

SoundAcoustics HA600/75 Hybrid Absorber/Diffuser

Application: Hybrid broadband selective diffuser/absorber

Frequency Characteristics: 160Hz - 20Khz

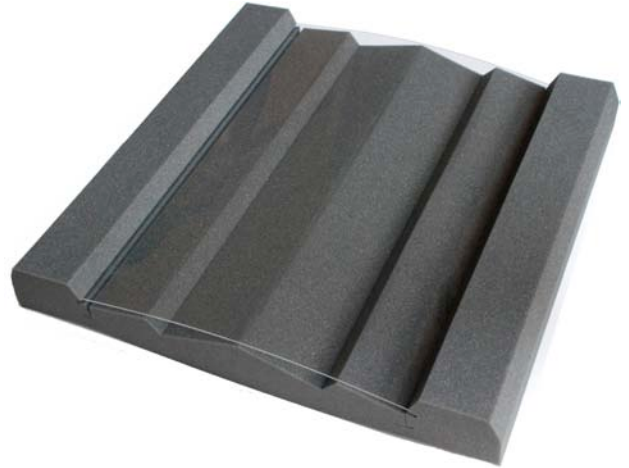
Installation: Staple gun or adhesive

Dimensions: 600 x 600 x 75mm

Acoustic Innovation

The unique patented HA600/75 hybrid absorber/diffuser panel offers selective absorption of lower frequencies and diffusion of high frequencies. In a critical listening environment these characteristics assist in creating a controlled acoustic environment whilst retaining a natural sense of space.

The HA600/75 acoustic panel is designed to receive a shallow radius polycarbonate insert, diffusing frequencies above 450Hz. The diffuser increases the low frequency absorption of the panel, down to a very useful 150Hz. Should you require just a straight absorption panel, the diffuser can be easily removed, the ultimate in flexibility.

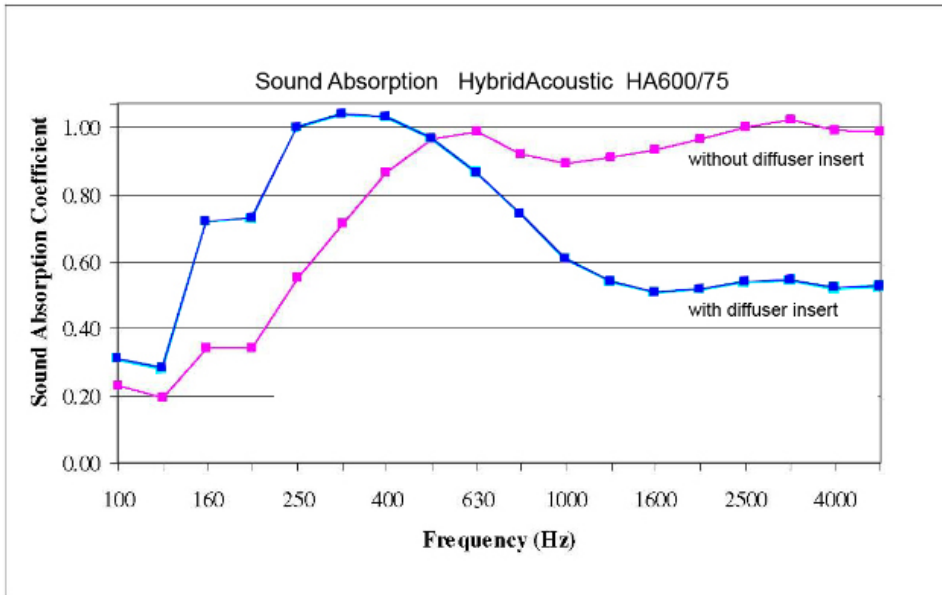


Creating the ideal space

Professional recording studios typically employ resonator type panels (usually perforated or slat timber), in order to absorb lower frequencies and reflect high frequencies, in both recording and control rooms. The HA600/75 offers very similar performance to a typical resonator panel, but in a far more convenient and flexible form. The HA600/75 is also ideal for audiophiles looking to improve the accuracy of a listening room. Used in conjunction with a corner bass trap such as the RAM400/1000, the HA600/75 provides a complete balanced acoustic solution for professional or home applications alike.

