

# Laboratory Sound Absorption Testing Using the Reverberation Room

Manufacturer & Product Code:

Decor Systems perforated and slotted panels with DecorSorb D400 Acoustic fabric backing.

Note:

Acoustic fabric DecorSorb D400 was replaced with DecorSorb D440. Acoustic properties retained, appearance approved.

Report by: ER00211/MK

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PhD EngSc CPEng MAAS

This test was carried out using the reverberation room of the Department of Applied Physics, The Royal Melbourne Institute of Technology Limited.

The sound absorption coefficients are determined by measurement of the reverberation times, both when the room is empty and when the room contained the sample, and by use of the surface area of the sample.

## Test Method

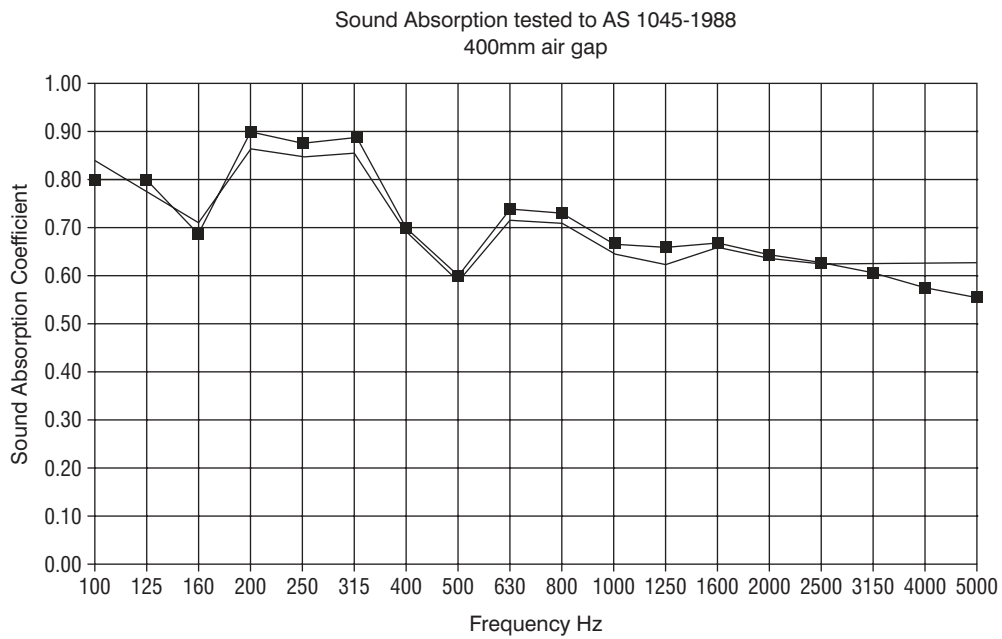
1. Testing has been carried out in accordance with AS1045-1988, "Measurement of absorption coefficients room".
2. The room volume is 200 cubic metres.
3. Diffuse sound field is established by the inclusion of 17 stationary diffusing boards of panelboard.
4. NATA certified instrumentation used for testing.

## Conclusions

DecorSorb D400 acoustic textile laminated onto perforated and slotted panels tested with two different air gaps of 90mm and 400mm returns Noise Reduction Coefficients in the range from 0.65-0.80. Details for different perforation patterns are shown in Figures 1 to 12 while numerical data is collected in Table 1.

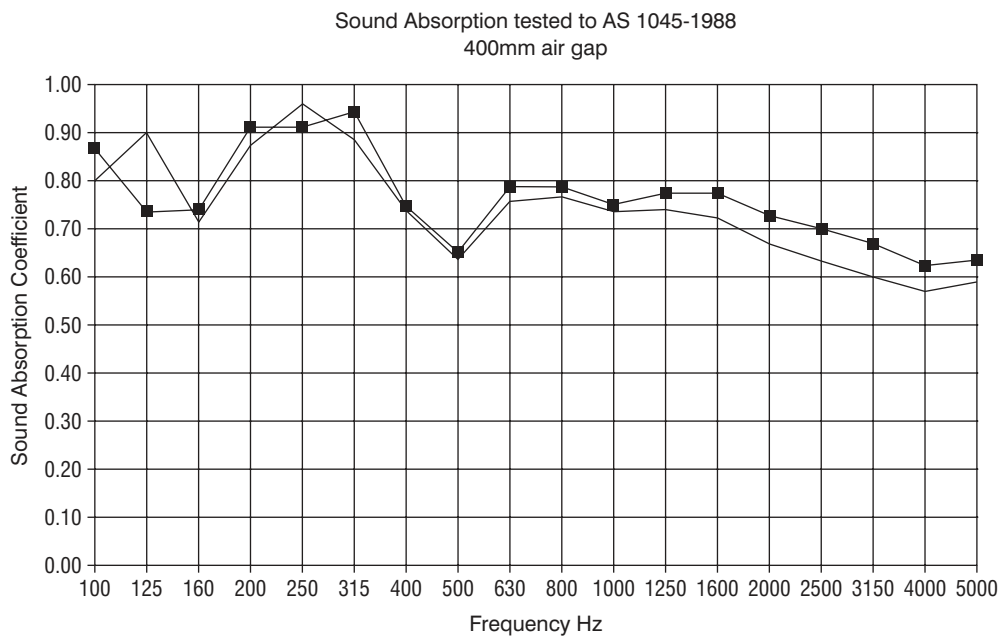
## Test Results

- Flow resistance: The measured flow resistance of the DecorSorb D400 used in these tests was 800 Rayls.
- Sound absorption results:



**FIGURE 1**

- Slotted MDF board 9mm thick, open area 21% with DecorSorb D400. NRC = 0.70.
- Slotted MDF board 15mm thick, open area 21% with DecorSorb D400. NRC = 0.70.

