



The Building Test Centre

Fire Acoustics Structures

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Report Number **BTC 11172F**

A FIRE RESISTANCE TEST, ON A GYPROC METAL STUD
PARTITION FEATURING A DOUBLE LAYER OF 15mm
GYPROC WALLBOARD, CONDUCTED IN ACCORDANCE
WITH BS EN 1364-1:1999

Test Date: 11th September 2000

Customer: **British Gypsum Limited**
East Leake
Loughborough
Leicestershire
LE12 6HX

Customer: **British Gypsum Limited**

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No. 0296



A FIRE RESISTANCE TEST, ON A GYPROC METAL STUD PARTITION FEATURING A DOUBLE LAYER OF 15mm GYPROC WALLBOARD, CONDUCTED IN ACCORDANCE WITH BS EN 1364-1:1999.

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FOREWORD

This test report details a fire resistance test conducted on a sheet and stud partition system. The test sponsors was British Gypsum Limited.

The test specimen was installed by British Gypsum Limited. The construction of the specimen took place between the 4th and 8th September 2000. The Building Test Centre played no role in the design or selection of the materials comprising the test specimen. The boards were delivered direct from British Gypsum's East Leake works.

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 or 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.

REPORT AUTHORISATION

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TEST CONSTRUCTION

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

Gyproc 50C50 channels were fixed to the head and base of the test aperture at 600mm centres with 60mm Hilti Hus fixings. Gyproc 48S50 studs were positioned at 600mm centres between the channels. The right hand stud viewed from unexposed face was not fixed to the perimeter test frame, but the gap between the stud and the lining was filled with a 50mm Rockwool Firebatt gasket. The left-hand stud was fixed to the test frame with 60mm Hilti Hus fixings.

The framework was lined both sides with a double layer 15mm Gyproc wallboard. The inner layer boards were fixed with 25mm Gyproc drywall screws at 300mm centres around the perimeter only. The outer layer boards were fixed with 42mm Gyproc Drywall screws at 300mm centres around the perimeter and at the intermediate stud positions. All vertical joints and horizontal joints were staggered between layers. The horizontal joints were positioned 2400mm from the base on the outer layer and 600mm from the base on the inner layer on both the exposed and unexposed faces of the construction. A Gyproc GFS1 fixing strap is used behind the horizontal board joint in the outer layers.

All external 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.

The descriptions of individual components making up the test specimen were provided by the customer and were checked for accuracy wherever possible.

TEST MATERIALS

Gyproc wallboard

Nominally, 2400mm (long) x 1200mm (wide) x 15mm (thick), Gyproc wallboard manufactured by British Gypsum Limited.

Measured surface density:	10.6 kg/m ² .
Measured thickness:	15.5 mm.
Board identification numbers:	2333165 23:40
Moisture content:	<1%

The surface density and board thickness were calculated using a selection of boards used in the test specimen.

Metal components

- (i) Gyproc 48S50 metal studs and 50C50 channel manufactured from galvanised mild steel nominally 0.5mm thick.
- (ii) Gyproc GFS1 fixing strap manufactured from galvanised mild steel nominally 0.5mm thick

All metal components supplied by British Gypsum Limited.

Fasteners

- i) 25mm Gyproc drywall screws supplied by British Gypsum Limited
- ii) 42mm Gyproc drywall screws supplied by British Gypsum Limited.
- iii) 60mm Hilti Hus fixings supplied by Hilti Limited

TEST PROCEDURE

The test was conducted fully in accordance with BS EN 1364-1:1999. The specimen was subjected to fire from one side, as specified in BS EN 1364-1:1999. 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 1.

The ambient temperature at the commencement of the test was 22°C.

Customer: **British Gypsum Limited**

The furnace pressure was maintained at 18 ± 2 Pa positive with respect to atmosphere, at a point 100 mm below the top of the specimen, except during the first 6 minutes of the test.

The test conditions did not meet the full requirements of BS EN 1363-1:1999 as the furnace linings and test frame stiffness did not fully comply. The test centre is of the opinion that these deviations from the documented method will not unduly effect the result of the test.

TEST RESULTS

The requirements of the standard were satisfied for the following periods:

Integrity	102 minutes (sustained flaming)
Insulation	93 minutes (unexposed face thermocouple)

The test was terminated at 102 minutes.

LIMITATIONS

The results only relate to the behaviour 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 specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.



TEST DATA

Observations

Observers: Unexposed face J McLavy
Exposed face L Cooper

Time		Observations
hrs	mins	
		All observations refer to the exposed face unless otherwise stated.
	0	Test Started
	12	Jointing material started to fall.
	22	Horizontal joints opened to approximately 4-5mm. Jointing material remained over vertical joints.
	28	Horizontal joints opened to approximately 8mm. Vertical joints opened to approximately 4mm. Top left-hand corner of lower right-hand board pulled away from fixings.
	35	Right-hand vertical joint opened to approximately 15mm. Left-hand vertical joint opened to approximately 10mm. Horizontal joints opened 10-20mm.
	41	Upper half of lower centre board fell.
	43	Upper half of lower left-hand board fell. Lower right-hand board curving back at top left-hand corner.
	44	Top left-hand corner fell from lower right hand board.
	45	Vertical joints in inner layer opened to approximately 3mm.
	52	Left hand vertical joints in inner layer opened approximately 15-20mm. Right hand side of left-hand outer layer board breaking away from fixings.
1	10	Inner layer of boards 'crazed'. Inner layer lower centre boards fallen.



