



The Building Test Centre

Fire Acoustics Structures

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Report Number **BTC 11928A**

SOUND INSULATION TEST TO BS EN ISO 140-3:1995
ON A GYPROC GYPWALL™ PARTITION CONSISTING
OF A DOUBLE LAYER OF 12.5mm GYPROC
WALLBOARD USING 146S50 GYPROC STUDS
,INCORPORATING A 50mm ISOWOOL 1200 QUILT IN
THE CAVITY.

Test Date: 3rd April 2002

www.btconline.co.uk

Customer: **British Gypsum Ltd.**
East Leake
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SOUND INSULATION TEST TO BS EN ISO 140-3:1995 ON A GYPROC GYPWALL™ PARTITION CONSISTING OF A DOUBLE LAYER OF 12.5mm GYPROC WALLBOARD USING 146S50 GYPROC STUDS ,INCORPORATING A 50mm ISOWOOL 1200 QUILT IN THE CAVITY.

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FOREWORD

This test report details a sound insulation test conducted on a sheet and stud partition system. The test sponsor was British Gypsum Limited.

The test specimen was installed by British Gypsum Limited. The construction of the specimen took place on the 3rd April 2002.

REPORT AUTHORISATION

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TEST CONSTRUCTION

Gyproc 148C50 metal channel was screw fixed at 300mm centres to the head and the base of the test aperture using 25mm Gyproc Drywall screws. Gyproc 146S50 studs were inserted between the head and base channels at 600mm centres. A double layer of 12.5mm Gyproc Wallboard boards were screw fixed to either side of the metal framework. The inner layer was screw fixed at 300mm centres around the perimeter using 25mm Gyproc Drywall screws, and the outer layer was screw fixed with 36mm Gyproc Drywall screws at 300mm centres around the perimeter and at the intermediate stud positions. 50mm Isowool 1200 quilt was inserted inside the cavity of the partition. The perimeter of the partition was sealed to the test aperture with Gyproc sealant. The board joints and screw heads were covered with adhesive tape.

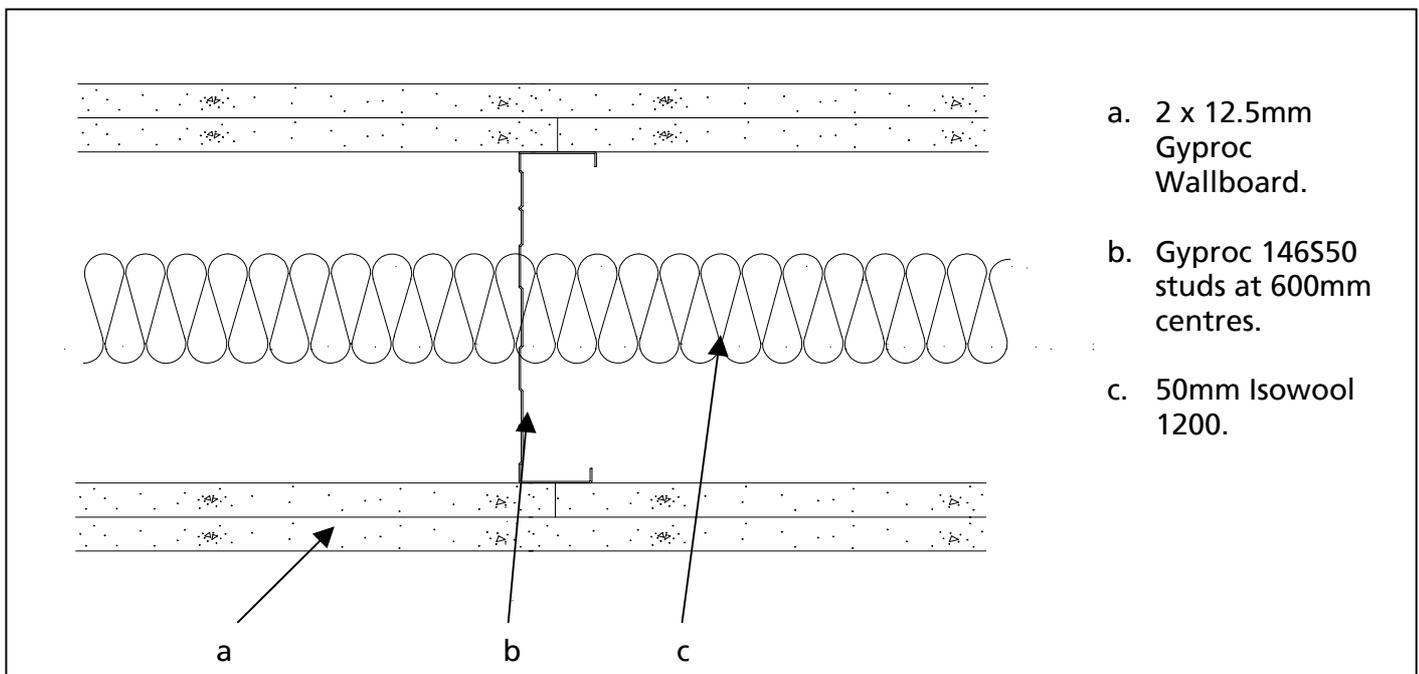


Figure 1. Cross-section through the partition.

