

Title:

The Fire Resistance Performance Of Six Specimens Of Wall Mounted Linear Gap Sealing Systems And Six Specimens Of Floor Mounted Linear Gap Sealing Systems, When Tested In Accordance With EN 1366-4: 2006 +A1:2010

Report No:

412463



Prepared for:

Everbuild
Site 41
Knowsthorpe Way
Leeds
Yorkshire
UK
LS9 0SW

Date:

15th July 2019

Notified Body No:



Summary

Objective

A fire resistance test has been conducted to assess the ability of six vertical specimens of linear gap sealing systems in an autoclaved aerated concrete blockwork wall and six specimens of linear gap sealing systems in an aerated concrete floor, to reinstate the fire resistance of the wall and floor constructions when tested in accordance with EN 1366-4: 2006 +A1:2010.

Sponsor

Everbuild
Site 41
Knowsthorpe Way
Leeds
Yorkshire
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LS9 0SW

Summary of the Tested Specimens

For the purpose of the test the floor specimens were referenced A to F and the wall specimens were referenced G to L.

The section of floor had overall dimensions of 2240 mm long by 1730 mm wide by 200 mm thick and was made up of autoclaved aerated concrete lintels arranged to provide six linear gaps of varying widths which were all 1000 mm in length.

Specimen	Substrate	Seal Details
A	AAC to AAC	12 mm wide linear gap, sealed with a 6 mm depth of Fire sealant 300, cartridge gunned in to unexposed face of the cavity and backed by a 13 mm diameter Polyethylene backing rod.
B		30 mm wide linear gap, sealed with a 15 mm depth of Fire sealant 300, cartridge gunned in to unexposed face of the cavity and backed by a 30 mm diameter Polyethylene backing rod.
C		50 mm wide linear gap, sealed with a 25 mm depth of Fire sealant 300, cartridge gunned in to unexposed face of the cavity and backed by two 25 mm diameter Polyethylene backing rod.
D	Steel to AAC	12 mm wide linear gap, sealed with a 6 mm depth of Fire sealant 300, cartridge gunned in to unexposed face of the cavity and backed by a 13 mm diameter Polyethylene backing rod.
E		30 mm wide linear gap, sealed with a 15 mm depth of Fire sealant 300, cartridge gunned in to unexposed face of the cavity and backed by a 30 mm diameter Polyethylene backing rod.
F		50 mm wide linear gap, sealed with a 25 mm depth of Fire sealant 300, cartridge gunned in to unexposed face of the cavity and backed by two 25 mm diameter Polyethylene backing rod.

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

The section of wall had overall dimensions of 1500 mm high by 1500 mm wide by 150 mm thick and was made up of autoclaved aerated concrete lintels arranged to provide six 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:

Specimen	Substrate	Seal Details
G	AAC to AAC	12 mm wide linear gap, sealed with a 6 mm depth of Fire sealant 300, cartridge gunned in to both faces of the cavity and backed by a 13 mm diameter Polyethylene backing rod.
H		30 mm wide linear gap, sealed with a 15 mm depth of Fire sealant 300, cartridge gunned in to both faces of the cavity and backed by a 30 mm diameter Polyethylene backing rod.
I	Softwood to AAC	12 mm wide linear gap, sealed with a 6 mm depth of Fire sealant 300, cartridge gunned in to both faces of the cavity and backed by a 13 mm diameter Polyethylene backing rod.
J	Hardwood to AAC	12 mm wide linear gap, sealed with a 6 mm depth of Fire sealant 300, cartridge gunned in to both faces of the cavity and backed by a 13 mm diameter Polyethylene backing rod.
K	Softwood to AAC	30 mm wide linear gap, sealed with a 15 mm depth of Fire sealant 300, cartridge gunned in to both faces of the cavity and backed by a 30 mm diameter Polyethylene backing rod.
L	Steel to AAC	12 mm wide linear gap, sealed with a 6 mm depth of Fire sealant 300, cartridge gunned in to both faces of the cavity and backed by a 13 mm diameter Polyethylene backing rod.

Full details of the specimens and installation methods are given in the Schedule of Components.

Test Results

Specimen	Integrity (minutes)		Insulation (minutes)
	Cotton Pad	Sustained flaming	
A	133	264*	107
B	264*	264*	68
C	264*	264*	151
D	135	264*	43
E	264*	264*	33
F	264*	264*	28
G	264*	264*	237
H	264*	264*	230
I	136	136	106
J	119	119	110
K	126	126	126
L	264*	264*	68

* The test was discontinued after a period of 264 minutes.

Date of Test

8th May 2019

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Signatories



Responsible Officer

D. Whittle*

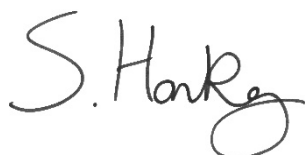
Technical Officer



Approved

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Technical Manager



Head of Department

S. Hankey*

Business Unit Head

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

Report Issued

Date: 15th July 2019

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CONTENTS	PAGE NO.
SUMMARY	2
SIGNATORIES.....	5
TEST PROCEDURE	7
TEST SPECIMEN	8
SCHEDULE OF COMPONENTS	17
INSTRUMENTATION.....	22
TEST PHOTOGRAPHS.....	26
TEMPERATURE DATA.....	36
PERFORMANCE CRITERIA AND TEST RESULTS.....	51
ONGOING IMPLICATIONS	52
CONCLUSIONS.....	52
FIELD OF DIRECT APPLICATION	53
SAMPLE REPORT	54

Test Procedure

Introduction

Walls and floors often incorporate gaps to accommodate a specific degree of movement within the linear joint. The fire resistance of such elements is only as good as their weakest point and it is, therefore, important that any gaps or apertures are adequately sealed, such that weaknesses are not created at these positions.

The specimens were judged on their ability to comply with the performance criteria for integrity and insulation, as required by EN 1366-4: 2006 +A1:2010.

Fire Test Study Group/EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have 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.

Instruction To Test

The test was conducted on the 8th May 2019 at the request of Everbuild, the sponsor of the test.

Mr. S. Austin, and Mr. D. Bell representatives of the test sponsor witnessed the test.

Test Specimen Construction

A comprehensive description of the test constructions is given in the Schedule of Components. The description is based on a detailed survey of the specimens and information supplied by the sponsor of the test.

Installation

Warringtonfire supplied the wall and floor constructions. The gap sealing systems were provided and installed by a representative of the test sponsor on the 8th April 2019.

Sampling

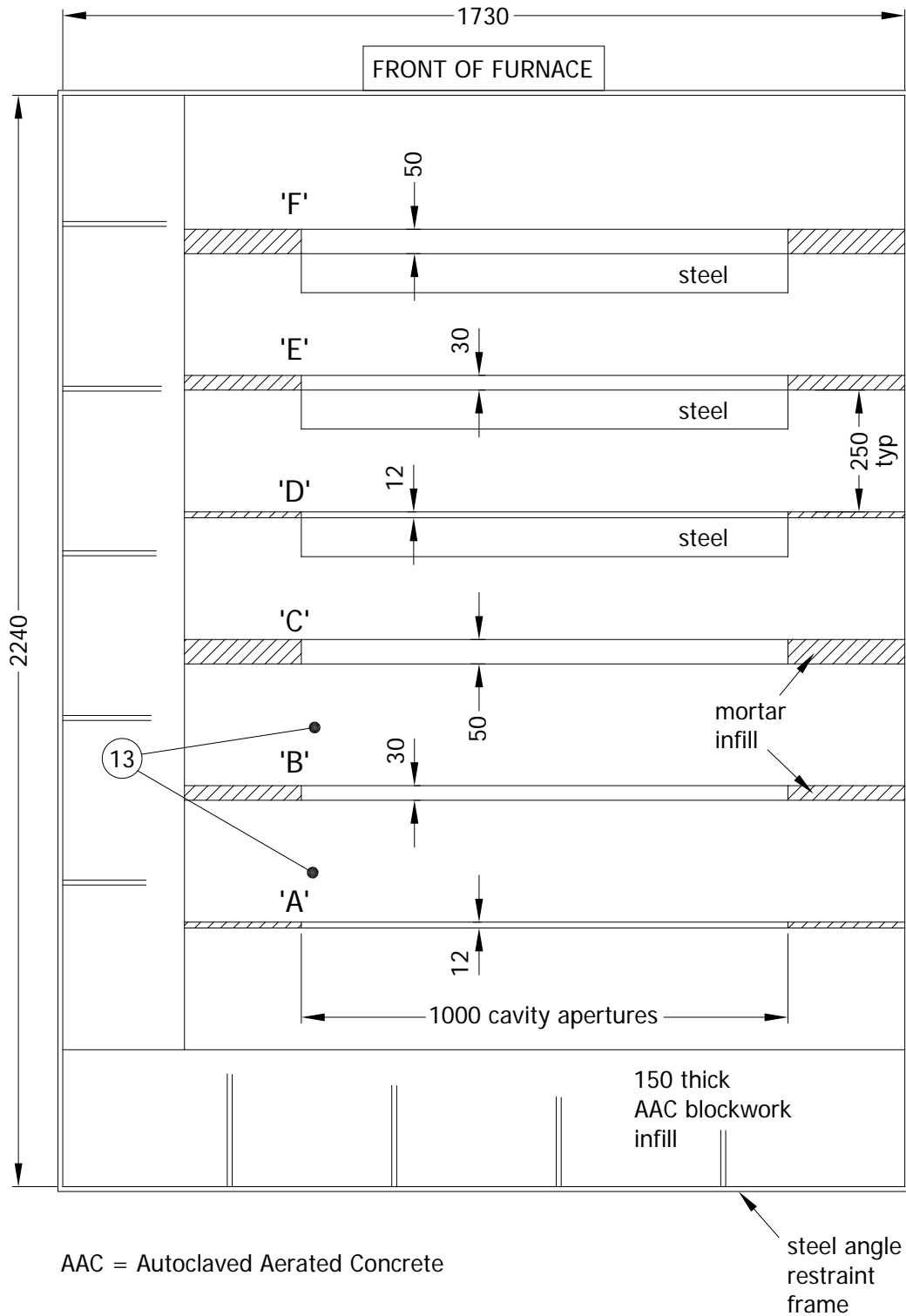
A representative of **Warringtonfire** witnessed manufacturing of Everbuild 'Fire Sealant 300' and selected samples for testing. Sampling conducted on 19/03/2019, sampling report reference: 411548.