Time		Observations
hrs	mins	
		All observations refer to the exposed face unless otherwise stated.
1	16	<i>Unexposed face:</i> Screw heads began to appear at mid height on right-hand joint.
1	19	<i>Unexposed face:</i> Heavy smoke emitted from top half of fixed edge.
1	20	<i>Unexposed face:</i> Screw heads appearing on left-hand joint and within the field of the boards.
1	24	All exposed face boards fallen. Inner layer of unexposed face boards 'crazed'.
1	28	<i>Unexposed face:</i> Discolouration of jointing material around screw heads.
1	31	<i>Unexposed face:</i> Discolouration of plasterboard face adjacent to screw positions.
1	33	<i>Unexposed face:</i> INSULATION FAILURE: Temperature of 280°C measured just below thermocouple no.35 position.
1	34	<i>Unexposed face:</i> Crack developing at point of insulation failure. Gap open approximately 1mm. Cotton pad used – not glow or flaming.
1	36	<i>Unexposed face:</i> Discolouration of board at inner layer horizontal joint at centre of specimen.
1	37	<i>Unexposed face:</i> Discolouration of outer board over right-hand vertical joint.
1	38	<i>Unexposed face:</i> Paper charring at height of approximately 600mm (over inner layer horizontal joint).



Time		Observations
hrs	mins	
		All observations refer to the exposed face unless otherwise stated.
1	39	<i>Unexposed face:</i> Cotton pad used 300mm below thermocouple no. 35. No glow or flaming.
1	40	<i>Unexposed face:</i> Paper charring adjacent to free edge.
1	41	<i>Unexposed face:</i> Deflection transducers removed.
1	42	INTEGRITY FAILURE: Sustained flaming at centre of specimen between thermocouples 35 and 22. TEST TERMINATED