A perfect balance of absorption and diffusion

Without the diffuser insert (see graph below) the HA600/75 functions as a quality broadband absorber, providing the performance expected of a 75mm thick panel. The ability of acoustic foam to absorb lower frequencies is directly related to thickness. With the diffuser insert installed, a smooth roll-off of high frequency absorption occurs above 400Hz.



At lower frequencies the diffuser insert has been designed to behave as a resonator panel, enhancing low frequency absorption, achieving a considerable 70% absorption at 160 Hertz (see graph above). SoundAcoustics testing and evaluation takes place at the NATA accredited acoustic laboratory at the Royal Melbourne Institute of Technology in Melbourne.

Get creative!

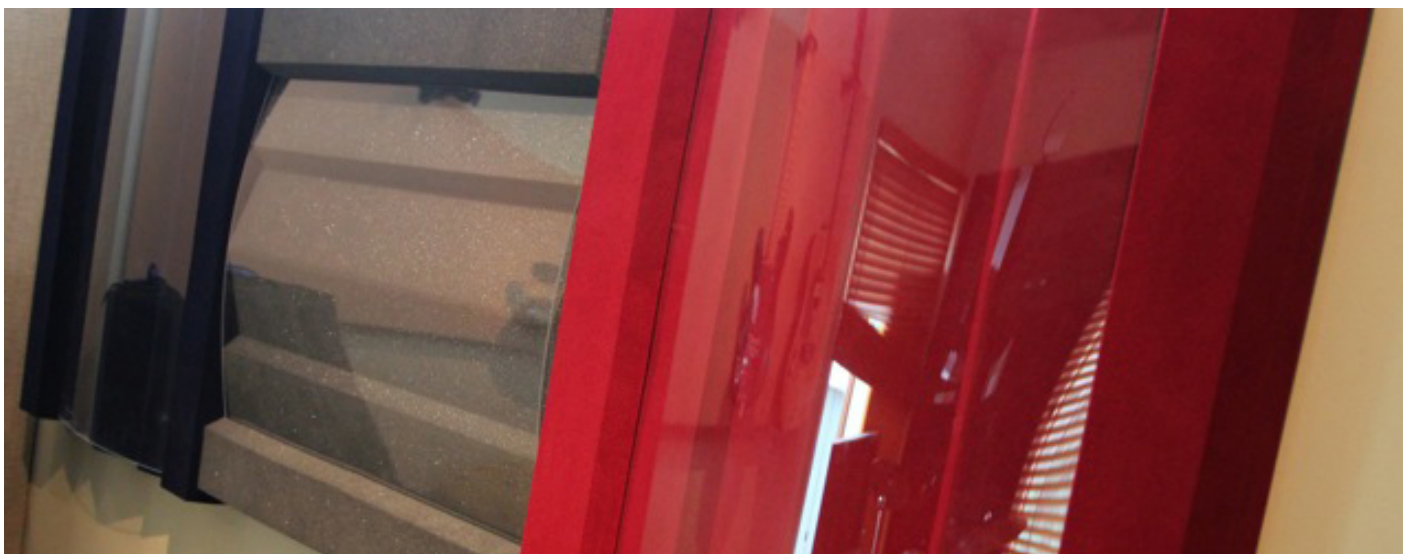
The clear diffuser provides the perfect opportunity for customization. For that extra splash of colour, insert a sheet of coloured cardboard (or similar) behind the diffuser. Posters also look great mounted behind the polycarbonate insert. An inexpensive way to create your own look, or match your existing decor.

The standard colour is charcoal grey but panels can be flock coated (suede fibre type finish) in a range of custom colours at additional cost.

