

Report Number: **BTC 20867F**

A FIRE RESISTANCE TEST ON A GYPWALL
EXTREME METAL STUD PARTITION WITH 70MM
STUD FRAMEWORK CLAD EACH SIDE WITH AN
INNER LAYER OF 15MM GYPROC SOUNDBLOC AND
AN OUTER LAYER OF 12.5MM RIGIDUR H
INCORPORATING 25MM ISOVER APR IN THE
CAVITY, CONDUCTED IN ACCORDANCE WITH
BS EN 1364 1: 2015.

Test Date: 22nd March 2019

Report Amendment Date: 26th June 2023

www.btconline.co.uk

Customer: **British Gypsum**
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TABLE OF CONTENTS

FOREWORD	4
REPORT AUTHORISATION	4
TEST REPORT AMENDMENTS	5
TEST CONSTRUCTION.....	6
Description of Construction	6
Test Construction Drawings.....	7
Horizontal Cross Section	7
Exposed Face Elevation	8
Unexposed Face Elevation	9
TEST MATERIALS.....	10
Plasterboard	10
Metal Components	10
Fasteners	10
Miscellaneous Components	11
Insulation	11
TEST PROCEDURE.....	11
TEST RESULTS	12
LIMITATIONS	12
TEST DATA.....	13
Observations	13
Furnace Temperature Graph	16
Furnace Pressure Graph.....	17
Unexposed Face Temperature Graph	18
Unexposed Face Thermocouple Layout.....	19
Unexposed Face Standard Five Temperature Data.....	20
Additional Unexposed Face Temperature Data.....	24
Additional Unexposed Face Temperature Data.....	28
Internal Temperature Data at 1500 mm Height	32
Specimen Lateral Deflection.....	35
PHOTOGRAPHS.....	39
Exposed Face Prior to Test	39
Unexposed Face Prior to Test	40

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BTC 20867F: Page 2 of 45



0296

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Unexposed Face at 30 Minutes.....	41
Unexposed Face at 1 Hour.....	42
Unexposed Face at 1 Hour, 30 Minutes	43
Unexposed Face at 1 Hour, 32 Minutes, at Test Termination.....	44
FIELD OF DIRECT APPLICATION	45
General.....	45
Extension of Width.....	45
Extension of Height.....	45

FOREWORD

This test report details a fire resistance test conducted on a metal stud partition clad on each face with an inner layer of Gyproc SoundBloc and an outer layer of Rigidur H incorporating 25mm Isover Acoustic Partition Roll in the cavity.

The test sponsor was British Gypsum.

The test specimen was installed by PVR Joinery. The construction of the specimen took place between the 12th and 13th March 2019. The Building Test Centre played no role in the design or selection of materials comprising the test specimen.

The test was conducted on the 22nd March 2019.

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedures outlined in EN 1363-1, and where appropriate EN 1363-2. Any significant deviation with respect to size, constructional details, loads, stresses, edge of end conditions other than those allowed under the field of direct application in EN 1364-1 is not covered by this report.

“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.” (BS EN 1363-1: 2012, section 12.1)

REPORT AUTHORISATION

Report Author



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Scientist

Authorised by



Paul Miller
BSc. (Hons.)
Fire Test Manager

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TEST REPORT AMENDMENTS

Page	Amendments	Date
1	Report amendment date added to title page	26 th June 2023
5	Report amendment table updated	26 th June 2023
7	Horizontal cross section corrected to include the insulation in the cavity	26 th June 2023

Report Amendments Author



Matthew Porter

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Customer: **British Gypsum**

Page Amended: 26th June 2023

BTC 20867F: Page 5 of 45



0296

TEST CONSTRUCTION

Description of Construction

The specimen was constructed in a refractory concrete lined steel restraint test frame with an opening of 3000mm (high) x 3000mm (wide).

Gypframe 72DC60 Deep Flange Floor and Ceiling Channels were fixed to the head and base of the test aperture at 600mm centres using 60mm fire resistant fixings.

Gypframe 70AS50 AcouStuds were positioned at 600mm centres between the channels. The right hand stud viewed from the unexposed face was not fixed to the perimeter of the test frame, and the gap between the stud and the frame lining was filled with a 25mm thick rock mineral fibre gasket.

At the left-hand edge a Gypframe 70AS50 AcouStud was used to fix the partition to the test frame, using 60mm fire resistance fixings at 600mm centres.

Thermocouples were added to the studs at mid height on the web, hot and cold flanges of the central two studs.

A layer of 25mm Isover Acoustic Partition Roll (APR1200) was positioned in the stud cavity.

Both the unexposed face and the exposed face of the specimen were clad with an inner layer of 15mm Gyproc SoundBloc and an outer layer of 12.5mm Rigidur H. The inner layer boards were fixed with 25mm British Gypsum Drywall Screws at 300mm centres around the perimeter of the boards only. The outer layer boards were fixed with 40mm Rigidur Screws at 300mm centres around the perimeter and within the field of the boards.

All vertical joints were staggered between layers, with a full board at the free end of the exposed face. A horizontal joint was positioned at 2400mm from the base on the outer layer boards and at 600mm from the base on the inner layer boards, on both faces of the specimen. A Gypframe GFS1 Fixing Strap was used behind the horizontal outer layer board joint.

All external board joints were taped and filled using Gyproc Paper Joint Tape and Gyproc Joint Filler as appropriate. All screw heads were spotted using Gyproc Joint Filler.