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Furnace Temperature Graph

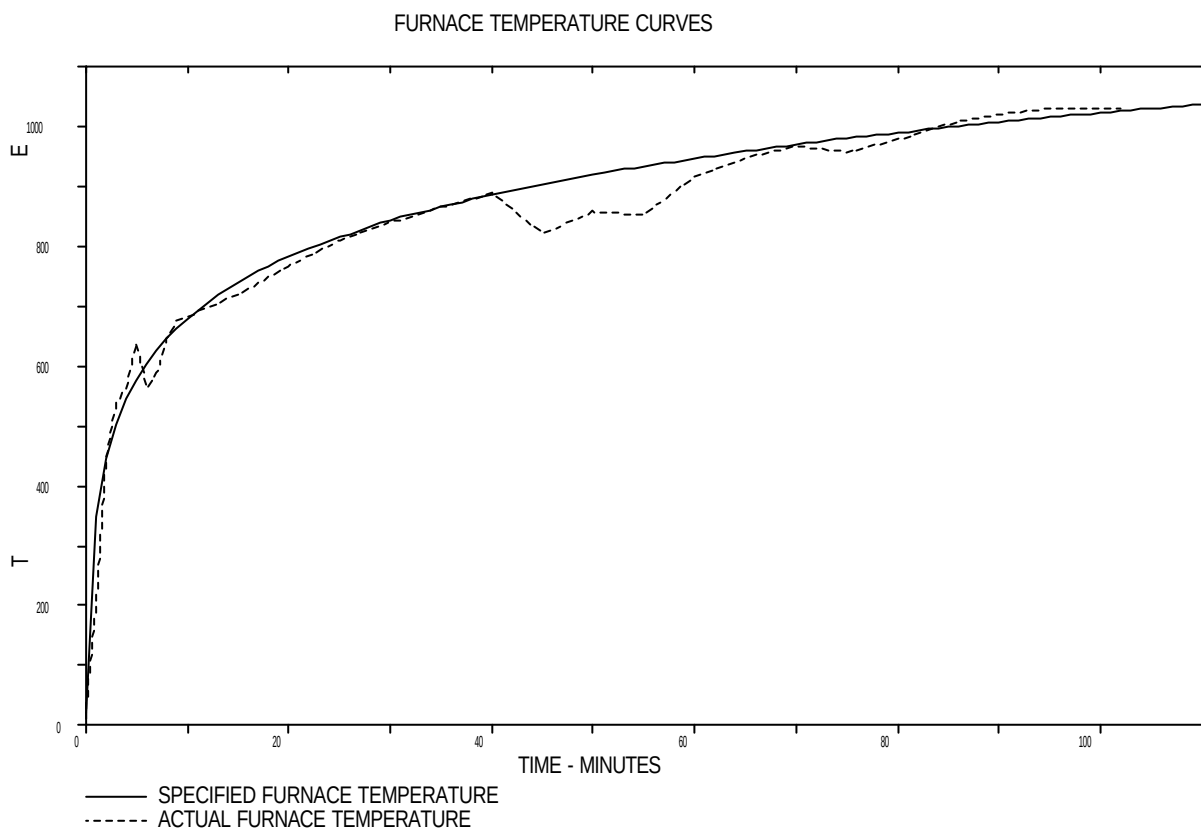


Figure 1. Furnace temperature graph



Unexposed Face Temperature Graph

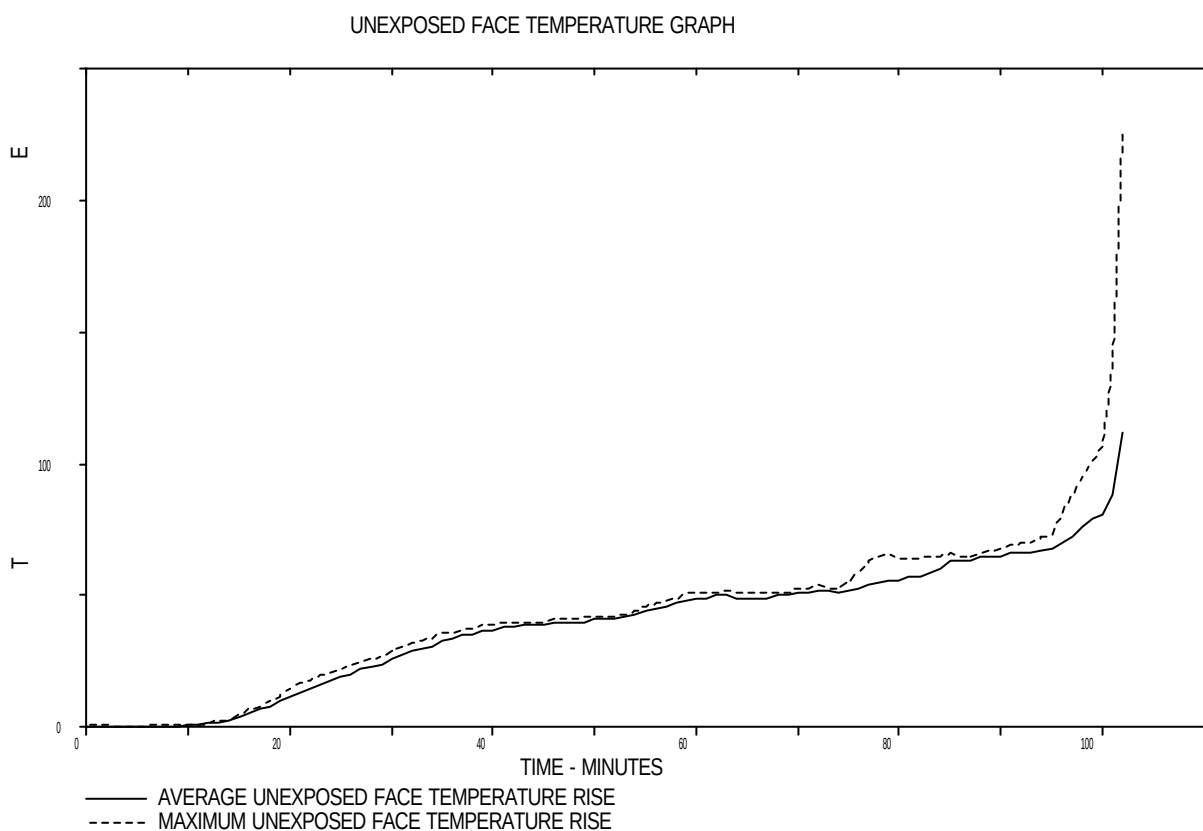


Figure 2. Unexposed face temperature graph

Unexposed Face Thermocouple Layout

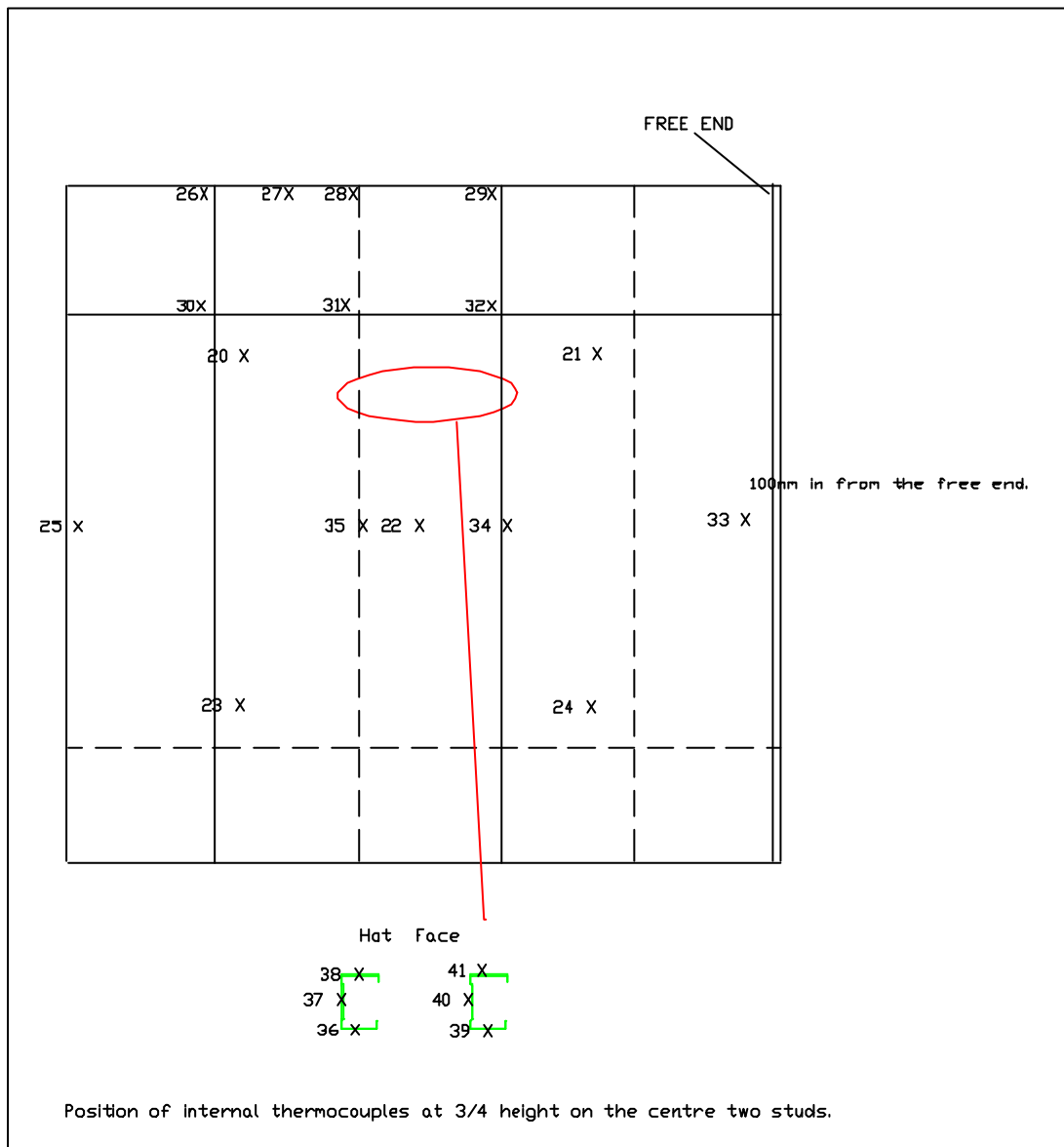


Figure 3. Unexposed face thermocouple layout.



Unexposed Face Standard Five Temperature Data

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



Time (mins)	Temperature Rise (°C)					
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24	Mean
39	39	38	35	36	35	37
40	39	38	36	37	36	37
41	40	39	37	37	36	38
42	40	39	37	38	37	38
43	40	40	37	39	37	39
44	40	40	37	39	37	39
45	40	40	38	40	38	39
46	41	41	38	40	38	40
47	41	41	39	41	39	40
48	41	41	39	41	39	40
49	41	41	39	42	39	40
50	41	41	40	42	40	41
51	41	41	40	42	40	41
52	41	42	41	42	40	41
53	42	43	42	42	40	42
54	44	44	44	43	40	43
55	45	46	46	43	40	44
56	46	47	47	42	41	45
57	48	47	48	42	43	46
58	49	48	49	43	45	47
59	50	48	51	44	47	48
60	50	49	51	46	49	49
61	49	50	51	47	50	49
62	49	49	51	48	51	50
63	49	49	50	50	52	50
64	49	48	49	50	51	49
65	49	48	48	51	51	49
66	50	47	48	51	49	49
67	50	48	49	51	49	49
68	51	48	49	51	49	50
69	51	49	51	51	50	50
70	51	50	53	51	51	51
71	51	50	53	51	52	51
72	51	50	54	51	53	52
73	52	50	53	51	53	52
74	51	49	52	51	53	51
75	51	49	55	51	53	52
76	51	49	59	51	54	53
77	51	49	63	52	54	54
78	52	50	65	54	54	55
79	52	50	66	55	56	56



