Number 24 Deg. C	T/C Number 25 Deg. C	T/C Number 26 Deg. C	T/C Number 27 Deg. C	T/C Number 28 Deg. C	T/C Number 29 Deg. C	T/C Number 30 Deg. C
0	21	21	21	23	21	23	22
2	21	22	21	23	22	23	22
4	21	22	22	23	22	23	23
6	22	22	23	24	24	23	23
8	22	22	24	24	30	24	23
10	23	22	26	26	34	25	24
12	24	23	27	29	37	26	26
14	24	24	28	32	39	28	27
16	25	26	29	35	41	29	29
18	26	26	30	36	43	31	30
20	27	27	32	39	46	33	32
22	28	29	32	41	48	35	34
24	29	30	34	44	51	37	36
26	30	32	35	47	55	39	38
28	31	34	35	49	59	42	40
30	33	36	36	52	63	44	42
32	34	38	37	54	64	47	44
34	35	40	38	56	67	49	46
36	36	43	39	58	68	52	48
38	37	45	40	59	71	55	50
40	38	46	41	61	72	59	52
42	40	48	42	62	73	63	54
44	41	50	43	63	74	67	56
46	42	52	44	65	75	70	59
48	42	54	44	66	73	73	64
50	43	56	46	67	74	75	68
52	44	57	47	68	74	78	72
54	46	58	48	70	75	80	75
56	46	60	48	71	75	81	78
58	47	61	49	73	76	82	80
60	48	62	49	74	76	83	82
62	49	64	50	75	77	84	83
64	50	65	51	75	78	85	84
66	51	66	51	76	78	85	85

Individual temperatures recorded on the unexposed surface of Specimen E and adjacent to Specimen E

