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## ACOUSTIC TEST RESULTS

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**½" THICK SOFTWALLS SYSTEM  
WITH  
6# DENSITY FIBERGLASS  
&  
GUILFORD OF MAINE FR701 FABRIC**

**0.50 NRC RATING**

# Johns Manville Technical Center Acoustical Laboratory

Contract Report 500-2361 (A2003-081-7)  
June 23, 2003

**Subject:**

**Random Incidence Sound  
Absorption of Acoustic Board  
with Fabric**

**For:**

**SoftWalls, Inc.  
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**Submitted by:**

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## INTRODUCTION

A series of measurements were made on April 1, 2003 at the Johns Manville Technical Center (JMTC) Acoustical Laboratory to determine the random incidence sound absorption of Acoustic Board with fabric, provided by SoftWalls, Inc. Measurements were made in full accordance with the requirements of current ASTM standard test method C 423-99a.

## TEST SPECIMEN

The specimen submitted for testing was delivered on March 24, 2003 and is described by the supplier as follows:

A2003-081-7: SoftWalls, Inc. 0.5 in. thick, 6.0 pcf Acoustic Board; fiberglass board with Guilford of Maine FR701 fabric and the SoftWalls, Inc. Stretch Fabric Track System. Measured thickness = 13.5 mm [0.53 in.]. Measured weight = 14.14 kg [31.18 lbs.]. Area = 6.86 m<sup>2</sup> [73.80 ft<sup>2</sup>]. Area density = 2.06 kg/m<sup>2</sup> [0.42 lbs/ft<sup>2</sup>]. Bulk density = 153.21 kg/m<sup>3</sup> [9.56 lbs/ft<sup>3</sup>].

The Acoustic Board was provided as two 1.22 m x 2.74 m [4.00 ft. x 9.00 ft.] nominal sections. The track was modified by SoftWalls, Inc. on sight to fit the perimeter of each 1.22 m x 2.74 m [4.00 ft. x 9.00 ft.] Acoustic Board section. The fabric was cut and placed on top of each Acoustic Board section and secured in each section's corresponding tracking system.

## TEST METHOD

The tests were conducted in full accordance with the American Society of Testing and Materials (ASTM) method C 423-99a, "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method".

### C 423-99a:

The specimen was tested in a type A mounting, as defined by ASTM Practice E 795-00. The specimen was secured directly to the reverberation room floor with its perimeter sealed with duct tape.

### Test Chamber

The JMTC reverberation room is constructed of 305 mm [12.0 in.] thick reinforced concrete surrounded by 203 mm [8.0 in.] thick solid concrete block walls. The block walls are spaced from the reinforced concrete walls a distance of 203 mm [8.0 in.]. The reverberation room has interior dimensions of 8.66 m [28.00 ft. 5.0 in.] long by 5.49 m [18.00 ft.] wide and 6.71



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m [22.00 ft.] high, for a total room volume of 319 m<sup>3</sup> [11,253 ft<sup>3</sup>].

### **Instrumentation**

All sound pressure levels were measured using a Brüel and Kjær 12.7 mm [0.5 in.] type 4165 condenser microphone operating on a Brüel and Kjær type 3923 rotating microphone boom. The microphone was calibrated immediately before all measurements were started using a Brüel and Kjær type 4220 pistonphone with output corrected for local barometric pressure.

The microphone was connected to a Norwegian Electronics type NE-830 digital frequency analyzer that was configured to average the microphone output over multiple sample/decay periods. The sound field decay was measured by taking 500 8-millisecond measurements. Each 8-millisecond period was linearly averaged. Measurements were made at the third-octave bands covering a center frequency range from 100 to 5,000 Hz. The rate of sound field decay was determined by making a regressive fit to the average of 15 ensembles of 5 decays each, by the method specified in C 423-99a, Section 11.

### **TEST RESULTS**

The detailed results of the tests, including third-octave band absorption data, the Sound Absorption Average (SAA), and Noise Reduction Coefficient (NRC) single number ratings, are presented in Table 1 and Graph 1. Test data sheets of the specimen's performance, as printed by the test equipment, are kept on record within the laboratory.



