

**Title:**

The Fire Resistance Performance Of Two Specimens Of Vertical Mounted And Three Specimens Of Horizontal Mounted Cavity Barrier Systems, When Tested In General Accordance With EN 1366-4:2006+A1:2010

**Date Of Test:**

3rd December 2020

**Issue 2:**

25th January 2021

**WF Report No:**

432893/R



**Prepared for:**

**Timloc Building Products**

Timloc House  
Ozone park  
Howden  
DN14 7SD

# Test Specimen

## Summary of Tested Specimen

For the purpose of the test the horizontal specimens were referenced A to C and the vertical specimens were referenced D and E.

The section of horizontal had overall dimensions of 2150 mm long by 1750 mm wide by 150 mm thick and was made up of autoclaved concrete lintels and blockwork arranged to provide three linear gaps of varying widths which were all 1000 mm in length.

The section of vertical had overall dimensions of 1500 mm high by 1500 mm wide by 150 mm thick and was made up of aerated blockwork arranged to provide two linear gaps of varying widths which were all 1000 mm in length.

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

## Horizontal Specimens

Specimen	Substrate	Seal Details
A	Concrete to Concrete	300 mm wide linear gap, sealed with a stone wool cavity barrier within a polythene sheath referenced 'Thermo-Loc FR60 for check/staggered reveal', which had a stated density of 140 kg/m <sup>3</sup> . The barrier was installed flush with the unexposed face and had overall dimensions of 1000 mm long by 300 mm wide by 50 mm deep. The barrier was fixed to the supporting construction along one longitudinal edge using two galvanised mild steel brackets, the opposite edge of the barrier was friction fitted into a PVCu carrier which was friction fitted between the cavity barrier and the supporting construction.
B	Concrete to Concrete	300 mm wide linear gap, sealed with a stone wool cavity barrier within a polythene sheath referenced 'Thermo-Loc FR60', which had a stated density of 140 kg/m <sup>3</sup> . The barrier was installed flush with the exposed face and had overall dimensions of 1000 mm long by 300 mm wide by 50 mm deep. The barrier was fixed to the supporting construction along one longitudinal edge using two galvanised mild steel brackets, the opposite edge of the barrier was friction fitted into a PVCu extruded profile carrier which was nailed to the supporting construction using three masonry nails.

**Horizontal  
Specimens  
Continued**

Specimen	Substrate	Seal Details
C	Concrete to Concrete	300 mm wide linear gap, sealed with a stone wool cavity barrier within a polythene sheath referenced 'Thermo-Loc FR60', which had a stated density of 140 kg/m <sup>3</sup> . The barrier was installed flush with the unexposed face and had overall dimensions of 1000 mm long by 300 mm wide by 50 mm deep. The barrier was fixed to the supporting construction along one longitudinal edge using two galvanised mild steel brackets, the opposite edge of the barrier was friction fitted into a PVCu extruded profile carrier which was nailed to the supporting construction using three masonry nails.

**Vertical  
Specimens**

Specimen	Substrate	Seal Details
D	Concrete to Concrete	300 mm wide linear gap, sealed with a stone wool cavity barrier within a polythene sheath referenced 'Thermo-Loc FR60', which had a stated density of 140 kg/m <sup>3</sup> . The barrier was installed flush with the exposed face and had overall dimensions of 1000 mm long by 300 mm wide by 50 mm deep. The barrier was fixed to the supporting construction along one vertical edge using two galvanised mild steel brackets, the opposite edge of the barrier was friction fitted into a PVCu extruded profile carrier which was nailed to the supporting construction using three masonry nails.
E	Concrete to Concrete	300 mm wide linear gap, sealed with a stone wool cavity barrier within a polythene sheath referenced 'Thermo-Loc FR60', which had a stated density of 140 kg/m <sup>3</sup> . The barrier was installed flush with the unexposed face and had overall dimensions of 1000 mm long by 300 mm wide by 50 mm deep. The barrier was fixed to the supporting construction along one vertical edge using two galvanised mild steel brackets, the opposite edge of the barrier was friction fitted into a PVCu extruded profile carrier which was nailed to the supporting construction using three masonry nails.

*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

<b>Integrity</b>	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 1363-1: 2020, or resulting in sustained flaming on the unexposed surface.																												
<b>Insulation</b>	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.																												
<b>Test Results</b>	<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>A</td> <td>55</td> <td>99*</td> <td>20</td> </tr> <tr> <td>B</td> <td>59</td> <td>73</td> <td>18</td> </tr> <tr> <td>C</td> <td>96</td> <td>99*</td> <td>16</td> </tr> <tr> <td>D</td> <td>98</td> <td>99*</td> <td>20</td> </tr> <tr> <td>E</td> <td>79</td> <td>81<sup>#</sup></td> <td>18</td> </tr> </tbody> </table> <p>*Test was discontinued after a period of 99 minutes. #Specimen blanked off.</p>			Specimen	Integrity (minutes)		Insulation (minutes)	Cotton Pad	Sustained flaming	A	55	99*	20	B	59	73	18	C	96	99*	16	D	98	99*	20	E	79	81 <sup>#</sup>	18
Specimen	Integrity (minutes)		Insulation (minutes)																										
	Cotton Pad	Sustained flaming																											
A	55	99*	20																										
B	59	73	18																										
C	96	99*	16																										
D	98	99*	20																										
E	79	81 <sup>#</sup>	18																										

**Date of Test** 3rd December 2020

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## Signatories

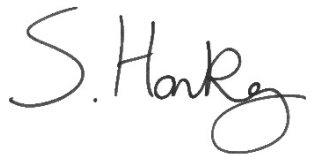
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\* For and on behalf of **Warringtonfire**.

Report Issued

**Date:** 25th January 2021

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## Revision History

Issue No: 2	Re-issue Date: 25 <sup>th</sup> January 2021
Revised By: J. Whalley	Approved By: D. Whittle
Reason for Revision: Specimen references changed from wall and floor to vertical and horizontal.	

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

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# Test Conditions

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<b>Standard</b>	<p>BS EN 1366-4: 2006 +A1:2010 Fire resistance tests for service installations – Part 4: Linear joint seals</p> <p>Clause 6.2 of BS EN 1366-4: 2006 + A1: 2010 specifies length to width ratio for a linear joint seal to be minimum 10:1. This requirement was not satisfied 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>
<b>Sampling</b>	<p><b>Warringtonfire</b> 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 <b>Warringtonfire</b>.</p>
<b>Installation</b>	<p><b>Warringtonfire</b> supplied the vertical and horizontal constructions. The gap sealing systems were provided and installed by a representative of the test sponsor on the 2<sup>nd</sup> December 2020.</p>
<b>Conditioning</b>	<p>The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 2 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 10°C to 18.5°C and 44.5% to 65% respectively.</p>
<b>Instruction to Test</b>	<p>The test was conducted on the 3rd December 2020 at the request of Timloc Building Products, the test sponsor.</p> <p>No representatives of the test sponsor were present to witness the test.</p>
<b>Ambient Temperature</b>	<p>The ambient air temperature in the vicinity of the test construction was 9°C at the start of the test with a maximum variation of +3°C during the test.</p>
<b>Furnace</b>	<p>The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2020 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>
<b>Thermocouples</b>	<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 6.</p>



