

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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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:

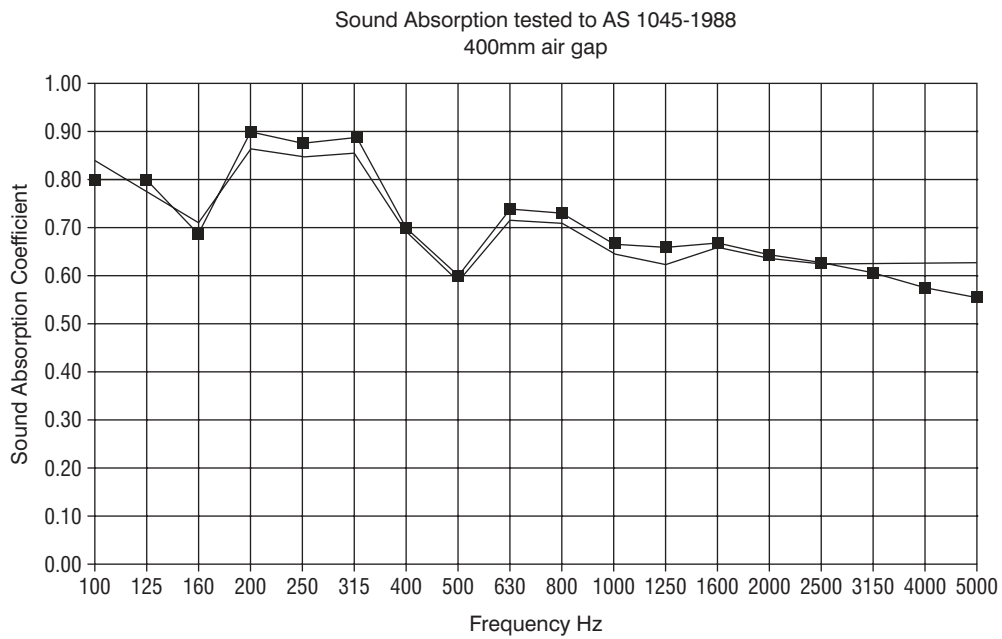


FIGURE 1

- 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.