Time (mins)	Temperature Rise (°C)					
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24	Mean
80	52	49	64	54	59	56
81	53	49	64	55	63	57
82	55	50	63	54	64	57
83	55	55	63	57	65	59
84	55	58	63	61	65	60
85	56	62	65	64	66	63
86	57	61	65	65	65	63
87	58	63	65	65	65	63
88	60	65	66	66	66	65
89	61	65	66	66	67	65
90	61	65	67	65	68	65
91	61	66	67	65	69	66
92	61	65	68	66	70	66
93	60	66	69	66	70	66
94	60	66	70	67	72	67
95	59	67	73	67	73	68
96	58	67	81	67	76	70
97	56	67	88	68	81	72
98	56	68	95	69	93	76
99	56	68	101	71	99	79
100	55	68	107	71	102	81
101	57	69	137	73	106	88
102	66	73	226	79	114	112



Additional Unexposed Face Temperature Data

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



Time (mins)	Temperature Rise (°C)					
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29	Thermocouple No. 30
39	34	35	39	37	-	30
40	35	36	39	38	-	31
41	35	37	39	38	-	32
42	36	38	40	38	-	33
43	37	39	40	38	-	33
44	37	39	40	38	-	34
45	37	40	40	38	-	35
46	37	40	40	38	-	35
47	38	41	41	39	-	36
48	38	41	40	39	-	36
49	38	42	40	38	-	36
50	38	42	40	38	-	37
51	38	42	40	39	-	37
52	37	42	40	39	-	37
53	37	42	40	39	-	37
54	37	42	39	38	-	38
55	37	42	39	38	-	38
56	37	41	39	38	-	38
57	37	41	38	38	-	39
58	37	41	37	37	-	40
59	37	42	37	37	-	41
60	38	42	37	37	-	42
61	39	42	37	38	-	43
62	40	42	36	38	-	43
63	41	43	37	39	-	44
64	43	44	37	39	-	44
65	44	45	37	40	-	45
66	45	45	37	40	-	45
67	47	47	37	41	-	46
68	48	49	38	42	37	45
69	49	51	40	43	44	46
70	49	53	41	44	45	46
71	50	54	42	44	52	47
72	50	55	44	45	56	47
73	51	56	46	46	60	47
74	52	56	47	47	59	47
75	52	57	49	47	68	47
76	52	57	49	47	69	47
77	53	57	51	48	74	48
78	54	58	54	49	80	49
79	55	59	55	49	81	50



Time (mins)	Temperature Rise (°C)					
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29	Thermocouple No. 30
80	54	57	55	48	83	49
81	55	58	55	49	86	50
82	58	58	56	49	90	51
83	59	59	56	49	86	53
84	60	59	57	50	95	54
85	62	61	59	54	99	56
86	61	61	59	55	97	57
87	60	62	60	57	103	58
88	61	63	61	59	103	60
89	61	63	62	60	113	62
90	63	64	62	61	117	63
91	66	64	62	62	125	64
92	68	64	62	62	138	65
93	69	64	62	63	145	66
94	69	65	64	65	154	67
95	69	66	65	67	162	68
96	70	67	67	68	168	69
97	69	69	67	68	176	70
98	70	70	67	69	175	70
99	70	71	67	70	187	71
100	70	70	66	69	193	71
101	70	71	66	70	194	72
102	70	71	66	71	200	74

- Missing data due to thermocouple fault.

Additional Unexposed Face Temperature Data

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

Customer: **British Gypsum Limited**

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Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33	Thermocouple No. 34	Thermocouple No. 35
37	29	29	35	31	29
38	30	30	35	31	30
39	31	31	37	32	31
40	32	32	37	33	32
41	33	33	38	34	33
42	33	34	38	35	33
43	33	34	38	35	34
44	33	34	38	36	34
45	33	35	39	36	34
46	33	35	39	37	34
47	34	36	40	37	35
48	34	36	40	37	35
49	34	37	40	38	35
50	34	38	41	39	36
51	34	38	40	39	36
52	34	38	40	40	38
53	34	38	39	41	39
54	34	38	39	45	42
55	34	38	38	49	45
56	35	39	38	55	47
57	35	40	37	58	49
58	36	41	37	59	50
59	37	43	36	61	51
60	39	44	37	63	52
61	40	45	37	64	53
62	41	46	38	65	53
63	43	47	40	66	53
64	43	48	41	68	54
65	44	48	43	69	54
66	44	48	44	70	53
67	44	48	46	71	53
68	44	49	47	73	53
69	44	50	49	75	53
70	44	51	50	76	53
71	45	51	51	78	53
72	45	51	51	80	54
73	45	52	51	81	54
74	45	52	51	83	55
75	46	53	51	85	56
76	46	55	51	86	59
77	47	57	52	88	62



Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33	Thermocouple No. 34	Thermocouple No. 35
78	48	59	54	90	66
79	48	61	56	92	68
80	47	61	55	93	67
81	47	61	56	95	67
82	47	62	56	97	68
83	47	63	56	99	68
84	47	63	60	101	69
85	49	64	63	105	71
86	48	64	63	108	71
87	49	65	64	111	72
88	52	67	65	117	75
89	58	68	64	122	81
90	60	68	64	127	97
91	61	69	65	134	111
92	62	70	65	140	130
93	63	70	65	147	172
94	63	71	66	154	231
95	63	72	66	162	291
96	64	73	66	171	354
97	64	74	66	180	411
98	64	76	67	190	434
99	65	79	68	199	441
100	64	81	69	208	449
101	65	83	72	219	452
102	65	84	78	232	445