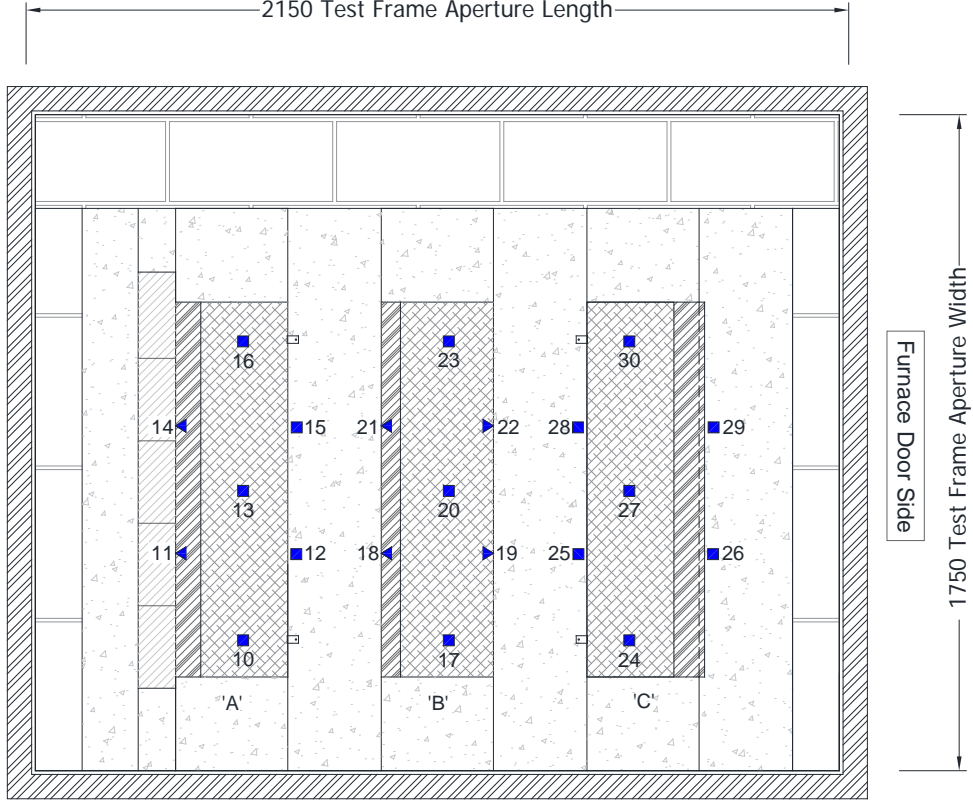
### Furnace Pressure

The requirements of BS EN 1366-4: 2006+A1:2010, clause 5.2 could not be satisfied due to simultaneous testing of vertical and horizontal specimens. The horizontal specimens were tested under more onerous conditions, at position 100 mm below the underside of the horizontal 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 vertical specimens satisfied the requirements of BS EN 1366-4: 2006+A1:2010, clause 5.2. The calculated pressure differential relative to the laboratory atmosphere at mid height of the lowest mounted vertical specimens was 15 ( $\pm$  5).

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.

