

**Title:**

The Fire Resistance Performance of an Asymmetrical, Non-Load Bearing, Partition Wall Assembly, Tested in Accordance with BS EN 1364-1: 2015

**Date of Test:**

22 October 2023

**Issue 1**

25 April 2024

**WF Report No.**

536193/R



**Prepared for:**

**Protektor Group UK Ltd.**

Protektor House,  
Frederick Road,  
Worcestershire,  
DY11 7RA.



0249

# Test Specimen

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## Summary of Tested Specimen

The test construction had overall nominal dimensions of 3030 mm high by 3000 mm wide by 139 mm thick and was formed from a core of 0.5 mm thick Protektor galvanised steel C studs, 34/36 mm x 70 mm. The cavity in between the studs was insulated with 50 mm thick glass wool based insulation, 22kg/m<sup>3</sup>. The exposed face of the specimen was fitted with 2 layers of 15 mm British Gypsum Fireline through fixed to steel framework. The exposed face also incorporated 0.6 mm Protektor galvanised steel resilient bar, 17 mm x 72 mm. The unexposed face of the specimen consisted of 2 layers of 15 mm British Gypsum Fireline through fixed to steel framework.

The specimen was fixed at head, base and one vertical edge with one vertical edge left unrestrained to incorporate a free edge.

*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: <ul style="list-style-type: none"><li>▪ causing ignition of a cotton pad when applied</li><li>▪ permitting the penetration of a gap gauge as specified in BS EN 1363-1: 2020</li><li>▪ sustained flaming on the unexposed surface</li></ul> <p><b>These requirements were satisfied for the periods shown below:</b></p>
<b>Sustained flaming</b>	132 minutes
<b>Gap gauge</b>	132 minutes No failure*
<b>Cotton pad</b>	132 minutes
<b>Insulation</b>	It is required that the mean temperature rise of the unexposed surface shall not be greater than 140°C and that the maximum temperature rise shall not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure. <p><b>These requirements were satisfied for the period shown below:</b></p>
<b>Specimen</b>	132 minutes No failure*
	*Test duration. The test was discontinued after a period of 132 minutes.

**Date of Test** 22 October 2023

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## Signatories

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Responsible Officer  
**K. Brennan\***  
Technical Officer



Approved  
**G. Edmonds\***  
Senior Technical Officer

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

Report Issued: 25 April 2024

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## Revision History

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

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Reason for Revision:	

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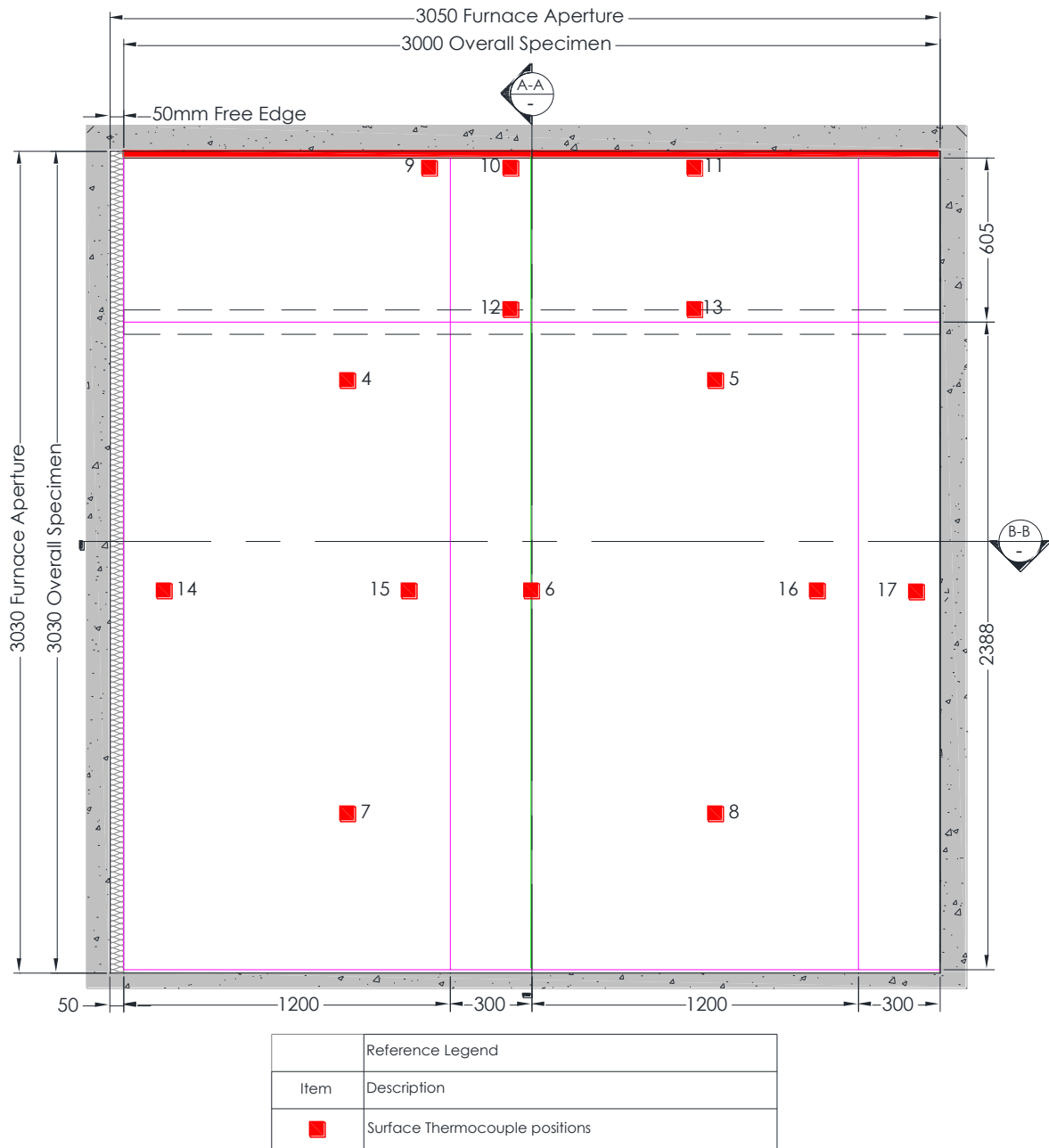
# Test Conditions

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<b>Standard</b>	BS EN 1364-1:2015 Fire resistance tests for non-loadbearing elements - Part 1: Walls.
<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>	The specimen was received on the 18 October 2023 and installed into a refractory concrete lined steel restraint frame, with one vertical edge unrestrained, by representative of the test sponsor between the 18 and 19 October 2023.
<b>Conditioning</b>	The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 4 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 16°C to 22°C and 42% to 75.5% respectively.
<b>Instruction to Test</b>	<p>The test was conducted on the 22 October 2023 at the request of Protektor Group UK Ltd., the test sponsor.</p> <p>Mr. Paul Lodge, a representative of the test sponsor, witnessed the test.</p>
<b>Ambient Temperature</b>	The ambient air temperature in the vicinity of the test construction was 15°C at the start of the test with a maximum variation of +/-2°C during the test.
<b>Furnace</b>	The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2020 Clause 5.1 using nine plate thermometers, distributed over a plane 100 mm from the surface of the test construction.
<b>Thermocouples</b>	Thermocouples were provided to monitor the unexposed surface of the specimen. 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 Figure 1.
<b>Furnace Pressure</b>	After the first five minutes of testing and for the remainder of the test, the furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 2020, clause 5.2.1 The calculated pressure differential relative to the laboratory atmosphere at the top of the specimen was 17 (± 5) Pa between 5 and 10 minutes and 17 (± 3) Pa thereafter.

