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ACOUSTIC SYSTEMS
ACOUSTICAL RESEARCH FACILITY
OFFICIAL LABORATORY REPORT
AS-SA1448C

ACOUSTIC SYSTEMS
Acoustical Research Facility

Subject: Sound Absorption Test

Date: 18 May, 1999

Contents: Sound Absorption Data, 1/3-octave bands
Absorption Coefficients, 1/3-octave bands
Noise Reduction Coefficient

on

Echotouch
3# Density Natural Fiber Acoustic Board – Thickness 2"

for Rendered by Manufacturer and released to:
Technature Inc.
376 Queen Street East
Toronto, ON M5A 1T1

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National Institute of Standards and Technology

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INTRODUCTION

"The sound absorption coefficient is a property of the material composing the surface. It is ideally defined as the fraction of the randomly incident sound power absorbed by the surface." [ASTM C 423]

APPLICABLE STANDARDS

ASTM C 423 - 90a "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method".
ASTM E 795 - 93 "Standard Practices for Mounting Test Specimens during Sound Absorption Tests".

TEST SPECIMEN

The test specimen consisted of composition acoustic material whose overall dimensions were: 2438 mm in width by 2743 mm in length by 50.8 mm in depth *[96 x 108 x 2 inch]*. The test specimen was manufactured, submitted for test, and designated "3# Density Natural Fiber Acoustic Board - Thickness 2" by manufacturer for Technature Inc., 376 Queen Street East, Toronto, Ontario, Canada, M5A 1T1. The manufacturer provided the test specimen in four (4) equal pieces of the dimension 1219 mm by 2743 mm by 25.4 mm *[48 x 108 x 1 inch]*, each having a density of 48.1 kg/m^3 *[3 pounds per cubic foot]*. These individual pieces were arranged so as to arrive at the final overall specimen dimensions. At the request of the manufacturer, additional details of the material's composition are withheld from this report for the purposes of safeguarding proprietary control over this product. (These construction details remain as part of the controlled test file to fulfill test specimen documentation requirements.)

The weight of the test specimen was 16.6 kg *[36.5 pounds]*. The test specimen was tested in a Type A Mount in strict accordance with ASTM E 795 requirements.

DESCRIPTION OF TEST

The decay rate of sound [which is inversely related to sound absorption] is measured upon terminating a steady-state broadband pink noise signal in the 254 m^3 reverberation chamber. Five ensemble averages containing thirty-two decays each are measured with both the test specimen inside of and removed from the chamber. The difference between these sound absorptions at a given frequency is defined as the sound absorption of the specimen. The Sound Absorption Coefficient is the Sound Absorption per unit area of the test specimen. The Noise Reduction Coefficient (NRC) is a four-frequency average of the Sound Absorption Coefficient. A rotation microphone boom and a Norsonic Instruments NI-830 Dual Channel Real Time Analyzer, computer controlled using custom software, are used for all measurements. Measurements are made in the ISO-Preferred one-third octave bands from 100 Hz to 5000 Hz. The test was conducted in strict accordance with ASTM C 423 - 90a except where noted. This test took place at ACOUSTIC SYSTEMS ACOUSTICAL RESEARCH FACILITY, Austin, Texas, on 14 May, 1999.

SOUND ABSORPTION DATA

The measured Sound Absorption [in units of area] and Sound Absorption Coefficients of the test specimen at the preferred one-third octave band center frequencies are tabulated below and then presented graphically

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Frequency	Sound Absorption [m²]	Sound Absorption Coeff.	Notes
100	02 ± 1.0	0.02 ± 1.16	[a]
125	2.3 ± 0.7	0.35 ± 0.10	[a]
160	2.7 ± 0.5	0.40 ± 0.08	
200	4.2 ± 0.4	0.64 ± 0.06	
250	6.3 ± 0.3	0.94 ± 0.04	
315	6.9 ± 0.2	1.02 ± 0.03	
400	8.2 ± 0.2	1.22 ± 0.03	
500	8.8 ± 0.2	1.32 ± 0.03	
630	8.7 ± 0.2	1.29 ± 0.03	
800	8.4 ± 0.2	1.26 ± 0.03	
1000	8.2 ± 0.2	1.22 ± 0.03	
1250	7.6 ± 0.2	1.13 ± 0.03	
1600	7.4 ± 0.2	1.10 ± 0.03	
2000	7.1 ± 0.2	1.06 ± 0.03	
2500	6.7 ± 0.2	1.01 ± 0.03	
3150	6.8 ± 0.2	1.01 ± 0.03	
4000	6.9 ± 0.2	1.03 ± 0.03	
5000	6.8 ± 0.2	1.02 ± 0.03	

Noise Reduction Coefficient = 1.15

[a] denotes empty room absorption was greater than 0.06 as required by ASTM C423. Round robin testing with other laboratories indicate results are nevertheless reliable at 125 Hz. [b] denotes that a significant effect due to changes in test chamber temperature and humidity was noted. Actual results in these bands are typically not greater than 1.00. [c] due to the very low absorption of the specimen tested, actual absorption values cannot be determined within the reverberation time uncertainties of the chamber itself. The result for this hand should be considered inconclusive.