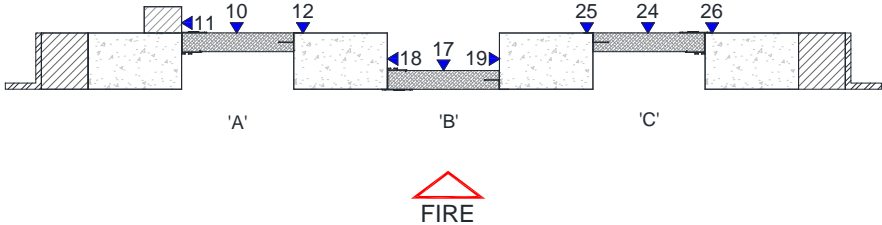
# Test Specimen Drawings

**Figure 1- General Plan View of Horizontal Test Construction and Unexposed Face Thermocouples**



■/▼ Positions of surface thermocouples

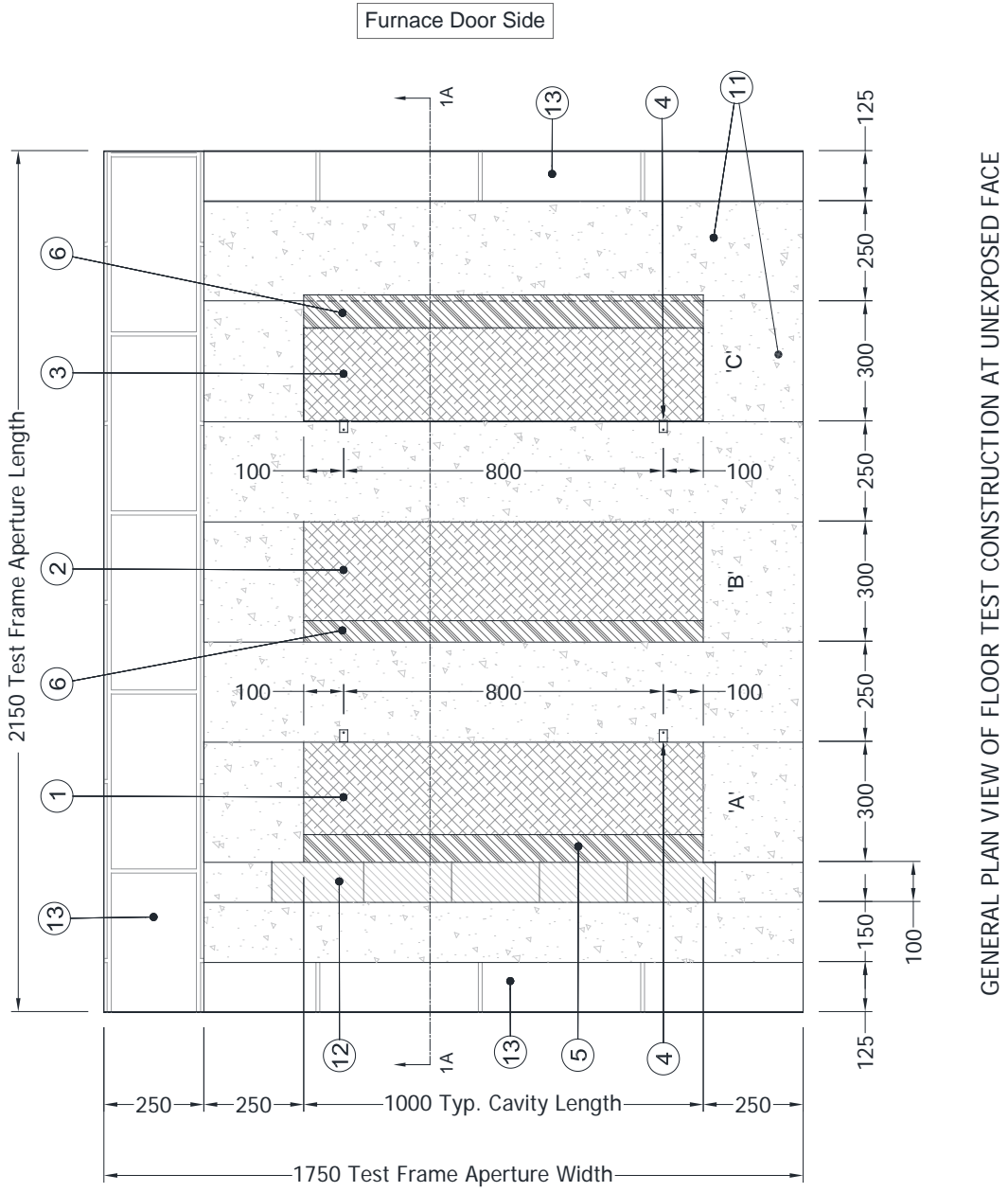
GENERAL PLAN VIEW OF FLOOR TEST CONSTRUCTION  
SHOWING THERMOCOUPLE LOCATIONS



VERTICAL SECTION THROUGH FLOOR TEST CONSTRUCTION  
SHOWING THERMOCOUPLE LOCATIONS

Do not scale. All dimensions are in mm

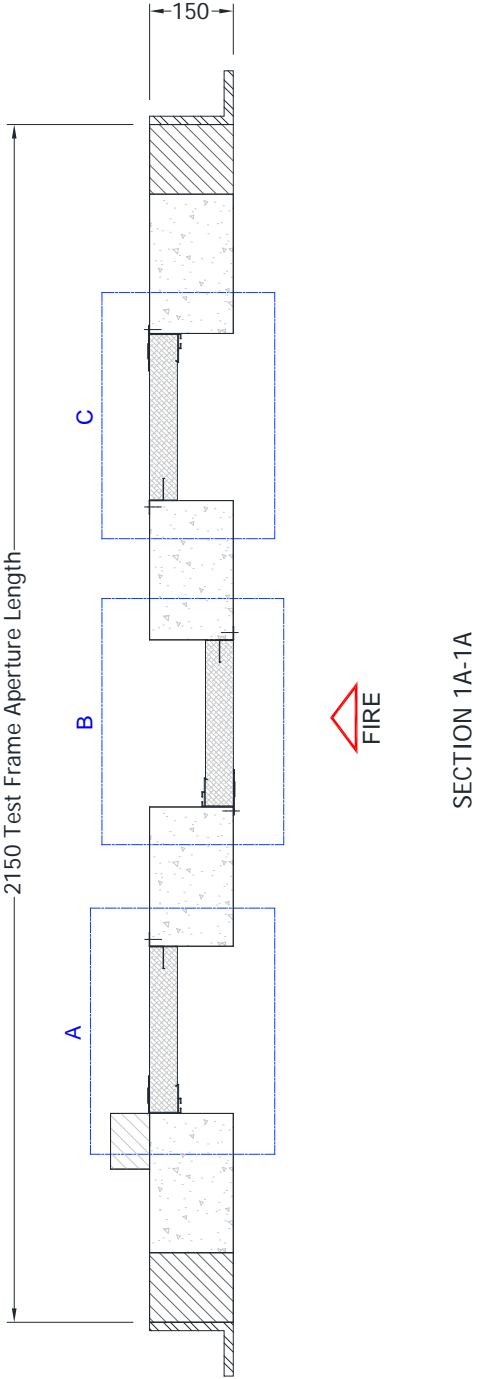
**Figure 2 – General Plan View of Horizontal Test Construction at Unexposed Face**



