

# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

Report Number: **BTC 20112F**

A FIRE RESISTANCE TEST ON A GYPWALL METAL STUD PARTITION WITH 70MM STUD FRAMEWORK CLAD EACH SIDE WITH A SINGLE LAYER OF 15MM GYPROC DURALINE EX KIRKBY THORE, CONDUCTED IN ACCORDANCE WITH BS EN 1364-1: 2015. (ULTRAEMBOSSED C STUD).

Test Date: 12<sup>th</sup> June 2017

[www.btconline.co.uk](http://www.btconline.co.uk)

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

Customer: **British Gypsum**

BTC 20112F: Page 1 of 39



0296

## TABLE OF CONTENTS

|                                                    |           |
|----------------------------------------------------|-----------|
| <b>FOREWORD .....</b>                              | <b>4</b>  |
| <b>REPORT AUTHORISATION .....</b>                  | <b>4</b>  |
| <b>TEST REPORT AMENDMENTS .....</b>                | <b>5</b>  |
| <b>TEST CONSTRUCTION.....</b>                      | <b>6</b>  |
| Description of Construction .....                  | 6         |
| Test Construction Drawings.....                    | 7         |
| Horizontal Cross Section .....                     | 7         |
| Exposed Face Elevation .....                       | 8         |
| Unexposed Face Elevation .....                     | 9         |
| <b>TEST MATERIALS.....</b>                         | <b>10</b> |
| Plasterboard .....                                 | 10        |
| Metal Components .....                             | 10        |
| Fasteners .....                                    | 10        |
| Miscellaneous Components .....                     | 10        |
| <b>TEST PROCEDURE.....</b>                         | <b>11</b> |
| <b>TEST RESULTS.....</b>                           | <b>12</b> |
| <b>LIMITATIONS.....</b>                            | <b>12</b> |
| <b>TEST DATA.....</b>                              | <b>13</b> |
| 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.....    | 23        |
| Additional Unexposed Face Temperature Data.....    | 26        |
| Internal Temperature Data at 1500mm Height.....    | 29        |
| Specimen Lateral Deflection.....                   | 32        |
| <b>PHOTOGRAPHS.....</b>                            | <b>35</b> |
| Unexposed Face Prior to Test .....                 | 35        |
| Unexposed Face at 30 Minutes.....                  | 36        |
| Unexposed Face at 1 Hour.....                      | 37        |

# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: btc.testing@saint-gobain.com

Unexposed Face After Test Termination ..... 38

FIELD OF DIRECT APPLICATION ..... 39

    General ..... 39

    Extension of Width ..... 39

    Extension of Height ..... 39



### FOREWORD

This test report details a fire resistance test conducted on a metal stud partition clad on each face with a single layer of Gyproc DuraLine.

The test sponsor was British Gypsum.

The test specimen was installed by PVR Joinery. The construction of the specimen took place on the 6<sup>th</sup> June 2017. The Building Test Centre played no role in the design or selection of materials comprising the test specimen.

The test was conducted on the 12<sup>th</sup> June 2017.

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

**Matthew Porter**  
MEng. (Hons.)  
Scientist

Authorised by

**Paul Miller**  
BSc. (Hons.)  
Fire Test Manager

*The Building Test Centre will not discuss the content of this report without written permission from the test sponsor. The Building Test Centre retains ownership of the test report content but authorises the test sponsor to reproduce the report as necessary in its entirety only.*

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: btc.testing@saint-gobain.com

### TEST REPORT AMENDMENTS

| Page | Amendments | Date |
|------|------------|------|
|      |            |      |
|      |            |      |
|      |            |      |

Report Amendments Author

**Name**  
*Role*

Amendments Authorised by

**Name**  
*Role*

Customer: **British Gypsum**

BTC 20112F: Page 5 of 39



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 70S50 'C' Studs 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 70S50 'C' Stud 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.

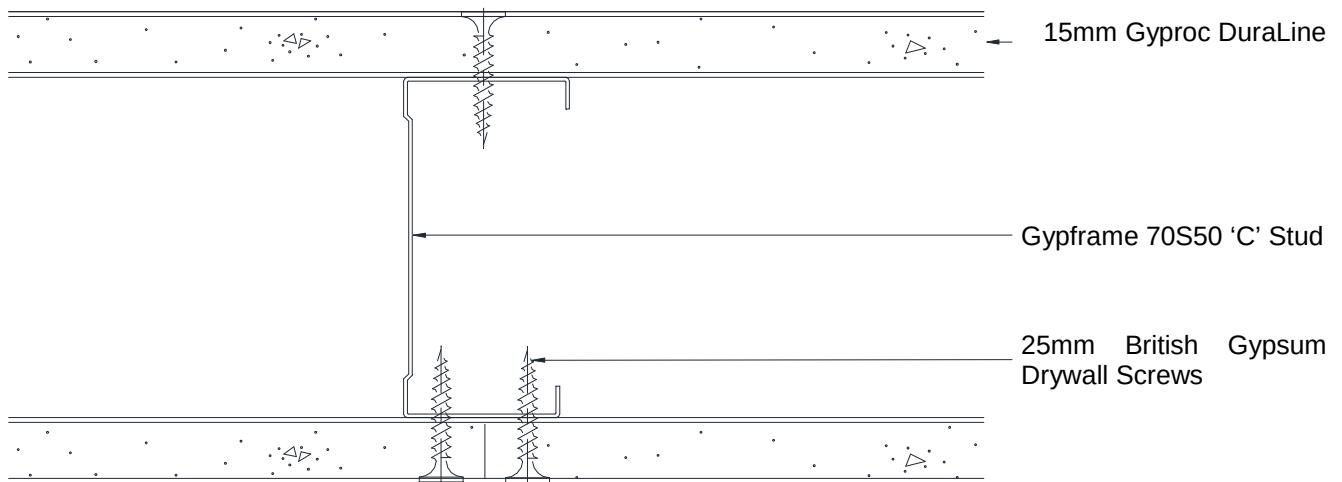
Both the unexposed face and the exposed face of the specimen were clad with a single layer of 15mm Gyproc DuraLine. The boards were fixed with 25mm British Gypsum Drywall Screws at 300mm centres around the perimeter and within the field of the boards.

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 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.