# Test Construction

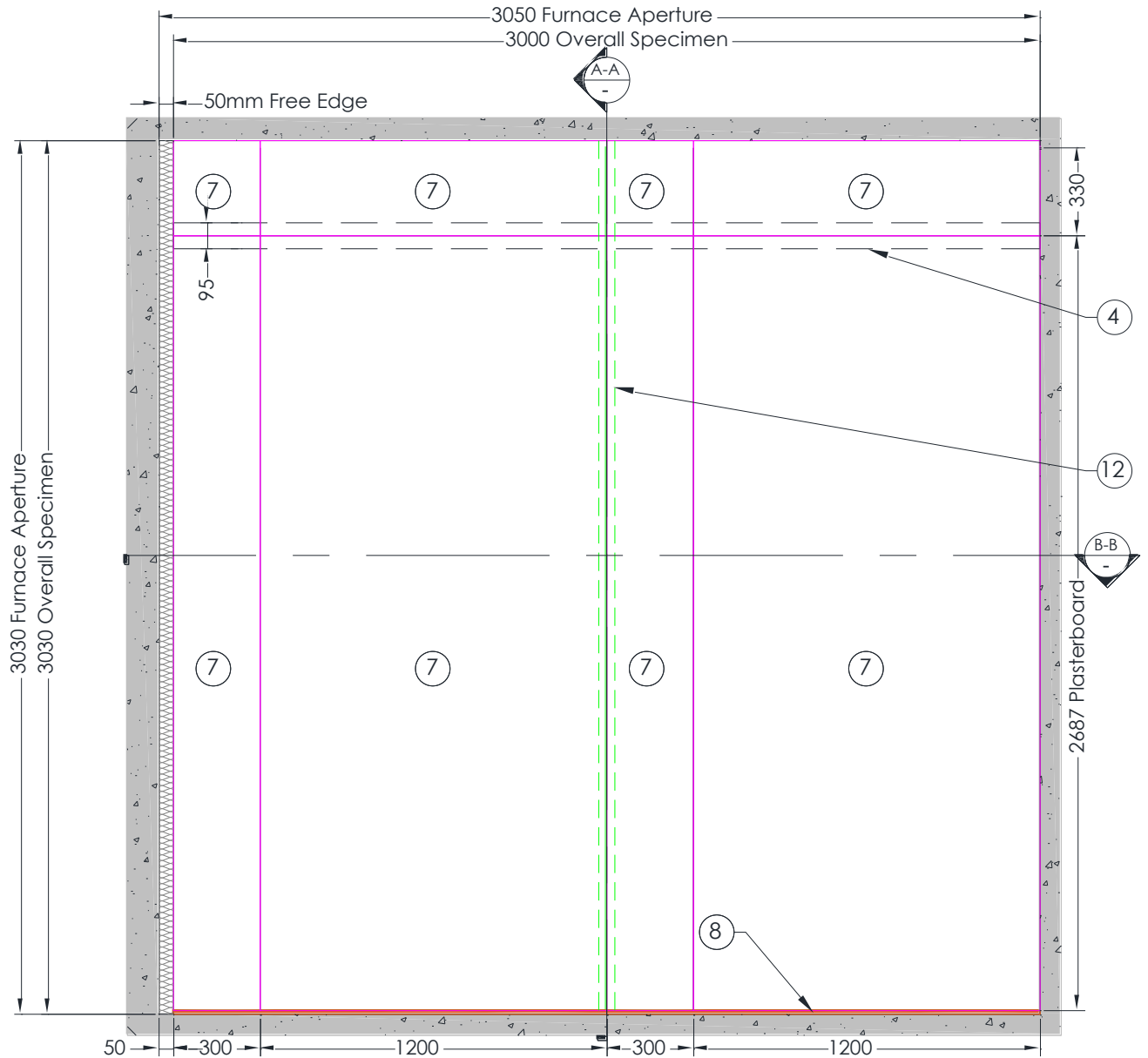
**Figure 1. General Elevation Showing Plasterboard Layout & Thermocouple Positions - Unexposed face**



GENERAL ELEVATION SHOWING PLASTERBOARD LAYOUT  
& THERMOCOUPLE POSITIONS - UNEXPOSED FACE

Do not scale. All dimensions are in mm

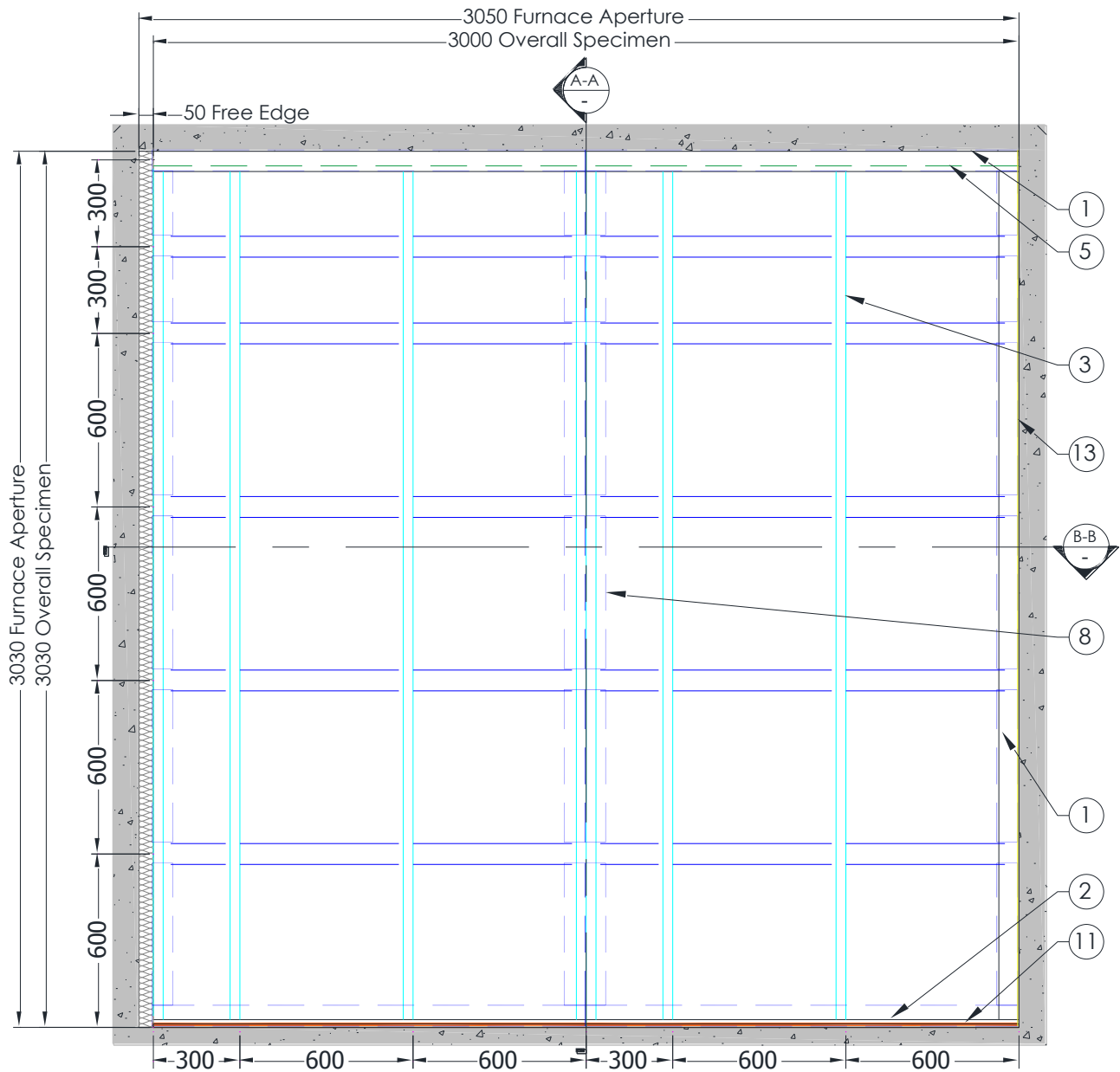
**Figure 2. General Elevation / Section Showing First Layer of Plasterboard – Unexposed Face**



