The Building Test Centre
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Report Number **BTC16043A**

An acoustic test report covering laboratory sound insulation testing to BS EN ISO 140-3:1995 on a British Gypsum GypWall Quiet IWL partition clad with a double layer of 15mm Gyproc SoundBloc with 100mm Isover Acoustic Partition Roll and incorporating Gypframe 60 I 50 I Studs.

Test Date: 21st October 2008

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

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FOREWORD

The test sponsor was British Gypsum Limited.

The test specimen was installed by John Gwynne and Liam Woodford on the 20th and 21st of October 2008.

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

REPORT AUTHORISATION

Report Author	Authorised by
Christopher Mutton M.Phys *Technologist*	**James Stonell** AMIOA *Technologist*

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TEST CONSTRUCTION

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

Gypframe 62 C 50 Standard Floor & Ceiling channels were fixed to the head and base of the test aperture using 25mm Gyproc drywall screws at 600mm centres.

Gypframe 60 S 50 'C' Studs were screw fixed to either side of the test aperture using 25mm Gyproc drywall screws at 600mm centres.

Gypframe 60 I 50 'I' Studs were inserted between the head and base channels at 600mm centres.

A second framework using the same components and fixing details was located to create the twin frame, and a final partition thickness of 250mm. The 60 I 50 'C' Studs were located at 600mm centres parallel with the first set of framework studs.

100mm Isover Acoustic Partition Roll 1200 was positioned in the partition cavity.

Both sides of the framework were clad in a double layer of 15mm Gyproc SoundBloc board.

The inner layer was fixed using 35mm Gyproc Jack-Point screws around the perimeter of the board at 300mm centres.

The outer layer was screw fixed around the perimeter of the board and to the intermediate studs using 41mm Gyproc Jack-Point screws at 300mm centres.

All joints were staggered between layers.

The perimeter of the partition was sealed to the test aperture with Gyproc Sealant. The board joints and screw heads we covered with tape.

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

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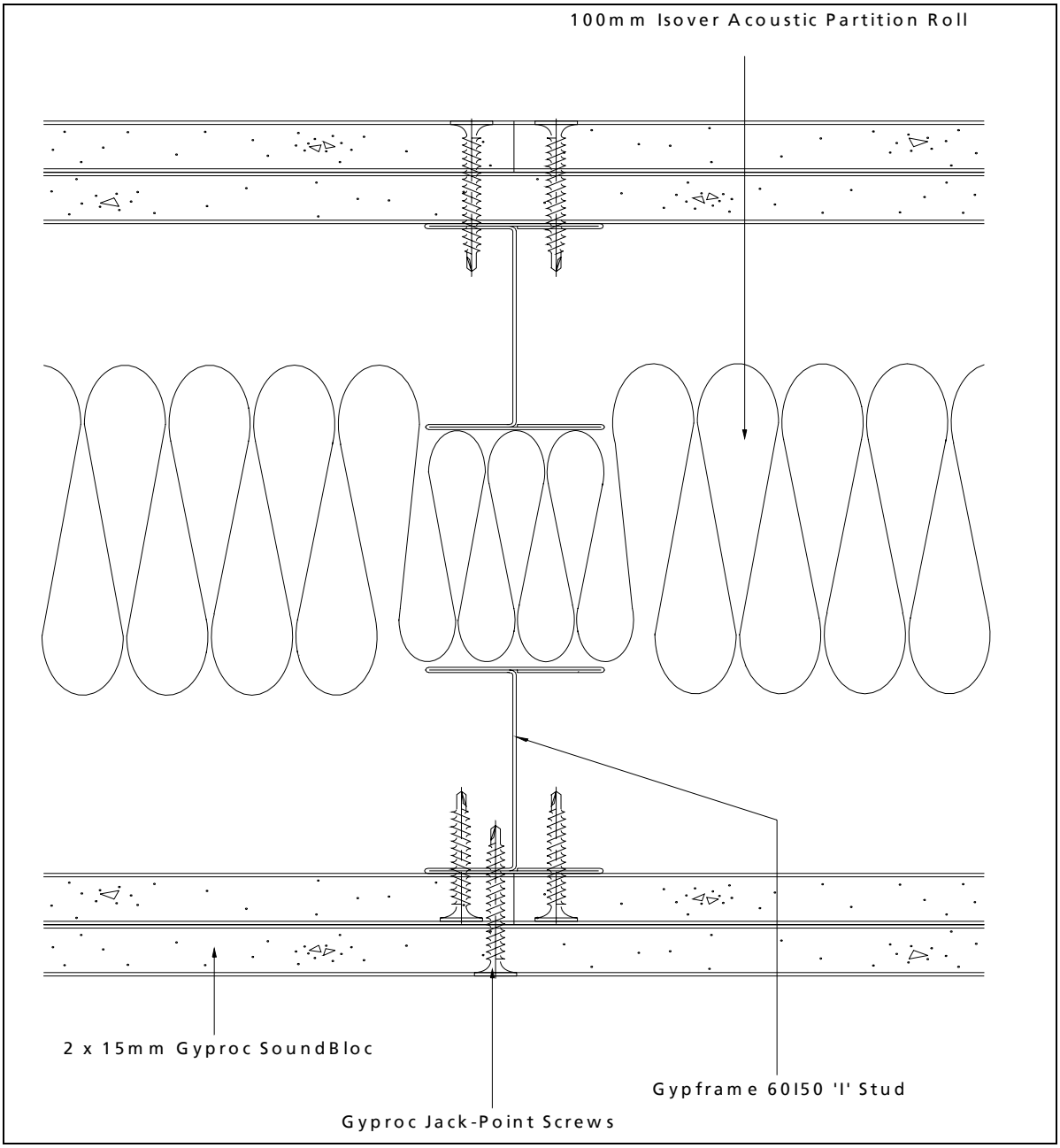