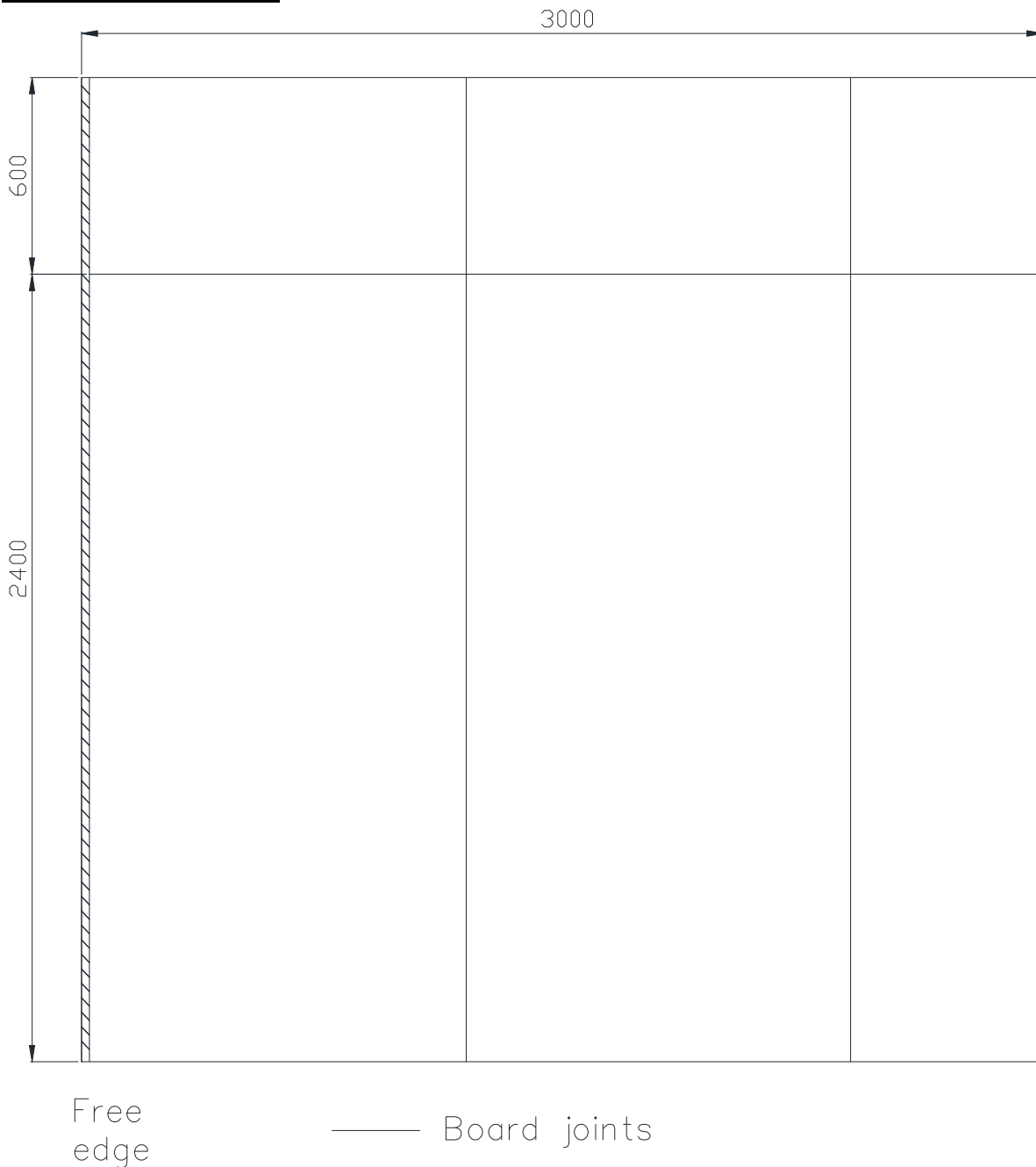
### Test Construction Drawings

#### Horizontal Cross Section



**Figure 1** – Horizontal cross section.

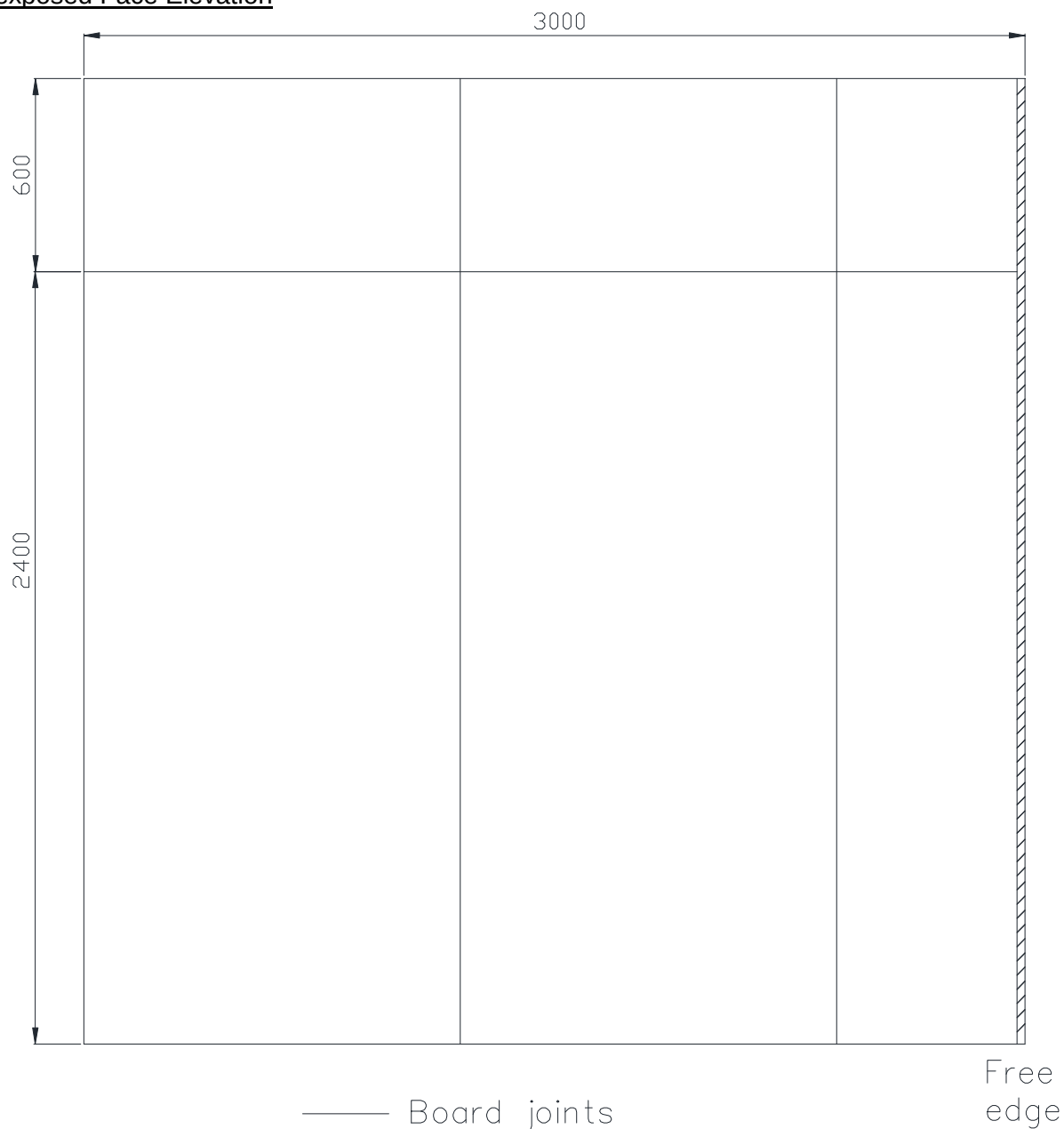
### Exposed Face Elevation



**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 15 mm (thick), Gyproc DuraLine (TE), manufactured and supplied by British Gypsum, ex Kirkby Thore.

|                               |                                                       |
|-------------------------------|-------------------------------------------------------|
| Measured mass per unit area:  | 14.7 kg/m <sup>2</sup>                                |
| Measured thickness:           | 15.1 mm                                               |
| Board identification numbers: | 26 143 17 04:40<br>26 143 17 04:00<br>26 143 17 04:01 |
| Measured moisture content:    | Less than 1%                                          |

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

- ii) Gypframe 72DC60 Deep Flange Floor & Ceiling Channels.  
iii) Gypframe 70S50 'C' Studs.  
iv) Gypframe GFS1 Fixing Strap.

All metal components were supplied by British Gypsum.

#### Fasteners

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

#### Miscellaneous Components

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

*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. 1.0.*

## 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 17°C.

The furnace pressure was set to control at  $18 \pm 2$  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:

|                        |                          |                                                   |
|------------------------|--------------------------|---------------------------------------------------|
| <b>Integrity</b>       | <b>Sustained Flaming</b> | <b>90 minutes, no failure.</b>                    |
|                        | <b>6mm Gap Gauge</b>     | <b>90 minutes, no failure.</b>                    |
|                        | <b>25mm Gap Gauge</b>    | <b>90 minutes, no failure.</b>                    |
|                        | <b>Cotton Pad</b>        | <b>90 minutes, no failure.</b>                    |
| <b>Insulation</b>      |                          | <b>66 minutes.</b>                                |
| <b>Test Terminated</b> |                          | <b>90 minutes, at the request of the sponsor.</b> |

## 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: Matthew Porter  
Exposed face: Lynda Cooper

| Time  |         | Observations                                                                                                                                                                                                                                                     |
|-------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hours | Minutes |                                                                                                                                                                                                                                                                  |
| 0     | 00      | Test started.                                                                                                                                                                                                                                                    |
| 0     | 10      | Jointing material was flaking away.<br>Face papers had charred.                                                                                                                                                                                                  |
| 0     | 20      | Left-hand vertical joint had opened to approximately 3mm.<br>Right-hand vertical joint had opened to approximately 4mm.<br>Horizontal joint had opened to approximately 2mm.                                                                                     |
| 0     | 30      | Left-hand vertical joint had opened to approximately 5mm.<br>Right-hand vertical joint had opened to approximately 5mm.<br>Horizontal joint had opened to approximately 5mm.                                                                                     |
| 0     | 40      | Left-hand vertical joint had opened to approximately 6mm.<br>Right-hand vertical joint had opened to approximately 5mm.<br>Horizontal joint had opened to approximately 5mm.<br>Boards were breaking away from screw heads adjacent to left-hand vertical joint. |
| 0     | 50      | Left-hand vertical joint had opened to approximately 10mm.<br>Right-hand vertical joint had opened to approximately 6mm.<br>Horizontal joint had opened to approximately 5mm.                                                                                    |
| 1     | 00      | Left-hand vertical joint had opened to approximately 10mm.<br>Right-hand vertical joint had opened to approximately 7mm.<br>Horizontal joint had opened to approximately 10mm.<br>Lower centre board was breaking away from screw heads adjacent to all joints.  |

| Time  |         | Observations                                                                                                                                                                                                                            |
|-------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hours | Minutes |                                                                                                                                                                                                                                         |
| 1     | 06      | <i>Unexposed face</i><br><b>INSULATION FAILURE.</b> The mean temperature rise of the standard five thermocouples exceeded 140°C.<br>The temperature rise of thermocouple no.22 positioned at the centre of the specimen exceeded 180°C. |
| 1     | 10      | Right-hand vertical joint had opened to approximately 10mm.<br><br><i>Unexposed face</i><br>Lower centre board had discoloured.<br>Lower left-hand board had discoloured.                                                               |
| 1     | 11      | <i>Unexposed face</i><br>Left-hand vertical joint had discoloured from approximately 600mm to 1800mm height.                                                                                                                            |
| 1     | 12      | <i>Unexposed face</i><br>Left-hand vertical joint had cracked at approximately 900mm to 1500mm height.                                                                                                                                  |
| 1     | 20      | Crack down the centre of the lower centre board.<br>Left-hand vertical joint had opened to approximately 12mm.<br>Right-hand vertical joint had opened to approximately 15mm.<br>Horizontal joint had opened to approximately 15mm.     |
| 1     | 23      | <i>Unexposed face</i><br>Horizontal joint was glowing at approximately mid-width of the specimen.<br>The cotton pad was placed on the horizontal joint at approximately mid-width of the specimen – no failure.                         |
| 1     | 25      | <i>Unexposed face</i><br>The cotton pad was placed on the horizontal joint at approximately mid-width of the specimen – no failure.                                                                                                     |
| 1     | 27      | <i>Unexposed face</i><br>The cotton pad was placed on the horizontal joint at approximately mid-width of the specimen – no failure.                                                                                                     |
| 1     | 28      | <i>Unexposed face</i><br>Left-hand vertical joint had opened up to approximately 2-3mm at approximately 2200mm height.                                                                                                                  |

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: btc.testing@saint-gobain.com

| Time  |         | Observations                                                                                                                                                                                                                             |
|-------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hours | Minutes |                                                                                                                                                                                                                                          |
| 1     | 29      | <i>Unexposed face</i><br>The cotton pad was placed on the horizontal joint at approximately mid-width of the specimen – no failure.                                                                                                      |
| 1     | 30      | Left-hand vertical joint had opened to approximately 15mm.<br>Right-hand vertical joint had opened to approximately 20mm.<br>Horizontal joint had opened to approximately 30mm.<br><b>TEST TERMINATED</b> at the request of the sponsor. |

