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 11130A**

ACOUSTIC TEST REPORT COVERING LABORATORY SOUND INSULATION TEST TO BS EN ISO 140-3:1995 ON A GYPROC METAL STUD PARTITION INCORPORATING A GYPROC RESILIENT BAR ON ONE SIDE.

Test Date: 13th July 2000

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

UKAS TESTING
No. 0296
No. 0296SI

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 LABORATORY SOUND INSULATION TEST TO BS EN ISO 140-3:1995 ON A GYPROC METAL STUD PARTITION INCORPORATING A GYPROC RESILIENT BAR ON ONE SIDE.

TABLE OF CONTENTS

UKAS TESTING
No. 0296
No. 0296SI

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 sponsors were British Gypsum Limited.

The test specimen was installed by British Gypsum Limited. The construction of the specimen took place between the 11th and 12th July 2000. 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
Neal Dangerfield B.Sc. (Hons.), GradInstP, AMIOA *Project Leader*	**Eur Ing. Paul Howard** BSc. (Hons.), CEng., MIOA *Head of Laboratory*

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 channel was fixed to the head and base of the test at 600mm centres. Gyproc 70S50 studs were located at 600mm between the head and base channels. Gyproc Resilient Bars were screw fixed horizontally at 600mm centres to one side of the framework only using Gyproc Wafer Head Screws into each stud.

The framework was clad each side with an inner layer of 19mm Gyproc Plank fixed horizontally using 32mm Gyproc Drywall S Point Screws to the perimeter of the board. An outer layer of 12.5mm Gyproc SoundBloc was fixed at 300mm centres using 42mm Gyproc Drywall S Point Screws to the perimeter of the board and at intermediate stud/ resilient bar positions. All board joints were staggered with respect to each other.

One layer of 50mm Isowool 1200 was placed in the cavity.

All joints on the outer layer were taped using acoustic tape and the perimeter of the specimen was sealed using Gyproc Sealant.

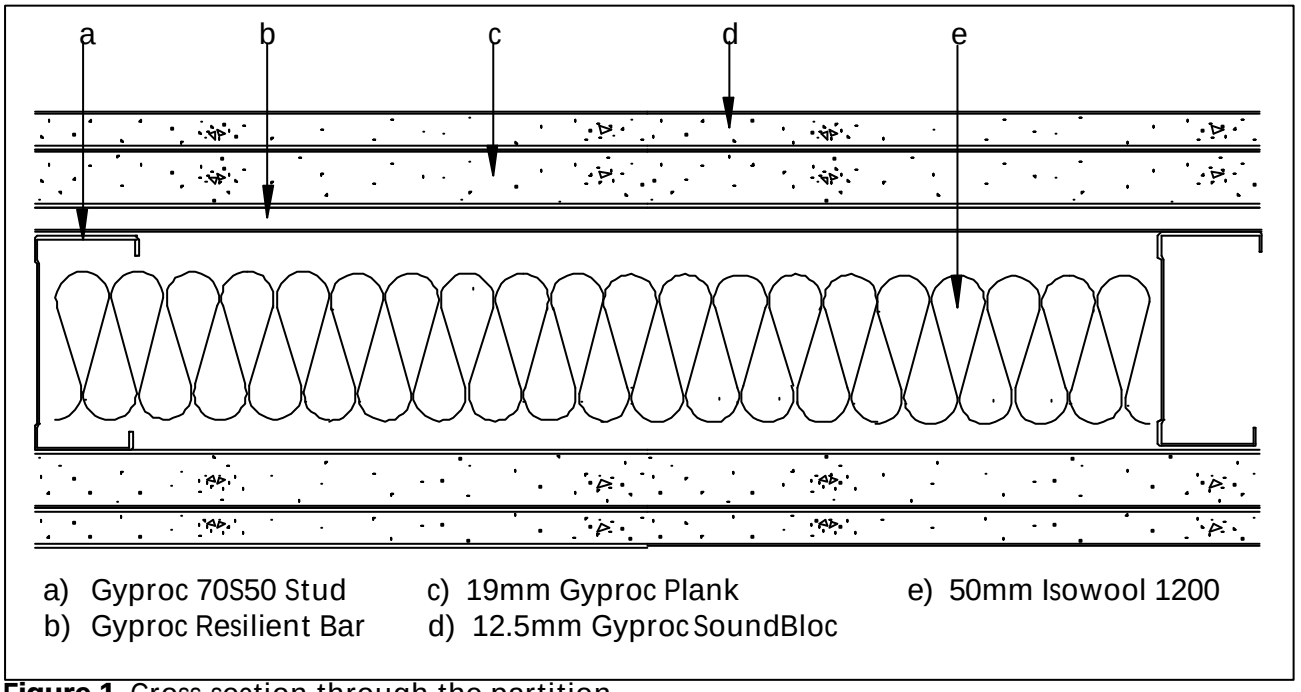


Figure 1. Cross-section through the partition

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 Plank

Nominally, 2400mm (long) x 600mm (wide) x 19mm (thick), Gyproc Plank manufactured by British Gypsum Limited.

