



N° 0296, 0296SI

**The Building Test Centre**  
British Gypsum Limited  
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## **Report Number BTC 2936A**

ACOUSTIC TEST REPORT COVERING  
LABORATORY SOUND INSULATION TEST  
TO BS 2750:PART 3:1980 ON A 102mm  
GYPROC METAL STUD PARTITION  
INCORPORATING GYPROC 70S50 STUDS  
LINED EACH SIDE WITH A SINGLE LAYER  
15mm GYPROC FIRELINE AND 50mm  
GYPGLAS 1200 IN THE CAVITY.

Test Date: 5th February 1996

Customer:

**British Gypsum Limited**  
Head Office  
East Leake  
Loughborough  
Leicestershire  
LE12 6HX



Nº 0296, 029651

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**ACOUSTIC TEST REPORT COVERING LABORATORY SOUND INSULATION TEST TO BS 2750:PART 3:1980 ON A 102mm GYPROC METAL STUD PARTITION INCORPORATING GYPROC 70S50 STUDS LINED EACH SIDE WITH A SINGLE LAYER 15mm GYPROC FIRELINE AND 50mm GYPGLAS 1200 IN THE CAVITY.**

**DESCRIPTION**

Gyproc 72C50 channel was fixed at the head and base of the test aperture at 600mm centres. Gyproc 70S50 studs were set at 600mm centres between the head and base channel.

The metal framework was clad both sides with a single layer of 15mm Gyproc Fireline. The inner layer was fixed with 25mm Gyproc S point screws at 300mm centres around the perimeter of the boards and at intermediate stud positions. 50mm Gypglas 1200 was placed in the cavity.

All joints were staggered with respect to each other and outer layer board joints were taped with Gyproc self adhesive tape. The perimeter of the partition was sealed with Gyproc sealant.

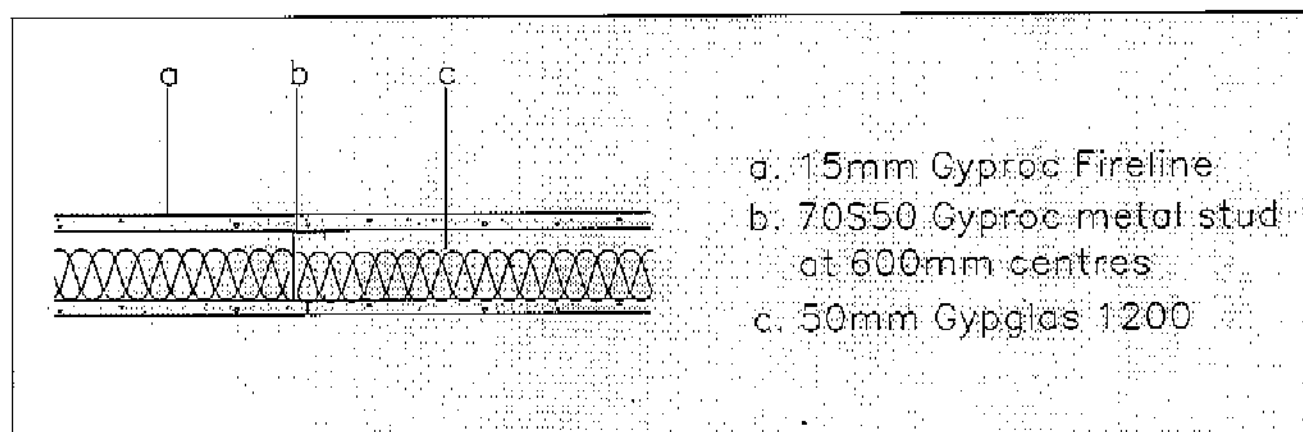


Figure 1 Cross section through test specimen.

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

**RESULTS**

**Weighted Airborne Sound Reduction Index**

**$R_w = 44$  dB**

For tabulated data see page 5.

Tested in accordance with BS 2750: Part 3: 1980(1993)

Rated in accordance with BS 5821: Part 1: 1984: (ISO 717/1 -1978)



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## MATERIALS

### Gyproc Fireline

Nominally 15mm (thick) x 1200mm (wide) x 2400mm (long) Gyproc Fireline manufactured by British Gypsum Limited Ex. East Leake works.

Actual surface density:	11.42 kg/m <sup>2</sup>
Actual thickness:	-
Board identification number:	1642555 10:40
Nominal moisture content:	-

Surface density calculated using actual weight of all the boards used in the test specimen.