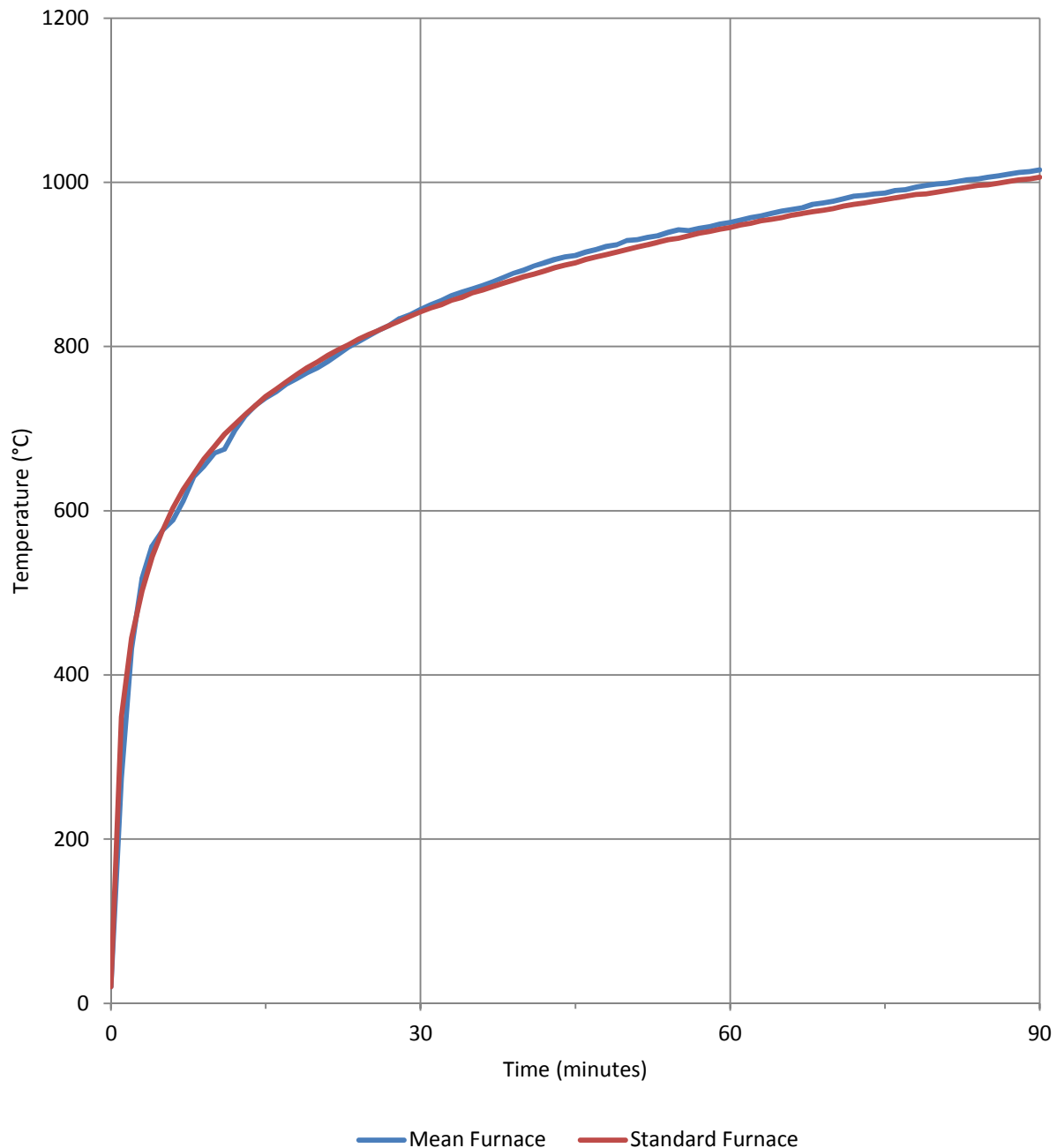
Customer: **British Gypsum**

BTC 20112F: Page 15 of 39



0296

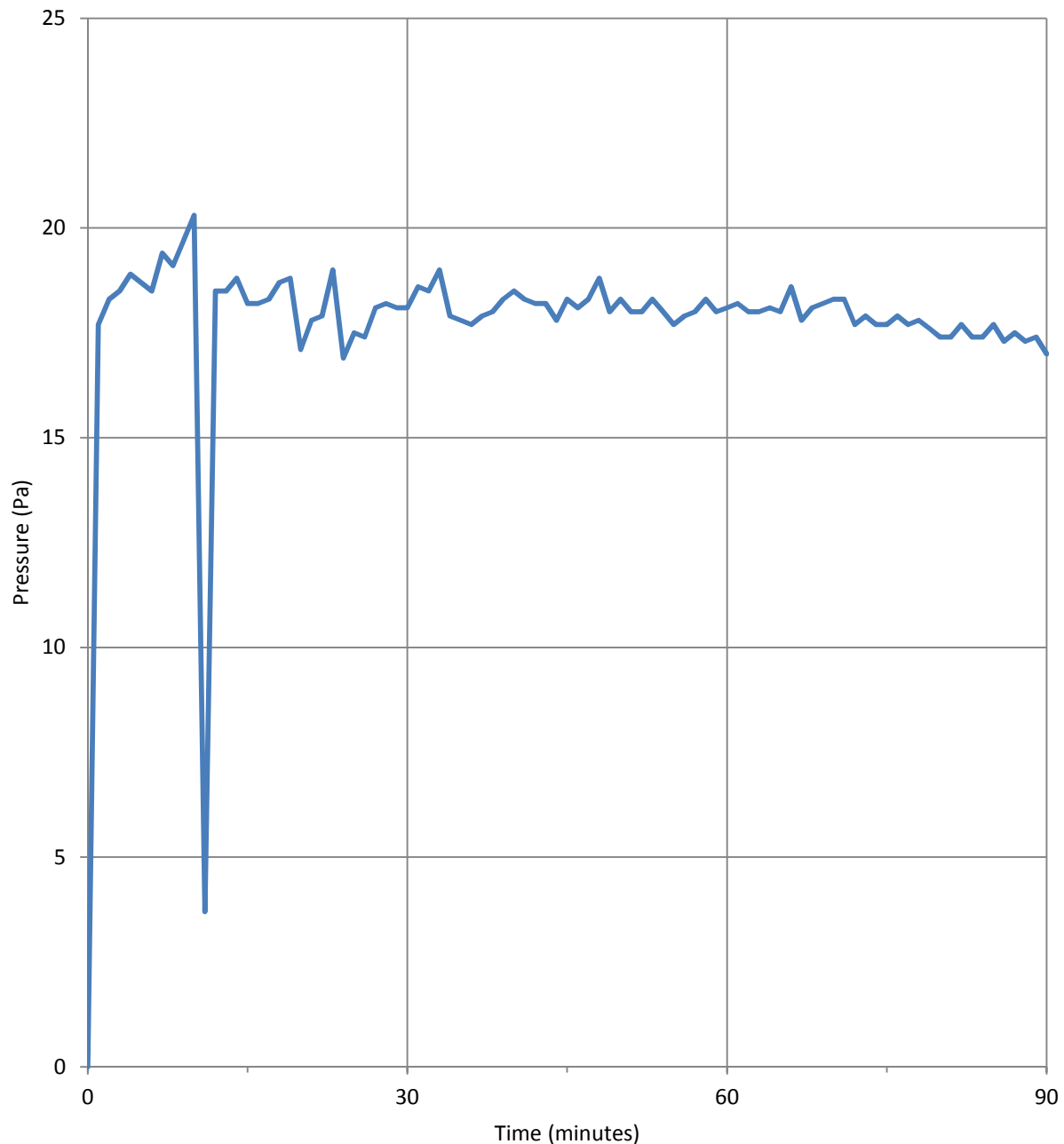
## Furnace Temperature Graph



**Figure 4** – Furnace temperature graph.

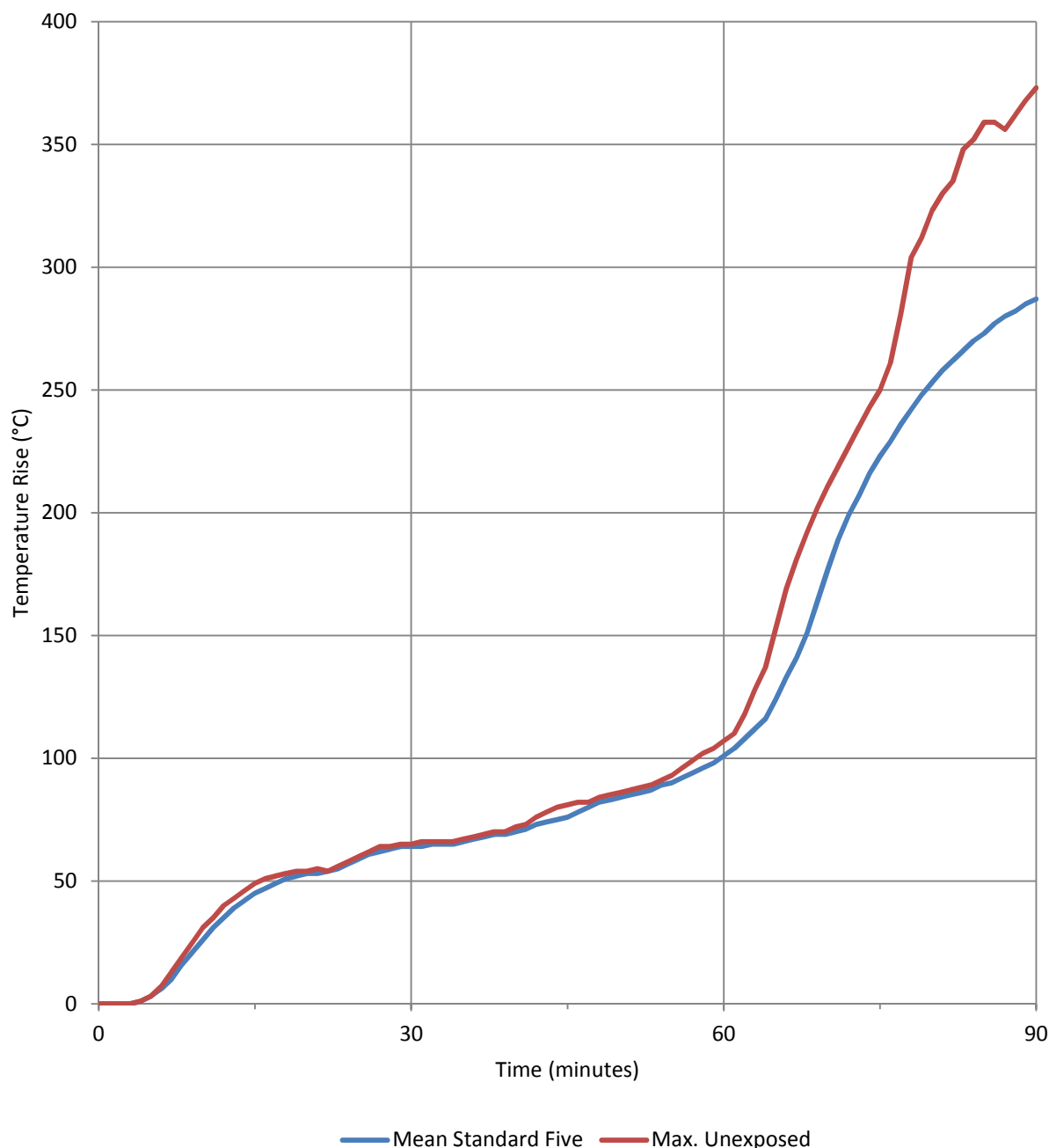


## Furnace Pressure Graph



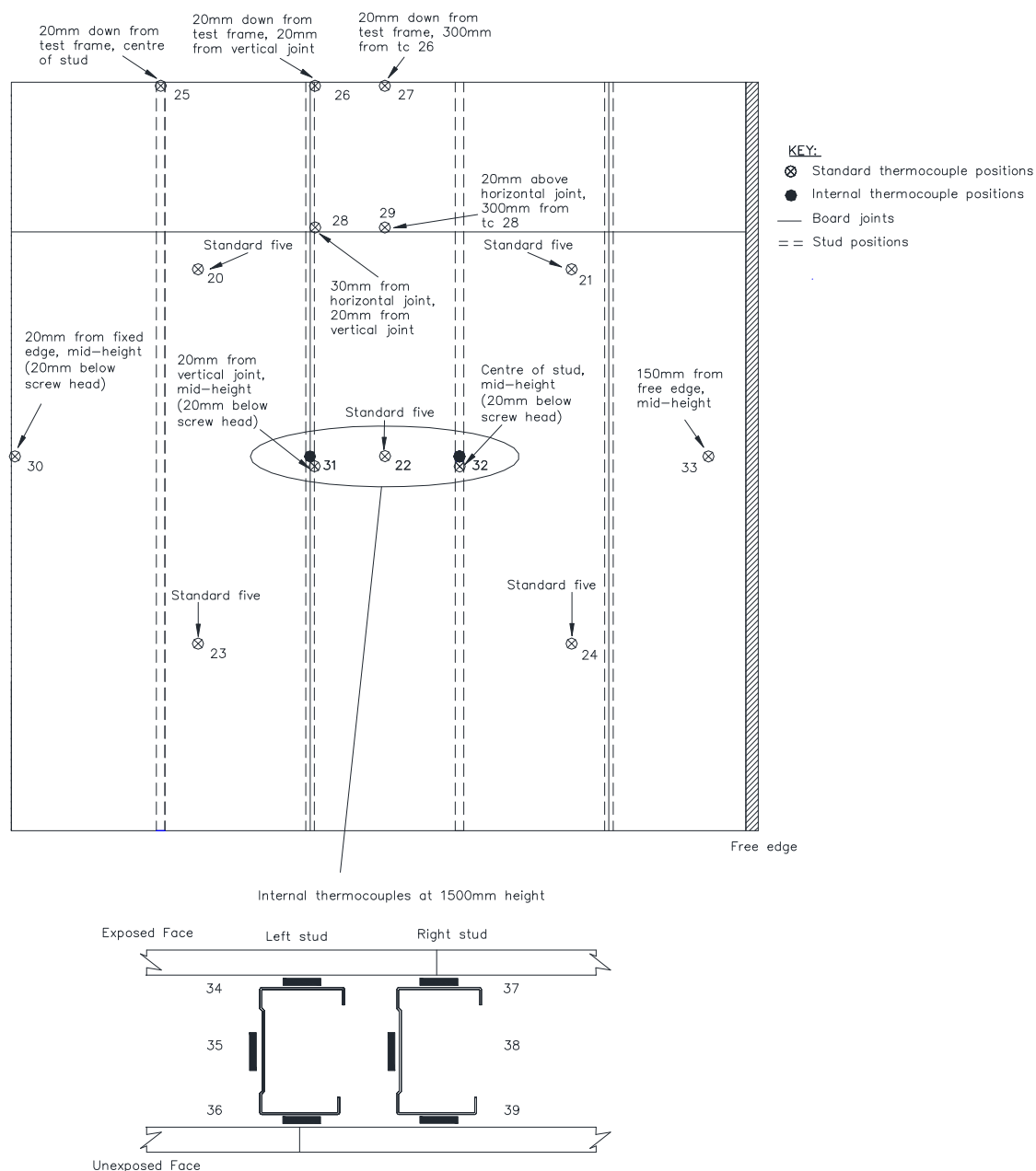
**Figure 5** – Furnace pressure graph.

## Unexposed Face Temperature Graph



**Figure 6** – Unexposed face temperature graph.

### Unexposed Face Thermocouple Layout



**Figure 7 – Unexposed face thermocouple layout.**

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: btc.testing@saint-gobain.com

### Unexposed Face Standard Five Temperature Data

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |                        | Mean Standard<br>Five |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|
|                   | Thermocouple<br>No. 20 | Thermocouple<br>No. 21 | Thermocouple<br>No. 22 | Thermocouple<br>No. 23 | Thermocouple<br>No. 24 |                       |
| 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                 | 1                      | 1                      | 1                      | 1                      | 0                      | 1                     |
| 5                 | 3                      | 3                      | 3                      | 2                      | 2                      | 3                     |
| 6                 | 7                      | 6                      | 6                      | 5                      | 4                      | 6                     |
| 7                 | 13                     | 11                     | 11                     | 8                      | 8                      | 10                    |
| 8                 | 19                     | 17                     | 17                     | 13                     | 13                     | 16                    |
| 9                 | 25                     | 24                     | 22                     | 17                     | 17                     | 21                    |
| 10                | 31                     | 29                     | 27                     | 22                     | 22                     | 26                    |
| 11                | 35                     | 35                     | 32                     | 26                     | 26                     | 31                    |
| 12                | 40                     | 39                     | 35                     | 30                     | 31                     | 35                    |
| 13                | 43                     | 43                     | 39                     | 34                     | 34                     | 39                    |
| 14                | 46                     | 46                     | 42                     | 37                     | 38                     | 42                    |
| 15                | 49                     | 49                     | 45                     | 41                     | 41                     | 45                    |
| 16                | 51                     | 51                     | 47                     | 44                     | 44                     | 47                    |
| 17                | 52                     | 52                     | 48                     | 46                     | 47                     | 49                    |
| 18                | 53                     | 53                     | 50                     | 48                     | 49                     | 51                    |
| 19                | 53                     | 53                     | 51                     | 50                     | 51                     | 52                    |
| 20                | 53                     | 54                     | 51                     | 52                     | 53                     | 53                    |
| 21                | 53                     | 53                     | 52                     | 53                     | 54                     | 53                    |
| 22                | 54                     | 54                     | 54                     | 54                     | 54                     | 54                    |
| 23                | 55                     | 54                     | 56                     | 56                     | 55                     | 55                    |
| 24                | 57                     | 56                     | 58                     | 58                     | 57                     | 57                    |
| 25                | 59                     | 58                     | 60                     | 60                     | 59                     | 59                    |
| 26                | 61                     | 59                     | 62                     | 62                     | 60                     | 61                    |
| 27                | 62                     | 61                     | 63                     | 64                     | 62                     | 62                    |
| 28                | 63                     | 62                     | 63                     | 64                     | 64                     | 63                    |
| 29                | 64                     | 63                     | 64                     | 65                     | 65                     | 64                    |
| 30                | 64                     | 63                     | 64                     | 65                     | 65                     | 64                    |
| 31                | 64                     | 63                     | 64                     | 66                     | 65                     | 64                    |
| 32                | 65                     | 63                     | 64                     | 66                     | 66                     | 65                    |
| 33                | 65                     | 63                     | 65                     | 66                     | 66                     | 65                    |
| 34                | 65                     | 63                     | 65                     | 66                     | 66                     | 65                    |
| 35                | 65                     | 64                     | 66                     | 67                     | 67                     | 66                    |
| 36                | 66                     | 65                     | 67                     | 68                     | 68                     | 67                    |
| 37                | 67                     | 66                     | 68                     | 68                     | 69                     | 68                    |

Customer: **British Gypsum**

BTC 20112F: Page 20 of 39



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre

British Gypsum

East Leake

Loughborough

Leicestershire, LE12 6NP

Tel: (0115) 945 1564

Fax: (0115) 945 1562

Email: btc.testing@saint-gobain.com

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |                        | Mean Standard<br>Five |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|
|                   | Thermocouple<br>No. 20 | Thermocouple<br>No. 21 | Thermocouple<br>No. 22 | Thermocouple<br>No. 23 | Thermocouple<br>No. 24 |                       |
| 38                | 68                     | 67                     | 69                     | 69                     | 70                     | 69                    |
| 39                | 68                     | 67                     | 70                     | 70                     | 70                     | 69                    |
| 40                | 69                     | 68                     | 72                     | 71                     | 71                     | 70                    |
| 41                | 70                     | 69                     | 73                     | 72                     | 72                     | 71                    |
| 42                | 71                     | 70                     | 76                     | 73                     | 73                     | 73                    |
| 43                | 72                     | 71                     | 78                     | 74                     | 74                     | 74                    |
