

6 July 2009

64 Beatty St
Tahunanui
Nelson

Email: andrew@cooperwebley.co.nz

Attention: Andrew Goodale

Dear Andrew

ACOUSTIC PERFORMANCE OF COOPER WEBLEY SLOTTED PANELS

Marshall Day Acoustics has been engaged to provide an opinion on the sound absorption performance of panels constructed by Cooper Webley for use in the building industry. The opinion we have provided is based on theoretical models, completed for each of the four panels.

OPINION

The general construction of the panels is a slotted wood face with a cavity filled with sound absorbing material. This type of construction is proven to be effective in absorbing noise.

The results from our computer model estimate that the Noise Reduction Coefficient is around 0.7 for each of the four panels. This means the panels absorb approximately 70% of the sound waves that come in contact with the panel, meaning only 30% are reflected back into the room.

The panels' acoustic performance is of a high level. The panels will be useful in controlling reverberant noise in rooms. Possible applications include use in restaurants, function rooms, conference centres and musical performance rooms.

If there are any questions regarding the above please do not hesitate to contact us.

Yours sincerely
MARSHALL DAY ACOUSTICS



Brigette Martin
Consultant
brigette.martin@marshallday.co.nz

Attachment: APPENDIX A – PANEL CONSTRUCTIONS
APPENDIX B – NRC VALUES
APPENDIX C – CALCULATION RESULTS
APPENDIX D – LIMITATIONS

APPENDIX A PANEL CONSTRUCTIONS

The standard construction each of the panels is as follows :

Panel 1

- 12mm thick panels with 8mm slots which are 550mm in length with a distance of 50mm between adjacent slots and a distance of 27.29mm between slots vertically;
- 8mm router diameter;
- Autex QuietStuf AAB 35-50 in cavity;
- Panel dimensions of 1200mm by 2400mm by 90mm.

Panel 2

- 12mm thick panels with 8mm slots which are 210mm in length with a distance of 30mm between adjacent slots and a distance of 26.29 mm between slots vertically;
- 8mm router diameter;
- Autex QuietStuf AAB 35-50 in cavity;
- Panel dimensions of 1200mm by 2400mm by 90mm.

Panel 3

- 12mm thick panels which have a decorative facing with 8mm slots which are 139mm in length with a distance of 122mm between adjacent slots and a distance of 22 mm between slots vertically;
- 8mm router diameter;
- Autex QuietStuf AAB 35-50 in cavity;
- Panel dimensions of 1200mm by 2400mm by 90mm.

Panel 4

- 12mm thick panels with 8mm slots which are 128mm in length with a distance of 22mm between adjacent slots and a distance of 22 mm between slots vertically;
- 8mm router diameter;
- Autex QuietStuf AAB 35-50 in cavity;
- Panel dimensions of 1200mm by 2400mm by 90mm.

APPENDIX B NRC VALUES

A computer programme was used to calculate the Noise Reduction Coefficient (NRC) of each of the panels. The output from the computer model can be found in Appendix A. The estimated laboratory performance of the panels is given in the table below:

Table 1: Estimated Acoustic Absorption of Panels

Panel	Noise Reduction Coefficient (NRC)
1	0.75
2	0.70
3	0.70
4	0.70

The NRC gives an indication of what percentage of sound waves that come in contact with an acoustic material are absorbed by the material. For example, Panel 1 absorbs 75% of the sound waves that come in contact with the panel, meaning only 25% are reflected back into the room. Please note that NRC gives a good guidance to the overall performance of the panels but has limited use for calculating reverberation times within rooms.

APPENDIX C CALCULATION RESULTS

C.1 PANEL 1

Sound Absorption Prediction 2.7

Program copyright Marshall Day Acoustics 2006

Margin of error is generally within +/- 0.05

JobName:Slotted Panel Analys

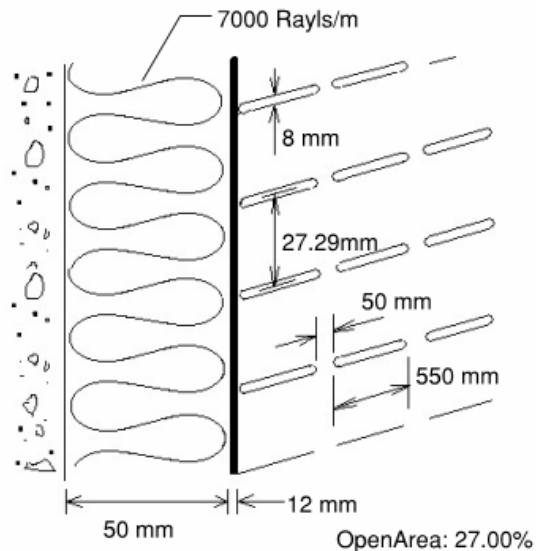
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Date: 7 Jul 09

