



# The Building Test Centre

Fire Acoustics Structures

The Building Test Centre  
East Leake  
Loughborough  
Leicestershire  
LE12 6NF  
Tel: 0115 945 1554  
Fax: 0115 945 1552

## Report Number BTC 3290A

ACOUSTIC TEST REPORT COVERING  
LABORATORY SOUND ABSORPTION TEST TO  
BS EN 20354: 1993 ON GYPTONE QUATTRO  
46 CEILING TILES, ON A 400mm TIMBER  
FRAME WITH 45mm x 45mm TIMBER BATTENS  
WITH 100mm GYPGLAS 1000 BETWEEN  
BATTENS OVER A 400mm AIRSPACE.

Test Date: 10th July 1997

Customer:

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

Customer: British Gypsum Ltd.

BTC 3290A Page 1 of 6



TESTING  
No. 0200  
020051

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# The Building Test Centre

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The Building Test Centre

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**ACOUSTIC TEST REPORT COVERING LABORATORY SOUND ABSORPTION TEST TO BS EN 20354: 1993 ON GYPTONE QUATTRO 46 CEILING TILES, ON A 400mm TIMBER FRAME WITH 45mm X 45mm TIMBER BATTENS WITH 100mm GYPGLAS 1000 BETWEEN BATTENS OVER A 400mm AIRSPACE.**

## DESCRIPTION

The Gyptone Quattro 46 ceiling tiles, with full depth square holes over the surface, had 100mm Gypglas 1000 stapled to the back of the board. The open area of the holes was 10.2 % of the total face area. The ceiling tiles were placed over a 400mm airspace over the concrete floor of the reverberation chamber. The specimen test frame was constructed from timber with 45mm x 45mm timber battens located at 1200mm centres running across in one direction set in a 400mm high perimeter frame. The frame was sealed to the chamber floor with Gyproc sealant. The perimeter edges of the boards were sealed using Gyproc adhesive tape.

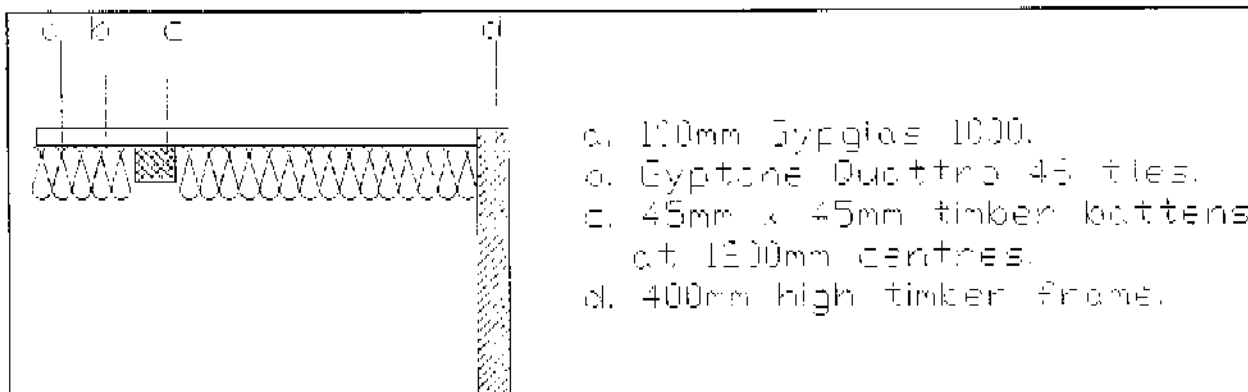


Figure 1: Section through test sample

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

## RESULT

NRC = 0.55

NRC calculated in accordance with ASTM C423-90a 1992.

For full test results see tabulated data on pages 4,5.

Test conducted in accordance with BS EN 20354:1993 and ISO 354:1985.

$\alpha_w = 0.5$  (rated to Draft ISO 11654 : 1996)

Customer : British Gypsum Limited

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TESTING  
No. 0295  
0295E1

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Leicestershire

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## MATERIALS

### Gyptone Quattro 46 ceiling tiles

Nominally 12.5mm (thick) x 1200 (wide) x 2400mm (long) Gyptone Quattro 46 ceiling tiles manufactured by British Gypsum Limited.

Actual surface density:	8.07 kg/m <sup>2</sup>
Actual thickness:	-
Board identification number:	-
Nominal moisture content:	-

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

### Insulation

100mm Gypgles 1000 glass mineral wool roll manufactured by British Gypsum Isover Ltd.

Actual surface density:	1.3 kg/m <sup>2</sup>
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Surface density calculated using the actual weight of the insulation.

