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National Acoustic Laboratories

Sorb/NA50 Mylar
Report ATF 509
Flat (Planar) Test Sample
Sound Absorption Test

Pyrotek

Testing Requirement

The National Acoustic Laboratories was commissioned by Pyrotek to measure the sound absorption coefficients of a test sample of 50mm thick Polyether Polyurethane foam with one face bonded to an 18.5µm thick film of metallised Polyester film.

The test sample was assembled from several pieces of different size 50mm thick Polyether Polyurethane foam placed edge to edge with their metallised film-faced surface uppermost to form a continuous 3200mm x 3200mm surface on the floor of one of the test facility reverberation rooms.

A timber framework was constructed around the test sample to ensure that only the top aluminised surface of the test sample was exposed to the sound field. There was no air gap between the underside of the test sample and the reverberation room floor.

The test sample was positioned at least two metres from sound sources and measurement microphone positions inside the room, and at least one metre from any other reflecting surface such as presented by acoustical diffuser baffles or wall surfaces (in accordance with the requirements of Australian Standard AS 1045*"Acoustics-measurement of sound absorption in a reverberation room"*).

Reverberation times at frequencies 100 Hz to 5000 Hz were obtained and acoustical absorption coefficients calculated by the methods and procedures of the Standard. The results were summarised and are presented in tabular form on page two of this report.

Noise Reduction Coefficient of the 18.5 micron thick metallised Polyether film faced 50mm thick Polyether Polyurethane foam test sample was determined to be NRC 0.85.

Date of Measurement: 13th February 1998

Signatory

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Peter Alway, Manager,
Acoustical Test Facilities
6th March 1998

Results

All readings taken during the measurement programme for this report were at least 10dB above the combined background noise level of the reverberation room and the electrical noise of the measurement system for each one-third octave band (Item 4.2.2 of AS1045).

A complete set of measurements and calculations for the determination of Absorption coefficients was calculated and is presented numerically on the appended spreadsheet (page 6). The acoustical absorption value at each one-third octave centre frequency was rounded to the nearest multiple of 0.05 as required by AS1045 and presented in the table below.

$^1/_3$ Octave Centre Frequency (Hz)	SORB/NA50 Test Sample Absorption Coefficients
100	0.25
125	0.35
160	0.55
200	0.75
250	0.75
315	0.60
400	0.70
500	0.75
630	0.80
800	0.85
1000	0.90
1250	0.90
1600	0.85
2000	0.90
2500	0.75
3150	0.85
4000	0.85
5000	0.70

Note 1. AS1045 requires averaging time to be ≤1/20 reverberation time of each one third octave band.

Note 2. Noise reduction coefficient of each measurement is determined as the arithmetic average of absorption coefficients at 250, 500, 1000 and 2000 in the table above (rounded to the nearest multiple of 0.05).

Note 3. Refer to the spreadsheet summaries (page 6) for deciBel precision at the 95% confidence level for each frequency. The uncertainties have been calculated on the basis of there being not more than five chances in one hundred that any value differs from the true value by more than the stated uncertainty.

Noise Reduction Coefficient of the 18.5 micron thick metallised Polyether film faced 50mm thick Polyether Polyurethane foam test sample was determined to be NRC 0.85.

Date of Measurement: 13th February 1998

Signatory

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Peter Alway, Manager,
Acoustical Test Facilities
6th March 1998

ATF Acoustic Absorption Test

Client Name: Pyrotek

ATF number - 509

r Test: 50mm polyether polyurethane open cell foam
density 29-32kg/cu m
faced with aluminised polyester film (18.5 µm)
SORB/NA5

Date of Test
13-Feb-98

Total Area Under Test (Sq m): 10.24
Temperature (C): 23
Receive Room Volume (Cu m): 200
Speed of Sound (m/s): 344.80

Reverb ation of Empty Room

(seconds, Rt60)