Actual surface density:	14.82kg/m^2.
Average thickness:	19.03mm
Board identification numbers:	19/11/99 - 09:16
Nominal moisture content:	<1%

Gyproc SoundBloc

Nominally, 2400mm (long) x 1200mm (wide) x 12.5mm (thick), Gyproc SoundBloc manufactured by British Gypsum Limited.

Actual surface density:	10.50kg/m^2.
Average thickness:	12.43mm
Board identification numbers:	27-175-0 19:37:25
Nominal moisture content:	<1%

The surface density was calculated using the actual weight and size of all the boards used in the test specimen. The moisture content of plasterboard has been established from measurements made over many tests using samples dried to constant weight in an oven at 40^{0}C.

Metal components

i) Gyproc 70S50 stud.
ii) Gyproc 72C50 channel.
iii) Gyproc Resilient Bar.

All metal components supplied by British Gypsum Limited.

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

Fasteners

i) Gyproc Wafer Head Screws.
ii) 32mm Gyproc Drywall S Point Screws.
iv) 42mm Gyproc Drywall S Point Screws.

All fasteners supplied by British Gypsum Limited.

Insulation

Isowool 1200 nominally 50mm thick supplied by British Gypsum - Isover Limited.

Actual surface density:	0.68 kg/m^2.
Actual density:	13.53 kg/m^3

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 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.

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 RESULTS

Weighted Airborne Sound Reduction Index R_w (C; Ctr) = 63(-2;-9)dB

For full test data see pages 8 and 9.

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.

The specification and interpretation of acoustic 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.

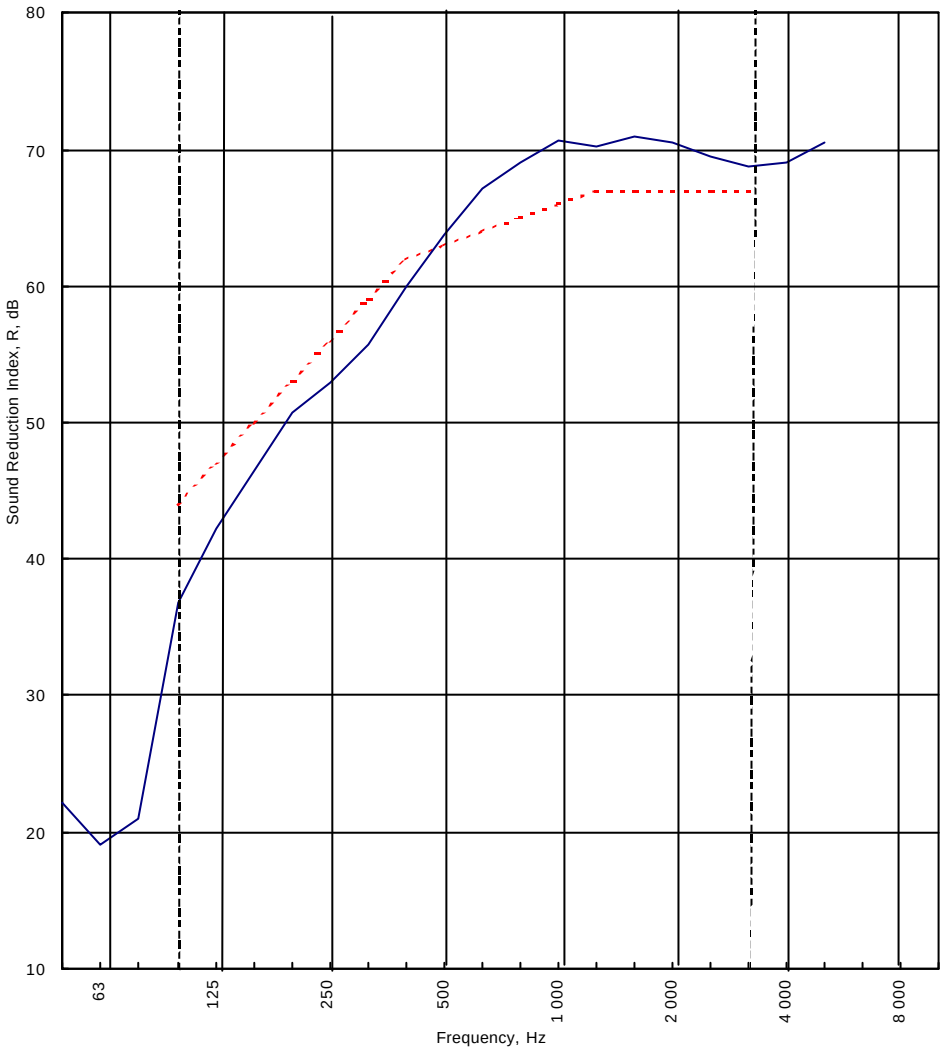
UKAS TESTING
No. 0296
No. 0296SI

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 DATA

Test Code: H11130A
Test Date: 13/07/00

Freq. Hz	R dB
50	22.1
63	19.1
80	21.0
100	36.8
125	42.2
160	46.5
200	50.7
250	53.0
315	55.7
400	59.9
500	63.8
630	67.1
800	69.0
1 000	70.7
1 250	70.2
1 600	71.0
2 000	70.5
2 500	69.5
3 150	68.8
4 000	69.0
5 000	70.5
6 300	
8 000	
10 000	



