



# **The Building Test Centre**

**Fire Acoustics Structures**

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## **Report Number BTC 12728F**

A FIRE RESISTANCE TEST ON A BRITISH GYPSUM GYPWALL PARTITION CLAD WITH A SINGLE LAYER OF 15mm GYPROC FIRELINE BOARD EACH SIDE OF GYPFRAME 70S50 STUDS, CONDUCTED IN ACCORDANCE WITH BS EN 1364-1: 1999.

Test Date: 19<sup>th</sup> May 2003

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**Customer:** British Gypsum Limited  
East Leake  
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**Customer:** British Gypsum Limited

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A FIRE RESISTANCE TEST ON A BRITISH GYPSUM GYPWALL PARTITION CLAD WITH A SINGLE LAYER OF 15mm GYPROC FIRELINE BOARD EACH SIDE OF GYPFRAME 70S50 STUDS, 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 sponsor was British Gypsum Limited.

The test specimen was installed by British Gypsum Limited. The construction of the specimen took place between the 14<sup>th</sup> and 15<sup>th</sup> May 2003. British Gypsum Limited designed the partition system and selected the materials for the test specimen.

The test was carried out on the 19<sup>th</sup> May 2003.

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, construction 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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Authorised by

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## TEST CONSTRUCTION

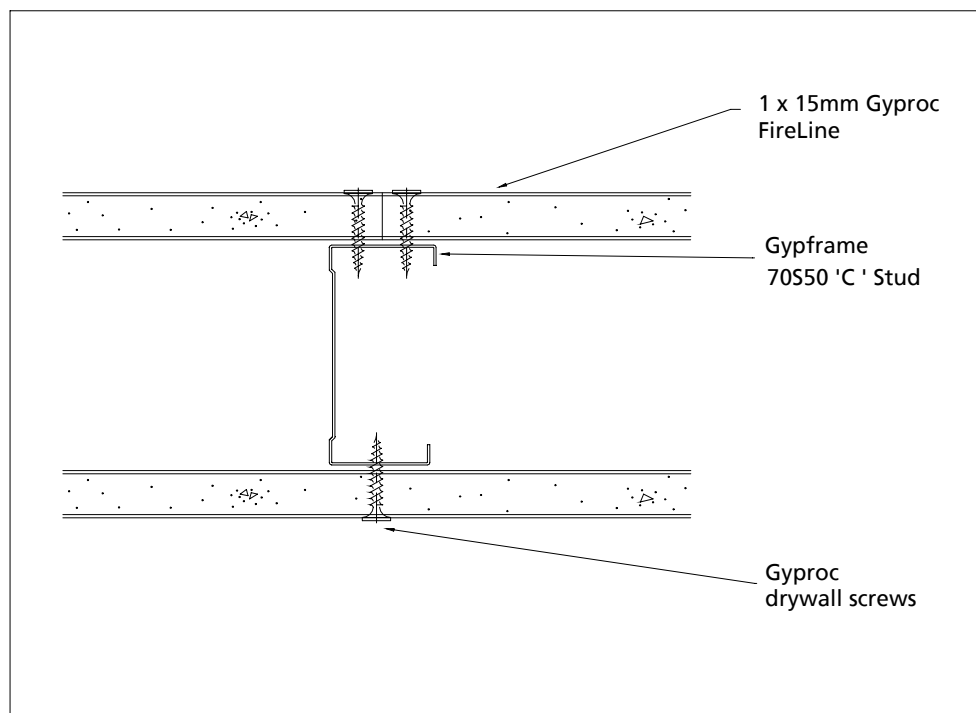
The specimen was constructed in a refractory concrete lined steel restraint frame having an opening of 3000mm high x 3000mm wide.

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the test aperture at 600mm centres with 60mm fire resistant fixings. Gypframe 70S50 'C' 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, and the gap between the stud and the frame lining was filled with a 25mm rock mineral fibre gasket. At the left-hand end a Gypframe 70S50 'C' Stud was used to fix the partition to the test frame with 60mm fire resistant fixings at 600mm centres.

The framework was lined both sides with a single layer of 15mm Gyproc FireLine board fixed around the perimeter and within the field of the board with 25mm Gyproc drywall screws at 300mm centres. All joints were staggered between layers.

Horizontal joints were positioned 2700mm from the base on both the exposed and unexposed faces of the construction. A Gypframe GFS1 Fixing Strap was used behind the horizontal board joint.

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



**Figure 1.** Cross-section of partition specimen.

*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 FireLine

Nominally, 3000mm (long) x 1200mm (wide) x 15mm (thick), Gyproc FireLine plasterboard manufactured and supplied by British Gypsum Limited, ex East Leake works.

Actual surface density:	11.56kg/m <sup>2</sup> .
Actual thickness:	15.06mm.
Board identification numbers:	16 119 3 10:14
Actual moisture content:	0.37%.

The surface density and thickness was calculated using the actual weight and size of a selection of the boards used in the test specimen. The moisture content of the plasterboard used in construction was established from measurements made using samples dried to a constant weight in an oven at 40°C.

### Metal components

- i) Gypframe 70S50'C' Studs manufactured from galvanised mild steel using the 'Ultrasteel' process.
- ii) Gypframe 72C50 Standard Floor & Ceiling Channel manufactured from galvanised mild steel using the 'Ultrasteel' process.
- iii) Gypframe GFS1 Fixing Strap.

All metal components supplied by British Gypsum Limited.

### Fasteners

- i) 25mm Gyproc drywall screws supplied by British Gypsum Limited.
- ii) 60mm fire resistant fixings.

### Miscellaneous components

- i) Gyproc Paper Joint Tape.
- ii) Gyproc Joint Filler.

All miscellaneous components were supplied by British Gypsum Limited.

Customer: **British Gypsum 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 2.

The ambient temperature at the commencement of the test was 19°C.