| 44                | 73                     | 72                     | 80                     | 75                     | 75                     | 75                    |
| 45                | 74                     | 73                     | 81                     | 77                     | 76                     | 76                    |
| 46                | 76                     | 75                     | 82                     | 78                     | 78                     | 78                    |
| 47                | 78                     | 77                     | 82                     | 81                     | 81                     | 80                    |
| 48                | 80                     | 79                     | 84                     | 82                     | 83                     | 82                    |
| 49                | 82                     | 80                     | 84                     | 84                     | 85                     | 83                    |
| 50                | 83                     | 82                     | 85                     | 85                     | 86                     | 84                    |
| 51                | 84                     | 83                     | 86                     | 87                     | 87                     | 85                    |
| 52                | 84                     | 84                     | 87                     | 88                     | 88                     | 86                    |
| 53                | 85                     | 85                     | 89                     | 89                     | 88                     | 87                    |
| 54                | 87                     | 85                     | 91                     | 91                     | 89                     | 89                    |
| 55                | 88                     | 86                     | 93                     | 93                     | 90                     | 90                    |
| 56                | 90                     | 87                     | 96                     | 95                     | 91                     | 92                    |
| 57                | 91                     | 88                     | 99                     | 97                     | 93                     | 94                    |
| 58                | 93                     | 89                     | 102                    | 100                    | 95                     | 96                    |
| 59                | 96                     | 90                     | 104                    | 102                    | 98                     | 98                    |
| 60                | 99                     | 92                     | 107                    | 104                    | 103                    | 101                   |
| 61                | 102                    | 95                     | 110                    | 105                    | 107                    | 104                   |
| 62                | 104                    | 99                     | 118                    | 107                    | 110                    | 108                   |
| 63                | 106                    | 103                    | 128                    | 110                    | 113                    | 112                   |
| 64                | 108                    | 107                    | 137                    | 114                    | 115                    | 116                   |
| 65                | 111                    | 110                    | 153                    | 123                    | 121                    | 124                   |
| 66                | 119                    | 112                    | 169                    | 132                    | 131                    | 133                   |
| 67                | 130                    | 117                    | 181                    | 138                    | 138                    | 141                   |
| 68                | 139                    | 126                    | 192                    | 150                    | 148                    | 151                   |
| 69                | 157                    | 134                    | 202                    | 165                    | 164                    | 164                   |
| 70                | 174                    | 148                    | 211                    | 176                    | 176                    | 177                   |
| 71                | 187                    | 165                    | 219                    | 186                    | 186                    | 189                   |
| 72                | 198                    | 178                    | 227                    | 195                    | 195                    | 199                   |
| 73                | 208                    | 189                    | 235                    | 202                    | 203                    | 207                   |
| 74                | 218                    | 199                    | 243                    | 209                    | 209                    | 216                   |
| 75                | 226                    | 207                    | 250                    | 215                    | 216                    | 223                   |
| 76                | 234                    | 214                    | 257                    | 221                    | 221                    | 229                   |
| 77                | 242                    | 221                    | 265                    | 226                    | 226                    | 236                   |

Customer: **British Gypsum**

BTC 20112F: Page 21 of 39



0296

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |                        |                       |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|
|                   | Thermocouple<br>No. 20 | Thermocouple<br>No. 21 | Thermocouple<br>No. 22 | Thermocouple<br>No. 23 | Thermocouple<br>No. 24 | Mean Standard<br>Five |
| 78                | 249                    | 228                    | 272                    | 230                    | 231                    | 242                   |
| 79                | 255                    | 234                    | 279                    | 234                    | 236                    | 248                   |
| 80                | 262                    | 240                    | 284                    | 238                    | 240                    | 253                   |
| 81                | 269                    | 246                    | 288                    | 241                    | 244                    | 258                   |
| 82                | 277                    | 251                    | 290                    | 245                    | 247                    | 262                   |
| 83                | 284                    | 258                    | 291                    | 247                    | 250                    | 266                   |
| 84                | 290                    | 264                    | 291                    | 250                    | 253                    | 270                   |
| 85                | 294                    | 271                    | 293                    | 252                    | 257                    | 273                   |
| 86                | 298                    | 277                    | 295                    | 254                    | 260                    | 277                   |
| 87                | 299                    | 282                    | 297                    | 257                    | 263                    | 280                   |
| 88                | 300                    | 287                    | 299                    | 259                    | 265                    | 282                   |
| 89                | 300                    | 291                    | 302                    | 262                    | 269                    | 285                   |
| 90                | 300                    | 294                    | 306                    | 264                    | 271                    | 287                   |

Figures highlighted in red indicated the minute in which the temperature rise exceeded 180°C and the mean temperature rise exceeded 140°C.