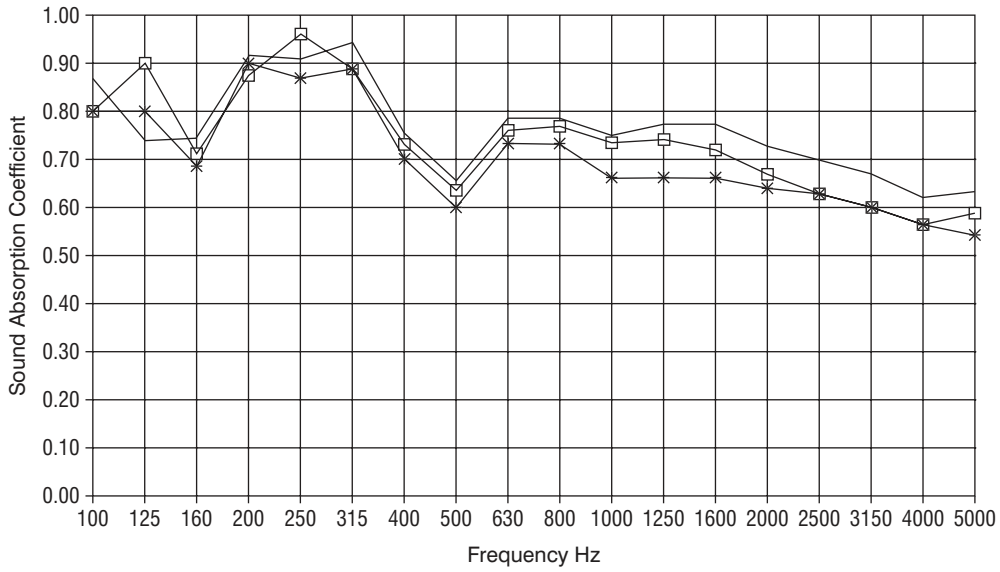


**FIGURE 2**

- Slotted MDF board 9mm thick, open area 17.2% with DecorSorb D400. NRC = 0.75.
- Slotted MDF board 9mm thick, open area 14% with DecorSorb D400. NRC = 0.75.



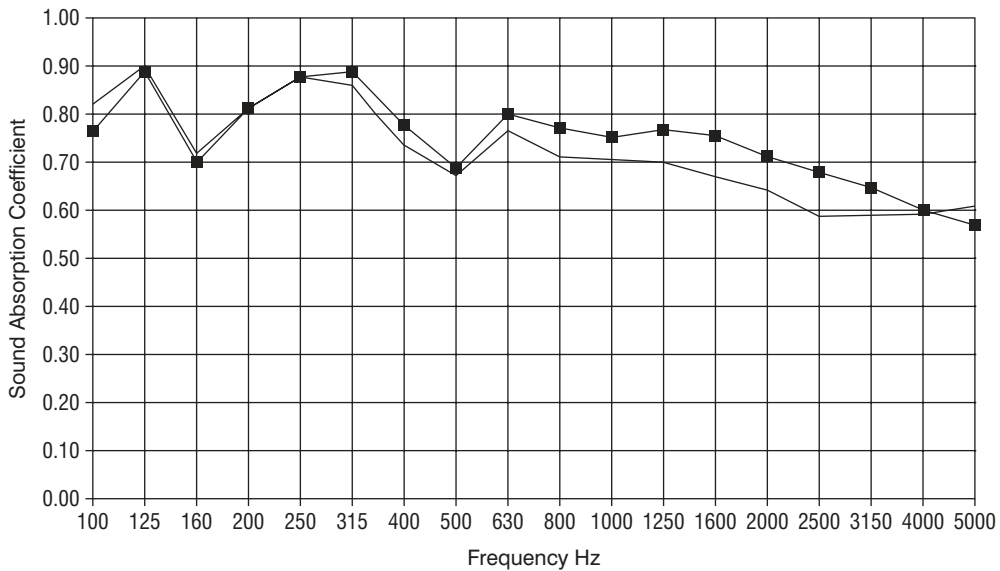
Sound Absorption tested to AS 1045-1988  
400mm air gap



**FIGURE 3**

- Slotted MDF board 9mm thick, open area 21% with DecorSorb D400. NRC = 0.70.
- Solid line — Slotted MDF board 9mm thick, open area 17.2% with DecorSorb D400. NRC = 0.75.
- \*— Slotted MDF board 9mm thick, open area 14% with DecorSorb D400. NRC = 0.75.

Sound Absorption tested to AS 1045-1988  
400mm air gap

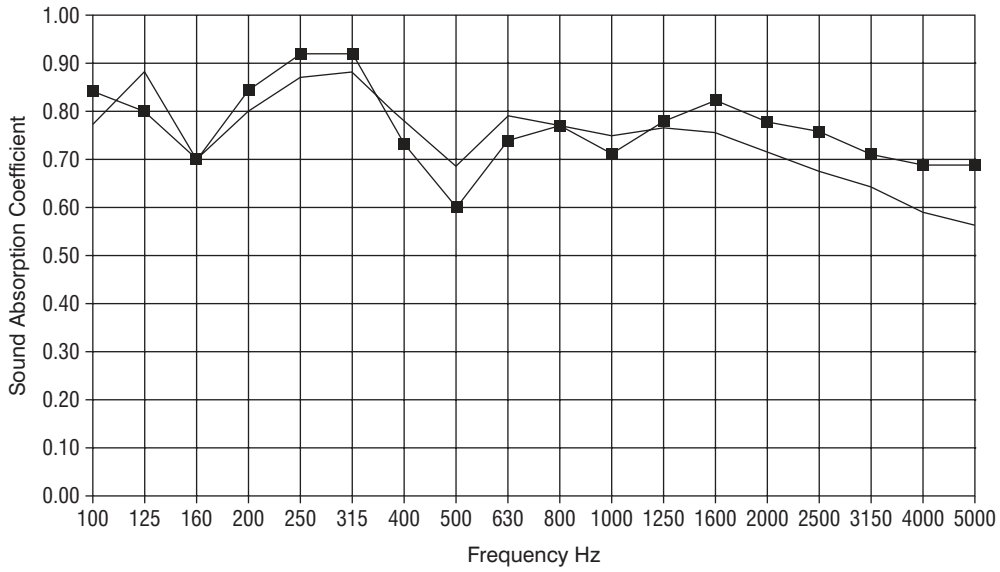


**FIGURE 4**

- Perforated MDF board 6mm thick, open area 10.2% with DecorSorb D400. NRC = 0.75.
- Solid line — Perforated MDF board 12mm thick, open area 10.2% with DecorSorb D400. NRC = 0.70.



