

Report Number BTC 10102A

ACOUSTIC TEST REPORT COVERING LABORATORY
SOUND ABSORPTION TEST TO BS EN 20354: 1993, ISO
354-1985 ON A GYPTONE LINE 4 CEILING TILE ON A
200mm HIGH FRAME. (RATED IN ACCORDANCE WITH
EN ISO 11654:1997).

Test Date: 22nd April 1996

RATED 05/05/98

Customer:

British Gypsum Ltd
East Leake
Loughborough
Leics
LE12 6HT

Gyproc AB
Box 505
S-201 25
Malmö
SWEDEN

Customer: British Gypsum Limited and Gyproc AB
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A BPP group company



TESTING
No. 0296
0296SI

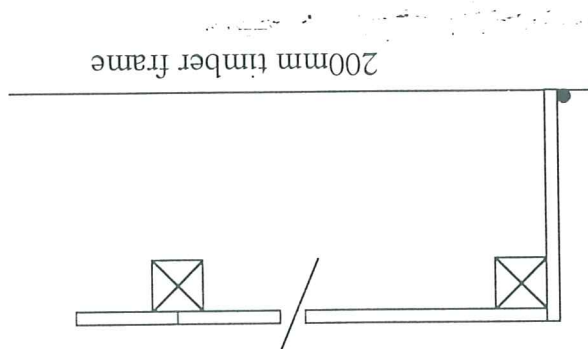
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ACOUSTIC TEST REPORT COVERING LABORATORY SOUND ABSORPTION TEST TO BS EN 20354:1993, ISO 354-1985 ON A GYPTONE LINE 4 CEILING TILE ON A 200mm HIGH FRAME. (RATED IN ACCORDANCE WITH EN ISO 11654:1997).

DESCRIPTION

13mm Gypstone Line 4 ceiling tiles manufactured by Gyproc AB, Sweden, with rectangular arrays of narrow full depth slots over the entire surface. The slots occupied 28% of the total face area. Adhered to the back of the tile was a porous tissue. The ceiling tiles were placed over a 200mm airspace over the concrete floor of the reverberation chamber. The specimen test frame was constructed from high density chipboard with 45mm x 45mm timber battens located at 595mm centres running in one direction. The frame was sealed to the chamber floor with Gyproc Sealant. The perimeter edges of the boards were sealed using Gyproc adhesive tape.



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

RESULT

$$\alpha_w = 0.65$$

$$\text{NRC} = 0.60$$

Test conducted in accordance with BS EN 20254:1993 and ISO 354:1985. The practical sound absorption coefficient, α_w calculated in accordance with EN ISO 11654:1997. The Noise Reduction Coefficient, NRC calculated in accordance with ASTM C423-90a 1992.

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MATERIALS

Gyptone Line 4 Ceiling Tiles with acoustic tissue

Nominally 13mm (thick) x 595 x 595mm Gyptone Line 4 Ceiling Tiles manufactured by Gyproc AB, Malmö, Sweden.

Actual surface density:
7.33 kg/m²
Board identification number:
204042

TEST PROCEDURE

For each of the 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:

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Eur. Ing Paul Royle B.Tech.(Hons.), M.Sc., CEng., MIOA

Report Date:

5 May, 1998

Customer: British Gypsum Limited and Gyproc AB



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LABORATORY SOUND ABSORPTION TEST - BS EN ISO 20354:1993

Test Code: R10102A

Test Date: 05/05/98

Specimen Area, S: 10.8 m²
Room Volume, m³: 196 m³
Temperature, deg.C: 16.2
Rel. Humidity, %RH: 62.7
Empty Specimen 16.1
Specimen 60.6

(Check environmental requirements - Table 2 of standard)

Freq Hz	Plane Absorber		U.D.
	Empty	Specimen	
T10, Sec	T20, Sec	T10, Sec	T20, Sec

50	22.25	24.19	8.11	9.49	0.19
63	17.20	21.13	6.71	7.50	0.25
80	13.92	16.34	4.92	5.68	0.34
100	11.12	12.56	3.94	4.04	0.49
125	10.48	11.69	3.70	4.28	0.44
160	8.09	8.88	3.47	3.52	0.51
200	10.29	10.22	3.09	3.45	0.57
250	10.48	11.89	3.59	3.60	0.57
315	10.62	11.54	3.20	3.45	0.60
400	9.86	9.33	3.07	2.98	0.67
500	6.80	7.02	2.60	2.71	0.67
630	7.34	7.49	2.70	2.79	0.66
800	7.89	7.92	3.07	2.99	0.61
1000	7.73	7.87	3.07	3.14	0.56
1250	7.41	7.41	2.79	2.97	0.59
1600	6.52	6.26	2.71	2.83	0.57
2000	5.77	5.61	2.68	2.70	0.57
2500	4.83	4.98	2.44	2.48	0.60
3150	4.06	4.02	2.22	2.19	0.61
4000	3.04	3.11	1.91	1.89	0.61
5000	2.58	2.51	1.66	1.68	0.58
6300					
8000					
10000					

Single Figure Rating
EN ISO 11654: 1997

$\alpha_w = 0.65$

It is strongly recommended to use this single figure rating in combination with the complete sound absorption coefficient curve that can be obtained on request