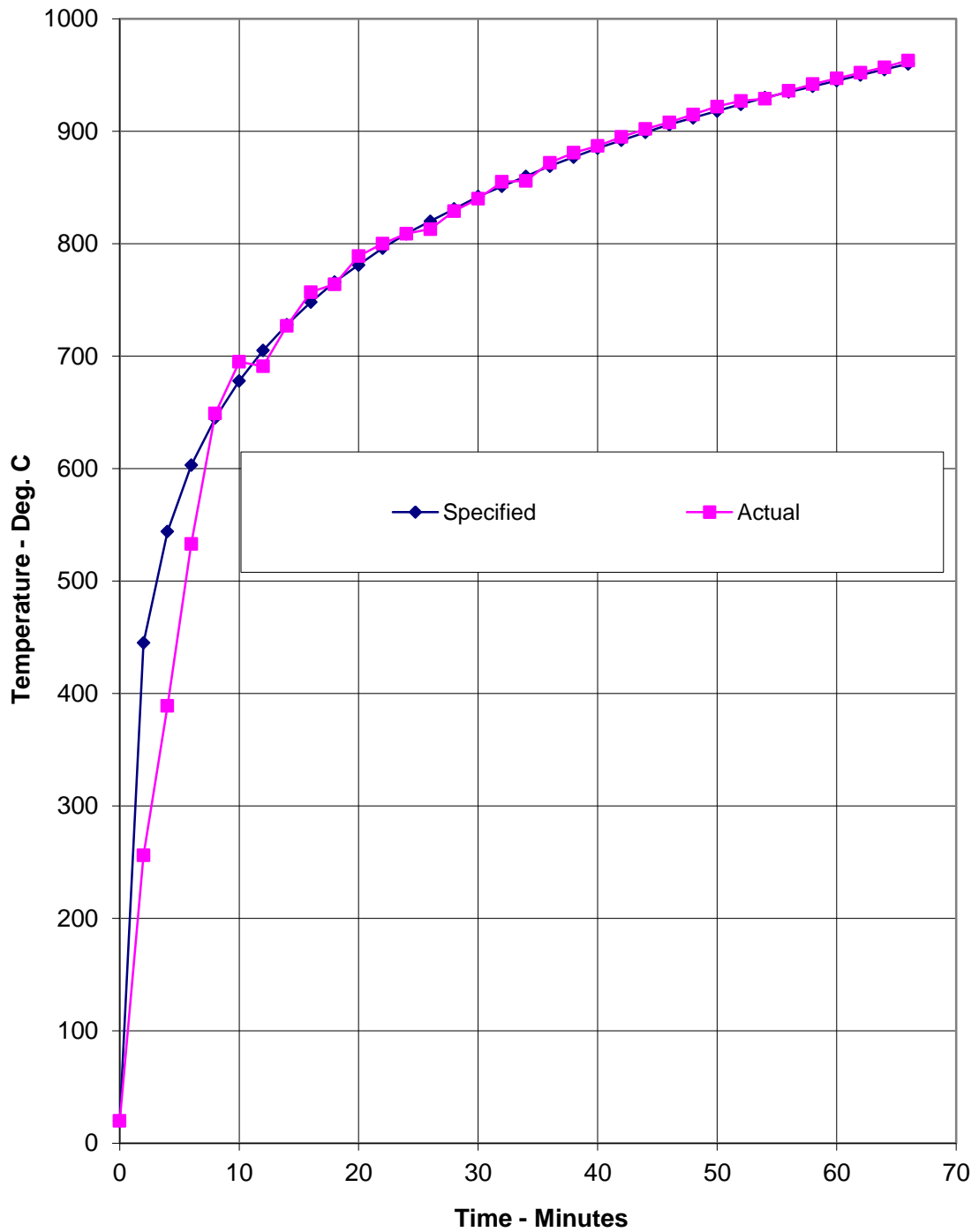
Time Minutes	T/C Number 38 Deg. C	T/C Number 39 Deg. C	T/C Number 40 Deg. C	T/C Number 41 Deg. C	T/C Number 42 Deg. C	T/C Number 43 Deg. C	T/C Number 44 Deg. C
0	22	21	24	23	22	22	22
2	24	24	26	26	26	26	25
4	26	27	32	31	32	29	28
6	30	30	41	38	39	33	33
8	29	30	44	39	40	33	33
10	30	31	43	39	41	34	35
12	30	30	40	39	40	34	34
14	30	30	39	40	39	33	34
16	30	30	37	42	39	34	34
18	30	30	36	44	39	34	34
20	31	30	35	47	40	35	35
22	31	31	34	49	41	36	35
24	32	32	35	52	43	37	36
26	33	32	36	55	45	38	37
28	33	33	36	57	47	39	38
30	34	33	35	59	49	40	38
32	34	34	34	61	50	41	39
34	35	34	35	63	53	42	40
36	36	35	36	65	55	43	40
38	36	35	36	66	56	43	41
40	36	35	36	68	58	44	41
42	37	36	38	70	61	46	42
44	38	36	40	71	63	48	43
46	38	36	41	71	65	49	44
48	39	37	41	73	66	52	45
50	40	37	43	74	55	55	45
52	40	38	44	75	49	57	46
54	41	38	46	76	49	60	47
56	41	39	48	76	48	62	48
58	42	39	49	77	48	65	49
60	42	39	51	77	48	66	50
62	43	40	53	78	49	68	52
64	*	*	*	*	*	*	*
66	*	*	*	*	*	*	*