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

### Additional Unexposed Face Temperature Data

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |                        |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Thermocouple<br>No. 25 | Thermocouple<br>No. 26 | Thermocouple<br>No. 27 | Thermocouple<br>No. 28 | Thermocouple<br>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                 | 1                      | 1                      | 1                      | 1                      | 2                      |
| 6                 | 3                      | 3                      | 4                      | 4                      | 5                      |
| 7                 | 7                      | 6                      | 8                      | 7                      | 9                      |
| 8                 | 12                     | 11                     | 13                     | 12                     | 15                     |
| 9                 | 17                     | 15                     | 18                     | 16                     | 20                     |
| 10                | 21                     | 21                     | 23                     | 21                     | 26                     |
| 11                | 26                     | 25                     | 28                     | 25                     | 31                     |
| 12                | 29                     | 29                     | 31                     | 29                     | 36                     |
| 13                | 32                     | 33                     | 34                     | 33                     | 40                     |
| 14                | 35                     | 36                     | 37                     | 36                     | 43                     |
| 15                | 37                     | 38                     | 40                     | 39                     | 46                     |
| 16                | 38                     | 40                     | 41                     | 41                     | 49                     |
| 17                | 39                     | 41                     | 43                     | 43                     | 50                     |
| 18                | 41                     | 42                     | 44                     | 44                     | 52                     |
| 19                | 41                     | 43                     | 44                     | 45                     | 52                     |
| 20                | 42                     | 43                     | 44                     | 45                     | 52                     |
| 21                | 42                     | 43                     | 44                     | 46                     | 52                     |
| 22                | 42                     | 42                     | 44                     | 46                     | 52                     |
| 23                | 42                     | 42                     | 44                     | 46                     | 53                     |
| 24                | 43                     | 42                     | 44                     | 47                     | 53                     |
| 25                | 43                     | 43                     | 45                     | 48                     | 54                     |
| 26                | 44                     | 43                     | 46                     | 50                     | 55                     |
| 27                | 45                     | 44                     | 47                     | 51                     | 56                     |
| 28                | 47                     | 46                     | 49                     | 53                     | 57                     |
| 29                | 49                     | 47                     | 51                     | 54                     | 59                     |
| 30                | 51                     | 49                     | 53                     | 55                     | 59                     |
| 31                | 53                     | 50                     | 54                     | 57                     | 60                     |
| 32                | 56                     | 52                     | 56                     | 57                     | 61                     |
| 33                | 59                     | 53                     | 57                     | 58                     | 61                     |
| 34                | 60                     | 54                     | 58                     | 58                     | 62                     |
| 35                | 61                     | 55                     | 60                     | 59                     | 62                     |
| 36                | 62                     | 55                     | 60                     | 59                     | 63                     |
| 37                | 62                     | 56                     | 61                     | 59                     | 63                     |

# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre

British Gypsum

East Leake

Loughborough

Leicestershire, LE12 6NP

Tel: (0115) 945 1564

Fax: (0115) 945 1562

Email: btc.testing@saint-gobain.com

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |                        |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Thermocouple<br>No. 25 | Thermocouple<br>No. 26 | Thermocouple<br>No. 27 | Thermocouple<br>No. 28 | Thermocouple<br>No. 29 |
| 38                | 62                     | 56                     | 62                     | 60                     | 64                     |
| 39                | 63                     | 56                     | 62                     | 60                     | 64                     |
| 40                | 63                     | 57                     | 63                     | 61                     | 65                     |
| 41                | 64                     | 56                     | 63                     | 61                     | 66                     |
| 42                | 65                     | 57                     | 64                     | 62                     | 66                     |
| 43                | 65                     | 58                     | 65                     | 63                     | 67                     |
| 44                | 66                     | 59                     | 66                     | 64                     | 67                     |
| 45                | 67                     | 60                     | 66                     | 65                     | 68                     |
| 46                | 69                     | 61                     | 67                     | 67                     | 68                     |
| 47                | 70                     | 62                     | 68                     | 68                     | 68                     |
| 48                | 71                     | 63                     | 69                     | 70                     | 69                     |
| 49                | 72                     | 64                     | 70                     | 71                     | 70                     |
| 50                | 72                     | 66                     | 71                     | 73                     | 70                     |
| 51                | 73                     | 66                     | 72                     | 74                     | 70                     |
| 52                | 74                     | 67                     | 74                     | 75                     | 71                     |
| 53                | 75                     | 68                     | 74                     | 76                     | 71                     |
| 54                | 76                     | 69                     | 75                     | 77                     | 72                     |
| 55                | 76                     | 70                     | 76                     | 78                     | 72                     |
| 56                | 77                     | 71                     | 77                     | 78                     | 73                     |
| 57                | 78                     | 71                     | 78                     | 79                     | 74                     |
| 58                | 78                     | 72                     | 79                     | 81                     | 76                     |
| 59                | 79                     | 72                     | 80                     | 82                     | 78                     |
| 60                | 79                     | 73                     | 80                     | 83                     | 81                     |
| 61                | 80                     | 74                     | 81                     | 84                     | 84                     |
| 62                | 80                     | 74                     | 82                     | 85                     | 86                     |
| 63                | 81                     | 75                     | 82                     | 87                     | 89                     |
| 64                | 81                     | 76                     | 83                     | 88                     | 91                     |
| 65                | 82                     | 76                     | 84                     | 89                     | 93                     |
| 66                | 82                     | 77                     | 85                     | 91                     | 95                     |
| 67                | 83                     | 78                     | 86                     | 93                     | 97                     |
| 68                | 84                     | 80                     | 86                     | 96                     | 99                     |
| 69                | 85                     | 81                     | 88                     | 101                    | 101                    |
| 70                | 86                     | 82                     | 89                     | 107                    | 103                    |
| 71                | 87                     | 83                     | 91                     | 117                    | 105                    |
| 72                | 88                     | 85                     | 94                     | 130                    | 109                    |
| 73                | 90                     | 88                     | 96                     | 141                    | 114                    |
| 74                | 92                     | 90                     | 100                    | 157                    | 122                    |
| 75                | 96                     | 93                     | 102                    | 176                    | 135                    |
| 76                | 98                     | 96                     | 107                    | 194                    | 150                    |
| 77                | 100                    | 99                     | 112                    | 211                    | 165                    |

Customer: **British Gypsum**

BTC 20112F: Page 24 of 39



0296



| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |                        |
|-------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Thermocouple<br>No. 25 | Thermocouple<br>No. 26 | Thermocouple<br>No. 27 | Thermocouple<br>No. 28 | Thermocouple<br>No. 29 |
| 78                | 103                    | 101                    | 117                    | 229                    | 188                    |
| 79                | 106                    | 103                    | 124                    | 247                    | 209                    |
| 80                | 108                    | 108                    | 136                    | 267                    | 226                    |
| 81                | 111                    | 113                    | 151                    | 284                    | 241                    |
| 82                | 115                    | 118                    | 168                    | 298                    | 256                    |
| 83                | 120                    | 128                    | 184                    | 312                    | 270                    |
| 84                | 126                    | 139                    | 197                    | 320                    | 287                    |
| 85                | 133                    | 151                    | 210                    | 326                    | 309                    |
| 86                | 143                    | 162                    | 221                    | 329                    | 330                    |
| 87                | 155                    | 173                    | 234                    | 331                    | 348                    |
| 88                | 167                    | 185                    | 247                    | 333                    | 362                    |
| 89                | 177                    | 198                    | 263                    | 339                    | 368                    |
| 90                | 187                    | 212                    | 280                    | 343                    | 373                    |

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

### Additional Unexposed Face Temperature Data

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |
|-------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Thermocouple<br>No. 30 | Thermocouple<br>No. 31 | Thermocouple<br>No. 32 | Thermocouple<br>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                      | 1                      |
| 5                 | 1                      | 1                      | 1                      | 2                      |
| 6                 | 4                      | 3                      | 2                      | 5                      |
| 7                 | 8                      | 6                      | 4                      | 10                     |
| 8                 | 13                     | 9                      | 7                      | 15                     |
| 9                 | 18                     | 13                     | 10                     | 21                     |
| 10                | 23                     | 16                     | 12                     | 27                     |
| 11                | 28                     | 20                     | 15                     | 32                     |
| 12                | 33                     | 23                     | 18                     | 36                     |
| 13                | 37                     | 27                     | 19                     | 40                     |
| 14                | 40                     | 30                     | 22                     | 44                     |
| 15                | 43                     | 34                     | 22                     | 47                     |
| 16                | 46                     | 36                     | 25                     | 49                     |
| 17                | 48                     | 39                     | 25                     | 51                     |
| 18                | 50                     | 41                     | 28                     | 53                     |
| 19                | 51                     | 42                     | 29                     | 54                     |
| 20                | 51                     | 44                     | 30                     | 54                     |
| 21                | 51                     | 45                     | 30                     | 55                     |
| 22                | 51                     | 46                     | 31                     | 54                     |
| 23                | 52                     | 48                     | 31                     | 54                     |
| 24                | 52                     | 50                     | 34                     | 55                     |
| 25                | 52                     | 52                     | 34                     | 57                     |
| 26                | 53                     | 55                     | 35                     | 58                     |
| 27                | 54                     | 56                     | 37                     | 60                     |
| 28                | 55                     | 58                     | 38                     | 62                     |
| 29                | 57                     | 60                     | 37                     | 64                     |
| 30                | 58                     | 61                     | 39                     | 64                     |
| 31                | 60                     | 62                     | 39                     | 64                     |
| 32                | 61                     | 63                     | 40                     | 65                     |
| 33                | 61                     | 63                     | 39                     | 65                     |
| 34                | 62                     | 63                     | 40                     | 65                     |
| 35                | 62                     | 64                     | 40                     | 65                     |
| 36                | 62                     | 64                     | 41                     | 66                     |
| 37                | 63                     | 64                     | 41                     | 66                     |

