



# **The Building Test Centre**

**Fire Acoustics Structures**

**The Building Test Centre**  
British Gypsum Limited  
East Leake  
Loughborough  
Leics. LE12 6NP  
Tel (0115) 945 1564  
Fax (0115) 945 1562  
email [btc.testing@bpb.com](mailto:btc.testing@bpb.com)  
web site [www.btconline.co.uk](http://www.btconline.co.uk)

## **Report Number BTC 15773A**

An acoustic test report covering laboratory sound insulation testing to BS EN ISO 140-3:1995 on a British Gypsum GypWall CLASSIC partition clad with a single layer of 15mm Gyproc FireLine, with 25mm thick Isover Acoustic Partition Roll positioned within the cavity.

Test Date: 9<sup>th</sup> April 2008

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

Customer: **British Gypsum Limited**

BTC 15773A: Page 1 of 11



0296

## TABLE OF CONTENTS

<b>FOREWORD .....</b>	<b>3</b>
<b>REPORT AUTHORISATION .....</b>	<b>3</b>
<b>TEST CONSTRUCTION .....</b>	<b>4</b>
<b>TEST MATERIALS .....</b>	<b>6</b>
<i>Plasterboard .....</i>	<i>6</i>
<i>Insulation.....</i>	<i>6</i>
<i>Metal Components.....</i>	<i>6</i>
<i>Fasteners .....</i>	<i>6</i>
<i>Miscellaneous Components .....</i>	<i>7</i>
<b>TEST RESULTS .....</b>	<b>8</b>
<b>TEST PROCEDURE .....</b>	<b>8</b>
<b>LIMITATIONS .....</b>	<b>8</b>
<b>APPENDIX A - TEST DATA .....</b>	<b>9</b>
<b>APPENDIX B - TEST METHOD AND CONDITIONS.....</b>	<b>11</b>

## **FOREWORD**

The test sponsor was British Gypsum Limited.

The test specimens were installed by Pete Rigley on the 9<sup>th</sup> April 2008.

The Building Test Centre played no role in the design or selection of the materials comprising the test specimen.

## **REPORT AUTHORISATION**

Report Author



**Martin Lynch**  
*Technologist*

Authorised by



**Alexandra Chambers**  
B.Eng. MIOA  
*Section 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.

## TEST CONSTRUCTION

The test specimen was constructed in an aperture having an overall opening of 2400mm (high) x 3600mm (wide).

Gypframe 72C50 Standard Floor & Ceiling Channels were fixed to the head and base of the aperture using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

Gypframe 70AS50 AcouStuds were positioned between the head and base channels at each end of the aperture and fixed using 25mm Gyproc drywall screw fixings spaced at 600mm centres.

