



Report Number BTC 13483F

A FIRE RESISTANCE TEST ON A BRITISH GYPSUM GYPWALL QUIET SF PARTITION CLAD WITH A DOUBLE LAYER OF 12.5mm GYPROC SOUNDBLOC EACH SIDE OF GYPFRAME 70S50 STUDS WITH GYPFRAME RB1 RESILIENT BAR ON THE UNEXPOSED FACE, CONDUCTED IN ACCORDANCE WITH BS EN 1364-1: 1999.

Test Date: 8th September 2004

www.btconline.co.uk

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

Customer: **British Gypsum Limited**

BTC 13483F: Page 1 of 43



0296

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TABLE OF CONTENTS

| | |
|--|-----------|
| FOREWORD | 4 |
| REPORT AUTHORISATION | 4 |
| TEST CONSTRUCTION | 5 |
| TEST MATERIALS | 8 |
| Gyproc SoundBloc | 8 |
| Metal components | 8 |
| Insulation | 8 |
| Fasteners | 9 |
| Miscellaneous components | 9 |
| TEST PROCEDURE | 9 |
| TEST RESULTS | 10 |
| LIMITATIONS | 10 |
| TEST DATA | 11 |
| Observations | 11 |
| Furnace Temperature Graph | 16 |
| Furnace Pressure Graph | 17 |
| Unexposed Face Temperature Graph | 18 |
| Unexposed Face Thermocouple Layout | 19 |
| Unexposed Face Standard Five Thermocouple Data | 20 |
| Additional Unexposed Face Temperature Data | 24 |
| Additional Unexposed Face Temperature Data | 28 |
| Internal Thermocouple Data at 1500mm height | 32 |
| Specimen Lateral Deflection | 35 |
| PHOTOGRAPHS | 38 |

Customer: British Gypsum Limited

BTC 13483F: Page 2 of 43



0296

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 on the 24th August 2004. British Gypsum Limited designed the partition system and selected the materials for the test specimen.

The test was carried out on the 8th September 2004.

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.

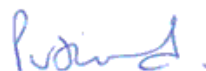
REPORT AUTHORISATION

Report Author



James McLavy
BSc. (Hons.), AMIOA, AIFireE
Project Leader

Authorised by



Eur Ing. Paul Howard
BSc. (Hons.), CEng., MIOA
Head of Laboratory

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Customer: **British Gypsum Limited**

BTC 13483F: Page 4 of 43

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.

50mm Isowool Acoustic Partition Roll (1200) was positioned in the partition cavity.

Gypframe RB1 Resilient Bar was fixed horizontally to the metal framework on the unexposed face at 600mm centres with Gyproc Wafer Head Drywall Screws. The Gypframe RB1 Resilient Bar was positioned such that it backs the partition's horizontal joints (see below). Sections of Gypframe RB1 Resilient Bar were fixed vertically to the fixed end stud using two Gyproc Wafer Head Drywall Screws per section.

The Gypframe RB1 Resilient Bar on the unexposed face was lined with a double layer of 12.5mm Gyproc SoundBloc board. The inner layer was fixed around the perimeter and within the field of the board with 25mm Gyproc drywall screws at 300mm centres. The outer layer was fixed around the perimeter and within the field of the board with 36mm Gyproc drywall screws at 300mm centres. All joints were staggered between layers.

The Gypframe 70S50 studs on the exposed face were lined with a double layer of 12.5mm Gyproc SoundBloc board. The inner layer was fixed around the perimeter with 25mm Gyproc drywall screws at 300mm centres. The outer layer was fixed around the perimeter and within the field of the board with 36mm Gyproc drywall screws at 300mm centres. All joints were staggered between layers.

Horizontal joints were positioned 2400mm from the base for the outer layers on both the exposed and unexposed faces of the construction. Horizontal joints were positioned 600mm from the base for the inner layers on both the exposed and unexposed faces of the construction.

All horizontal joints on the unexposed face coincided with the Gypframe RB1 Resilient Bar positions.

Customer: **British Gypsum Limited**

BTC 13483F: Page 5 of 43

A Gypframe GFS1 Fixing Strap was used behind the horizontal board joint in the exposed face outer layer.

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

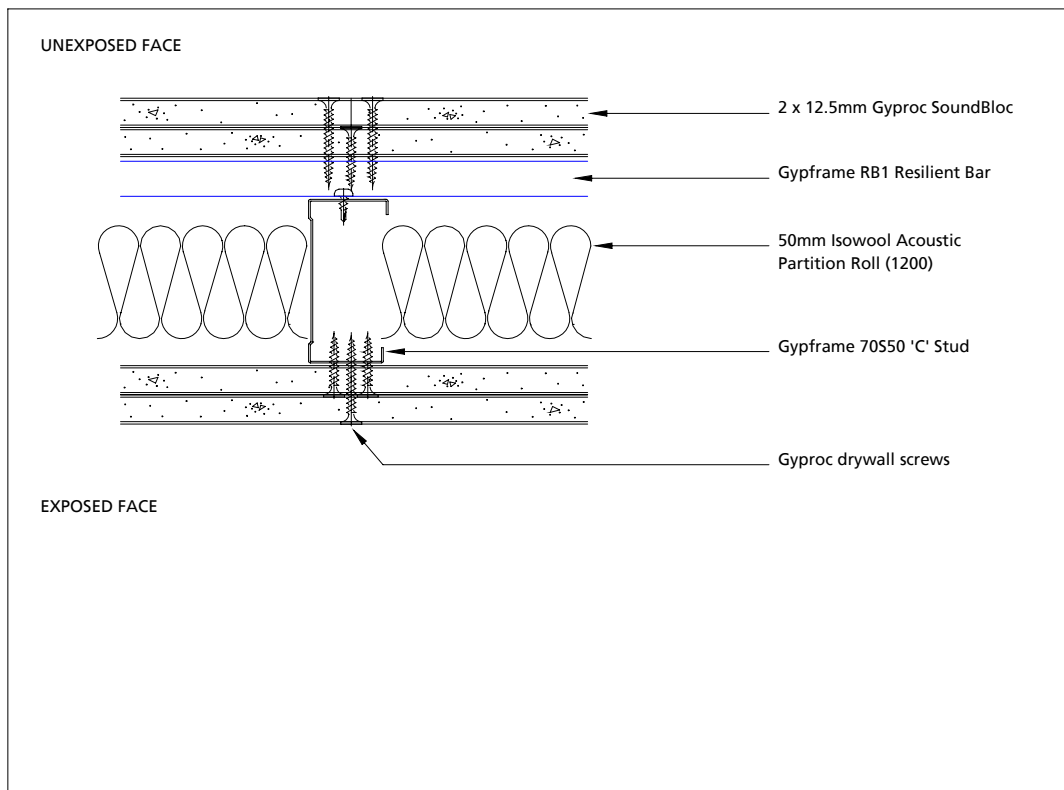


Figure 1. Cross-section of partition specimen.

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 SoundBloc

Nominally, 3000mm (long) x 1200mm (wide) x 12.5mm (thick), Gyproc SoundBloc plasterboard manufactured and supplied by British Gypsum Limited, ex East Leake works.

| | |
|-------------------------------|--------------------------|
| Actual surface density: | 10.72kg/m ² . |
| Actual thickness: | 12.66mm. |
| Board identification numbers: | 18 219 4 09:08 |
| Actual moisture content: | 0.51%. |

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 RB1 Resilient Bar.
- iv) Gypframe GFS1 Fixing Strap.

All metal components supplied by British Gypsum Limited.

Insulation

Nominally 50mm (thick) Isowool Acoustic Partition Roll (1200) glass mineral wool manufactured and supplied by British Gypsum – Isover Limited.

| | |
|---------------------------|------------------------|
| Measured density: | 14.23kg/m ³ |
| Measured surface density: | 0.71kg/m ² |

The density was calculated using the insulation roll used in the test specimen.

Fasteners

- i) 25mm Gyproc drywall screws supplied by British Gypsum Limited.
- ii) 36mm Gyproc drywall screws supplied by British Gypsum Limited.
- iii) 13mm Gyproc Wafer head Drywall Screws supplied by British Gypsum Limited.
- iv) 60mm fire resistant fixings.

Miscellaneous components

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

All miscellaneous components were supplied by 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. The test specimen was asymmetrical therefore separate test would be required to cover the fire resistance from the other direction.

The test procedure used was EN 1364-1 Issue 2.

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

The furnace pressure was set to control at 18 ± 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 ± 5 Pa from 5 minutes to 10 minutes and ± 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 17.

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.