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre

British Gypsum

East Leake

Loughborough

Leicestershire, LE12 6NP

Tel: (0115) 945 1564

Fax: (0115) 945 1562

Email: btc.testing@saint-gobain.com

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |
|-------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Thermocouple<br>No. 30 | Thermocouple<br>No. 31 | Thermocouple<br>No. 32 | Thermocouple<br>No. 33 |
| 38                | 63                     | 65                     | 42                     | 67                     |
| 39                | 63                     | 66                     | 41                     | 67                     |
| 40                | 63                     | 66                     | 43                     | 68                     |
| 41                | 63                     | 67                     | 44                     | 69                     |
| 42                | 64                     | 68                     | 45                     | 70                     |
| 43                | 64                     | 68                     | 45                     | 71                     |
| 44                | 65                     | 69                     | 47                     | 71                     |
| 45                | 66                     | 70                     | 47                     | 72                     |
| 46                | 66                     | 71                     | 47                     | 73                     |
| 47                | 67                     | 72                     | 48                     | 74                     |
| 48                | 68                     | 74                     | 51                     | 76                     |
| 49                | 69                     | 76                     | 50                     | 78                     |
| 50                | 70                     | 78                     | 52                     | 80                     |
| 51                | 70                     | 79                     | 53                     | 82                     |
| 52                | 71                     | 81                     | 53                     | 83                     |
| 53                | 73                     | 82                     | 54                     | 84                     |
| 54                | 74                     | 83                     | 54                     | 85                     |
| 55                | 76                     | 84                     | 56                     | 86                     |
| 56                | 77                     | 86                     | 56                     | 88                     |
| 57                | 78                     | 87                     | 58                     | 89                     |
| 58                | 79                     | 89                     | 58                     | 91                     |
| 59                | 80                     | 92                     | 59                     | 92                     |
| 60                | 81                     | 94                     | 61                     | 94                     |
| 61                | 82                     | 95                     | 63                     | 97                     |
| 62                | 83                     | 96                     | 65                     | 99                     |
| 63                | 83                     | 97                     | 67                     | 101                    |
| 64                | 84                     | 99                     | 70                     | 102                    |
| 65                | 85                     | 103                    | 71                     | 103                    |
| 66                | 85                     | 110                    | 78                     | 105                    |
| 67                | 87                     | 123                    | 84                     | 108                    |
| 68                | 87                     | 132                    | 91                     | 112                    |
| 69                | 89                     | 143                    | 104                    | 121                    |
| 70                | 90                     | 163                    | 121                    | 130                    |
| 71                | 92                     | 182                    | 141                    | 136                    |
| 72                | 95                     | 200                    | 148                    | 148                    |
| 73                | 99                     | 216                    | 170                    | 162                    |
| 74                | 102                    | 232                    | 162                    | 174                    |
| 75                | 104                    | 245                    | 167                    | 184                    |
| 76                | 108                    | 261                    | 172                    | 192                    |
| 77                | 110                    | 281                    | 181                    | 200                    |

Customer: **British Gypsum**

BTC 20112F: Page 27 of 39



0296

# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre

British Gypsum

East Leake

Loughborough

Leicestershire, LE12 6NP

Tel: (0115) 945 1564

Fax: (0115) 945 1562

Email: btc.testing@saint-gobain.com

| Time<br>(minutes) | Temperature Rise (°C)  |                        |                        |                        |
|-------------------|------------------------|------------------------|------------------------|------------------------|
|                   | Thermocouple<br>No. 30 | Thermocouple<br>No. 31 | Thermocouple<br>No. 32 | Thermocouple<br>No. 33 |
| 78                | 113                    | 304                    | 186                    | 207                    |
| 79                | 118                    | 312                    | 190                    | 213                    |
| 80                | 125                    | 323                    | 196                    | 219                    |
| 81                | 133                    | 330                    | 206                    | 224                    |
| 82                | 144                    | 335                    | 213                    | 229                    |
| 83                | 157                    | 348                    | 220                    | 234                    |
| 84                | 169                    | 352                    | 227                    | 239                    |
| 85                | 179                    | 359                    | 225                    | 243                    |
| 86                | 188                    | 359                    | 230                    | 247                    |
| 87                | 197                    | 356                    | 230                    | 251                    |
| 88                | 205                    | 354                    | 231                    | 255                    |
| 89                | 212                    | 361                    | 234                    | 258                    |
| 90                | 219                    | 360                    | 238                    | 262                    |

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

Customer: **British Gypsum**

BTC 20112F: Page 28 of 39



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: btc.testing@saint-gobain.com

### Internal Temperature Data at 1500mm Height

| Time<br>(minutes) | Actual Temperature (°C)              |                               |                                       |                                      |                               |                                       |
|-------------------|--------------------------------------|-------------------------------|---------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|
|                   | Left stud                            |                               |                                       | Right stud                           |                               |                                       |
|                   | Hot Flange<br>Thermocouple<br>No. 34 | Web<br>Thermocouple<br>No. 35 | Cold Flange<br>Thermocouple<br>No. 36 | Hot Flange<br>Thermocouple<br>No. 37 | Web<br>Thermocouple<br>No. 38 | Cold Flange<br>Thermocouple<br>No. 39 |
| 0                 | 19                                   | 19                            | 18                                    | 19                                   | 19                            | 18                                    |
| 1                 | 23                                   | 19                            | 18                                    | 21                                   | 19                            | 18                                    |
| 2                 | 31                                   | 24                            | 19                                    | 28                                   | 21                            | 19                                    |
| 3                 | 53                                   | 46                            | 25                                    | 50                                   | 33                            | 24                                    |
| 4                 | 82                                   | 65                            | 40                                    | 84                                   | 56                            | 39                                    |
| 5                 | 96                                   | 76                            | 54                                    | 96                                   | 71                            | 55                                    |
| 6                 | 99                                   | 82                            | 62                                    | 98                                   | 79                            | 64                                    |
| 7                 | 99                                   | 86                            | 68                                    | 98                                   | 83                            | 70                                    |
| 8                 | 100                                  | 89                            | 72                                    | 98                                   | 86                            | 73                                    |
| 9                 | 100                                  | 91                            | 75                                    | 99                                   | 88                            | 76                                    |
| 10                | 100                                  | 92                            | 78                                    | 100                                  | 90                            | 79                                    |
| 11                | 100                                  | 95                            | 80                                    | 99                                   | 91                            | 81                                    |
| 12                | 101                                  | 97                            | 83                                    | 101                                  | 93                            | 84                                    |
| 13                | 103                                  | 99                            | 85                                    | 102                                  | 95                            | 85                                    |
| 14                | 107                                  | 101                           | 87                                    | 104                                  | 96                            | 88                                    |
| 15                | 110                                  | 104                           | 88                                    | 106                                  | 98                            | 89                                    |
| 16                | 115                                  | 107                           | 89                                    | 110                                  | 100                           | 90                                    |
| 17                | 123                                  | 111                           | 90                                    | 117                                  | 102                           | 90                                    |
| 18                | 136                                  | 122                           | 90                                    | 130                                  | 105                           | 90                                    |
| 19                | 155                                  | 145                           | 90                                    | 153                                  | 110                           | 90                                    |
| 20                | 176                                  | 173                           | 92                                    | 187                                  | 120                           | 94                                    |
| 21                | 206                                  | 204                           | 99                                    | 220                                  | 138                           | 101                                   |
| 22                | 242                                  | 232                           | 112                                   | 251                                  | 162                           | 115                                   |
| 23                | 274                                  | 254                           | 123                                   | 280                                  | 184                           | 127                                   |
| 24                | 302                                  | 272                           | 136                                   | 309                                  | 204                           | 140                                   |
| 25                | 327                                  | 287                           | 150                                   | 339                                  | 224                           | 154                                   |
| 26                | 347                                  | 296                           | 164                                   | 368                                  | 243                           | 169                                   |
| 27                | 362                                  | 305                           | 174                                   | 392                                  | 256                           | 179                                   |
| 28                | 374                                  | 313                           | 183                                   | 414                                  | 269                           | 189                                   |
| 29                | 384                                  | 320                           | 191                                   | 436                                  | 285                           | 198                                   |
| 30                | 394                                  | 321                           | 199                                   | 455                                  | 301                           | 207                                   |
| 31                | 402                                  | 326                           | 207                                   | 473                                  | 314                           | 217                                   |
| 32                | 411                                  | 333                           | 217                                   | 486                                  | 326                           | 229                                   |
| 33                | 418                                  | 340                           | 227                                   | 495                                  | 336                           | 240                                   |
| 34                | 425                                  | 346                           | 236                                   | 502                                  | 347                           | 252                                   |
| 35                | 431                                  | 353                           | 247                                   | 510                                  | 357                           | 264                                   |