GENERAL PLAN VIEW OF FLOOR TEST CONSTRUCTION AT UNEXPOSED FACE

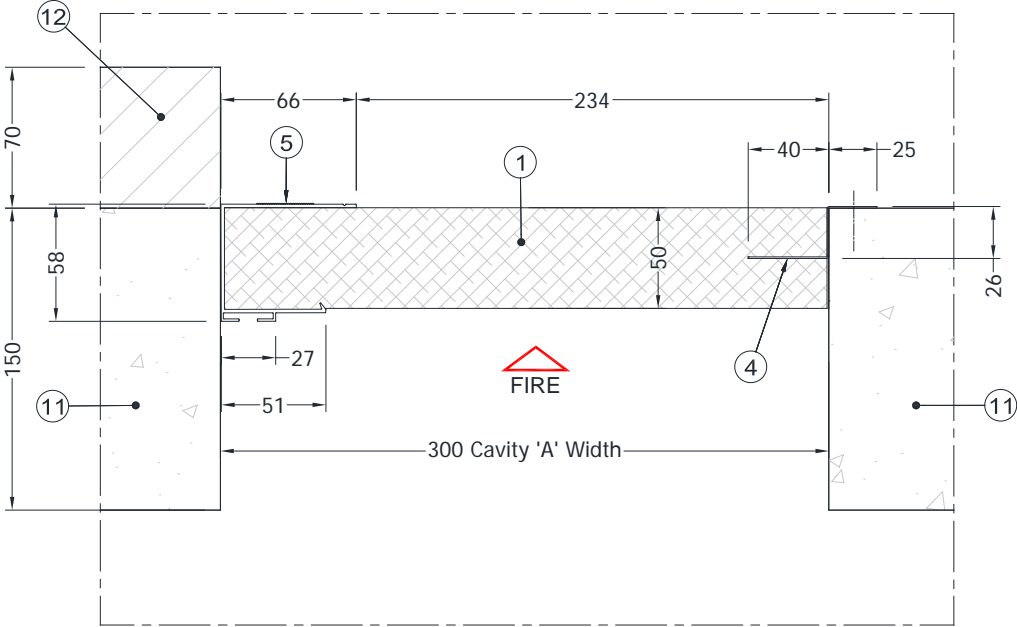
Do not scale. All dimensions are in mm

**Figure 3 – Section 1A-1A**

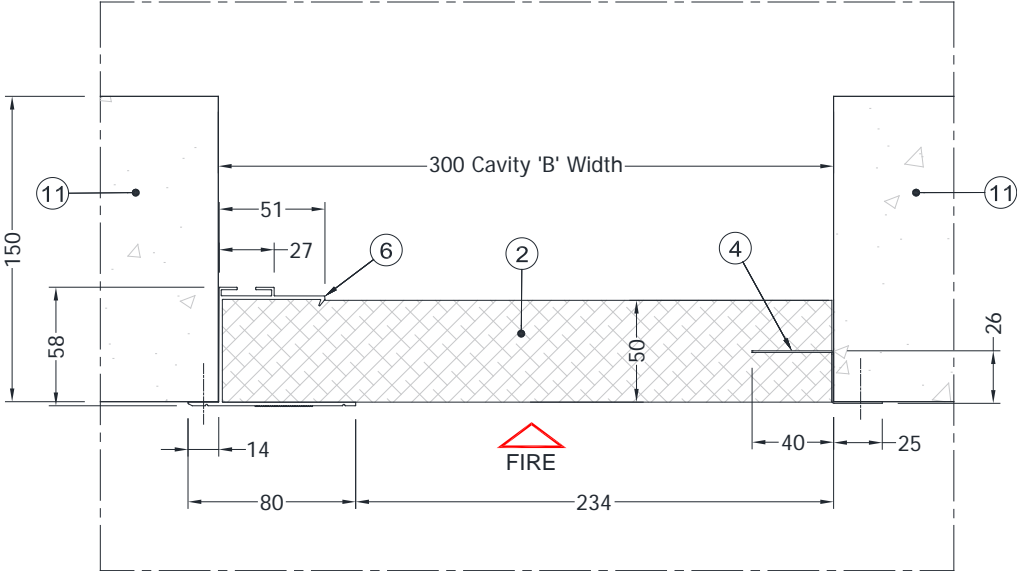


Do not scale. All dimensions are in mm

**Figure 4 – Details 'A' & 'B'**



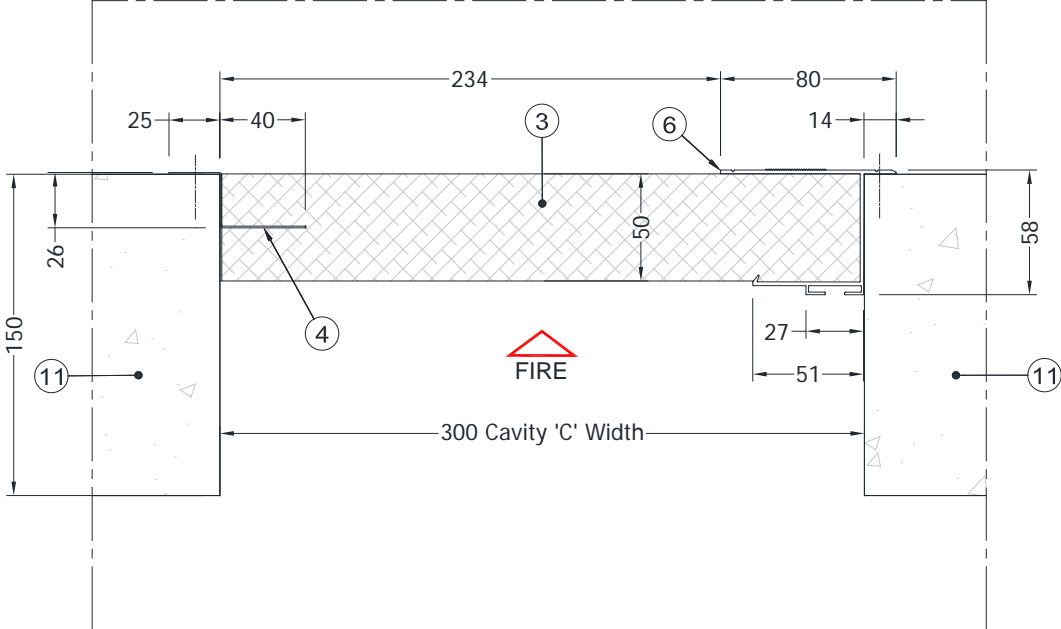
DETAIL 'A'



DETAIL 'B'

Do not scale. All dimensions are in mm

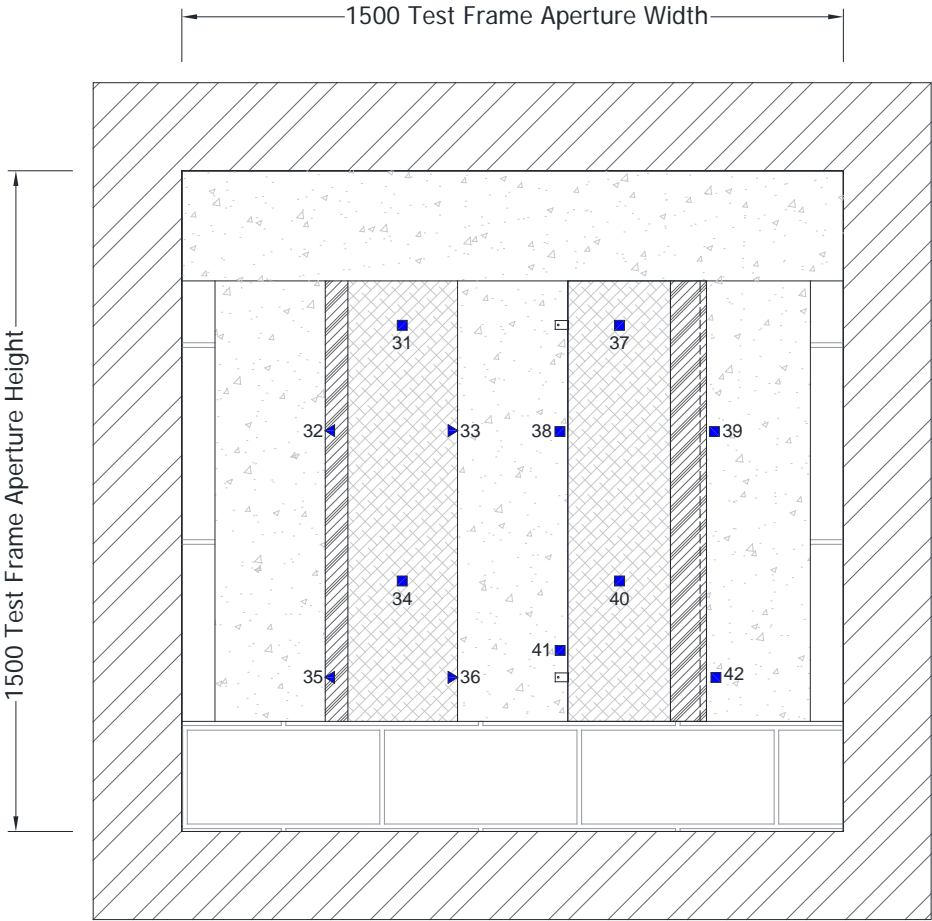
**Figure 5 – Detail 'C'**



DETAIL 'C'