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**Table 1. Sound Absorption Performance of SoftWalls, Inc. 0.5 in. thick, 6.0 pcf Acoustic Board with Guilford of Maine FR701 Fabric and the SoftWalls, Inc. Stretch Fabric Track System**

Test Number: A2003-081-7

<b>Frequency (Hz)</b>	<b>Absorption Coefficient, <math>\alpha</math> (Sabins/m<sup>2</sup>)</b>
100	0.09
125	0.01
160	0.03
200	0.07
250	0.11
315	0.14
400	0.21
500	0.31
630	0.41
800	0.54
1000	0.66
1250	0.76
1600	0.85
2000	0.91
2500	0.96
3150	1.02
4000	1.04
5000	1.05
<b>SAA</b>	<b>0.49</b>
<b>NRC</b>	<b>0.50</b>

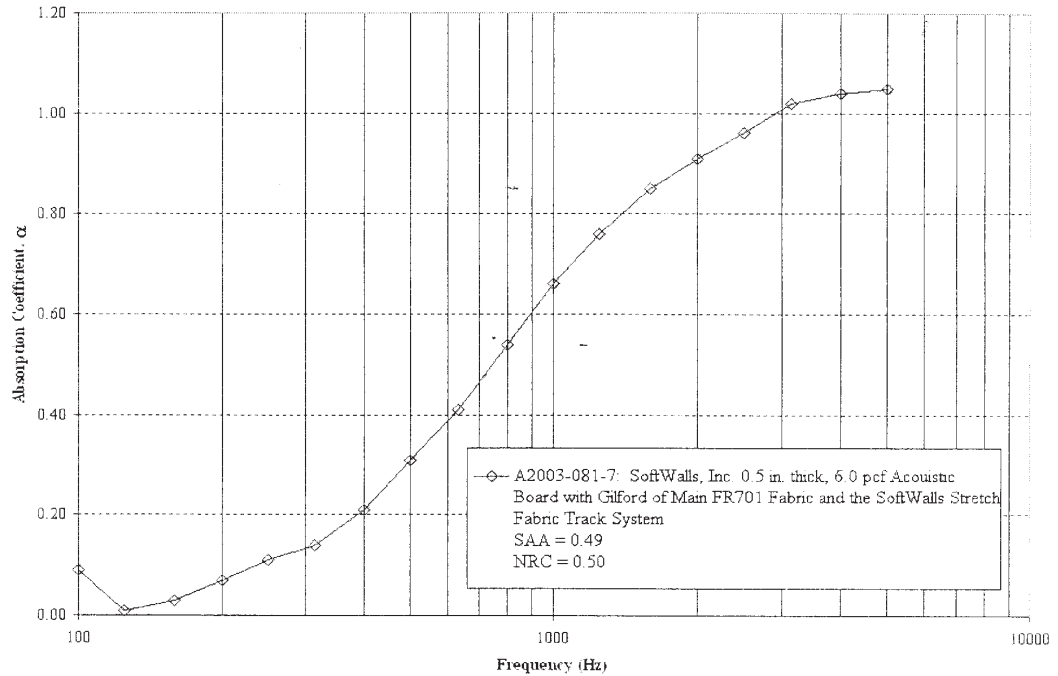
*Note on Single Number Ratings: The Sound Absorption Average (SAA) is calculated as the arithmetic average of the all absorption coefficients from 200 - 2500 Hz, inclusive. The Noise Reduction Coefficient (NRC) is calculated as the arithmetic average (rounded to the nearest 0.05) of the absorption coefficients in the shaded bands only (250, 500, 1000 & 2000 Hz).*



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**Graph 1. Sound Absorption Performance of SoftWalls, Inc. 0.5 in. thick, 6.0 pcf Acoustic Board with Guilford of Maine FR701 Fabric and the SoftWalls, Inc. Stretch Fabric Track System**



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