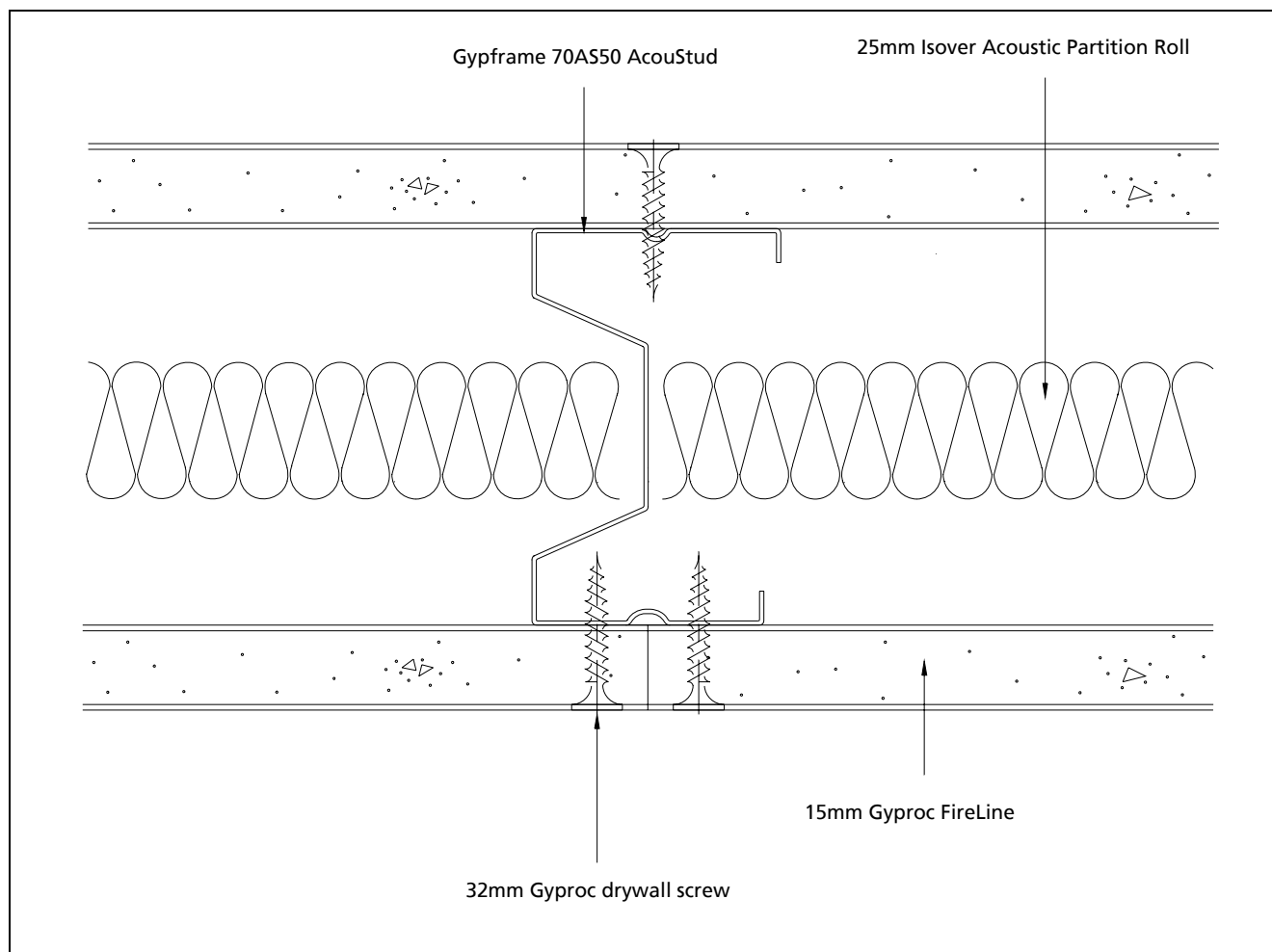
Gypframe 70AS50 AcouStuds were positioned between the head and base channels at 600mm centres.

A layer of 25mm Isover Acoustic Partition Roll was positioned in the cavity.

The framework was clad with a single layer of 15mm Gyproc FireLine.

The boards were screw fixed around the perimeter of the board and the intermediate stud positions at 600mm centres using 32mm Gyproc drywall screws.

All vertical joints were staggered between layers. All joints were taped and the perimeter sealed with Gyproc Sealant.



**Figure 1.** Horizontal cross section view of BTC 15773AA



## TEST MATERIALS

### Plasterboard

- i) Nominally 2400mm (long) x 1200mm (wide) x 15mm (thick) Gyproc FireLine manufactured by British Gypsum Limited, ex East Leake.

Surface density:	12.39kg/m <sup>2</sup>
Average thickness:	15.47mm
Board Code:	18 089 8 10:45

The surface densities were calculated using the actual weight and size of a selection of the boards used in the test specimen.

### Insulation

- i) Nominally 25mm thick Isover APR insulation supplied by Saint Gobain Isover.

Average area	24.00m <sup>2</sup>
Average weight	9.84Kg
Density	16.40Kg/m <sup>3</sup>

The density was calculated using the actual weight and size of the insulation used in the test specimen.

### Metal Components

- i) 0.5mm thick Gypframe 70AS50 AcouStuds  
ii) 0.5mm thick Gypframe 72C50 Standard Flange Floor & Ceiling Channel

All metal components are manufactured from galvanised mild steel using the 'UltraSTEEL' process and supplied by British Gypsum Limited.