Customer: **British Gypsum**

BTC 20112F: Page 29 of 39



0296

# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: btc.testing@saint-gobain.com

| Time<br>(minutes) | Actual Temperature (°C)              |                               |                                       |                                      |                               |                                       |
|-------------------|--------------------------------------|-------------------------------|---------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|
|                   | Left stud                            |                               |                                       | Right stud                           |                               |                                       |
|                   | Hot Flange<br>Thermocouple<br>No. 34 | Web<br>Thermocouple<br>No. 35 | Cold Flange<br>Thermocouple<br>No. 36 | Hot Flange<br>Thermocouple<br>No. 37 | Web<br>Thermocouple<br>No. 38 | Cold Flange<br>Thermocouple<br>No. 39 |
| 36                | 440                                  | 361                           | 258                                   | 517                                  | 365                           | 275                                   |
| 37                | 447                                  | 367                           | 270                                   | 524                                  | 374                           | 287                                   |
| 38                | 454                                  | 374                           | 281                                   | 531                                  | 382                           | 300                                   |
| 39                | 461                                  | 383                           | 290                                   | 537                                  | 391                           | 312                                   |
| 40                | 467                                  | 390                           | 299                                   | 542                                  | 400                           | 325                                   |
| 41                | 471                                  | 398                           | 307                                   | 546                                  | 407                           | 335                                   |
| 42                | 476                                  | 405                           | 315                                   | 551                                  | 415                           | 346                                   |
| 43                | 480                                  | 414                           | 324                                   | 556                                  | 423                           | 356                                   |
| 44                | 485                                  | 422                           | 332                                   | 561                                  | 431                           | 366                                   |
| 45                | 489                                  | 429                           | 340                                   | 565                                  | 437                           | 377                                   |
| 46                | 494                                  | 436                           | 349                                   | 571                                  | 445                           | 387                                   |
| 47                | 500                                  | 443                           | 359                                   | 577                                  | 452                           | 398                                   |
| 48                | 505                                  | 449                           | 368                                   | 584                                  | 459                           | 408                                   |
| 49                | 511                                  | 456                           | 377                                   | 591                                  | 466                           | 418                                   |
| 50                | 515                                  | 462                           | 387                                   | 596                                  | 472                           | 428                                   |
| 51                | 521                                  | 469                           | 396                                   | 601                                  | 478                           | 438                                   |
| 52                | 526                                  | 475                           | 406                                   | 606                                  | 484                           | 448                                   |
| 53                | 531                                  | 481                           | 415                                   | 613                                  | 490                           | 458                                   |
| 54                | 536                                  | 487                           | 425                                   | 619                                  | 496                           | 468                                   |
| 55                | 541                                  | 493                           | 434                                   | 624                                  | 502                           | 477                                   |
| 56                | 546                                  | 500                           | 444                                   | 626                                  | 508                           | 485                                   |
| 57                | 551                                  | 504                           | 454                                   | 628                                  | 512                           | 493                                   |
| 58                | 556                                  | 509                           | 464                                   | 632                                  | 518                           | 501                                   |
| 59                | 562                                  | 515                           | 474                                   | 634                                  | 524                           | 509                                   |
| 60                | 567                                  | 520                           | 483                                   | 638                                  | 529                           | 516                                   |
| 61                | 574                                  | 527                           | 492                                   | 641                                  | 535                           | 524                                   |
| 62                | 580                                  | 533                           | 501                                   | 647                                  | 542                           | 532                                   |
| 63                | 586                                  | 541                           | 510                                   | 651                                  | 548                           | 540                                   |
| 64                | 593                                  | 549                           | 519                                   | 657                                  | 555                           | 548                                   |
| 65                | 602                                  | 556                           | 528                                   | 664                                  | 563                           | 557                                   |
| 66                | 611                                  | 563                           | 538                                   | 669                                  | 570                           | 566                                   |
| 67                | 619                                  | 570                           | 548                                   | 679                                  | 578                           | 576                                   |
| 68                | 627                                  | 578                           | 558                                   | 688                                  | 588                           | 587                                   |
| 69                | 635                                  | 590                           | 568                                   | 700                                  | 599                           | 601                                   |
| 70                | 643                                  | 600                           | 580                                   | 713                                  | 610                           | 614                                   |
| 71                | 651                                  | 609                           | 591                                   | 726                                  | 621                           | 628                                   |
| 72                | 658                                  | 617                           | 602                                   | 737                                  | 632                           | 640                                   |
| 73                | 665                                  | 624                           | 613                                   | 744                                  | 642                           | 651                                   |

Customer: **British Gypsum**

BTC 20112F: Page 30 of 39



0296

| Time<br>(minutes) | Actual Temperature (°C)              |                               |                                       |                                      |                               |                                       |
|-------------------|--------------------------------------|-------------------------------|---------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|
|                   | Left stud                            |                               |                                       | Right stud                           |                               |                                       |
|                   | Hot Flange<br>Thermocouple<br>No. 34 | Web<br>Thermocouple<br>No. 35 | Cold Flange<br>Thermocouple<br>No. 36 | Hot Flange<br>Thermocouple<br>No. 37 | Web<br>Thermocouple<br>No. 38 | Cold Flange<br>Thermocouple<br>No. 39 |
| 74                | 672                                  | 628                           | 623                                   | 752                                  | 652                           | 660                                   |
| 75                | 678                                  | 632                           | 633                                   | 763                                  | 663                           | 673                                   |
| 76                | 684                                  | 635                           | 643                                   | 776                                  | 675                           | 685                                   |
| 77                | 690                                  | 638                           | 652                                   | 792                                  | 685                           | 696                                   |
| 78                | 696                                  | 640                           | 662                                   | 799                                  | 693                           | 704                                   |
| 79                | 702                                  | 642                           | 671                                   | 809                                  | 702                           | 714                                   |
| 80                | 708                                  | 646                           | 681                                   | 817                                  | 709                           | 721                                   |
| 81                | 714                                  | 650                           | 690                                   | 818                                  | 715                           | 726                                   |
| 82                | 722                                  | 653                           | 700                                   | 820                                  | 721                           | 732                                   |
| 83                | 731                                  | 655                           | 711                                   | 823                                  | 728                           | 738                                   |
| 84                | 741                                  | 662                           | 723                                   | 823                                  | 735                           | 745                                   |
| 85                | 750                                  | 665                           | 732                                   | 820                                  | 740                           | 748                                   |
| 86                | 759                                  | 663                           | 739                                   | 811                                  | 741                           | 748                                   |
| 87                | 771                                  | 662                           | 747                                   | 802                                  | 744                           | 750                                   |
| 88                | 783                                  | 664                           | 754                                   | 789                                  | 744                           | 748                                   |
| 89                | 791                                  | 663                           | 759                                   | 775                                  | 742                           | 743                                   |
| 90                | 797                                  | 663                           | 765                                   | 764                                  | 742                           | 741                                   |

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

### Specimen Lateral Deflection

| Time<br>(minutes) | Centre<br>Deflection<br>(mm) |
|-------------------|------------------------------|
| 0                 | 0                            |
| 1                 | 1                            |
| 2                 | 1                            |
| 3                 | 3                            |
| 4                 | 5                            |
| 5                 | 6                            |
| 6                 | 6                            |
| 7                 | 5                            |
| 8                 | 5                            |
| 9                 | 5                            |
| 10                | 5                            |
| 11                | 6                            |
| 12                | 6                            |
| 13                | 6                            |
| 14                | 7                            |
| 15                | 7                            |
| 16                | 8                            |
| 17                | 8                            |
| 18                | 9                            |
| 19                | 11                           |
| 20                | 13                           |
| 21                | 16                           |
| 22                | 20                           |
| 23                | 24                           |
| 24                | 27                           |
| 25                | 32                           |
| 26                | 34                           |
| 27                | 37                           |
| 28                | 39                           |
| 29                | 41                           |
| 30                | 43                           |
| 31                | 44                           |
| 32                | 44                           |
| 33                | 45                           |
| 34                | 45                           |
| 35                | 45                           |
| 36                | 46                           |
| 37                | 46                           |



# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre

British Gypsum

East Leake

Loughborough

Leicestershire, LE12 6NP

Tel: (0115) 945 1564

Fax: (0115) 945 1562

Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

| Time<br>(minutes) | Centre<br>Deflection<br>(mm) |
|-------------------|------------------------------|
| 38                | 47                           |
| 39                | 48                           |
| 40                | 49                           |
| 41                | 49                           |
| 42                | 50                           |
| 43                | 50                           |
| 44                | 51                           |
| 45                | 52                           |
| 46                | 53                           |
| 47                | 54                           |
| 48                | 55                           |
| 49                | 55                           |
| 50                | 55                           |
| 51                | 56                           |
| 52                | 56                           |
| 53                | 56                           |
| 54                | 57                           |
| 55                | 57                           |
| 56                | 57                           |
| 57                | 57                           |
| 58                | 57                           |
| 59                | 57                           |
| 60                | 56                           |
| 61                | 56                           |
| 62                | 56                           |
| 63                | 55                           |
| 64                | 54                           |
| 65                | 54                           |
| 66                | 55                           |
| 67                | 55                           |
| 68                | 56                           |
| 69                | 57                           |
| 70                | 58                           |
| 71                | 59                           |
| 72                | 60                           |
| 73                | 62                           |
| 74                | 64                           |
| 75                | 66                           |
| 76                | 68                           |
| 77                | 70                           |

Customer: **British Gypsum**

BTC 20112F: Page 33 of 39



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

| Time<br>(minutes) | Centre<br>Deflection<br>(mm) |
|-------------------|------------------------------|
| 78                | 71                           |
| 79                | 72                           |
| 80                | 73                           |
| 81                | 74                           |
| 82                | 76                           |
| 83                | 76                           |
| 84                | 78                           |
| 85                | 79                           |
| 86                | 80                           |
| 87                | 81                           |
| 88                | 83                           |
| 89                | 84                           |
| 90                | 85                           |

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

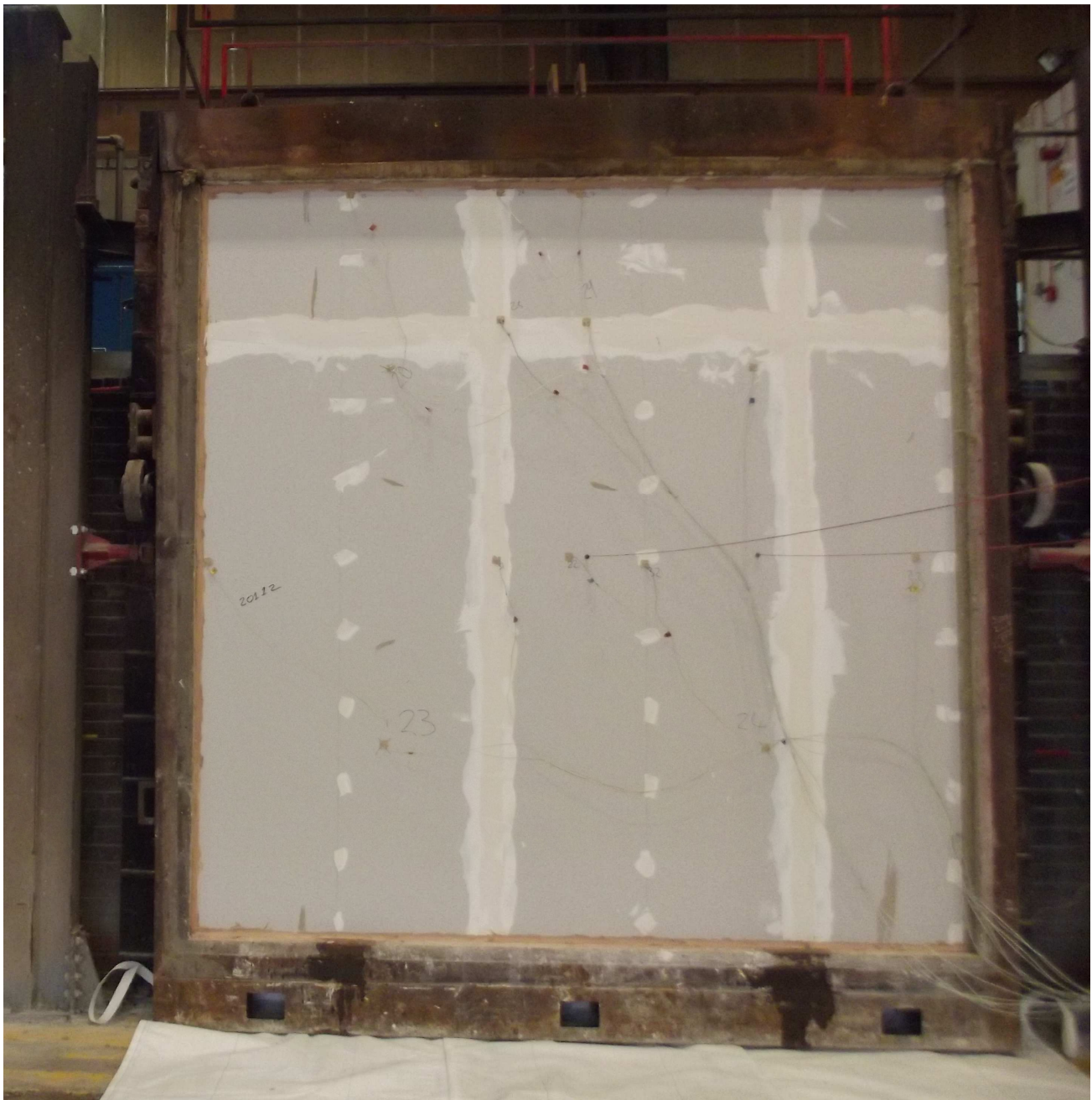
# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

