

## LETTER OF CONFORMITY BTC 180LC

Gyproc one and a half hour shaftwall system incorporating Gyproc 60170 metal studs at 600mm centres sealed version with 25mm Gypglas 1200 in the cavity - SOUND INSULATION.

The system described above has been subjected to an airborne sound insulation test in accordance with BS 2750:Part 3 see test report BGATR 1389 attached. However, subsequent to the time of test, the manufacturing process has changed for the 12.5mm Gyproc Fireline product. The change in manufacture has led to a reduction in the density of the board from approx. 11 kg/m<sup>2</sup> to 9.7 kg/m<sup>2</sup>.

As the board density has changed this will affect the sound insulation of the system. Taking the most cautious view of the effect of a lighter weight leaf in this structure, we calculate the loss of sound insulation of the whole structure as the loss experienced by the affected leaf i.e. the reduction caused by lower mass. This is calculated as 20 Log m (where m = surface mass). Hence for Leaf 1 the loss will be 1.1 dB and for Leaf 2 there will be no loss. Hence overall we would expect a loss of 1 dB on the Rw rating.

### RESULT

Rw = 44 dB

We would expect the spectral values to lie 1.1 dB lower than the values in BGATR 1389 with a variation of +/- 2 dB.

### LIMITATIONS

This letter is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to the test house then the letter will be unconditionally withdrawn. Similarly the letter is invalidated if the proposed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. The opinions and interpretations expressed in this letter are outside the scope of NAMAS accreditation.

Issued by



Paul Howard B.Sc. (Hons.) , MIOA  
*Test Services Manager*

Date:

19-May-96

The information contained in this report is not intended to convey the complete and detailed fixing and/or application requirements of British Gypsum or other supplier's materials. For full specification details, please consult the latest relevant Company trade literature

Acoustics Test Report Number 1389 Date 02/05/89

LABORATORY AIRBORNE SOUND INSULATION  
MEASUREMENTS ON A SEALED 1.5 HOUR SHAFT  
WALL WITH 25 mm GYPGLAS 1200 IN THE STUD  
CAVITY AND AN UNSEALED 15 mm DEFLECTION  
HEAD (60 I70 STUDS).

Test carried out for

British Gypsum Ltd.,  
Marketing Dept.



*Project Manager (Acoustics)*



TESTING  
No. 0296



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Test code  
E389.2

Date tested  
25 Apr.1989

Type of test

AIRBORNE SOUND INSULATION

Tested in accordance with

BS 2750:Part 3:1980

ISO 140/111-1978

ASTM E90-87

Report prepared by

P.V.HOWARD

P V Howard.

## 1. CONSTRUCTION TESTED

1.5 hour fire rated shaft wall sealed (60I70 Studs).

comprising:

- \* 60 mm Gyproc 60I70 metal I studs at 600 mm centres
- \* 19 mm Gyproc Core board
- \* Gyproc G102 shaft wall retaining channel
- \* 25 mm Gypglas 1200
- \* 2 x 12.5 mm Gyproc Fireline board
- \* 15 mm deflection head

Joints of the 15 mm Fireline board filled and perimeter sealed both sides. The junction between the Gyproc Core boards and the studs and base channel sealed on shaft side.

See Appendix 1 for details of the airborne sound insulation test procedure, and Appendix 2 for construction schedule and Appendix 3 for description of materials.

See Figure 1 for a section through the 15 mm deflection head.