The furnace pressure was set to control at  $18 \pm 2$  Pa positive with respect to atmosphere, at the top of the specimen, except during the first 5 minutes of the test.

The allowable tolerances are  $\pm 5$  Pa from 5 minutes to 10 minutes and  $\pm 3$  Pa from 10 minutes onwards. It is of the opinion of the laboratory that the variations in the furnace pressure exceeding the tolerances stated in BS EN 1363-1:1999 have not unduly influenced the results of this test. Furnace pressure data is shown on page 13.

The test conditions did not meet the full requirements of BS EN 1363-1:1999 as the test frame stiffness did not fully comply. The test centre is of the opinion that this deviation 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:	25mm Gap gauge	75 minutes (no failure test discontinued at the request of the customer)
	6mm Gap gauge	75 minutes (no failure test discontinued at the request of the customer)
	Sustained flaming	75 minutes (no failure test discontinued at the request of the customer)
	Cotton pad	71 minutes
Insulation:		64 minutes

The test was terminated at 75 minutes at the request of the customer.

## LIMITATIONS

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 R Evans  
Exposed face J McLavy

Time		Observations
hrs	mins	
		All observations refer to exposed face unless otherwise stated.
	0	Test started.
	5	The jointing material and face paper had started to char.
	10	The jointing material and face paper continued to char.
	15	All joints had opened to approximately 1-2mm where exposed. 50% of the jointing material had fallen into the furnace.
	20	All joints had opened to approximately 2-3mm. All of the jointing material had fallen into the furnace.
	25	All joints had opened to approximately 5-7mm.
	30	All joints had opened to approximately 10mm. The boards had started to pull away from the perimeter fixings.
	35	All joints had opened to approximately 10-15mm.
	40	All joints had opened to approximately 15mm. The lower centre board had detached from its perimeter fixings at mid-height adjacent to the left-hand vertical joint.
	45	All joints had opened to approximately 15-20mm.  <i>Unexposed face</i> Jointing tape had peeled away from the specimen on the right-hand vertical joint at mid-height. Smoke was issued from the right-hand vertical joint at mid-height.

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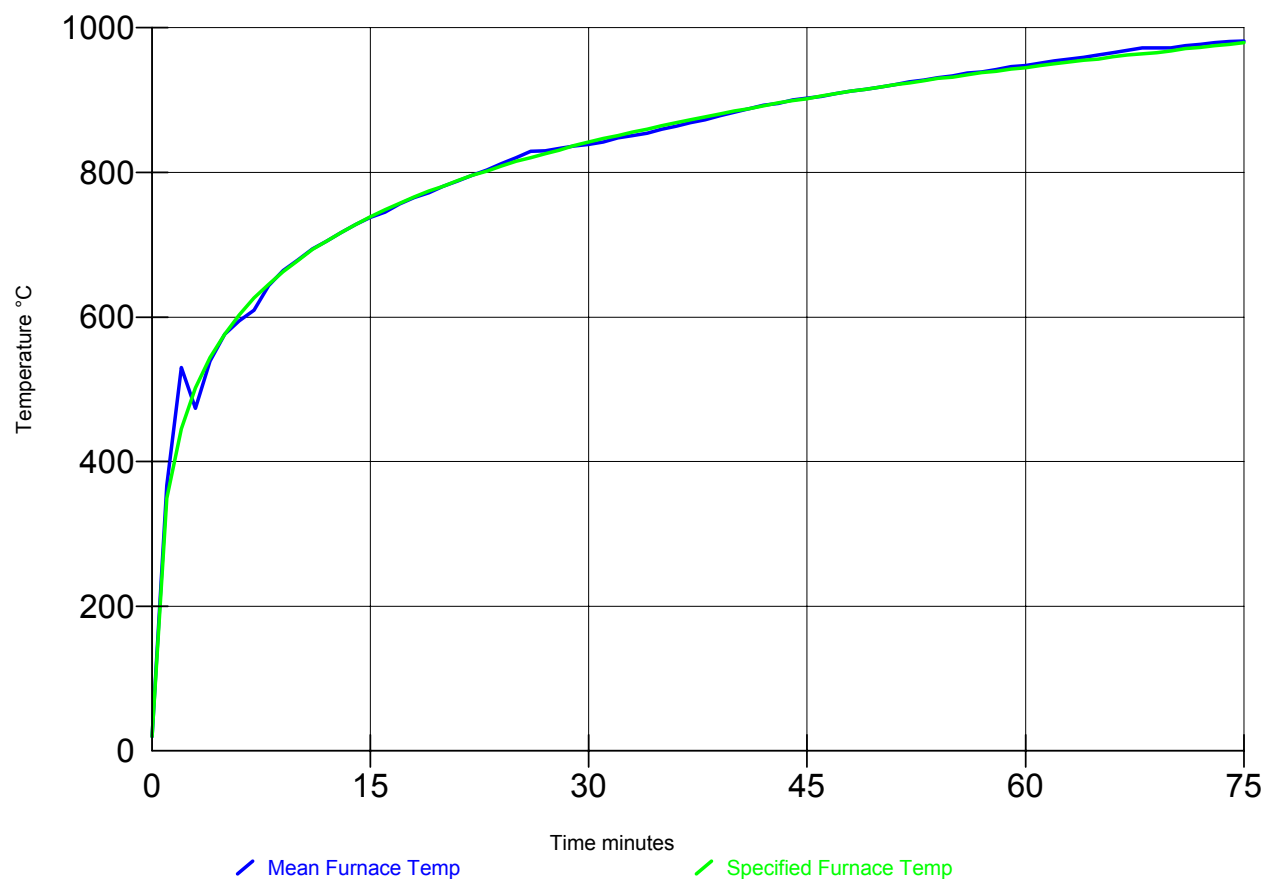
Time		Observations
hrs	mins	
		All observations refer to exposed face unless otherwise stated.
	50	No visible change to the specimen.  <i>Unexposed face</i> The jointing material had discoloured at the screw head positions on horizontal joint.
	51	<i>Unexposed face</i> The jointing material had cracked on the left-hand vertical at mid-height. Screws heads had pulled through the field of the lower centre and left-hand boards.
	53	<i>Unexposed face</i> The jointing material had discoloured at the screw head positions on the left-hand and right-hand vertical joints.
	55	All joints had opened to approximately 20-25mm.
	58	<i>Unexposed face</i> The left-hand vertical joint had opened to approximately 5mm at mid-height. The right-hand vertical joint had opened to approximately 3-4mm at mid-height.
1	00	All joints had opened to approximately 25-30mm.  <i>Unexposed face</i> The lower centre board had moved into the furnace by approximately 25mm (exposing the stud) adjacent to the left-hand vertical joint.
1	03	<i>Unexposed face</i> The cotton pad was used on the left-hand vertical joint at approximately 1500mm height but did not glow or ignite.