### Metal components

- (i) Gyproc 70S50 metal studs and 72C50 channel manufactured using the Ultrasteel process from hot dipped galvanised mild steel nominally 0.5mm thick.

All metal components supplied by British Gypsum Limited.

### Fasteners

- (i) 25mm Gyproc S point screws.

All fasteners supplied by British Gypsum Limited.

### Insulation

50mm Gypglas 1200 manufactured by British Gypsum Limited.

Actual surface density:	0.69 kg/m <sup>2</sup>
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Surface density calculated by using actual weight of the insulation.



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## TEST PROCEDURE

The test specimen (2.4 m x 3.6 m) was constructed in a wall dividing two reverberant rooms of approximately 62 m<sup>3</sup> and 98 m<sup>3</sup>. The accuracy of the test method conforms to BS 2750:Part 2:1980. the test procedures used were BAL 2750/3 issue 4. 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.

Report Author:

  
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Head of Laboratory:

  
Paul Royle B.Tech. (Hons.), M.Sc., MIOA  
Executive Manager

Report Date: 5 February 1996



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A I R B O R N E - L A B

H2936A

Test Date 05-02-96

Freq Hz	LD12 dB	BG2 dB	Rec2 dB	LD21 dB	BG1 dB	Rec1 dB	T1 s	T2 s	Diff. dB	R dB	AD dB	Oct. dB
50	21.9	28.7	54.5	22.6	23.6	55.5	0.44	2.50	4.9	20.8		
63	8.9	25.1	73.5	15.6	16.4	67.4	0.87	2.39	-4.3	12.2		13.5
80	9.2	20.8	74.7	15.7	13.2	68.3	0.87	1.86	-5.2	11.8		
100	14.1	15.8	70.0	13.3	10.5	70.8	1.10	1.89	1.2	13.6	11.4	
125	24.1	15.3	63.7	23.4	11.3	61.8	1.05	1.63	0.6	23.2	4.8	17.9
160	34.1	14.3	58.4	33.3	9.6	58.0	0.90	1.52	1.1	32.7		
200	35.0	18.0	59.5	35.8	20.2	56.2	1.31	1.88	-1.2	35.7		
250	36.8	12.5	59.7	39.6	16.7	56.6	1.47	1.94	-3.5	38.8		38.3
315	43.0	14.1	58.0	43.0	16.1	54.2	1.39	1.90	-0.6	43.4		
400	47.7	19.3	53.1	46.9	16.4	51.7	1.38	1.92	0.2	47.7		
500	49.8	21.0	52.0	49.1	19.3	50.8	1.41	1.77	-0.3	49.8		49.4
630	51.1	13.9	50.5	50.9	17.4	48.6	1.49	1.71	-1.2	51.4		
800	54.4	10.4	46.1	53.2	15.7	44.7	1.58	1.65	-0.6	54.2		
1000	57.7	11.9	43.0	55.0	13.8	40.4	1.81	1.62	0.2	57.0		55.9
1250	57.5	8.9	40.4	54.9	10.7	38.4	2.05	1.61	-0.4	57.1		
1600	57.3	9.8	43.2	54.1	14.3	39.8	1.98	1.58	0.2	56.5		
2000	47.6	9.8	53.2	44.8	12.4	52.8	1.82	1.47	-0.1	46.7	1.3	44.8
2500	42.7	7.7	56.1	39.7	9.9	55.3	1.55	1.38	0.4	41.2	6.8	
3150	45.8	7.8	53.6	42.5	10.8	53.8	1.37	1.24	0.8	43.7	4.3	
4000	49.7	8.6	49.3	46.6	11.6	47.9	1.23	1.13	0.7	47.2		46.0
5000	50.9	9.4	40.4	49.0	10.5	42.0	1.10	0.96	-0.7	48.4		

**Rw(BS 5821) = 44 dB**

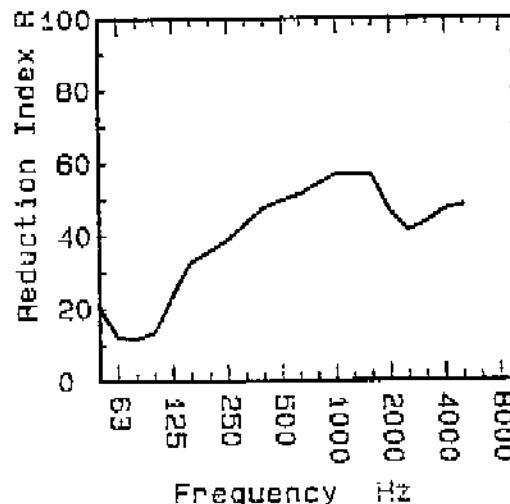
Cal. Diff. = -1.2  
R(100-3150) = 43.3 dB  
R(50-5000) = 39.7 dB  
Rw(8 dB limit) = 40 dB  
STC(ASTM E413) = 45 dB  
dB(A)(100-5000) = 41.1 dB  
dB(A)(50-5000) = 39.2 dB  
FREQ 100 > 8dB ADV. = 11 dB