## 2. RESULTS

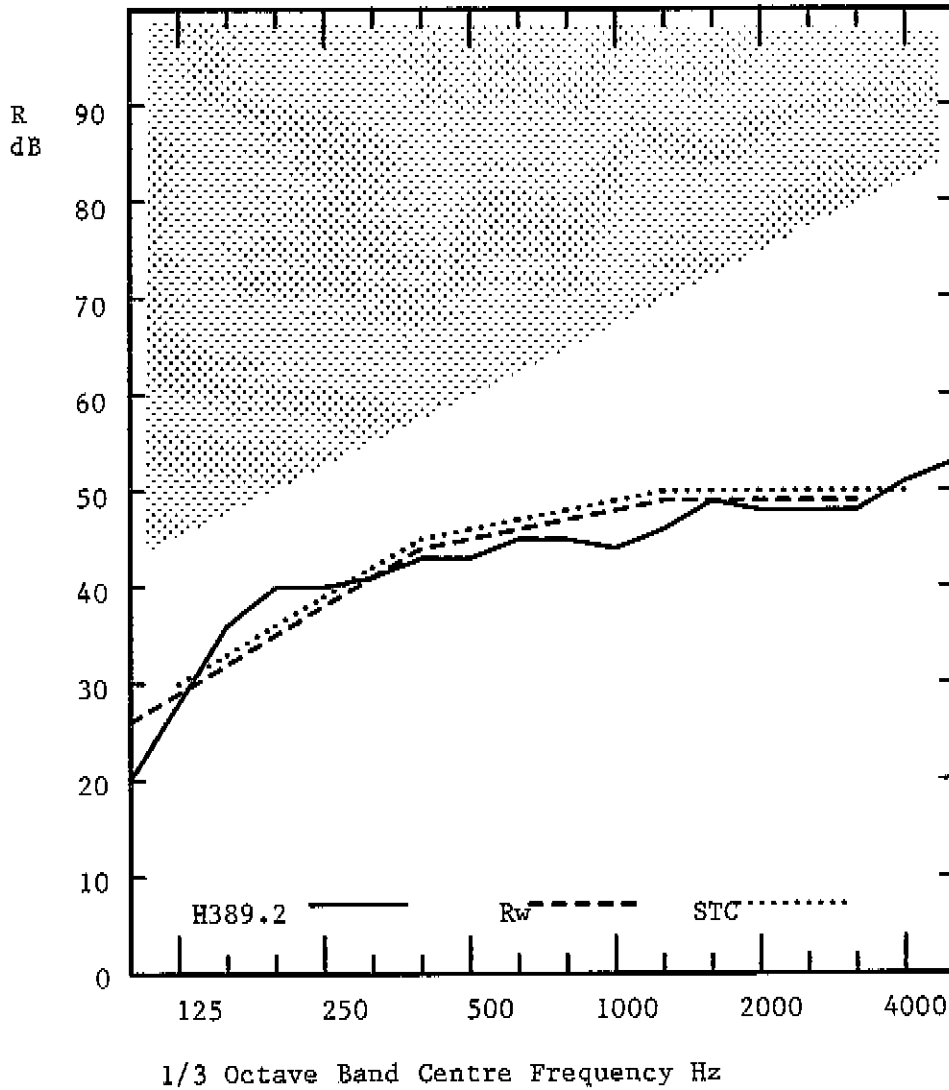
The result sheet overleaf gives the tabulated sound reduction indices and the principal single figure ratings in addition to the plotted spectrum, the BS 5821:Part 1:1984 curve and the ASTM E413 curve.

The result calculated to BS 5821:Part 1:1984 is:

Weighted Sound Reduction Index  $R_w = 45$  (BS 5821)