Customer: **British Gypsum Limited**

BTC 13483F: Page 9 of 43

TEST RESULTS

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

| | | |
|--------------------|--------------------------|--|
| Integrity: | Sustained flaming | 120 minutes (no failure test discontinued at the request of the customer) |
| | 25mm Gap gauge | 120 minutes (no failure test discontinued at the request of the customer) |
| | 6mm Gap gauge | 120 minutes (no failure test discontinued at the request of the customer) |
| | Cotton pad | 117 minutes |
| Insulation: | | 102 minutes |

The test was terminated at 120 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 J McLavy
Exposed face P Cao & L Cooper

| Time | | <i>Observations</i> |
|------|------|--|
| 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 left-hand vertical joint had opened to approximately 2-3mm. The right-hand vertical joint had opened to approximately 1mm. The horizontal joint had opened to approximately 2-3mm. |
| | 20 | All board joints had opened to approximately 5mm. Cracks had developed around the screw heads adjacent to the left-hand vertical joint. Cracks had developed around the screw heads on the lower boards adjacent to the horizontal joint. |
| | 25 | The left-hand vertical joint had opened to approximately 10mm. The right-hand vertical joint had opened to approximately 8mm. The horizontal joint had opened to approximately 10mm. Cracks had developed around the screw heads adjacent to the right-hand vertical joint. |
| | 30 | The left-hand vertical joint had opened to approximately 10-12mm. The right-hand vertical joint had opened to approximately 10mm. The horizontal joint had opened to approximately 15mm. |
| | 35 | No visible change to the specimen. |
| | 40 | The horizontal joint had opened to approximately 20mm. |

| Time | | Observations |
|------|------|---|
| hrs | mins | |
| | | All observations refer to exposed face unless otherwise stated. |
| | 45 | The lower centre board had peeled into the furnace by approximately 50mm adjacent to the horizontal joint. |
| | 50 | No visible change to the specimen. |
| | 55 | The horizontal joint had opened to a maximum of approximately 30mm. |
| 1 | 00 | No visible change to the specimen. |
| 1 | 05 | A section of the outer layer lower left-hand board approximately 1400mm x 800mm had fallen into the furnace. The lower centre board had peeled into the furnace by approximately 100mm adjacent to the horizontal joint. |
| 1 | 10 | A section of the outer layer lower left-hand board approximately 1400mm x 400mm had fallen into the furnace. A section of the outer layer lower centre board approximately 1700mm x 1200mm had fallen into the furnace. Cracks had developed on the inner layer boards. The inner layer board joints had opened to approximately 20-25mm. <i>Unexposed face</i> The free end had buckled out of the furnace at mid-height. |
| 1 | 15 | A section of the outer layer lower centre board approximately 700mm x 1200mm had fallen into the furnace. The inner layer right-hand and centre boards had peeled into the furnace by approximately 50mm adjacent to the vertical joints. |
| 1 | 20 | The inner layer right-hand and centre boards had peeled into the furnace by approximately 100-150mm adjacent to the vertical joints. Visibility was poor inside the furnace. |
| 1 | 25 | Sections of the inner layer upper centre board and upper right-hand board had fallen into the furnace (approximately 2000mm x 1700mm in total). |



| Time | | Observations |
|------|------|--|
| hrs | mins | |
| | | All observations refer to exposed face unless otherwise stated. |
| 1 | 26 | <i>Unexposed face</i> The jointing material had discoloured at the screw head positions on the left-hand vertical joint at approximately 1800mm height. The jointing material had discoloured at the screw head positions on the right-hand vertical joint at approximately 1800mm height. |
| 1 | 28 | <i>Unexposed face</i> The jointing material had discoloured at the screw head positions on the left-hand vertical joint at approximately 1200-2400mm height. The jointing material had discoloured at the screw head positions on the right-hand vertical joint at approximately 1200-2400mm height. |
| 1 | 30 | A section of the inner layer upper left-hand board approximately 1900mm x 600mm had fallen into the furnace. No further exposed face observations were possible due to poor visibility. |
| 1 | 33 | <i>Unexposed face</i> Smoke issued from the fixed end at mid-height. The edge of the left-hand board had discoloured / stained at approximately 1500-3000mm height due to smoke issue. |
| 1 | 40 | <i>Unexposed face</i> Discolouration had developed on the centre line of the lower centre board at approximately 1500-1800mm height. |
| 1 | 42 | <i>Unexposed face</i> INSULATION FAILURE. The temperature rise of thermocouple No. 32 exceeded 180°C. |
| 1 | 46 | <i>Unexposed face</i> Discolouration had developed on the left-hand vertical joint at approximately 1200-2400mm height. Discolouration had developed on the right-hand vertical joint at approximately 1200-2400mm height. |



| Time | | Observations |
|------|------|--|
| hrs | mins | |
| | | All observations refer to exposed face unless otherwise stated. |
| 1 | 48 | <i>Unexposed face</i> Discolouration had developed on the centre line of the lower centre board at approximately 1000-2400mm height. Discolouration had developed on the centre line of the lower left-hand board at approximately 1500mm height. Discolouration had developed across the specimen at approximately 600mm height. |
| 1 | 52 | <i>Unexposed face</i> Discolouration had developed on the right-hand side of the lower centre board. A glow was visible at the head at approximately mid-width of the specimen. A cotton pad was used on the above location but did not glow or ignite. |
| 1 | 54 | <i>Unexposed face</i> Discolouration had developed on the left-hand side of the lower centre board. Discolouration had developed on the right-hand side of the lower left-hand board. A glow was visible at the head from approximately mid-width to the free end of the specimen. A slight glow was visible on the left-hand vertical joint at approximately 1500mm height. |
| 1 | 55 | <i>Unexposed face</i> A cotton pad was used at the head above the left-hand vertical joint but did not glow or ignite. |
| 1 | 56 | <i>Unexposed face</i> A cotton pad was used at the head above the left-hand vertical joint but did not glow or ignite. |
| 1 | 57 | <i>Unexposed face</i> INTEGRITY FAILURE. The cotton pad glowed when used at the head above the left-hand vertical joint. |



| Time | | <i>Observations</i> |
|------|------|--|
| hrs | mins | |
| 2 | 00 | <p>All observations refer to exposed face unless otherwise stated.</p> <p>TEST TERMINATED at the request of the customer.</p> |

Furnace Temperature Graph

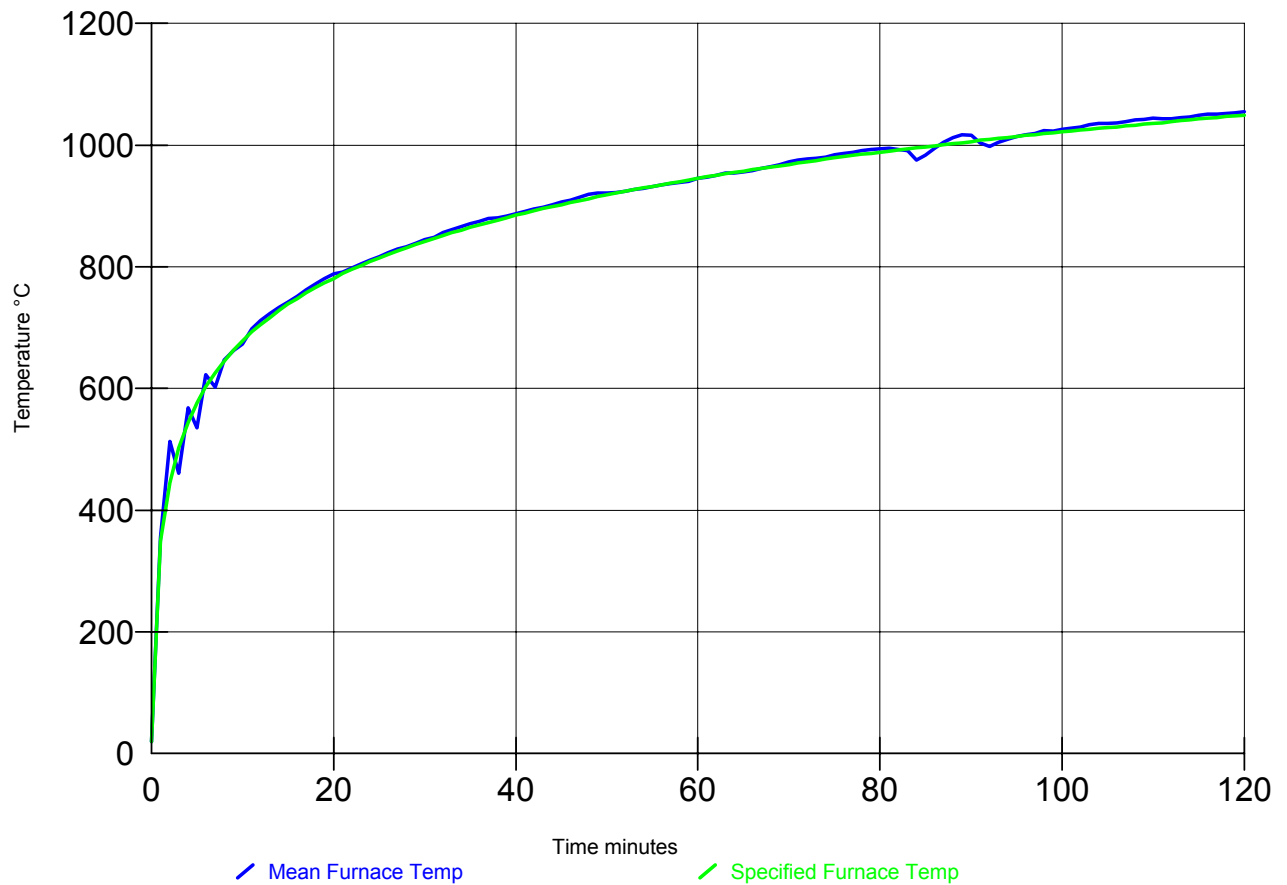


Figure 2. Furnace temperature graph.