Conditioning

The specimens' storage, construction, and test preparation took place in the test laboratory over a total, combined time of 30 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 27.5°C and 33% to 68% respectively.

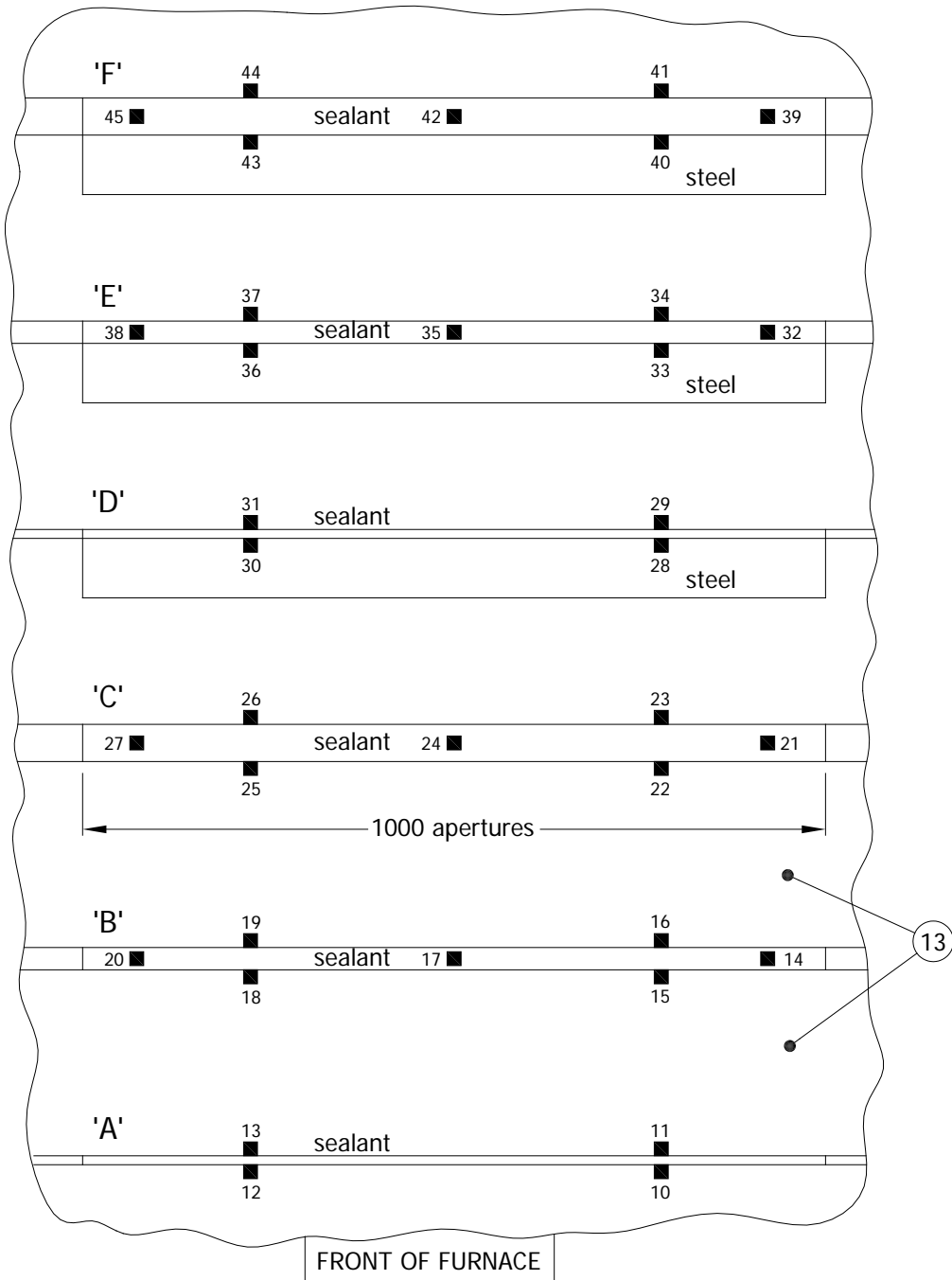
Test Specimen

Figure 1- General plan of floor test specimens from unexposed face



Do not scale. All dimensions are in mm

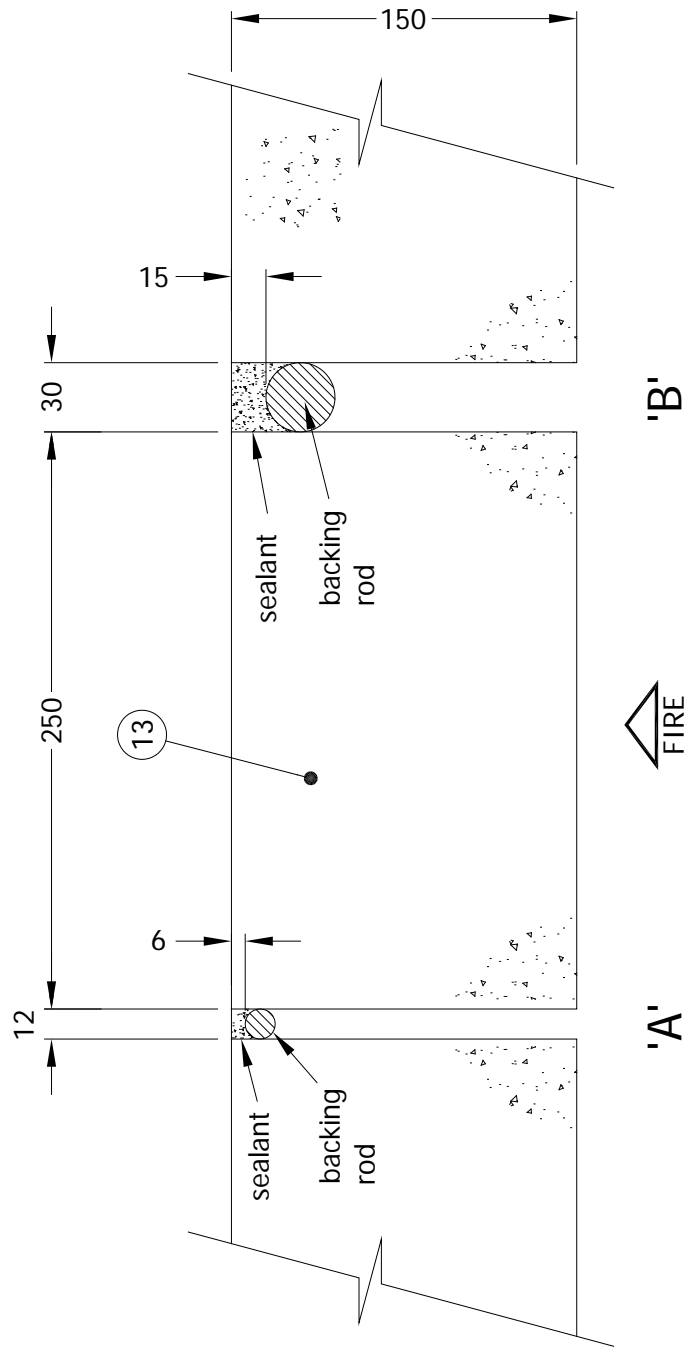
Figure 2 – Enlarged view showing unexposed face thermocouples for floor test specimens