Laboratory Test Code H389.2

Sound Reduction Index R

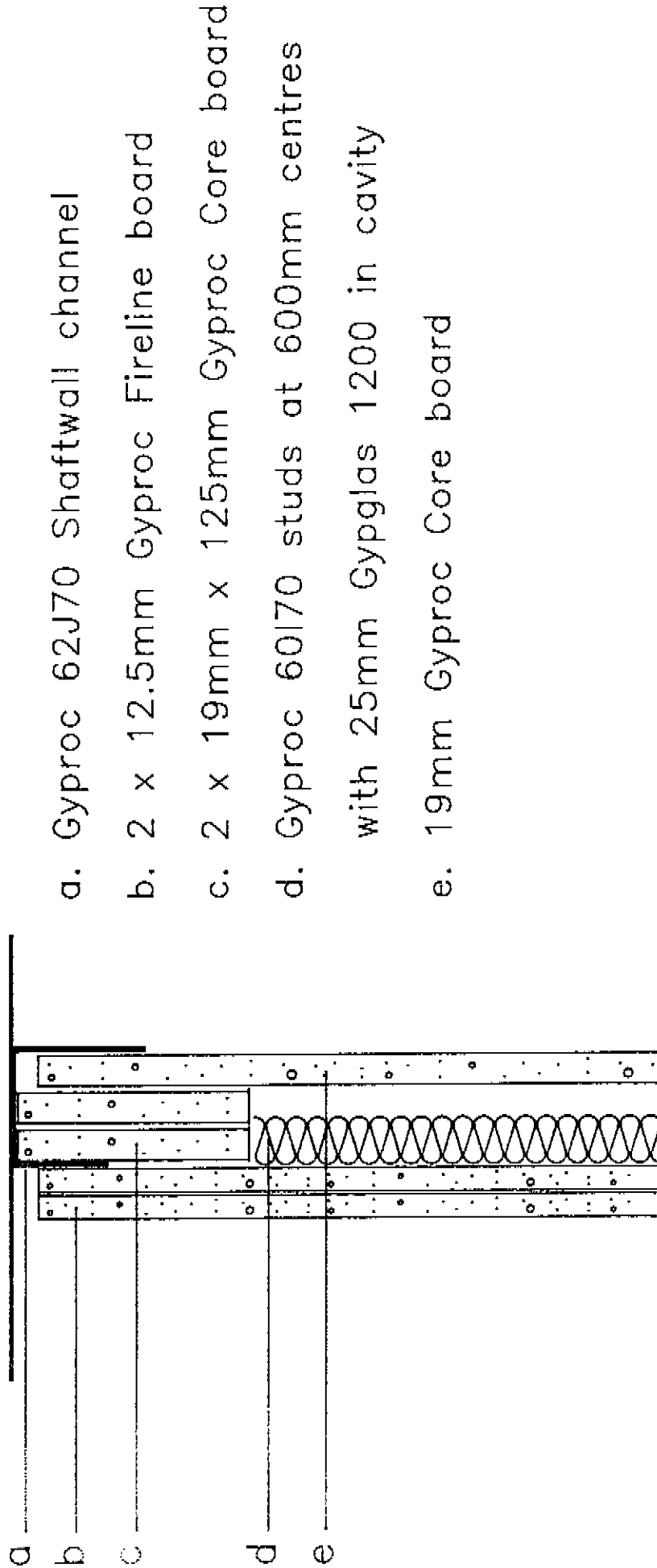


1/3 Octave Band Centre Freq. Hz	R dB
100	20
125	28
160	36
200	40
250	40
315	41
400	43
500	43
630	45
800	45
1000	44
1250	46
1600	49
2000	48
2500	48
3150	48
4000	51
5000	53

R <sub>w</sub> (BS5821)	45
Mean(100-3150)	42
STC(ASTM E413)	46
dB(A)(100-5000)	44

**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



a. Gyproc 62J70 Shaftwall channel

b. 2 x 12.5mm Gyproc Fireline board

c. 2 x 19mm x 125mm Gyproc Core board

d. Gyproc 60|70 studs at 600mm centres  
with 25mm Gypglas 1200 in cavity

e. 19mm Gyproc Core board

FIGURE 1 SECTION THROUGH 15mm DEFLECTION HEAD

APPENDIX 1

HORIZONTAL TEST SUITE - AIRBORNE SOUND INSULATION

Test method to BS 2750:Part 3:1980, ISO 140/III-1978 and ASTM E90-87. 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<sub>10</sub> 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