GENERAL ELEVATION / SECTION THROUGH SPECIMEN SHOWING FIRST LAYER OF PLASTERBOARD - UNEXPOSED FACE

Do not scale. All dimensions are in mm

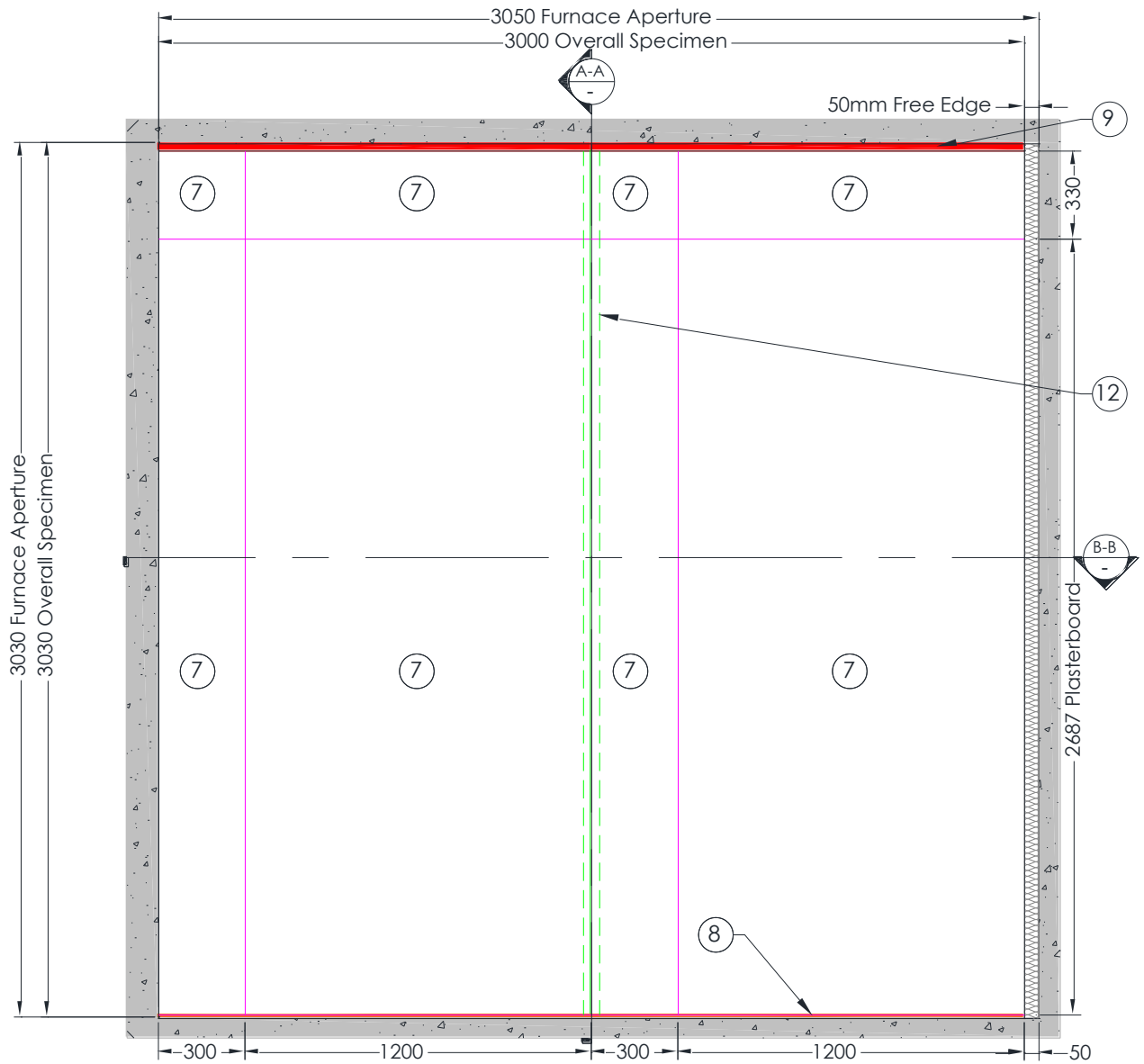
**Figure 3. General Section Through Specimen Showing Framework – Unexposed Face**



GENERAL SECTION THROUGH  
SPECIMEN SHOWING FRAMEWORK - UNEXPOSED FACE

Do not scale. All dimensions are in mm

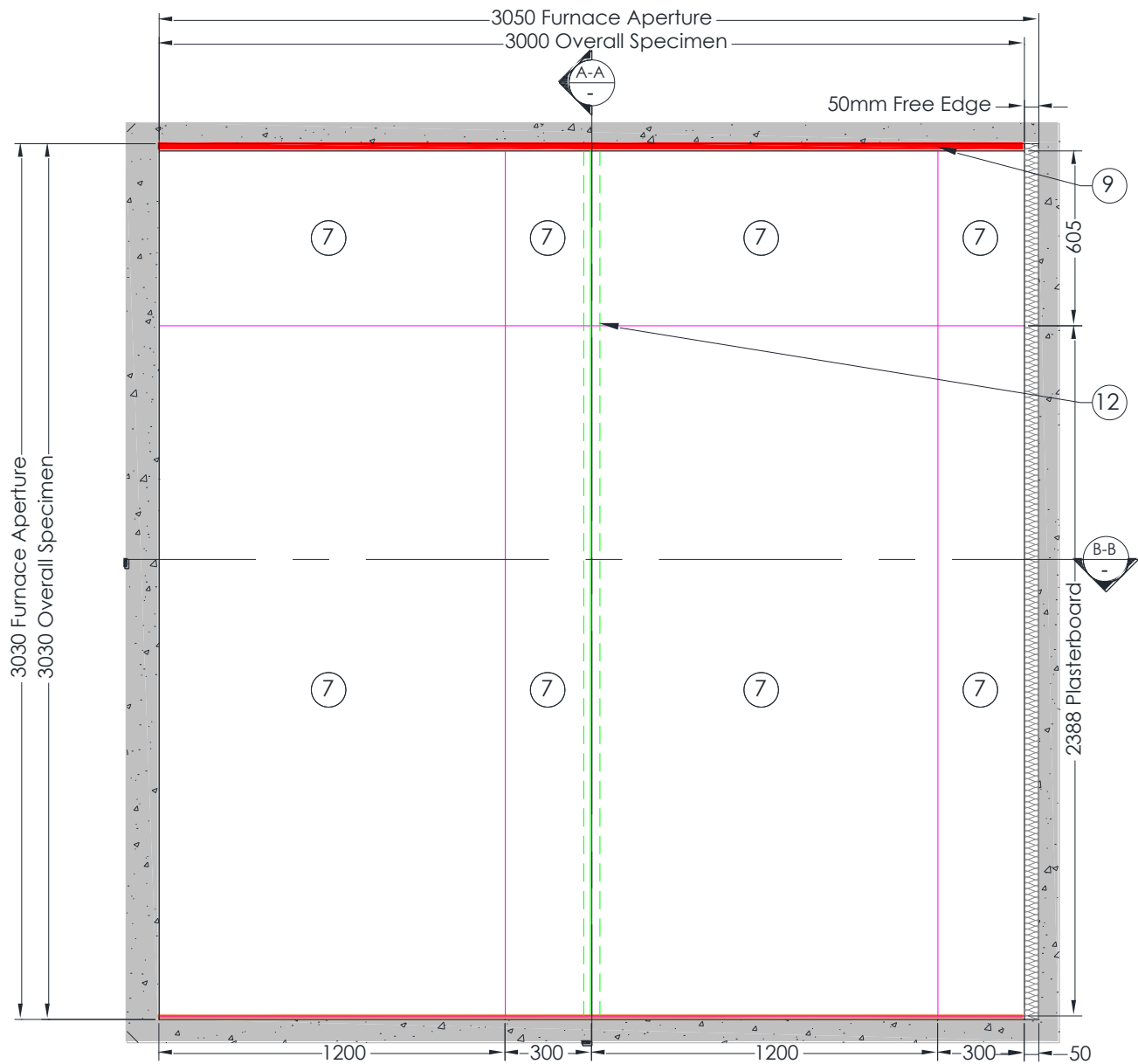
**Figure 4. General Elevation of Test Specimen Showing Inner Plasterboard Layout – Exposed Face**