Furnace Pressure Graph

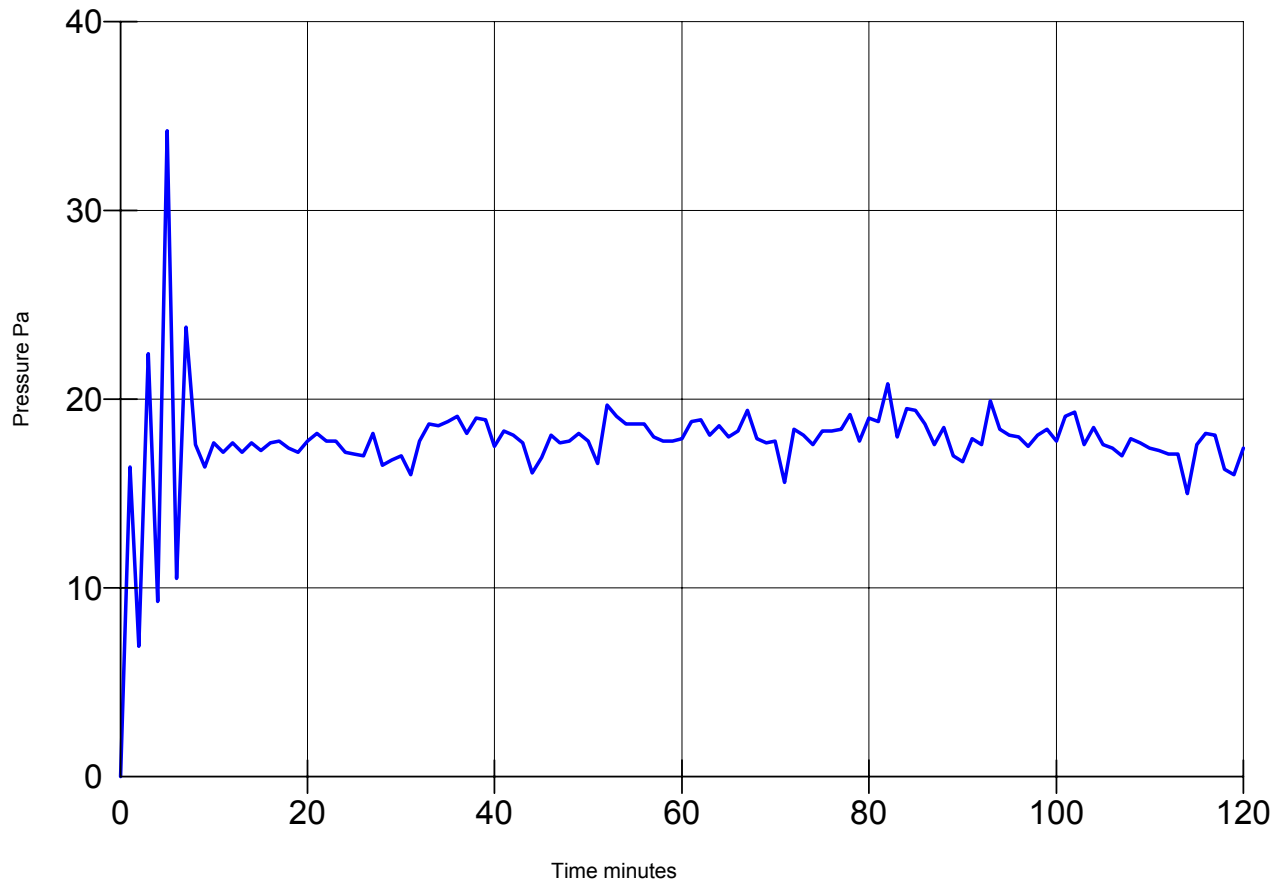


Figure 3. Furnace pressure graph.

The furnace pressure was outside of the allowable tolerance at 6-7 and 82 minutes.

Unexposed Face Temperature Graph

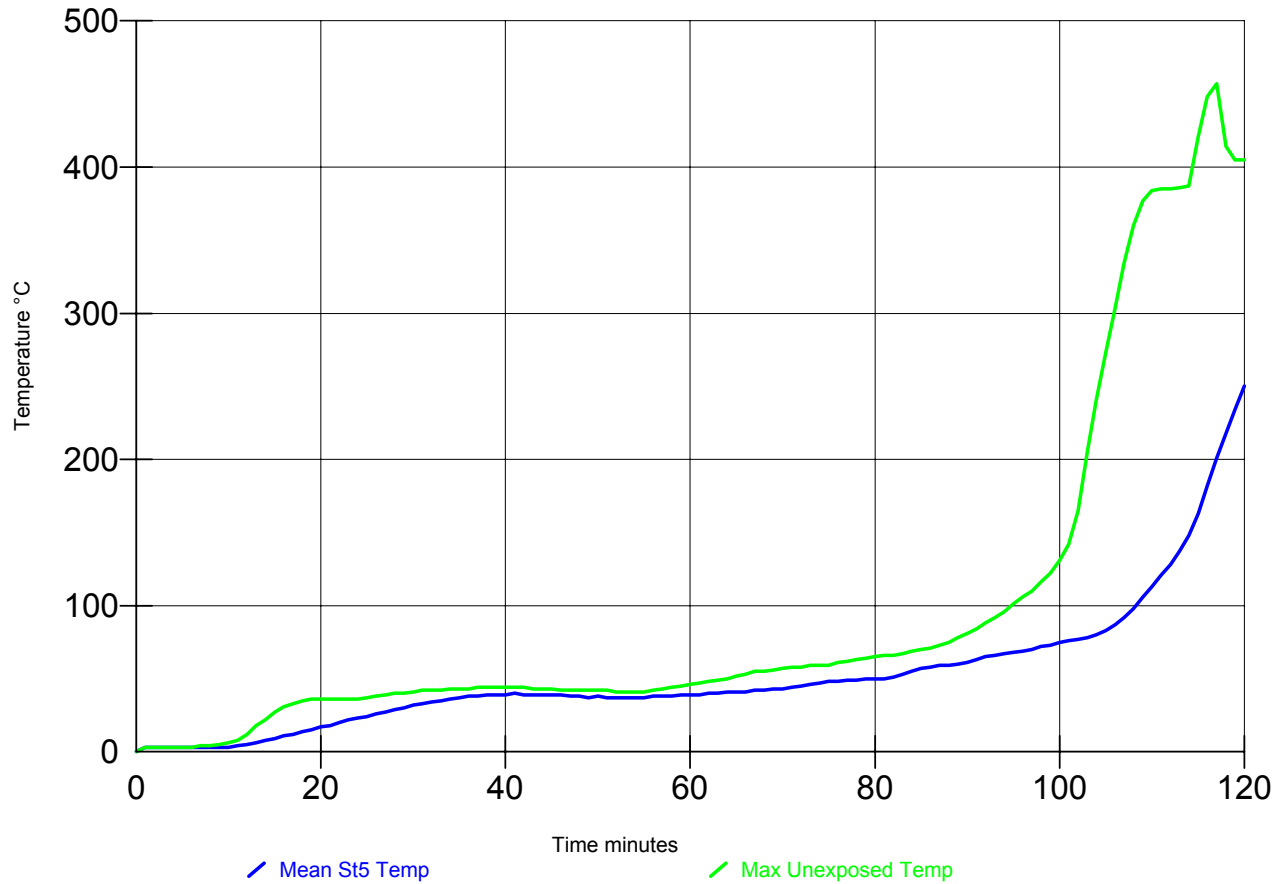


Figure 4. Unexposed face temperature graph.