### Fasteners

- i) 25mm Gyproc drywall screws  
ii) 32mm Gyproc drywall screws

All fasteners supplied by British Gypsum Limited

Customer: **British Gypsum Limited**

### Miscellaneous Components

- i) Gyproc Sealant supplied by British Gypsum Limited
- ii) Joint tape supplied by The Building Test Centre

Where measurements could not be taken, then weight and dimensions were provided by the customer or the manufacturer e.g. from material labelling. Material information was recorded according to procedure MAT/1.

## TEST RESULTS

Test Code	Description	Weighted Airborne Sound Reduction Index $R_w$ (C; Ctr)
H15773AA	Single Layer 15mm FireLine (ex East Leake) 25mm Isover APR positioned within the cavity	43 (-3;-8)dB

For full data see data in Appendix A of this report.

Test conducted in accordance with BS EN ISO 140-3: 1995 except for Clause F.2 where minimum distances for measurements at frequencies under 100Hz can not be met.

Rated in accordance with BS EN ISO 717-1: 1997

## TEST PROCEDURE

The test specimen (3.6 m x 2.4 m) was constructed in a wall dividing two reverberant rooms of approximately 98m<sup>3</sup> and 62m<sup>3</sup>. The accuracy of the test method conforms to BS EN 20140-2:1993, the test procedure used is detailed in the test data in Appendix A of this report. Broad-band white noise was used to measure the level differences and broad-band pink noise was used to measure the reverberation times. Third octave band pass filters were used in real time mode. See appendix B for further information.

## LIMITATIONS

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential acoustic performance of the element in use nor do they reflect the actual behaviour.