Rating according to BS EN ISO 717-1:1997

Rw (C;Ctr) = 63 (-2;-9) dB

Max dev. 7.2 dB at 100 Hz

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

$C_{50\text{-}3150}$=	**-12 dB**	$C_{50\text{-}5000}$=	**-11 dB**	$C_{100\text{-}5000}$=	**-1 dB**
$C_{tr,50\text{-}3150}$=	**-25 dB**	$C_{tr,50\text{-}5000}$=	**-25 dB**	$C_{tr,100\text{-}5000}$=	**-9 dB**

UKAS TESTING
No. 0296
No. 0296SI

Customer: **British Gypsum Limited**

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

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

Test Code: **H11130A** Test Date: **13/07/00**

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

	Room T2	Room T1
Room Volume, m^3:	**98**	**62**
Temperature, deg.C:	**17.3**	**17.3**
Rel. Humidity, %RH:	**64.7**	**65.6**

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	55.9	30.5	16.9	**30.3**	0.51	-3.5	**22.1**		
63	62.4	41.2	12.9	41.2	0.71	-2.1	**19.1**		20.6
80	66.3	43.0	8.9	43.0	0.67	-2.3	**21.0**		
100	75.9	38.4	13.0	38.4	0.98	-0.7	**36.8**	7.2	
125	80.6	38.7	3.8	38.7	1.23	0.3	**42.2**	4.8	40.1
160	88.5	43.0	7.0	43.0	1.43	1.0	**46.5**	3.5	
200	93.8	44.4	20.8	44.4	1.55	1.3	**50.7**	2.3	
250	95.6	43.8	17.8	43.8	1.52	1.2	**53.0**	3.0	52.7
315	95.5	41.1	14.3	41.1	1.55	1.3	**55.7**	3.3	
400	93.7	34.0	17.8	34.0	1.19	0.2	**59.9**	2.1	
500	91.8	28.5	14.9	**28.3**	1.24	0.3	**63.8**		62.6
630	90.6	24.5	9.9	**24.3**	1.39	0.8	**67.1**		
800	91.0	23.3	8.9	**23.1**	1.49	1.1	**69.0**		
1 000	90.7	22.4	12.5	**21.9**	1.78	1.9	**70.7**		69.9
1 250	91.5	23.3	7.9	23.3	1.83	2.0	**70.2**		
1 600	94.4	25.5	7.9	25.5	1.85	2.1	**71.0**		
2 000	95.7	27.2	7.6	27.2	1.80	2.0	**70.5**		70.3
2 500	94.2	26.3	7.0	26.3	1.65	1.6	**69.5**		
3 150	93.6	25.8	7.9	25.8	1.43	1.0	**68.8**		
4 000	93.0	25.3	11.7	**25.1**	1.49	1.1	**69.0**		69.4
5 000	91.1	21.9	12.3	**21.4**	1.39	0.8	**70.5**		
6 300									
8 000									
10 000									

Single Figure Ratings	**Rw**	**C**	**Ctr**	**Total U. Dev., dB**	**26.2**
BS EN ISO 717-1: 1997	**dB**	**dB**	**dB**		
	63	**-2**	**-9**		
	(100-5000)	**-1**	**-9**		
Background Corrected					
	(50-3150)	**-12**	**-25**		
	(50-5000)	**-11**	**-25**		

Test Procedure: 140/3/issue 3

Worksheet: MSOFFICE\EXCEL\140\140_3_1.XLS

UKAS TESTING
No. 0296
No. 0296SI

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

APPENDIX A – LABORATORY DETAILS

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^{o} 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 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

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

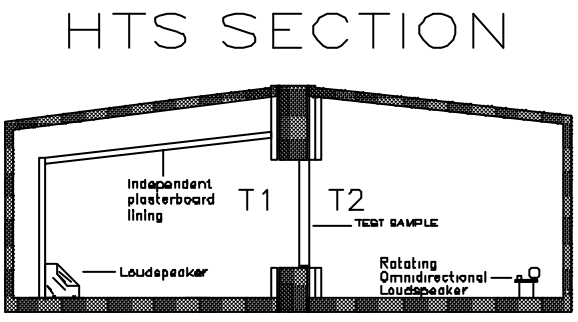


Figure 2. Chamber layout

UKAS TESTING
No. 0296
No. 0296SI