Time		Observations
hrs	mins	
		All observations refer to exposed face unless otherwise stated.
1	04	<i>Unexposed face</i> <b>INSULATION FAILURE.</b> The temperature rise of thermocouple numbers 28, 29 and 32 exceeded 180°C. In addition the average temperature rise of the standard five thermocouples exceeded 140°C.
1	05	No visible change to the specimen.  <i>Unexposed face</i> A crack had developed on the horizontal joint adjacent to the top left-hand corner of the lower centre board.
1	10	The lower centre board was bowing into the partition cavity adjacent to the left-hand vertical joint.
1	11	<i>Unexposed face</i> <b>INTEGRITY FAILURE.</b> The cotton pad ignited when used on the left-hand vertical joint at approximately 1500mm height.
1	15	No visible change to the specimen.  <b>TEST TERMINATED</b> at the request of the customer.



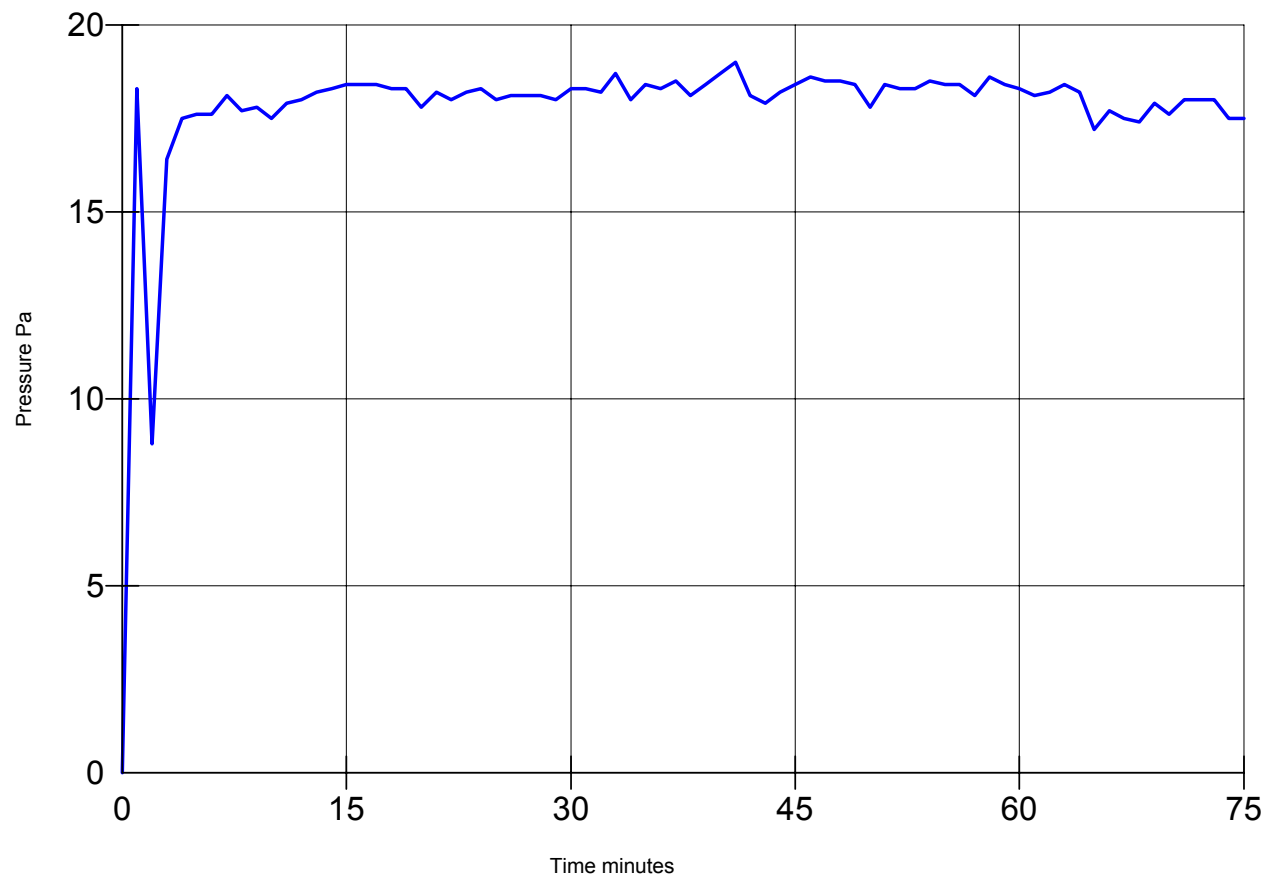
### Furnace Temperature Graph



**Figure 2.** Furnace temperature graph.



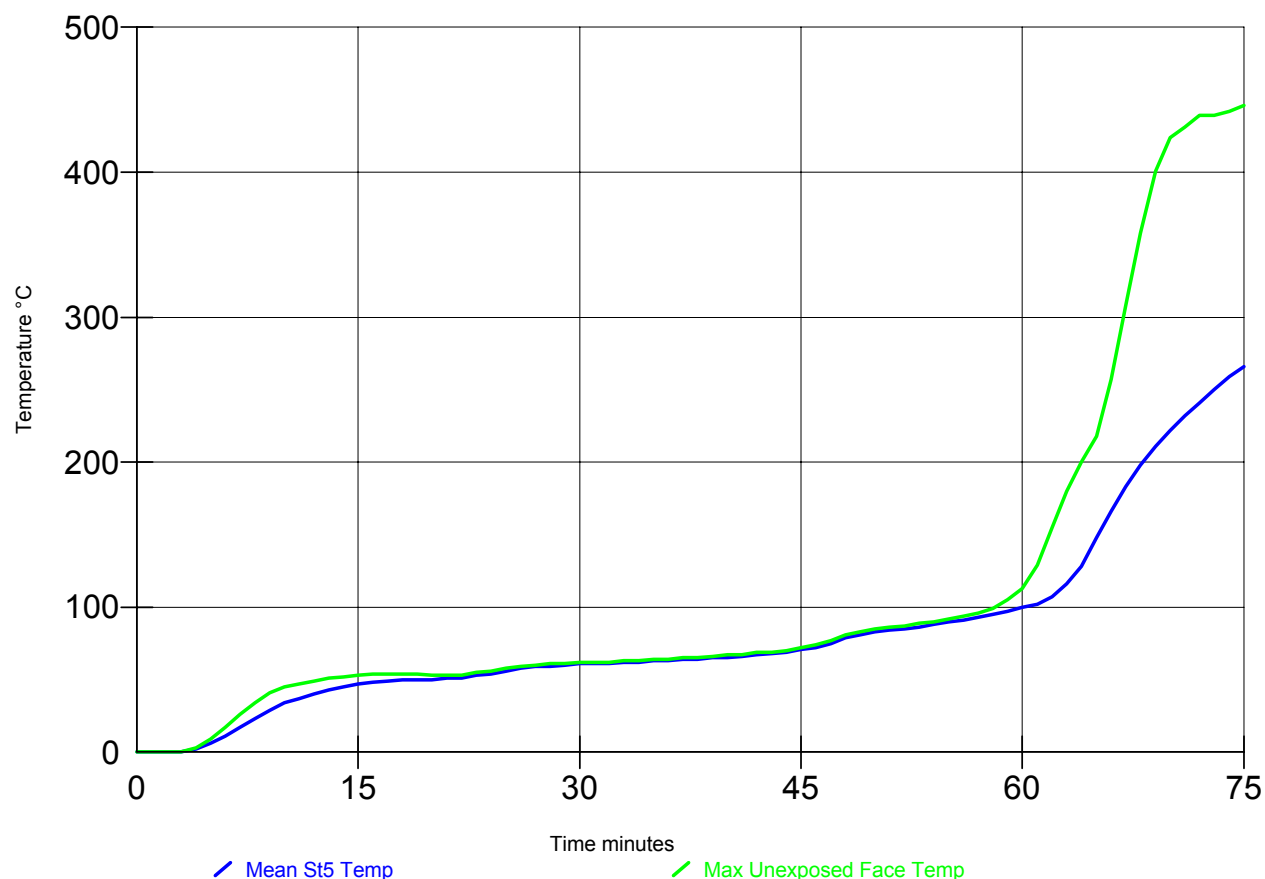
### Furnace Pressure Graph



**Figure 3.** Furnace pressure graph.



### Unexposed Face Temperature Graph



**Figure 4.** Unexposed face temperature graph.



## Unexposed Face Thermocouple Layout

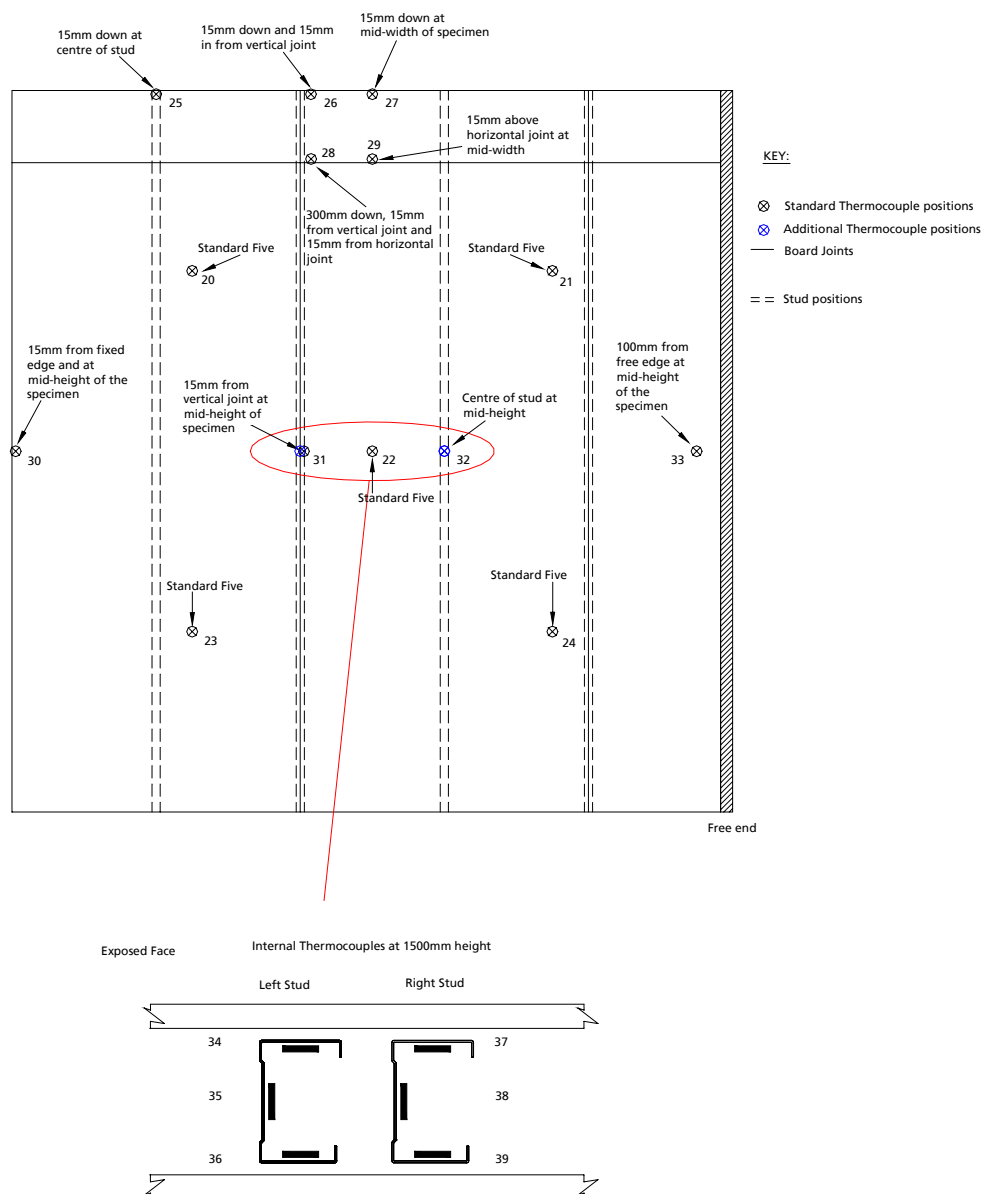


Figure 5. Unexposed face thermocouple layout.



## Unexposed Face Thermocouple Data

Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24
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	3	3	3	2	2
5	7	7	6	5	5
6	13	13	12	10	9
7	19	20	18	15	14
8	26	27	24	20	20
9	33	33	29	26	25