Tested By: A. Mudd.
Checked By: R. James

Test Procedure: 20354/Issue 1

Worksheet: MSOFFICE\EXCEL\20354\20354.XLS



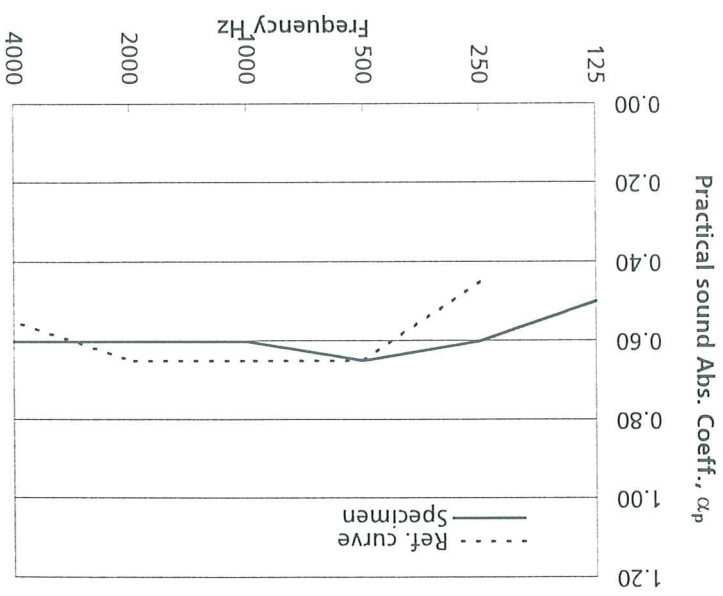
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Test Code: R10102A
Test Date: 05/05/98

Specimen	Ref. curve	Freq. Hz
125	0.50	0.45
250	0.60	0.65
500	0.65	0.65
1000	0.65	0.65
2000	0.65	0.65
4000	0.55	0.60

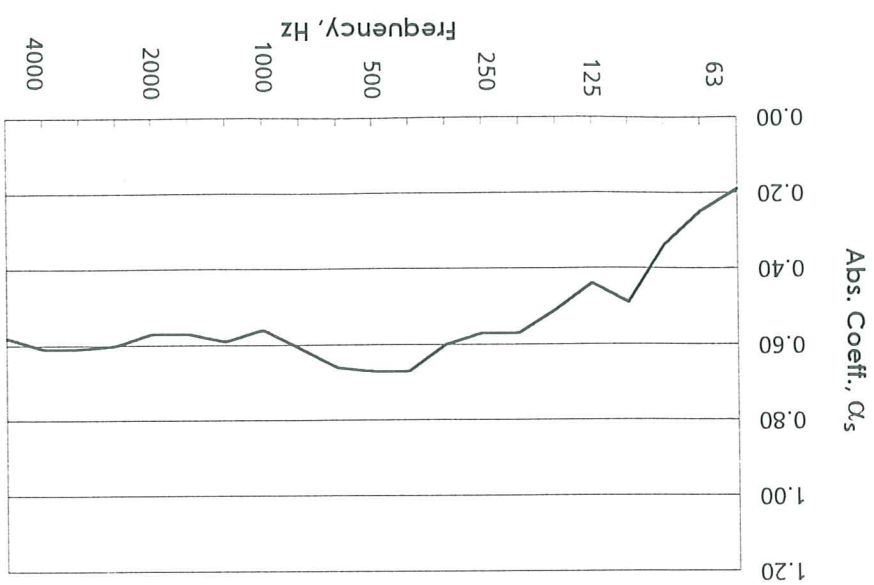


Rating according to
EN ISO 11654: 1997

$\alpha_w = 0.65$

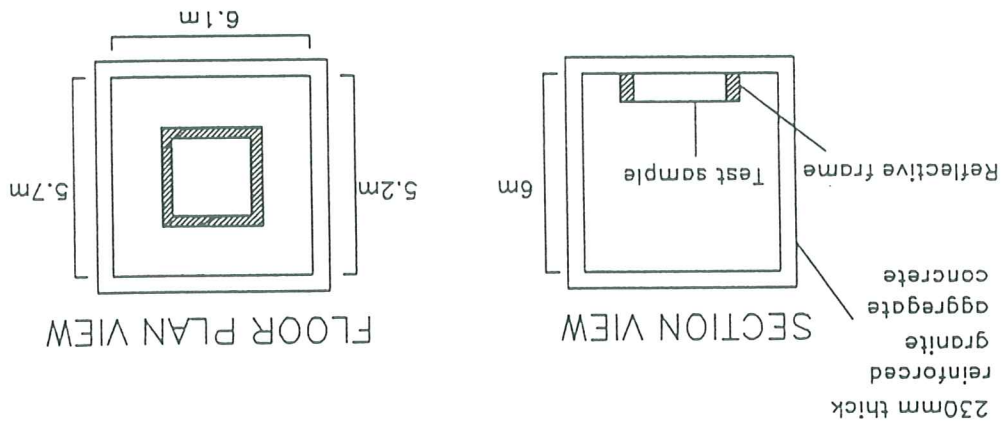
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Freq. Hz	α_s
50	0.19
63	0.25
80	0.34
100	0.49
125	0.44
160	0.51
200	0.57
250	0.57
315	0.60
400	0.67
500	0.67
630	0.66
800	0.61
1000	0.56
1250	0.59
1600	0.57
2000	0.57
2500	0.60
3150	0.61
4000	0.61
5000	0.58
6300	0.58



Customer: British Gypsum Limited and Gyproc AB





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

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	.056	.077	.085	.068	.146	.106	.213	.205	.2	.116	.051	.218	.109	.068	.048	.06

The test room is of rectangular shape with an area between 10 and 12 m² 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

TEST METHOD AND CONDITIONS

The test room with a volume of 196m³ is treated with 16 perspex diffusers of approximately 1220mm x 1220mm dimensions positioned randomly throughout the room.