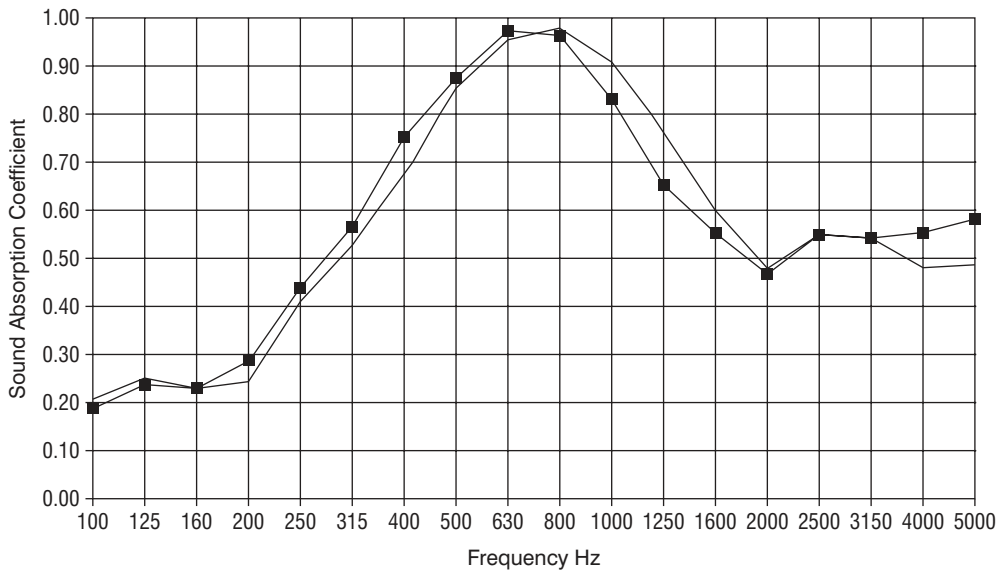
Sound Absorption tested to AS 1045-1988  
400mm air gap



**FIGURE 5**

- Perforated MDF board 6mm thick, open area 25% with DecorSorb D400. NRC = 0.75.
- Perforated MDF board 6mm thick, open area 10.2% with DecorSorb D400. NRC = 0.75.

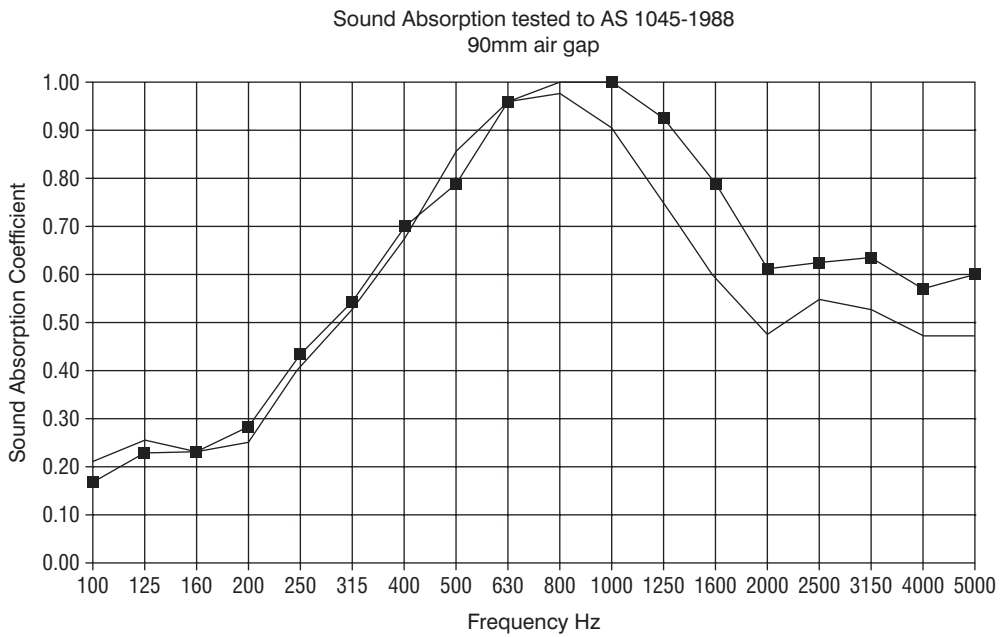
Sound Absorption tested to AS 1045-1988  
90mm air gap



**FIGURE 6**

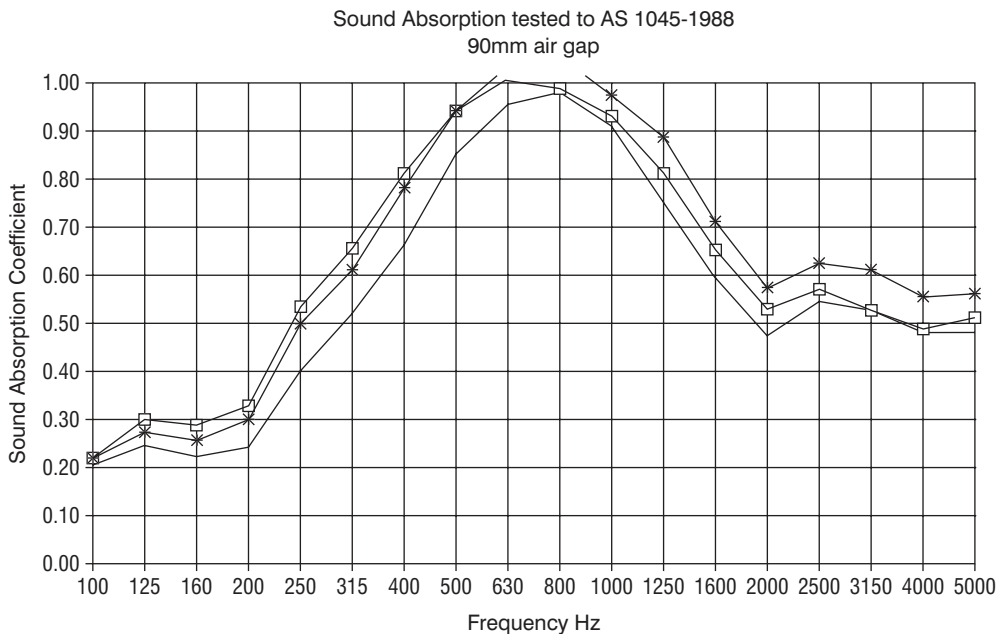
- Slotted MDF board 16mm thick, open area 21% with DecorSorb D400. NRC = 0.65.
- Slotted MDF board 9mm thick, open area 21% with DecorSorb D400. NRC = 0.65.