10	38	37	34	31	30
11	41	41	38	35	33
12	44	44	41	38	36
13	47	46	44	41	40
14	48	48	46	44	42
15	50	50	48	46	45
16	51	51	49	47	46
17	52	52	50	48	47
18	52	52	51	49	48
19	52	52	51	50	48
20	52	52	51	50	49
21	52	52	51	51	50
22	51	53	52	52	51
23	52	55	53	54	52
24	53	56	55	56	54
25	55	58	57	57	55
26	57	59	59	59	57
27	59	60	60	60	59
28	59	61	60	60	59
29	60	61	61	61	60
30	60	62	61	62	61
31	60	62	61	62	61
32	60	62	62	62	61
33	61	63	62	63	61





Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24
34	61	63	62	63	62
35	62	64	63	64	63
36	62	64	64	64	63
37	63	65	64	65	63
38	63	65	65	65	64
39	64	66	65	66	64
40	64	66	66	67	65
41	65	67	66	67	65
42	66	69	68	69	67
43	67	69	68	69	67
44	68	70	70	70	68
45	70	72	71	72	70
46	72	74	73	74	71
47	75	77	76	77	74
48	78	81	80	79	78
49	81	83	82	81	79
50	83	85	84	83	82
51	84	86	85	84	83
52	85	87	86	85	84
53	87	89	87	86	85
54	88	90	89	87	86
55	90	92	91	89	88
56	91	94	93	89	88
57	93	96	95	91	90
58	96	98	98	93	92
59	99	100	100	95	94
60	102	103	102	98	97
61	105	106	105	99	98
62	111	111	110	102	101
63	125	121	123	107	106
64	143	136	139	113	110
65	169	161	166	126	122
66	189	183	188	138	132
67	206	200	206	157	150
68	221	214	222	172	165
69	233	226	235	184	177
70	244	237	250	195	187



Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 20	Thermocouple No. 21	Thermocouple No. 22	Thermocouple No. 23	Thermocouple No. 24
71	253	246	262	203	196
72	261	255	275	211	203
73	269	264	291	218	211
74	275	272	308	223	217
75	281	280	325	225	222

See figure 5 for the locations of the thermocouples.