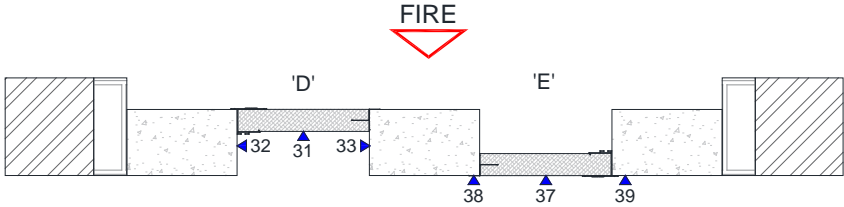
Do not scale. All dimensions are in mm

**Figure 6 – General Elevation of Vertical Test Construction and Unexposed Face Thermocouples**



■/▼ Positions of surface thermocouples

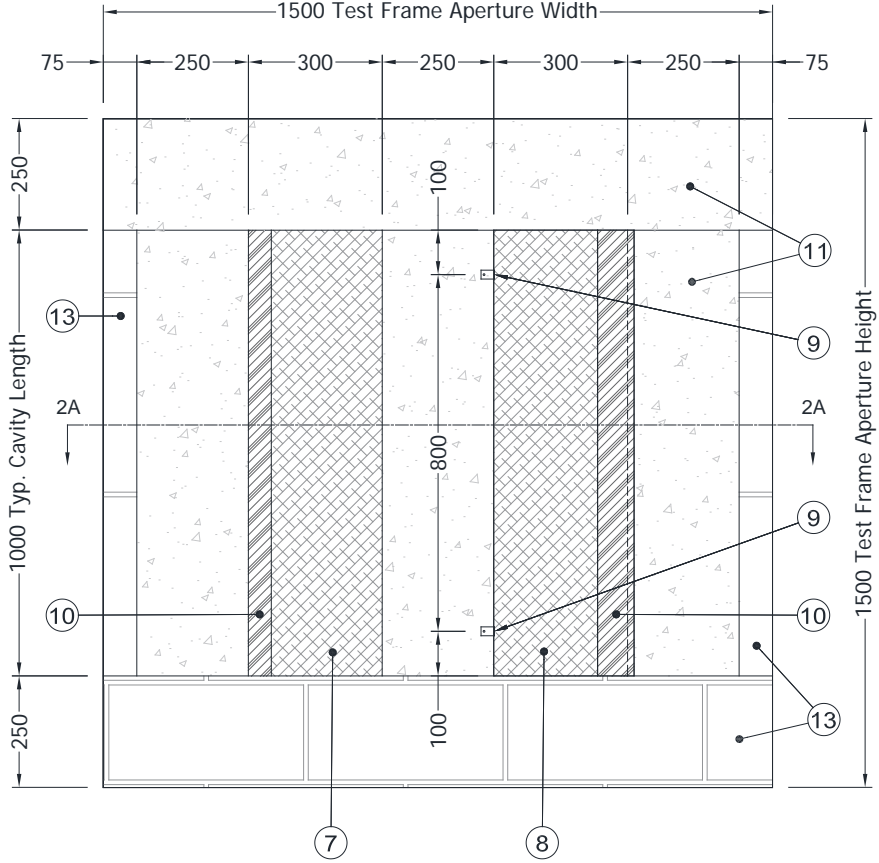
GENERAL ELEVATION OF WALL TEST CONSTRUCTION  
SHOWING THERMOCOUPLE LOCATIONS



HORIZONTAL SECTION THROUGH WALL TEST CONSTRUCTION  
SHOWING THERMOCOUPLE LOCATIONS

Do not scale. All dimensions are in mm

**Figure 7 – General Elevation of Vertical Test Construction at Unexposed Face**

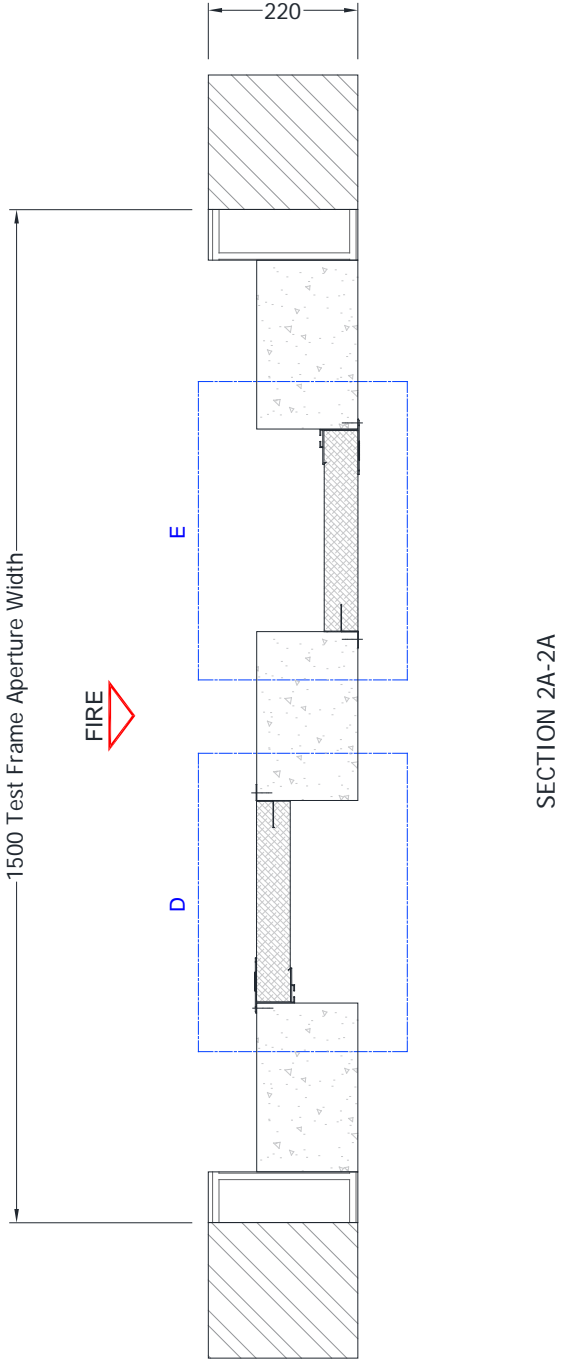


GENERAL ELEVATION OF WALL TEST CONSTRUCTION AT UNEXPOSED FACE

Do not scale. All dimensions are in mm



**Figure 8 –Section 2A-2A**



Do not scale. All dimensions are in mm



# Schedule of Components

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(Refer to Figures 1 & 9)

(All values are nominal unless stated otherwise)

(All other details are as stated by the sponsor)

<u>Item</u>	<u>Description</u>
<b>Horizontal Construction</b>	
<b>1. Cavity Barrier (Specimen 'A')</b>	
Manufacturer	: Knauf Insulations
Reference	: Earthwool Building Slab RS140
Material	: Polythene enclosed stone wool insulation
Density	: 140 kg/m <sup>3</sup> (stated)
Overall aperture size	: 150 mm deep x 300 mm wide x 1000 mm long
Overall barrier size	: 50 mm thick x 300 mm wide x 1000 mm long
Fixing method	: Fixed along one edge via 2no. brackets (item 4) and fixed along the opposite, parallel edge, via 1no. rigid plastic carrier closer (item 5).
<b>2. Cavity Barrier (Specimen 'B')</b>	
Manufacturer	: Knauf Insulations
Reference	: Earthwool Building Slab RS140
Material	: Polythene enclosed stone wool insulation
Density	: 140 kg/m <sup>3</sup> (stated)
Overall aperture size	: 150 mm deep x 300 mm wide x 1000 mm long
Overall barrier size	: 50 mm thick x 300 mm wide x 1000 mm long
Fixing method	: Fixed along one edge via 2no. brackets (item 4) and fixed along the opposite, parallel edge, via 1no. rigid plastic carrier (item 6).
<b>3. Cavity Barrier (Specimen 'C')</b>	
Manufacturer	: Knauf Insulations
Reference	: Earthwool Building Slab RS140
Material	: Polythene enclosed stone wool insulation
Density	: 140 kg/m <sup>3</sup> (stated)
Overall aperture size	: 150 mm deep x 300 mm wide x 1000 mm long
Overall barrier size	: 50 mm thick x 300 mm wide x 1000 mm long
Fixing method	: Fixed along one edge via 2no. brackets (item 4) and fixed along the opposite, parallel edge, via 1no. rigid plastic carrier (item 6).
<b>4. Bracket</b>	
Manufacturer	: Shanghai Jin Li Mechanical
Reference	: 3322
Material	: Galvanised mild steel
Overall size	: 65 mm long x 26 mm high x 20 mm wide x 1 mm thick
Fixing method	: 2no. brackets were inserted approximately 40 mm, centrally, into the cavity barrier and fixed to the supporting construction using 1no. 3.7 mm diameter x 30 mm long, zinc-plated steel mickey pin capping nail, with fixed washer, per bracket, at 800 mm centres (100 mm in from each end).

<b><u>Item</u></b>	<b><u>Description</u></b>
<b>5. Rigid Plastic Carrier - Check Reveal</b>	
Manufacturer	: PAL extrusions
Reference	: 3321CR
Material	: Extruded PVCu
Overall size	: 1000 mm long x 66 mm wide x 58 mm high x 1.7 mm thick
Quantity	: 1 off (barrier 'A')
Fixing method	: Friction fitted along the edge of the cavity barrier
<b>6. Rigid Plastic Carrier - Flush Reveal</b>	
Manufacturer	: PAL Extrusions
Reference	: 3321
Material	: Extruded PVCu
Overall size	: 1000 mm long x 80 mm wide x 58 mm high x 1.7 mm thick
Quantity	: 1 off per cavity barrier (barriers 'B' & 'C')
Fixing method	: Friction fitted along the edge of the cavity barrier and fixed to supporting construction using 2no. 3.7 mm diameter x 30 mm long, zinc-plated steel mickey pin capping nails, with fixed washer, at 800 mm centres (100 mm in from each end).
<b><u>Vertical Construction</u></b>	
<b>7. Cavity Barrier (Specimen 'D')</b>	
Manufacturer	: Knauf Insulations
Reference	: Polythene enclosed rock mineral wool slab
Material	: Polythene enclosed stone wool insulation
Density	: 140 kg/m <sup>3</sup> (stated)
Overall aperture size	: 150 mm deep x 300 mm wide x 1000 mm long
Overall barrier size	: 50 mm thick x 300 mm wide x 1000 mm long
Fixing method	: Fixed along one edge via 2no. brackets (item 9) and fixed along the opposite, parallel edge, via 1no. rigid plastic carrier (item 10).
<b>8. Cavity Barrier (Specimen 'E')</b>	
Manufacturer	: Knauf Insulation
Reference	: Earthwool Building Slab RS140
Material	: Polythene enclosed stone wool insulation
Density	: 140 kg/m <sup>3</sup> (stated)
Overall aperture size	: 150 mm deep x 300 mm wide x 1000 mm long
Overall barrier size	: 50 mm thick x 300 mm wide x 1000 mm long
Fixing method	: Fixed along one edge via 2no. brackets (item 9) and fixed along the opposite, parallel edge, via 1no. rigid plastic carrier (item 10).
<b>9. Bracket</b>	
Manufacturer	: Shanghai Jin Li Mechanical
Reference	: 3322
Material	: Galvanised mild steel
Overall size	: 65 mm long x 26 mm high x 20 mm wide x 1 mm thick
Fixing method	: 2no. brackets were inserted approximately 40 mm, centrally, into the cavity barrier and fixed to the supporting construction using 1no. 3.7 mm diameter x 30 mm long, zinc-plated steel mickey pin capping nail, with fixed washer, per bracket, at 800 mm centres (100 mm in from each end).