Unexposed Face Thermocouple Layout

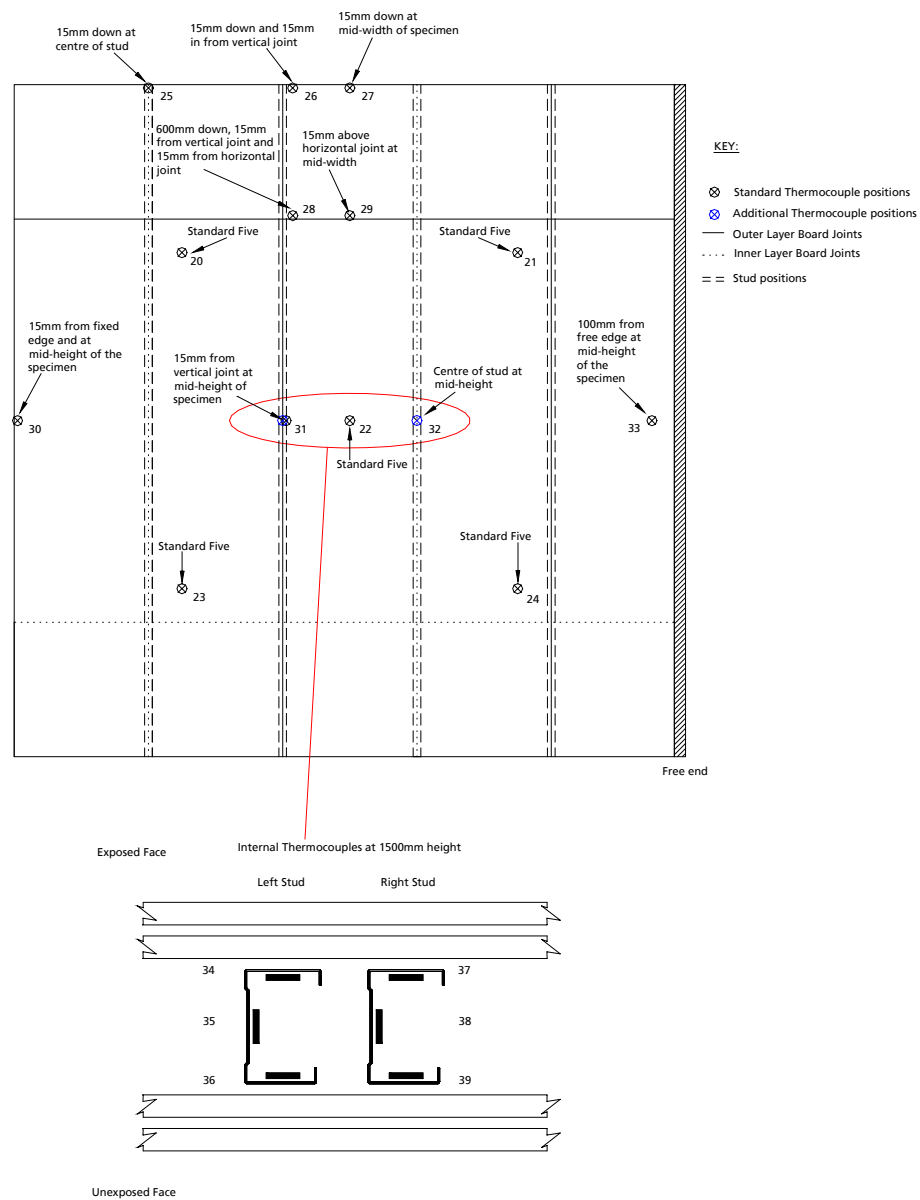


Figure 5. Unexposed face thermocouple layout.

Customer: British Gypsum Limited

Unexposed Face Standard Five 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 | 3 | 3 | 3 | 3 | 3 |
| 2 | 3 | 3 | 3 | 3 | 3 |
| 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 3 | 3 | 3 | 3 | 3 |
| 5 | 3 | 3 | 3 | 3 | 3 |
| 6 | 3 | 3 | 3 | 3 | 3 |
| 7 | 3 | 3 | 3 | 3 | 3 |
| 8 | 3 | 3 | 3 | 3 | 3 |
| 9 | 3 | 4 | 3 | 3 | 3 |
| 10 | 4 | 4 | 4 | 4 | 3 |
| 11 | 4 | 6 | 4 | 4 | 4 |
| 12 | 5 | 7 | 5 | 4 | 4 |
| 13 | 6 | 9 | 6 | 5 | 5 |
| 14 | 8 | 12 | 8 | 6 | 6 |
| 15 | 10 | 14 | 9 | 7 | 7 |
| 16 | 12 | 16 | 11 | 8 | 8 |
| 17 | 14 | 19 | 12 | 9 | 9 |
| 18 | 16 | 21 | 14 | 10 | 10 |
| 19 | 18 | 23 | 16 | 11 | 11 |
| 20 | 20 | 25 | 17 | 12 | 12 |
| 21 | 22 | 27 | 19 | 13 | 13 |
| 22 | 24 | 28 | 20 | 15 | 14 |
| 23 | 26 | 30 | 22 | 16 | 16 |
| 24 | 28 | 32 | 24 | 18 | 17 |
| 25 | 29 | 33 | 25 | 19 | 18 |
| 26 | 31 | 35 | 27 | 21 | 19 |
| 27 | 32 | 36 | 28 | 22 | 21 |
| 28 | 34 | 37 | 30 | 24 | 23 |
| 29 | 35 | 38 | 31 | 26 | 24 |
| 30 | 36 | 39 | 33 | 27 | 26 |
| 31 | 37 | 40 | 34 | 29 | 27 |
| 32 | 38 | 41 | 35 | 31 | 29 |
| 33 | 39 | 41 | 36 | 32 | 30 |

| Time (mins) | Temperature Rise (°C) | | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 20 | Thermocouple No. 21 | Thermocouple No. 22 | Thermocouple No. 23 | Thermocouple No. 24 |
| 34 | 40 | 41 | 37 | 34 | 31 |
| 35 | 40 | 42 | 38 | 35 | 32 |
| 36 | 41 | 42 | 39 | 36 | 33 |
| 37 | 41 | 42 | 39 | 37 | 34 |
| 38 | 42 | 42 | 39 | 38 | 35 |
| 39 | 42 | 42 | 40 | 38 | 36 |
| 40 | 42 | 42 | 40 | 39 | 36 |
| 41 | 43 | 42 | 40 | 39 | 36 |
| 42 | 42 | 42 | 39 | 39 | 37 |
| 43 | 42 | 41 | 39 | 39 | 37 |
| 44 | 42 | 41 | 39 | 39 | 37 |
| 45 | 42 | 40 | 39 | 39 | 37 |
| 46 | 41 | 40 | 38 | 39 | 37 |
| 47 | 41 | 39 | 38 | 39 | 37 |
| 48 | 40 | 39 | 37 | 38 | 37 |
| 49 | 39 | 38 | 37 | 38 | 37 |
| 50 | 39 | 38 | 37 | 38 | 38 |
| 51 | 38 | 37 | 37 | 37 | 38 |
| 52 | 38 | 37 | 37 | 37 | 38 |
| 53 | 38 | 37 | 37 | 37 | 38 |
| 54 | 38 | 38 | 37 | 37 | 38 |
| 55 | 38 | 38 | 37 | 37 | 39 |
| 56 | 38 | 39 | 37 | 38 | 39 |
| 57 | 38 | 40 | 38 | 37 | 39 |
| 58 | 39 | 40 | 38 | 38 | 39 |
| 59 | 39 | 41 | 38 | 38 | 40 |
| 60 | 39 | 41 | 39 | 38 | 40 |
| 61 | 40 | 42 | 39 | 38 | 40 |
| 62 | 41 | 42 | 40 | 38 | 41 |
| 63 | 42 | 42 | 40 | 38 | 41 |
| 64 | 42 | 43 | 40 | 39 | 41 |
| 65 | 43 | 43 | 41 | 39 | 41 |
| 66 | 44 | 43 | 41 | 39 | 42 |
| 67 | 44 | 43 | 41 | 40 | 42 |
| 68 | 45 | 43 | 42 | 40 | 42 |
| 69 | 45 | 44 | 42 | 41 | 43 |
| 70 | 46 | 45 | 43 | 42 | 43 |