Figures shown in red indicate the time of insulation failure (average standard five thermocouples).



## 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
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	1	2	3	1	1
5	4	7	9	4	4
6	10	16	17	9	8
7	17	25	26	15	13
8	24	33	34	20	18
9	31	40	41	25	23
10	37	44	45	30	27
11	41	47	47	33	30
12	44	49	49	36	33
13	46	50	51	38	35
14	48	51	52	40	38
15	49	52	53	41	39
16	50	53	54	43	41
17	51	53	54	44	42
18	51	54	54	44	43
19	51	53	54	45	44
20	52	53	53	46	44
21	51	52	53	46	44
22	50	51	52	45	44
23	50	51	52	45	44
24	49	50	51	45	44
25	48	50	53	47	45
26	48	51	54	49	48
27	49	52	56	52	52
28	51	54	58	56	56
29	52	55	60	58	59
30	54	57	61	60	60
31	55	57	61	61	61
32	57	58	62	62	61
33	59	59	63	62	62



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Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29
34	59	60	63	63	62
35	61	61	64	63	63
36	61	61	64	63	63
37	61	62	65	64	63
38	61	62	65	64	63
39	62	62	66	64	64
40	63	63	66	65	65
41	63	63	66	65	65
42	65	64	68	67	66
43	65	64	68	67	66
44	65	64	68	67	67
45	66	64	68	68	67
46	67	65	70	69	68
47	68	65	71	70	70
48	69	66	73	71	71
49	70	67	76	73	73
50	72	69	80	78	76
51	74	71	83	81	79
52	76	74	84	82	81
53	79	77	85	84	84
54	81	80	87	86	86
55	83	82	88	89	88
56	85	83	88	90	89
57	86	84	89	92	91
58	88	86	91	96	94
59	90	88	92	98	98
60	91	90	94	101	102
61	92	92	96	105	107
62	95	94	99	112	117
63	97	98	102	139	133
64	100	101	105	171	156
65	103	104	108	214	187
66	107	108	113	257	208
67	112	113	123	308	235
68	118	124	139	358	303
69	134	140	163	401	359
70	157	156	189	424	408