**FIGURE 7**

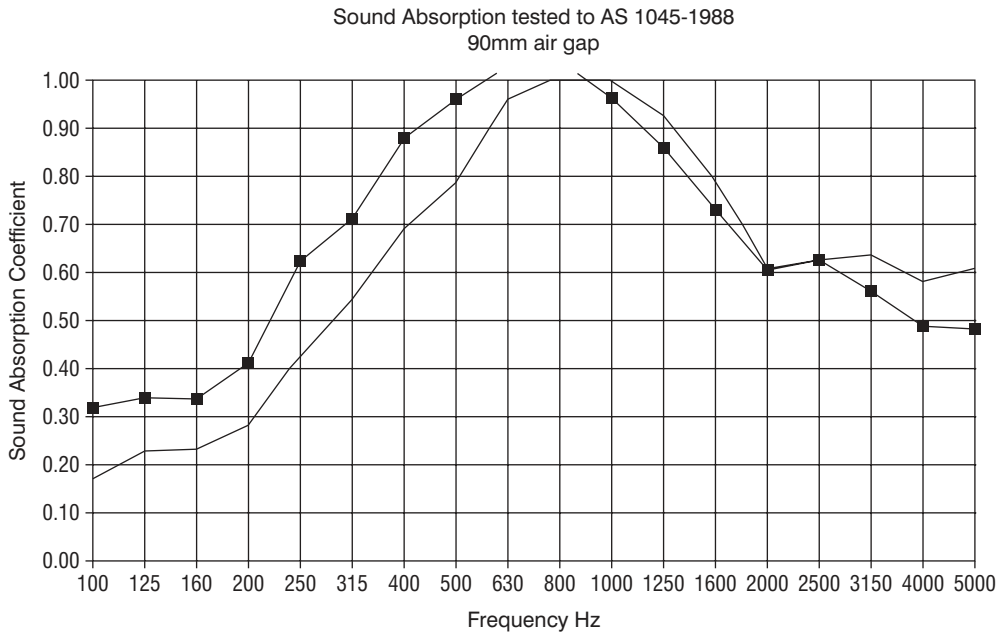
- Perforated MDF board 6mm thick, open area 25% with DecorSorb D400. NRC = 0.70.
- Slotted MDF board 9mm thick, open area 21% with DecorSorb D400. NRC = 0.65.



**FIGURE 8**

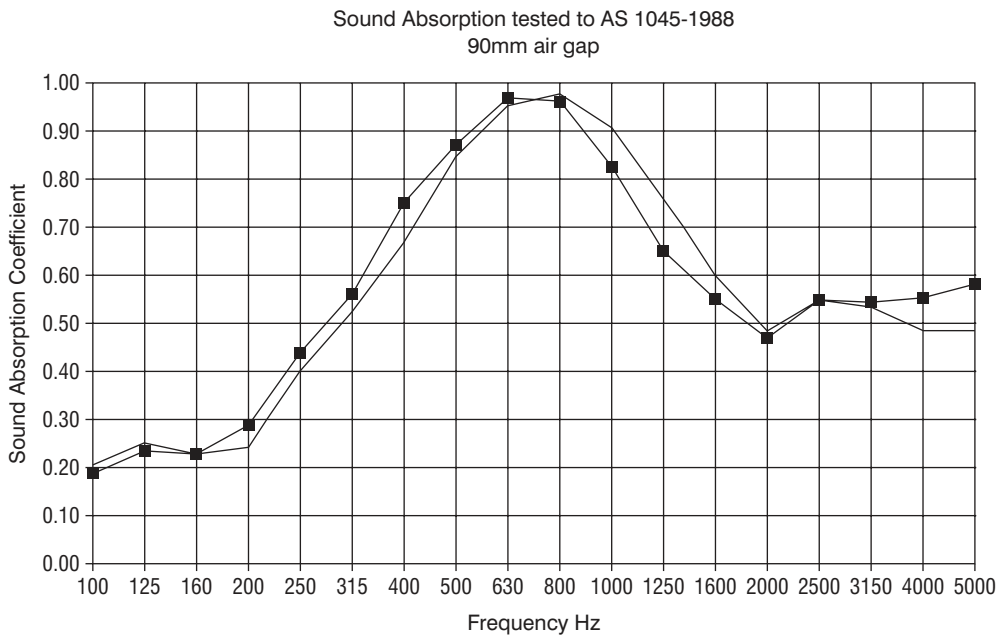
- Slotted MDF board 9mm thick, open area 14% with DecorSorb D400. NRC = 0.75.
- \* Slotted MDF board 9mm thick, open area 17.2% with DecorSorb D400. NRC = 0.75.
- Slotted MDF board 9mm thick, open area 21% with DecorSorb D400. NRC = 0.65.





