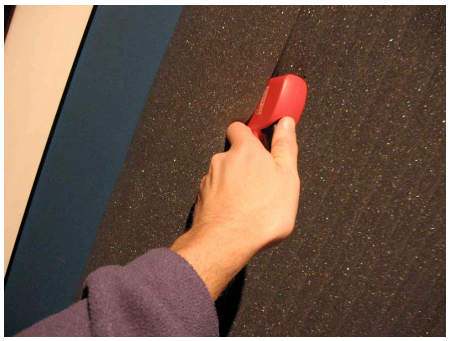
SoundAcoustics SA600/75

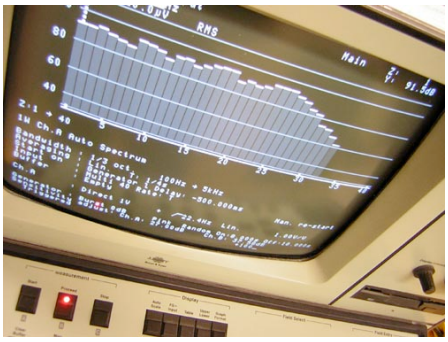
Application: Control broad frequency reverb and reflection

Frequency Characteristics: 200Hz - 20Khz

Installation: Staple gun or adhesive

Dimensions: 600 x 600 x 75mm





The **SoundAcoustics SA600/75** acoustic panel is designed for installation in environments requiring broad frequency control of echo, reflection and reverberation.
The SoundAcoustics SA600/75 profile is 75 mm thick, consisting of rows of anechoic valleys, designed to absorb from 200Hz to 20 Khz. The ability of acoustic foam to absorb lower frequencies is directly related to the thickness of the foam panel. Acoustic treatments, particularly in areas where music is played, should ideally have the ability to absorb over a wide frequency spectrum. Thin acoustic panels (less than 50 mm) are not designed to absorb lower frequencies, typically offering little absorption below 500 Hz.
To put this into perspective, middle C on a piano is 256 Hz and the clear tone of a common “A” tuning fork is 440Hz. A room treated with thin acoustic panels can sound very ‘dead’ to the spoken word, but this is not an accurate indication of effective acoustic control. Amplified music will sound muddy and poorly defined due to uncontrolled lower frequency reverberation and resonance. The SA600/75 provides effective absorption over a broad frequency range.

The SoundAcoustics SA600/75 features the exclusive patented ‘Staple T’ channel for easy installation with a staple gun as an alternative to adhesive.
The “Staple T” staple gun channel design feature is unique to SoundAcoustic products, and allows simple and rapid installation in areas where it is not desirable to use adhesive. Any water based adhesive or adhesive stated safe for bonding polyurethane foam may also be used.
The robust design of the SA600/75 also allows it to be easily removed and relocated without any visible damage. The SA600/75 is manufactured from combustion modified (flame retardant) polyurethane foam. The standard colour is Charcoal grey. The panels can be flock coated in a range of colours at additional cost.

Testing and evaluation of the SA600/75 acoustic panel has taken place at the RMIT acoustic laboratory. All SoundAcoustics products are proudly manufactured in Australia.

RMIT UNIVERSITY

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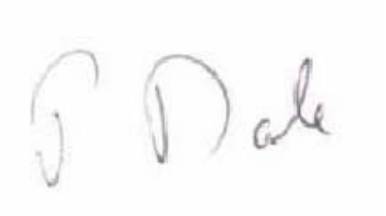
REPORT ON THE DETERMINATION OF SOUND ABSORPTION COEFFICIENTS OF SOUNDACOUSTICS SA600/75 ACOUSTIC TILES IN A REVERBERATION ROOM.

Testing Procedure:	AS ISO 354 - 2006
Testing Laboratory:	Applied Acoustics Laboratory RMIT University, Applied Physics Discipline Melbourne, Victoria 3000, Australia
Client:	SoundAcoustics. 12 Main Street Northcote, Victoria 3070 Australia
Date of Test:	3rd November 2006
Date of Report:	14th November 2006
Report Number:	121I/06-106/PD
Testing Officer:	Peter Dale



Peter Dale
Approved Signatory

REPORT ON THE DETERMINATION OF SOUND ABSORPTION COEFFICIENTS OF SOUNDACOUSTICS SA600/75 ACOUSTIC TILES IN A REVERBERATION ROOM.