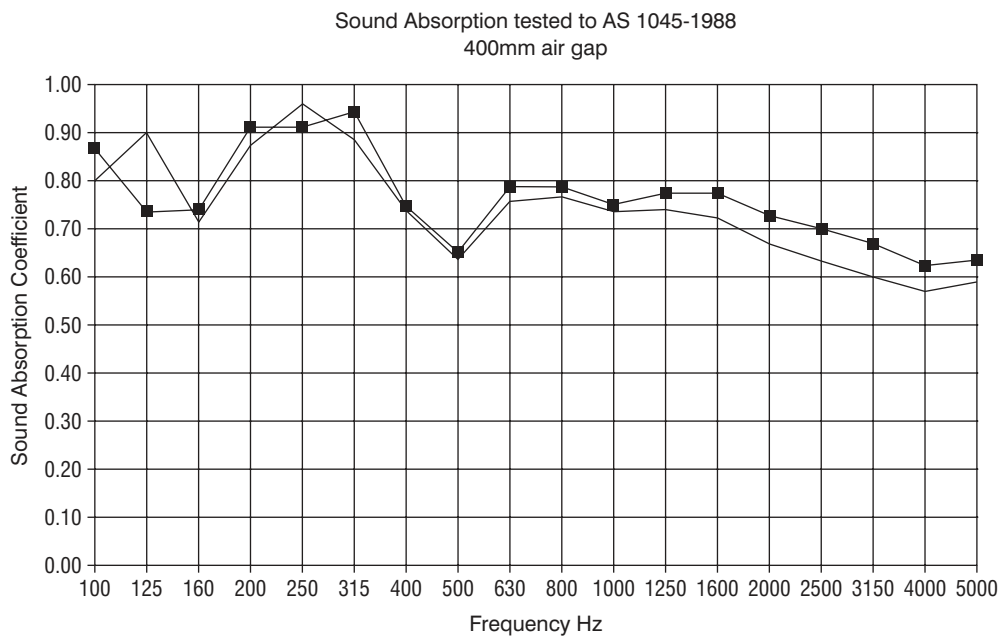


FIGURE 2

- 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

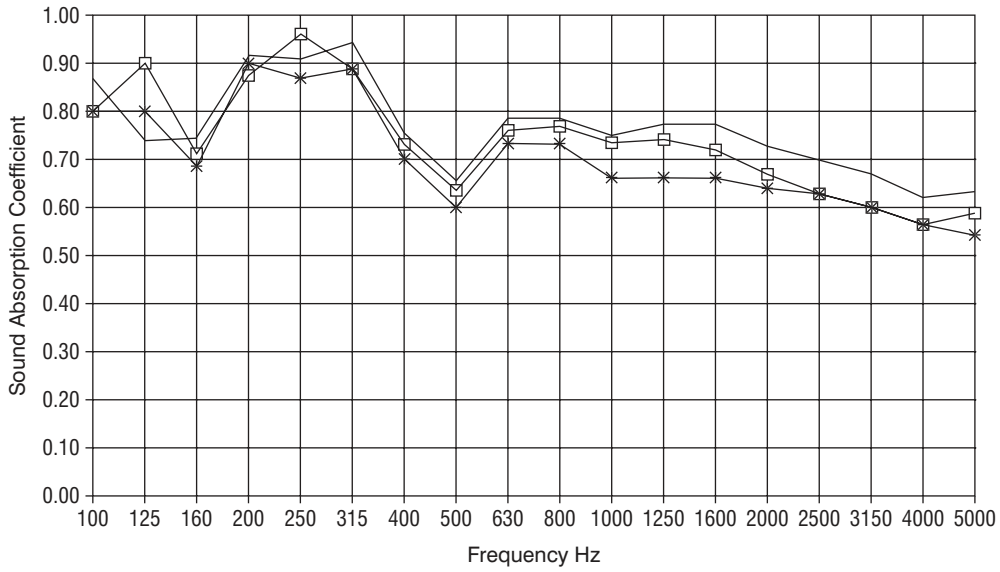


FIGURE 3

- 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

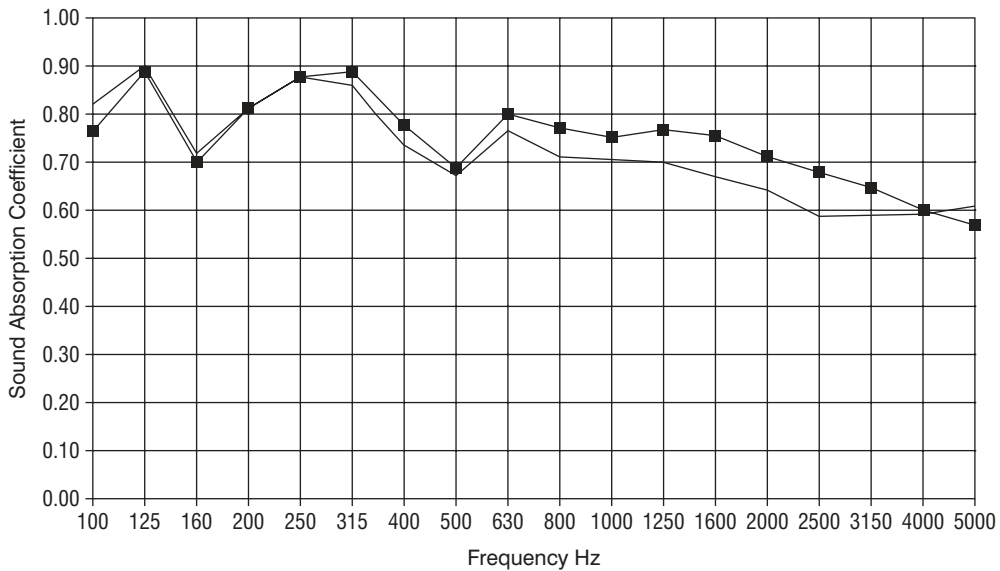


FIGURE 4

