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Acoustics Test Report Number 1202 Date 10/12/87

LABORATORY AIRBORNE SOUND INSULATION  
MEASUREMENTS ON A 75mm GYPROC METAL STUD  
PARTITION

Test carried out for

BRITISH GYPSUM LTD, MARKETING DEPT.

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as an agent for, BPB United Kingdom Ltd.  
Ruddington Hall, Ruddington, Nottingham

Test code

H367.4

Date tested

09 Dec. 1987

Type of test

AIRBORNE SOUND INSULATION

Tested in accordance with

BS 2750 AND ISO 140

Report prepared by

J. DARGIE



## Specimen description

1. CONSTRUCTION TESTED75 mm Gyproc metal stud partition

comprising:

- \* 12.5 mm Gyproc wallboard
- \* 48 mm Gyproc 48855 metal studs at 600 mm centres
- \* 12.5 mm Gyproc wallboard

Joints filled and perimeter sealed.

See Appendix 1 for construction schedule and Appendix 2 for details of the airborne sound insulation test procedure.

2. RESULTS

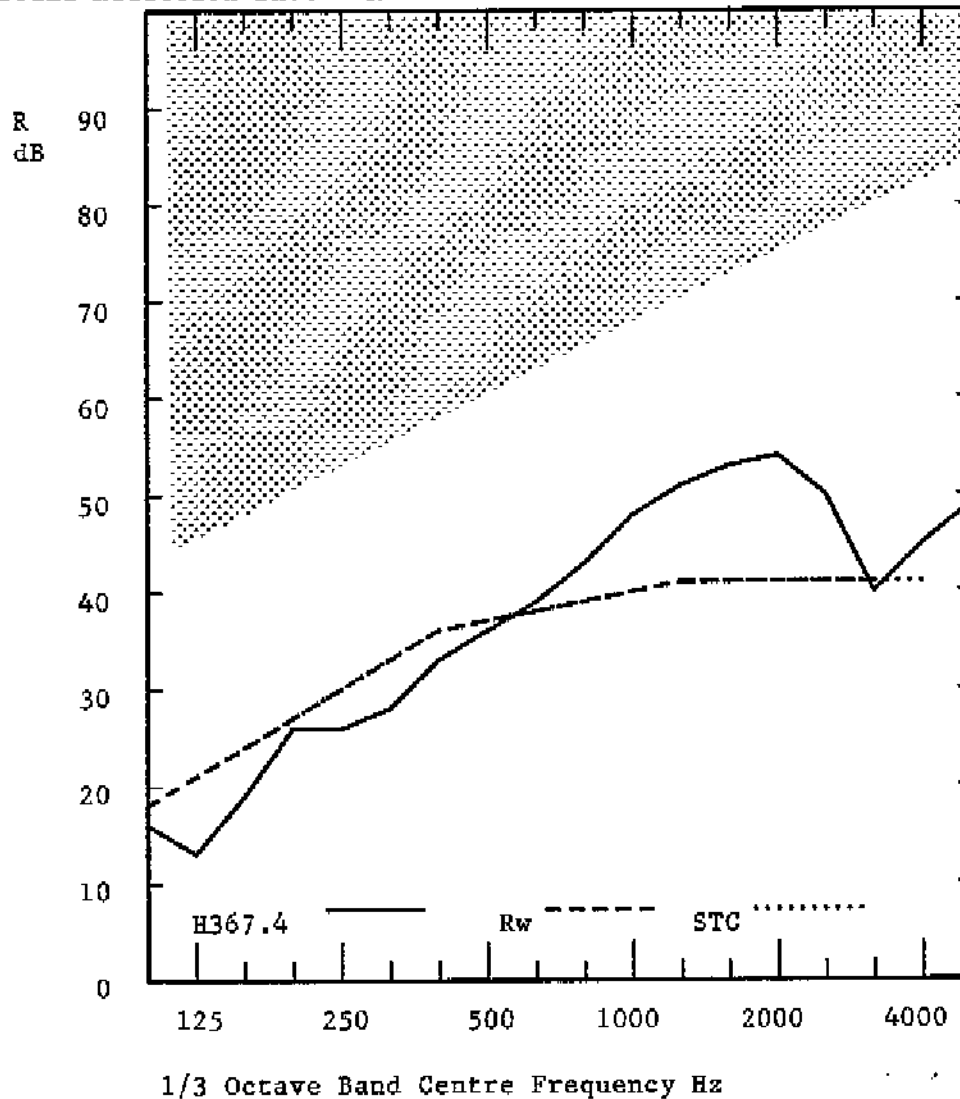
The result sheet overleaf gives the tabulated sound reduction indices and the principal single figure ratings in addition to the plotted spectrum, the BS 5821:1984 curve and the ASTM E413 curve.