■ Positions of thermocouples

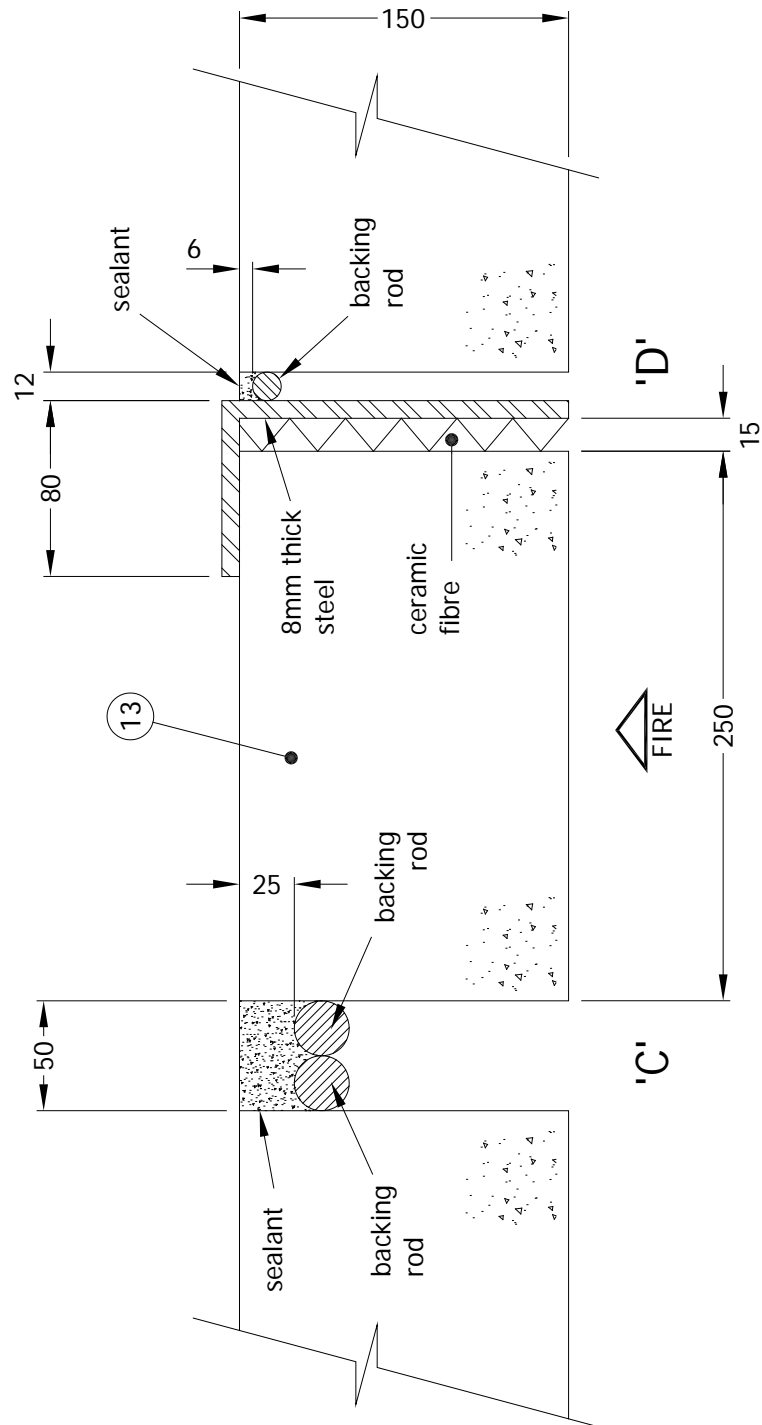
Do not scale. All dimensions are in mm

Figure 3 – Section through floor specimens 'A' and 'B' (items 1 and 2)



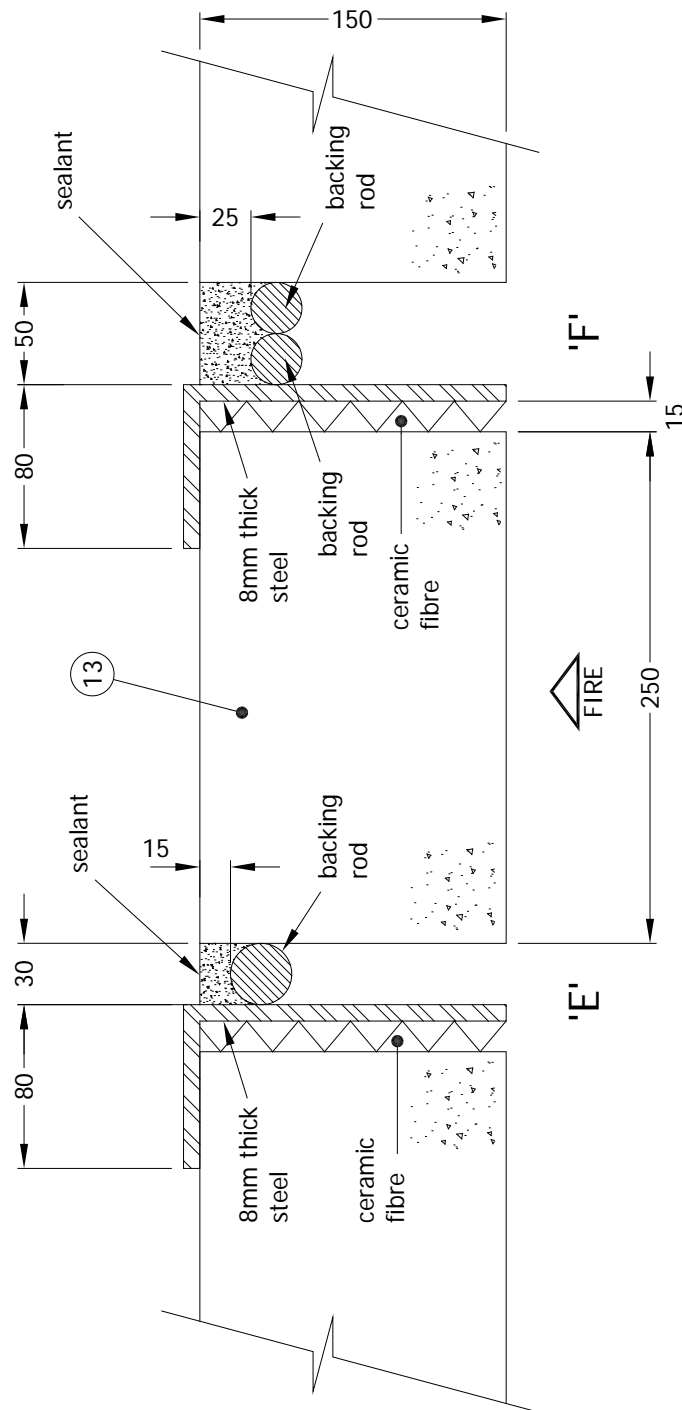
Do not scale. All dimensions are in mm

Figure 4 – Section through floor specimens 'C' and 'D' (items 3 and 4)



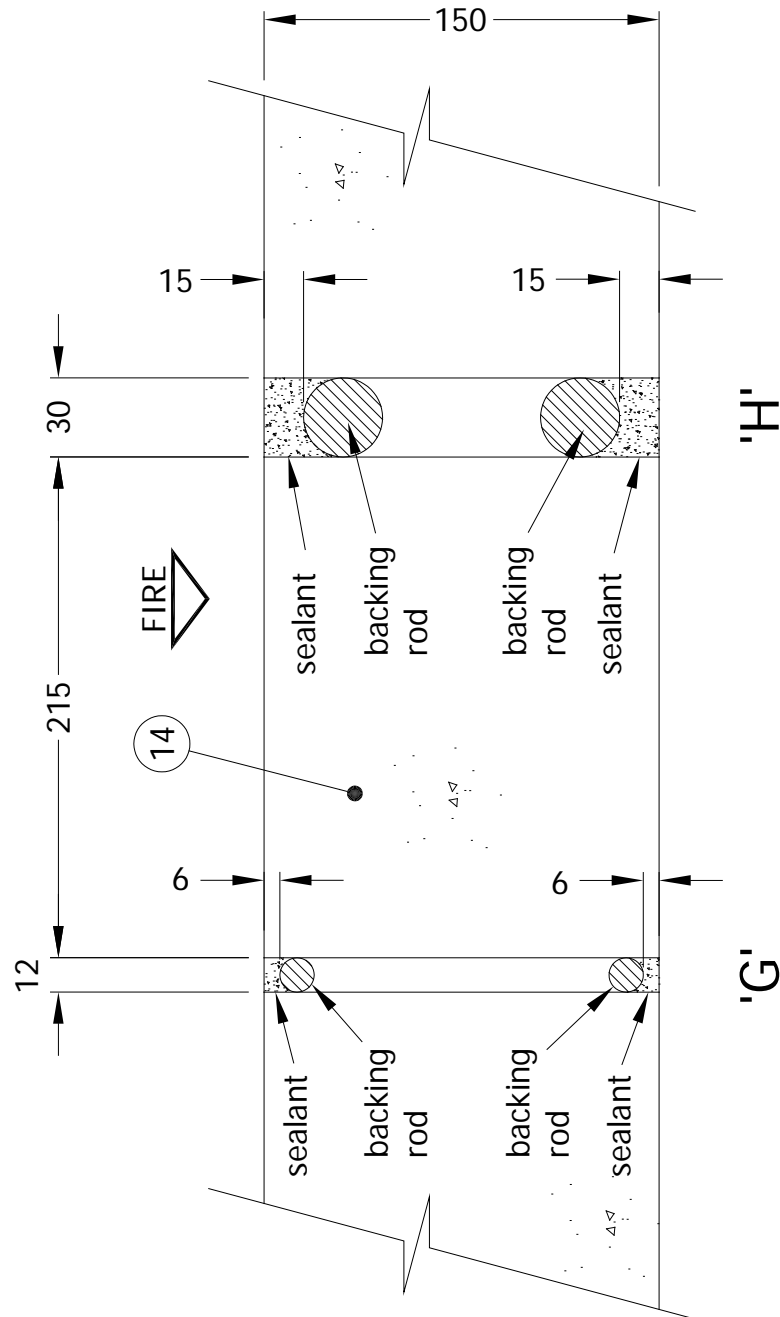
Do not scale. All dimensions are in mm

Figure 5 – Section through floor specimens 'E' and 'F' (items 5 and 6)