Customer: British Gypsum Limited

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Time (mins)	Temperature Rise (°C)				
	Thermocouple No. 25	Thermocouple No. 26	Thermocouple No. 27	Thermocouple No. 28	Thermocouple No. 29
71	183	179	206	431	422
72	204	199	223	439	420
73	222	216	235	439	418
74	238	232	245	442	421
75	252	251	254	446	418

See figure 5 for the locations of the thermocouples.

Figures shown in red indicate the time and position of insulation failure.

Additional Unexposed Face Temperature Data

Time (mins)	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	1	2	1	2
5	4	6	3	6
6	9	11	6	11
7	15	16	9	17
8	21	21	13	23
9	27	26	17	29
10	32	30	21	34
11	37	33	25	38
12	41	37	28	42
13	43	39	30	45
14	46	41	33	47
15	48	43	35	49
16	50	45	37	50
17	51	46	38	51
18	51	46	39	52
19	52	47	39	52
20	52	47	40	53
21	52	47	41	53
22	51	47	42	52
23	50	48	43	52
24	49	49	44	53
25	49	51	47	55
26	48	53	49	56
27	50	57	52	58
28	51	60	55	60
29	54	61	57	60
30	55	62	58	61
31	57	62	59	61
32	58	63	60	61
33	59	64	61	61



Time (mins)	Temperature Rise (°C)			
	Thermocouple No. 30	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33
34	59	64	62	62
35	60	65	63	63
36	60	65	63	63
37	60	65	64	63
38	60	66	65	64
39	60	67	65	64
40	60	68	66	65
41	61	69	66	65
42	62	72	68	67
43	62	74	69	66
44	62	76	70	67
45	63	78	71	68
46	64	80	73	70
47	65	82	75	71
48	66	84	78	74
49	67	86	80	77
50	68	89	82	80
51	70	92	84	82
52	72	95	85	83
53	76	101	87	85
54	78	107	89	86
55	80	117	91	88
56	81	146	93	88
57	82	167	95	89
58	84	194	99	91
59	84	248	105	93
60	86	316	113	95
61	86	364	129	96
62	87	404	155	98
63	89	-	180	101
64	91	-	200	104
65	93	-	218	108
66	95	-	234	112
67	97	-	252	122
68	98	-	271	134
69	101	-	296	153
70	104	-	326	172



Time (mins)	Temperature Rise (°C)			
	Thermocouple No. 30	Thermocouple No. 31	Thermocouple No. 32	Thermocouple No. 33
71	108	-	350	186
72	112	-	369	197
73	119	-	388	207
74	132	-	401	215
75	146	-	402	223

See figure 5 for the locations of the thermocouples.

Figures shown in red indicate the time and position of insulation failure.

Thermocouple No. 31 was affected by hot gases therefore is discounted from the failure criteria.





## Internal Thermocouple Data at 1500mm height

Time  (mins)	Actual Temperature (°C)					
	Left-hand stud			Right-hand 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	19	19	19	20	19	19
1	21	19	19	20	19	19
2	47	28	23	40	29	23
3	71	54	43	74	56	43
4	78	66	57	88	67	56
5	87	74	68	93	76	66
6	91	79	73	94	80	73
7	93	82	77	95	83	76
8	95	83	78	95	84	78
9	96	85	80	96	86	80
10	96	87	81	96	88	82
11	96	89	83	97	89	83
12	97	90	85	98	91	85
13	99	92	87	99	93	87
14	103	93	88	102	95	88
15	103	96	89	102	97	89
16	106	97	90	102	98	89
17	102	97	90	103	100	89
18	102	98	90	104	102	90
19	102	99	90	108	105	90
20	104	102	90	122	111	91
21	107	107	91	153	123	98
22	117	115	98	190	145	107
23	141	135	108	227	168	116
24	185	163	118	266	195	129
25	234	196	136	308	222	149
26	271	224	160	340	246	171
27	302	247	185	364	266	192
28	329	265	206	382	284	209
29	349	282	225	395	300	224
30	365	296	242	409	315	238
31	378	310	258	422	327	251

Customer: British Gypsum Limited



Time  (mins)	Actual Temperature (°C)					
	Left-hand stud			Right-hand 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
32	391	324	274	435	339	265
33	402	337	288	452	351	281
34	411	347	301	472	363	297
35	419	357	313	486	377	318
36	425	367	325	534	396	347
37	435	377	337	564	416	379
38	444	387	349	589	438	407
39	455	398	362	607	459	423
40	461	409	375	619	478	440
41	465	419	387	627	492	461
42	474	430	401	638	506	481
43	481	440	412	644	518	495
44	490	452	422	651	530	510
45	499	462	436	658	543	524
46	508	474	449	665	555	537
47	517	485	463	672	565	549
48	527	496	475	679	576	562
49	536	507	487	689	587	574
50	546	517	499	697	599	585
51	556	528	511	704	610	597
52	566	538	522	711	621	608
53	576	548	534	720	633	621
54	586	559	546	727	645	634
55	597	568	556	736	657	647
56	606	578	567	745	668	656
57	615	590	578	753	679	666
58	626	602	592	760	690	680
59	636	614	604	768	702	693
60	647	627	617	778	717	709
61	657	640	632	790	734	726
62	667	655	646	806	756	748
63	675	666	658	825	784	775
64	681	680	668	842	813	803
65	691	693	678	846	825	816
66	699	680	687	845	834	821



Time  (mins)	Actual Temperature (°C)					
	Left-hand stud			Right-hand 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
67	705	694	694	836	837	823
68	711	698	702	829	843	822
69	717	704	708	824	845	816
70	722	711	712	824	848	807
71	725	716	715	826	847	801
72	727	722	717	834	845	797
73	730	732	718	841	839	791
74	730	733	719	854	824	784
75	729	733	719	876	810	777

See figure 5 for the locations of the thermocouples.