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

TEST MATERIALS

Gyproc Wallboard

Nominally 2400mm (long) x 1200mm (wide) x 12.5mm (thick) Gyproc Wallboard, manufactured by British Gypsum Limited ex East Leake works.

Average surface density:	8.03 kg/m ²
Actual thickness:	12.27 mm
Board code:	160672 12:43

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

Metal components

- i) Gyproc 148C50 channel manufactured from hot dipped galvanised mild steel.
- ii) Gyproc 146S50 studs manufactured from hot dipped galvanised mild steel 0.5mm thick using the Ultra steel process.

All components supplied by British Gypsum Limited.

Fasteners

- i) 25mm Gyproc S point Drywall screws supplied by British Gypsum Limited.
- ii) 36mm Gyproc S point Drywall screws supplied by British Gypsum Limited.

Insulation

Nominally 50mm Isowool 1200 glass mineral wool insulation manufactured by British Gypsum- Isover Limited.

- i) Average surface density 0.69 Kg/m²
- ii) Average density 13.82 Kg/m³

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

Customer: **British Gypsum Ltd.**

TEST PROCEDURE

The test specimen (3.6 m x 2.4 m) was constructed in a wall dividing two reverberant rooms of approximately 98m³ and 62m³. The accuracy of the test method conforms to BS EN 20140-2:1993, the test procedure used was 140/3 issue 3. 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.

TEST RESULTS

Weighted Airborne Sound Reduction Index

R_w (C; Ctr) = 51 (-2; -5) dB

For full data see pages 7 - 8.

Test conducted in accordance with BS EN ISO 140-3: 1995

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

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

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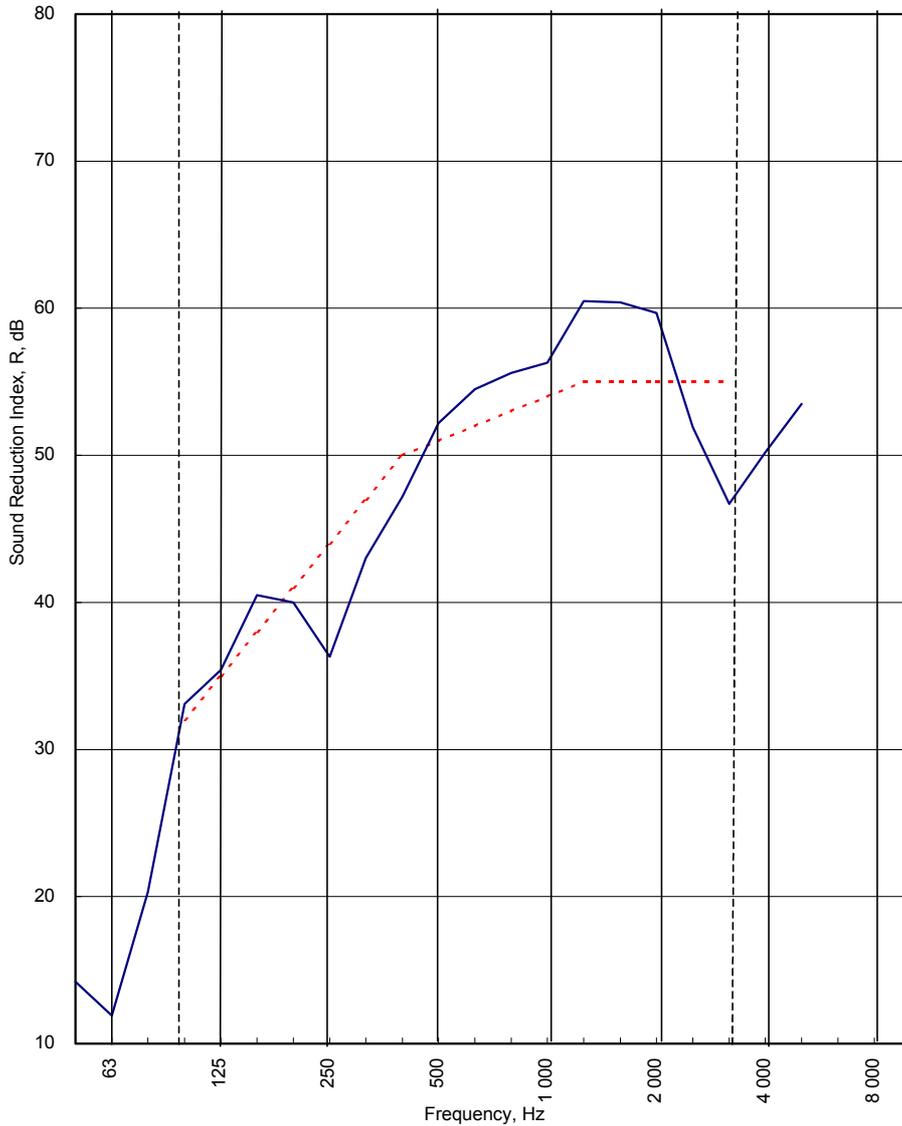