- 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

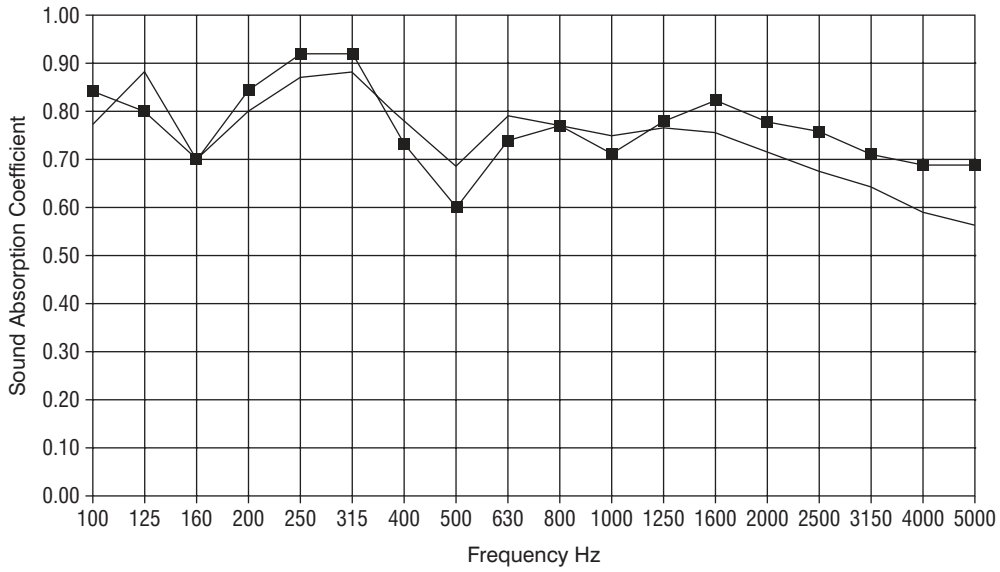


FIGURE 5

- 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

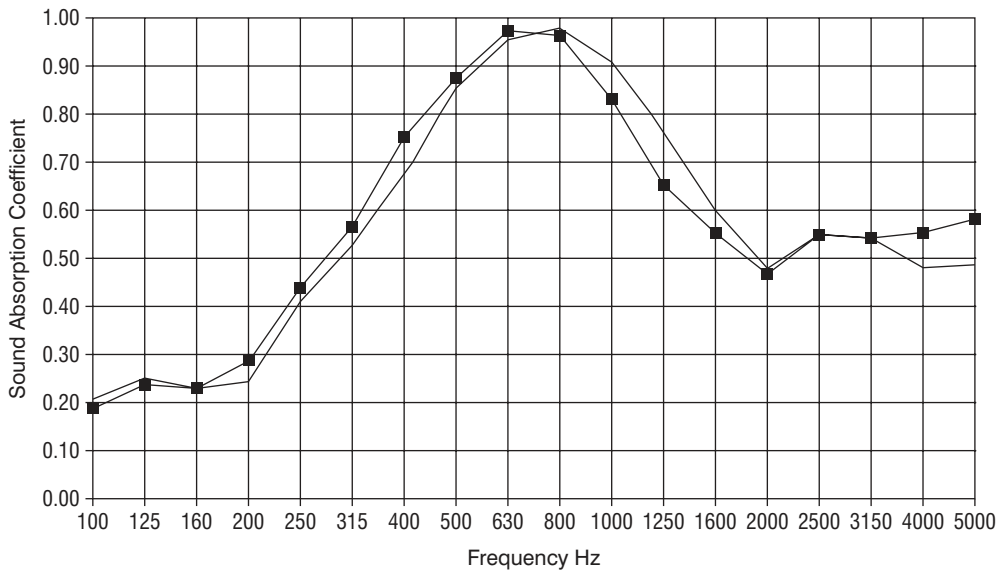


FIGURE 6

- 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.