<u>Item</u>	<u>Description</u>
<b><u>Vertical Construction Cont.</u></b>	
<b>10. Rigid Plastic Carrier - Flush Reveal</b>	
Manufacturer	: PAL Extrusions
Reference	: Extruded PVCu
Material	: Extruded PVCu
Overall size	: 1000 mm long x 80 mm wide x 58 mm high x 1.7 mm thick
Quantity	: 1 off per cavity barrier (barriers 'D' & 'E')
Fixing method	: Friction fitted along the edge of the cavity barrier and fixed to supporting construction using 2no. 3.7 mm diameter x 30 mm long, zinc-plated steel mickey pin capping nails, with fixed washer, at 800 mm centres (100 mm in from each end).

**Supporting Construction – Horizontal & Vertical (Supplied by Warringtonfire)**

**11. Concrete slab**

Material	: Concrete
Density	: 670 kg/m <sup>3</sup>
Overall size	: 250 mm wide x 150 mm deep
Fixing method	: Ordinary sand/cement mortar mix

**12. Concrete Blockwork**

Material	: Concrete
Density	: 670 kg/m <sup>3</sup>
Overall size	: 100 mm wide x 70 mm high x 1110 mm long
Fixing method	: Ordinary sand/cement mortar mix

**13. AAC Blockwork**

Material	: Autoclaved aerated concrete blocks
Density	: 760 kg/m <sup>3</sup>
Overall sizes	: See Figures 2,3,7 & 8
Fixing method	: Ordinary sand/cement mortar mix

# Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	
00	00	<b>The test commences.</b>
01	20	Steam/smoke release can be seen at the perimeter of all specimens.
12	13	When viewed from the exposed face, plastic wrap and plastic channel has melted on all specimens.
15	30	Plastic wrap starts to melt on horizontal specimens.
18	01	Plastic wrap starts to melt on vertical specimens.
22	00	Slight gap formed at the perimeter of specimen A, close to the location of thermocouple number 10.
23	03	Exposed mineral wool core on Specimens B, C and E is darkening.
26	15	When viewed from the exposed face, Specimen B to E can be seen to be contracting and darkening around their perimeters.
32	02	Plastic channels starts to soften and deform at the head of the vertical specimens.
44	17	Cotton pad applied to area of glow on Specimen A. Pad discolours but does not ignite.
45	04	Area of glow has formed on Specimen B at both corners adjacent to deforming plastic channel.
52	30	Cotton pad applied on the area of glow in Specimen B. Pad discolours but does not ignite.
54	50	Cotton pad applied on the area of glow in Specimen B. Pad discolours but does not ignite.
55	60	<b>Cotton pad applied to the area of glow on Specimen A. Pad ignites, integrity failure deemed to have occurred.</b>
59	08	<b>Cotton pad applied to the area of glow on Specimen B. Pad ignites, integrity failure deemed to have occurred.</b>
60	43	Areas of glow have formed on Specimen C along the edge close to thermocouple number 30, and at the head of Specimens D and E adjacent to plastic channel.
62	55	Cotton pad applied to the head of Specimen E. Pad discolours but does not ignite.
65	45	Cotton pad applied to the head of Specimen D. Pad discolours slightly but does not ignite.
67	04	Specimen C starts to vibrate, plastic channel has detached.

## Time

mins secs

67	52	Plastic channel starts to detach from Specimen E.
68	40	Cotton pad applied to head of Specimen E. Pad discolours but does not ignite.
73	30	Cotton pad applied to head of Specimen E. Pad discolours but does not ignite.
		<b>Specimen B falls into the furnace, sustained flaming is observed, integrity failure deemed to have occurred.</b>
74	00	<b>Specimen B is blanked off to allow the test to continue.</b>
76	10	Cotton pad applied to the area of glow on Specimen C. Pad discolours but does not ignite.
78	31	Specimen E starts to vibrate.
79	00	<b>Cotton pad applied to the area of glow on Specimen E. Pad ignites, integrity failure deemed to have occurred.</b>
81	30	Cotton pad applied to area of glow on Specimen D. Pad discolours but does not ignite.
81	50	<b>Specimen E is blanked off to allow the test to continue.</b>
83	10	Cotton pad applied to area of glow on Specimen C. Pad discolours but does not ignite.
87	20	Cotton pad applied to area of glow on Specimen C. Pad discolours but does not ignite.
88	15	Cotton pad applied to area of glow on Specimen D. Pad discolours but does not ignite.
92	13	Glowing areas continue to grow on Specimen C and merge along the edge where plastic channel has melted. Specimen D continues to contract and vibrate.
96	10	<b>Cotton pad applied to area of glow on Specimen C. Pad ignites, integrity failure deemed to have occurred.</b>
98	30	<b>Cotton pad applied to the area of glow on Specimen D. Pad ignites, integrity failure deemed to have occurred.</b>
99	00	<b>Test discontinued for health and safety reasons.</b>

## Test Photographs

The exposed face of the vertical assembly prior to testing



The exposed face of the horizontal assembly prior to testing





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



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



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



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



The unexposed face of the vertical assembly after a test duration of 95 minutes



The unexposed face of the horizontal assembly after a test duration of 95 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	17
3	502	493
6	603	617
9	663	665
12	705	705
15	739	730
18	766	773
21	789	800
24	809	818
27	826	835
30	842	837
33	856	847
36	869	860
39	881	875
42	892	891
45	902	905
48	912	917
51	921	926
54	930	937
57	938	945
60	945	955
63	953	963
66	960	968
69	966	973
72	973	979
75	979	979
78	985	986
81	990	993
84	996	998
87	1001	1004
90	1006	1009
93	1011	1014
96	1016	1020
99	1020	1024