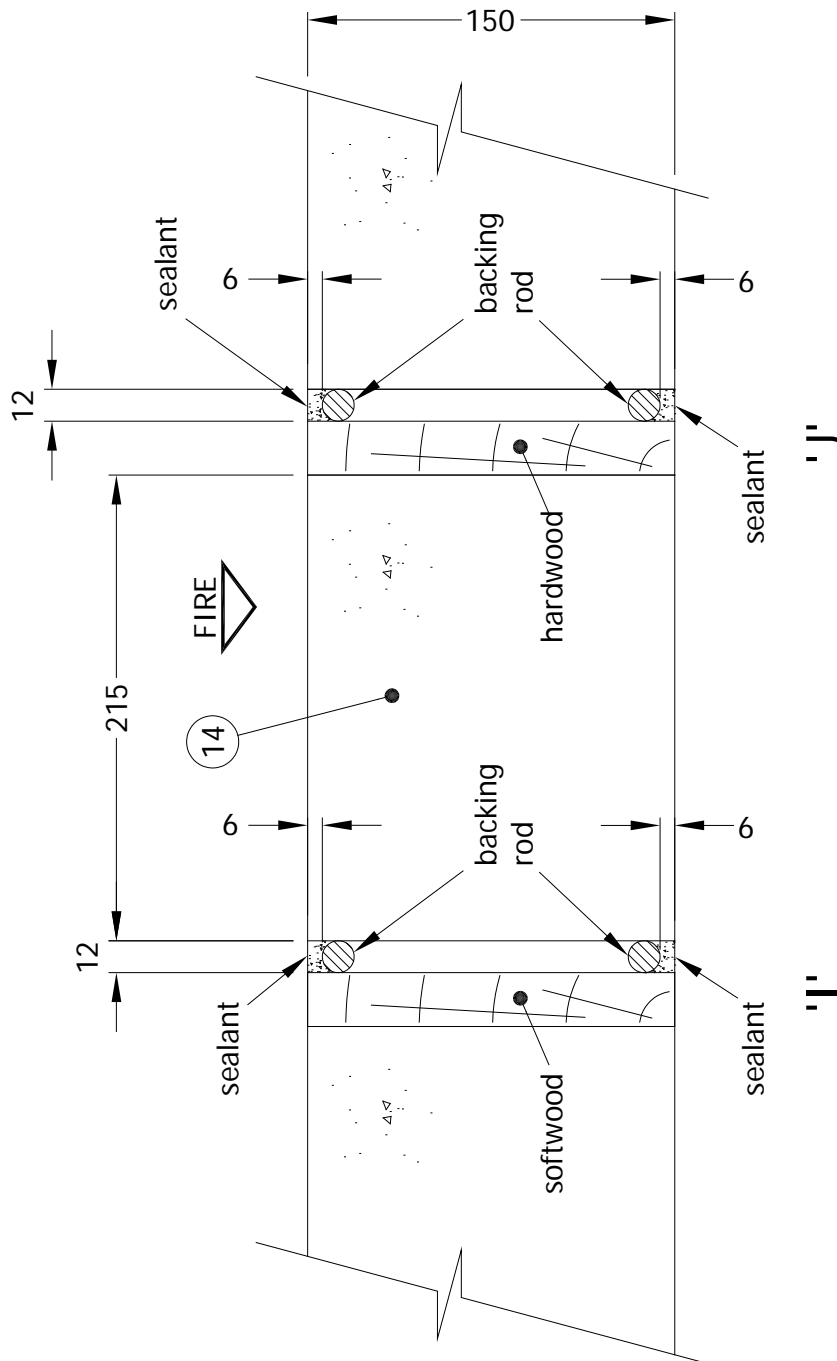
Do not scale. All dimensions are in mm

Figure 7 – Section through wall specimens 'G' and 'H' (items 7 and 8)



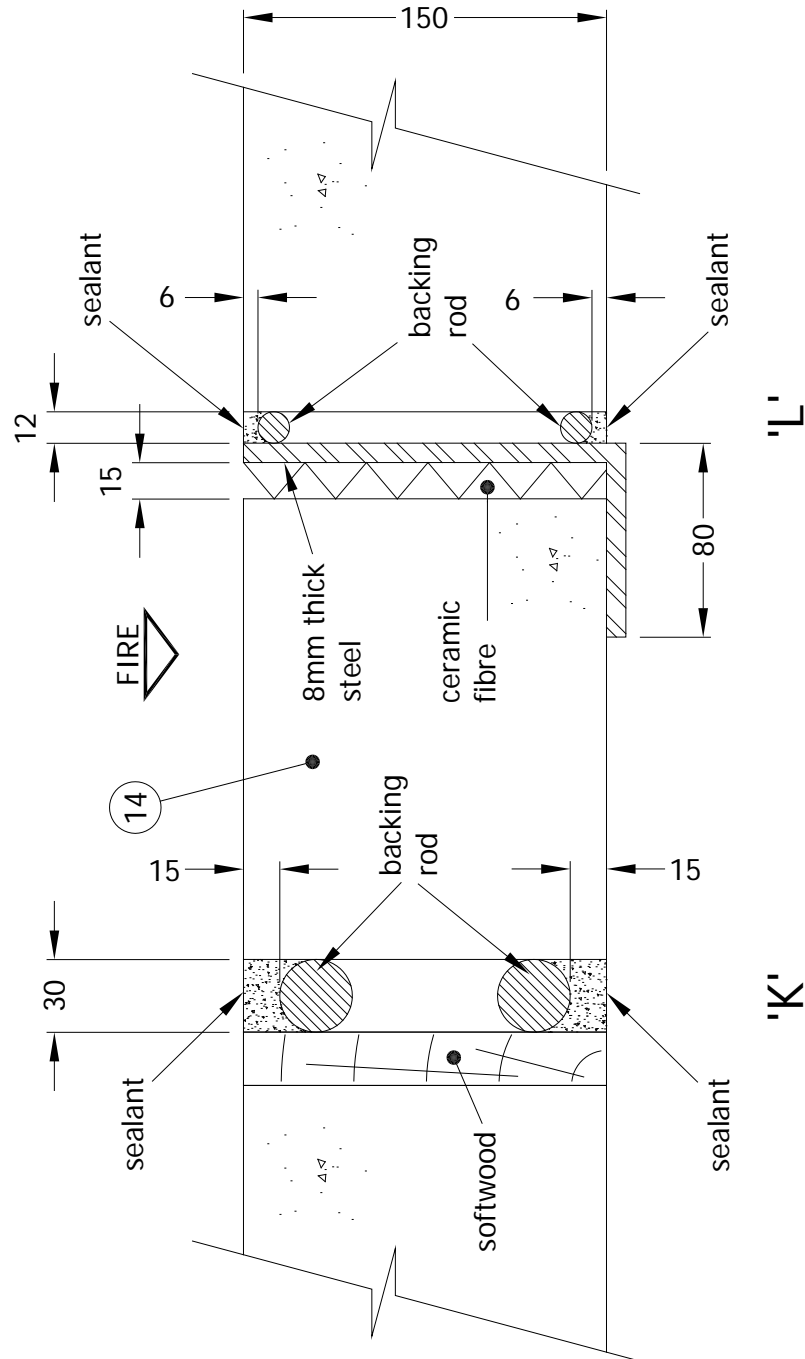
Do not scale. All dimensions are in mm

Figure 8 – Section through wall specimens 'I' and 'J' (items 9 and 10)



Do not scale. All dimensions are in mm

Figure 9 – Section Through Wall Specimens 'K' and 'L' (items 11 and 12)



Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 4)

(All values are nominal unless stated otherwise)

(All other details are as stated by the sponsor)

<u>Item</u>	<u>Description</u>
Details of Floor Cavity Barriers (items 1 to 6)	
1. Specimen 'A'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 12 mm wide x 6 mm deep x 1000 mm long
Application method	: Cartridge gunned at unexposed face of cavity
Overall size of cavity	: 12 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 13 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Masonry (item 13)
2. Specimen 'B'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 30 mm wide x 15 mm deep x 1000 mm long
Application method	: Cartridge gunned at unexposed face of cavity
Overall size of cavity	: 30 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 30 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Masonry (item 13)
3. Specimen 'C'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 50 mm wide x 25 mm deep x 1000 mm long
Application method	: Cartridge gunned at unexposed face of cavity
Overall size of cavity	: 50 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 2 no. rods, each 25 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Masonry (item 13)

<u>Item</u>	<u>Description</u>
4. Specimen 'D'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 12 mm wide x 6 mm deep x 1000 mm long
Application method	: Cartridge gunned at unexposed face of cavity
Overall size of cavity	: 12 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 13 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Steel/Masonry (item 13)
Details of steel	
Overall section size	: 150 mm x 80 mm rolled steel angle (RSA)
Thickness	: 8 mm
Fixing method to masonry	: 3 no. 100 mm long countersunk head steel screws
Details of insulation infill	
Material	: Ceramic fibre insulation
Fixing method	: Friction fit within void behind steel facing. See Figure 4.
5. Specimen 'E'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 30 mm wide x 15 mm deep x 1000 mm long
Application method	: Cartridge gunned at unexposed face of cavity
Overall size of cavity	: 30 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 30 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Steel/Masonry (item 13)
Details of steel	
Overall section size	: 150 mm x 80 mm rolled steel angle (RSA)
Thickness	: 8 mm
Fixing method to masonry	: 3 no. 100 mm long countersunk head steel screws
Details of insulation infill	
Material	: Ceramic fibre insulation
Fixing method	: Friction fit within void behind steel facing. See Figure 5.
6. Specimen 'F'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 50 mm wide x 25 mm deep x 1000 mm long
Application method	: Cartridge gunned at unexposed face of cavity
Overall size of cavity	: 50 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 2 no. rods, each 25 mm diameter

<u>Item</u>	<u>Description</u>
6. Specimen 'F'- continued	
Fixing method	: Friction fit within cavity
Details of Gap facing	: Steel/Masonry (item 13)
Details of steel	
Overall section size	: 150 mm x 80 mm rolled steel angle (RSA)
Thickness	: 8 mm
Fixing method to masonry	: 3 no. 100 mm long countersunk head steel screws
Details of insulation infill	
Material	: Ceramic fibre insulation
Fixing method	: Friction fit within void behind steel facing. See Figure 5.