Additional Internal Temperature Data

Time (mins)	Actual Temperature (°C)					
	Stud 1			Stud 2		
	Cold Flange Thermocouple No. 36	Web Thermocouple No. 37	Hot Flange Thermocouple No. 38	Cold Flange Thermocouple No. 39	Web Thermocouple No. 40	Hot Flange Thermocouple No. 41
0	22	22	22	21	22	22
1	22	22	22	21	22	21
2	22	22	22	21	22	22
3	22	22	22	21	24	36
4	23	24	25	27	36	60
5	26	29	33	34	44	64
6	32	38	45	40	49	66
7	39	47	56	44	54	71
8	46	55	65	50	59	75
9	53	62	72	54	63	77
10	58	66	76	58	68	81
11	62	70	80	62	70	82
12	66	73	82	66	74	84
13	69	75	84	69	76	87
14	71	77	85	72	79	88
15	72	78	86	74	81	89
16	74	79	87	76	83	90
17	74	80	87	77	83	90
18	75	80	87	77	83	90
19	76	81	88	78	84	90
20	77	82	88	78	84	89
21	77	82	88	78	84	90
22	78	83	91	78	85	90
23	80	85	92	79	85	90
24	81	87	93	80	86	92
25	82	88	94	81	88	93
26	84	89	95	83	89	94
27	85	90	95	84	89	94
28	85	90	95	85	90	95
29	86	91	95	85	91	95
30	87	92	96	87	91	95
31	87	92	96	88	93	96
32	88	93	97	88	93	96
33	88	93	97	89	94	96

Customer: **British Gypsum Limited**



Time (mins)	Actual Temperature (°C)					
	Stud 1			Stud 2		
	Cold Flange Thermocouple No. 36	Web Thermocouple No. 37	Hot Flange Thermocouple No. 38	Cold Flange Thermocouple No. 39	Web Thermocouple No. 40	Hot Flange Thermocouple No. 41
34	88	94	97	89	94	96
35	89	94	98	89	95	96
36	89	95	98	90	95	96
37	90	95	98	90	96	97
38	90	95	98	90	96	97
39	90	96	98	91	97	98
40	90	96	100	91	98	99
41	91	98	105	92	98	100
42	91	99	110	92	98	102
43	92	102	114	92	98	103
44	92	104	118	92	99	104
45	93	107	124	93	99	106
46	94	111	138	93	100	108
47	96	121	165	94	101	119
48	98	136	202	94	105	149
49	100	158	238	98	115	248
50	101	184	271	101	139	357
51	101	213	302	102	216	483
52	101	238	328	112	330	552
53	101	259	346	233	409	611
54	100	279	360	439	515	694
55	103	300	374	525	572	-
56	131	321	392	872	630	-
57	206	341	407	899	687	776
58	274	356	420	832	757	777
59	302	373	437	819	746	772
60	328	396	457	814	752	770
61	347	414	472	807	747	768
62	363	431	486	809	752	775
63	381	453	503	803	756	777
64	401	476	522	798	757	779
65	418	496	538	788	753	777
66	438	515	553	785	755	780
67	463	534	570	777	752	778
68	489	551	586	773	751	778
69	509	564	600	774	754	783
70	528	581	619	777	760	791
71	546	597	638	779	765	798



Time (mins)	Actual Temperature (°C)					
	Stud 1			Stud 2		
	Cold Flange Thermocouple No. 36	Web Thermocouple No. 37	Hot Flange Thermocouple No. 38	Cold Flange Thermocouple No. 39	Web Thermocouple No. 40	Hot Flange Thermocouple No. 41
72	564	618	534	783	772	805
73	587	638	610	779	772	804
74	615	661	674	778	777	805
75	824	721	809	787	795	814
76	952	945	952	792	798	821
77	970	967	972	808	815	836
78	974	974	977	970	976	984
79	977	978	984	966	976	999
80	981	982	993	945	1035	861
81	983	987	1001	949	1113	894
82	977	995	1010	947	1207	908
83	960	999	875	1099	1250	990
84	924	998	830	947	1232	981
85	904	1004	814	933	1181	943
86	898	1011	827	914	1133	926
87	897	1020	822	902	1083	910
88	902	1021	813	893	1020	896
89	906	1019	832	897	992	897
90	916	1017	841	891	966	895
91	916	1021	833	875	923	877
92	924	1021	836	867	910	874
93	932	1019	841	856	867	867
94	929	984	845	849	856	872
95	919	982	846	843	855	873
96	909	979	842	835	845	865
97	889	975	837	826	824	851
98	879	962	831	817	807	833
99	863	937	821	803	783	804
100	844	909	805	791	773	782
101	824	882	785	780	768	765
102	820	862	777	770	769	900

- Missing data due to thermocouple fault.