Band Centre Frequency	Position A1 1	A1 2	A1 3	A1 4	Position A2 1	A2 2	A2 3	A2 4	Position B1 1	B1 2	B1 3	B1 4	Position B2 1	B2 2	B2 3	B2 4	Position C1 1	C1 2	C1 3	C1 4	Position C2 1	C2 2	C2 3	C2 4	Average of (1,5,9,13,17,21)	Average of (2,6,10,14,18,22)	Average of (3,7,11,15,19,23)	Average of (4,8,12,16,20,24)	Average Reverb	Standard Deviation
100	7.98	8.79	8.61	9.53	8.35	10.20	6.81	9.00	10.00	10.20	11.00	9.66	9.00	10.10	[illegible]	9.23	9.26	11.20	9.67	10.50	7.71	7.70	6.45	6.73	8.72	9.70	8.60	9.11	9.03	0.50
125	8.60	9.75	10.70	9.06	9.13	9.30	8.79	9.77	11.10	10.60	11.60	9.48	10.40	9.30	[illegible]	10.20	12.40	12.70	9.81	12.90	11.10	10.00	11.00	8.50	10.46	10.28	10.29	9.99	10.25	0.20
160	11.60	12.40	11.80	12.80	11.60	11.70	11.80	11.70	12.90	11.50	10.20	11.30	11.40	11.20	[illegible]	12.90	12.00	11.80	12.90	12.00	11.20	10.80	12.40	11.70	11.78	11.57	11.65	12.07	11.77	0.22
200	12.30	11.90	12.50	11.90	11.90	11.20	12.50	11.40	12.20	13.10	12.00	13.10	12.40	13.10	[illegible]	12.80	13.00	11.40	12.20	11.70	11.30	11.50	11.00	11.30	12.18	12.03	11.95	12.03	12.05	0.10
250	11.70	11.90	11.10	11.40	11.10	10.90	10.80	10.70	10.40	11.60	10.80	10.90	11.80	10.50	[illegible]	11.40	11.60	11.70	12.40	11.70	12.20	13.10	11.20	12.20	11.47	11.62	11.30	11.38	11.44	0.14
[illegible]	10.90	11.20	12.10	11.90	10.80	10.60	10.90	11.00	12.80	11.50	11.30	11.20	11.10	10.80	[illegible]	10.30	10.70	10.60	10.40	11.00	12.10	10.30	10.90	9.93	11.40	10.83	11.17	10.89	11.07	0.26
	8.95	10.20	9.99	9.98	10.30	10.40	9.56	10.10	9.40	10.20	9.81	9.40	10.10	10.80	9.21	10.20	10.10	10.00	10.90	9.28	10.40	9.61	9.14	10.50	9.88	10.20	9.77	9.91	9.94	0.19
	8.84	8.53	8.65	8.26	8.97	9.93	9.42	9.32	8.31	8.74	8.77	8.42	8.86	9.53	[illegible]	8.87	9.51	9.16	8.87	9.26	8.86	7.68	7.68	8.39	8.89	8.93	8.62	8.75	8.80	0.14
	7.93	7.84	7.61	7.10	7.48	7.46	8.14	8.12	7.35	7.58	8.19	7.64	7.38	7.62	[illegible]	8.41	7.89	7.42	7.71	7.23	7.99	7.92	7.98	8.15	7.67	7.64	7.84	7.78	7.73	0.09
	6.45	7.02	7.27	7.09	6.85	6.87	6.88	6.57	6.48	6.94	6.63	6.78	6.35	6.83	6.69	7.12	6.87	6.84	6.37	6.43	6.61	6.79	6.35	6.60	6.60	6.88	6.70	6.77	6.74	0.12
	5.60	5.94	5.80	5.67	5.98	5.56	5.51	5.78	6.22	6.06	5.77	5.76	5.90	6.01	[illegible]	6.29	5.69	6.67	5.94	6.35	6.09	6.30	5.89	5.89	5.91	6.09	5.76	5.96	5.93	0.13
	4.85	4.92	5.17	5.03	5.24	4.94	5.03	5.13	5.00	4.94	4.98	5.06	5.09	5.05	[illegible]	4.78	4.93	5.12	5.08	5.04	4.69	4.79	4.92	4.83	4.97	4.96	5.08	4.98	5.00	0.06
1600	4.19	3.90	3.99	3.90	4.09	4.17	4.33	4.40	4.30	4.03	4.00	4.30	4.09	4.00	[illegible]	4.00	4.25	4.00	4.44	3.97	4.19	4.16	4.33	4.28	4.19	4.04	4.18	4.14	4.14	0.07
2000	3.88	3.90	3.75	3.81	3.88	3.53	3.78	3.63	3.82	3.87	4.02	3.50	3.85	3.91	3.70	3.61	3.95	3.90	3.81	3.50	3.73	3.68	3.88	3.80	3.85	3.80	3.83	3.64	3.78	0.10
2500	3.24	3.32	3.38	3.26	3.36	3.52	3.68	3.45	3.30	3.13	3.38	3.16	3.06	3.23	[illegible]	3.21	3.39	3.38	3.30	3.36	3.29	3.32	3.36	3.19	3.27	3.32	3.37	3.27	3.31	0.05
3150	3.01	2.91	2.85	2.95	2.79	3.05	3.08	2.93	2.93	2.94	3.08	2.87	2.90	3.02	[illegible]	2.87	2.70	3.02	3.01	2.80	3.25	2.96	2.92	2.99	2.93	2.98	3.01	2.90	2.96	0.05
4000	2.65	2.44	2.46	2.64	2.41	2.37	2.57	2.41	2.55	2.45	2.66	2.62	2.58	2.44	2.54	2.58	2.58	2.59	2.61	2.66	2.46	2.45	2.45	2.45	2.54	2.46	2.55	2.56	2.53	0.05
5000	2.23	2.19	2.08	2.20	2.14	2.06	2.11	2.17	2.24	2.14	2.20	2.27	2.27	2.16	[illegible]	2.15	2.31	2.16	2.13	2.19	2.13	2.24	2.29	2.15	2.22	2.16	2.19	2.19	2.19	0.03