Details of Wall Cavity Barriers (items 7 to 12)

7. Specimen 'G'

Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 12 mm wide x 6 mm deep x 1000 mm long
Application method	: Cartridge gunned at both faces of cavity
Overall size of cavity	: 12 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 13 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Masonry (item 14)

8. Specimen 'H'

Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 30 mm wide x 15 mm deep x 1000 mm long
Application method	: Cartridge gunned at both faces of cavity
Overall size of cavity	: 30 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 30 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Masonry (item 14)

9. Specimen 'I'

Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 12 mm wide x 6 mm deep x 1000 mm long
Application method	: Cartridge gunned at both faces of cavity
Overall size of cavity	: 12 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 13 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Timber/Masonry (item 14)

<u>Item</u>	<u>Description</u>
9. Specimen 'I' - continued	
Details of Timber	
Material	: Softwood
Thickness	: 30 mm
Fixing method to masonry	: 100 mm long countersunk head steel screws
10. Specimen 'J'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 12 mm wide x 6 mm deep x 1000 mm long
Application method	: Cartridge gunned at both faces of cavity
Overall size of cavity	: 12 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 13 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Timber/Masonry (item 14)
Details of Timber	
Material	: Hardwood
Thickness	: 30 mm
Fixing method to masonry	: 100 mm long countersunk head steel screws
11. Specimen 'K'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 30 mm wide x 15 mm deep x 1000 mm long
Application method	: Cartridge gunned at both faces of cavity
Overall size of cavity	: 30 mm wide x 150 mm deep x 1000 mm long
Details of Backing rod	
Material	: Polyethylene
Size	: 30 mm diameter
Fixing method	: Friction fit within cavity
Details of Gap facing	: Timber/Masonry (item 14)
Details of Timber	
Material	: Softwood
Thickness	: 30 mm
Fixing method to masonry	: 100 mm long countersunk head steel screws
12. Specimen 'L'	
Details of Sealant	
Manufacturer	: Everbuild
Reference	: Fire Sealant 300
Material	: Intumescent and Acoustic Acrylic Sealant
Overall section size of sealant	: 12 mm wide x 6 mm deep x 1000 mm long
Application method	: Cartridge gunned at both faces of cavity
Overall size of cavity	: 12 mm wide x 150 mm deep x 1000 mm long

Item**Description****12. Specimen 'L' - continued**

Details of Backing rod

Material	:	Polyethylene
Size	:	13 mm diameter
Fixing method	:	Friction fit within cavity
Details of Gap facing	:	Steel/Masonry (item 14)
Details of steel		
Overall section size	:	150 mm x 80 mm rolled steel angle (RSA)
Thickness	:	8 mm
Fixing method to masonry	:	3 no. 100 mm long countersunk head steel screws
Details of insulation infill		
Material	:	Ceramic fibre insulation
Fixing method	:	Friction fit within void behind steel facing. See Figure 9.

13. Concrete Floor

Material	:	Autoclaved aerated concrete lintels
Density	:	670 kg/m ³
Thickness	:	150 mm
Bedding material	:	Ordinary sand/cement mortar mix

14. Blockwork Wall

Material	:	Autoclaved aerated concrete blocks
Density	:	760 kg/m ³
Thickness	:	150 mm
Bedding material	:	Ordinary sand/cement mortar mix

Instrumentation

General	The instrumentation was provided in accordance with the requirements of EN 1366-4: 2006 +A1:2010.
Furnace	The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2012 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.
Thermocouple Allocation	<p>Thermocouples were provided to monitor the unexposed surface of the specimens and the output of all instrumentation was recorded at no less than one minute intervals as follows:</p> <p>The locations and reference numbers of the various unexposed surface thermocouples are shown in Figures 2 and 6.</p>
Roving Thermocouple	A roving thermocouple was available to measure temperatures on the unexposed surface of the specimens at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.
Integrity Criteria	Cotton pads were available to evaluate the integrity of the specimens.
Furnace Pressure	After the first five minutes of testing, the furnace pressure was controlled to maintain a slightly positive pressure relative to the pressure of the laboratory. The furnace atmospheric pressure was measured and controlled such that, at a point at mid height of the lowest specimen in the wall assembly, the differential pressure was calculated to be 15 (± 2) Pa. At a position 100 mm below the underside of the floor assembly the pressure was calculated to be above 20 Pa.

Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	The ambient air temperature in the vicinity of the test construction was 12°C at the start of the test with a maximum variation of $\pm 7^{\circ}\text{C}$ during the test.
00	00	The test commences.
15	00	Smoke release from all joints.
26	00	Smoke release continues from behind the timber substrates.
33	00	Seals A-F have all bubbled out from the supporting construction.
38	00	Moisture release from seals E and F.
38	30	Loud cracking sound from the floor construction.
48	40	Seals A to F have started to discolour.
60	00	Seals A to F continue to expand towards unexposed face. Seals B and C expanded approximately 5mm beyond unexposed face of supporting construction.
72	00	Glowing down the length of seal A and D.
73	30	Slight discolouring to seal L abut the steel substrate.
74	30	Discoloured black down seal D to F abut the steel substrate.
76	00	Slight bubbling under the seal of I to K.
85	00	Discolouring and expansion of seals A to C has increased.
87	10	Two small tears approximately 100mm below the head of seal L, no glowing.
89	00	Discoloured black on seal A.
90	30	Discolouring and glowing adjacent to Thermocouple 44 on seal F.
98	00	Cotton wool pad applied to seal D at the glowing, cotton wool pad discoloured but failed to ignite.
100	00	Cotton wool pad applied to glowing on seal A. cotton wool pad discoloured but failed to ignite.
101	00	Smoke release has increased from timber substrates of seal I and K.
104	20	Expansion has increased on all wall seals.
109	40	The seal of J has expanded beyond the timber at the approximately centre. Discolouring at the head of seals I and J.

Time		
mins	secs	
112	00	Cotton wool pad applied to glowing on seal A. cotton wool pad discoloured but failed to ignite.
115	00	Tears in the seal of L at approximately 100mm from the base.
117	00	Cotton wool pad applied to seal D at the glowing, cotton wool pad discoloured but failed to ignite.
118	00	Glowing at the head of timber adjacent to seal J.
119	00	Flickers of flame at the head of seal J.
119	20	Sustained flaming at the head of seal J integrity failure is deemed to have occurred.
120	00	Glowing at the head of seal I.
125	00	Flickers of flame at the head of seal K.
126	30	Sustained flaming at the head of seal K integrity failure is deemed to have occurred.
128	00	Flickers of flame at the head of seal I.
133	00	Cotton wool pad applied to Specimen A, cotton wool pad ignited. Integrity failure is deemed to have occurred.
135	30	Cotton wool pad applied to seal D, cotton wool pad ignited. Integrity failure is deemed to have occurred.
136	50	Sustained flaming at the head of seal I, integrity failure was deemed to have occurred.
143	00	Seals I to K blanked off to allow the test to continue.
150	00	Glowing has increased down the edge of seal F.
153	00	Slight tear in the seal of Specimen C approximately 2mm long.
161	00	Cracking in the seal of Specimen L.
168	10	Cracks in the surface of all remaining floor seals.
191	00	Seal G and H have continued to expand.
193	10	Smoke release from Thermocouple 79 on seal L.
198	00	Cotton wool pad applied to Specimen F, cotton wool pad discoloured but failed to ignite.

Time**mins secs**

205	00	Cotton wool pad applied to Specimen F, cotton wool pad discoloured but failed to ignite.
210	10	Slight glowing to the edge of seal B.
227	30	Small tear marks in the top 100mm of seal H.
228	00	Discolouring to seal G.
231	00	Glowing on seal B has increased down one side of the seal.
239	00	Cotton wool pad applied to Specimen F, cotton wool pad discoloured but failed to ignite.
251	00	Glowing at the edge of seal C.
255	00	Cotton wool pad applied to seal B, cotton wool pad discoloured but failed to ignite.
256	00	Cotton wool pad applied to seal C, cotton wool pad discoloured but failed to ignite.
264	00	Test discontinued.

Test Photographs

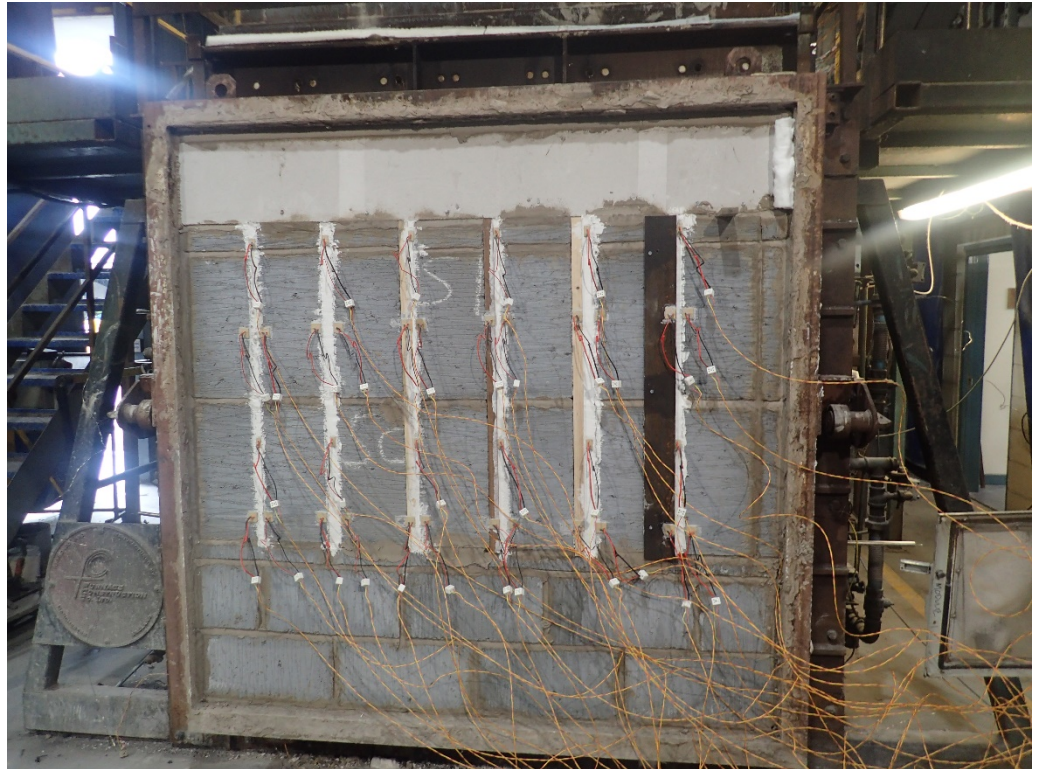
The exposed face of the wall construction prior to testing