Specimen Lateral Deflection

Time (mins)	Deflection at centre of the specimen (mm)	Deflection 50mm from free end of the specimen (mm)
0	0	0
1	3.3	0.7
2	4.5	0.9
3	6.4	1
4	7.1	1
5	6.9	0.9
6	6.6	0.7
7	6.1	0.5
8	5.9	0.3
9	5.8	0.2
10	5.9	0.1
11	5.8	0
12	6.1	-0.1
13	6.4	-0.2
14	7.1	-0.2
15	7.7	-0.2
16	8.2	-0.2
17	8.6	-0.2
18	9.4	-0.2
19	10.7	0
20	12.7	0.4
21	15.6	1.8
22	19.4	4.4
23	23.5	6.6
24	28.5	8.3
25	32.4	10.1
26	36	11.1
27	39.1	11.4
28	41.6	11.4
29	43.4	11.3
30	45	11.1
31	46.9	10.8
32	48.6	10.5
33	50.4	10.2
34	52	10
35	53.5	9.8



Time (mins)	Deflection at centre of the specimen (mm)	Deflection 50mm from free end of the specimen (mm)
36	55.3	9.8
37	57.4	9.7
38	59.4	9.8
39	61.3	9.8
40	63.1	9.8
41	64.9	9.8
42	66.5	10
43	67.8	10.4
44	69.1	11.2
45	70.4	12
46	72.3	12.6
47	73.5	13.2
48	74.8	13.7
49	76.2	14.1
50	77.4	14.5
51	78.1	14.8
52	78.9	15.2
53	79.3	15.6
54	79.5	16.1
55	79.4	16.5
56	79.6	16.9
57	79.8	17.1
58	80.3	17.2
59	80.7	17.2
60	81.4	17.4
61	82.1	17.6
62	82.9	17.8
63	83.3	17.9
64	84.1	18
65	84.8	18.1
66	84.9	18.4
67	84.8	19

Both deflection measurements were taken at the mid-height of the specimen.  
Negative values indicate that the specimen deflected out of the furnace.  
The deflection transducers were removed after 67 minutes.