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

Time Mins	T/C Number 10 Deg. C	T/C Number 11 Deg. C	T/C Number 12 Deg. C	T/C Number 13 Deg. C	T/C Number 14 Deg. C	T/C Number 15 Deg. C	T/C Number 16 Deg. C
0	10	9	9	10	9	10	10
3	41	9	10	35	9	10	46
6	59	9	13	58	10	12	61
9	61	10	16	60	10	15	64
12	84	10	20	71	10	18	85
15	120	11	25	88	11	23	129
18	163	12	31	118	11	29	166
20	187	13	35	143	10	32	178
21	203	14	37	146	11	33	188
24	231	15	42	167	11	38	226
27	197	17	48	145	11	43	205
30	180	19	53	116	11	47	187
33	175	21	58	109	20	51	178
36	172	22	62	109	22	56	175
39	173	24	65	108	23	60	175
42	175	26	68	111	25	64	176
45	179	28	71	116	27	68	179
48	180	30	74	111	28	71	186
51	187	32	77	123	30	75	187
54	190	34	79	122	32	77	193
57	193	35	82	126	34	80	195
60	195	37	84	125	32	82	200
63	198	39	86	125	29	83	204
66	200	41	87	125	37	84	209
69	204	44	88	130	42	86	207
72	205	46	89	128	44	87	210
75	213	91	236	389	45	306	484
78	211	68	115	112	*	100	254
81	208	62	98	88	*	94	227
84	210	62	96	92	*	92	222
87	211	65	96	87	*	92	223
90	213	66	96	95	*	93	221
93	214	69	96	79	*	92	226
96	215	76	97	82	*	93	219
99	217	98	98	96	*	93	219

\*Thermocouple malfunction

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

Time Mins	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	10	10	10	9	10	10	10
2	14	16	10	17	12	10	16
4	51	18	11	57	14	10	55
6	58	20	12	62	17	11	59
8	58	21	13	61	17	12	58
10	62	23	15	71	17	13	69
12	75	24	18	93	18	14	99
14	93	25	20	132	19	16	127
16	122	27	24	169	21	18	161
18	148	30	27	189	23	20	179
19	157	31	29	200	23	21	181
20	165	32	31	219	25	23	187
22	180	36	35	245	29	26	207
24	177	40	39	218	32	28	210
26	160	43	44	203	36	32	188
28	146	47	48	197	40	35	176
30	141	49	52	193	42	38	171
32	139	51	56	192	45	41	166
34	140	54	60	193	48	43	167
36	139	57	64	194	51	45	166
38	141	59	67	193	53	47	165
40	143	62	69	194	55	49	166
42	145	65	73	198	58	52	169
44	143	68	75	203	60	54	169
46	147	70	77	204	62	55	172
48	152	72	79	210	64	58	178
50	150	73	81	213	68	59	176
52	162	73	81	213	71	61	177
54	166	76	83	216	86	63	180
56	175	76	84	221	97	64	181
58	173	79	86	219	129	66	185
60	171	86	87	228	184	68	194
62	170	96	88	230	214	70	201
64	176	108	90	232	236	72	201
66	181	123	91	236	282	74	202
68	182	186	92	242	370	77	210
70	183	291	96	254	422	81	211
72	179	349	98	266	435	85	214
73	657	390	107	405	416	96	656
74	#	#	#	#	#	#	#

#Specimen blanked off

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

Time Mins	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	11	11	11	11	11	11	10
3	47	11	11	54	11	12	53
6	59	11	12	64	13	13	60
9	61	12	12	71	15	13	63
12	93	14	13	106	19	14	93
15	167	17	15	162	24	17	154
16	189	19	16	177	26	17	176
17	202	20	17	192	28	18	190
18	205	22	19	203	30	19	199
21	220	26	23	215	37	22	219
24	201	32	29	197	42	28	196
27	184	37	36	186	48	33	179
30	179	42	41	183	53	38	174
33	179	47	47	183	57	44	175
36	180	52	52	183	61	49	177
39	180	56	56	185	63	54	176
42	182	59	59	187	65	58	179
45	185	62	63	191	67	62	186
48	189	64	66	196	69	66	192
51	192	66	68	200	71	68	192
54	195	68	70	203	73	71	198
57	199	70	72	207	74	73	204
60	202	71	74	210	76	75	212
63	204	73	75	212	79	78	214
66	207	74	76	215	80	79	221
69	208	75	76	218	81	80	218
72	209	76	77	219	82	81	224
75	216	171	92	563	169	93	417
78	219	102	84	367	140	87	257
81	222	*	83	251	145	86	227
84	221	*	84	234	150	86	225
87	225	*	87	234	166	86	227
90	226	*	87	234	166	86	229
93	229	*	89	234	193	87	242
96	228	*	89	235	196	88	241
99	230	*	89	234	211	90	243

\*Thermocouple malfunction

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

Time Mins	T/C Number 31 Deg. C	T/C Number 32 Deg. C	T/C Number 33 Deg. C	T/C Number 34 Deg. C	T/C Number 35 Deg. C	T/C Number 36 Deg. C
0	14	12	12	14	12	12
3	33	13	12	20	13	13
6	61	13	13	55	16	15
9	64	14	15	60	18	17
12	73	15	16	64	19	20
15	102	17	18	86	20	23
18	152	21	22	103	21	28
20	183	24	24	113	23	31
21	196	26	26	118	24	33
24	232	33	30	173	28	38
27	210	40	36	207	32	43
30	194	46	41	204	35	47
33	189	52	46	195	40	52
36	187	57	50	191	43	55
39	187	61	53	188	47	58
42	190	65	56	190	51	60
45	195	67	59	193	56	63
48	200	70	62	196	59	65
51	206	72	64	202	63	67
54	210	75	67	208	66	70
57	215	77	70	212	68	72
60	220	80	72	218	71	74
63	224	97	74	223	73	76
66	229	114	75	229	76	78
69	229	162	75	234	79	79
72	232	252	76	232	85	80
75	229	211	77	228	92	80
78	232	284	80	232	96	82
81	235	366	83	235	99	83
84	237	468	86	240	106	85
87	239	555	88	241	131	86
90	243	616	92	243	176	88
93	242	648	95	245	219	90
96	247	666	97	242	254	91
99	251	676	99	241	281	92



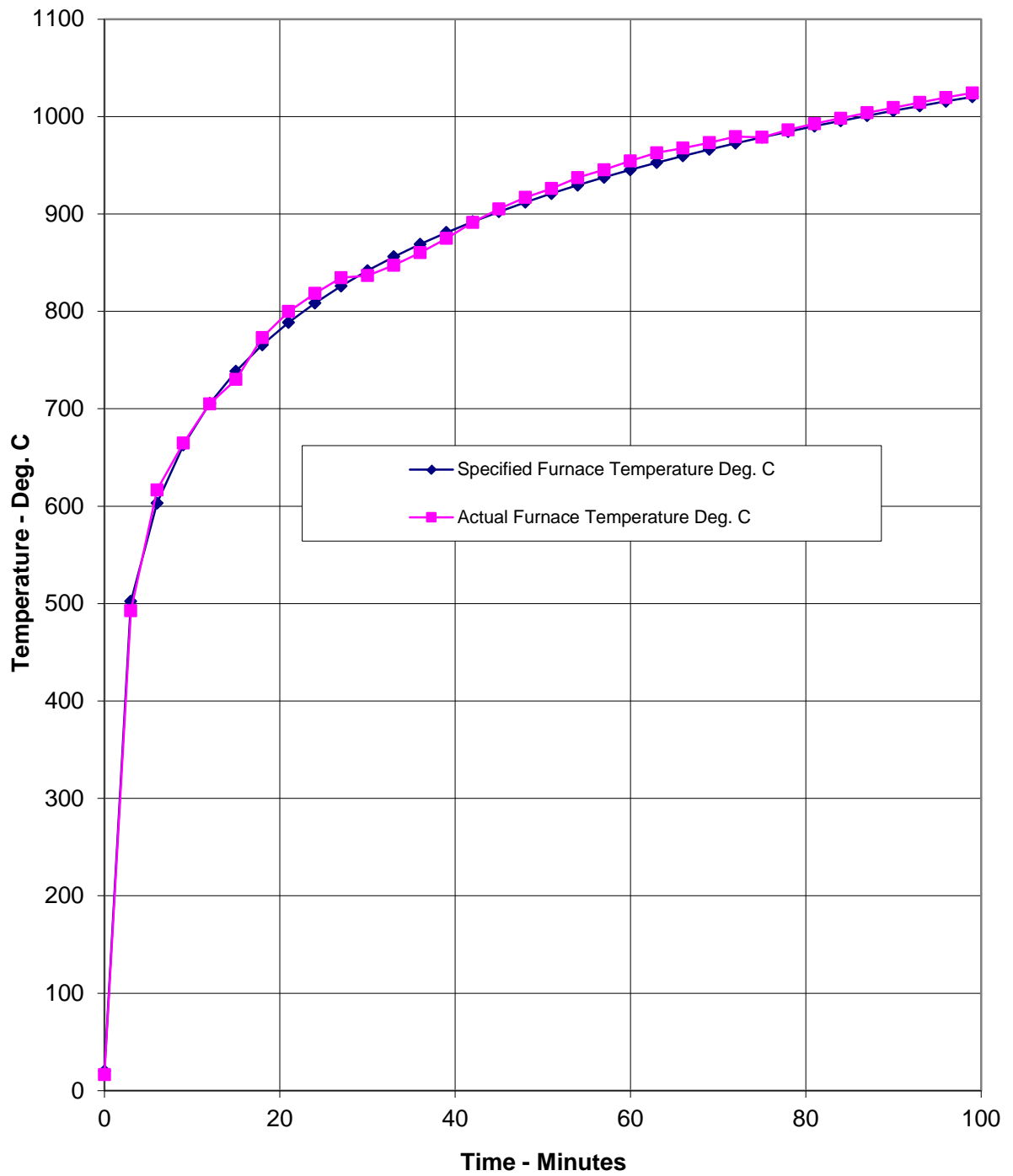
**Individual temperatures recorded on the unexposed surface of Specimen E  
and adjacent to Specimen E**