The result calculated to BS 5821:1984 is:

Weighted Sound Reduction Index  $R_w = 37$  (BS 5821)

Laboratory Test Code H367.4

Sound Reduction Index R



1/3 Octave Band Centre Freq. Hz	R dB
100	16
125	13
160	19
200	26
250	26
315	28
400	33
500	36
630	39
800	43
1000	48
1250	51
1600	53
2000	54
2500	50
3150	40
4000	45
5000	49

Rw(BS5821)	37
Mean(100-3150)	36
STC(ASTM E413)	37
dB(A)(100-5000)	35

Note: The lower edge of the shaded region approximates to the maximum sound reduction index that can be measured in this laboratory. A measured curve which lies in the shaded region will be an underestimate of the performance of the construction.

RESULT SHEET

APPENDIX 1CONSTRUCTION SCHEDULE

Test specimen erected within a timber lined aperture between two reverberation rooms in the Acoustics Research and Testing Laboratory, British Gypsum Research and Development Department.

Test aperture dimensions: 2400 mm high x 3600 mm wide.

**Component List**

Floor/ceiling channel: Gyproc 50C55  
Metal studs : Gyproc 48855  
Wallboard : 12.5 mm Gyproc wallboard (10.02 kg/m<sup>2</sup>)  
Gyproc Jointex  
Gyproc Joint Tape  
Gyproc Sealant

**Metal Stud Partition Construction Details:**

Channels screw-fixed to the head and base of the aperture lining at 600 mm centres.

Studs located between channels at 600 mm centres. The end studs screw-fixed to the aperture lining at 600 mm centres.

A single layer of wallboard fixed to one side of the frame with Gyproc Drywall screws around the perimeter at 300 mm centres and at 300 mm centres along all studs. The other side of the frame lined with a single layer of wallboard commencing with a half-width board.

The joints between wallboard filled with Gyproc Jointex and reinforced with Gyproc joint tape.

The perimeters sealed with Gyproc Sealant.

Product specification and further application details are available in the British Gypsum White Book.

APPENDIX 2HORIZONTAL TEST SUITE - AIRBORNE SOUND INSULATION

Test method to BS 2750:1980 Part III, ISO 140 Part III and ASTM E90-83. The test rooms are approximately 109 m<sup>3</sup> in volume and the test specimen is 2.4 m x 3.6 m. The level difference at a given 1/3 octave band centre frequency is obtained by measuring the difference in mean sound pressure levels between rooms when one room contains a loudspeaker emitting band limited pink noise. The mean sound pressure level is estimated from the average of the spatial intensities measured within the room. The Sound Reduction Index R for the test specimen is obtained by the addition of the term  $10 \log_{10} S/A$  to the level difference where S is the area of the test specimen and A is the equivalent absorption in the receiving room.