Customer : British Gypsum Limited

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TEST NO  
NO. 0028  
02965

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## TEST PROCEDURE

For each of three microphone locations and the two loudspeaker positions, 2 decays are taken for each combination, making a total of 12 decays. The two loudspeaker positions are placed in diagonally opposite corners of the room - one on the floor and one in the upper corner. Broad-band pink noise and third-octave band filters in real time mode are used to make simultaneous measurements for all frequency bands. The test procedure used was 20354 issue 1. See appendix for further information.

Report Author:

**Arshad Mahmood BSc., GradInstP.**

*Senior Technologist*

Head of Laboratory:

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

*Executive Manager*

Report Date:

11 July 1997

Customer : **British Gypsum Limited**

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11 ST NG  
No. 0295  
02003

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East Leake

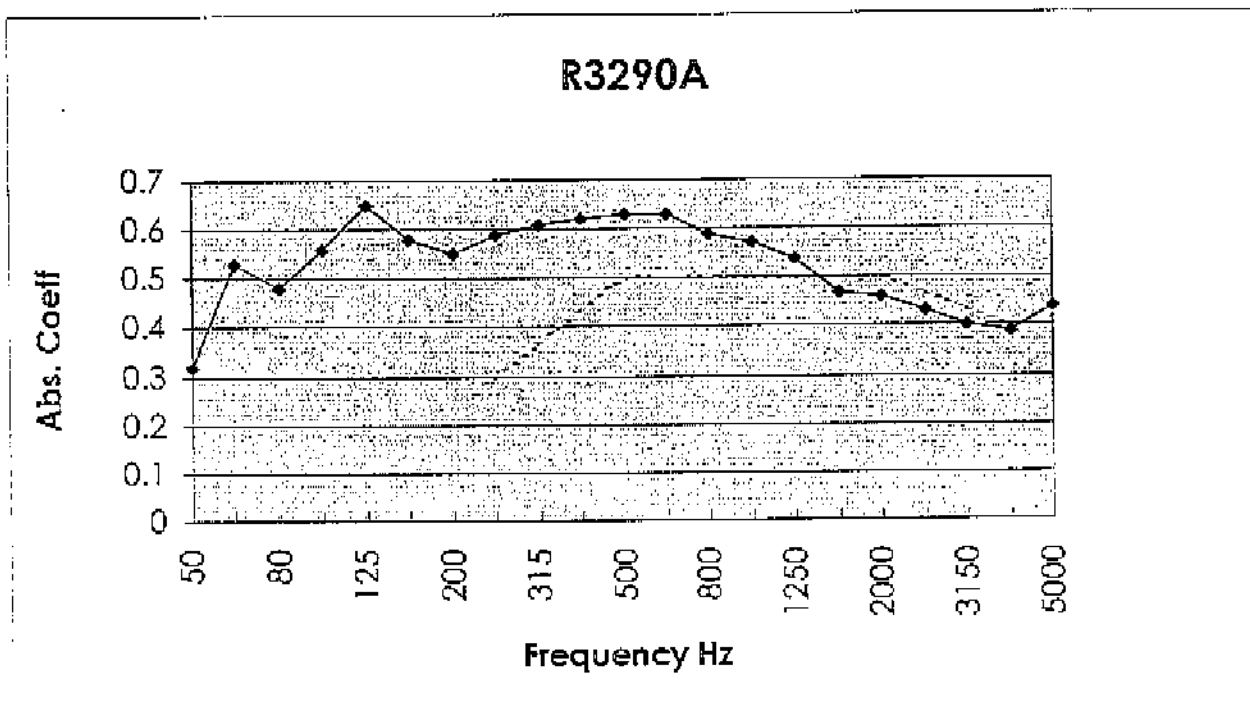
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$\alpha_w = 0.5$  (rated to Draft ISO 11654 : 1996)

Customer : British Gypsum Limited

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A BFB group company



TESTING  
No. 0296  
029651

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Fire Acoustics Structures

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## SOUND ABSORPTION TEST

TEST CODE R3290A Test Date 10-07-97

Sample: Gyptone Quattro 46 tiles and 100mm Gypglas over 400mm airspace

EMPTY ROOM : Air. Temp. = 19.4 C : Rel. Hum. = 27.4 %

WITH SAMPLE: Air. Temp. = 19.5 C : Rel. Hum. = 68.9 %

SAMPLE AREA = 10.8 M<sup>2</sup>

FREQ Hz	T20* empty	T20* sample	ABS COEFF a <sub>s</sub>	ASTM values
50	25.95	6.75	0.32	
63	25.01	4.52	0.52	
80	14.50	4.31	0.48	
100	13.57	3.78	0.66	
125	11.97	3.27	0.66	0.55
160	8.54	3.16	0.58	
200	10.30	3.50	0.55	
250	12.24	3.55	0.53	0.58
315	11.05	3.23	0.91	
400	9.04	3.11	0.82	
500	7.15	2.81	0.62	0.53
630	7.26	2.93	0.63	
800	6.04	3.08	0.53	
1000	9.05	3.14	0.57	0.57
1250	7.34	3.11	0.54	
1600	6.35	3.15	0.47	
2000	5.82	3.04	0.45	0.45
2500	5.16	2.93	0.43	
3150	4.30	2.71	0.40	
4000	3.35	2.31	0.39	0.39
5000	2.83	1.99	0.44	