#### Test Room

T1 T2  
Temperature deg.C = 9.5 10.2  
Rel. Humidity %RH = 37.3 38.6  
Room Volume M<sup>3</sup> = 62.0 98.0  
Specimen Size M<sup>2</sup> = 8.64

Tested by *[Signature]* Checked by *[Signature]*

Test Standard :- BS 2750:Part 3:1980  
Test Procedure :- 2750/3 issue 4  
Program Name :- AIR8D  
Plot Program :- RTAPLOT3





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## TEST METHOD AND CONDITIONS

The larger of the two test rooms was treated with six perspex diffusers of approximately 900mm x 1220mm and a loudspeaker sound source is placed in the corner of each room 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 2m and between microphone and room boundaries is 1m.

The rotating microphone has a sweep radius between 1m and 1.5m 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 each room is determined by producing the arithmetic average of six reverberation times and applying this to the Sabine formula.

The laboratory limit for measurement due to flanking is

Freq Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
R <sub>max</sub>	32	35	44	53	57	61	60	63	68	71	78	84	90	94	97	97	99	96	96	97	83

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

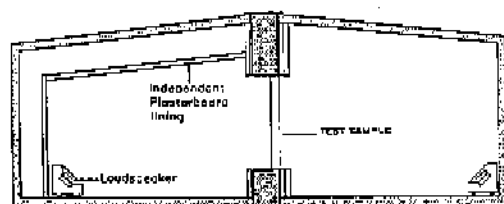


Figure 1 Chamber Layout

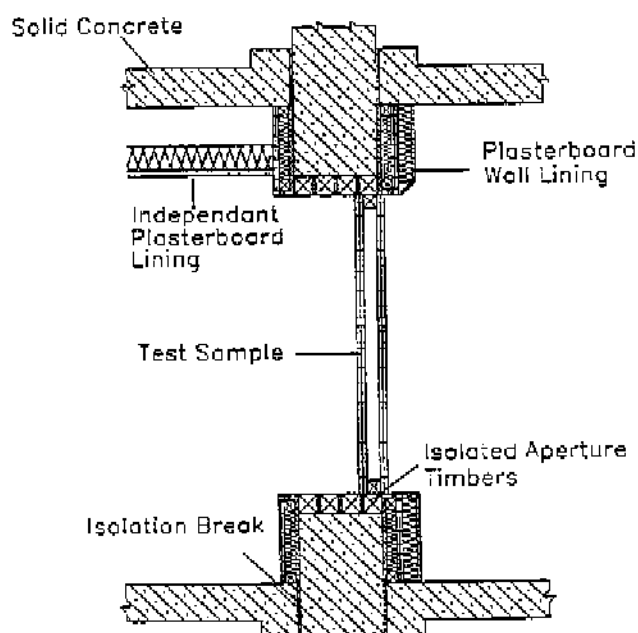


Figure 2 Flanking treatment applied to the chamber

## Addendum To BTC 2936A

## Ctr CALCULATION

Freq Hz	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							20.8		
63							12.2		
80							11.8		
100							13.6	11.4	
125							23.2	4.8	
160							32.7		
200							35.7		
250							38.8		
315							43.4		
400							47.7		
500							49.8		
630							51.4		
800							54.2		
1 000							57.0		
1 250							57.1		
1 600							56.5		
2 000							46.7	1.3	
2 500							41.2	6.8	
3 150							43.7	4.3	
4 000							47.2		
5 000							48.4		
6 300									
8 000									
10 000									