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

Customer: **British Gypsum Limited**

BTC 15773A: Page 8 of 11

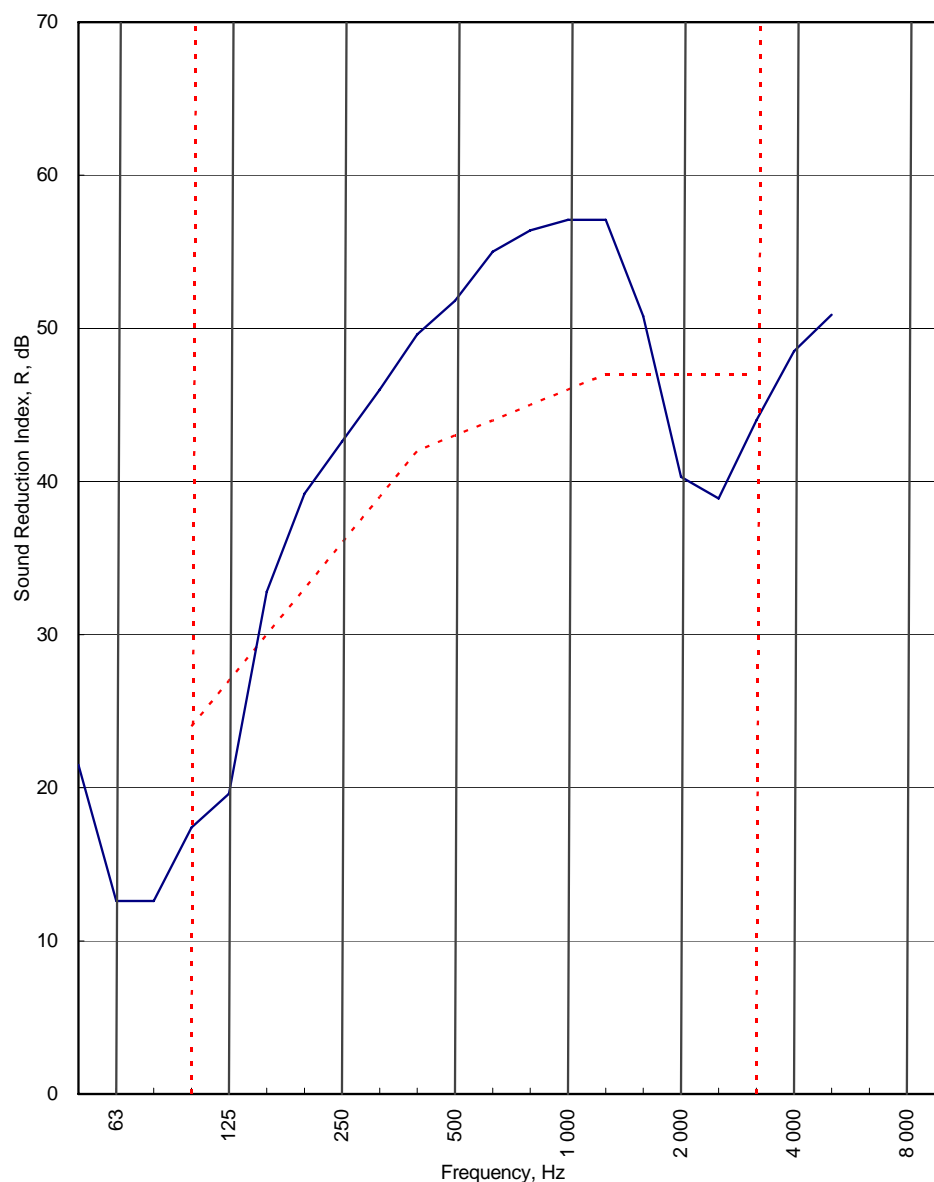


0296

## APPENDIX A - TEST DATA

Test Code:
H15773AA
Test Date:
09/04/2008

Freq. Hz	R dB
50	21.5
63	12.6
80	12.6
100	17.4
125	19.6
160	32.8
200	39.2
250	42.6
315	46.0
400	49.6
500	51.8
630	55.0
800	56.4
1 000	57.1
1 250	57.1
1 600	50.8
2 000	40.3
2 500	38.9
3 150	44.0
4 000	48.5
5 000	50.9
6 300	
8 000	
10 000	



----- Curve of reference values (ISO 717-1)

Rating according to  
BS EN ISO 717-1:1997

**R<sub>w</sub> (C;C<sub>tr</sub>) = 43 (-3;-8) dB**

Max dev. 8.1 dB at 2 500 Hz

Evaluation based on laboratory  
measurement results obtained by  
an engineering method:

C<sub>50-3150</sub>= -4 dB

C<sub>50-5000</sub>= -3 dB

C<sub>100-5000</sub>= -2 dB

C<sub>tr,50-3150</sub>= -13 dB

C<sub>tr,50-5000</sub>= -13 dB

C<sub>tr,100-5000</sub>= -8 dB

Customer: **British Gypsum Limited**

BTC 15773A: Page 9 of 11



0296

# LABORATORY AIRBORNE SOUND INSULATION TEST - BS EN ISO 140-3:1995

Test Code: **H15773AA**

Test Date: **09/04/2008**

Specimen Area, S = **8.64** m<sup>2</sup>

	Room T2	Room T1
Room Volume, m <sup>3</sup> :	<b>98</b>	<b>60.12</b>
Temperature, deg.C:	<b>13.7</b>	<b>13.8</b>
Rel. Humidity, %RH:	<b>42.7</b>	<b>43</b>