*Thermocouple malfunction

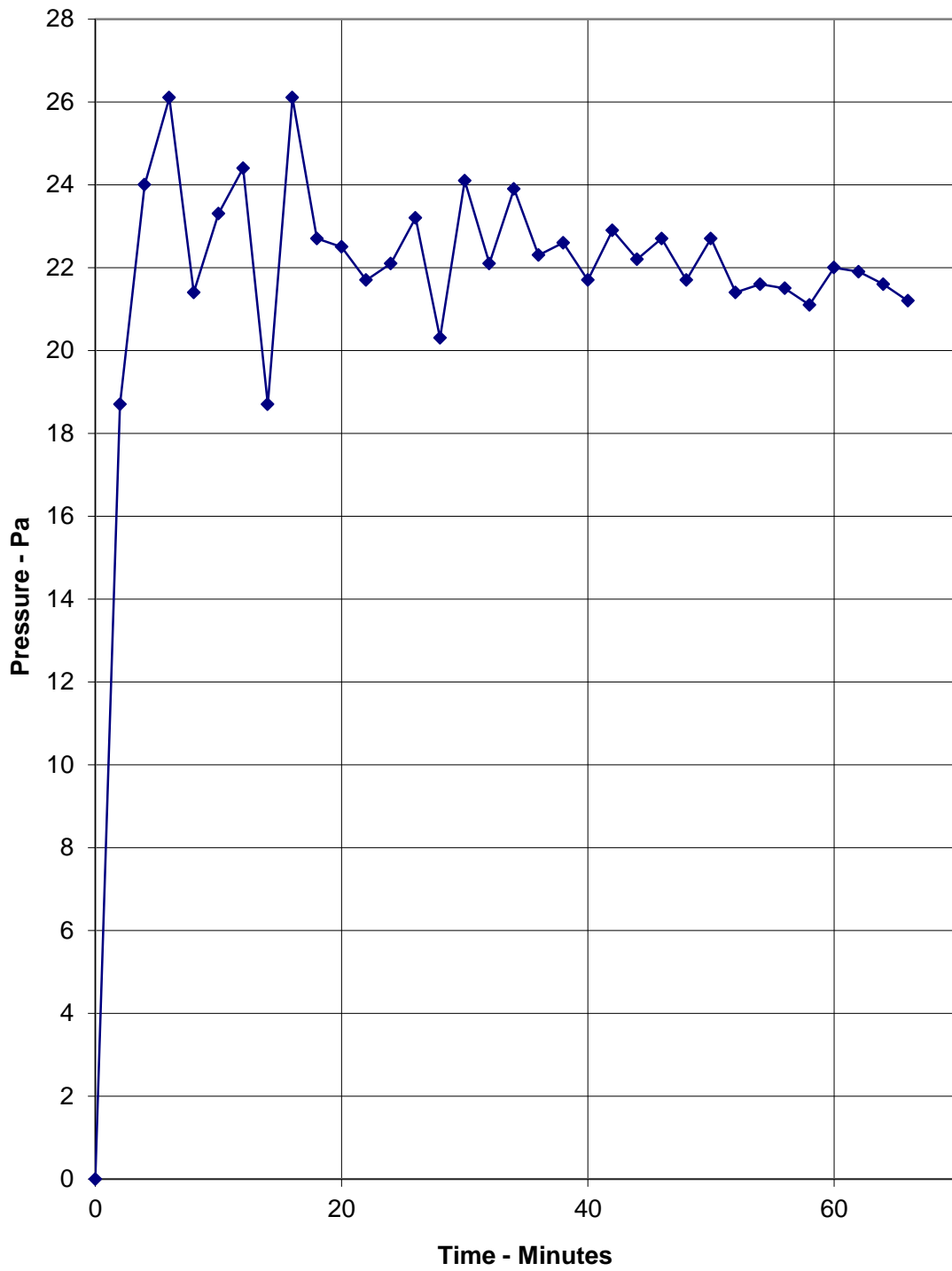
Individual temperatures recorded on the unexposed surface of Specimen F and adjacent to Specimen F

Time Minutes	T/C Number 45 Deg. C	T/C Number 46 Deg. C	T/C Number 47 Deg. C	T/C Number 48 Deg. C	T/C Number 49 Deg. C	T/C Number 50 Deg. C	T/C Number 51 Deg. C
0	22	22	23	23	22	23	22
2	25	25	26	29	27	25	24
4	27	27	30	34	33	26	26
6	29	29	34	40	39	29	28
8	29	28	36	38	39	29	29
10	29	29	42	40	39	31	30
12	29	29	45	39	38	31	29
14	29	28	47	39	37	31	30
16	29	29	49	40	37	31	30
18	30	29	50	41	37	32	30
20	30	29	49	41	37	32	31
22	30	29	49	42	36	32	31
24	30	30	51	43	37	33	31
26	31	30	53	44	37	34	32
28	32	31	56	47	40	35	34
30	32	31	59	48	40	36	34
32	33	32	62	49	40	37	35
34	34	32	65	52	42	38	36
36	34	33	65	53	44	39	38
38	35	34	66	55	45	41	39
40	35	34	67	55	45	41	40
42	36	35	69	58	48	43	43
44	37	36	70	60	51	44	46
46	38	37	71	62	55	46	49
48	38	39	72	64	58	47	52
50	39	40	73	66	62	49	56
52	40	41	74	69	66	51	59
54	41	43	71	71	69	53	63
56	43	44	63	73	71	56	67
58	44	46	58	76	73	58	70
60	45	47	58	77	73	61	73
62	46	48	59	78	74	63	77
64	47	50	60	79	74	66	79
66	48	50	59	78	74	68	82

Graph showing mean furnace temperature, together with the temperature/time relationship specified in BS EN 1363-1: 2020



Graph showing recorded furnace pressure 100mm above head of the wall specimens



On-going Implications

Limitations

The results relate only to the behaviour of the specimens 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.

The results may not be applicable to situations where the joint widths, sealant depths, orientations, supporting construction and backing material vary from those tested.

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.

EGOLF

Certain aspects of some fire test specifications are open to different interpretations. EGOLF has identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed

Note: The field of direct application may only be defined following the identification of classification(s). The field of direct and, where applicable, extended application will be included in the classification report.