Specimen Lateral Deflection

A negative deflection indicates movement toward the furnace.

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



Time (mins)	Deflection (mm)	
	On free edge	Centrally
38	-1	-12
39	-1	-12
40	-1	-12
41	-1	-13
42	-2	-14
43	-2	-15
44	-2	-15
45	-2	-17
46	-2	-19
47	-2	-22
48	-2	-27
49	-3	-33
50	-3	-38
51	-4	-42
52	-5	-45
53	-6	-47
54	-6	-49
55	-8	-51
56	-9	-54
57	-11	-56
58	-14	-59
59	-18	-61
60	-22	-63
61	-25	-65
62	-27	-66
63	-28	-68
64	-30	-69
65	-31	-70
66	-32	-71
67	-34	-72
68	-36	-72
69	-38	-73
70	-39	-73
71	-39	-73
72	-39	-74
73	-40	-74
74	-40	-73
75	-40	-73
76	-40	-74
77	-40	-75
78	-41	-76
79	-41	-77



Time (mins)	Deflection (mm)	
	On free edge	Centrally
80	-41	-78
81	-41	-78
82	-41	-79
83	-42	-79
84	-42	-80
85	-42	-80
86	-43	-81
87	-44	-81
88	-45	-82
89	-46	-82
90	-47	-82
91	-47	-82
92	-47	-81
93	-47	-80
94	-47	-79
95	-47	-77
96	-47	-74
97	-47	-69
98	-48	-64
99	-49	-59
100	-51	-52
101	-53	-45
102	-	-

Negative readings indicate deflection into the furnace.
Transducers removed at 101 minutes.

PHOTOGRAPHS

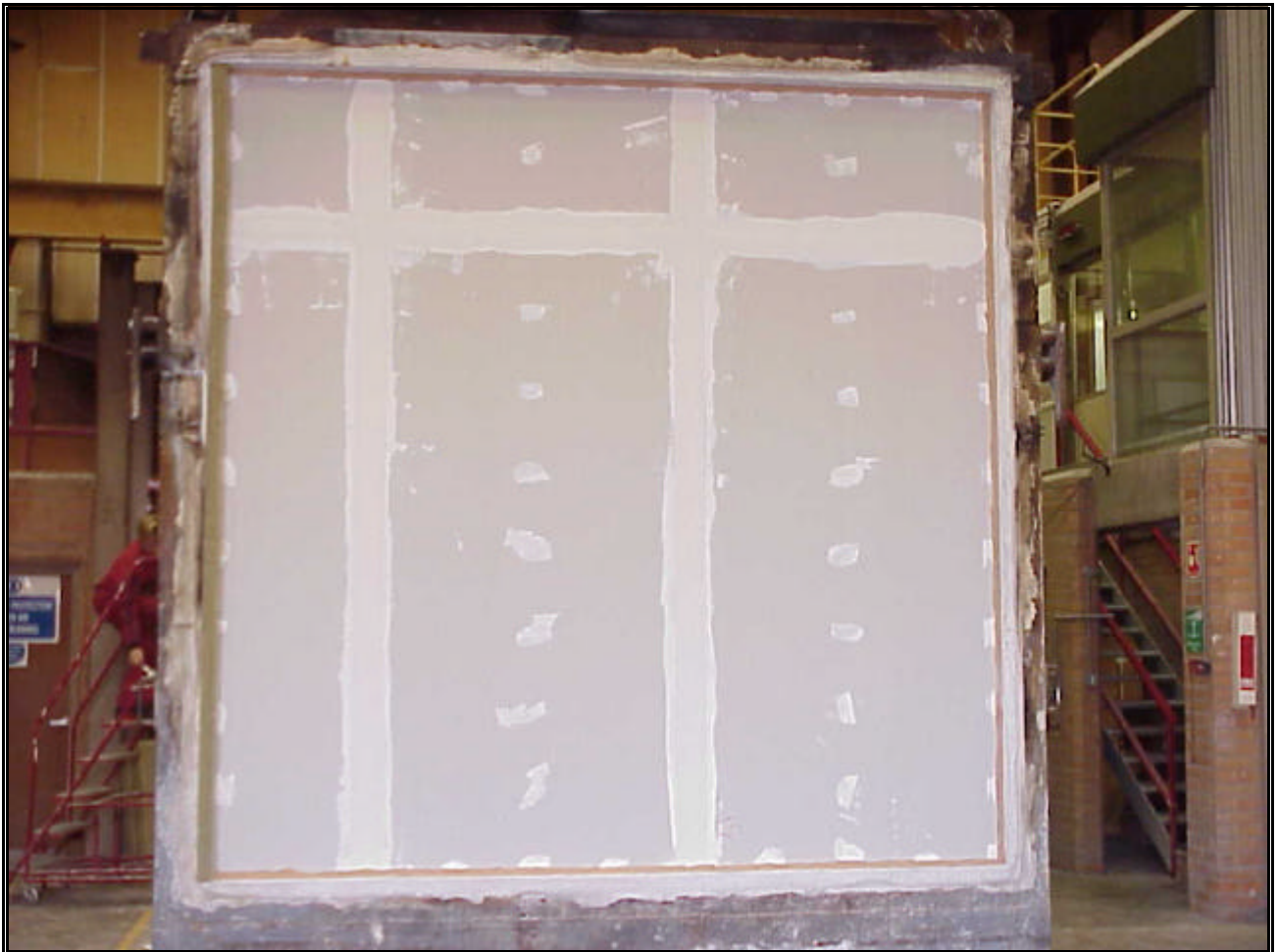


Photo 1. Exposed face prior to test.