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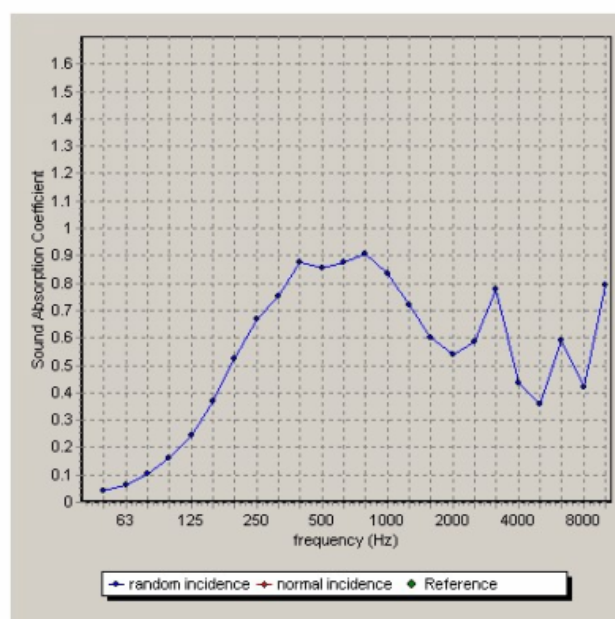
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Notes:



NRC 0.75

Frequency (Hz)	alpha random	
50	0.04	
63	0.06	
80	0.10	
100	0.16	
125	0.24	0.25
160	0.37	
200	0.53	
250	0.67	0.65
315	0.75	
400	0.88	
500	0.86	0.85
630	0.88	
800	0.91	
1000	0.83	0.80
1250	0.72	
1600	0.60	
2000	0.54	0.60
2500	0.59	
3150	0.78	
4000	0.44	0.50
5000	0.36	



C.2 PANEL 2

Sound Absorption Prediction 2.7

Program copyright Marshall Day Acoustics 2006

Margin of error is generally within +/- 0.05

JobName:Slotted Panel Analys

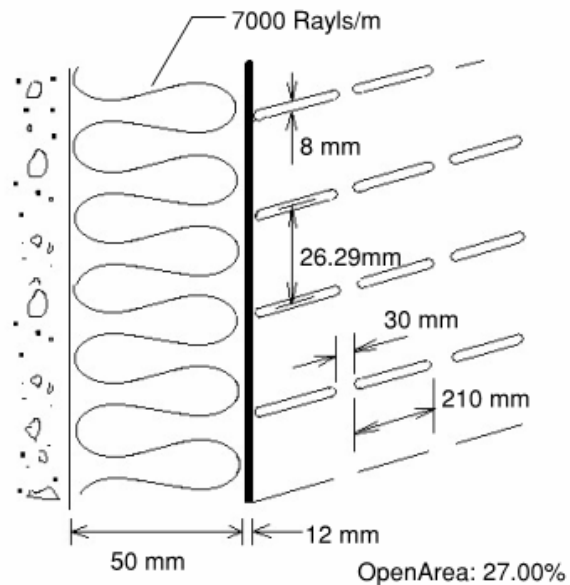
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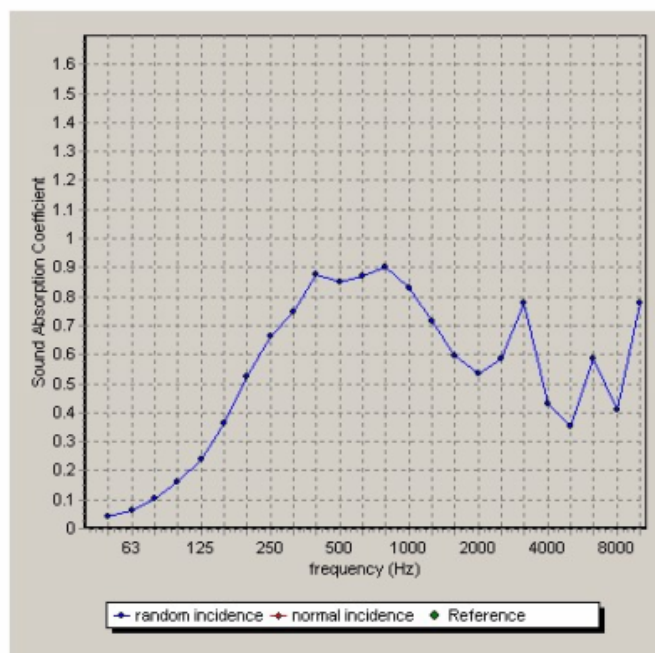
File name:Zb 002 2009275 Design 2.abs