During the test, environmental conditions in the reverberation chamber were 25.7C and 77.6% relative humidity. The precision values [±] tabulated above represent 95% probability that the true mean value lies within the stated range.

Respectfully Submitted,

Michael C. Black
Laboratory Technical Director

EchoTouch
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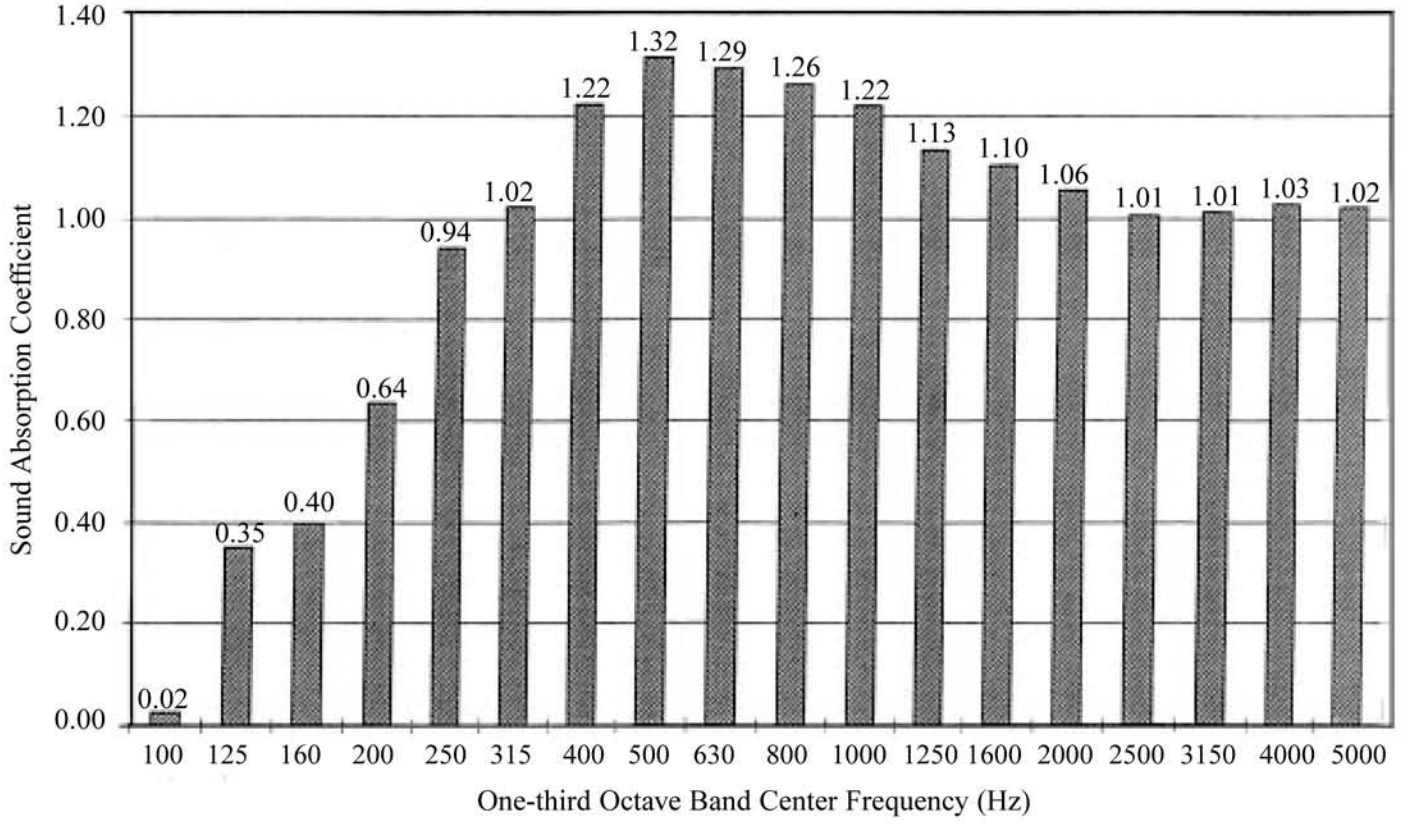
AS-SA1448C; NRC 1.15



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