The Building Test Centre

Fire Acoustics Structures

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Photo 2. Unexposed face prior to test

Customer: **British Gypsum Limited**

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No. 0296



Photo 3. Unexposed face of specimen at 60 minutes.

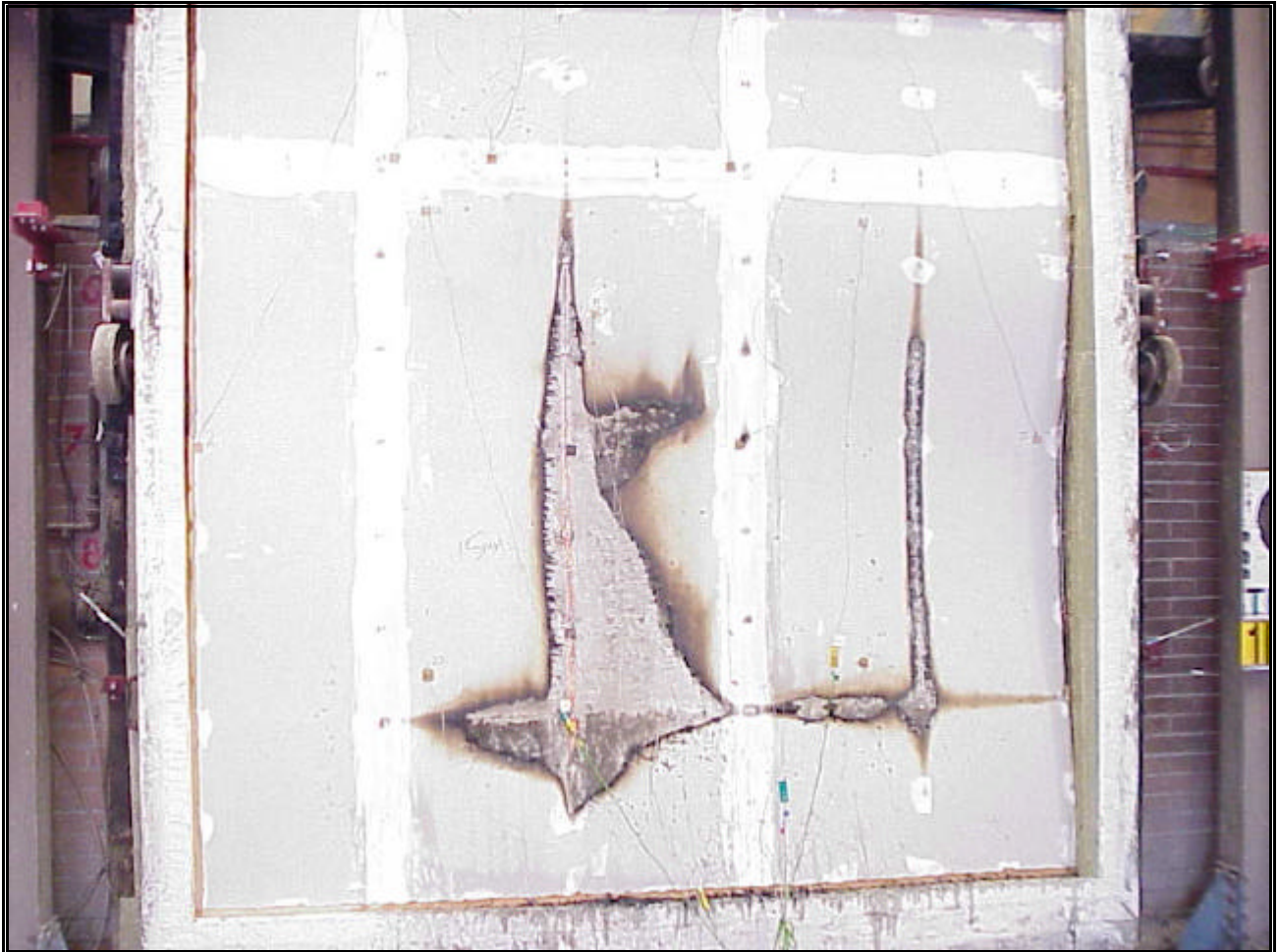


Photo 4. Specimen following test termination (sustained flaming of paper liner visible)