GENERAL ELEVATION OF TEST SPECIMEN SHOWING  
INNER LAYER OF PLASTERBOARD - EXPOSED FACE

Do not scale. All dimensions are in mm

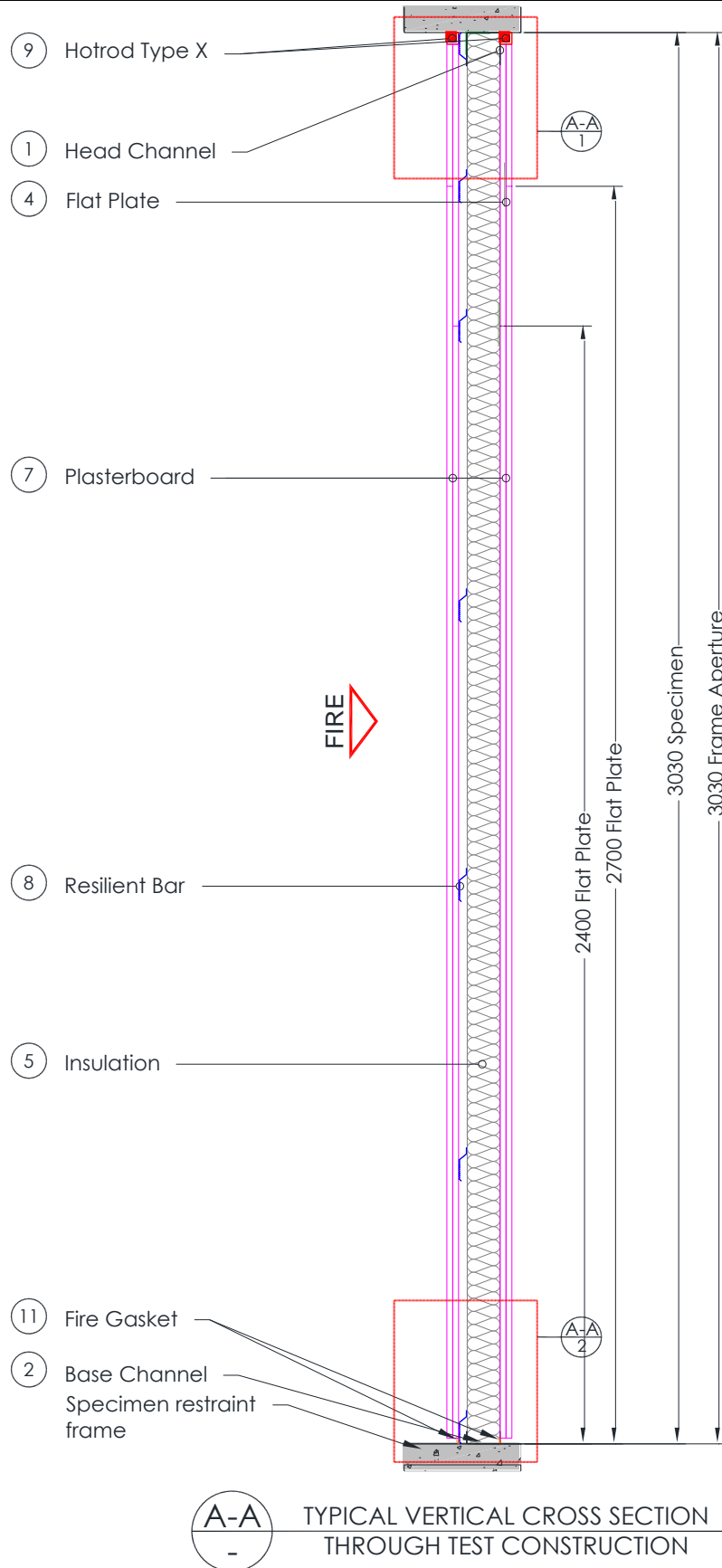
**Figure 5. General Elevation of Test Specimen Showing Outer Plasterboard Layout – Exposed Face**



GENERAL ELEVATION OF TEST SPECIMEN SHOWING OUTER LAYER OF PLASTERBOARD - EXPOSED FACE

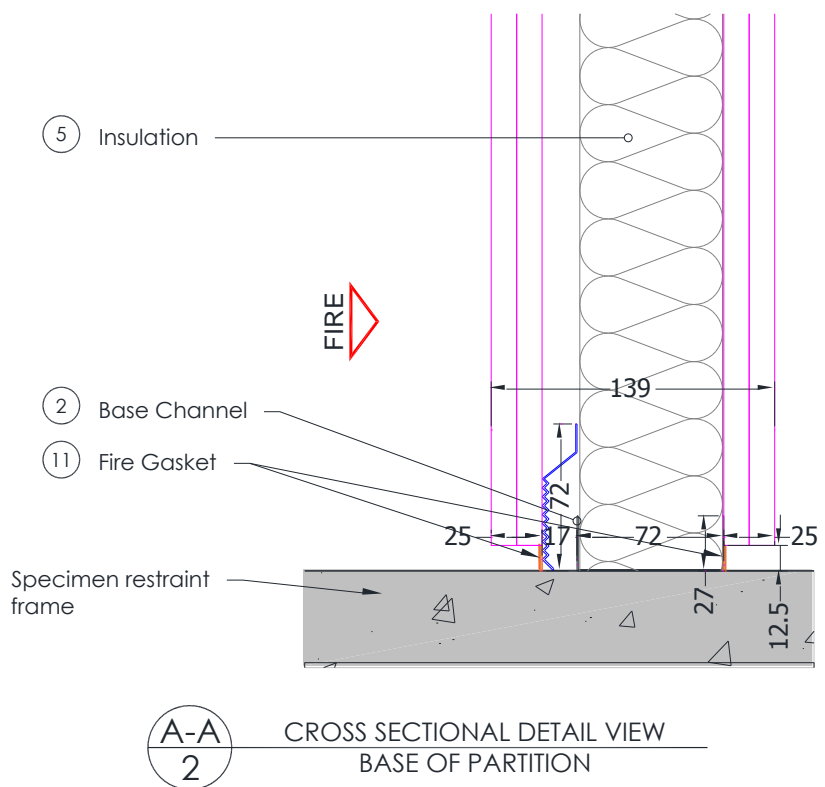
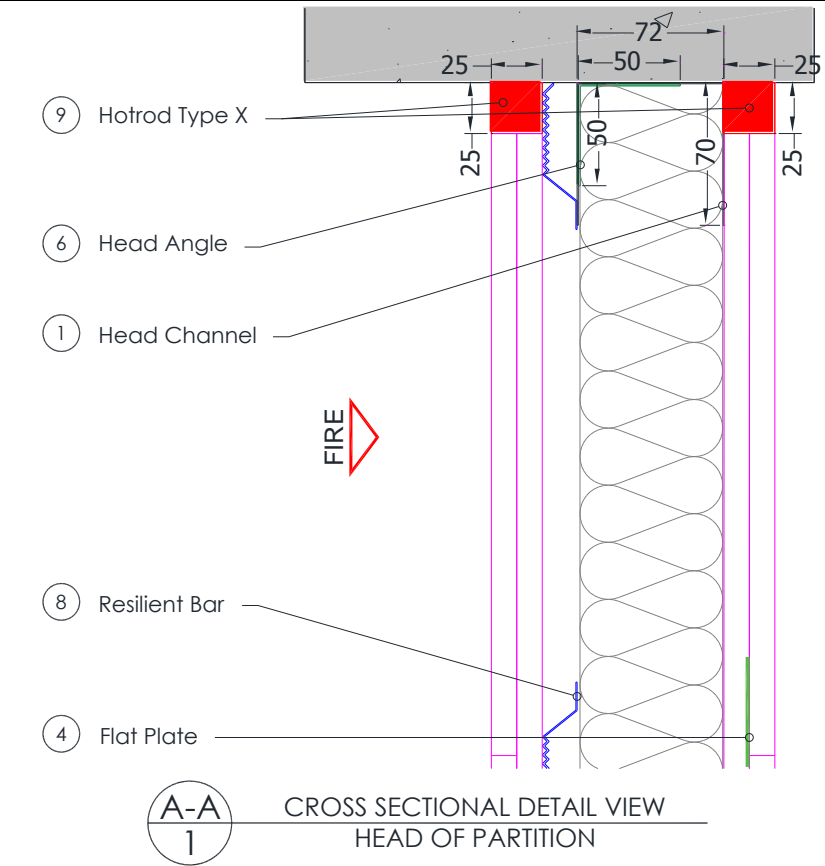
Do not scale. All dimensions are in mm