1. INTRODUCTION

The tests described in this report were carried out on 3rd of November 2006 at the request of the SoundAcoustics to determine the sound absorption coefficients of SA600/75 acoustic tiles.

The tests were carried out using the reverberation room of the Applied Physics discipline, The RMIT University.

Testing has been carried out in accordance with AS ISO 354 - 2006,"Measurement of 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 11654-2002 "Acoustics-Rating of sound absorption-Materials and systems".

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 Analyzer System. The Pulse analyzer 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.

3. SAMPLE FOR TESTING

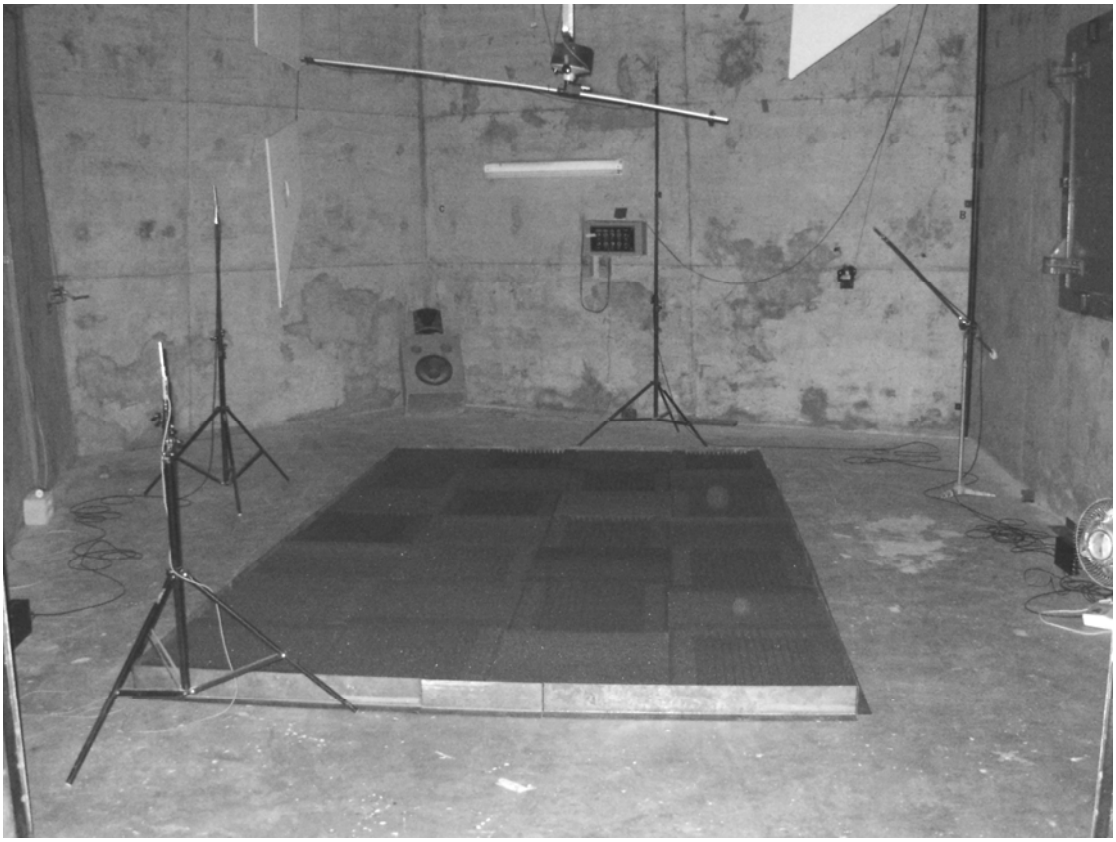
Tile Designation:	SoundAcoustics SA600/75
Material:	Polyurethane Foam
Surface Density:	28 kg/m3
Size of Tiles:	600mm X 600mm
Thickness of Tiles:	75mm (maximum)
	45mm (minimum)

Figure 1 details the profile of the acoustic tiles.

Figure 1

The tiles were mounted directly on the floor of the reverberation room. The sample tested comprised of 28 tiles laid out in a 4 x 7 array to give a total surface area of 10.08 square metres. The perimeter of the sample was contained by steel edges. Figure 2 shows the sample installed in the reverberation chamber.