TEST PROCEDURE

With the following test method, the measurement of the sound reduction index of a test specimen meets the requirements of BS 2750:1980 Part II and ISO 140 Part II in terms of repeatability:

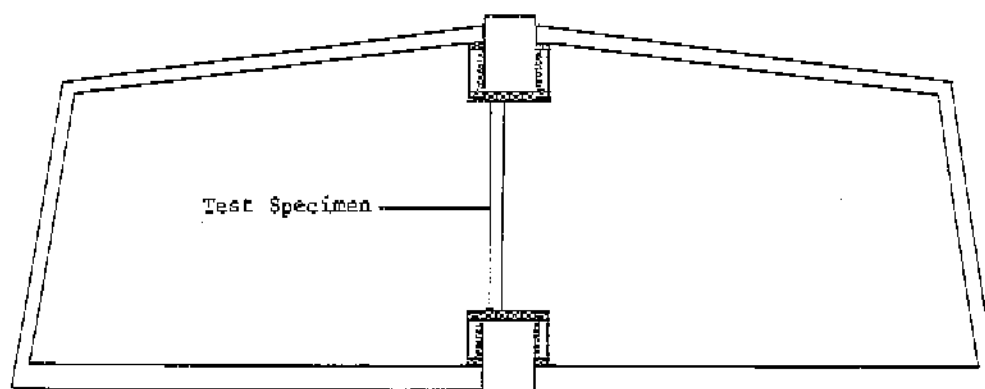
Four randomly placed stationary microphones to sample sound pressure levels in each room - Four reverberation time measurements (at different microphone locations) - The sound reduction index is measured in both directions and the mean result reported.

EXPRESSION OF RESULTS

The Sound Reduction Index R over the 1/3 octave band centre frequency range 100 - 5000 Hz is presented in tabular and graphical form. Four single figure ratings are given; the arithmetic mean of the sixteen spectral values over the range 100 - 3150 Hz, i.e. Mean R, The Weighted Sound Reduction Index  $R_w$ , evaluated in accordance with BS 5821:1984, the Sound Transmission Class STC evaluated in accordance with ASTM E413 and the single figure rating in dB(A) as used in France.

TEST EQUIPMENT

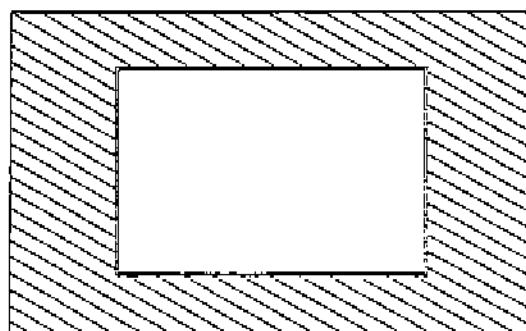
Norwegian Electronics Sound Insulation Measuring System Type 823 controlled by a Hewlett Packard 9836 microcomputer with Norwegian Electronics Microphone Multiplexers Type 827 with Bruel and Kjaer Type 4166/2619 microphones.



Section through Horizontal Test Suite

Room Dimensions

Mean Height = 3.6 m  
 Mean Width = 6.0 m  
 Mean Depth = 5.0 m  
 Volume = 109 m<sup>3</sup>

DETAILS OF THE TEST FACILITY

Elevation of Test Aperture (2.4 m x 3.6 m)