Test Construction Drawings

Horizontal Cross Section

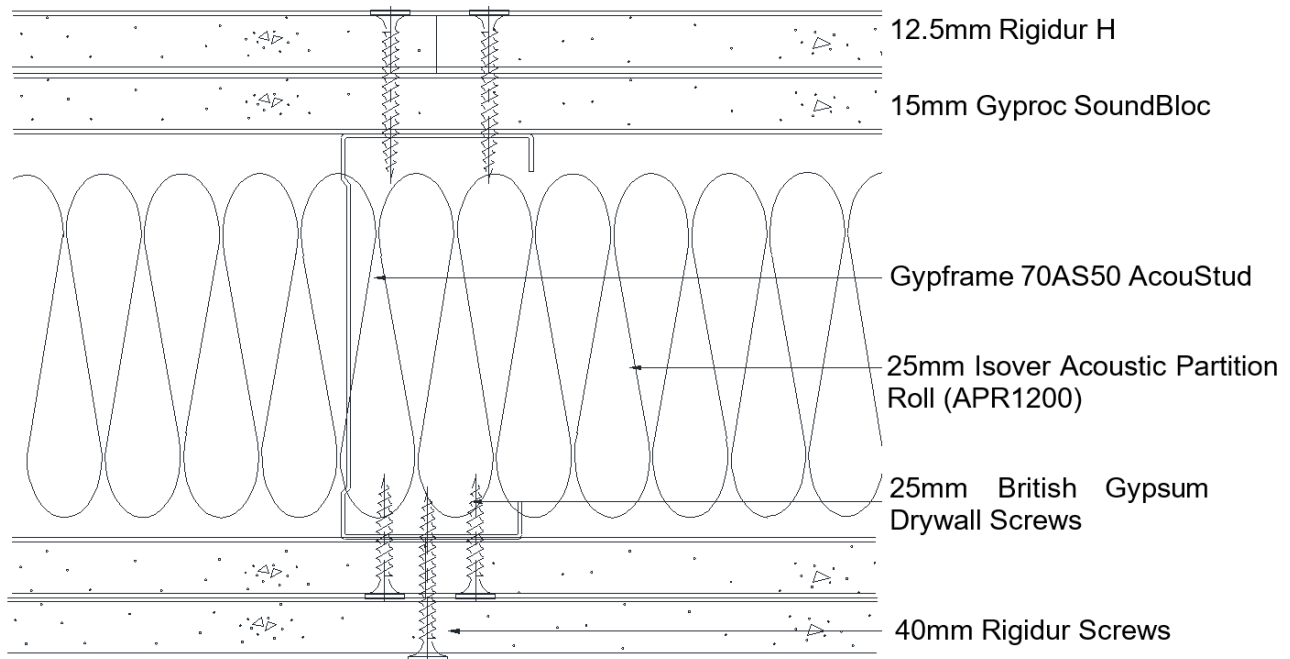
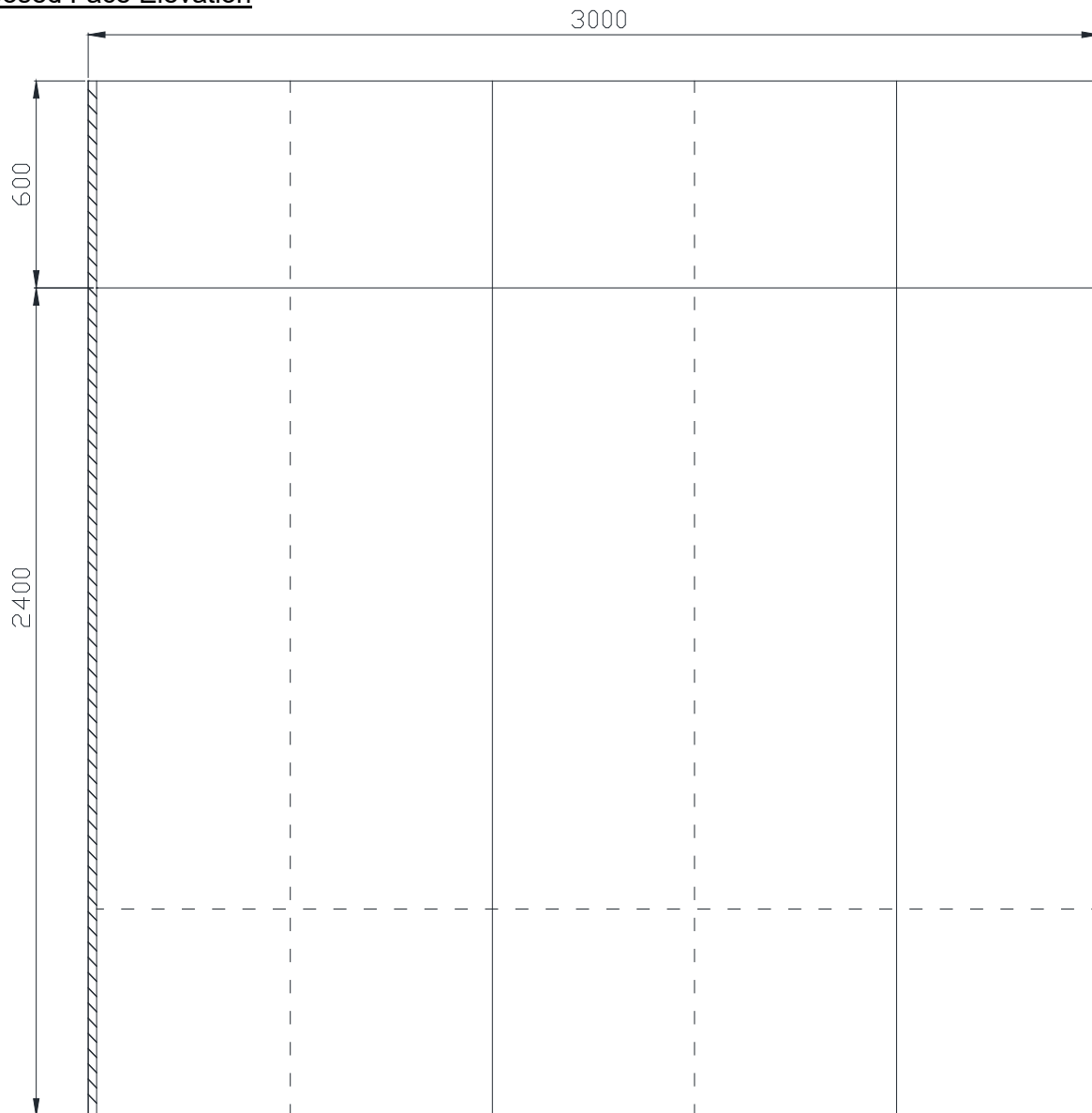


Figure 1 – Horizontal cross section.

Exposed Face Elevation



Free
edge

- - - - Inner layer board joints

—— Outer layer board joints

Figure 2 – Exposed face elevation.