10 year warranty

SoundAcoustics products are manufactured in Melbourne, Australia from the highest quality combustion modified polyurethane foam and carry a ten year factory warranty. For more information see: www.soundacoustics.com.au

ph: 03 9410 9335 email: sales@soundacoustics.com.au



**REPORT ON THE DETERMINATION OF SOUND
ABSORPTION COEFFICIENTS OF SOUNDACOUSTICS HYBRID
ACOUSTIC PANELS WITH ACRYLIC DIFFUSER INSTALLED IN A
REVERBERATION ROOM.**

Testing Procedure: AS ISO 354 - 2006

Testing Laboratory: Applied Acoustics Laboratory
RMIT University, School of Applied Sciences
Melbourne, Victoria 3000, Australia
NATA Accreditation Number 1421

Client: SoundAcoustics

Northcote, Victoria 3070
Australia

Date of Test: 17th February 2009

Date of Report: 6th March 2009

Report Number: 1211/09-041/JW

Testing Officer: John Watson



John Watson
Approved NATA Signatory



This document issued in compliance with NATA's
accreditation requirements.
Accredited for compliance with ISO/IEC 17025

REPORT ON THE DETERMINATION OF SOUND ABSORPTION COEFFICIENTS OF SOUNDACOUSTICS HYBRID ACOUSTIC PANELS WITH ACRYLIC DIFFUSER INSTALLED IN A REVERBERATION ROOM.

1. INTRODUCTION

The tests described in this report were carried out at the request of the SoundAcoustics to determine the sound absorption coefficients of a sample of Sound Acoustics Hybrid Acoustic Panels with acrylic diffuser installed.

The tests were carried out using the reverberation room of the Applied Physics Discipline, The Royal Melbourne Institute of Technology Limited.

Testing has been carried out in accordance with AS ISO 354–2006 “Acoustics: Measurement of sound absorption in a reverberation room”. At the request of the client the weighted sound absorption coefficient α_w has been determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption”.

The equipment used to perform these tests has been calibrated at an accredited laboratory and is in current calibration.

2. TEST FACILITIES AND PROCEDURES

2.1 Facilities The reverberation room is of pentagonal plan with the ceiling inclined with respect to the floor. No two room dimensions are equal or in the ratio of small whole numbers. The volume of the room is 200.0 cubic metres. A sufficiently diffuse sound field is established by the inclusion of 17 stationary diffusing boards of panelboard, each of one-sided area approximately one square metre and suspended with random orientation. The total two-sided area of the diffusing elements is 0.16 of the total boundary surface area of the room. Previous tests carried out in the room have established that diffusivity of the room sound field is acceptable.

The total surface area of the room boundaries and diffusing elements is 235.6 square metres.

2.2 Generation of sound field The test signals is random noise, band limited to a frequency range of 40Hz to 6300Hz. Three individual loudspeaker positions are used to excite the sound field in the reverberation chamber. The signal is fed to each loudspeaker in turn.

2.3 Receipt of signals Four microphones each mounted in statistically independent locations in the reverberation room are used to measure the sound field decays in the room. Ten sound decays are obtained at each of the twelve loudspeaker/microphone combinations, thus representing 120 decays for each frequency band.

The microphone signal is relayed via a microphone amplifier, to a Bruel & Kjaer 3560 Pulse Multi Analyser System. The Pulse analyser is interfaced to a personal computer. A program running on the personal computer allows the determination of the reverberation time from the sound decays in accordance with the standard. The measuring equipment has been calibrated by an external laboratory, and is in current calibration.

Figure 3: Sound Acoustics Hybrid Acoustic Panels with acrylic diffuser installed in the reverberation chamber.



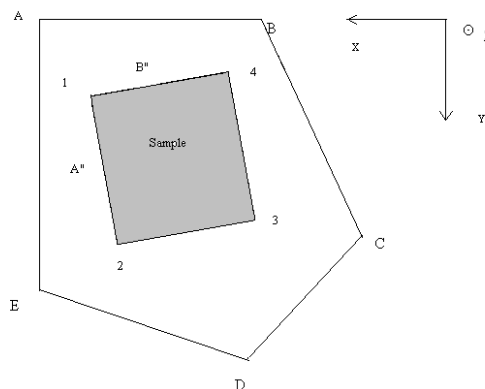
LOCATION OF SAMPLE IN THE REVERBERATION ROOM

Reverberation Chamber (Not to scale):

X and Y co-ordinates of the sample location in the Reverberation Room

Corner Ref. Number	X co-ordinate (metres)	Y co-ordinate (metres)
1	-1.01	1.42
2	-1.45	5.60
3	-3.84	5.35
4	-3.40	1.17

Descriptor	Diagram Reference	Length (m)
Sample Length 1 to 2	Diagram Ref. A''	4.205
Sample Length 1 to 4	Diagram Ref. B''	2.400



4. RESULTS

The mean reverberation times at each frequency for the empty room, $T60_e$, the room with the sample installed, $T60_{e+s}$, the sound absorption coefficient and the 95% confidence interval are provided in Table 1. The results are rounded to 0.01. The 95% confidence interval for each frequency is determined from the standard deviation of the reverberation times of the empty room and the room with the sample. The k factor used to determine the 95% Confidence interval is 2.201.