# Addendum To BGATR 1202

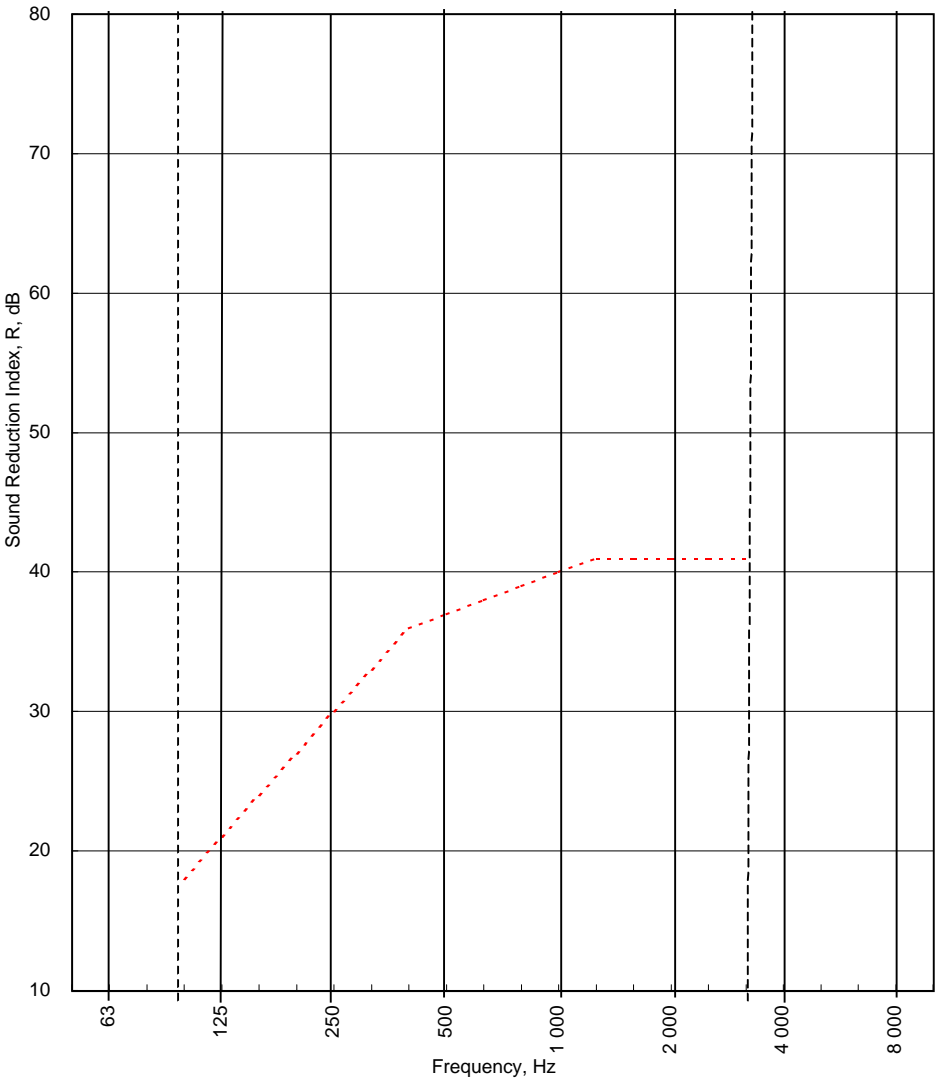
## Ctr CALCULATION

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									
63									
80									
100							16.0	2.0	
125							13.0	8.0	
160							19.0	5.0	
200							26.0	1.0	
250							26.0	4.0	
315							28.0	5.0	
400							33.0	3.0	
500							36.0	1.0	
630							39.0		
800							43.0		
1 000							48.0		
1 250							51.0		
1 600							53.0		
2 000							54.0		
2 500							50.0		
3 150							40.0	1.0	
4 000							45.0		
5 000							49.0		
6 300									
8 000									
10 000									

Single Figure Ratings BS EN ISO 717-1: 1997	Rw dB 37	C dB -3	Ctr dB -8	Total U. Dev., dB	30
Rw + Ctr = 29				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	
63	
80	
100	16.0
125	13.0
160	19.0
200	26.0
250	26.0
315	28.0
400	33.0
500	36.0
630	39.0
800	43.0
1 000	48.0
1 250	51.0
1 600	53.0
2 000	54.0
2 500	50.0
3 150	40.0
4 000	45.0
5 000	49.0
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:	<b>R<sub>w</sub> (C;C<sub>tr</sub>) = 37 (-3;-8) dB</b>		
	<b>Max dev. dB at Hz</b>		
	<b>C<sub>50-3150</sub> =   dB</b>	<b>C<sub>50-5000</sub> =   dB</b>	<b>C<sub>100-5000</sub> =   dB</b>
	<b>C<sub>tr,50-3150</sub> =   dB</b>	<b>C<sub>tr,50-5000</sub> =   dB</b>	<b>C<sub>tr,100-5000</sub> =   dB</b>