Unexposed Face Elevation

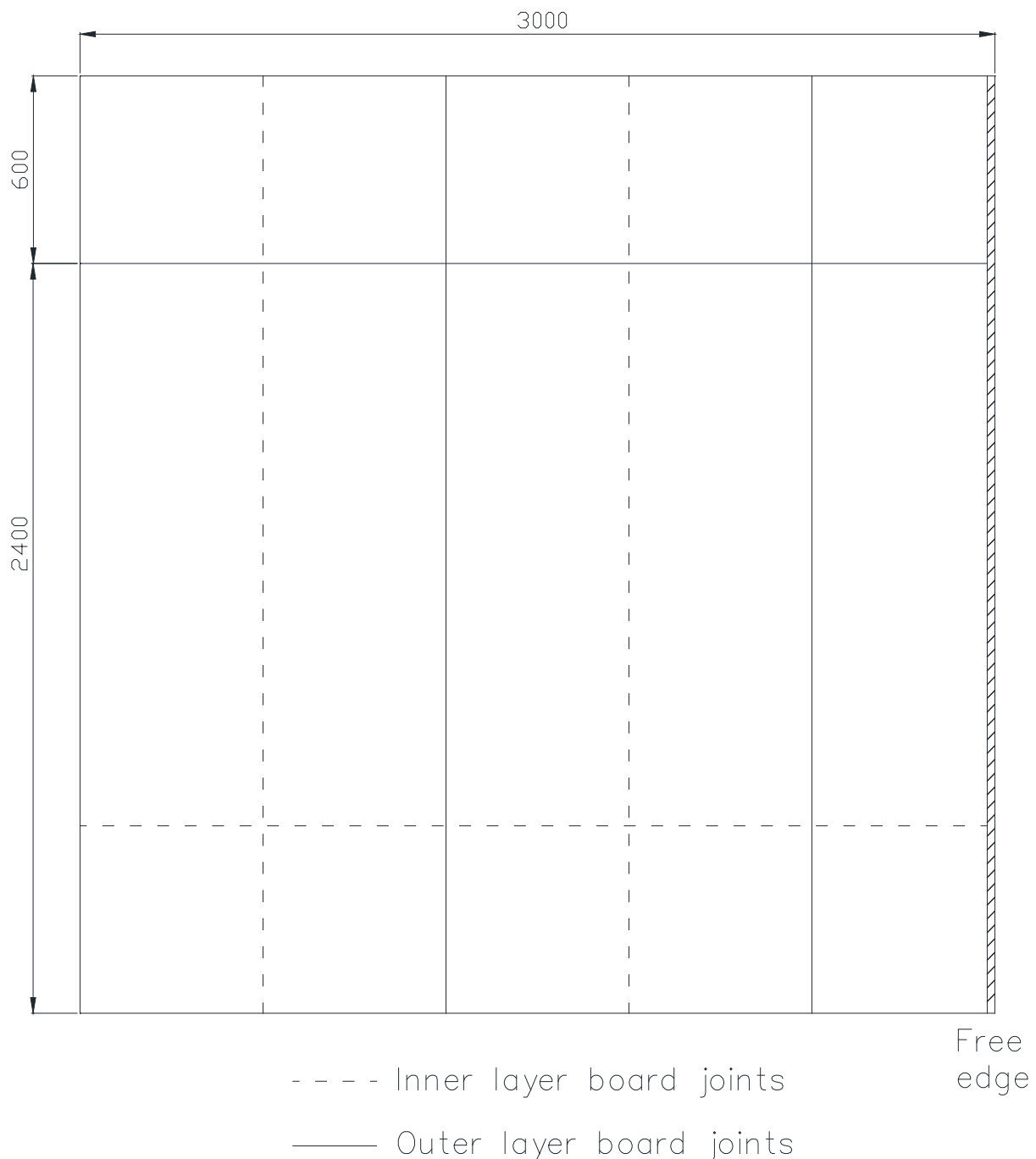


Figure 3 – Unexposed face elevation.

TEST MATERIALS

Plasterboard

- i) Nominally, 2400 mm (long) x 1200 mm (wide) x 12.5 mm (thick), Rigidur H (TE), manufactured and supplied by British Gypsum, ex Rigips.

Measured mass per unit area:	16.2 kg/m ²
Measured thickness:	12.6 mm
Board identification numbers:	250119 04:06 L 250119 04:51 L 250119 04:51 L
Measured moisture content:	0.83%

- ii) Nominally, 2400 mm (long) x 1200 mm (wide) x 15 mm (thick), Gyproc SoundBloc (TE), manufactured and supplied by British Gypsum, ex Kirkby Thore.

Measured mass per unit area:	14.0 kg/m ²
Measured thickness:	15.0 mm
Board identification numbers:	26 042 19 09:39 26 042 19 09:40 26 042 19 09:40
Measured moisture content:	0.48%

The surface density and board thickness were calculated using the actual weight and size of a selection of boards used in the test specimen. The moisture content of plasterboard was determined using samples dried to constant weight in an oven at 50°C.

Material dimensions were supplied by British Gypsum.

Metal Components

- iii) Gypframe 70AS50 AcouStuds.
- iv) Gypframe 72DC60 Deep Flange Floor and Ceiling Channels.
- v) Gypframe GFS1 Fixing Strap.

All metal components were supplied by British Gypsum.

Fasteners

- vi) 25mm British Gypsum Drywall Screws, supplied by British Gypsum.
- vii) 40mm Rigidur Screws, supplied by British Gypsum.
- viii) 60mm fire resistant fixings, supplied by The Building Test Centre.

Miscellaneous Components

- ix) Gyproc Paper Joint Tape, supplied by British Gypsum.
- x) Gyproc Joint Filler, supplied by British Gypsum.
- xi) Rock mineral fibre gasket, supplied by The Building Test Centre.

Insulation

- xii) Nominally 25mm (thick) Modular Roll manufactured and supplied by Saint-Gobain Isover.

Measured surface density: 0.429 kg/m²

Where measurements could not be taken then mass and dimensions were provided by the customer or the manufacturer e.g. from material labelling. Material information was recorded according to procedure AP070 vs. 1.1.

TEST PROCEDURE

The test was conducted fully in accordance with BS EN 1364-1: 2015. The specimen was subjected to fire from one side, as specified in BS EN 1364-1: 2015.

As the test specimen is considered to be symmetrical one test is adequate to cover the fire resistance performance in both directions.

The test procedure used was EN 1364-1 Issue 3.

The ambient temperature at the commencement of the test was 18 °C.

The furnace pressure was set to control at 18 ± 2 Pa positive with respect to atmosphere, at the top of the specimen. Furnace pressure data is shown in **Figure 5**.

The test conditions did not meet the full requirements of BS EN 1363-1: 2012 as the test frame stiffness did not fully comply.

The specimen and associated construction were not conditioned in accordance with clause 8 of BS EN 1363-1: 2012.

TEST RESULTS

The requirement of the standard was satisfied for the following periods:

Integrity	Sustained Flaming	132 minutes, no failure.
	6mm Gap Gauge	131 minutes.
	25mm Gap Gauge	132 minutes, no failure.
	Cotton Pad	132 minutes, no failure.
Insulation		108 minutes.
Test Terminated		132 minutes, at the request of the sponsor.

LIMITATIONS

The scope of the Field of Direct Application of the results and construction details in this test report is explained in BS EN 1364-1: 2015, section 13.

TEST DATA

Observations

All observations refer to the exposed face unless stated.

Observers: Unexposed face: Matt Porter, Denis Bradshaw, Lindsey Watson
Exposed face: Liam Woodford

Time		Observations
Hours	Minutes	
0	00	Test started.
0	10	Jointing material was flaking away. Face papers had charred.
0	20	All joints had opened up to approximately 10 mm. Vertical crack in centre of lower left-hand board had opened up to approximately 10-15 mm.
0	30	Left-hand vertical joint had opened up to approximately 15 mm. Right-hand vertical joint had opened up to approximately 15 mm. Horizontal joint had opened up to approximately 30 mm. Vertical crack in centre of lower left-hand board had opened up to approximately 20 mm. Cracks around screw heads adjacent to all joints. <i>Unexposed face</i> No visible change.
0	38	Right-hand side of lower left-hand board had fallen into the furnace. Left-hand side of lower left-hand board was leaning against furnace thermocouples. Second layer left-hand vertical joint had opened up to approximately 5-8 mm.
0	45	Top of lower centre board was peeling into the furnace. Remainder of left-hand board had fallen into the furnace.

Time		Observations
Hours	Minutes	
1	00	Lower centre board had fallen into the furnace. Lower right hand board was leaning against furnace thermocouple. Second layer left-hand vertical joint had opened up to approximately 20 mm. Second layer right-hand vertical joint had opened up to approximately 25-30 mm. <i>Unexposed face</i> No visible change.
1	10	Lower right-hand board had fallen into the furnace. Second layer left-hand vertical joint had opened up to approximately 40 mm. Second layer right-hand vertical joint had opened up to approximately 50 mm.
1	20	Second layer centre board had fallen into the furnace.
1	25	<i>Unexposed face</i> The mean temperature rise of the standard five thermocouples exceeded 140°C.
1	30	No visible change. <i>Unexposed face</i> No visible change.
1	35	<i>Unexposed face</i> Screw heads had discoloured on the lower centre board from approximately 900 mm to 1800 mm height.
1	38	<i>Unexposed face</i> Screw heads had discoloured on the left-hand vertical joint from approximately 900 mm to 2400 mm height. Screw heads had discoloured on the right-hand vertical joint from approximately 1200 mm to 2400 mm height.
1	40	100% of first layer boards had fallen into the furnace.
1	45	<i>Unexposed face</i> Discoloured line down the centre of the lower left-hand board from approximately 900 mm to 1800 mm height.