The results for the sample are detailed in Table 1 and Graph 1 of this report.

Test conditions:

Room Empty Air temperature 23.0°C,
 Relative Humidity 47%
 Barometric Pressure 0.7638 metre of mercury.

Room with Sample Air temperature 23.2°C,
 Relative Humidity 49%
 Barometric Pressure 0.7639 metres of mercury

Table 1: Reverberation times and Sound Absorption Coefficients of Sound Acoustics Hybrid Acoustic Panels with acrylic diffuser installed.

Octave Centre Frequency Bands, Hz	Average RT's for empty room. $T60_e$	Average RT's for room. with sample $T60_{e+s}$	Sound Absorption Coefficient α_s	95% Confidence Interval for α_s
100	7.238	4.235	0.31	0.06
125	6.355	4.063	0.28	0.05
160	8.571	2.904	0.72	0.06
200	8.841	2.914	0.73	0.07
250	8.778	2.333	1.00	0.08
315	7.864	2.197	1.04	0.04
400	7.054	2.141	1.03	0.05
500	6.488	2.177	0.97	0.04
630	6.341	2.323	0.87	0.05
800	6.032	2.497	0.74	0.03
1000	5.461	2.659	0.61	0.02
1250	5.054	2.708	0.54	0.02
1600	4.415	2.581	0.51	0.02
2000	3.887	2.379	0.52	0.02
2500	3.448	2.179	0.54	0.02
3150	2.933	1.962	0.55	0.02
4000	2.364	1.717	0.52	0.02
5000	1.951	1.494	0.53	0.03

The weighted sound absorption coefficient α_w of the sample determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption” is:

$$\alpha_w = 0.60(LM)$$

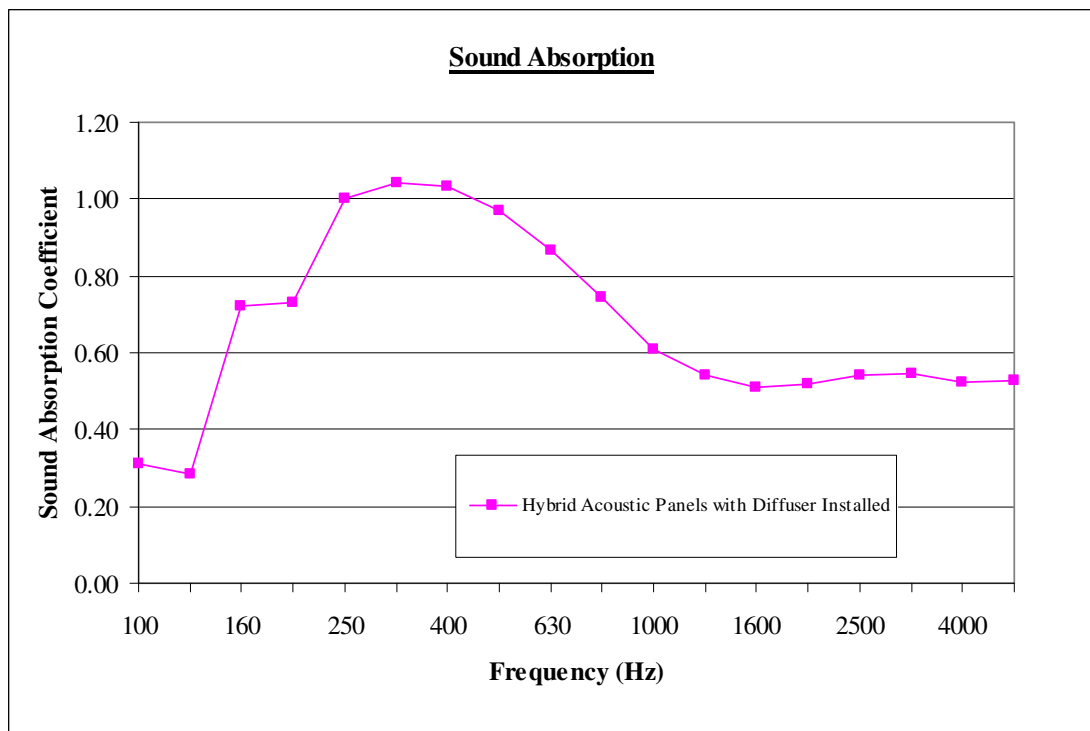
The Practical Sound Absorption Coefficients are detailed below in Table 2. These values have been determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption”.