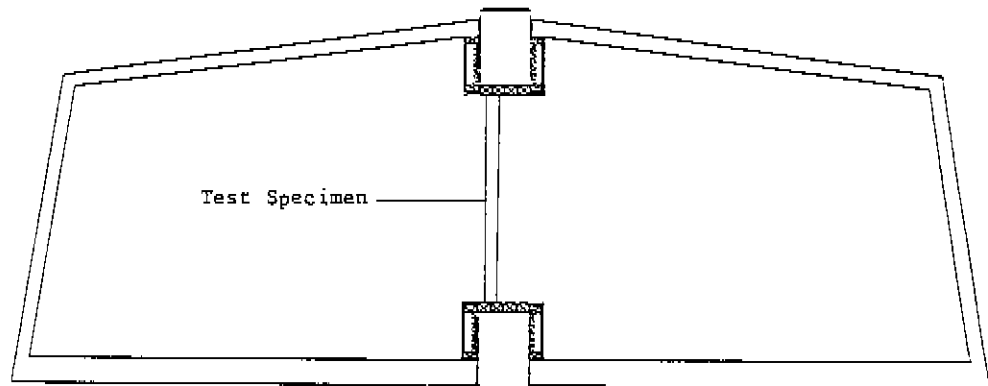
With the following test method, the measurement of the sound reduction index of a test specimen meets the requirements of BS 2750:Part 2:1980 and ISO 140/II-1978 in terms of repeatability: Four randomly placed stationary microphones to sample sound pressure levels in each room - Four reverberation time 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 Weighted Sound Reduction Index R<sub>w</sub> evaluated in accordance with BS 5821:Part 1:1984, the arithmetic mean of the sixteen spectral values over the range 100 - 3150 Hz, i.e Mean R, the Sound Transmission Class STC evaluated in accordance with ASTM E413 and the single figure rating dB(A) evaluated to the French standard NF S 31-002.

TEST EQUIPMENT

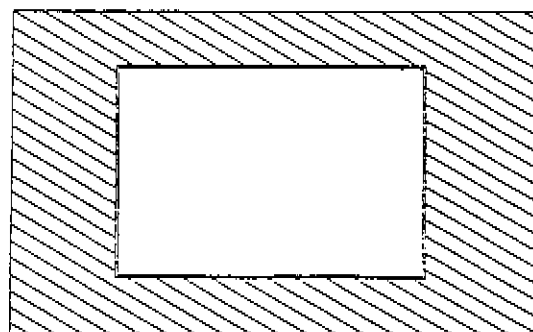
Norwegian Electronics Sound Insulation Measuring System Type 823 controlled by a Hewlett Packard 9836 microcomputer with Norwegian Electronics Microphone Multiplexers Type 827 with Bruel and Kjaer Type 4166/2619 microphones.



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)

APPENDIX 2CONSTRUCTION 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.

Test sample: 1.5 hour fire rated shaft wall sealed (60I70 Studs).

**Gyproc 60SC55 starter channel**

Cut back to 2385 mm length and screw-fixed to the sides of the aperture lining at 600 mm centres.

**Gyproc 62C55 channel**

Screw-fixed to the base of the aperture lining at 600 mm centres.

**Gyproc 62JC70 J channel**

Screw-fixed to the head of the aperture lining at 600 mm centres.

A bead of Gyproc Sealant applied to the junction of the perimeter framing and the aperture timber on the room side of the wall.

**Gyproc 60I70 metal I studs**

Cut to 2385 mm length and located between channels at 600 mm centres.

**19 mm Gyproc Core board**

A layer of Core board cut to 2385 mm length and placed between I studs

**Gyproc G102 shaft wall retaining channel**

Cut to 2240 mm length and located in the I studs to retain the Gyproc Core board on the shaft side. G102 channels screwed to the I stud webs at head and base.

**Gyproc fire stop packer**

A double layer of 125 mm deep 19 mm Gyproc Core board placed in the Gyproc J channel and held in place with screws.

**25 mm Gypglas 1200**

Hung in the stud cavity.



**12.5 mm Gyproc Fireline board**

A double layer of Fireline board cut to 2385 mm length fixed to the I stud frame on the room side; the base layer fixed with Gyproc Drywall screws at 300 mm centres around the perimeter of each board and the second layer, starting with a half-width board fixed with screws around the perimeter at 300 mm centres and at 300 mm centres along all studs.

**Gyproc Jointex and Gyproc Joint Tape**

The joints between 15 mm Fireline board filled with Gyproc Jointex and reinforced with Gyproc joint tape.

**Gyproc Sealant**

The perimeter of the room side of the wall sealed with Gyproc Sealant. The junction between the Gyproc Core board and the studs and base channel sealed with Gyproc Sealant on the shaft side.

APPENDIX 3DESCRIPTION OF MATERIALS60 mm Gyproc 60SC55 Starter Channels

Fabricated from hot-dip zinc-coated steel to BS 2989:1982, 0.55 mm thickness and cold rolled to BS 2994:1976. The width of the channel is 60 mm with two 32 mm flanges.