Reverberation with Sample in Room

(seconds, Rt60)

Band Centre Frequency	Position A1 1	A1 2	A1 3	A1 4	Position A2 1	A2 2	A2 3	A2 4	Position B1 1	B1 2	B1 3	B1 4	Position B2 1	B2 2	B2 3	B2 4	Position C1 1	C1 2	C1 3	C1 4	Position C2 1	C2 2	C2 3	C2 4	Average of (1,5,9,13,17,21)	Average of (2,6,10,14,18,22)	Average of (3,7,11,15,19,23)	Average of (4,8,12,16,20,24)	Average Reverb	Standard Deviation
100	4.97	5.34	5.34	4.92	4.41	4.97	5.71	6.16	5.85	6.15	5.82	4.90	6.05	6.15	5.94	5.98	5.73	5.76	3.99	4.28	5.21	5.31	4.40	4.79	5.37	5.61	5.20	5.17	5.34	0.20
125	4.84	4.76	4.79	4.92	6.31	5.70	5.29	5.53	4.91	4.07	4.44	4.54	4.67	4.76	[illegible]	4.96	4.03	4.67	4.59	4.87	4.98	4.72	5.21	4.33	4.96	4.78	4.84	4.86	4.86	0.07
160	3.69	3.85	3.52	4.43	3.83	3.78	3.97	4.00	3.79	3.58	3.82	3.96	4.25	3.77	[illegible]	3.30	3.16	3.95	3.14	3.54	4.06	3.94	3.65	3.68	3.80	3.81	3.72	3.82	3.79	0.05
200	3.15	3.74	3.40	2.76	3.56	2.95	3.17	3.27	2.41	2.97	3.34	3.16	3.19	3.06	[illegible]	3.33	3.15	3.38	3.05	2.82	3.39	2.65	3.06	3.54	3.14	3.13	3.21	3.15	3.15	0.03
250	3.32	2.92	2.55	2.54	3.26	3.33	3.34	3.05	2.92	3.22	2.54	2.86	2.81	3.74	[illegible]	3.29	3.10	3.23	3.03	3.31	3.18	3.48	2.80	2.86	3.10	3.32	2.91	2.99	3.08	0.18
315	3.60	3.07	3.23	3.21	3.83	3.64	3.49	3.65	3.83	3.76	2.56	3.17	3.32	3.30	[illegible]	2.81	3.62	3.92	3.27	3.73	3.89	3.59	3.90	3.91	3.68	3.55	3.24	3.41	3.47	0.19
400	3.28	3.52	3.00	2.91	3.42	2.76	3.24	3.13	3.69	3.01	2.80	3.46	3.06	3.11	[illegible]	2.41	3.16	2.98	3.21	3.10	2.87	2.69	2.92	3.32	3.25	3.01	3.05	3.06	3.09	0.11
500	2.59	2.88	3.05	2.82	2.59	2.55	2.82	2.74	3.01	2.82	2.69	2.53	3.11	2.75	3.07	2.89	2.79	2.54	2.62	2.98	2.66	2.71	2.86	3.06	2.79	2.71	2.85	2.84	2.80	0.06
630	2.79	2.92	2.82	2.75	2.44	2.36	2.78	2.59	2.62	2.44	2.53	2.27	2.40	2.62	2.80	2.46	2.83	2.58	2.63	2.84	2.78	2.90	2.79	2.68	2.64	2.64	2.73	2.60	2.65	0.05