Figure 1. Cross section through partition

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TEST MATERIALS

Plasterboard

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

Surface density:	13.46 kg/m^2
Average thickness:	15.08 mm
Board Code:	16 253 8 07:55

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 100mm thick Isover APR insulation supplied by Saint Gobain Isover.

Average area	11.00 m^2
Average weight	9.73 kg
Density	8.85 kg/m^3

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 60I50 I Studs
ii) 0.5mm thick Gypframe 60S50 C Studs
iii) 0.5mm thick Gypframe 62C50 Standard Flange Floor & Ceiling Channel.

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

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Fasteners

i) 25mm Gyproc Drywall screws
ii) 35mm Gyproc Jack-Point screws
iii) 41mm Gyproc Jack-Point screws

All fasteners supplied by 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.

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TEST RESULTS

Test Code	Description	Weighted Airborne Sound Reduction Index R_w (C; Ctr)
H16043AA	250mm Gypwall Quite IWL partition clad with a Double layer of 15mm SoundBloc (ex East Leake), with 100mm Isover APR in the cavity, incorporating Gypframe 60I50 I studs	70 (-2;-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^3 and 62m^3. 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

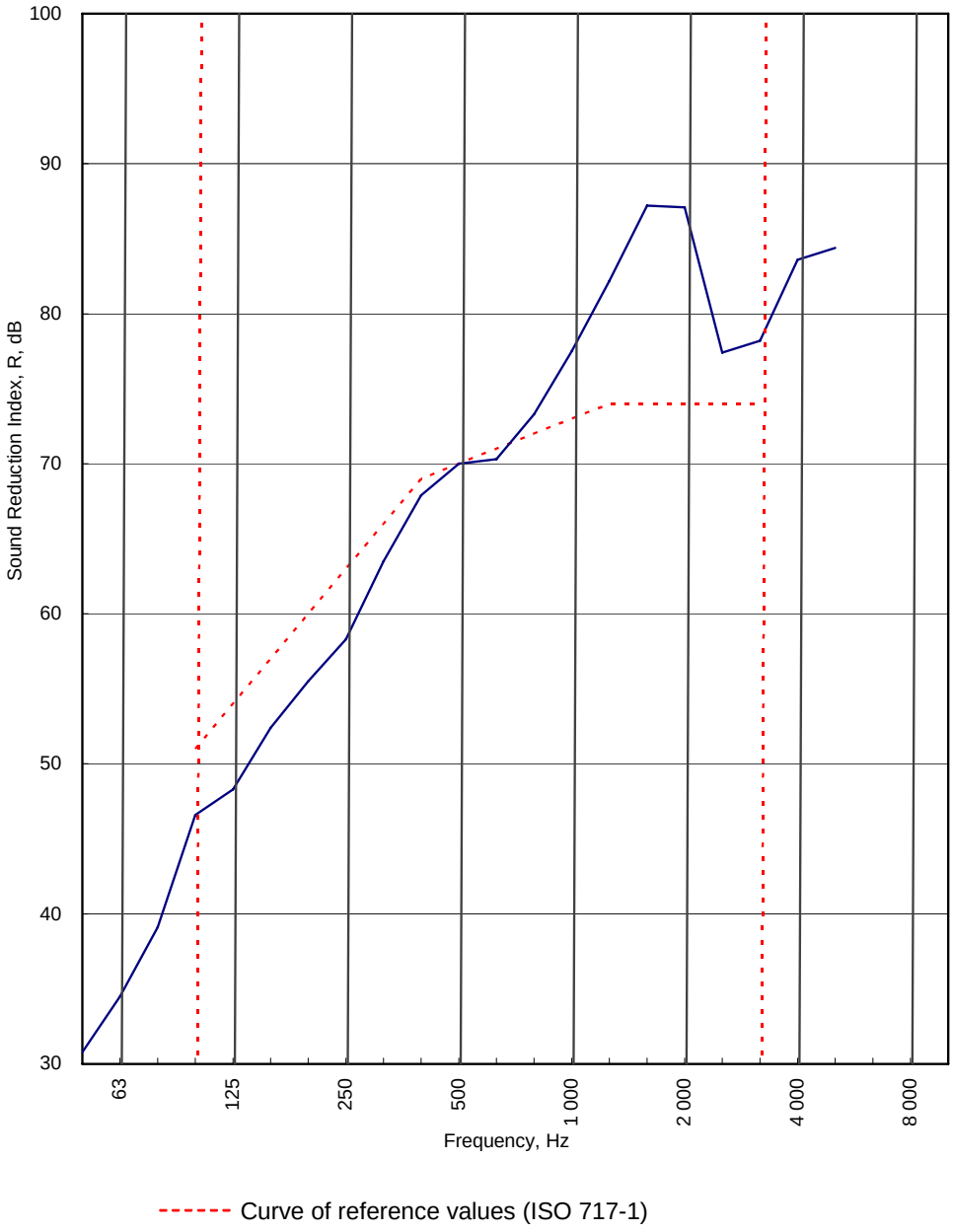
The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential acoustic performance of the element in use nor do they reflect the actual behaviour.

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.

APPENDIX A - TEST DATA

Test Code:
H16043AA
Test Date:
21/10/2008

Freq. Hz	R dB
50	30.8
63	34.5
80	39.1
100	46.6
125	48.3
160	52.4
200	55.5
250	58.3
315	63.5
400	67.9
500	70.0
630	70.3
800	73.3
1 000	77.5
1 250	82.2
1 600	87.2
2 000	87.1
2 500	77.4
3 150	78.2
4 000	83.6
5 000	84.4
6 300	
8 000	
10 000	



Rating according to BS EN ISO 717-1:1997	**Rw (C;Ctr) = 70 (-2;-8) dB** **Max dev. 5.7 dB at 125 Hz**		
Evaluation based on laboratory measurement results obtained by an engineering method:	$C_{50\text{-}3150}$= **-6 dB**	$C_{50\text{-}5000}$= **-5 dB**	$C_{100\text{-}5000}$= **-1 dB**
	$C_{tr,50\text{-}3150}$= **-18 dB**	$C_{tr,50\text{-}5000}$= **-18 dB**	$C_{tr,100\text{-}5000}$: **-8 dB**