Time		Observations
Hours	Minutes	
1	48	<i>Unexposed face</i> INSULATION FAILURE. The temperature rise of thermocouple no.32 positioned at 1500 mm height in the centre of the lower centre board, exceeded 180°C.
1	50	100% of second layer boards had fallen into the furnace.
2	00	<i>Unexposed face</i> Crack on the lower centre board at approximately 900 mm to 2400 mm height. Discoloured line from left-hand vertical joint to right-hand vertical joint board from approximately 600 mm height.
2	02	<i>Unexposed face</i> Discoloured line down the centre of the lower left-hand board at approximately 1200 mm to 2400 mm height.
2	06	<i>Unexposed face</i> Cotton pad attempt at approximately 2000 mm height on the centre of the lower centre board – no failure.
2	07	<i>Unexposed face</i> Cotton pad attempt at approximately 2000 mm height on the centre of the lower centre board – no failure.
2	10	<i>Unexposed face</i> Cotton pad attempt at approximately 2000 mm height on the centre of the lower centre board – no failure.
2	11	<i>Unexposed face</i> INTEGRITY FAILURE. The gap at approximately 1500 mm height on the centre of the lower centre board exceeded 6mm x 150mm (visual).
2	12	TEST TERMINATED at the request of the sponsor.

Furnace Temperature Graph

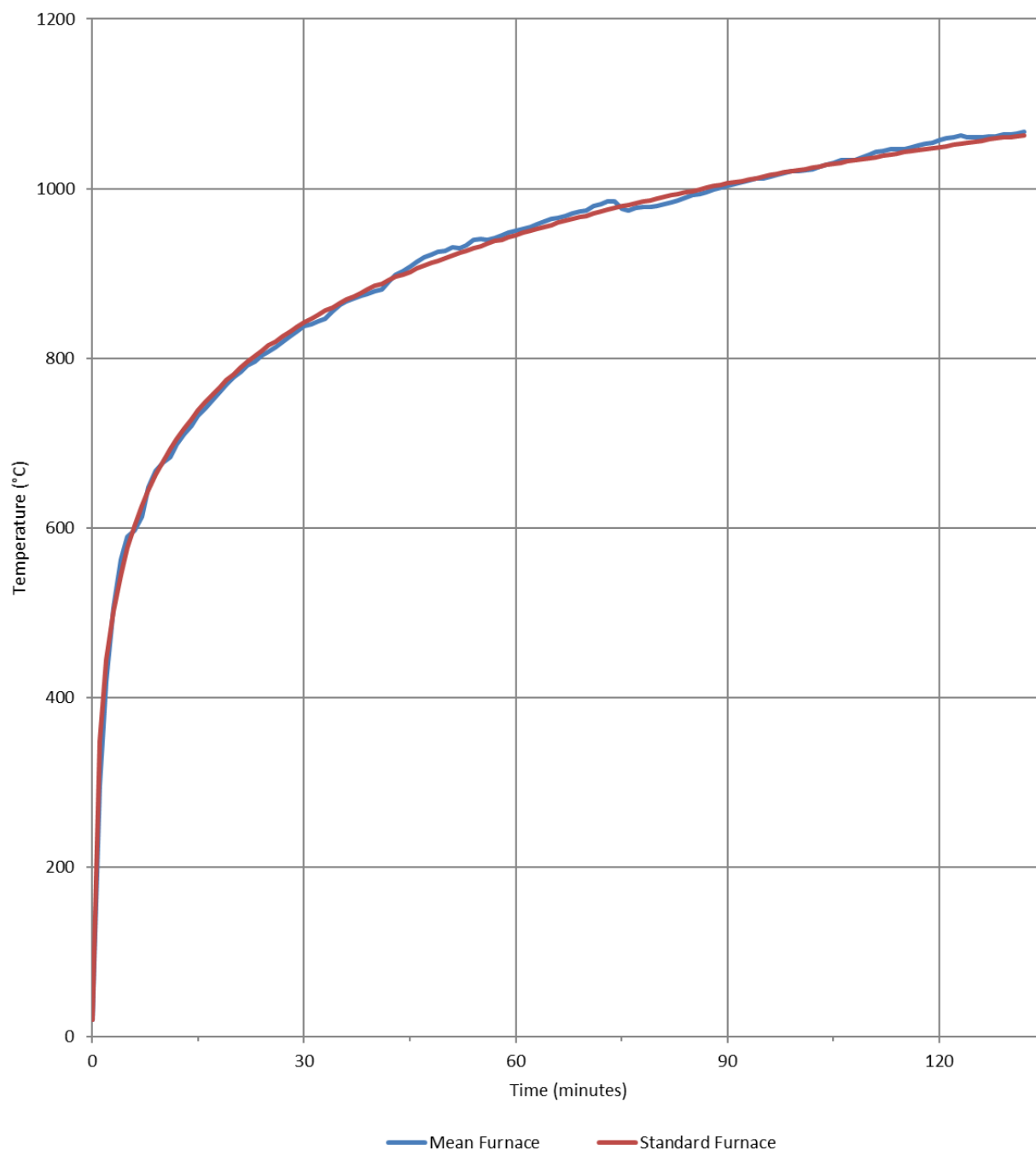


Figure 4 – Furnace temperature graph.