## PHOTOGRAPHS

### Unexposed Face Prior to Test



Customer: **British Gypsum**

BTC 20112F: Page 35 of 39



0296

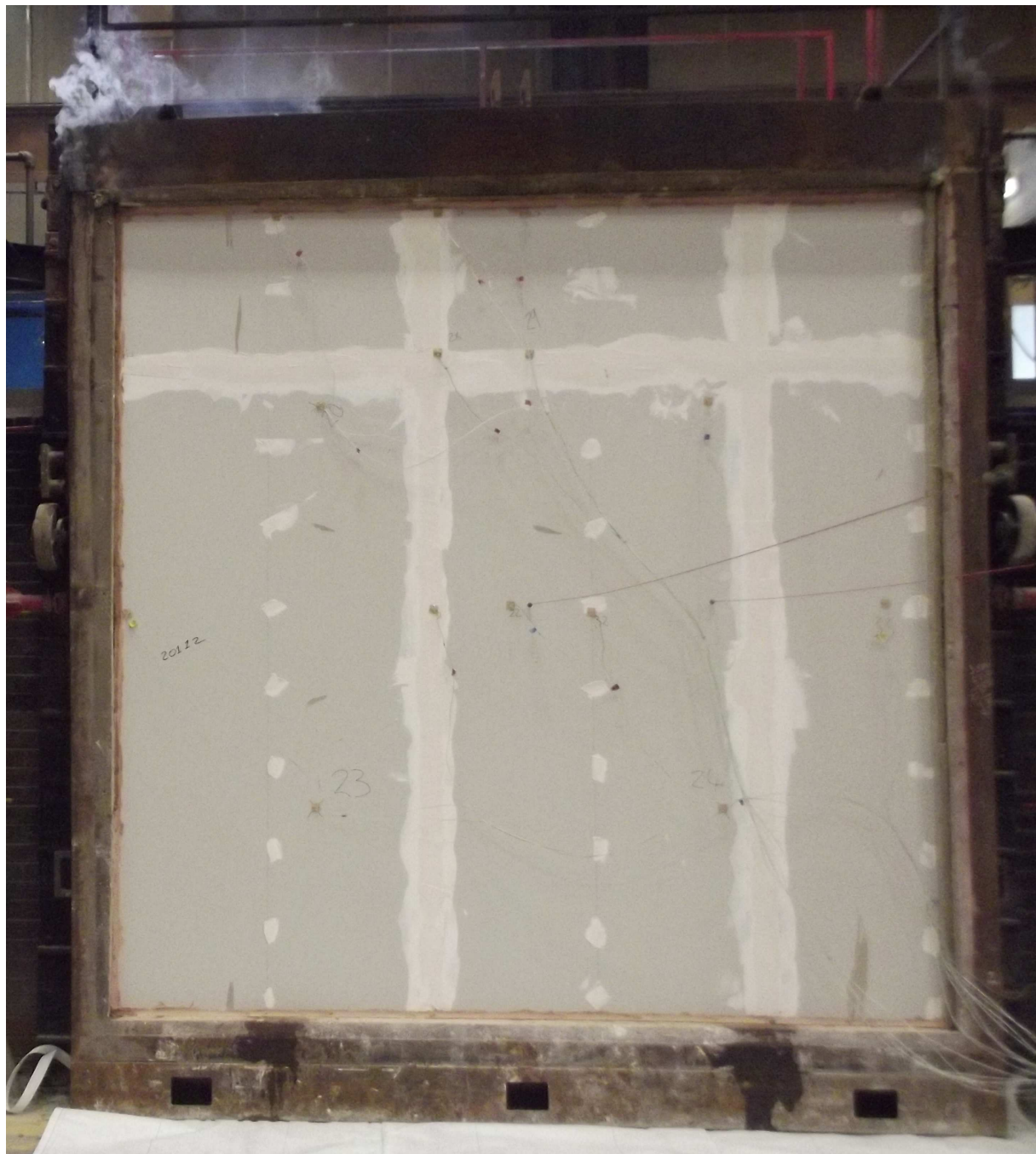


# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

## Unexposed Face at 30 Minutes



Customer: **British Gypsum**

BTC 20112F: Page 36 of 39



0296

# The Building Test Centre

## Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

### Unexposed Face at 1 Hour



Customer: **British Gypsum**

BTC 20112F: Page 37 of 39



0296

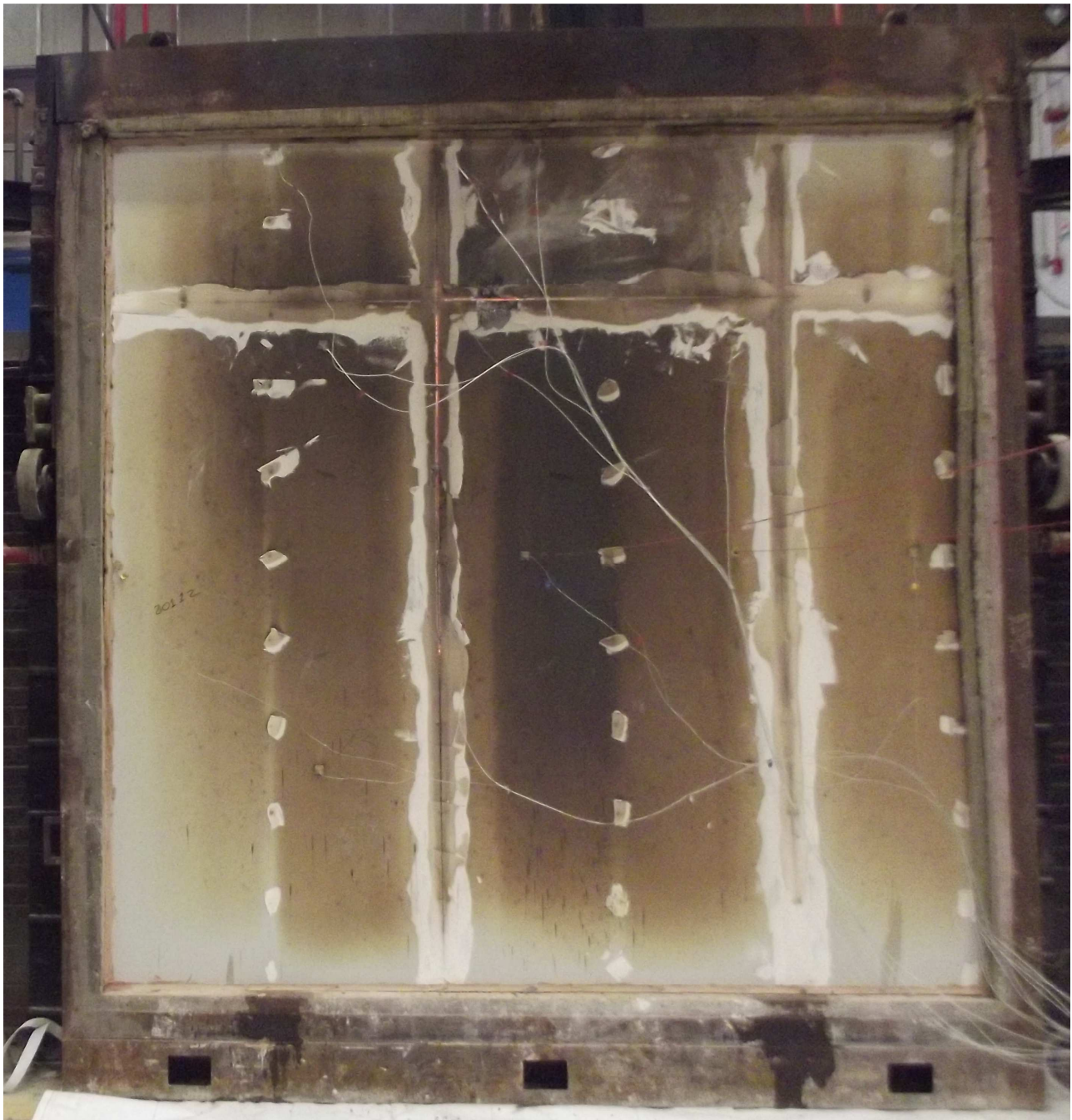


# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
British Gypsum  
East Leake  
Loughborough  
Leicestershire, LE12 6NP  
Tel: (0115) 945 1564  
Fax: (0115) 945 1562  
Email: [btc.testing@saint-gobain.com](mailto:btc.testing@saint-gobain.com)

## Unexposed Face After Test Termination



Customer: **British Gypsum**

BTC 20112F: Page 38 of 39



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 75mm).
- iii) Increase thickness of component materials (minimum Gypframe stud depth 70mm, minimum Gypframe stud gauge 0.50mm).
- iv) Decrease in the linear dimensions of the boards but not thickness ( $\leq 2400$  mm (long) x  $\leq 1200$  mm (wide) Gyproc DuraLine).
- v) Decrease stud spacing from 600mm.
- vi) Decrease in fixing centres from 300mm.
- vii) Increase in the number of horizontal joints, of the type tested, when tested with one joint not more than  $(500 \pm 150)$  mm from the top edge.

#### 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          |
| $\leq 100\text{mm}$ | $\leq 100\text{mm}$ |