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

Report Number **BTC 11507A**

ACOUSTIC TEST REPORT COVERING A TEST TO BS EN ISO 140-3:1995 ON A GYPROC GYPWALL™ PARTITION CONSISTING OF GYPROC 70mm UN-RIGIDISED ACOUSTIC STUDS CLAD EACH SIDE WITH A DOUBLE LAYER OF 12.5mm GYPROC SOUNdBLOC BOARD WITH 25mm ISOWOOL 1200 IN THE CAVITY.

Test Date: 2ND May 2001

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

UKAS TESTING
No. 0296

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

ACOUSTIC TEST REPORT COVERING A TEST TO BS EN ISO 140-3:1995 ON A GYPROC GYPWALL™ PARTITION CONSISTING OF GYPROC 70mm UN-RIGIDISED ACOUSTIC STUDS CLAD EACH SIDE WITH A DOUBLE LAYER OF 12.5mm GYPROC SOUNdBLOC BOARD WITH 25mm ISOWOOL 1200 IN THE CAVITY.

TABLE OF CONTENTS

FOREWORD ____ *3*
REPORT AUTHORISATION ____ *3*
TEST CONSTRUCTION ____ *4*
TEST MATERIALS ____ *5*
Gyproc SoundBloc ____ *5*
Insulation ____ *5*
Metal components ____ *5*
Fasteners ____ *5*
TEST PROCEDURE ____ *6*
TEST RESULTS ____ *6*
LIMITATIONS ____ *6*
APPENDIX A: TEST DATA ____ *7*
APPENDIX B: TEST METHOD AND CONDITIONS ____ *9*

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

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 2nd May 2001.

REPORT AUTHORISATION

Report Author	Authorised by
Franklin Sanicharane HND, BEng. (Hons.). *Technologist*	Eur Ing. **Paul Howard** BSc. (Hons.), CEng., MIOA *Head of Laboratory*

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

TEST CONSTRUCTION

Gyproc 72C50 metal channel was screw fixed at 600mm centres to the head and the base of the test aperture using 25mm Gyproc Drywall screws. The un-rigidised 70mm Gyproc acoustic studs were inserted between the head and base channels at 600mm centres. A double layer of 12.5mm Gyproc SoundBloc board was screw fixed to either side of the partition. The inner layer was screw fixed around the perimeter at 300mm centres using 25mm Gyproc Drywall screws. The outer layer was screw fixed at 300mm centres around the perimeter and to the intermediate stud positions using 42mm Gyproc Drywall screws. 25mm Isowool 1200 was inserted between the cavity.

The perimeter of the partition was sealed to the test aperture with Gyproc sealant. All board joints were staggered and the board joints and screw heads were covered with Gyproc adhesive tape. All board joints were staggered.