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

Test Code: **H16043AA** Test Date: **21/10/2008**

Specimen Area, S = **8.64** m^2

	Room T2	Room T1
Room Volume, m^3:	**98**	**58.84**
Temperature, deg.C:	**16.6**	**16.5**
Rel. Humidity, %RH:	**51.9**	**50.8**

Freq Hz	Test Room T2 to Test Room T1 Source dB	Rec. (uc) dB	Bgrnd dB	Rec. (corr) dB	Rev.time Sec	Corr. dB	**R dB**	U.Dev. dB	R 1/1Oct dB
50	61.9	29.0	22.1	**28.0**	0.53	-3.1	**30.8**		
63	64.5	28.8	16.9	**28.5**	0.78	-1.5	**34.5**		33.6
80	72.4	30.9	11.1	30.9	**0.62**	-2.4	**39.1**		
100	83.4	36.2	13.4	36.2	**0.96**	-0.6	**46.6**	4.4	
125	81.0	33.0	11.2	33.0	1.17	0.3	**48.3**	5.7	48.5
160	86.5	35.3	11.4	35.3	1.42	1.2	**52.4**	4.6	
200	92.3	37.7	15.5	37.7	1.35	0.9	**55.5**	4.5	
250	94.2	37.3	5.8	37.3	1.51	1.4	**58.3**	4.7	58.0
315	93.8	32.0	7.3	32.0	1.63	1.7	**63.5**	2.5	
400	115.2	48.5	11.5	48.5	1.45	1.2	**67.9**	1.1	
500	90.8	22.1	3.0	22.1	1.47	1.3	**70.0**		69.3
630	89.7	20.7	4.1	20.7	1.48	1.3	**70.3**	0.7	
800	110.0	38.3	6.7	38.3	1.59	1.6	**73.3**		
1 000	108.6	32.7	13.8	32.7	1.59	1.6	**77.5**		76.3
1 250	107.8	27.2	7.2	27.2	1.59	1.6	**82.2**		
1 600	110.1	24.8	12.7	**24.5**	1.58	1.6	**87.2**		
2 000	111.3	25.8	9.5	25.8	1.59	1.6	**87.1**		81.3
2 500	109.0	32.6	9.3	32.6	1.38	1.0	**77.4**		
3 150	107.5	30.1	8.9	30.1	1.32	0.8	**78.2**		
4 000	106.5	24.0	13.2	**23.6**	1.29	0.7	**83.6**		81.1
5 000	106.1	22.4	11.8	**22.0**	1.17	0.3	**84.4**		
6 300									
8 000									
10 000									

Single Figure Ratings	**Rw**	**C**	**Ctr**	**Total U. Dev., dB**	**28.2**
BS EN ISO 717-1: 1997	**dB**	**dB**	**dB**		
	70	**-2**	**-8**		
	(100-5000)	**-1**	**-8**		
Background Corrected					
	(50-3150)	**-6**	**-18**		
RT's > factor 1.5 apart				Procedure: ISO140/3/B - issue 2	
	(50-5000)	**-5**	**-18**	Worksheet: 140_3_1.XLS	

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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.

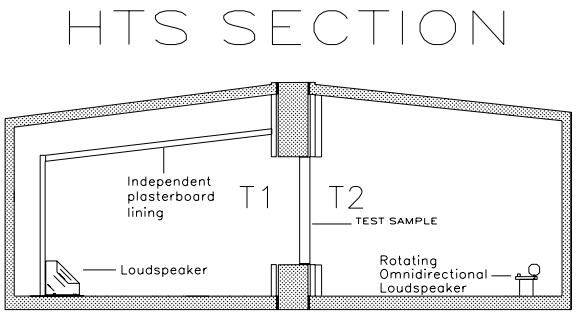
The equivalent absorption area of the receiving room is determined by producing the arithmetic average of twelve reverberation times and applying this to the Sabine formula.

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, BTC 15398A and BTC 15829A)

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	96.4	96.2

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



Chamber layout

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