**FIGURE 9**

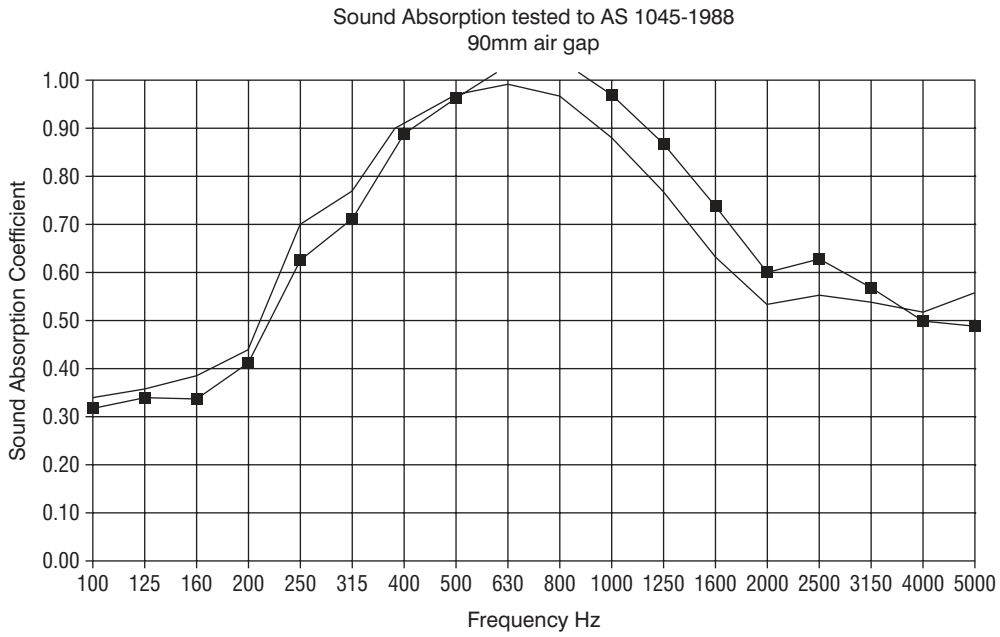
- Perforated MDF board 6mm thick, open area 10.2% with DecorSorb D400. NRC = 0.80.
- Perforated MDF board 6mm thick, open area 25% with DecorSorb D400. NRC = 0.70.



**FIGURE 10**

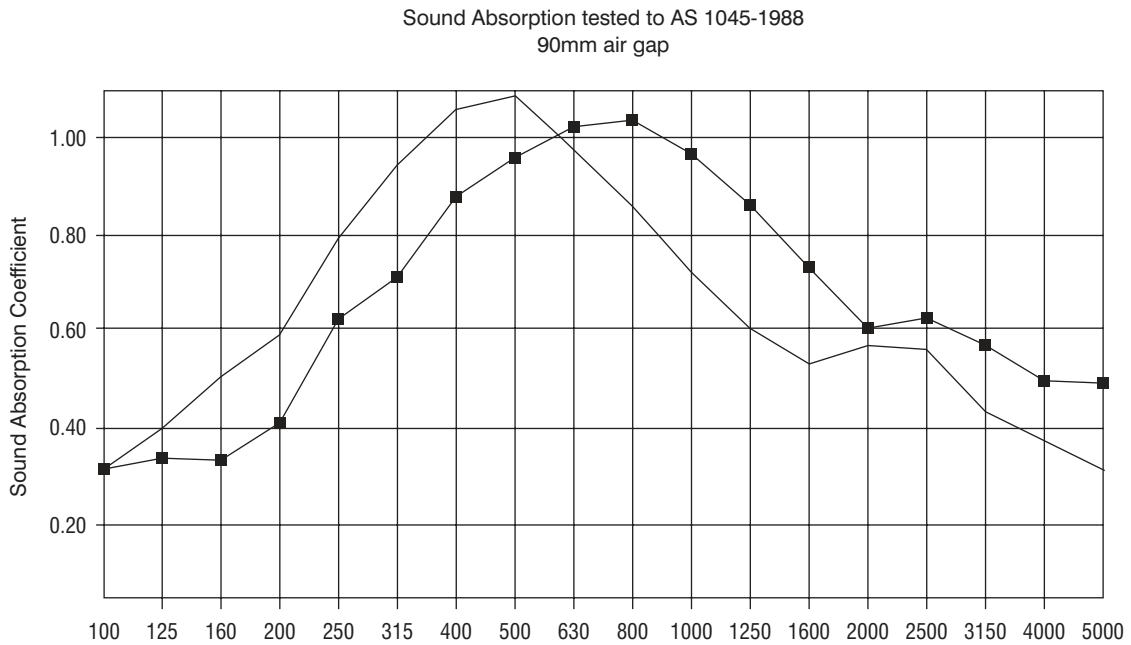
- Slotted MDF board 16mm thick, open area 21% with DecorSorb D400. NRC = 0.65.
- Slotted MDF board 9mm thick, open area 21% with DecorSorb D400. NRC = 0.65.





**FIGURE 11**

- Perforated MDF board 6mm thick, open area 10.2% with DecorSorb D400. NRC = 0.80.
- Perforated MDF board 12mm thick, open area 10.2% with DecorSorb D400. NRC = 0.75.



**FIGURE 12**

- Perforated MDF board 6mm thick, open area 10.2% with DecorSorb D400. NRC = 0.80.
- Perforated MDF board 6mm thick, open area 10.2% with 30kg poly, 80mm thick. NRC = 0.80.