Furnace Pressure Graph

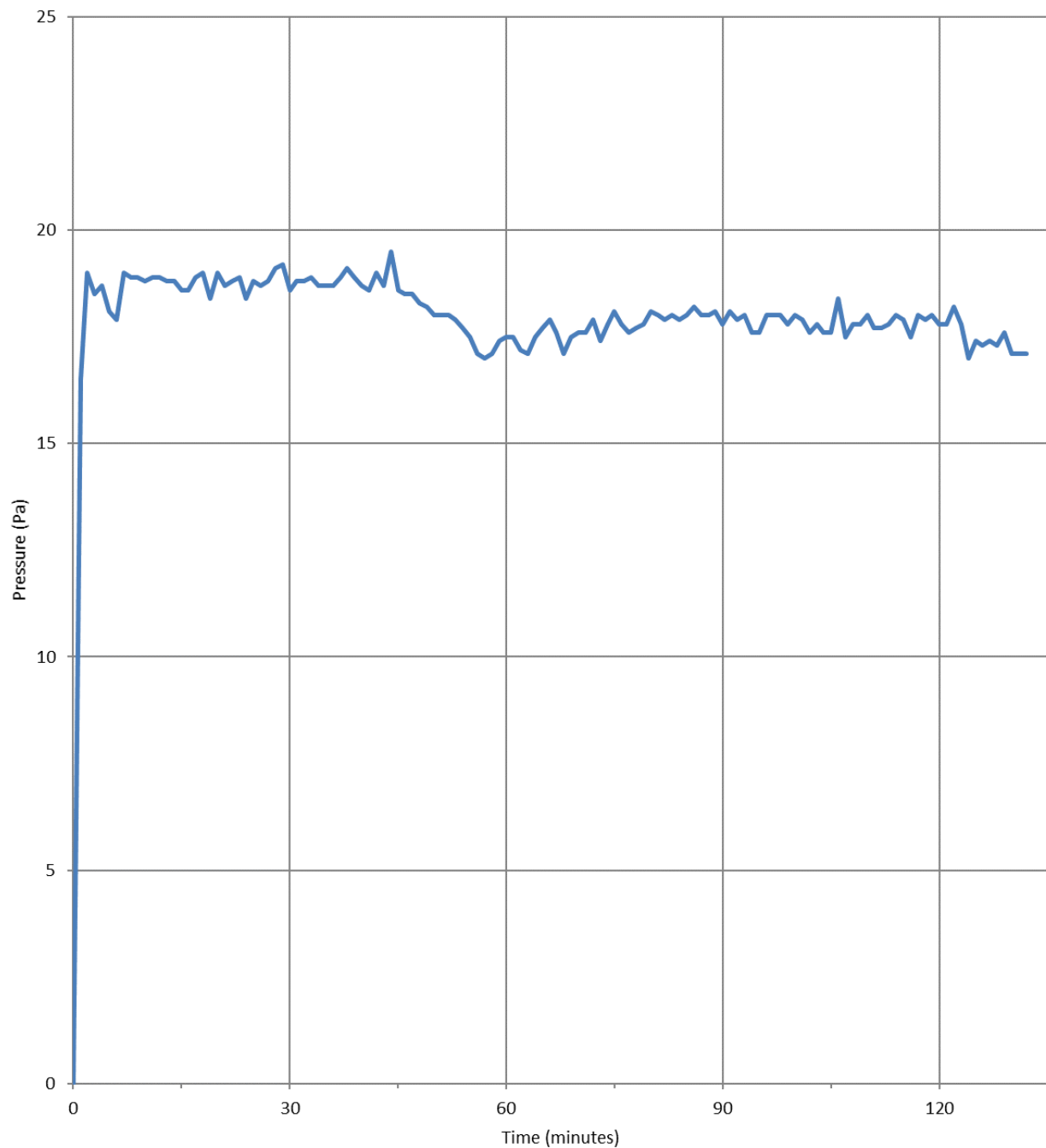


Figure 5 – Furnace pressure graph.

Unexposed Face Temperature Graph

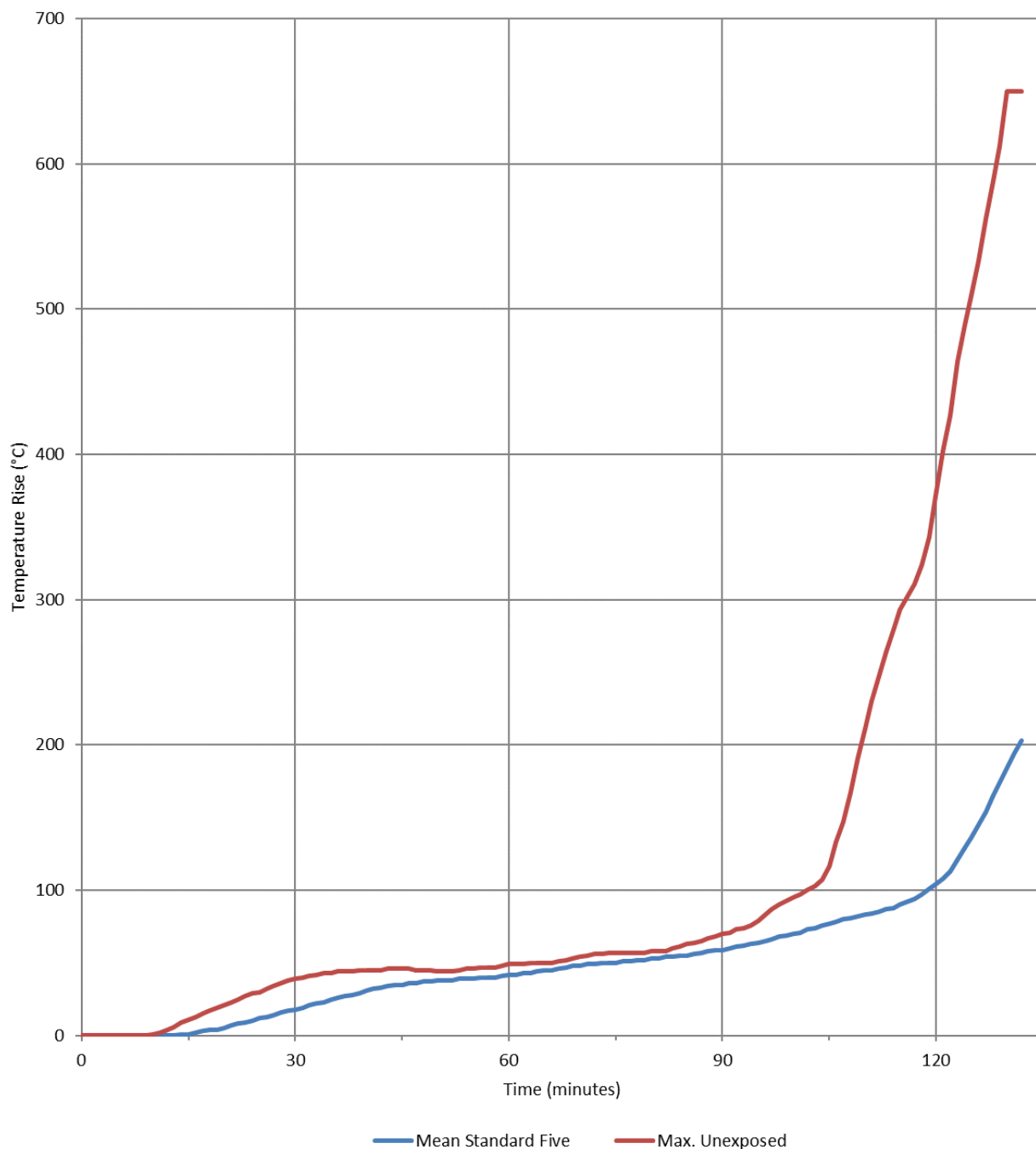


Figure 6 – Unexposed face temperature graph.

Unexposed Face Thermocouple Layout

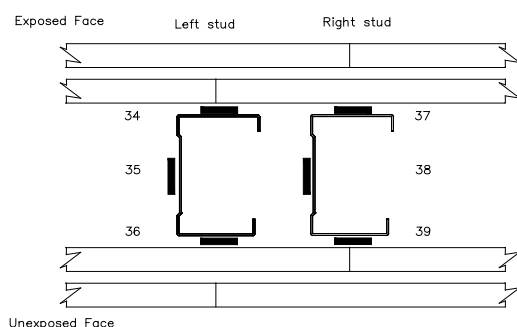
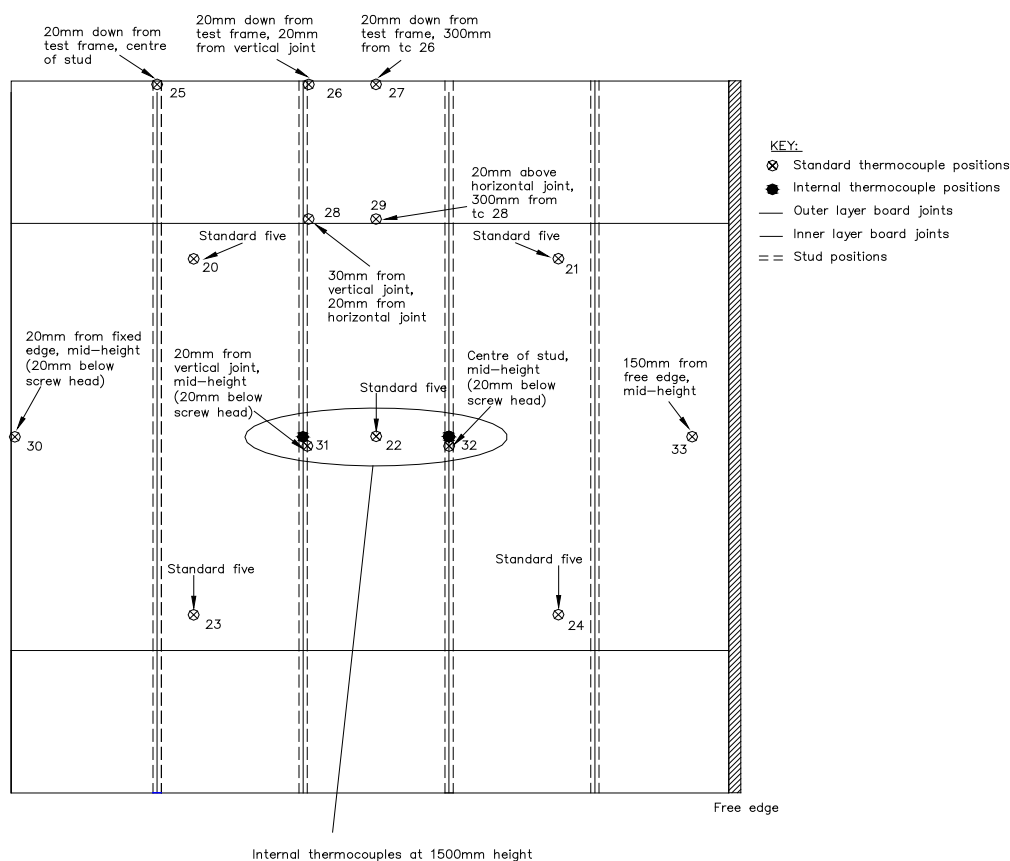