The exposed face of the floor construction prior to testing



The unexposed face of the wall construction prior to testing



The unexposed face of the floor construction prior to testing



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



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



The unexposed face of the wall construction after a test duration of 71 minutes



The unexposed face of the floor construction after a test duration of 71 minutes



The unexposed face of the wall construction after a test duration of 90 minutes



The unexposed face of the floor construction after a test duration of 90 minutes



The unexposed face of the wall construction after a test duration of 120 minutes



The unexposed face of the floor construction after a test duration of 120 minutes



The unexposed face of the wall construction after a test duration of 180 minutes



The unexposed face of the floor construction after a test duration of 180 minutes



The unexposed face of the wall construction after a test duration of 240 minutes



The unexposed face of the floor construction after a test duration of 240 minutes



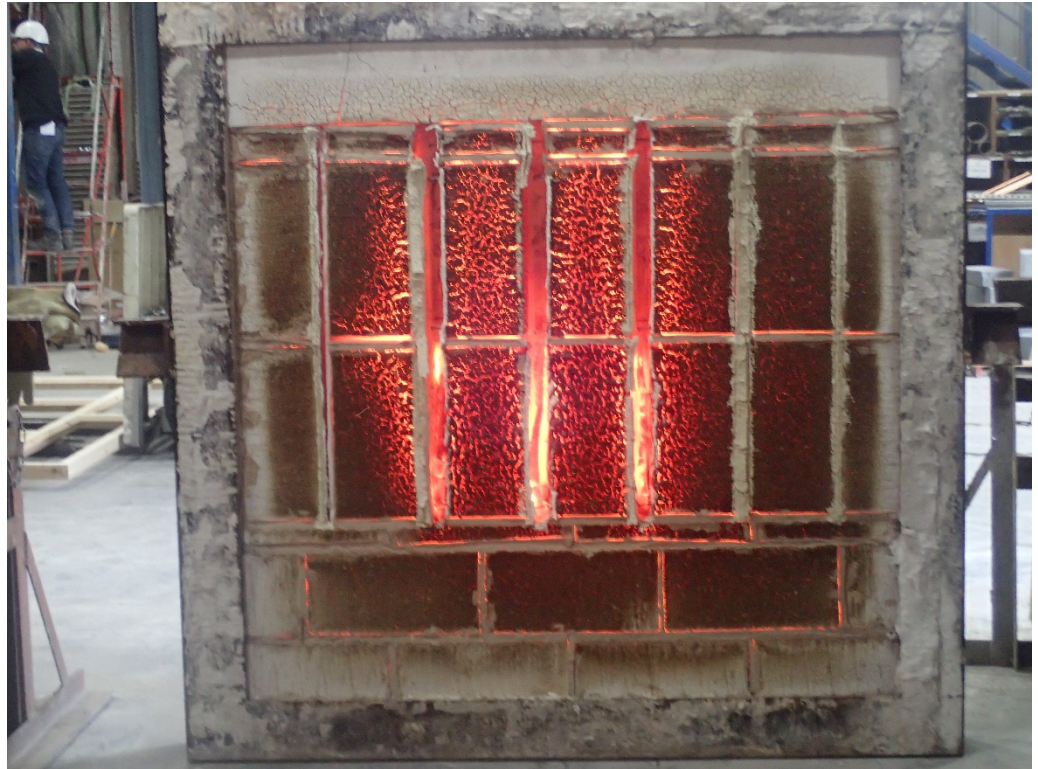
The unexposed face of the wall construction after a test duration of 264 minutes



The unexposed face of the floor construction after a test duration of 264 minutes



The exposed face of the wall construction immediately after the test



Temperature Data

Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In BS
EN 1363-1: 2012

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	36
10	678	686
20	781	782
30	842	837
40	885	882
50	918	915
60	945	945
70	968	966
80	988	987
90	1006	1008
100	1022	1027
110	1036	1043
120	1049	1058
130	1061	1071
140	1072	1082
150	1082	1091
160	1092	1101
170	1101	1110
180	1110	1118
190	1118	1125
200	1126	1132
210	1133	1139
220	1140	1145
230	1146	1150
240	1153	1156
250	1159	1160
260	1165	1165
264	1167	1167

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen A**

Time	T/C	T/C	T/C	T/C
Mins	Number	Number	Number	Number
	10	11	12	13
	Deg. C	Deg. C	Deg. C	Deg. C
0	18	17	17	17
10	34	28	23	23
20	54	49	36	37
30	69	65	47	49
40	81	78	55	59
50	90	87	62	67
60	100	97	69	75
70	112	111	77	81
80	131	127	83	89
90	155	148	89	100
100	182	167	99	115
107	198	181	109	128
108	201	183	111	130
110	205	186	114	135
120	218	198	135	162
130	236	210	165	188
140	249	218	191	206
150	259	226	207	217
160	279	240	222	225
170	282	242	237	234
180	285	245	242	236
190	285	250	249	240
200	279	251	256	240
210	281	257	256	241
220	295	259	253	240
230	296	263	253	240
240	301	266	256	243
250	303	278	255	255
260	309	302	259	283
264	304	314	260	295

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen B**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number	Number
	14 Deg. C	15 Deg. C	16 Deg. C	17 Deg. C	18 Deg. C	19 Deg. C	20 Deg. C
0	18	18	17	18	17	17	18
10	65	24	26	43	23	29	52
20	89	42	46	71	43	56	73
30	99	60	62	83	62	74	84
40	119	72	74	90	76	87	90
50	157	81	84	95	87	96	95
60	182	88	91	100	93	113	101
68	197	94	96	106	101	131	109
69	199	96	97	107	103	133	110
70	201	97	99	108	104	136	111
80	217	114	116	123	121	155	134
90	230	129	132	142	136	172	152
100	238	140	145	154	148	184	166
110	246	151	155	164	158	195	177
120	251	158	163	171	166	204	187
130	256	166	171	177	174	212	195
140	261	170	177	183	178	218	200
150	264	174	182	186	184	224	205
160	268	178	186	190	187	228	207
170	272	182	191	192	193	234	211
180	277	187	199	197	195	238	211
190	279	190	204	200	199	241	216
200	285	196	214	205	204	248	220
210	293	201	224	210	208	253	224
220	311	207	236	214	213	260	223
230	329	211	244	217	215	262	223
240	352	213	249	220	217	266	227
250	367	219	253	223	221	271	229
260	390	226	257	228	228	277	235
264	392	228	258	230	230	278	237

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen C**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number	Number
	21 Deg. C	22 Deg. C	23 Deg. C	24 Deg. C	25 Deg. C	26 Deg. C	27 Deg. C
0	19	17	18	19	18	18	20
10	37	22	21	32	20	22	31
20	65	38	35	56	32	39	54
30	78	57	53	72	49	56	70
40	84	70	67	81	62	69	78
50	88	78	77	85	71	79	83
60	91	84	84	88	77	86	86
70	95	91	89	91	83	91	89
80	100	98	93	94	88	95	91
90	114	114	100	98	95	109	95
100	137	129	113	104	107	123	98
110	156	146	126	123	123	136	101
120	169	157	135	141	138	147	110
130	180	169	145	154	153	155	124
140	191	179	155	164	164	163	139
150	199	186	162	170	174	169	149
151	199	186	163	170	175	170	150
152	200	186	162	171	176	172	152
160	207	193	169	174	183	174	157
170	214	201	175	180	193	180	164
180	221	209	181	183	203	185	170
190	228	217	185	187	214	189	176
200	235	227	190	191	227	194	182
210	242	234	194	196	242	198	188
220	251	241	201	199	258	199	189
230	259	247	205	201	267	204	195
240	273	250	210	204	277	207	201
250	297	256	216	209	286	212	208
260	447	262	220	214	292	222	215
264	519	263	223	219	293	229	220

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen D**

Time	T/C	T/C	T/C	T/C
Mins	Number	Number	Number	Number
	28	29	30	31
	Deg. C	Deg. C	Deg. C	Deg. C
0	22	18	22	18
10	44	23	43	24
20	88	37	84	35
30	139	50	133	50
40	186	63	178	63
43	199	67	191	67
44	203	68	194	69
50	225	75	215	76
60	256	84	247	85
70	282	94	272	94
80	303	105	293	104
90	321	112	310	113
100	340	123	326	122
110	359	133	341	131
120	381	147	357	141
130	405	160	378	153
140	433	181	407	169
150	462	204	439	187
160	485	216	465	204
170	507	238	487	214
180	523	253	503	237
190	540	290	525	276
200	555	319	545	317
210	567	337	561	346
220	579	341	577	347
230	588	345	598	354
240	607	358	636	367
250	643	368	676	375
260	678	378	699	388
264	689	381	704	389