**Figure 6. Typical Vertical Cross Section Through Test Construction A-A**



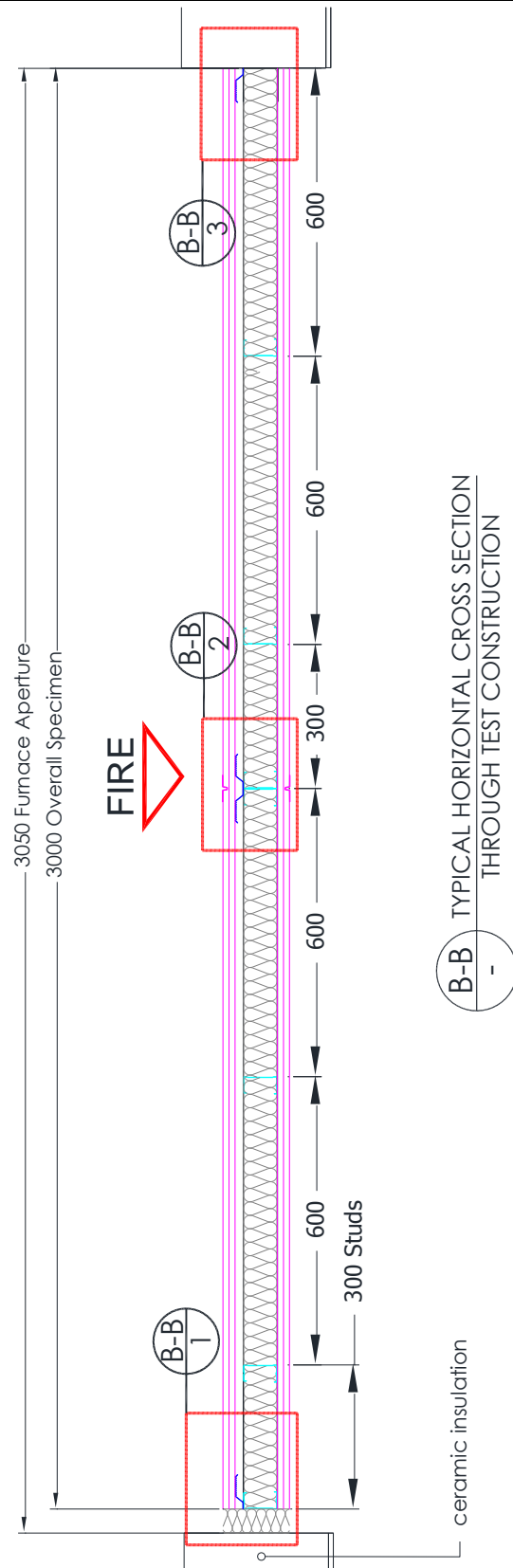
Do not scale. All dimensions are in mm

**Figure 7. Typical Detail of Vertical Cross Section Through Test Construction A-A 1 & A-A 2**



Do not scale. All dimensions are in mm

**Figure 8. Typical Horizontal Cross Section Through Test Construction B-B**



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.

Figures 1-9 supplied by the test sponsor.

<u>Item</u>	<u>Description</u>
<b>1. Head &amp; Wall Channel</b>	
Manufacturer	: Protektor
Reference	: Protektor Extra Deep Track 5072-D
Material	: Galvanised Steel
Section size	: 72 mm x 70 mm
Thickness	: 0.6 mm
Fixing method	: Screwed into frame aperture
Fixings	
i. Manufacturer	: Protektor
ii. Reference	: M650MSB
iii. Size	: 50 mm x 6 mm
iv. Centres	: 400 mm
<b>2. Base Channel</b>	
Manufacturer	: Protektor
Reference	: Protektor Standard Track 5072
Material	: Galvanised Steel
Section size	: 27 mm x 72 mm
Thickness	: 0.6 mm
Fixing method	: Screwed into frame aperture
Fixings	
i. Manufacturer	: Protektor
ii. Reference	: M650MSB
iii. Size	: 50 mm x 6 mm
iv. Centres	: 400 mm
<b>3. Stud</b>	
Manufacturer	: Protektor
Reference	: Protektor Maxi-Tec C profile 70 mm 57775
Material	: Galvanised Steel
Section size	: 34/36 mm x 70 mm
Thickness	: 0.5 mm
Fixing method	: Placed in between channels.

<b>Item</b>	<b>Description</b>
<b>4. Flat plate</b>	
Manufacturer	: Protektor
Reference	: Flatplate PP31
Material	: Galvanised Steel
Section Size	: 95 mm
Thickness	: 0.7 mm
Fixing Method	Through fixed to internal framework with drywall screws
Fixings	
i. Manufacturer	: Protektor
ii. Reference	: 13mm wafer head screws 6239
iii. Size	: 13 mm x 4.2 mm
iv. Quantity per stud	: 2
<b>5. Insulation</b>	
Manufacturer	: URSA Terra
Reference	: Acoustic Roll
Material	: Glass wool based Insulation
Thickness	: 50 mm
Density	: 22 kg/m <sup>3</sup> (nominal)
Fixing Method	: Fitted into gaps between studs and retained by Head Angle
<b>6. Head Angle</b>	
Manufacturer	: Protektor
Reference	: Protektor Angle PP50
Material	: Galvanised Steel
Section Size	: 50 mm x 50 mm
Thickness	: 0.7 mm
Fixing Method	: Fixed inside head channel to fix insulation in place
Fixings	
i. manufacturer	: Protektor
ii. reference	: M650MSB
iii. size	: 50 mm x 6 mm
iv. quantity	: 2

<b>Item</b>	<b>Description</b>
<b>7. Plasterboard</b>	
Manufacturer	: British Gypsum
Reference	: Fireline
Board Size	: 3000 mm x 1200 mm
Thickness	: 15 mm
Stated Density	: 1034.5 kg/m <sup>3</sup> (Measured) 848 kg/m <sup>3</sup> (nominal)
Fixing method	: Through fixed to steel framework.
Fixings (1st Layer)	
i. Manufacturer	: Protektor
ii. Type	: Drywall Screws 6215
iii. Material	: Black phosphate coated steel
iv. Overall size	: 25 mm x 3.5 mm
v. Centres	: 300 mm 150 mm @ board edges
Fixings (2nd Layer)	
i. manufacturer	: Evolution
ii. type	: Drywall Screws
iii. material	: Black phosphate coated steel
iv. overall size	: 42 mm x 3.5 mm
v. centres	: 300 mm 150 mm @ board edges
Joint Tape	
i. manufacturer	: Protektor
ii. reference	: Joint tape Roll
Joint Filler	
i. manufacturer	: British Gypsum
ii. reference	: Gyproc ProMix Lite
<b>8. Resilient Bar</b>	
Manufacturer	: Protektor
Reference	: Standard resilient bar 5102
Material	: Galvanised Steel
Section size	: 17 mm x 72 mm
Thickness	: 0.6 mm
Fixing method	: Screwed into frame aperture
Fixings	
i. Manufacturer	: Protektor
ii. Reference	: 13mm wafer head screws 6239
iii. Size	: 13 mm x 4.2 mm
iv. Centres	: 400 mm
<b>9. Hotrod Type X</b>	
Manufacturer	: Trim-Tex
Reference	: 9285 Trim-Tex / 70918 Protektor Hotrod Type X
Material	: Open cell polyurethane and Promat Promaseal® PLSK Wrap Strip
Section size	: 25 mm x 25 mm
Fixing method	: Compression fit within joint
Fixings	: Self-adhered to head channel above plasterboard.