Figure 7 – Unexposed face thermocouple layout.

Unexposed Face Standard Five Temperature Data

Time (minutes)	Temperature Rise (°C)					
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24	Mean Standard Five
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	1	1	0	0	0	0
14	1	2	0	0	0	1
15	2	3	1	0	0	1
16	3	4	1	1	1	2
17	4	5	2	1	1	3
18	5	7	3	1	2	4
19	6	9	3	2	2	4
20	8	10	4	2	3	5
21	9	12	5	3	4	7
22	11	14	6	3	5	8
23	12	16	7	4	6	9
24	14	18	8	5	7	10
25	15	20	10	5	8	12
26	17	21	11	6	9	13
27	18	23	12	7	11	14
28	20	25	13	8	12	16
29	21	26	15	9	13	17
30	23	28	16	10	15	18
31	24	29	17	11	16	19
32	25	31	19	13	17	21
33	27	32	20	14	19	22
34	28	33	21	15	20	23
35	29	34	23	16	21	25
36	30	35	24	17	23	26
37	31	37	25	19	24	27

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Time (minutes)	Temperature Rise (°C)					
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24	Mean Standard Five
38	32	38	26	20	26	28
39	33	39	27	21	27	29
40	34	39	29	22	29	31
41	35	40	30	24	30	32
42	35	41	31	25	31	33
43	36	41	32	27	33	34
44	37	41	33	28	34	35
45	37	41	34	29	35	35
46	37	42	35	30	35	36
47	38	42	35	31	36	36
48	38	42	36	32	37	37
49	38	43	36	33	37	37
50	38	43	36	34	37	38
51	38	44	36	34	38	38
52	37	44	36	35	38	38
53	38	45	37	35	39	39
54	37	46	36	35	39	39
55	38	46	37	36	40	39
56	38	47	37	36	40	40
57	38	47	37	37	41	40
58	38	47	37	37	41	40
59	39	48	37	38	43	41
60	40	49	38	39	43	42
61	40	49	38	39	44	42
62	40	49	39	40	45	43
63	41	50	39	41	46	43
64	41	50	40	42	47	44
65	42	50	41	43	48	45
66	42	50	42	44	49	45
67	42	51	42	45	50	46
68	43	51	43	46	52	47
69	43	51	44	47	53	48
70	43	51	44	48	54	48
71	43	52	45	49	55	49
72	44	52	45	50	56	49
73	44	53	45	50	56	50
74	45	53	45	51	57	50
75	45	53	45	52	57	50
76	45	53	46	52	57	51
77	46	53	48	53	57	51

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BTC 20867F: Page 21 of 45



0296

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Time (minutes)	Temperature Rise (°C)					
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24	Mean Standard Five
78	46	54	50	54	57	52
79	46	54	51	54	57	52
80	47	54	52	55	58	53
81	47	54	53	55	58	53
82	47	55	53	55	58	54
83	48	55	53	55	58	54
84	48	56	54	56	60	55
85	48	58	54	56	61	55
86	49	59	54	57	63	56
87	49	61	55	57	64	57
88	48	62	56	57	65	58
89	48	63	58	57	67	59
90	48	64	60	57	68	59
91	48	65	61	57	69	60
92	48	66	61	57	71	61
93	48	67	62	58	73	62
94	48	69	63	60	75	63
95	49	70	64	61	77	64
96	48	72	64	63	78	65
97	49	74	65	64	80	66
98	50	76	67	65	81	68
99	51	77	68	66	82	69
100	52	78	70	67	82	70
101	54	79	71	68	84	71
102	55	80	73	69	86	73
103	57	81	75	71	87	74
104	59	82	77	72	88	76
105	60	83	78	73	89	77
106	61	85	80	75	91	78
107	62	86	82	76	92	80
108	63	87	83	78	93	81
109	64	88	85	79	94	82
110	64	89	86	81	95	83
111	65	90	87	83	96	84
112	66	91	88	84	98	85
113	68	92	90	86	99	87
114	69	93	91	87	101	88
115	70	95	93	89	104	90
116	71	96	95	90	107	92
117	72	98	96	91	112	94

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BTC 20867F: Page 22 of 45



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Time (minutes)	Temperature Rise (°C)					
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24	Mean Standard Five
118	73	99	98	93	121	97
119	75	102	100	94	132	101
120	76	105	103	95	141	104
121	78	109	106	97	148	108
122	79	115	113	98	160	113
123	80	124	123	100	180	121
124	81	134	134	102	196	129
125	82	141	142	103	210	136
126	83	149	162	106	223	145
127	84	162	182	108	235	154
128	86	180	199	112	248	165
129	87	194	213	118	260	174
130	88	206	227	128	273	184
131	89	217	241	139	284	194
132	91	226	255	148	295	203

Figures highlighted in red indicate the minute in which the temperature rise exceeded the mean temperature rise exceeded 140°C.

See **Figure 7** for the location of the thermocouples.