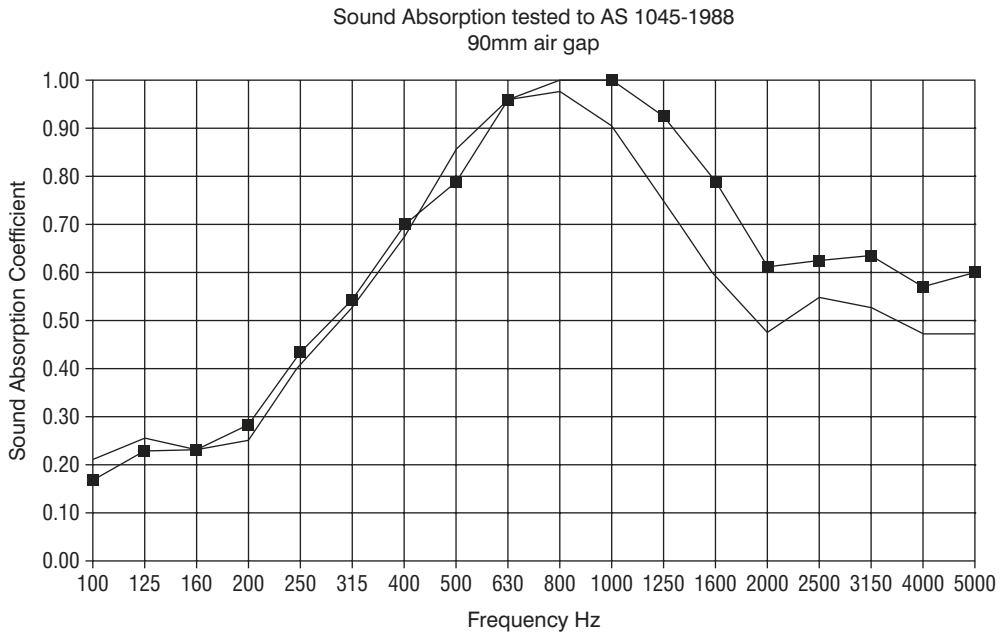


FIGURE 7

- 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.

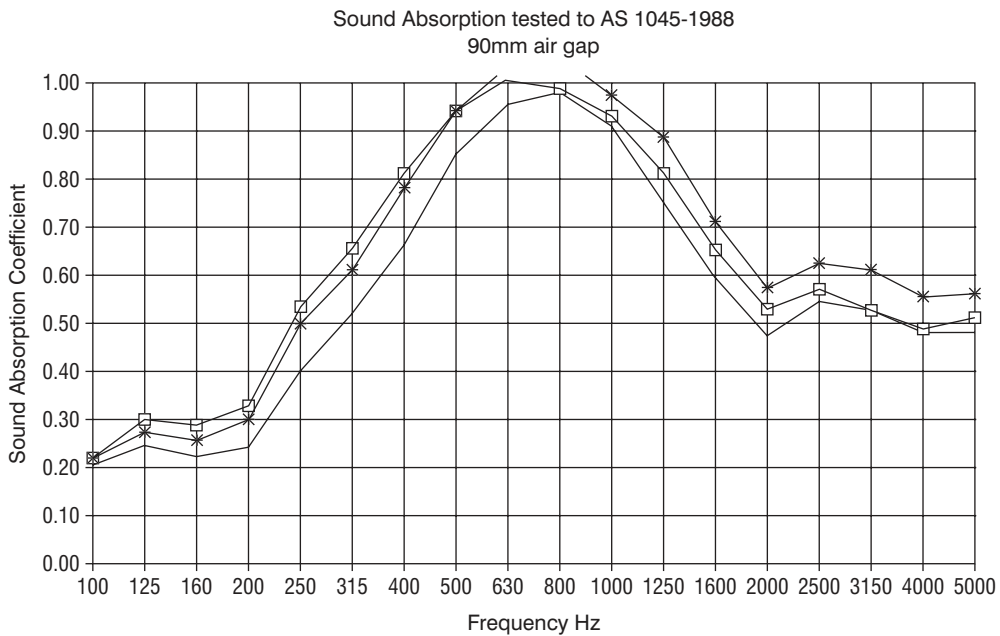


FIGURE 8

- 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.