Table 1 – Numerical data for test results

Frequency Hz	90mm gap						400mm gap						
	Perforated MDF board 6mm thick, open area 10.2% with Decororb NRC = 0.80	Perforated MDF board 6mm thick, open area 25% with Decororb NRC = 0.70	Perforated MDF board 12mm thick, open area 10.2% with Decororb NRC = 0.75	Slotted MDF board 9mm thick, open area 14% with Decororb NRC = 0.75	Slotted MDF board 9mm thick, open area 17.2% with Decororb NRC = 0.75	Slotted MDF board 16mm thick, open area 21% with Decororb NRC = 0.65	Perforated MDF board 6mm thick, open area 10.2% with 30kg poly, 80mm thick NRC = 0.80	Slotted MDF board 9mm thick, open area 21% with Decororb NRC = 0.65	Slotted MDF board 16mm thick, open area 21% with Decororb NRC = 0.65	Slotted MDF board 9mm thick, open area 21% with Decororb NRC = 0.70	Slotted MDF board 9mm thick, open area 17.2% with Decororb NRC = 0.75	Slotted MDF board 9mm thick, open area 14% with Decororb NRC = 0.75	Perforated MDF board 12mm thick, open area 10.2% with Decororb NRC = 0.70
100	0.32	0.17	0.34	0.22	0.22	0.18	0.31	0.21	0.84	0.87	0.80	0.84	0.82
125	0.34	0.23	0.36	0.30	0.28	0.24	0.40	0.25	0.77	0.74	0.90	0.80	0.90
160	0.34	0.23	0.39	0.29	0.26	0.23	0.50	0.23	0.71	0.74	0.71	0.70	0.72
200	0.41	0.28	0.44	0.33	0.31	0.29	0.59	0.25	0.86	0.92	0.88	0.84	0.80
250	0.62	0.43	0.71	0.54	0.51	0.44	0.80	0.41	0.85	0.91	0.96	0.92	0.88
315	0.71	0.54	0.77	0.66	0.62	0.56	0.85	0.53	0.86	0.95	0.86	0.82	0.86
400	0.88	0.69	0.93	0.81	0.79	0.75	1.06	0.67	0.69	0.75	0.73	0.73	0.73
500	0.98	0.79	0.97	0.94	0.93	0.87	1.09	0.86	0.59	0.65	0.84	0.60	0.67
630	1.03	0.96	0.99	1.01	1.04	0.97	0.98	0.96	0.74	0.79	0.76	0.74	0.77
800	1.04	1.01	0.97	0.99	1.02	0.96	0.86	0.98	0.73	0.79	0.77	0.77	0.71
1000	0.87	1.00	0.88	0.93	0.98	0.83	0.72	0.91	0.67	0.76	0.74	0.72	0.70
1250	0.85	0.93	0.76	0.82	0.89	0.85	0.60	0.78	0.65	0.78	0.75	0.78	0.70
1800	0.73	0.79	0.62	0.65	0.71	0.55	0.52	0.59	0.67	0.78	0.73	0.82	0.87
2000	0.60	0.61	0.63	0.64	0.58	0.47	0.57	0.48	0.64	0.73	0.67	0.76	0.64
2500	0.62	0.63	0.55	0.58	0.63	0.55	0.55	0.55	0.63	0.71	0.63	0.76	0.58
3150	0.58	0.64	0.53	0.53	0.61	0.54	0.42	0.53	0.60	0.67	0.60	0.72	0.59
4000	0.40	0.58	0.51	0.49	0.58	0.65	0.38	0.48	0.57	0.62	0.57	0.68	0.59
5000	0.48	0.61	0.55	0.51	0.56	0.58	0.30	0.46	0.55	0.64	0.59	0.68	0.61
NRC	0.80	0.70	0.75	0.75	0.75	0.65	0.80	0.65	0.70	0.75	0.75	0.75	0.70





# decorTrend

Test Method: AS 1045-1988, MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM.

RMIT Test No.: 121I/04-069/PD  
 Report No.: A03RMST1  
 Test No.: A03D44RMS2  
 Date of test: 2/06/2004  
 Product: DecorTrend

Sample tested in the following configuration:

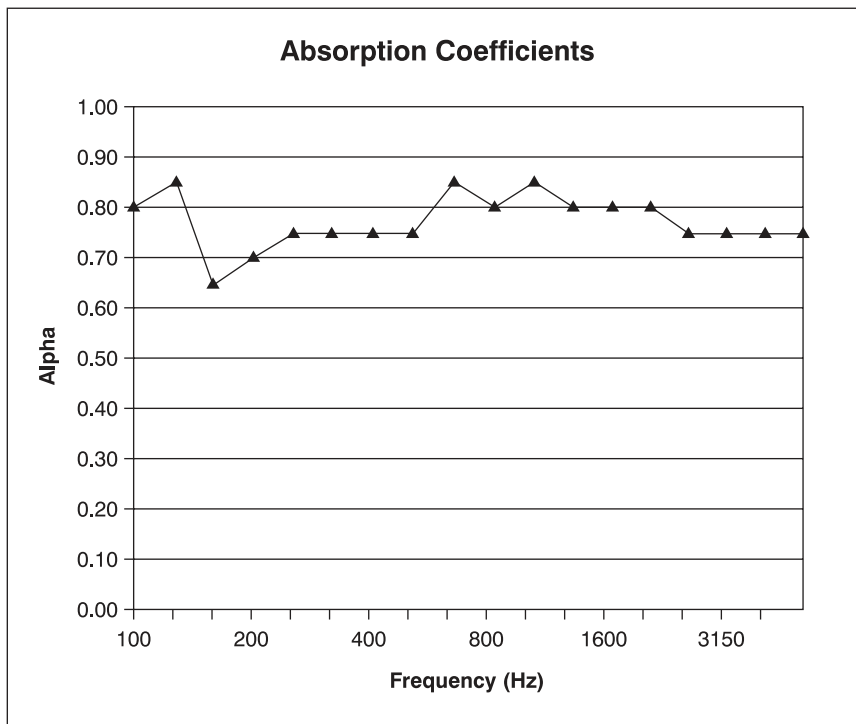
Surface panel: DecorTrend  
 Material: MDF with DecorSorb backing  
 Panel thickness: 9mm  
 Panel type: AS26-20/47  
 Open area: 20.2%  
 Insulation: A8225, 65mm dual density insulation, of mounted directly under panel face  
 Air gap under panel: 400mm  
 Sample size: 8.64 square metres

The perimeter of the sample was enclosed with an MDF frame.

Table 21

Frequency (Hertz)	Sound Absorption Coefficient (Alpha)
100	0.80
125	0.85
160	0.65
200	0.70
250	0.75
315	0.75
400	0.75
500	0.75
630	0.80
800	0.80
1000	0.85
1250	0.80
1600	0.80
2000	0.80
2500	0.75
3150	0.75
4000	0.75
5000	0.75

Graph 21



NRC = 0.80

# decorTrend

Test Method: AS 1045-1988, MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM.