62 mm Gyproc 62C55 Metal Channel

Fabricated from hot-dip zinc-coated steel to BS 2989:1982, 0.55 mm thickness and cold rolled to BS 2994:1976. The width of the channel is 62 mm with two 32 mm flanges.

62 mm Gyproc 62JC70 Shaftwall J Channel

Fabricated from hot-dip zinc-coated steel to BS 2989:1982, 0.70 mm thickness and cold rolled to BS 2994:1976. The width of the channel is 62 mm with one 50mm flange and one 70mm flange.

60 mm Gyproc 60I70 Metal I Studs

Fabricated from hot-dip zinc-coated steel to BS 2989:1982, 0.70 mm thickness and cold rolled to BS 2994:1976. The width of the stud is 60 mm with 38 mm flanges.

Gyproc G102 Shaft Wall Retaining Channel

Fabricated from hot-dip zinc-coated steel to BS 2989:1982, 0.55 mm thickness and cold rolled to BS 2994:1976. The width of the channel is 38 mm and depth 18 mm.

12.5 mm Gyproc Fireline Board

Tapered edge board ( $11 \text{ kg/m}^2$ ), 1200 mm x 2400 mm. Gyproc Fireline board is a gypsum plasterboard with improved fire protection properties manufactured to BS 1230:Part 1:Part 1:1985.

19 mm Gyproc Core board

Square edge Core board ( $16.25 \text{ kg/m}^2$ ), 600 mm x 2400 mm. Gyproc Core board is a gypsum plasterboard with improved moisture and fire protection properties manufactured to BS 1230:Part 1:Part 1:1985.

Gyproc Drywall Screws

Self-drilling and tapping screws with countersunk Phillips heads.

Gyproc Jointex

Gypsum based setting compound (Class B) conforming to BS 6214:1982. It is used for hand jointing of tapered edge wallboard.

Gyproc Joint Tape

A 53 mm wide paper tape used for reinforcing joints between Gyproc tapered edge wallboard.

Gyproc Sealant

A water based acrylic sealant.