\* Average of 12 decays

NRC (ASTM C423-90a) = .55

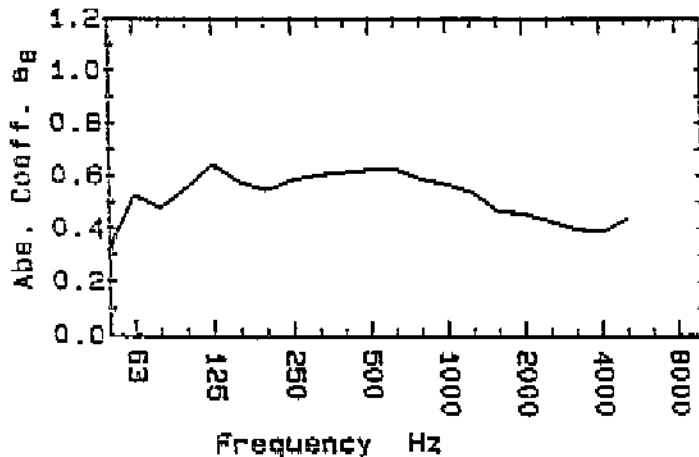
Tested by A. M. L. Checked by [Signature]

Test Standard :- BS EN 20354:1993

Test Procedure :- 20354 issue 1

Program Name :- REV46

Plot Program :- ABS PLOT2



Customer : British Gypsum Limited

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UKAS  
No. 0256  
0268

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## TEST METHOD AND CONDITIONS

The test room with a volume of 196m<sup>3</sup> is treated with 16 perspex diffusers of approximately 1220mm x 1220mm dimensions positioned randomly throughout the room.

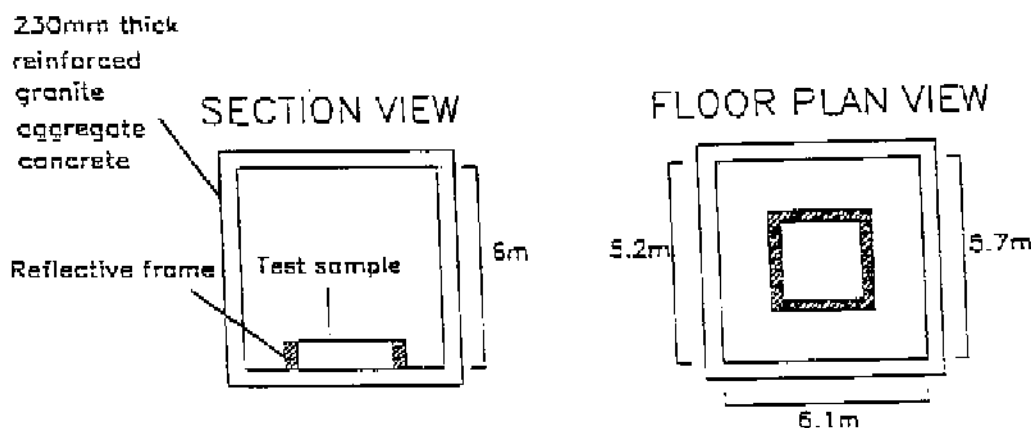
The test specimen is of rectangular shape with an area between 10 and 12 m<sup>2</sup> placed in the test room so that no part of it is closer than 1m to any edge of the boundary of the room. The edges of the test specimen are tightly enclosed by a reflective frame, sealed to the floor and protruding above the surface of the test specimen.

The equivalent sound absorption area is determined by the measured reverberation times and used to calculate the absorption coefficients.

The repeatability of measurement for low absorption,  $r_1$ , and high absorption,  $r_2$ , are

Freq Hz	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
$r_1$	.035	.064	.018	.018	.035	0	.018	0	.035	.028	.028	.021	.053	.066	.033	.048
$r_2$	.055	.077	.085	.068	.148	.106	.213	.205	.2	.116	.051	.218	.109	.068	.048	.06

The figure below shows the section and floor plan view of the test room.



Customer: British Gypsum Limited

BTC 3290A: Appendix

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TESTING  
 No. 0203  
 009651

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