800	2.29	2.14	2.15	2.09	2.57	2.38	2.46	2.53	2.53	2.32	2.52	2.39	2.44	2.36	2.33	2.59	2.49	2.58	2.51	2.29	2.23	2.40	2.28	2.48	2.43	2.36	2.38	2.40	2.39	0.03
1000	2.38	2.26	2.33	2.13	2.19	1.92	2.16	2.16	2.33	2.47	2.40	2.16	2.31	2.25	2.12	2.39	2.03	2.17	2.16	2.06	2.12	2.18	2.04	2.06	2.23	2.21	2.20	2.16	2.20	0.03
1250	1.95	2.12	1.98	2.04	2.04	1.95	1.99	1.85	1.99	2.21	2.07	1.96	2.17	2.09	[illegible]	2.06	2.18	2.04	2.02	2.34	2.20	2.15	2.05	2.16	2.09	2.09	1.99	2.07	2.06	0.05
1600	1.92	1.82	1.94	2.08	2.05	1.88	2.05	1.88	2.03	1.80	1.96	1.81	2.14	1.95	[illegible]	2.04	1.81	1.92	1.82	1.89	1.98	2.03	1.91	2.11	1.99	1.90	1.95	1.97	1.95	0.04
2000	1.82	1.81	1.86	1.82	1.77	1.72	1.98	1.85	1.80	1.80	1.73	1.88	1.93	1.88	[illegible]	1.79	1.82	1.65	1.77	1.78	1.77	1.75	1.63	1.81	1.82	1.77	1.82	1.82	1.81	0.03
2500	1.88	1.97	1.90	1.89	1.81	1.74	1.84	1.89	1.76	1.58	1.76	1.83	1.87	1.88	[illegible]	1.76	1.87	1.80	1.64	1.74	1.90	1.96	1.92	1.82	1.85	1.82	1.82	1.82	1.83	0.01
3150	1.62	1.68	1.70	1.63	1.65	1.67	1.57	1.73	1.69	1.67	1.67	1.76	1.59	1.56	[illegible]	1.46	1.69	1.56	1.75	1.70	1.74	1.72	1.71	1.65	1.66	1.64	1.66	1.66	1.66	0.01
4000	1.56	1.51	1.54	1.56	1.45	1.43	1.52	1.50	1.53	1.44	1.47	1.51	1.39	1.48	[illegible]	1.59	1.49	1.50	1.53	1.54	1.61	1.51	1.49	1.54	1.51	1.48	1.50	1.54	1.51	0.03
5000	1.40	1.42	1.45	1.47	1.47	1.46	1.54	1.46	1.35	1.47	1.38	1.46	1.37	1.44	[illegible]	1.48	1.51	1.42	1.49	1.45	1.50	1.52	1.48	1.42	1.43	1.46	1.47	1.46	1.45	0.01

The NRC of this material is: 0.85

Results

Band Centre Frequency	Sound Absorption Coefficient	Precision 95% Confidence Level
100	0.24	0.04
125	0.34	0.02
160	0.56	0.02
200	0.73	0.02
250	0.74	0.09
315	0.62	0.07
400	0.70	0.05
500	0.76	0.04
630	0.78	0.04
800	0.85	0.02
1000	0.90	0.03
1250	0.89	0.05
1600	0.85	0.05
2000	0.91	0.05
2500	0.77	0.03
3150	0.83	0.03
4000	0.84	0.06
5000	0.72	0.04