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APPENDIX A- TEST DATA

Test Code: H11928A
Test Date: 03/04/02

Freq. Hz	R dB
50	14.2
63	11.9
80	20.3
100	33.1
125	35.4
160	40.5
200	40.0
250	36.3
315	43.0
400	47.2
500	52.2
630	54.5
800	55.6
1 000	56.3
1 250	60.5
1 600	60.4
2 000	59.7
2 500	51.9
3 150	46.7
4 000	50.2
5 000	53.5
6 300	
8 000	
10 000	



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

Rating according to BS EN ISO 717-1:1997	R_w (C;Ctr) = 51 (-2;-5) dB		
Evaluation based on laboratory measurement results obtained by an engineering method:	Max dev. 8.3 dB at 3 150 Hz		
	C₅₀₋₃₁₅₀ = -7 dB	C₅₀₋₅₀₀₀ = -6 dB	C₁₀₀₋₅₀₀₀ = -1 dB
	C_{tr,50-3150} = -18 dB	C_{tr,50-5000} = -18 dB	C_{tr,100-5000} = -5 dB

Customer: **British Gypsum Ltd.**



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

Test Code: **H11928A**

Test Date: **03/04/02**

Specimen Area, S = **8.64** m²

	Room T2	Room T1
Room Volume, m ³ :	98	62
Temperature, deg.C:	17.6	16.7
Rel. Humidity, %RH:	51.8	55.8

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	58.4	41.4	27.6	41.2	0.58	-3.0	14.2		
63	63.3	50.1	18.9	50.1	0.85	-1.3	11.9		14.3
80	67.5	46.7	13.9	46.7	1.02	-0.5	20.3		
100	76.2	42.8	16.4	42.8	1.08	-0.3	33.1		
125	80.9	45.9	12.3	45.9	1.25	0.4	35.4		35.4
160	87.4	47.0	14.4	47.0	1.17	0.1	40.5		
200	93.2	54.0	18.1	54.0	1.38	0.8	40.0	1.0	
250	95.7	59.5	13.7	59.5	1.17	0.1	36.3	7.7	38.9
315	96.0	52.9	17.2	52.9	1.13	-0.1	43.0	4.0	
400	94.6	47.4	15.7	47.4	1.15	0.0	47.2	2.8	
500	92.3	40.1	13.7	40.1	1.15	0.0	52.2		50.2
630	91.1	36.5	10.8	36.5	1.11	-0.1	54.5		
800	91.6	36.8	8.1	36.8	1.37	0.8	55.6		
1 000	91.0	35.7	10.8	35.7	1.46	1.0	56.3		57.0
1 250	92.0	32.9	7.7	32.9	1.58	1.4	60.5		
1 600	94.7	35.8	9.0	35.8	1.63	1.5	60.4		
2 000	96.4	38.1	8.7	38.1	1.60	1.4	59.7		55.5
2 500	94.8	43.9	6.6	43.9	1.43	1.0	51.9	3.1	
3 150	93.9	47.7	8.6	47.7	1.28	0.5	46.7	8.3	
4 000	93.2	43.7	11.5	43.7	1.36	0.7	50.2		49.3
5 000	91.7	38.8	18.5	38.8	1.32	0.6	53.5		
6 300									
8 000									
10 000									

Single Figure Ratings	Rw	C	Ctr	Total U. Dev., dB	26.9
BS EN ISO 717-1: 1997	dB	dB	dB		
	51	-2	-5		
	(100-5000)	-1	-5		
Background Corrected					
	(50-3150)	-7	-18		
	(50-5000)	-6	-18		

Customer: **British Gypsum Ltd.**



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 six 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 (BTC 11709A)

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	56.3	61.8	58.5	60.6	62.5	66.3	74.1	79.5	85.0	90.4	93.8	95.0	95.3	98.3	100.4	98.5	96.3	93.9	91.1

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

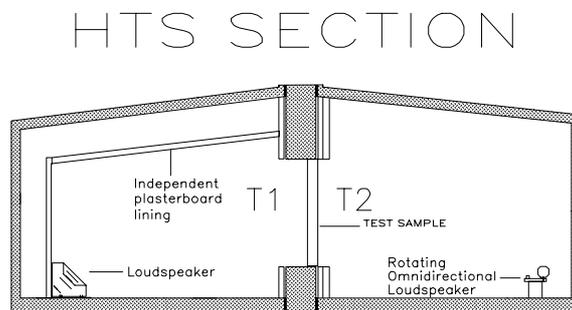


Figure 2 Chamber layout.

Customer: **British Gypsum Ltd.**

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