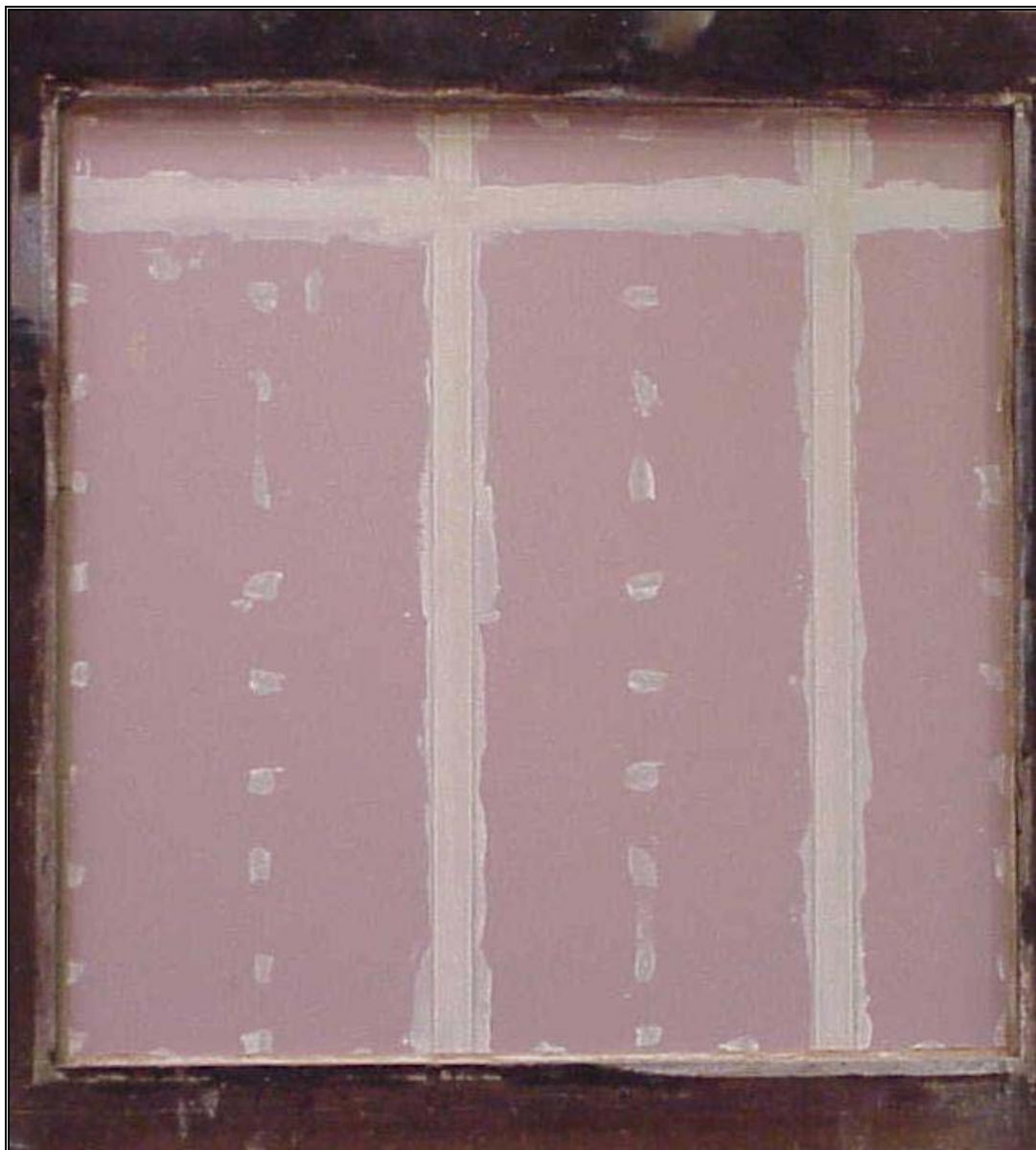


# The Building Test Centre

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## PHOTOGRAPHS



**Photograph 1.** View of the exposed face prior to test.

Customer: **British Gypsum Limited**

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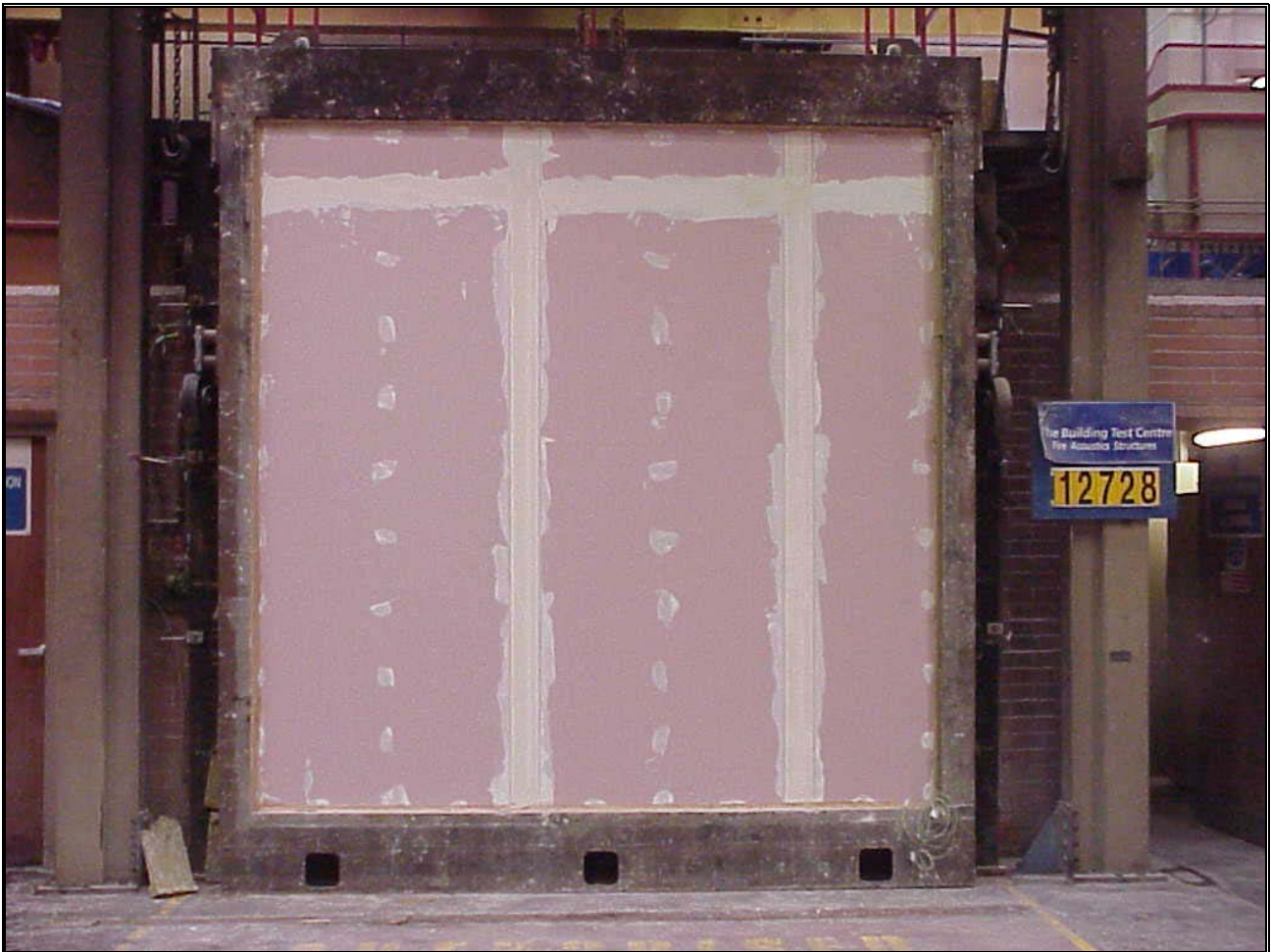
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Photograph 2. View of the unexposed face prior to test.

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**Photograph 3.** View of the unexposed face at 74 minutes.

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**Photograph 4.** View of the exposed face after test termination.

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## 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 3000mm.
- (ii) Increase in the thickness of the wall (minimum thickness 100mm).
- (iii) Increase thickness of component materials (minimum Gypframe stud depth 70mm, minimum Gypframe 'C' stud gauge 0.5mm).
- (iv) Decrease in the linear dimensions of the boards but not thickness ( $\leq 2700\text{mm}$  long  $\times \leq 1200\text{mm}$  wide Gyproc FireLine).
- (v) Decrease stud spacing from 600mm.
- (vi) Decrease in fixing centres from 300mm.
- (vii) Increase in the number of horizontal joints.
- (viii) Horizontal and vertical joints, of the type tested.

### Extension of Width

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 constructions tested at a minimum of 3000mm, maybe increased to 4000mm at the following fire resistance periods as the lateral deflection was below 100mm.

30 minutes	60 minutes
<100mm, $\therefore$ 4000mm	<100mm, $\therefore$ 4000mm