Additional Unexposed Face Temperature Data

Time (minutes)	Temperature Rise (°C)				
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29
0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	1	0	0	0
11	1	2	0	0	0
12	1	4	1	1	0
13	2	6	2	1	1
14	4	9	4	2	1
15	6	11	5	3	2
16	8	13	8	4	3
17	9	15	10	5	4
18	11	17	12	7	6
19	13	19	15	8	7
20	14	21	18	10	9
21	16	23	20	11	10
22	18	25	23	12	12
23	19	27	25	14	13
24	21	29	28	16	15
25	22	30	30	17	16
26	24	32	32	19	18
27	25	34	34	20	20
28	26	35	36	22	21
29	27	36	38	23	23
30	28	38	39	25	25
31	29	39	40	26	26
32	30	40	41	27	28
33	31	41	42	28	29
34	32	41	43	29	31
35	33	42	43	30	32
36	34	43	44	31	33
37	35	43	44	32	34

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Time (minutes)	Temperature Rise (°C)				
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29
38	36	44	44	33	35
39	36	44	45	34	36
40	37	45	45	35	37
41	37	45	45	36	38
42	38	45	45	36	38
43	38	45	46	37	39
44	39	45	46	38	40
45	39	45	46	38	40
46	39	45	46	38	40
47	39	45	45	38	40
48	39	45	45	38	40
49	39	45	45	38	40
50	39	44	44	38	40
51	39	44	44	38	40
52	39	44	43	38	40
53	39	44	43	38	40
54	39	44	42	38	40
55	39	44	42	38	39
56	38	44	42	38	39
57	38	45	41	38	39
58	38	45	41	38	39
59	38	46	41	38	40
60	38	47	41	38	40
61	37	47	42	39	40
62	37	48	42	39	41
63	38	49	42	40	41
64	38	49	43	40	41
65	38	50	44	41	42
66	38	50	44	42	42
67	38	50	44	43	43
68	38	51	45	44	43
69	39	51	46	44	43
70	39	51	46	45	44
71	40	51	46	45	44
72	40	51	47	45	44
73	40	52	47	46	45
74	41	52	48	46	45
75	41	52	48	46	45
76	42	52	49	46	45
77	42	53	49	47	46

Customer: **British Gypsum**

BTC 20867F: Page 25 of 45



0296

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Time (minutes)	Temperature Rise (°C)				
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29
78	42	53	50	47	46
79	43	53	50	48	46
80	43	53	50	48	47
81	43	54	51	48	47
82	44	54	51	49	49
83	44	54	52	49	50
84	44	55	52	50	52
85	45	55	53	50	52
86	45	56	53	50	53
87	45	56	53	50	53
88	46	56	54	50	53
89	46	57	54	51	53
90	46	57	54	51	54
91	47	57	55	52	54
92	47	58	55	53	54
93	47	58	55	54	54
94	48	59	55	55	55
95	48	59	55	56	55
96	48	60	55	56	56
97	49	61	55	57	57
98	49	62	55	57	58
99	49	62	55	58	60
100	51	63	56	59	61
101	50	63	56	59	62
102	50	64	56	60	62
103	51	66	57	61	63
104	51	67	57	62	64
105	51	68	58	63	64
106	51	69	59	64	65
107	51	71	59	66	67
108	52	72	60	67	67
109	52	74	61	69	69
110	52	75	62	70	70
111	52	76	63	71	71
112	53	77	64	72	73
113	53	79	66	74	75
114	54	80	67	75	77
115	54	81	68	76	78
116	54	82	70	77	79
117	55	83	71	78	81

Customer: **British Gypsum**

BTC 20867F: Page 26 of 45



0296

Time (minutes)	Temperature Rise (°C)				
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29
118	55	84	73	78	82
119	55	85	76	79	84
120	56	86	77	80	85
121	57	87	79	81	86
122	57	88	81	82	87
123	58	90	82	83	88
124	59	92	84	85	89
125	60	93	85	86	91
126	61	95	87	88	92
127	62	98	88	90	94
128	64	101	90	92	96
129	65	105	91	94	97
130	66	109	92	97	100
131	68	114	94	103	102
132	69	120	95	112	104

See **Figure 7** for the location of the thermocouples.

Additional Unexposed Face Temperature Data

Time (minutes)	Temperature Rise (°C)			
	Thermocouple No. 30	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	1	1	1
15	1	1	1	1
16	1	2	2	3
17	2	2	2	4
18	2	3	3	5
19	3	4	4	7
20	4	5	5	8
21	4	6	6	10
22	5	7	8	12
23	7	8	9	13
24	8	9	10	15
25	9	11	12	16
26	11	12	14	17
27	13	13	15	18
28	15	15	17	20
29	17	16	18	21
30	19	18	20	22
31	21	19	21	23
32	23	20	23	24
33	24	22	24	25
34	26	23	25	26
35	27	24	26	27
36	29	26	27	28
37	30	27	28	29

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Time (minutes)	Temperature Rise (°C)			
	Thermocouple No. 30	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33
38	32	28	29	30
39	33	29	30	31
40	34	31	31	32
41	35	32	32	33
42	37	33	33	34
43	37	34	33	35
44	38	35	34	35
45	39	36	35	36
46	40	36	35	36
47	40	37	35	36
48	41	37	36	37
49	41	38	36	37
50	41	38	36	37
51	42	38	37	37
52	42	39	37	37
53	42	39	38	37
54	42	40	39	38
55	42	41	39	38
56	42	42	40	39
57	42	43	41	39
58	41	43	41	40
59	41	44	43	41
60	41	46	43	41
61	41	47	44	42
62	41	47	45	43
63	41	48	46	44
64	40	49	47	45
65	41	50	48	45
66	41	50	48	46
67	41	51	48	46
68	41	51	49	47
69	41	52	49	47
70	41	53	50	48
71	41	53	50	48
72	42	53	51	48
73	42	54	51	49
74	43	54	51	49
75	43	55	52	49
76	43	55	52	50
77	44	55	53	50

Customer: **British Gypsum**

BTC 20867F: Page 29 of 45



0296

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Time (minutes)	Temperature Rise (°C)			
	Thermocouple No. 30	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33
78	45	55	54	50
79	45	55	55	50
80	46	56	56	50
81	47	56	57	50
82	47	57	58	50
83	48	57	60	50
84	49	58	61	51
85	49	59	63	51
86	50	61	64	51
87	50	62	65	51
88	50	64	67	51
89	51	65	68	51
90	51	66	70	51
91	51	67	71	51
92	52	67	73	51
93	52	68	74	51
94	52	68	76	51
95	53	69	79	51
96	53	70	83	52
97	53	71	87	52
98	54	73	90	53
99	53	75	93	53
100	53	76	95	54
101	54	78	97	54
102	54	80	100	54
103	55	82	103	55
104	55	83	107	55
105	55	84	117	55
106	55	85	133	55
107	55	85	147	56
108	55	86	167	58
109	56	87	191	59
110	56	88	211	60
111	57	88	230	62
112	57	89	247	63
113	58	90	264	64
114	59	91	279	65
115	59	93	293	67
116	60	96	302	68
117	61	100	311	70

Customer: **British Gypsum**

BTC 20867F: Page 30 of 45



0296

Time (minutes)	Temperature Rise (°C)			
	Thermocouple No. 30	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33
118	63	105	324	72
119	64	113	343	73
120	66	124	371	75
121	68	132	402	76
122	69	138	427	77
123	70	145	464	78
124	72	156	489	79
125	73	176	509	81
126	75	191	533	82
127	77	205	562	83
128	79	217	588	84
129	80	228	612	85
130	82	238	650	86
131	83	247	650	87
132	85	256	650	88

Figures highlighted in red indicate the minute in which the temperature rise exceeded 180°C.

See **Figure 7** for the location of the thermocouples.