Table 2: Practical Sound Absorption Coefficients for the Sample

Frequency (Hz)	125	250	500	1000	2000	4000
Practical Sound Absorption Coefficient, α_p	0.45	0.90	0.95	0.65	0.50	0.55

NRC of the sample calculated in accordance with ASTM C423-90A is: 0.75

Graph 1: Sound Absorption Coefficients of Sound Acoustics Hybrid Acoustic Panels with acrylic diffuser installed.



**REPORT ON THE DETERMINATION OF SOUND
ABSORPTION COEFFICIENTS OF SOUNDACOUSTICS HYBRID
ACOUSTIC PANELS WITH ACRYLIC DIFFUSER REMOVED IN A
REVERBERATION ROOM.**

Testing Procedure: AS ISO 354 - 2006

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NATA Accreditation Number 1421

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REPORT ON THE DETERMINATION OF SOUND ABSORPTION COEFFICIENTS OF SOUNDACOUSTICS HYBRID ACOUSTIC PANELS WITH ACRYLIC DIFFUSER REMOVED IN A REVERBERATION ROOM.

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Figure 3: Sound Acoustics Hybrid Acoustic Panels with acrylic diffuser removed in the reverberation chamber.



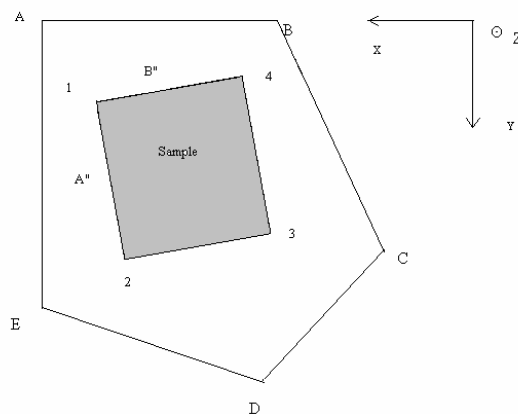
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125	6.355	4.573	0.19	0.04
160	8.571	4.447	0.34	0.04
200	8.841	4.518	0.34	0.05
250	8.778	3.490	0.55	0.03
315	7.864	2.844	0.71	0.05
400	7.054	2.411	0.87	0.04
500	6.488	2.183	0.96	0.05
630	6.341	2.130	0.99	0.04
800	6.032	2.190	0.92	0.03
1000	5.461	2.150	0.89	0.04
1250	5.054	2.064	0.91	0.03
1600	4.415	1.922	0.93	0.03
2000	3.887	1.782	0.97	0.03
2500	3.448	1.655	1.00	0.02
3150	2.933	1.512	1.02	0.03
4000	2.364	1.367	0.99	0.03
5000	1.951	1.223	0.99	0.04

The weighted sound absorption coefficient α_w of the sample determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption” is:

$$\alpha_w = 0.85(H)$$

The Practical Sound Absorption Coefficients are detailed below in Table 2. These values have been determined in accordance with AS ISO 11654-1997 “Acoustics: Sound Absorbers for Use in Buildings - Rating of sound absorption”.

Table 2: Practical Sound Absorption Coefficients for the Sample

Frequency (Hz)	125	250	500	1000	2000	4000
Practical Sound Absorption Coefficient, α_p	0.25	0.55	0.95	0.90	0.95	1.00

NRC of the sample calculated in accordance with ASTM C423-90A is: 0.85

Graph 1: Sound Absorption Coefficients of Sound Acoustics Hybrid Acoustic Panels with acrylic diffuser removed.