RMIT Test No.: 121I/04-069/PD  
 Report No.: A03RMST1  
 Test No.: A03D44RMS4  
 Date of test: 3/06/2004  
 Product: DecorTrend

Sample tested in the following configuration:

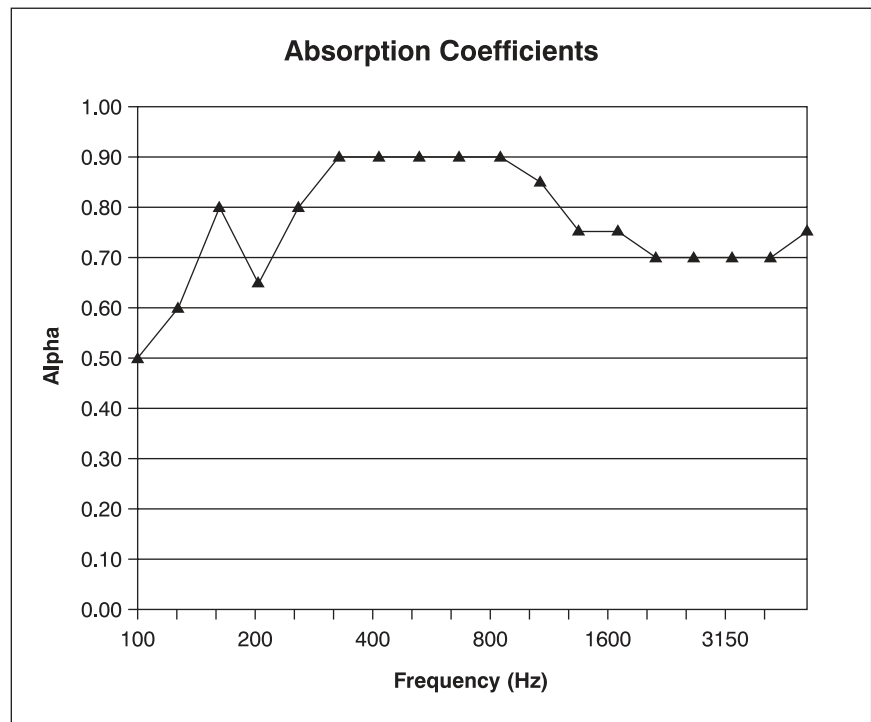
Surface panel: DecorTrend  
 Material: MDF with DecorSorb backing  
 Panel thickness: 9mm  
 Panel type: AS26-20/47  
 Open area: 20.2%  
 Insulation: A8225, 65mm dual density insulation, mounted on floor of chamber away from the face panel  
 Air gap under panel: 90mm  
 Sample size: 8.64 square metres

The perimeter of the sample was enclosed with an MDF frame.

Table 22

Frequency (Hertz)	Sound Absorption Coefficient (Alpha)
100	0.50
125	0.60
160	0.80
200	0.65
250	0.80
315	0.90
400	0.90
500	0.90
630	0.90
800	0.90
1000	0.85
1250	0.75
1600	0.75
2000	0.70
2500	0.70
3150	0.70
4000	0.70
5000	0.75

Graph 22



NRC = 0.80

# decorTrend

Test Method: AS 1045-1988, MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM.

RMIT Test No.: 121I/04-069/PD  
 Report No.: A03RMST1  
 Test No.: A03D44RMS5  
 Date of test: 3/06/2004  
 Product: DecorTrend

Sample tested in the following configuration:

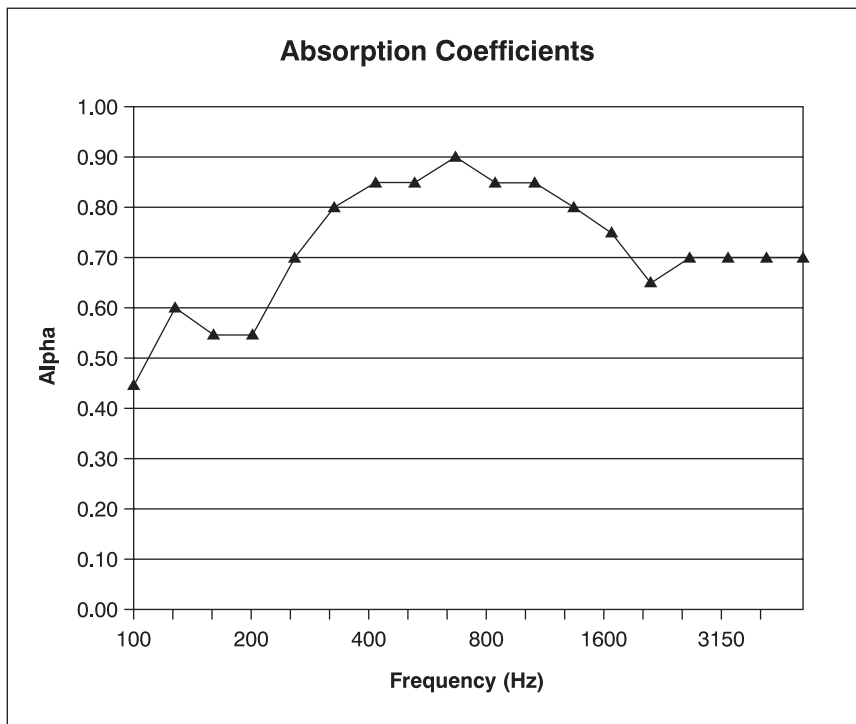
Surface panel: DecorTrend  
 Material: MDF with DecorSorb backing  
 Panel thickness: 9mm  
 Panel type: AS26-20/47  
 Open area: 20.2%  
 Insulation: ATK3 Insulation mounted on the floor away from panel face  
 Air gap under panel: 90mm  
 Sample size: 8.64 square metres

The perimeter of the sample was enclosed with an MDF frame.

Table 23

Frequency (Hertz)	Sound Absorption Coefficient (Alpha)
100	0.45
125	0.60
160	0.55
200	0.55
250	0.70
315	0.80
400	0.85
500	0.85
630	0.90
800	0.85
1000	0.85
1250	0.80
1600	0.75
2000	0.65
2500	0.70
3150	0.70
4000	0.70
5000	0.70

Graph 23



NRC = 0.75



# decorTrend

Test Method: AS 1045-1988, MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM.