<b>Item</b>	<b>Description</b>
<b>10. Fire Bead</b>	
Manufacturer	: Trim-Tex
Reference	: Protektor 70926 / Trim-Tex 9260
Material	: Vinyl Gasket
Section size	: 41mm x 21 mm
Fixing method	: Stapled to plasterboard
Fixings	
i. Manufacturer	: Timco
ii. Reference	: 377761
iii. Size	: 10 mm x 13 mm
iv. Centres	: 100 mm
<b>11. Fire Gasket</b>	
Manufacturer	: Trim-Tex
Reference	: 70915 Protektor / 9265 Trim-Tex Fire Gasket
Material	: Vinyl Gasket
Section size	: 12.5 mm x 0.5 mm
Fixing method	: Screwed onto the base channel
Fixings	
i. Manufacturer	: Protektor
ii. Reference	: 13mm wafer head screws 6239
iii. Size	: 13 mm x 4.2 mm
iv. Centres	: 300 - 400 mm
<b>12. 093X – V Fire rated</b>	
Manufacturer	: Trim-Tex 093X
Reference	: Protektor 70927
Material	: Vinyl Gasket Expansion Joint
Section size	: 63 mm x 12 mm wide
Fixing method	: Fixed within joint, stapled to plasterboard and then filler applied
Fixings	
i. Manufacturer	: Timco
ii. Reference	: 377761
iii. Size	: 10 mm x 13 mm
iv. Centres	: 100 mm
<b>13. Intumescent Sealant</b>	
Manufacturer	: Promat
Reference	: Promaseal HPEX Sealant
Material	: Intumescent expanding mastic
Application Method	: Gun applied to wall channel and frame aperture.on both sides and on the plasterboard touching the frame aperture.
<b>Alkaline Earth Silicate Fibre based Insulation (Ceramic)</b>	
Manufacturer	: Morgan Advanced Materials
Reference	: Superwool Plus
Material	: High temperature insulation wool
Thickness	: 25 mm, uncompressed
Density	: 96 kg/m <sup>3</sup> (stated)
Fixing Method	: Compressed within the gap between the specimen frame and the brickwork aperture and then sealed over with the relevant perimeter sealant

## Test Observations

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Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	
00	00	<b>The test commences.</b>
01	30	Slight smoke / steam release at the head of the specimen on the unexposed face.
13	00	Paper layer of boards burning away and jointing compound starting to detach from the joints on the exposed face.
50	00	Intumescent at the central joint expanding to seal gap. All other vertical and horizontal joints opening up slightly on exposed face.
60	00	Specimen maintaining performance criteria.
92	00	Sections of the first layer of board starting to detach on the exposed face.
96	00	Specimen visibly deflecting towards the heating conditions.
100	00	Joints in second layer of board widened to approximately 25mm on the exposed face.
115	00	Sections of the second layer of board detached on the exposed face, exposing core insulation and studs to heating conditions.
117	00	Intumescent expanding through central joint at $\frac{3}{4}$ height and smoke release occurring on the unexposed face.
132	00	<b>Test Discontinued.</b>

# Test Photographs

The exposed face of the specimen prior to testing



The unexposed face of the specimen prior to testing



The unexposed face of the specimen after a test duration of 60 minutes



The unexposed face of the specimen after a test duration of 120 minutes



The exposed face of the specimen immediately after the test



## Temperature and Deflection Data

Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard BS EN 1363-1: 2020

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	24
5	576	578
10	678	678
15	739	745
20	781	775
25	815	818
30	842	848
35	865	862
40	885	882
45	902	901
50	918	916
55	932	931
60	945	943
65	957	957
70	968	972
75	979	984
80	988	996
85	998	1005
90	1006	1005
95	1014	1012
100	1022	1017
105	1029	1027
110	1036	1029
115	1043	1051
120	1049	1048
125	1055	1049
130	1061	1058
132	1063	1066

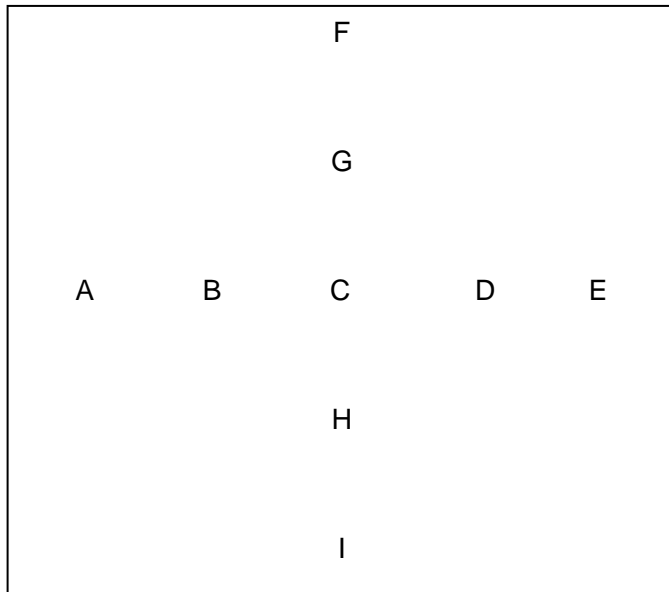
**Individual Temperatures And Mean Recorded On The Unexposed Surface Of The Specimen**

Time Mins	T/C Number 4 Deg. C	T/C Number 5 Deg. C	T/C Number 6 Deg. C	T/C Number 7 Deg. C	T/C Number 8 Deg. C	Mean Temp Deg. C
0	20	20	20	19	18	19
5	20	20	20	19	18	19
10	19	19	19	19	18	19
15	20	20	20	19	18	19
20	21	24	21	20	18	21
25	23	30	24	23	19	24
30	26	37	28	27	20	28
35	29	44	32	33	23	32
40	32	49	36	39	26	36
45	35	52	40	44	29	40
50	38	54	44	48	34	44
55	40	56	46	50	37	46
60	41	56	46	51	41	47
65	41	55	47	52	42	47
70	40	52	48	50	43	47
75	41	51	51	49	44	47
80	42	51	57	49	45	49
85	45	54	61	51	48	52
90	49	57	64	55	51	55
95	53	60	66	60	54	59
100	56	62	67	62	57	61
105	57	63	69	62	60	62
110	58	68	70	63	62	64
115	59	75	71	64	64	67
120	62	78	73	65	66	69
125	68	83	75	66	73	73
130	71	86	79	68	75	76
132	71	88	80	70	76	77

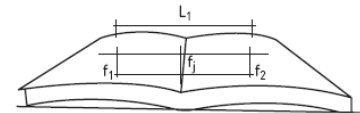
**Individual Temperatures Recorded On The Unexposed Surface Of The Specimen**

Time Mins	T/C Number 9 Deg. C	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	T/C Number 17 Deg. C
0	21	21	21	21	21	21	20	20	20
5	21	21	21	21	20	21	20	20	20
10	21	22	21	20	20	20	20	20	20
15	24	26	24	21	21	21	20	20	20
20	30	34	31	26	25	22	23	21	20
25	36	41	37	35	32	27	28	24	21
30	40	46	41	41	38	34	34	28	23
35	43	51	44	45	42	41	38	32	25
40	45	56	47	47	46	46	41	37	28
45	48	62	50	48	48	50	43	41	32
50	50	67	51	48	50	53	45	45	36
55	52	71	53	48	50	55	46	47	40
60	54	74	55	50	51	55	46	49	43
65	57	74	60	53	50	55	45	49	44
70	60	75	66	56	49	53	45	49	45
75	64	75	70	58	49	51	47	49	45
80	68	78	71	61	51	50	50	51	44
85	69	80	71	65	53	50	55	56	45
90	70	81	73	69	55	52	59	60	45
95	71	82	74	72	56	55	61	62	47
100	70	84	74	75	57	58	62	63	49
105	71	85	76	77	59	60	63	65	51
110	73	86	80	79	60	61	64	67	53
115	76	87	83	82	64	61	64	70	56
120	79	89	86	85	75	62	65	72	59
125	82	91	89	88	81	63	67	75	64
130	85	93	92	91	86	66	70	85	69
132	86	96	92	93	87	69	71	87	71

**Deflection Of The Specimen During The Test**



EN 15254-5:2009 (E)