Single Figure Ratings

BS EN ISO 717-1: 1997

**Rw**
**dB**
**44**
**C**
**dB**
**-4**
**Ctr**
**dB**
**-11**

Total U. Dev., dB

**28.6**

$$Rw + Ctr = 33$$

Calculated By: \_ Franklin Sanicharane

Checked By: \_ Bob Allen

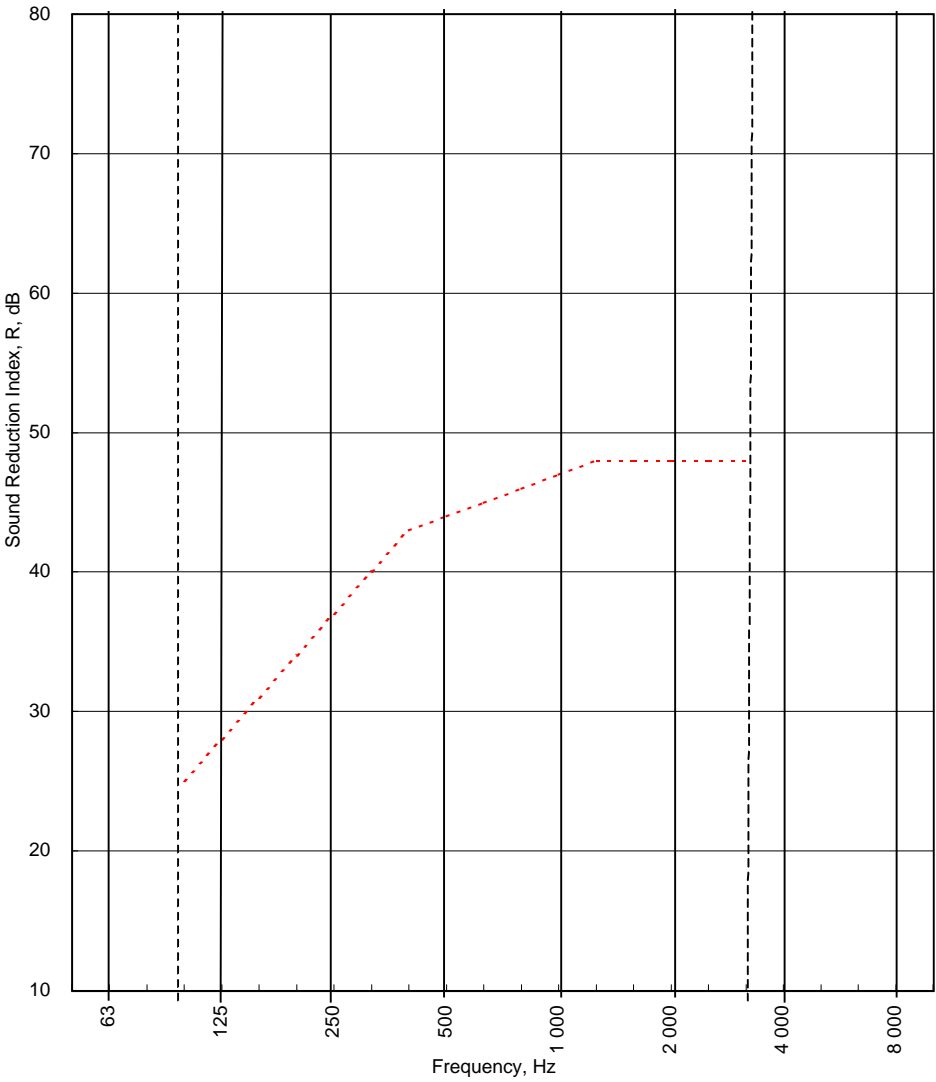
Test Standard: BS 2750: Part 3: 1980

Test Procedure: 2750/3 issue 4

Worksheet: ctr calculation.xls

Test Code:
Test Date:

Freq. Hz	R dB
50	20.8
63	12.2
80	11.8
100	13.6
125	23.2
160	32.7
200	35.7
250	38.8
315	43.4
400	47.7
500	49.8
630	51.4
800	54.2
1 000	57.0
1 250	57.1
1 600	56.5
2 000	46.7
2 500	41.2
3 150	43.7
4 000	47.2
5 000	48.4
6 300	
8 000	
10 000	



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

Rating according to  
BS EN ISO 717-1:1997

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

**R<sub>w</sub> (C;C<sub>tr</sub>) = 44 (-4;-11) dB**

Max dev. dB at Hz

C <sub>50-3150</sub> =	<b>dB</b>	C <sub>50-5000</sub> =	<b>dB</b>	C <sub>100-5000</sub> =	<b>dB</b>
C <sub>tr,50-3150</sub> =	<b>dB</b>	C <sub>tr,50-5000</sub> =	<b>dB</b>	C <sub>tr,100-5000</sub> =	<b>dB</b>