| Time (mins) | Temperature Rise (°C) | | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 20 | Thermocouple No. 21 | Thermocouple No. 22 | Thermocouple No. 23 | Thermocouple No. 24 |
| 71 | 46 | 46 | 43 | 42 | 44 |
| 72 | 46 | 49 | 44 | 43 | 44 |
| 73 | 47 | 51 | 45 | 43 | 45 |
| 74 | 47 | 54 | 46 | 44 | 45 |
| 75 | 48 | 56 | 47 | 45 | 46 |
| 76 | 48 | 57 | 47 | 46 | 46 |
| 77 | 49 | 57 | 48 | 47 | 47 |
| 78 | 49 | 57 | 48 | 47 | 47 |
| 79 | 50 | 57 | 48 | 48 | 48 |
| 80 | 50 | 56 | 49 | 49 | 48 |
| 81 | 51 | 56 | 49 | 50 | 48 |
| 82 | 52 | 56 | 50 | 51 | 49 |
| 83 | 53 | 60 | 52 | 52 | 49 |
| 84 | 54 | 64 | 55 | 52 | 52 |
| 85 | 55 | 67 | 58 | 53 | 55 |
| 86 | 56 | 67 | 58 | 53 | 57 |
| 87 | 57 | 68 | 59 | 54 | 58 |
| 88 | 58 | 69 | 58 | 56 | 58 |
| 89 | 58 | 69 | 58 | 57 | 58 |
| 90 | 59 | 70 | 62 | 58 | 58 |
| 91 | 63 | 71 | 65 | 59 | 60 |
| 92 | 66 | 71 | 66 | 59 | 64 |
| 93 | 68 | 72 | 67 | 59 | 66 |
| 94 | 68 | 72 | 68 | 60 | 67 |
| 95 | 69 | 72 | 69 | 63 | 68 |
| 96 | 70 | 73 | 70 | 65 | 69 |
| 97 | 71 | 75 | 70 | 66 | 70 |
| 98 | 72 | 80 | 71 | 68 | 71 |
| 99 | 72 | 85 | 71 | 69 | 71 |
| 100 | 73 | 88 | 72 | 70 | 72 |
| 101 | 73 | 90 | 73 | 71 | 73 |
| 102 | 74 | 92 | 74 | 72 | 73 |
| 103 | 74 | 96 | 75 | 73 | 75 |
| 104 | 75 | 100 | 79 | 73 | 76 |
| 105 | 77 | 105 | 84 | 74 | 79 |
| 106 | 80 | 112 | 87 | 75 | 84 |
| 107 | 85 | 124 | 90 | 76 | 87 |



| Time (mins) | Temperature Rise (°C) | | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 20 | Thermocouple No. 21 | Thermocouple No. 22 | Thermocouple No. 23 | Thermocouple No. 24 |
| 108 | 89 | 140 | 93 | 79 | 89 |
| 109 | 92 | 168 | 97 | 84 | 91 |
| 110 | 96 | 191 | 101 | 87 | 94 |
| 111 | 100 | 209 | 107 | 91 | 98 |
| 112 | 104 | 224 | 116 | 94 | 103 |
| 113 | 110 | 237 | 133 | 98 | 108 |
| 114 | 118 | 248 | 157 | 102 | 118 |
| 115 | 134 | 258 | 183 | 108 | 136 |
| 116 | 159 | 267 | 204 | 117 | 163 |
| 117 | 186 | 276 | 221 | 135 | 187 |
| 118 | 205 | 284 | 236 | 159 | 207 |
| 119 | 220 | 293 | 250 | 186 | 224 |
| 120 | 235 | 302 | 266 | 208 | 239 |

See figure 5 for the locations of the 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 | 3 | 3 | 3 | 3 | 3 |
| 2 | 3 | 3 | 3 | 3 | 3 |
| 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 3 | 3 | 3 | 3 | 3 |
| 5 | 3 | 3 | 3 | 3 | 3 |
| 6 | 3 | 3 | 3 | 3 | 3 |
| 7 | 3 | 3 | 3 | 4 | 3 |
| 8 | 4 | 4 | 4 | 4 | 3 |
| 9 | 4 | 5 | 4 | 5 | 4 |
| 10 | 5 | 6 | 6 | 6 | 4 |
| 11 | 8 | 8 | 8 | 7 | 5 |
| 12 | 12 | 11 | 10 | 8 | 6 |
| 13 | 18 | 14 | 13 | 10 | 8 |
| 14 | 22 | 18 | 16 | 12 | 9 |
| 15 | 27 | 21 | 18 | 13 | 11 |
| 16 | 31 | 24 | 21 | 15 | 13 |
| 17 | 33 | 27 | 24 | 17 | 15 |
| 18 | 35 | 29 | 26 | 18 | 18 |
| 19 | 36 | 30 | 28 | 20 | 20 |
| 20 | 36 | 32 | 30 | 22 | 22 |
| 21 | 36 | 33 | 31 | 24 | 24 |
| 22 | 36 | 34 | 33 | 26 | 26 |
| 23 | 36 | 35 | 34 | 27 | 28 |
| 24 | 36 | 36 | 35 | 29 | 29 |
| 25 | 37 | 37 | 36 | 31 | 31 |
| 26 | 38 | 38 | 37 | 32 | 33 |
| 27 | 38 | 39 | 38 | 34 | 34 |
| 28 | 39 | 40 | 39 | 35 | 35 |
| 29 | 40 | 40 | 39 | 36 | 37 |
| 30 | 41 | 41 | 40 | 37 | 38 |
| 31 | 41 | 42 | 40 | 38 | 39 |
| 32 | 42 | 42 | 40 | 39 | 39 |
| 33 | 42 | 42 | 41 | 40 | 40 |



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



| Time (mins) | Temperature Rise (°C) | | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 25 | Thermocouple No. 26 | Thermocouple No. 27 | Thermocouple No. 28 | Thermocouple No. 29 |
| 71 | 45 | 58 | 55 | 53 | 49 |
| 72 | 46 | 58 | 56 | 54 | 50 |
| 73 | 47 | 59 | 57 | 55 | 50 |
| 74 | 49 | 59 | 57 | 57 | 51 |
| 75 | 50 | 59 | 57 | 59 | 51 |
| 76 | 51 | 60 | 58 | 61 | 51 |
| 77 | 52 | 60 | 58 | 62 | 52 |
| 78 | 53 | 60 | 58 | 63 | 52 |
| 79 | 53 | 60 | 58 | 64 | 52 |
| 80 | 54 | 61 | 58 | 65 | 52 |
| 81 | 54 | 61 | 59 | 66 | 53 |
| 82 | 54 | 61 | 59 | 66 | 53 |
| 83 | 55 | 62 | 59 | 67 | 53 |
| 84 | 55 | 62 | 59 | 69 | 54 |
| 85 | 56 | 63 | 60 | 70 | 55 |
| 86 | 56 | 64 | 60 | 71 | 56 |
| 87 | 57 | 66 | 60 | 73 | 57 |
| 88 | 58 | 67 | 61 | 75 | 58 |
| 89 | 59 | 68 | 61 | 78 | 60 |
| 90 | 59 | 69 | 62 | 81 | 61 |
| 91 | 60 | 71 | 63 | 84 | 61 |
| 92 | 61 | 72 | 65 | 88 | 62 |
| 93 | 62 | 73 | 67 | 92 | 62 |
| 94 | 63 | 75 | 68 | 96 | 63 |
| 95 | 64 | 77 | 70 | 101 | 65 |
| 96 | 66 | 80 | 72 | 106 | 67 |
| 97 | 67 | 82 | 73 | 110 | 68 |
| 98 | 69 | 84 | 75 | 116 | 69 |
| 99 | 69 | 86 | 76 | 122 | 70 |
| 100 | 70 | 89 | 79 | 131 | 71 |
| 101 | 71 | 91 | 82 | 142 | 72 |
| 102 | 71 | 93 | 85 | 154 | 73 |
| 103 | 72 | 97 | 88 | 167 | 74 |
| 104 | 74 | 101 | 90 | 181 | 75 |
| 105 | 75 | 107 | 92 | 196 | 77 |
| 106 | 76 | 115 | 94 | 211 | 82 |
| 107 | 79 | 125 | 96 | 225 | 87 |



| Time (mins) | Temperature Rise (°C) | | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 25 | Thermocouple No. 26 | Thermocouple No. 27 | Thermocouple No. 28 | Thermocouple No. 29 |
| 108 | 86 | 144 | 100 | 240 | 91 |
| 109 | 93 | 163 | 106 | 256 | 96 |
| 110 | 98 | 187 | 114 | 273 | 101 |
| 111 | 103 | 209 | 124 | 289 | 107 |
| 112 | 109 | 249 | 141 | 302 | 114 |
| 113 | 118 | 292 | 165 | 316 | 124 |
| 114 | 135 | 368 | 188 | 336 | 139 |
| 115 | 160 | 421 | 216 | 365 | 158 |
| 116 | 190 | 448 | 240 | 383 | 181 |
| 117 | 219 | 457 | 252 | 386 | 201 |
| 118 | 248 | 414 | 271 | 382 | 227 |
| 119 | 276 | 392 | 292 | 382 | 258 |
| 120 | 308 | 390 | 322 | 383 | 285 |

See figure 5 for the locations of the thermocouples.

Thermocouple No. 28 was located on a screw head.