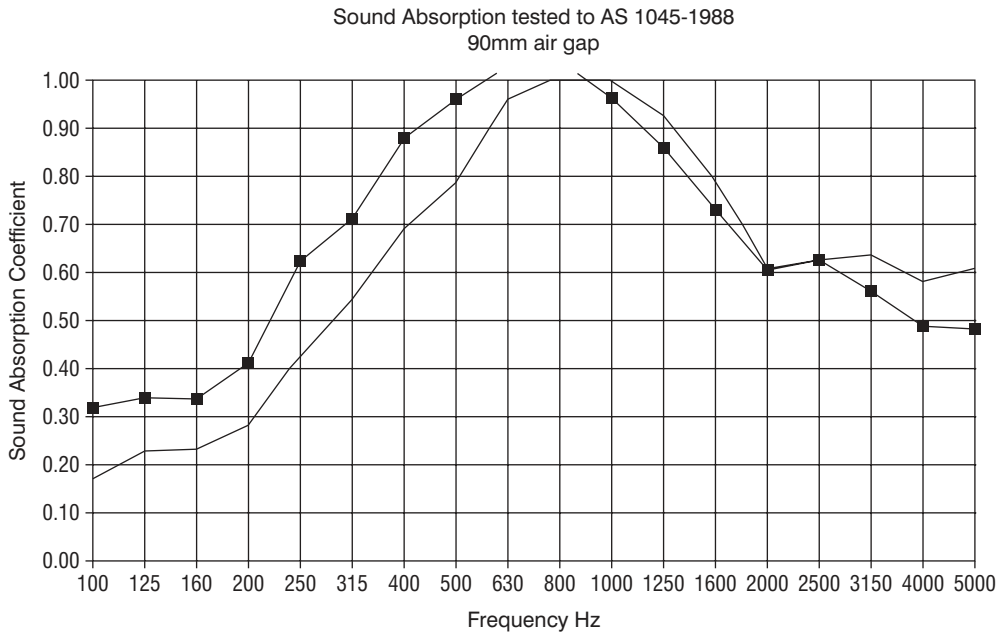


FIGURE 9

- 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.

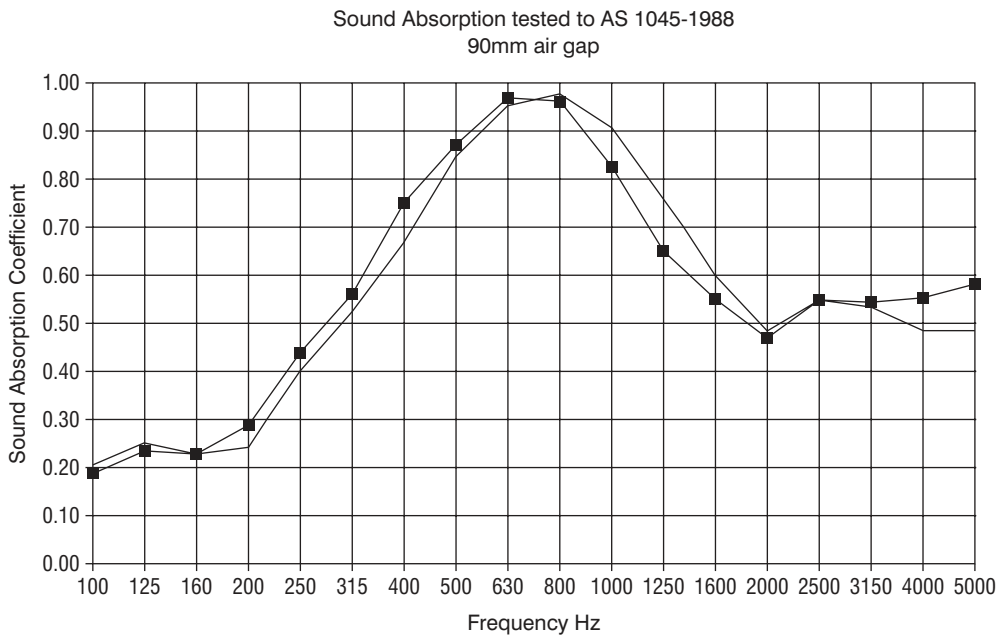


FIGURE 10

- 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.