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen E**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number	Number
	32 Deg. C	33 Deg. C	34 Deg. C	35 Deg. C	36 Deg. C	37 Deg. C	38 Deg. C
0	24	25	19	23	25	18	19
10	66	55	25	47	53	22	32
20	94	114	44	85	109	40	71
30	104	182	57	96	175	54	86
33	115	204	60	100	196	58	89
34	120	211	61	100	203	59	90
40	157	250	68	105	241	66	95
50	199	305	79	146	295	78	111
60	229	348	90	188	339	90	155
70	254	381	105	215	374	100	190
80	276	406	123	235	401	118	216
90	287	425	136	249	423	131	232
100	300	441	150	264	440	146	250
110	310	454	161	273	454	156	261
120	324	466	173	285	466	168	280
130	333	475	179	289	478	174	282
140	344	484	187	295	487	182	288
150	357	493	194	301	496	189	297
160	370	502	200	308	504	195	304
170	371	509	206	314	512	202	319
180	368	515	212	320	519	206	326
190	365	521	217	332	525	211	349
200	362	527	220	335	531	216	358
210	357	532	222	339	537	220	360
220	357	537	230	344	542	227	351
230	359	541	234	347	546	230	335
240	358	546	239	350	551	234	326
250	135	549	242	356	554	238	321
260	134	552	242	363	558	244	327
264	128	554	243	365	560	247	334

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen F**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number	Number
	39 Deg. C	40 Deg. C	41 Deg. C	42 Deg. C	43 Deg. C	44 Deg. C	45 Deg. C
0	20	21	12	15	19	13	16
10	42	59	20	48	55	21	36
20	76	130	39	74	122	40	65
28	87	198	51	81	190	53	76
29	88	206	53	82	199	55	77
30	88	214	54	82	206	56	78
40	92	288	66	89	282	68	84
50	97	344	74	96	340	77	90
60	107	386	82	121	384	86	97
70	123	418	89	159	416	97	117
80	148	442	103	184	440	114	149
90	172	460	117	199	457	128	180
100	193	475	132	215	473	141	205
110	208	488	144	226	487	150	222
120	222	510	155	236	509	159	240
130	231	516	163	241	522	163	252
140	240	530	170	248	526	170	263
150	247	521	174	255	524	177	275
160	253	528	180	260	531	183	284
170	258	534	181	264	538	188	293
180	261	537	184	267	542	197	301
190	268	569	186	273	576	200	305
200	271	698	187	281	713	205	311
210	274	665	189	286	672	207	310
220	275	620	194	297	627	215	305
230	280	570	195	302	574	217	308
240	282	589	200	311	592	218	311
250	285	579	203	314	583	221	309
260	288	585	207	316	590	216	201
264	287	587	204	320	594	218	192

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen G**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	46	47	48	49	50	51
	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C
0	18	18	18	18	18	18
10	22	18	18	19	18	19
20	37	19	19	21	19	19
30	50	23	24	28	21	22
40	67	28	29	37	25	27
50	74	35	35	47	32	34
60	78	43	44	58	41	42
70	84	54	55	68	51	53
80	89	62	64	78	61	66
90	92	68	70	82	68	73
100	94	71	74	84	73	77
110	97	73	76	86	76	79
120	98	75	78	88	78	80
130	98	77	79	89	79	81
140	98	78	80	90	80	82
150	104	79	81	92	80	82
160	113	80	82	95	81	82
170	126	82	83	98	82	83
180	138	83	84	100	83	84
190	152	84	86	102	84	85
200	164	85	87	107	85	86
210	174	86	88	119	87	88
220	181	88	89	132	88	89
230	192	89	90	148	89	91
237	197	91	91	156	90	92
238	199	91	92	158	90	93
240	199	92	92	160	90	93
250	208	94	93	172	92	95
260	217	97	96	182	94	97
264	220	99	97	185	94	98

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen H**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	52	53	54	55	56	57
	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C
0	18	18	18	18	18	18
10	18	18	18	19	18	18
20	20	18	18	19	18	18
30	31	19	19	20	19	19
40	49	22	23	25	19	19
50	72	27	28	42	22	22
60	87	36	38	54	26	26
70	92	47	49	61	33	34
80	94	56	57	66	42	45
90	96	63	64	69	52	56
100	98	68	68	71	60	63
110	101	71	71	73	66	68
120	102	73	73	74	70	71
130	104	75	74	74	73	73
140	108	76	76	75	75	75
150	115	77	76	75	76	75
160	126	78	77	76	77	76
170	137	79	77	76	78	77
180	147	80	78	77	79	77
190	158	80	79	78	80	78
200	168	81	81	79	80	79
210	178	83	82	80	81	79
220	189	84	83	80	82	80
230	198	85	85	82	82	81
231	200	85	85	82	83	81
240	209	85	86	82	83	82
250	221	87	87	84	84	83
260	232	88	89	87	86	84
264	238	89	90	87	86	84

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen I**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	58	59	60	61	62	63
	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C
0	18	18	18	18	18	18
4	18	18	18	18	18	18
8	19	18	18	18	18	18
12	22	18	18	18	18	18
16	27	18	19	19	18	19
20	32	19	21	21	19	19
24	37	21	23	24	19	19
28	43	23	26	28	20	20
32	49	25	28	31	21	22
36	59	26	30	35	23	24
40	70	28	33	38	24	26
44	83	29	35	40	26	28
48	94	31	38	42	28	30
52	100	34	41	44	31	32
56	103	37	46	45	34	33
60	106	42	53	47	39	35
64	109	48	59	49	44	37
68	114	56	66	51	47	38
72	120	65	71	54	49	41
76	127	71	75	58	51	43
80	133	76	78	64	51	45
84	141	80	82	72	54	48
88	149	82	84	80	54	50
92	156	83	86	88	56	53
96	162	85	88	94	56	55
100	172	87	90	98	58	58
104	186	89	92	101	59	61
106	195	90	93	104	60	63
107	199	90	94	103	61	63
108	203	91	94	104	61	64
112	218	92	96	106	64	67
116	231	94	100	110	65	70
120	241	98	106	121	68	73
124	253	101	113	133	69	76
128	271	107	121	147	71	78
132	294	114	129	159	72	80
136	326	121	137	170	74	81
138	352	127	143	176	74	82
139	#	#	#	#	#	#
264	#	#	#	#	#	#

Specimen Blanked Off

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen J**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	64	65	66	67	68	69
	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C
0	18	18	17	18	18	18
4	18	18	18	18	18	18
8	19	18	18	19	18	18
12	23	18	18	20	18	18
16	29	19	20	22	19	18
20	36	20	23	26	19	19
24	42	22	26	30	21	19
28	47	24	30	34	22	21
32	51	26	33	37	24	22
36	57	28	37	39	25	24
40	64	31	41	42	27	25
44	70	34	47	44	29	27
48	77	37	52	46	30	28
52	84	40	57	47	31	30
56	90	44	63	49	32	32
60	95	49	67	50	34	34
64	98	53	71	51	35	36
68	101	58	74	53	36	38
72	104	62	77	56	37	41
76	105	65	80	59	38	43
80	107	68	82	64	40	46
84	112	70	84	74	41	48
88	126	73	87	79	42	51
92	140	75	90	85	44	53
96	154	79	93	91	46	56
100	168	83	96	96	48	58
104	180	86	98	100	51	60
108	191	91	102	103	55	63
110	198	94	105	105	57	64
111	200	95	107	105	58	65
112	201	96	109	105	58	65
116	218	100	120	108	61	68
120	203	105	127	114	63	70
124	189	111	134	123	64	71
128	203	119	143	135	66	73
132	220	135	153	149	67	74
136	256	187	161	162	67	74
138	307	236	167	170	68	75
139	#	#	#	#	#	#
264	#	#	#	#	#	#

Specimen Blanked Off

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen K**

Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	70	71	72	73	74	75
	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C
0	18	17	17	18	18	18
4	18	17	18	18	18	18
8	19	18	18	18	18	18
12	20	18	18	18	18	18
16	22	18	18	19	18	18
20	25	18	18	19	18	18
24	28	18	19	19	18	18
28	31	18	19	20	18	18
32	34	19	21	22	18	19
36	38	19	22	26	18	19
40	43	20	25	30	19	19
44	49	21	27	34	19	19
48	56	22	29	37	19	20
52	64	23	31	41	20	21
56	73	23	32	44	21	22
60	79	24	34	48	22	24
64	83	25	36	50	23	26
68	87	25	37	53	23	28
72	90	27	40	56	25	31
76	92	28	43	58	26	34
80	94	34	47	61	27	36
84	96	41	52	62	30	40
88	98	45	57	64	31	43
92	100	49	63	66	34	46
96	101	52	68	69	35	49
100	104	54	72	72	37	52
104	111	56	76	74	38	54
108	119	58	79	77	40	58
112	128	60	81	78	40	59
116	139	62	83	80	43	62
120	148	64	85	82	43	65
124	156	66	86	83	44	67
128	166	68	88	85	46	70
132	177	71	89	86	48	72
136	194	76	90	87	48	73
138	198	80	91	88	48	74
139	200	76	77	88	49	75
140	#	#	#	#	#	#
264	#	#	#	#	#	#