Notes:



NRC 0.70

Frequency (Hz)	alpha random	
50	0.04	
63	0.06	
80	0.10	
100	0.16	
125	0.24	0.25
160	0.36	
200	0.52	
250	0.66	0.65
315	0.75	
400	0.87	
500	0.85	0.85
630	0.87	
800	0.90	
1000	0.83	0.80
1250	0.72	
1600	0.60	
2000	0.54	0.55
2500	0.59	
3150	0.78	
4000	0.43	0.50
5000	0.35	



C.3 PANEL 3

Sound Absorption Prediction 2.7

Program copyright Marshall Day Acoustics 2006

Margin of error is generally within +/- 0.05

JobName: Slotted Panle Analy

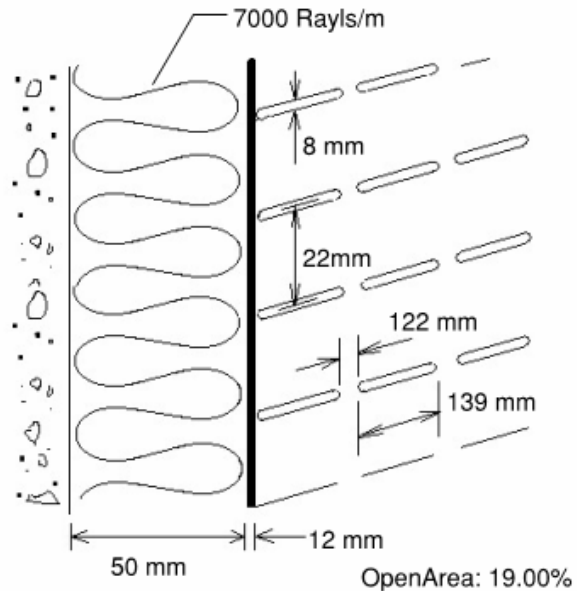
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Date: 7 Jul 09

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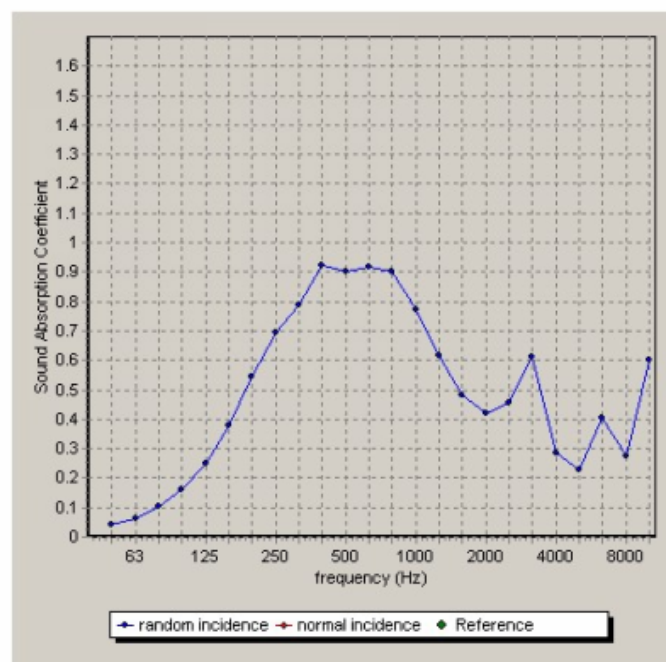
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Notes:



NRC 0.70

Frequency (Hz)	alpha random	
50	0.04	
63	0.06	
80	0.10	
100	0.16	
125	0.25	0.25
160	0.38	
200	0.54	
250	0.69	0.65
315	0.79	
400	0.92	
500	0.90	0.90
630	0.92	
800	0.90	
1000	0.77	0.75
1250	0.62	
1600	0.48	
2000	0.42	0.45
2500	0.46	
3150	0.61	
4000	0.29	0.40
5000	0.23	



C.4 PANEL 4

Sound Absorption Prediction 2.7

Program copyright Marshall Day Acoustics 2006

Margin of error is generally within +/- 0.05

JobName:Slotted Panel Analys

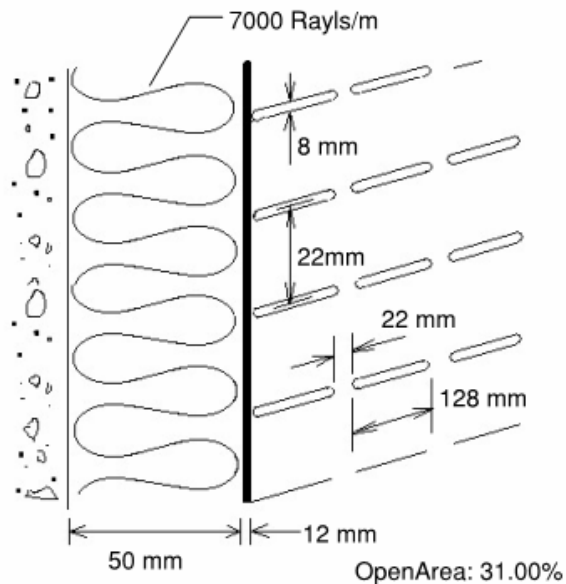
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Date: 7 Jul 09

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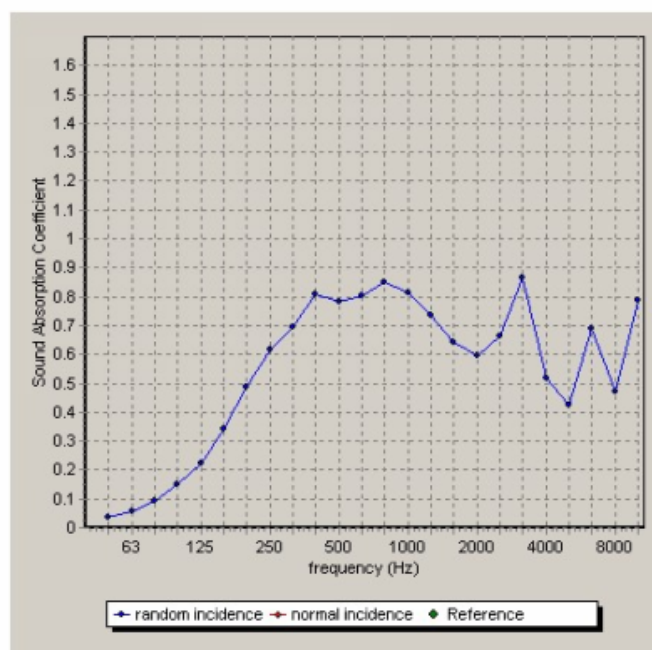
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Notes:



NRC 0.70

Frequency (Hz)	alpha random	
50	0.04	
63	0.06	
80	0.10	
100	0.15	
125	0.22	0.25
160	0.34	
200	0.49	
250	0.62	0.60
315	0.70	
400	0.81	
500	0.78	0.80
630	0.80	
800	0.85	
1000	0.81	0.80
1250	0.74	
1600	0.64	
2000	0.59	0.65
2500	0.66	
3150	0.87	
4000	0.52	0.60
5000	0.43	



APPENDIX D LIMITATIONS

The opinion given is an estimate of the laboratory performance not the field performance.

The estimate is based on the materials as set out above. Readers are advised to check that this opinion has not been revised by a later issue. The estimate is expected to be in error by less than ± 0.05 .

This estimate of performance is valid for a period of five years from the date of issue.

This opinion may be reproduced in full but not in part without the written consent of Marshall Day Acoustics Ltd.

For specific purposes, further information may be required and we encourage the consultation of a suitably experienced acoustic consultant.