Freq Hz	Test Room T2 to Test Room T1						R dB	U.Dev. dB	R 1/1Oct dB
	Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB			
50	59.1	35.5	17.0	35.5	<b>0.68</b>	-2.1	<b>21.5</b>		
63	61.3	49.1	21.6	49.1	<b>1.23</b>	0.4	<b>12.6</b>		14.1
80	68.5	54.9	12.2	54.9	0.88	-1.0	<b>12.6</b>		
100	81.7	63.3	27.5	63.3	0.88	-1.0	<b>17.4</b>	6.6	
125	106.6	86.3	11.6	86.3	0.95	-0.7	<b>19.6</b>	7.4	20.0
160	86.5	54.1	7.2	54.1	1.23	0.4	<b>32.8</b>		
200	92.0	53.7	16.4	53.7	1.36	0.9	<b>39.2</b>		
250	94.8	53.5	11.6	53.5	1.50	1.3	<b>42.6</b>		41.8
315	94.4	49.8	11.1	49.8	1.53	1.4	<b>46.0</b>		
400	92.8	44.2	15.1	44.2	1.39	1.0	<b>49.6</b>		
500	91.0	39.9	14.6	39.9	1.31	0.7	<b>51.8</b>		51.6
630	90.1	36.2	12.2	36.2	1.45	1.1	<b>55.0</b>		
800	90.4	35.2	10.3	35.2	1.47	1.2	<b>56.4</b>		
1 000	90.0	34.0	14.4	34.0	1.45	1.1	<b>57.1</b>		56.9
1 250	91.3	35.3	12.8	35.3	1.45	1.1	<b>57.1</b>		
1 600	93.8	44.1	9.8	44.1	1.44	1.1	<b>50.8</b>		
2 000	95.5	56.3	10.0	56.3	1.42	1.1	<b>40.3</b>	6.7	41.1
2 500	93.7	55.2	9.1	55.2	1.22	0.4	<b>38.9</b>	8.1	
3 150	92.7	49.1	8.7	49.1	1.22	0.4	<b>44.0</b>	3.0	
4 000	94.0	45.5	10.5	45.5	1.12	0.0	<b>48.5</b>		46.8
5 000	98.3	47.2	9.9	47.2	1.06	-0.2	<b>50.9</b>		
6 300									
8 000									
10 000									
<b>Single Figure Ratings</b> <b>BS EN ISO 717-1: 1997</b>  <b>Rw</b> <b>dB</b> <b>43</b>  <b>C</b> <b>dB</b> <b>-3</b>  <b>Ctr</b> <b>dB</b> <b>-8</b>  <b>(100-5000)</b> <b>-2</b> <b>-8</b>  <b>(50-3150)</b> <b>-4</b> <b>-13</b>  <b>RT's &gt; factor 1.5 apart</b> <b>(50-5000)</b> <b>-3</b> <b>-13</b>							<b>Total U. Dev., dB</b> <b>31.8</b>		
							Procedure: ISO140/3/B - issue 2 Worksheet: 140_3_1.XLS		

Customer: **British Gypsum Limited**

BTC 15773A: Page 10 of 11



0296

**APPENDIX B - TEST METHOD AND CONDITIONS**

The source room (T2) was treated with six perspex diffusers of approximately 900mm x 1220mm. An omni-directional loudspeaker sound source is placed near a back corner of the source room (T2), rotating at 1 rpm and at least 0.7m from any room boundary to satisfy Annex C of BS EN ISO 140-3: 1995. A stationary loudspeaker sound source is placed in the corner of the receiving room (T1) opposite the test specimen.

The average sound pressure level in each 1/3 octave band is measured using a rotating microphone boom, positioned such that the minimum distance between microphone and sound source is 1m and between microphone and room boundaries is 0.7m. The rotating microphone has a sweep radius of at least 1m and is inclined in relation to the boundaries at an angle of at least 30° to the horizontal. The microphone has a traverse time of 32 seconds, and the sound pressure levels are averaged over 64 seconds which is equivalent to two complete sweeps of the microphone boom.

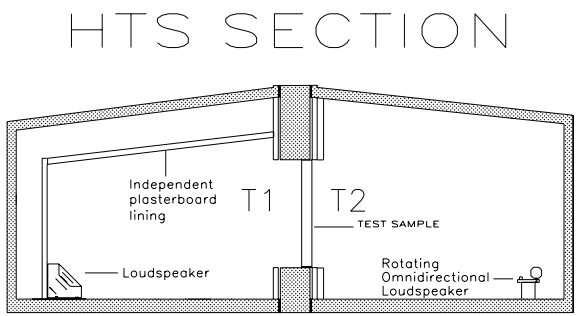
The equivalent absorption area of the receiving room is determined by producing the arithmetic average of twelve reverberation times and applying this to the Sabine formula.

The test specimen is installed in the aperture so that it finishes flush with the first independent timber in room T2 side to eliminate indirect transmission between rooms. The specimen is not installed so that the aperture depth ratio 2:1 is met as recommended in section 5.2.1 of BS EN ISO 140-3:1995. Laboratory tests have been carried out to prove the insignificance of this installation position on the test results.

The laboratory limit for measurement due to flanking is (combined BTC 11709A, BTC13562EA and BTC 15398A)

Freq Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R'max	45.0	46.9	58.5	62.4	62.9	67.7	71.2	77.2	84.2	92.0	97.7	101.5	103.8	97.6	102.4	104.8	101.8	102.9	98.7	93.9	94.3

The figure below shows flanking and isolation treatments in the test chamber.



Chamber layout