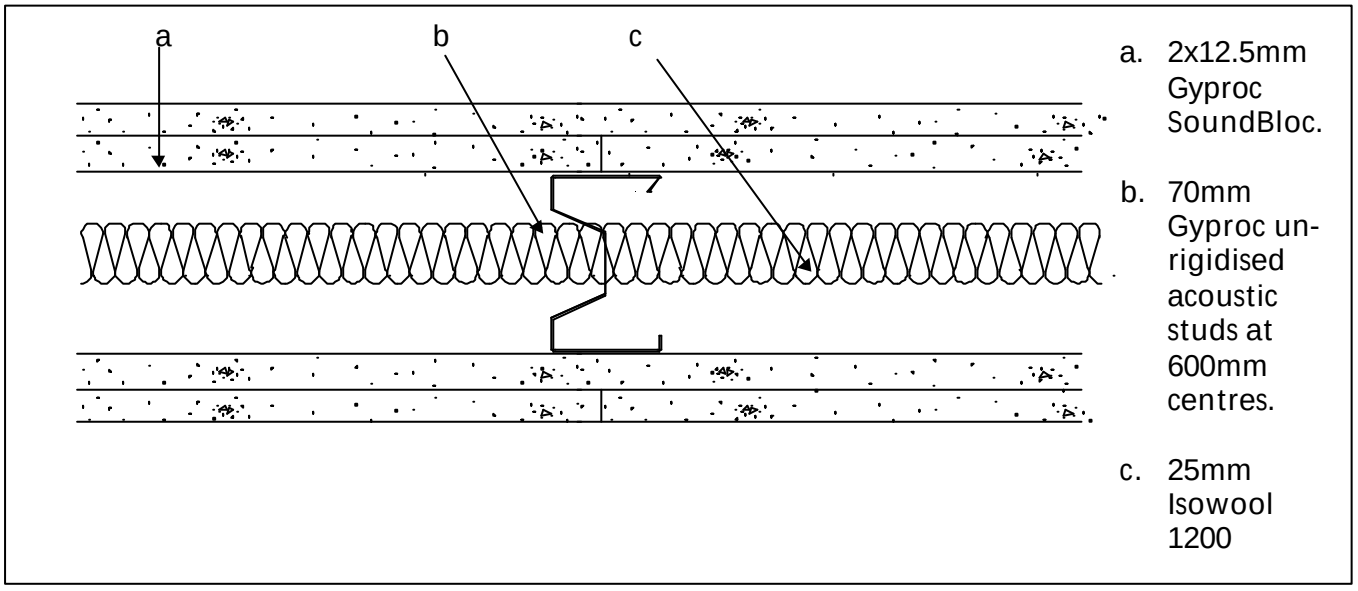


Figure 1. Cross-section through the partition.

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

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

TEST MATERIALS

Gyproc SoundBloc

Nominally 2400mm (long) x 1200mm (wide) x 12.5mm (thick) Gyproc SoundBloc Board manufactured by British Gypsum Limited ex Kirby Thore works.

Average surface density:	10.63 kg/m^2
Actual thickness:	12.8 mm
Board code:	270221 17:19

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

Metal components

i) un-rigidised 70mm Gyproc acoustic studs manufactured from hot dipped galvanised mild steel, 0.5mm thick.
ii) Gyproc 72C50 channel manufactured from hot dipped galvanised mild steel.

All components supplied by British Gypsum Limited.

Insulation

Nominally 25mm Isowool 1200 glass mineral wool insulation manufactured by British Gypsum-Isover Limited.

Average surface density:	0.45 kg/m^3
Average density:	17.88 kg/m^3

Fasteners

i) 25mm Gyproc S point screws supplied by British Gypsum Limited.
ii) 42mm Gyproc S point screws supplied by British Gypsum Limited.

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.

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

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 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 for further information.

TEST RESULTS

Weighted Airborne Sound Reduction Index	**R_w (C; Ctr) = 58 (-2; -7) 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