RMIT Test No.: 121I/04-069/PD  
 Report No.: A03RMST1  
 Test No.: A03044RMS6  
 Date of test: 1/06/2004  
 Product: DecorTrend

Sample tested in the following configuration:

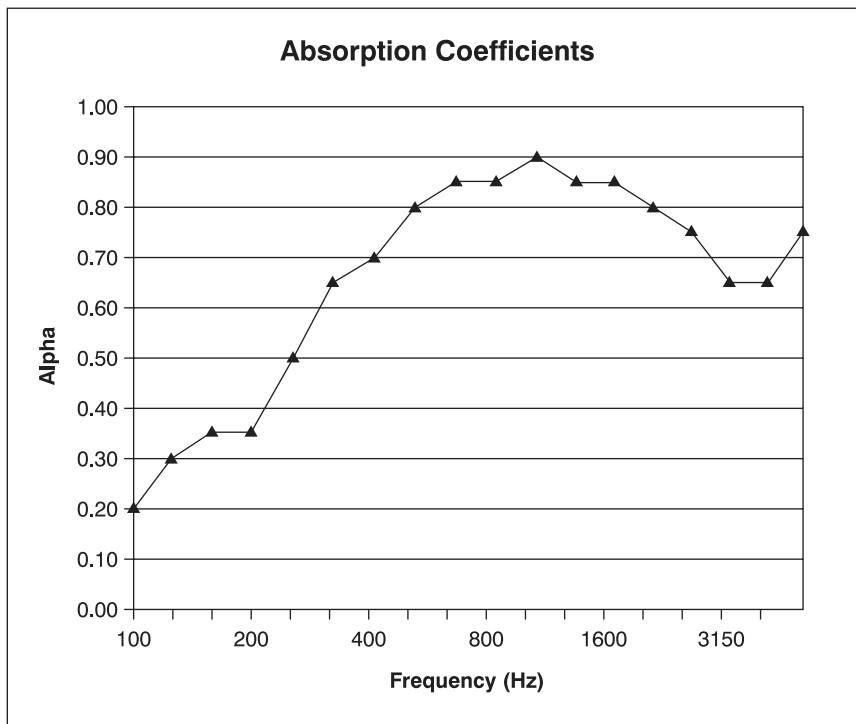
Surface panel: DecorTrend  
 Material: MDF with DecorSorb backing  
 Panel thickness: 9mm  
 Panel type: AS26-20/47  
 Open area: 20.2%  
 Insulation: A8210, 25mm insulation, mounted on floor of chamber away from the face panel  
 Air gap under panel: 50mm  
 Sample size: 8.64 square metres

The perimeter of the sample was enclosed with an MDF frame.

Table 24

Frequency (Hertz)	Sound Absorption Coefficient (Alpha)
100	0.20
125	0.30
160	0.35
200	0.35
250	0.50
315	0.65
400	0.70
500	0.80
630	0.85
800	0.85
1000	0.90
1250	0.85
1600	0.85
2000	0.80
2500	0.75
3150	0.65
4000	0.65
5000	0.75

Graph 24



NRC = 0.75



# decorTrend

Test Method: AS 1045-1988, MEASUREMENT OF SOUND ABSORPTION IN A REVERBERATION ROOM.

RMIT Test No.: 121I/04-069/PD  
 Report No.: A03RMST1  
 Test No.: A03D44RMS7  
 Date of test: 3/06/2004  
 Product: DecorTrend

Sample tested in the following configuration:

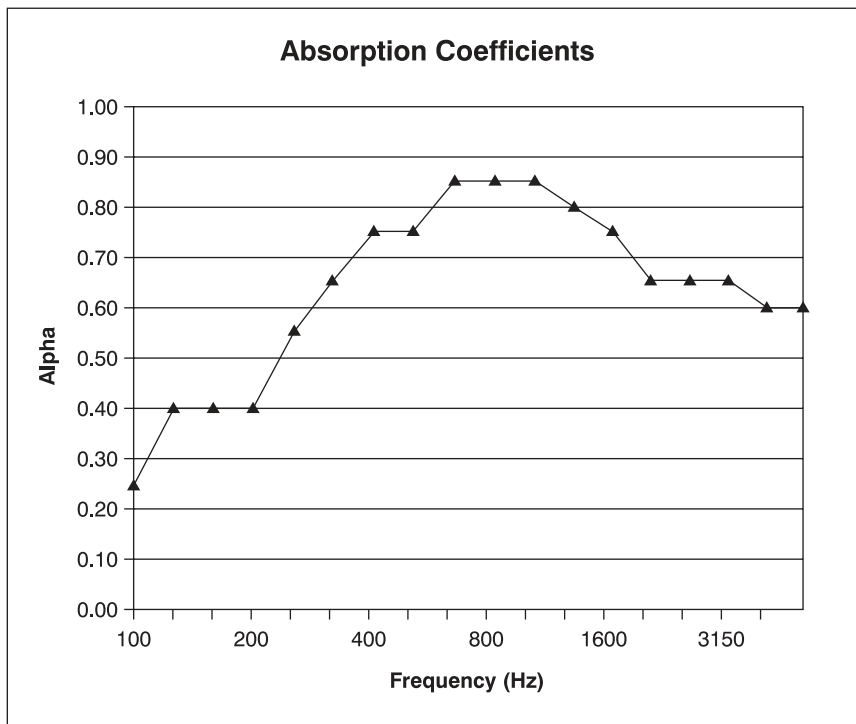
Surface panel: DecorTrend  
 Material: MDF with DecorSorb backing  
 Panel thickness: 9mm  
 Panel type: AS11-25/80  
 Open area: 22.6%  
 Insulation: None  
 Air gap under panel: 90mm  
 Sample size: 8.64 square metres

The perimeter of the sample was enclosed with an MDF frame.

Table 25

Frequency (Hertz)	Sound Absorption Coefficient (Alpha)
100	0.25
125	0.40
160	0.40
200	0.40
250	0.55
315	0.65
400	0.75
500	0.75
630	0.85
800	0.85
1000	0.85
1250	0.80
1600	0.75
2000	0.65
2500	0.65
3150	0.65
4000	0.60
5000	0.60

Graph 25



NRC = 0.70