Figure 1: Sample installed in the reverberation chamber.



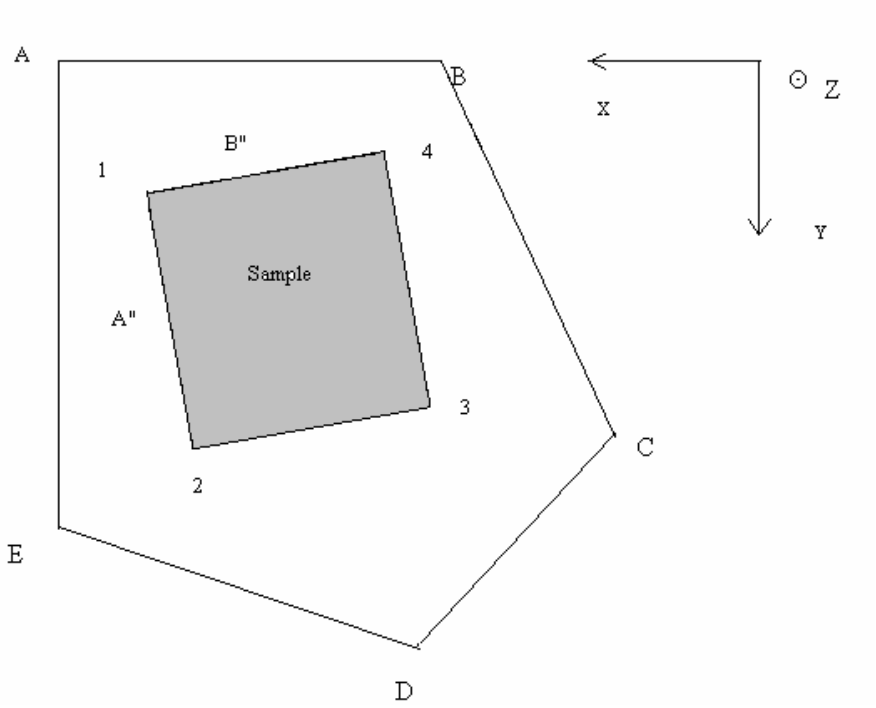
LOCATION OF SAMPLE IN THE REVERBERATION ROOM

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	-1.420	1.530
2	-1.320	5.729
3	-3.719	5.786
4	-3.819	1.587

Descriptor	Diagram Reference	Length (m)
Sample Length 1 to 2	Diagram Ref. A”	4.200
Sample Length 1 to 4	Diagram Ref. B”	2.400



5 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 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 2.21.

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

Test conditions:

Room Empty	Air temperature	20.8^{O}C,
	Relative Humidity	49%
	Barometric Pressure	0.7636 metre of mercury.
Room with Sample	Air temperature	20.8^{O}C,
	Relative Humidity	49%
	Barometric Pressure	0.7636 metres of mercury

Table 1: Reverberation times and Sound Absorption Coefficients of SoundAcoustics SA600/75 Acoustic Tiles.

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	8.439	4.714	0.30	0.04
125	7.121	4.307	0.29	0.04
160	8.690	4.548	0.33	0.03
200	9.130	4.460	0.37	0.03
250	9.495	3.565	0.56	0.02
315	8.272	2.760	0.77	0.01
400	7.629	2.465	0.88	0.02
500	6.833	2.339	0.90	0.02
630	6.628	2.286	0.91	0.02
800	6.575	2.326	0.89	0.02
1000	5.933	2.235	0.89	0.01
1250	5.351	2.125	0.91	0.01
1600	4.730	1.992	0.93	0.01
2000	4.079	1.844	0.95	0.01
2500	3.579	1.701	0.99	0.01
3150	2.990	1.540	1.01	0.01
4000	2.434	1.393	0.98	0.01
5000	1.946	1.221	0.98	0.03

The weighted sound absorption coefficient α_w of the sample determined in accordance with AS ISO 11654-2002 “Acoustics-Rating of sound absorption-Materials and systems” 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 11654-2002 “Acoustics-Rating of sound absorption-Materials and systems”.

Table 2

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

Graph 1: Sound Absorption Coefficients of SoundAcoustics SA600/75 Acoustic Tiles..