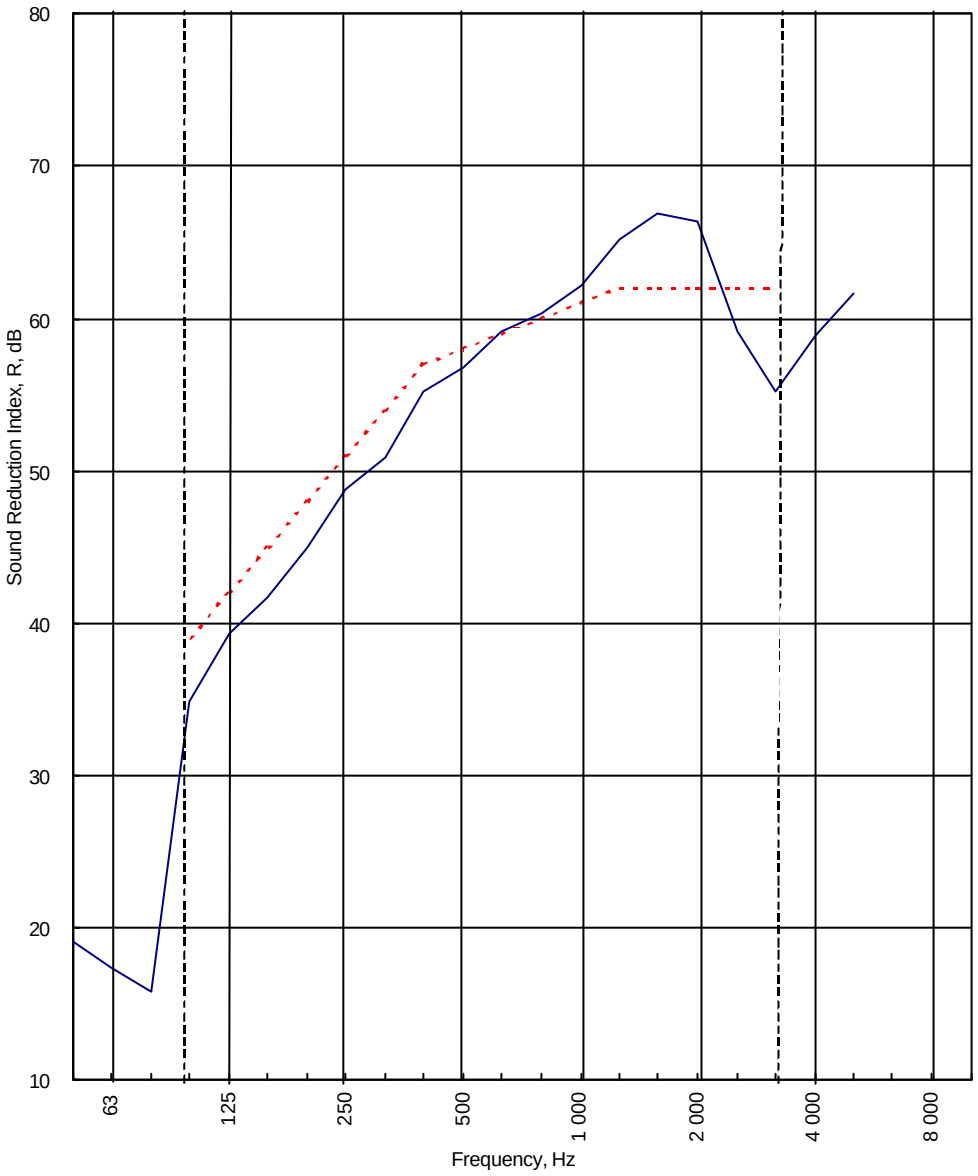
The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential acoustic performance of the element in use nor do they reflect the actual behaviour.

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.

APPENDIX A- TEST DATA

Test Code:
H11507A
Test Date:
02/05/01

Freq. Hz	R dB
50	19.1
63	17.3
80	15.7
100	34.8
125	39.3
160	41.6
200	45.0
250	48.7
315	50.9
400	55.2
500	56.7
630	59.2
800	60.3
1 000	62.2
1 250	65.2
1 600	66.9
2 000	66.3
2 500	59.1
3 150	55.2
4 000	58.8
5 000	61.7
6 300	
8 000	
10 000	



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

Rating according to BS EN ISO 717-1:1997

Rw (C;Ctr) = 58 (-2;-7) dB

Max dev. 6.8 dB at 3 150 Hz

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

$C_{50\text{-}3150}$ = **-11 dB** $C_{50\text{-}5000}$ = **-10 dB** $C_{100\text{-}5000}$ = **-2 dB**

$C_{tr,50\text{-}3150}$ = **-23 dB** $C_{tr,50\text{-}5000}$ = **-23 dB** $C_{tr,100\text{-}5000}$ = **-7 dB**

UKAS TESTING
No. 0296

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

Test Code: **H11507A** Test Date: **02/05/01**

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

	Room T2	Room T1
Room Volume, m^3:	**98**	**62**
Temperature, deg.C:	**14**	**14**
Rel. Humidity, %RH:	**47**	**47**