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 | 3 | 3 | 3 | 3 |
| 2 | 3 | 3 | 3 | 3 |
| 3 | 3 | 3 | 3 | 3 |
| 4 | 3 | 3 | 3 | 3 |
| 5 | 3 | 3 | 3 | 3 |
| 6 | 3 | 3 | 3 | 3 |
| 7 | 4 | 3 | 3 | 3 |
| 8 | 4 | 3 | 3 | 3 |
| 9 | 4 | 3 | 3 | 3 |
| 10 | 4 | 4 | 4 | 4 |
| 11 | 4 | 5 | 4 | 4 |
| 12 | 4 | 5 | 5 | 5 |
| 13 | 5 | 7 | 7 | 6 |
| 14 | 6 | 8 | 9 | 8 |
| 15 | 6 | 10 | 10 | 10 |
| 16 | 7 | 11 | 12 | 11 |
| 17 | 8 | 13 | 14 | 13 |
| 18 | 10 | 14 | 16 | 15 |
| 19 | 11 | 15 | 18 | 17 |
| 20 | 12 | 17 | 19 | 19 |
| 21 | 13 | 18 | 21 | 20 |
| 22 | 15 | 20 | 23 | 22 |
| 23 | 16 | 21 | 25 | 23 |
| 24 | 18 | 23 | 27 | 25 |
| 25 | 19 | 25 | 29 | 26 |
| 26 | 21 | 26 | 30 | 28 |
| 27 | 22 | 28 | 31 | 29 |
| 28 | 24 | 29 | 31 | 30 |
| 29 | 26 | 31 | 32 | 32 |
| 30 | 27 | 32 | 33 | 33 |
| 31 | 29 | 34 | 33 | 34 |
| 32 | 31 | 35 | 34 | 35 |
| 33 | 32 | 36 | 35 | 36 |



| Time (mins) | Temperature Rise (°C) | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 30 | Thermocouple No. 31 | Thermocouple No. 32 | Thermocouple No. 33 |
| 34 | 33 | 37 | 36 | 38 |
| 35 | 35 | 37 | 36 | 38 |
| 36 | 36 | 38 | 37 | 39 |
| 37 | 37 | 39 | 37 | 40 |
| 38 | 38 | 39 | 38 | 40 |
| 39 | 39 | 39 | 38 | 41 |
| 40 | 39 | 40 | 38 | 41 |
| 41 | 40 | 39 | 38 | 41 |
| 42 | 40 | 39 | 38 | 41 |
| 43 | 40 | 39 | 38 | 41 |
| 44 | 41 | 39 | 38 | 41 |
| 45 | 41 | 39 | 38 | 41 |
| 46 | 41 | 38 | 38 | 40 |
| 47 | 42 | 38 | 38 | 40 |
| 48 | 42 | 38 | 38 | 39 |
| 49 | 42 | 38 | 38 | 39 |
| 50 | 42 | 38 | 39 | 38 |
| 51 | 42 | 39 | 39 | 38 |
| 52 | 41 | 39 | 40 | 38 |
| 53 | 41 | 39 | 40 | 38 |
| 54 | 40 | 40 | 41 | 38 |
| 55 | 40 | 40 | 41 | 38 |
| 56 | 39 | 40 | 42 | 38 |
| 57 | 39 | 40 | 42 | 38 |
| 58 | 39 | 40 | 42 | 38 |
| 59 | 38 | 40 | 43 | 38 |
| 60 | 38 | 40 | 43 | 39 |
| 61 | 38 | 40 | 43 | 39 |
| 62 | 39 | 40 | 43 | 39 |
| 63 | 39 | 40 | 43 | 40 |
| 64 | 39 | 41 | 44 | 40 |
| 65 | 39 | 41 | 44 | 41 |
| 66 | 39 | 41 | 44 | 41 |
| 67 | 40 | 42 | 44 | 41 |
| 68 | 40 | 42 | 44 | 42 |
| 69 | 40 | 44 | 44 | 42 |
| 70 | 40 | 45 | 45 | 43 |



| Time (mins) | Temperature Rise (°C) | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 30 | Thermocouple No. 31 | Thermocouple No. 32 | Thermocouple No. 33 |
| 71 | 41 | 47 | 45 | 43 |
| 72 | 41 | 49 | 46 | 44 |
| 73 | 41 | 51 | 46 | 45 |
| 74 | 42 | 52 | 47 | 45 |
| 75 | 42 | 53 | 47 | 46 |
| 76 | 43 | 53 | 48 | 46 |
| 77 | 43 | 54 | 48 | 46 |
| 78 | 43 | 55 | 49 | 47 |
| 79 | 44 | 55 | 50 | 47 |
| 80 | 44 | 56 | 51 | 48 |
| 81 | 45 | 56 | 52 | 49 |
| 82 | 45 | 56 | 53 | 50 |
| 83 | 45 | 56 | 56 | 52 |
| 84 | 46 | 56 | 60 | 54 |
| 85 | 46 | 57 | 62 | 55 |
| 86 | 46 | 58 | 65 | 55 |
| 87 | 46 | 60 | 67 | 56 |
| 88 | 47 | 65 | 68 | 57 |
| 89 | 47 | 68 | 71 | 58 |
| 90 | 48 | 69 | 73 | 58 |
| 91 | 48 | 69 | 73 | 59 |
| 92 | 49 | 70 | 73 | 58 |
| 93 | 50 | 70 | 75 | 58 |
| 94 | 50 | 70 | 75 | 59 |
| 95 | 51 | 71 | 76 | 65 |
| 96 | 51 | 71 | 76 | 68 |
| 97 | 52 | 72 | 77 | 68 |
| 98 | 52 | 73 | 82 | 68 |
| 99 | 53 | 74 | 92 | 68 |
| 100 | 54 | 76 | 105 | 69 |
| 101 | 56 | 82 | 126 | 70 |
| 102 | 57 | 88 | 165 | 71 |
| 103 | 58 | 92 | 206 | 71 |
| 104 | 59 | 97 | 241 | 72 |
| 105 | 61 | 103 | 273 | 73 |
| 106 | 63 | 108 | 304 | 74 |
| 107 | 64 | 113 | 334 | 75 |



| Time (mins) | Temperature Rise (°C) | | | |
|----------------|------------------------|------------------------|------------------------|------------------------|
| | Thermocouple No. 30 | Thermocouple No. 31 | Thermocouple No. 32 | Thermocouple No. 33 |
| 108 | 65 | 129 | 360 | 78 |
| 109 | 66 | 152 | 377 | 83 |
| 110 | 68 | 182 | 384 | 86 |
| 111 | 70 | 207 | 385 | 89 |
| 112 | 72 | 231 | 385 | 91 |
| 113 | 73 | 251 | 386 | 94 |
| 114 | 75 | 264 | 387 | 98 |
| 115 | 76 | 280 | 391 | 103 |
| 116 | 78 | 295 | 395 | 110 |
| 117 | 82 | 303 | 398 | 119 |
| 118 | 86 | 312 | 403 | 135 |
| 119 | 89 | 322 | 405 | 160 |
| 120 | 93 | 331 | 405 | 185 |

See figure 5 for the locations of the thermocouples.

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

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 | 31 | 29 | 27 | 34 | 32 | 31 |
| 1 | 34 | 32 | 30 | 37 | 35 | 34 |
| 2 | 35 | 32 | 30 | 38 | 35 | 34 |
| 3 | 49 | 35 | 30 | 41 | 36 | 34 |
| 4 | 72 | 47 | 33 | 46 | 37 | 34 |
| 5 | 86 | 76 | 64 | 54 | 43 | 38 |
| 6 | 91 | 82 | 76 | 64 | 52 | 48 |
| 7 | 92 | 82 | 78 | 72 | 61 | 58 |
| 8 | 94 | 86 | 82 | 79 | 71 | 69 |
| 9 | 95 | 89 | 85 | 87 | 86 | 84 |
| 10 | 95 | 89 | 86 | 91 | 90 | 85 |
| 11 | 95 | 89 | 85 | 94 | 90 | 82 |
| 12 | 94 | 88 | 84 | 94 | 87 | 82 |
| 13 | 94 | 87 | 83 | 95 | 87 | 82 |
| 14 | 94 | 87 | 83 | 97 | 87 | 81 |
| 15 | 94 | 88 | 83 | 98 | 89 | 82 |
| 16 | 95 | 89 | 84 | 101 | 90 | 84 |
| 17 | 98 | 91 | 87 | 103 | 92 | 86 |
| 18 | 99 | 94 | 90 | 106 | 94 | 88 |
| 19 | 100 | 95 | 91 | 108 | 96 | 91 |
| 20 | 102 | 97 | 92 | 110 | 98 | 93 |
| 21 | 103 | 97 | 93 | 114 | 101 | 96 |
| 22 | 103 | 99 | 93 | 117 | 104 | 99 |
| 23 | 103 | 100 | 94 | 121 | 107 | 101 |
| 24 | 104 | 101 | 95 | 124 | 110 | 104 |
| 25 | 105 | 103 | 95 | 127 | 112 | 105 |
| 26 | 106 | 104 | 96 | 129 | 114 | 106 |
| 27 | 107 | 105 | 97 | 131 | 116 | 108 |
| 28 | 109 | 107 | 97 | 134 | 118 | 109 |
| 29 | 113 | 108 | 98 | 139 | 120 | 110 |
| 30 | 118 | 110 | 98 | 148 | 123 | 111 |
| 31 | 126 | 112 | 99 | 161 | 126 | 112 |