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Internal Temperature Data at 1500 mm Height

Time (minutes)	Actual Temperature (°C)					
	Left stud			Right stud		
	Hot Flange Thermocouple No. 34	Web Thermocouple No. 35	Cold Flange Thermocouple No. 36	Hot Flange Thermocouple No. 37	Web Thermocouple No. 38	Cold Flange Thermocouple No. 39
0	27	25	22	26	23	22
1	29	25	22	26	23	22
2	30	25	22	26	23	22
3	33	25	22	27	23	22
4	42	25	22	27	23	22
5	74	28	22	27	24	22
6	91	37	24	33	24	22
7	96	55	29	46	27	24
8	98	67	34	56	35	28
9	99	73	42	66	45	34
10	99	77	51	71	57	44
11	99	80	58	74	66	53
12	100	81	63	77	70	59
13	100	81	66	78	73	63
14	101	80	69	79	74	65
15	101	80	70	80	75	67
16	101	82	72	81	77	69
17	101	83	74	82	78	71
18	102	85	76	84	79	72
19	103	87	79	85	81	74
20	105	89	82	88	82	76
21	107	90	83	90	84	78
22	107	92	85	91	85	80
23	108	92	86	93	86	82
24	108	92	86	93	87	83
25	109	92	86	94	88	84
26	110	92	87	95	89	85
27	111	92	87	95	89	85
28	114	93	88	96	89	86
29	117	93	88	97	90	86
30	122	94	89	98	90	87
31	131	94	90	98	91	88
32	139	95	90	99	92	88
33	146	96	91	100	93	89
34	152	97	92	101	94	90
35	158	98	92	102	95	90

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BTC 20867F: Page 32 of 45



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Time (minutes)	Actual Temperature (°C)					
	Left stud			Right stud		
	Hot Flange Thermocouple No. 34	Web Thermocouple No. 35	Cold Flange Thermocouple No. 36	Hot Flange Thermocouple No. 37	Web Thermocouple No. 38	Cold Flange Thermocouple No. 39
36	164	100	93	103	96	91
37	170	101	93	104	97	92
38	177	102	94	108	97	92
39	185	103	94	112	98	92
40	196	105	93	122	98	92
41	211	107	93	142	99	92
42	232	111	94	174	102	92
43	257	119	94	206	108	91
44	285	132	94	240	117	91
45	321	157	96	273	129	91
46	365	193	105	312	148	91
47	404	233	118	349	170	94
48	439	272	130	378	190	101
49	469	306	142	401	207	106
50	491	335	154	420	222	111
51	508	359	165	437	236	118
52	544	377	176	454	249	124
53	597	402	186	468	262	132
54	634	428	197	483	275	140
55	662	450	208	497	290	149
56	686	467	219	509	302	158
57	704	482	230	520	312	165
58	717	496	240	529	325	172
59	731	509	251	539	337	180
60	742	521	261	547	348	186
61	756	535	271	554	359	192
62	767	548	282	561	367	198
63	776	561	294	567	375	204
64	785	577	308	572	381	210
65	790	590	329	576	386	216
66	793	603	353	583	394	222
67	795	617	386	594	408	228
68	794	634	423	606	427	236
69	768	643	475	619	451	246
70	765	652	533	629	471	256
71	766	671	577	632	476	265
72	767	688	611	631	479	272
73	771	704	640	632	488	278

Customer: **British Gypsum**

BTC 20867F: Page 33 of 45



0296

Time (minutes)	Actual Temperature (°C)					
	Left stud			Right stud		
	Hot Flange Thermocouple No. 34	Web Thermocouple No. 35	Cold Flange Thermocouple No. 36	Hot Flange Thermocouple No. 37	Web Thermocouple No. 38	Cold Flange Thermocouple No. 39
74	775	721	668	635	507	288
75	894	942	699	968	949	907
76	911	943	852	976	955	960
77	-	-	877	993	968	965
78	-	-	895	-	-	-
79	-	-	927	-	-	-
80	-	-	937	-	-	-
81	-	-	948	-	-	-
82	-	-	969	-	-	-
83	-	-	975	-	-	-
84	-	-	-	-	-	-

- Thermocouple broken due to equipment failure.

See **Figure 7** for the location of the thermocouples.

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Specimen Lateral Deflection

Time (minutes)	Deflection (mm)
	Centre
0	0
1	5
2	5
3	4
4	4
5	5
6	6
7	7
8	8
9	9
10	9
11	9
12	8
13	8
14	8
15	8
16	8
17	8
18	8
19	8
20	8
21	8
22	8
23	8
24	9
25	9
26	9
27	10
28	10
29	10
30	11
31	12
32	12
33	12
34	13
35	14
36	15
37	16

Customer: **British Gypsum**

BTC 20867F: Page 35 of 45



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Time (minutes)	Deflection (mm)
	Centre
38	17
39	19
40	21
41	23
42	26
43	31
44	34
45	38
46	41
47	44
48	46
49	48
50	51
51	53
52	55
53	57
54	58
55	60
56	61
57	62
58	63
59	64
60	65
61	66
62	67
63	68
64	69
65	69
66	70
67	71
68	71
69	72
70	72
71	72
72	73
73	73
74	73
75	72
76	71
77	71

Customer: **British Gypsum**

BTC 20867F: Page 36 of 45



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Time (minutes)	Deflection (mm)
	Centre
78	71
79	71
80	71
81	71
82	71
83	72
84	72
85	72
86	73
87	73
88	73
89	72
90	72
91	72
92	71
93	71
94	71
95	70
96	70
97	71
98	70
99	70
100	70
101	70
102	70
103	70
104	70
105	70
106	70
107	70
108	70
109	70
110	70
111	69
112	69
113	69
114	69
115	69
116	72
117	73

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BTC 20867F: Page 37 of 45



0296

Time (minutes)	Deflection (mm)
	Centre
118	73
119	73
120	73
121	74
122	74
123	76
124	76
125	76
126	75
127	72
128	67
129	61
130	54
131	45
132	41

The deflection was recorded at the approximate centre of the specimen. Positive readings indicate deflection into the furnace.

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PHOTOGRAPHS

Exposed Face Prior to Test



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Unexposed Face Prior to Test



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Unexposed Face at 30 Minutes



Customer: **British Gypsum**

BTC 20867F: Page 41 of 45



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Unexposed Face at 1 Hour



Customer: **British Gypsum**

BTC 20867F: Page 42 of 45



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Unexposed Face at 1 Hour, 30 Minutes



Customer: **British Gypsum**

BTC 20867F: Page 43 of 45



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Unexposed Face at 1 Hour, 32 Minutes, at Test Termination



Customer: **British Gypsum**

BTC 20867F: Page 44 of 45



0296

FIELD OF DIRECT APPLICATION

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.

- i) Decrease in height from 3000 mm.
- ii) Increase in the thickness of the wall (minimum thickness 127 mm).
- iii) Increase thickness of component materials (minimum Gypframe stud depth 70 mm, minimum Gypframe stud gauge 0.50 mm).
- iv) Decrease in the linear dimensions of the boards but not thickness (≤ 2400 mm (long) x ≤ 1200 mm (wide) Gyproc SoundBloc and Rigidur H).
- v) Decrease stud spacing from 600mm.
- vi) Decrease in fixing centres from 300 mm.
- vii) Increase in the number of horizontal joints, of the type tested, when tested with one joint not more than (500 ± 150) mm from the top edge.

Extension of Width

For test specimens tested without a supporting construction, the width of an identical construction may be increased as the specimen was tested at nominally 3000mm wide with one vertical edge without restraint.

Extension of Height

The height of the construction may be increased by 1000mm under the following conditions:

30 minutes	60 minutes	90 minutes	120 minutes
$\leq 100\text{mm}$	$\leq 100\text{mm}$	$\leq 100\text{mm}$	$\leq 100\text{mm}$