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	60.2	36.6	16.1	36.6	**0.41**	-4.5	**19.1**		
63	60.8	42.4	8.2	42.4	**0.89**	-1.1	**17.3**		17.1
80	63.4	45.3	4.6	45.3	0.66	-2.4	**15.7**		
100	74.6	39.0	18.5	39.0	0.95	-0.8	**34.8**	4.2	
125	79.5	40.1	7.3	40.1	1.12	-0.1	**39.3**	2.7	37.6
160	86.0	43.0	12.8	43.0	**0.84**	-1.4	**41.6**	3.4	
200	92.1	47.5	23.9	47.5	**1.27**	0.4	**45.0**	3.0	
250	95.4	47.2	12.0	47.2	1.29	0.5	**48.7**	2.3	47.5
315	95.5	44.5	19.0	44.5	1.13	-0.1	**50.9**	3.1	
400	93.9	39.0	17.1	39.0	1.24	0.3	**55.2**	1.8	
500	91.7	35.2	16.2	35.2	1.19	0.2	**56.7**	1.3	56.7
630	90.7	32.2	13.3	32.2	1.34	0.7	**59.2**		
800	90.9	31.7	13.6	31.7	1.48	1.1	**60.3**		
1 000	90.4	29.4	12.4	29.4	1.51	1.2	**62.2**		62.1
1 250	91.7	28.3	9.0	28.3	1.74	1.8	**65.2**		
1 600	94.3	29.3	11.3	29.3	1.79	1.9	**66.9**		
2 000	95.9	31.2	14.0	31.2	1.67	1.6	**66.3**		62.5
2 500	94.3	36.4	9.2	36.4	1.52	1.2	**59.1**	2.9	
3 150	93.1	38.7	7.5	38.7	1.39	0.8	**55.2**	6.8	
4 000	92.1	34.1	10.8	34.1	1.37	0.8	**58.8**		57.8
5 000	90.9	29.6	12.4	29.6	1.27	0.4	**61.7**		
6 300									
8 000									
10 000									

Single Figure Ratings	**Rw**	**C**	**Ctr**	**Total U. Dev., dB**	**31.5**
BS EN ISO 717-1: 1997	**dB**	**dB**	**dB**		
	58	**-2**	**-7**		
	(100-5000)	**-2**	**-7**		
	(50-3150)	**-11**	**-23**		
RT's > factor 1.5 apart					
Tested Serially[ ] Real Time[ ]	**(50-5000)**	**-10**	**-23**		

UKAS TESTING
No. 0296

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 was measured using a rotating microphone boom, positioned such that the minimum distance between microphone and sound source was 1m, and between microphone and room boundaries 0.7m. The rotating microphone has a sweep radius of at least 1m and was inclined in relation to the boundaries at an angle of at least 30^{o} to the horizontal. The microphone has a traverse time of 32 seconds, and the sound pressure levels were 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 last 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 shown to prove the insignificance of this installation position on the test results.

The laboratory limit for measurement due to flanking is (BTC H 3306A)

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	32	44	39	55	56	59	64	63	70	77	84	88	91	92	94	97	96	98	96	90	87

Figure 2 below shows flanking and isolation treatments in the test chamber.

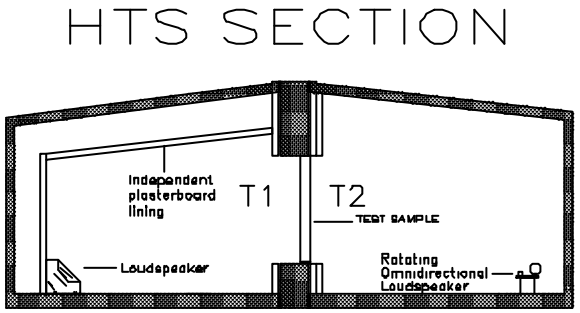


Figure 2. Test Chamber Layout