| 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 | 135 | 115 | 101 | 178 | 131 | 114 |
| 33 | 145 | 119 | 102 | 199 | 139 | 117 |
| 34 | 155 | 124 | 105 | 222 | 149 | 121 |
| 35 | 167 | 131 | 108 | 244 | 161 | 126 |
| 36 | 181 | 138 | 112 | 264 | 174 | 133 |
| 37 | 198 | 149 | 115 | 285 | 186 | 139 |
| 38 | 218 | 161 | 119 | 305 | 200 | 147 |
| 39 | 240 | 176 | 123 | 324 | 214 | 155 |
| 40 | 264 | 194 | 130 | 343 | 230 | 166 |
| 41 | 290 | 215 | 141 | 360 | 246 | 177 |
| 42 | 320 | 237 | 155 | 375 | 263 | 190 |
| 43 | 349 | 260 | 172 | 391 | 282 | 206 |
| 44 | 377 | 283 | 188 | 408 | 304 | 223 |
| 45 | 405 | 304 | 201 | 424 | 326 | 238 |
| 46 | 429 | 325 | 214 | 441 | 344 | 248 |
| 47 | 450 | 344 | 228 | 457 | 360 | 256 |
| 48 | 469 | 363 | 244 | 466 | 372 | 265 |
| 49 | 478 | 380 | 258 | 472 | 383 | 275 |
| 50 | 487 | 389 | 266 | 479 | 393 | 283 |
| 51 | 493 | 393 | 269 | 488 | 402 | 289 |
| 52 | 504 | 395 | 270 | 496 | 407 | 290 |
| 53 | 504 | 387 | 265 | 501 | 402 | 280 |
| 54 | 497 | 377 | 259 | 501 | 389 | 267 |
| 55 | 496 | 373 | 255 | 502 | 377 | 258 |
| 56 | 499 | 372 | 255 | 504 | 371 | 252 |
| 57 | 501 | 373 | 255 | 506 | 370 | 250 |
| 58 | 505 | 376 | 257 | 509 | 371 | 251 |
| 59 | 511 | 380 | 260 | 513 | 374 | 253 |
| 60 | 520 | 387 | 264 | 517 | 379 | 255 |
| 61 | 530 | 395 | 269 | 522 | 383 | 258 |
| 62 | 541 | 404 | 274 | 528 | 387 | 260 |
| 63 | 553 | 414 | 280 | 534 | 393 | 264 |
| 64 | 564 | 424 | 287 | 540 | 398 | 267 |
| 65 | 575 | 435 | 294 | 545 | 404 | 271 |
| 66 | 584 | 444 | 301 | 549 | 409 | 275 |

| 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 | 661 | 468 | 314 | 554 | 416 | 280 |
| 68 | 706 | 514 | 345 | 563 | 425 | 286 |
| 69 | 713 | 550 | 379 | 575 | 436 | 295 |
| 70 | 707 | 564 | 398 | 588 | 449 | 305 |
| 71 | 711 | 577 | 414 | 603 | 462 | 315 |
| 72 | 717 | 587 | 428 | 615 | 472 | 326 |
| 73 | 727 | 603 | 448 | 628 | 484 | 336 |
| 74 | 737 | 623 | 481 | 639 | 497 | 346 |
| 75 | 743 | 642 | 519 | 649 | 508 | 357 |
| 76 | 745 | 662 | 563 | 656 | 518 | 368 |
| 77 | 743 | 683 | 617 | 662 | 530 | 381 |
| 78 | 734 | 701 | 666 | 666 | 542 | 397 |
| 79 | 725 | 711 | 695 | 669 | 556 | 415 |
| 80 | 720 | 716 | 711 | 674 | 572 | 438 |
| 81 | 715 | 714 | 713 | 680 | 593 | 495 |
| 82 | 739 | 755 | 748 | 762 | 752 | 645 |
| 83 | 722 | 738 | 726 | 810 | 804 | 804 |
| 84 | 787 | 785 | 770 | - | 818 | 952 |
| 85 | 937 | 955 | - | - | 845 | 964 |
| 86 | 935 | 989 | - | - | - | - |
| 87 | 955 | - | - | - | - | - |
| 88 | - | - | - | - | - | - |

See figure 5 for the locations of the thermocouples.

Thermocouple No. 34 did not work after 87 minutes.
Thermocouple No. 35 did not work after 86 minutes.
Thermocouple No. 36 did not work after 84 minutes.
Thermocouple No. 37 did not work after 83 minutes.
Thermocouple No. 38 did not work after 85 minutes.
Thermocouple No. 39 did not work after 85 minutes.

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BTC 13483F: Page 34 of 43



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 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 0 | 0 |
| 7 | 0 | 0 |
| 8 | 0 | 0 |
| 9 | 0 | 0 |
| 10 | 0 | 0 |
| 11 | 0 | 0 |
| 12 | 0 | 0 |
| 13 | 0 | 0 |
| 14 | 0 | 0 |
| 15 | -1 | 0 |
| 16 | -1 | 0 |
| 17 | -1 | 0 |
| 18 | -2 | 0 |
| 19 | -2 | 0 |
| 20 | -2 | 0 |
| 21 | -2 | 0 |
| 22 | -1 | 0 |
| 23 | -1 | 0 |
| 24 | -1 | 0 |
| 25 | -1 | 0 |
| 26 | -1 | 0 |
| 27 | -1 | 0 |
| 28 | -1 | 0 |
| 29 | -1 | 0 |
| 30 | -1 | 0 |
| 31 | -1 | 0 |
| 32 | 1 | 0 |
| 33 | 2 | 0 |
| 34 | 3 | 0 |



| Time (mins) | Deflection at centre of the specimen (mm) | Deflection 50mm from free end of the specimen (mm) |
|-------------|---|--|
| 35 | 5 | 0 |
| 36 | 5 | 0 |
| 37 | 12 | 1 |
| 38 | 12 | 1 |
| 39 | 14 | 2 |
| 40 | 15 | 3 |
| 41 | 18 | 3 |
| 42 | 20 | 6 |
| 43 | 22 | 8 |
| 44 | 24 | 10 |
| 45 | 25 | 11 |
| 46 | 27 | 13 |
| 47 | 29 | 14 |
| 48 | 30 | 15 |
| 49 | 30 | 15 |
| 50 | 30 | 15 |
| 51 | 30 | 15 |
| 52 | 29 | 14 |
| 53 | 28 | 14 |
| 54 | 27 | 14 |
| 55 | 24 | 14 |
| 56 | 23 | 14 |
| 57 | 20 | 14 |
| 58 | 20 | 14 |
| 59 | 17 | 14 |
| 60 | 15 | 14 |
| 61 | 15 | 14 |
| 62 | 13 | 13 |
| 63 | 11 | 13 |
| 64 | 8 | 12 |
| 65 | 6 | 11 |
| 66 | 5 | 11 |
| 67 | 2 | 10 |
| 68 | 0 | 10 |
| 69 | -3 | 9 |
| 70 | -6 | 8 |
| 71 | -8 | 8 |
| 72 | -7 | 8 |



| Time (mins) | Deflection at centre of the specimen (mm) | Deflection 50mm from free end of the specimen (mm) |
|-------------|---|--|
| 73 | -7 | 8 |
| 74 | -8 | 7 |
| 75 | -9 | 6 |
| 76 | -10 | 6 |
| 77 | -11 | 6 |
| 78 | -12 | 5 |
| 79 | -13 | 5 |
| 80 | -15 | 4 |
| 81 | -17 | 4 |
| 82 | -15 | 4 |
| 83 | -18 | 4 |
| 84 | -21 | 4 |
| 85 | -24 | 4 |
| 86 | -24 | 4 |
| 87 | -25 | 4 |
| 88 | -25 | 3 |
| 89 | -25 | 3 |
| 90 | -27 | 3 |
| 91 | -29 | 3 |
| 92 | -30 | 3 |
| 93 | -32 | 2 |
| 94 | -32 | 2 |
| 95 | -34 | 2 |
| 96 | -34 | 2 |
| 97 | -34 | 2 |
| 98 | -34 | 2 |
| 99 | -34 | 2 |

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 readings were discontinued after 99 minutes.

(The lateral deflection was recorded by taking measurements relative to a fixed reference wire at 1 minute intervals due to equipment availability at the time of the test).