Time Mins	T/C Number 37 Deg. C	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
0	17	14	13	16	13	14
2	18	15	14	17	13	15
4	44	16	14	36	13	18
6	59	17	14	51	14	18
8	58	17	14	49	14	19
10	60	17	14	50	15	19
12	67	15	15	53	16	19
14	88	14	15	60	18	19
16	129	15	16	82	20	20
18	183	25	18	118	22	22
19	215	28	19	152	24	22
20	232	28	20	185	26	23
22	218	*	23	211	29	25
24	205	*	26	203	33	28
26	196	*	30	192	38	31
28	190	*	35	183	42	34
30	188	*	39	179	46	38
32	187	*	44	176	50	41
34	188	*	49	175	54	45
36	187	31	53	173	57	47
37	187	32	55	173	58	49
38	187	34	57	173	58	50
40	186	36	60	174	61	54
42	188	38	63	175	62	57
44	189	40	65	178	65	59
46	191	42	67	181	67	62
48	193	43	68	185	68	63
50	196	44	70	188	70	66
52	199	45	71	192	72	65
54	201	46	72	196	73	67
56	205	46	74	199	75	69
58	208	47	76	201	76	72
60	211	47	77	203	77	76
62	216	48	80	207	79	76
64	225	47	81	213	80	79
66	233	48	83	217	81	81
68	234	48	86	219	82	83
70	240	48	88	222	83	86
72	234	45	88	223	83	88
74	221	42	88	216	84	86
76	219	38	92	222	85	92
78	220	39	95	226	86	94
80	221	45	97	222	88	99
81	#	#	#	#	#	#

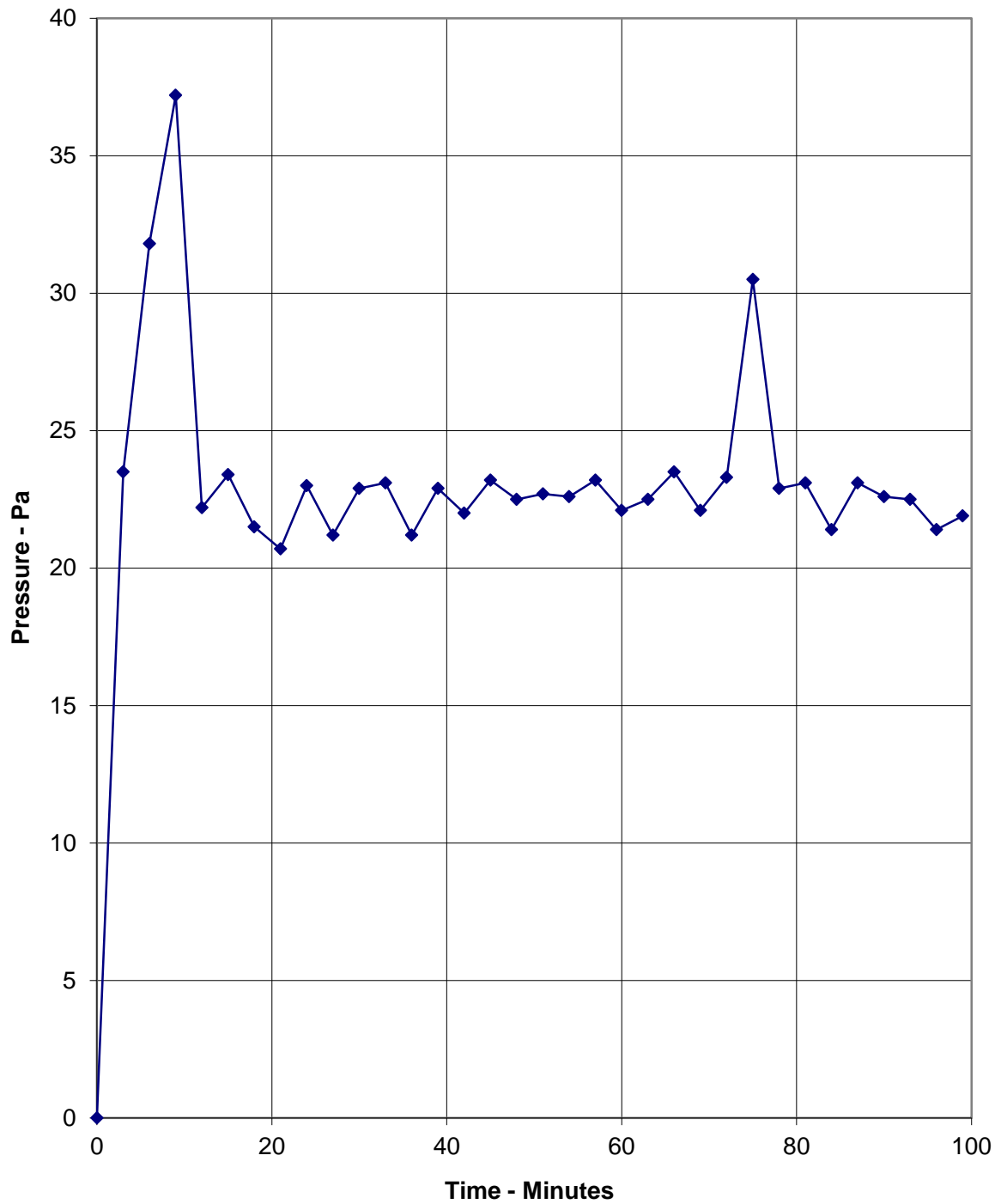
\*Thermocouple malfunction

#Specimen blanked off

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



Graph showing recorded furnace pressure 270 mm above the head of the vertical specimens



# On-going Implications

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## 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