Specimen Blanked Off

**Individual Temperatures Recorded On The Unexposed Surface
And Adjacent To Specimen L**

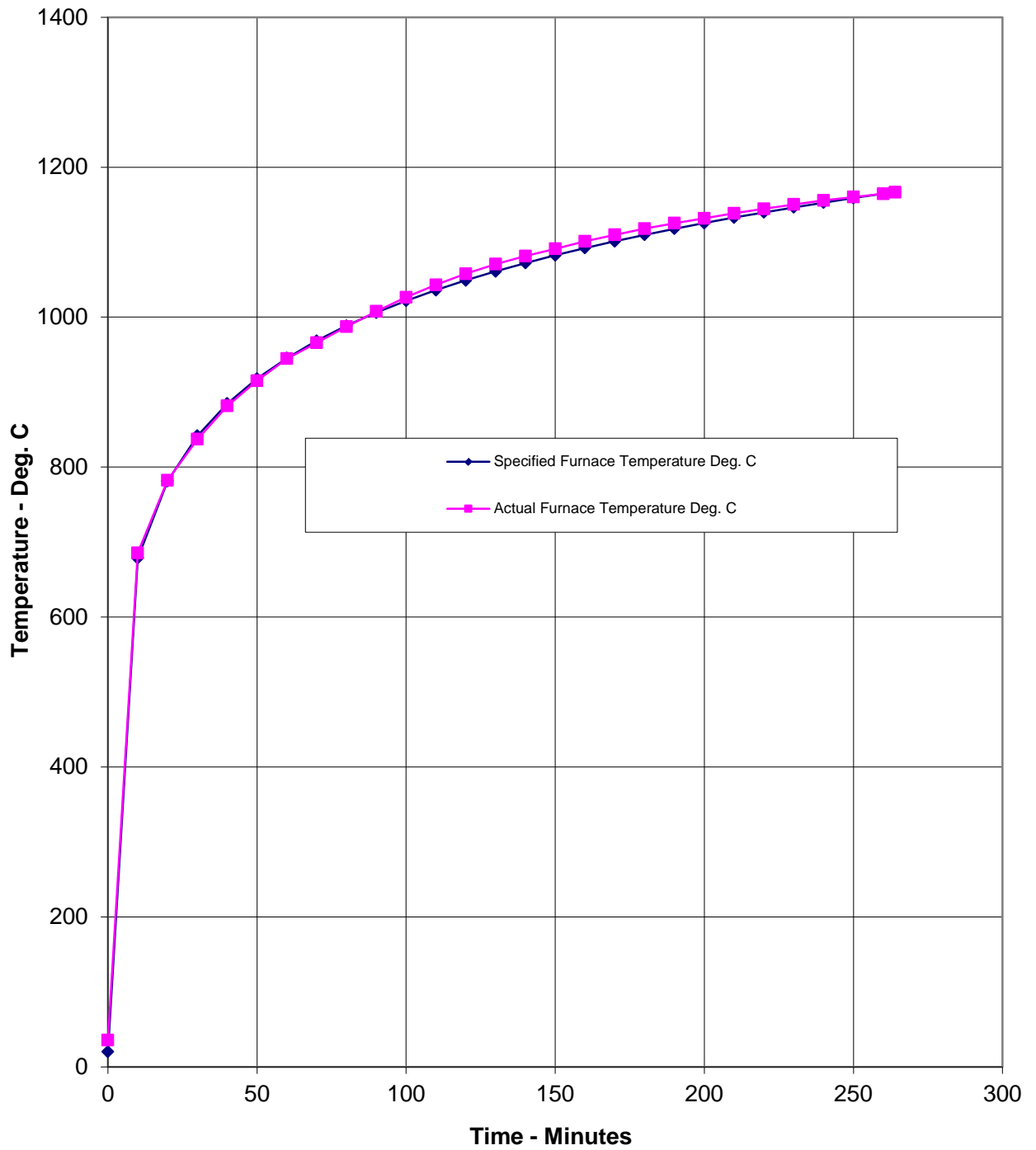
Time Mins	T/C	T/C	T/C	T/C	T/C	T/C
	Number	Number	Number	Number	Number	Number
	76	77	78	79	80	81
	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C	Deg. C
0	19	19	18	19	19	18
10	27	35	19	25	26	18
20	53	66	24	46	43	19
30	79	95	32	73	68	22
40	96	127	43	96	93	27
50	105	155	54	109	116	34
60	117	180	65	132	139	42
68	138	198	71	149	155	49
69	141	200	72	151	157	51
70	143	202	73	153	159	51
80	166	223	81	171	176	63
90	183	242	84	187	192	70
100	198	260	88	200	207	75
110	212	276	91	214	221	78
120	226	292	94	228	233	80
130	240	306	97	240	245	81
140	254	318	101	250	255	82
150	266	330	107	259	265	83
160	278	341	114	270	274	84
170	288	352	120	279	283	84
180	298	361	127	291	291	86
190	306	371	133	302	296	86
200	311	379	139	311	302	87
210	319	388	144	321	*	88
220	327	396	150	330	*	90
230	334	402	154	337	*	91
240	342	409	158	342	*	92
250	349	416	164	350	341	93
260	356	422	169	356	349	94
264	359	425	171	359	351	95

* Thermocouple Malfunction

Graph Showing Recorded Furnace Pressure 250 mm Above The Head Of The Wall Specimens

Time Mins	Recorded Pressure Pascals
0	0.0
10	20.9
20	21.5
30	22.1
40	22.2
50	21.6
60	21.6
70	20.7
80	20.6
90	19.6
100	19.9
110	21.2
120	21.5
130	21.0
140	20.0
150	20.2
160	22.5
170	20.8
180	20.8
190	20.9
200	21.7
210	20.4
220	21.4
230	20.1
240	21.0
250	20.9
260	20.5
264	20.5

Graph Showing Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In BS EN 1363-1: 2012



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 1363-1: 2012, or resulting in sustained flaming on the unexposed surface.

These requirements were satisfied for the periods shown below.

Test Results

Specimen	Integrity (minutes)	
	Cotton Pad	Sustained flaming
A	133	264*
B	264*	264*
C	264*	264*
D	135	264*
E	264*	264*
F	264*	264*
G	264*	264*
H	264*	264*
I	136	136
J	119	119
K	126	126
L	264*	264*

* The test was discontinued after a period of 264 minutes.

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: 2012.

These requirements were satisfied for the periods shown below:

Test Results

Specimen	Insulation (minutes)
A	107
B	68
C	151
D	43
E	33
F	28
G	237
H	230
I	106
J	110
K	126
	68

* The test was discontinued after a period of 264 minutes.

Ongoing 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.

Conclusions

Evaluation against objective

A fire resistance test has been conducted to assess the ability of six wall mounted specimens of linear joint sealing systems and six floor mounted specimens of linear joint sealing systems, to reinstate the integrity and insulation performance (as defined in EN 1366-4: 2006 +A1:2010) of a simulated construction, where adjacent structures abut.

Test Results:

Specimen	Integrity (minutes)		Insulation (minutes)
	Cotton Pad	Sustained flaming	
A	133	264*	107
B	264*	264*	68
C	264*	264*	151
D	135	264*	43
E	264*	264*	33
F	264*	264*	28
G	264*	264*	237
H	264*	264*	230
I	136	136	106
J	119	119	110
K	126	126	126

* The test was discontinued after a period of 264 minutes.

Field of Direct Application

Orientation

The field of application regarding the orientation of the linear joint is given in Table 1 of EN 1366-4: 2006 +A1:2010).

Table 1 – Field of application regarding orientation

Tested orientation	Application
A	A, D, E ^a
B	B
C	C, D ^b
<p>^a Orientation E will only be covered by test orientation A if shear movement was chosen and one face of the joint was fixed and the other face was moved.</p> <p>^b Orientation D will only be covered by test orientation C if shear movement was chosen and one face of the joint was fixed and the other face was moved.</p>	

Key

- A. Linear joint in a horizontal test construction.
- B. Vertical linear joint in a vertical test construction.
- C. Horizontal linear joint in a vertical test construction.
- D. Horizontal wall joint abutting a floor, ceiling or roof.
- E. Horizontal floor joint abutting a wall.

Table 1 only applies when both the supporting construction and the location of the seal within the linear joint remain unchanged.

Supporting construction

Test results obtained with autoclaved aerated concrete standard supporting constructions apply to concrete, block work and masonry separating elements of a thickness and density equal to or greater than that tested.

Seal position

Test results are valid only for the position in which the seal was tested, except that where the linear joint seal was fitted flush with the surface of the supporting construction and is exposed to the fire.

Mechanically induced movement

The linear gap sealing systems were not tested for mechanically induced movement, therefore the movement capability of the linear joint seal must be less than $\pm 7.5\%$

Results obtained with mechanically induced movement prior to or during the tests are only valid for the movement capability tested or lower.

Sample Report



Sample Report

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

Job No.	FM411548
Manufacturer	Everbuild (Sika Group)
Manufacturing site	41 Cross Green Ind. Est. Knowsthorpe Road Leeds LS9 0SW.
Place of sampling	As Above
Traceability information	Date/time of production: 19/03/2019 Production unit/line: Main factory Batch number: Shift: Day
Product Number/ Description	Fire Sealant 300 Intumescent
Marking of the product by the manufacturer e.g. label, batch number and date of manufacture	80 20 Va Emulsion Polymer Wq 409 Batch 409430919/400260 Fire Sealant 300 batch 999921219/40251
Marking of the samples by Warringtonfire Testing and Certification Limited	Job No: WF FM411548 Date: 19/03/2019 Signature or initials: Signature + 1121
Stock/batch quantity from which samples selected and sample quantity	Witnessed the manufacture of batch 999921219/40251 Fire sealant 300 for testing, selected 6 boxes of 12 cartridges out of 210 boxes
Results of tests and/or inspections during manufacture	Reviewed polymer mixing sheet tests all passed Witnessed Fire Sealant mixing, tests and packaging
Essential Characteristics to be tested ie. Test reference	BS EN 1366-4:2006
Samples to be dispatched by manufacturer to *** within *** weeks/month(s)	8 th May 2019
Date of sampling	19/03/2019
Warringtonfire Testing and Certification Limited notified body number	1121

Warringtonfire Testing and Certification Limited
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Company Registration No.11371436

Doc. Ref. EWC-QU-FT-90 (Issue 3 – 29/11/2018)



<p>Signed: </p> <p>(for and on behalf of Manufacturer)</p>	<p>Signed: </p> <p>(for and on behalf of Warringtonfire Testing and Certification Limited)</p>
<p>Print:</p> <p>Simon Austin</p>	<p>Print:</p> <p>Andy Cape</p>
<p>Date:</p> <p>19th March 2019</p>	<p>Date:</p> <p>19th March 2019</p>