PHOTOGRAPHS



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



The Building Test Centre

Fire Acoustics Structures

The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com



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

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BTC 13483F: Page 39 of 43



0296



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British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com



Photograph 3. View of the unexposed face at 102 minutes (after insulation failure).

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BTC 13483F: Page 40 of 43



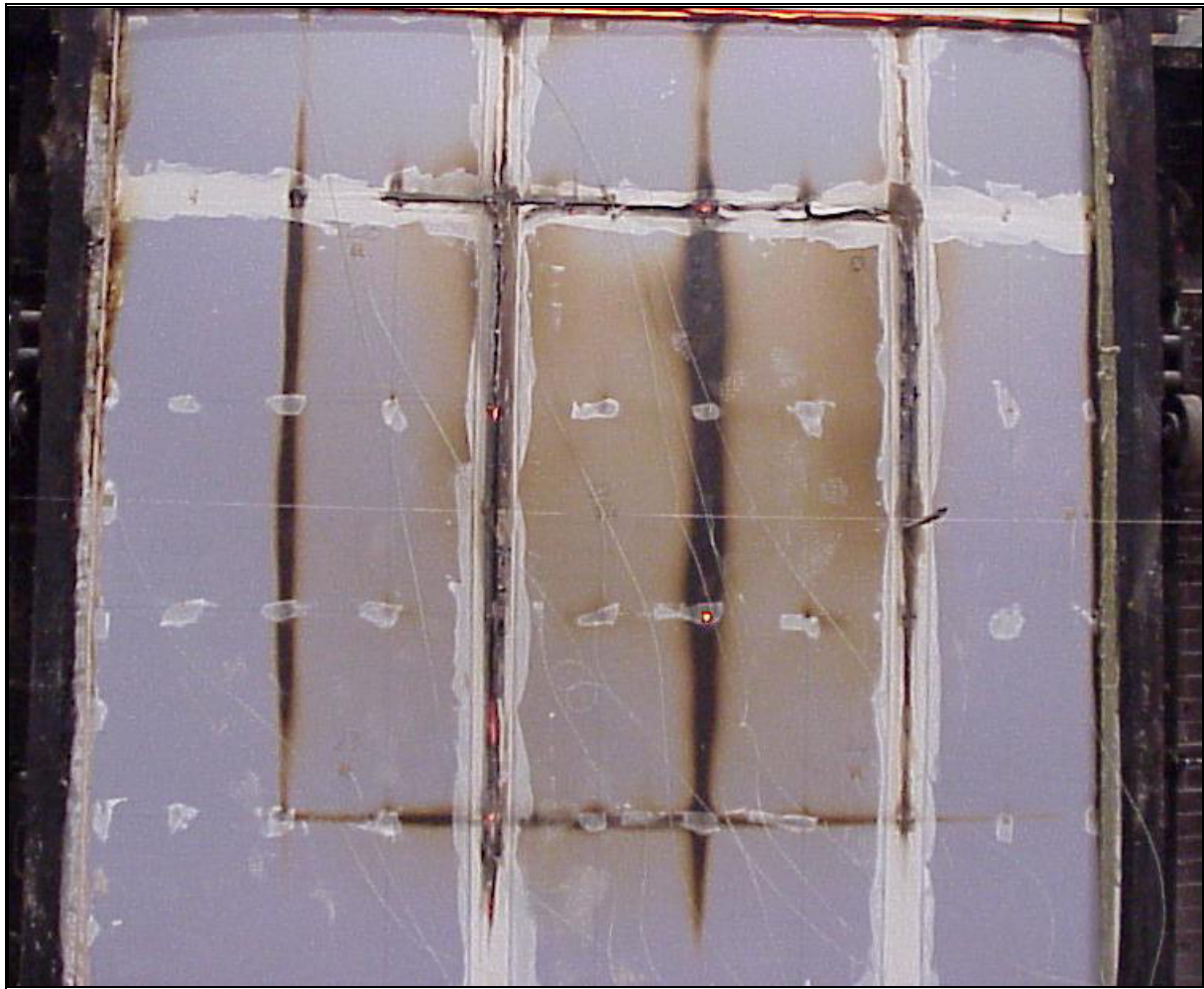
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The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com



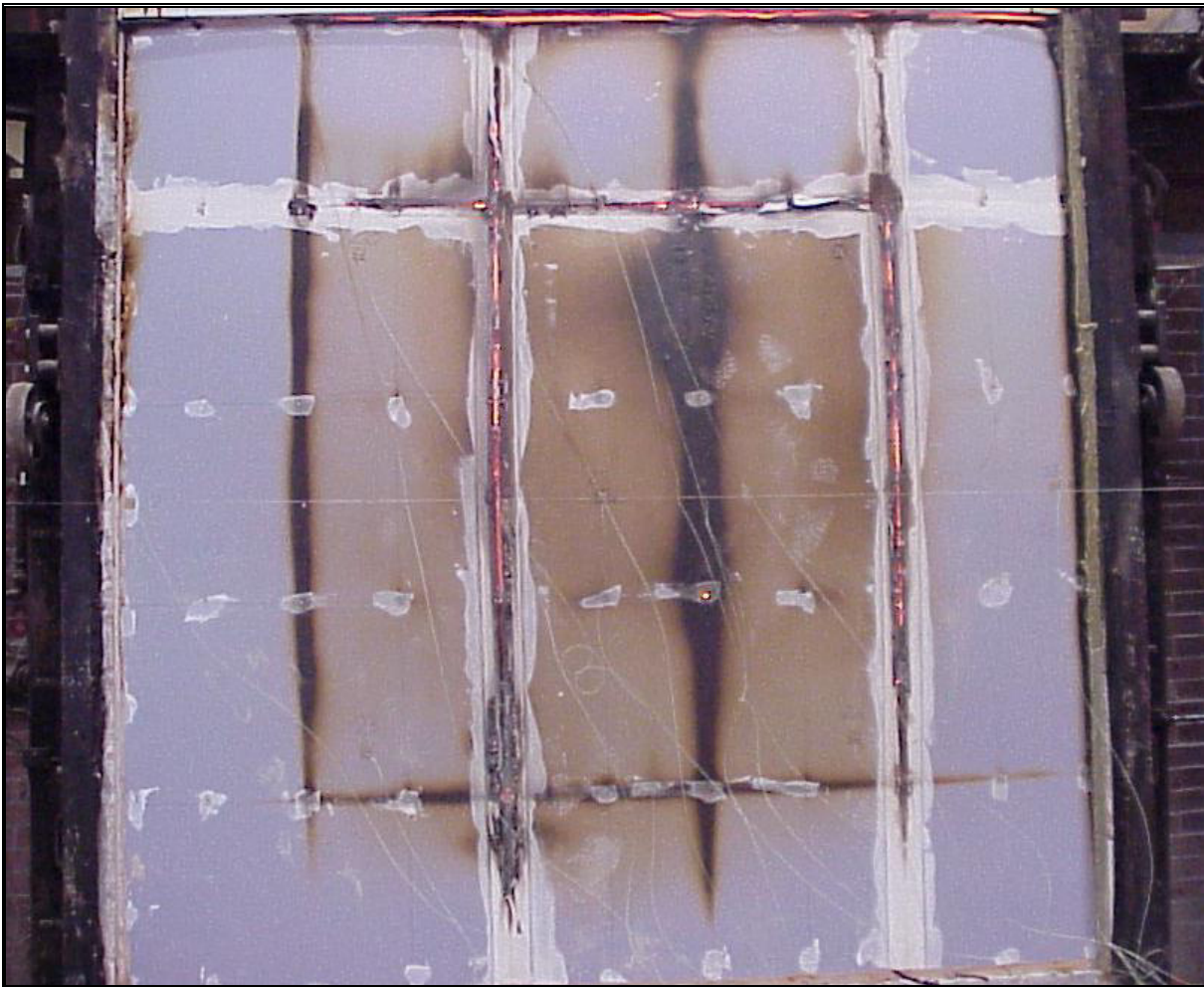
Photograph 4. View of the unexposed face at 117 minutes (after integrity failure).



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The Building Test Centre
British Gypsum Limited
East Leake
Loughborough
Leics. LE12 6NP
Tel (0115) 945 1564
Fax (0115) 945 1562
email btc.testing@bpb.com



Photograph 5. View of the unexposed face at test termination (120 minutes).

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BTC 13483F: Page 42 of 43



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 3000mm.
- (ii) Increase in the thickness of the wall (minimum thickness 138mm).
- (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 ($\leq 2400\text{mm}$ long x $\leq 1200\text{mm}$ wide Gyproc SoundBloc).
- (v) Decrease stud spacing from 600mm.
- (vi) Decrease in fixing centres from 300mm.
- (vii) 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 | 90 minutes |
|------------------|------------------|------------------|
| <100mm, ∴ 4000mm | <100mm, ∴ 4000mm | <100mm, ∴ 4000mm |