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

25 mm Gypglas 1200 glass wool

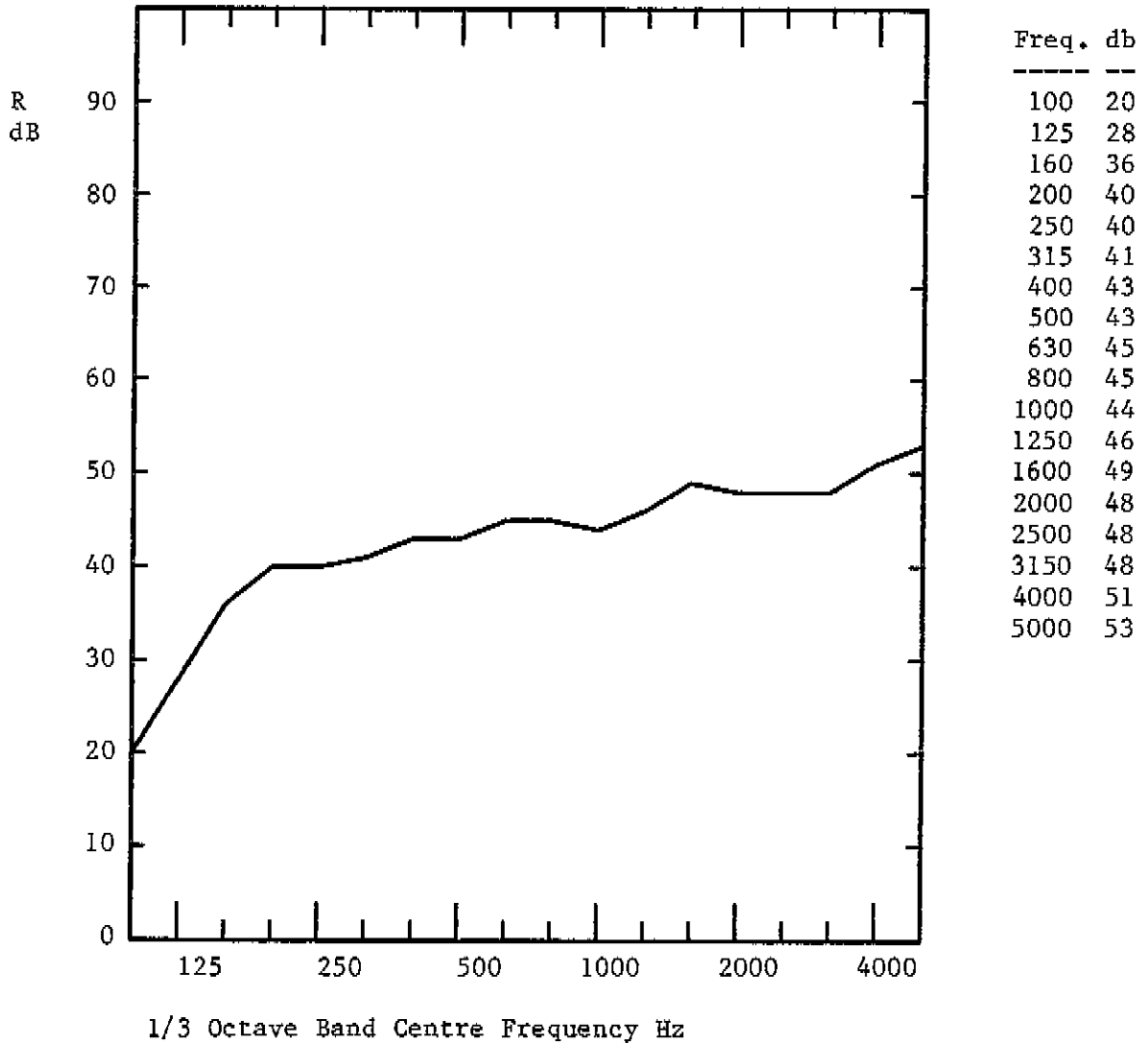
Spun glass wool in 1200 mm wide roll form ( $0.38 \text{ kg/m}^2$ ). Supplied by Gyproc Insulation Ltd., Whitehouse Industrial Estate, Runcorn, Cheshire., WA73DP, Tel 0928 712627.

# ACOUSTIC TEST DATA SHEET

Laboratory Test Code H389.2

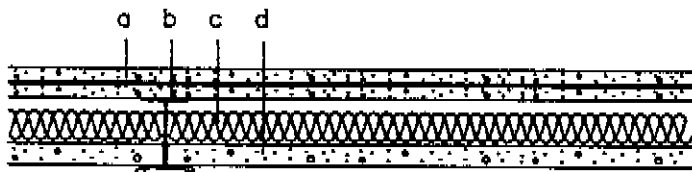


Sound Reduction Index R



R<sub>w</sub> = 45      Mean = 42      STC = 46      dB(A) = 44

**1.5 hr. SHAFTWALL SEALED**  
**(25mm Gypglas 1200)**



- a. 2 x 12.5mm Gyproc Fireline board
- b. Gyproc 60170 metal studs at 600mm centres with 25mm Gypglas 1200 in the cavity
- c. Gyproc G102 retaining channel
- d. 19mm Gyproc Core board

This data sheet presents the results of LABORATORY sound insulation tests on the partition under ideal conditions. When the partition is used in a building to divide rooms the result is affected by the surrounding structure. In order to achieve the optimum sound insulation it is therefore imperative that the surrounding structure is considered. The partition will achieve its maximum sound insulation as long as sound cannot find a weaker path from the source room to the receiving room. There must be no leakage path under, over or at the sides of the partition. The introduction of doors, windows or other departures from the specified partition construction may also reduce the sound insulation. Continuous floorboards under the partition or continuous timber joists over the partition may be weak paths as may blockwork flank walls. In the absence of flanking transmission the laboratory Rw rating is equivalent to the field Rw when the receiving room is 30m<sup>3</sup> in volume with a common wall area of 10m<sup>2</sup>. When the room sizes vary from this, the ratings differ from each other slightly depending on the layout. Further advice can be obtained from British Gypsum's Technical Advisory Service if required.



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