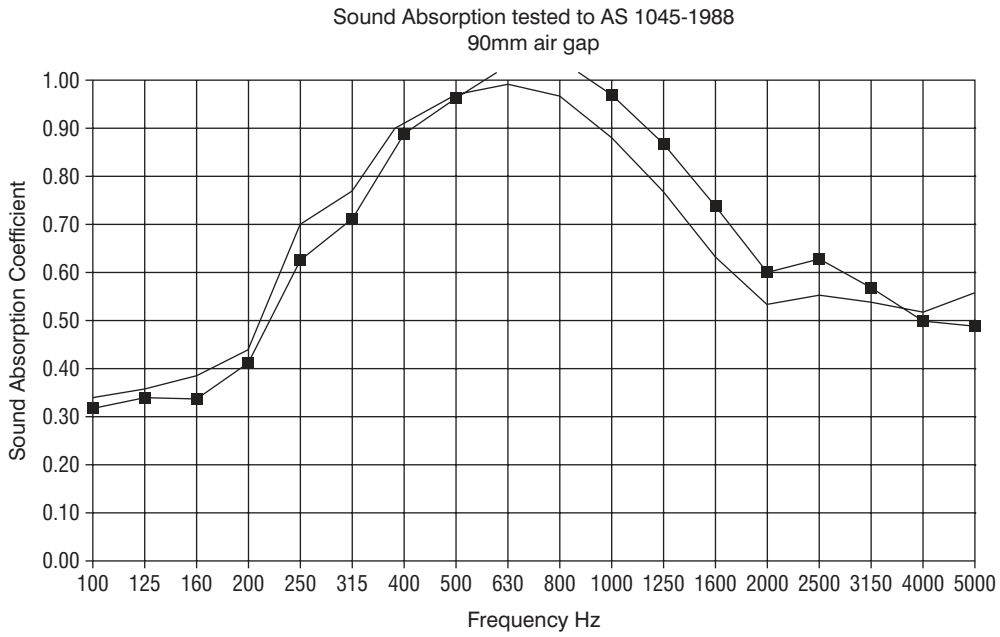


FIGURE 11

- 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.

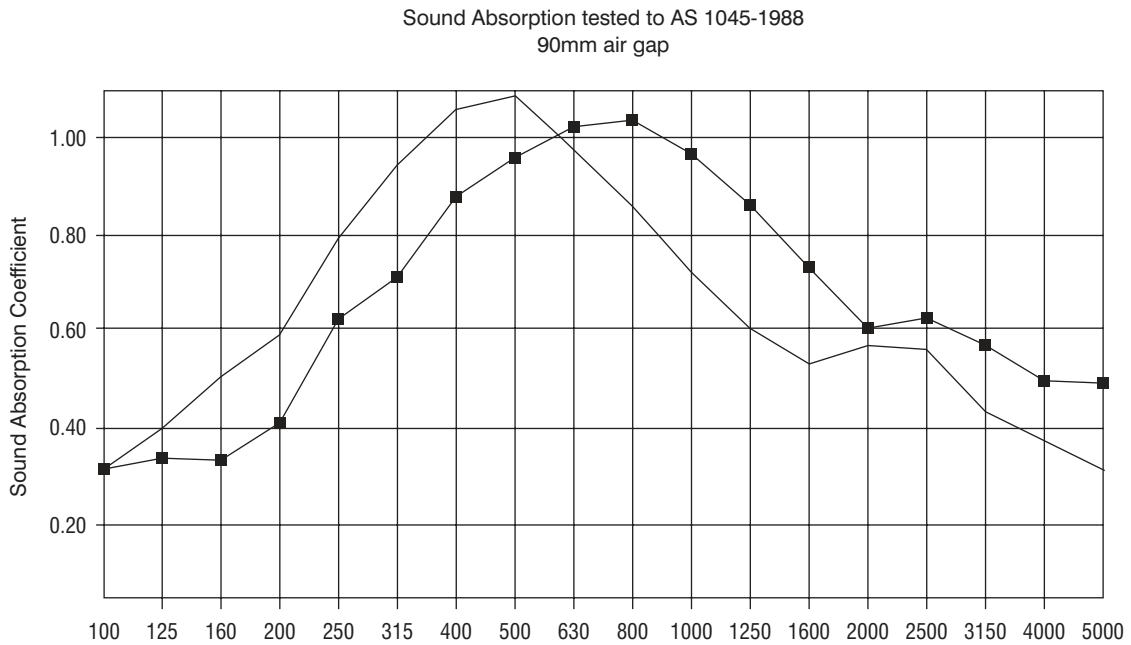


FIGURE 12

- 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	0.72	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	0.71	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	0.65	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	0.62	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	0.66	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	0.63	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	0.62	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	0.62	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	0.62	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	0.62	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



Appendix 1

Absorption Material Specifications

Decor Systems Product Reference	Product Specifications
A8210, 25mm Insulation	25mm polyester @ 28kg/m ³
A8225, 65mm Dual Density Insulation	65mm dual layer polyester, comprising 40mm face layer @20kg/m ³ and 25mm back layer @ 40kg/m ³
ATK3 Insulation	65mm polyester @ 7.7kg/m ³