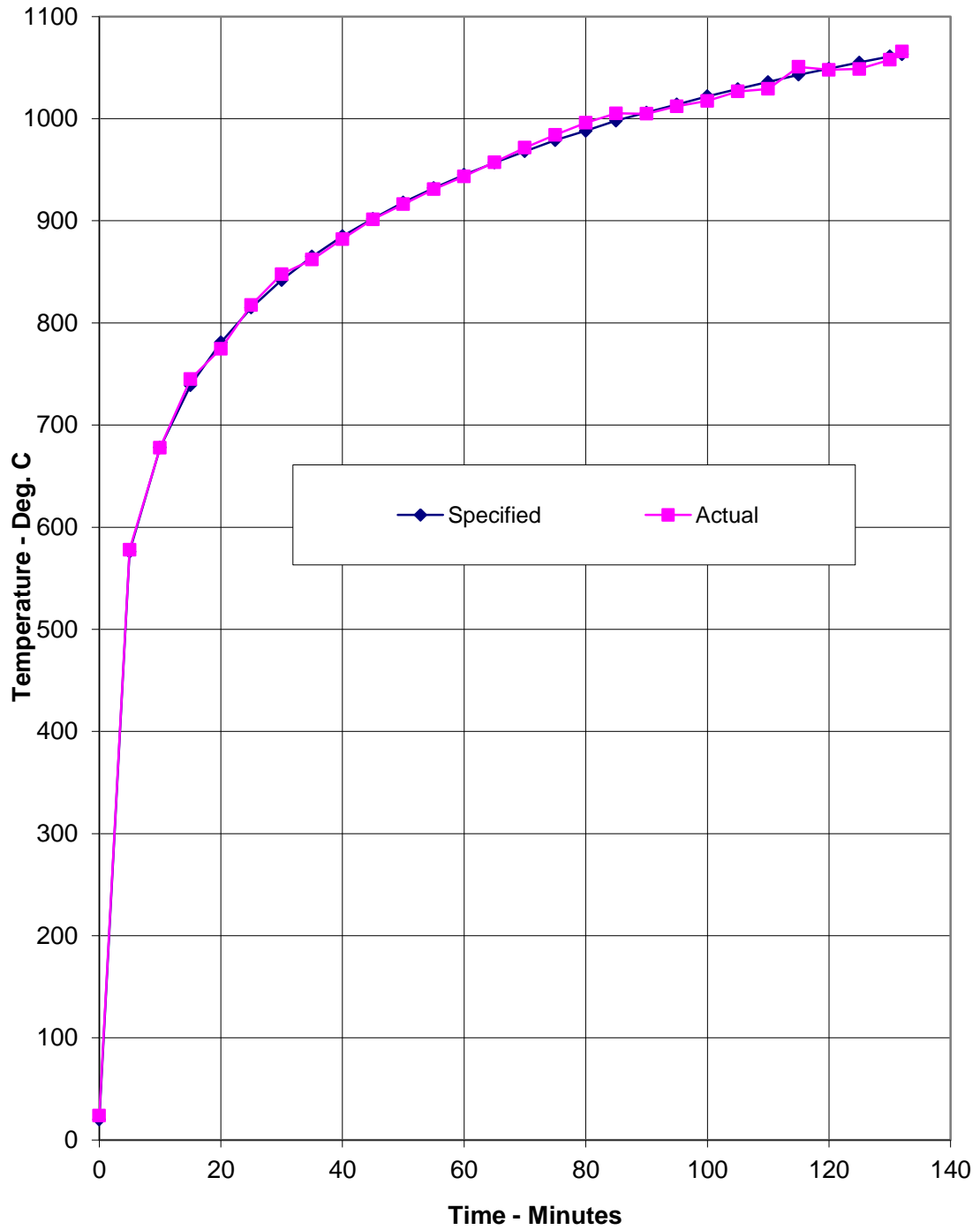
$$\Delta f = (f_j - 0.5 \cdot (f_1 + f_2)) / L_1$$

Figure B.1 — Calculation of  $\Delta f$  in midspan section

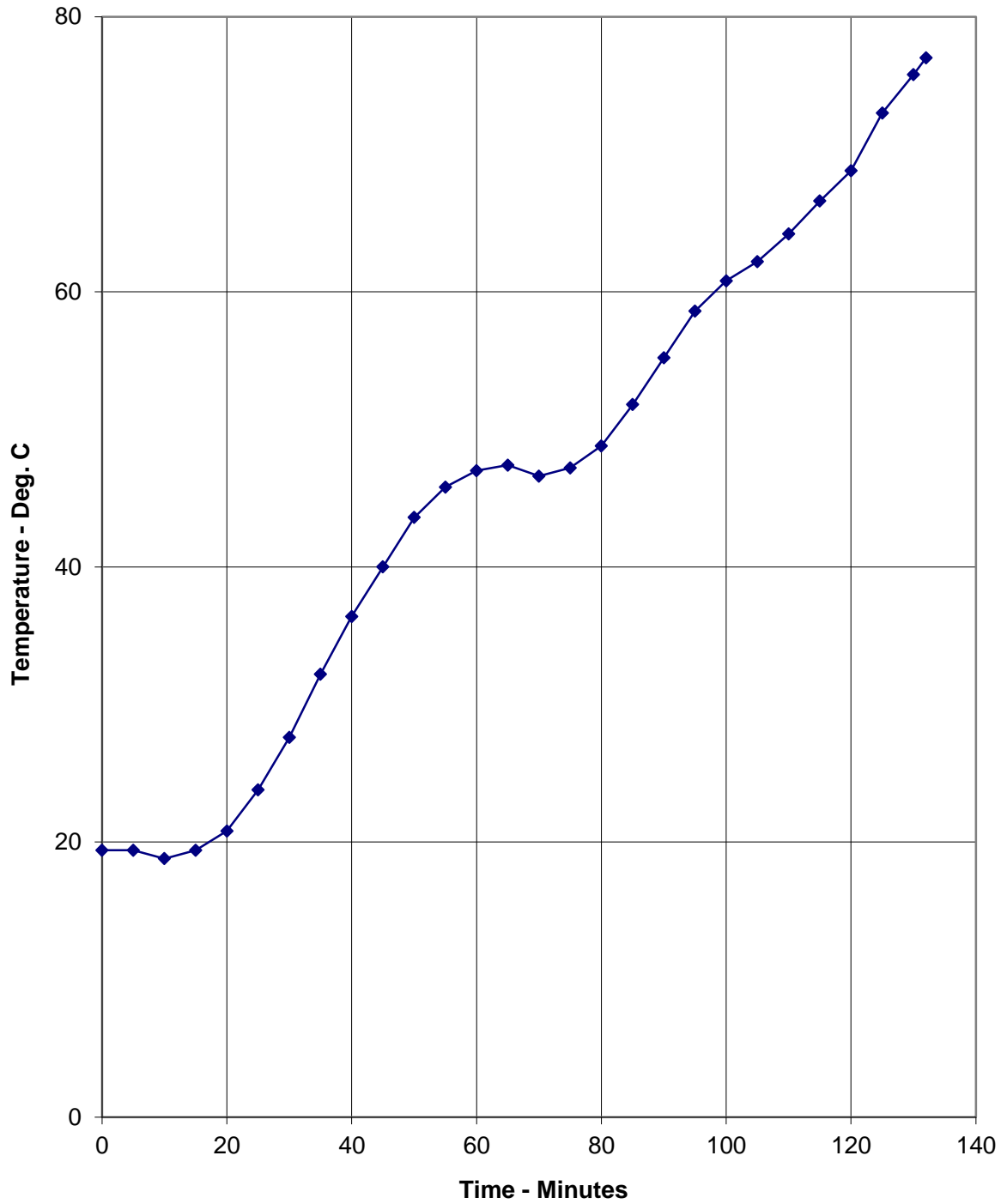
Time (Mins)	Deflections - mm								
	A	B	C	D	E	F	G	H	I
0	0	0	0	0	0	0	0	0	0
10	7	6	4	12	1	-4	5	8	2
20	-5	-1	1	4	0	3	2	-2	-1
30	3	-7	3	-4	4	-4	4	1	-1
40	1	10	4	-2	-3	-2	3	2	2
50	0	2	3	1	2	-1	-2	2	0
60	1	3	7	10	-1	3	8	5	-3
70	4	19	18	14	-4	-12	11	17	2
80	0	8	13	5	2	9	6	11	3
90	1	4	3	-1	2	2	1	0	-2
100	-3	-1	-5	-4	-1	-2	2	-5	1
110	3	-5	-2	-6	0	4	2	-6	0
120	-1	-7	-2	-8	2	-3	-12	-4	0
130	4	-4	-13	-8	2	-3	-13	-6	-2

**Positive deflections indicate movement towards the furnace chamber**

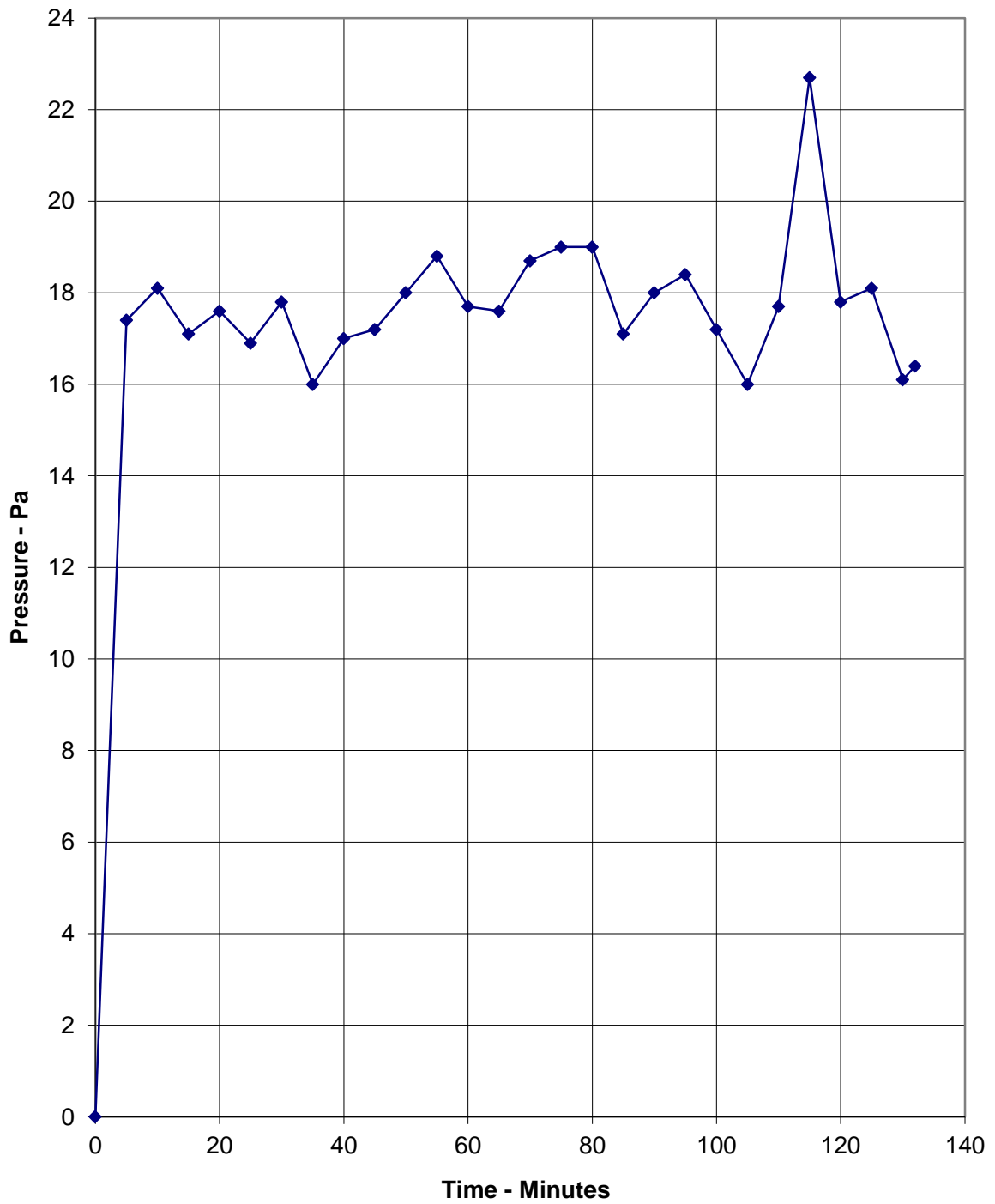
**Graph Showing Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard BS EN 1363-1: 2020**



Graph Showing Mean Temperature Recorded On The Unexposed Surface Of The Specimen



Graph Showing Recorded Furnace Pressure 300 mm Below The Head Of The Specimen



## On-going Implications

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### Limitations

This report details the method of construction, the test conditions and the results obtained when the specific elements of construction described herein were tested following the procedure outlined in BS EN 1363-1: 2020, and where appropriate BS EN 1363-2: 1999. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report. Annex A of BS EN 1363-1: 2020, provides guidance information on the application of fire resistance tests and the interpretation of test data.

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 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

## Field of Direct Application

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### General

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability, except with respect to the construction types covered in Annex A (Glazed elements) and Annex B (Horizontally spanning elements) where specific direct field of application rules are given.

- a) decrease in height;
- b) increase in the thickness of the wall;
- c) increase in the thickness of component materials;
- d) decrease in linear dimensions of boards or panels but not thickness;
- e) decrease in stud spacing;
- f) decrease in distance of fixing centres;
- g) increase in the number of horizontal joints, of the type tested, when tested with one joint not more than  $(500\pm 150)$  mm from the top edge;
- h) increase in the number of vertical joints, of the type tested;
- i) the use of installations such as electrical sockets, switches, etc. when tested as illustrated in Figures 9, 10 and 11 with the installations not more than 500 mm from the top edge;
- j) horizontal and/or vertical joints, of the type tested.

For framing systems or systems with visible profiles on the unexposed side, intended to be used for EI classification, no increase in width and depth is allowed in case no temperature measurements on the unexposed side of the profiles were made during the test.

The field of direct application for glazed elements or non-loadbearing walls incorporating glazing is given in Annex A.

The field of direct application for non-loadbearing external and internal walls designed to span horizontally between two independently proven fire resisting vertical structural elements is given in Annex B.

**Extension of width** For test specimens tested without a supporting construction, the width of an identical construction may be increased if the specimen was tested at a minimum of nominally 3 m wide with one vertical edge without restraint.

For test specimens tested with a supporting construction, the width of an identical construction may be increased if the specimen was tested at a minimum of nominally 2,8 m wide with one vertical edge without restraint.

In case of EW classification, an increase in width of an identical construction is only allowed when the average unexposed surface temperature of any discrete area of the test specimen remains below 300°C or the measured radiation remains below 6 kW/m<sup>2</sup>. In any other case, no increase in width is allowed.

**Extension of height**

The height of the construction may be increased by 1,0 m under the following conditions:

- a) minimum tested height is 3 m when tested without a supporting construction or 2,8 m when tested with a supporting construction
- b) the maximum deflection of the test specimen was not in excess of 100 mm (see 9.3)
- c) the expansion allowances are increased pro-rata

In case of EW classification, an increase in height of an identical construction is only allowed when the average unexposed surface temperature of any discrete area of the test specimen remains below 300°C or the measured radiation remains below 6 kW/m<sup>2</sup>. In any other case, no increase in height is allowed.

**Supporting Constructions**

The following rules for the field of application apply.

**Standard supporting constructions**

a) For specimens tested in the test frame without any supporting construction, the result is applicable to high density rigid supporting constructions with at least the same fire resistance as the test specimen.

b) For specimens tested with any standard supporting construction as defined in EN 1363-1, the result is applicable to any other supporting construction of the same type (flexible or rigid) that has the same or a greater classified fire resistance (thicker, denser, more layers of boards, as appropriate) than the one used in the test and the same horizontal and/or vertical orientation, i.e.:

- only vertical if the specimen was tested with the standard supporting construction fixed along the vertical edge (see Figure 17, b1);
- only horizontal if the specimen was tested with the standard supporting construction fixed along the horizontal edge (see Figure 17, b2);
- both if the specimen was tested with the standard supporting fixed along both the horizontal and the vertical edge (see Figure 17, b3).

**Non-standard supporting constructions**

The result of a test on a non-loadbearing wall tested in a non-standard supporting construction is only applicable to that construction.