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# Johns Manville Technical Center Acoustical Laboratories

Contract Report 500-2155 (A2002-038)

March 11, 2002

Subject:

Random Incidence Sound Absorption of Whisper Walls' WhisperTak Tackboard Panel

For:

Whisper Walls 10957 East Bethany Drive Aurora, CO 80014

Submitted by:

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## INTRODUCTION

A series of measurements were made on February 28, 2002 at the Johns Manville Technical Center (JMTC) Acoustical Laboratories to determine the random incidence sound absorption of a WhisperTak tackboard panel, provided by Whisper Walls. Measurements were made in full accordance with the requirements of current ASTM standard test method C 423-99a.

## TEST SPECIMENS

The specimen submitted for testing was delivered on February 27, 2002 and is described by the supplier as follows:

Test Sample #3:

Whisper Walls WhisperTak tackboard panel consisting of 1 layer of Whisper Walls high impact, lightweight core with Z-clip mounting attachment, and covered with Whisper Walls Acoustitex 100% polyester fabric. Measured thickness = 25.4 mm [1.0 in.]. Measured weight = 14.33 kg [31.60 lbs.]. Measured area = 6.69 m² [72.00 ft²]. Area density = 2.14 kg/m² [0.44 lb/ft²]. Bulk density = 84.36 kg/m³ [5.27 lb/ft³].

The test sample was supplied as two 4 ft. x 9 ft. sections.

#### **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 795-93. The sample was placed directly on the reverberation room floor and secured in place with 1.0 in. square aluminum framing members.

#### Test Chamber

The JMTC reverberation room is constructed of 305 mm [12 in.] thick, reinforced concrete, surrounded by 203 mm [8 in.] thick solid concrete block walls that are spaced from the reinforced concrete walls a distance of 203 mm [8 in.]. The reverberation room has interior dimensions of 8.66 m [28 ft. 5 in.] in length by 5.49 m [18 ft.] in width with a height of 6.71 m [22 ft.], for a total volume of 319 m³ [11,253 ft³.].



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## 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, and a sound absorption graph, are presented on pages 4 and 5 this document. Test data sheets of the system'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 Whisper Walls Test Sample # 3

Test Number: A2002-038-1

Frequency	Absorption Coefficient,
(Hz)	α (Sabins/m²)
100	0.01
125	0.03
160	0.06
200	0.09
250	0.12
315	0.21
400	0.29
500	0:42
630	0.56
800	0.72
1000	0.84
1250	0.91
1600	0.95
2000	0.98
2500	0.99
3150	0.97
4000	0.95
5000	0.95
SAA	0.59
NRC	0.60

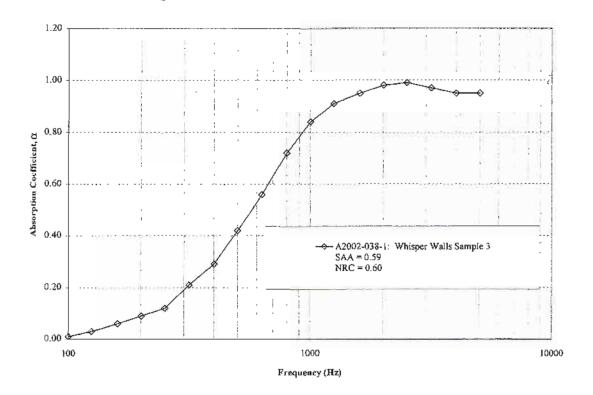
Note on Single Number Ratings: The Sound Absorption Average (SAA) is calculated as the arithmetic average of the all absorption coefficients from 200 - 2500 Hz, inclusive. The Noise Reduction Coefficient (NRC) is calculated as the arithmetic average (rounded to the nearest 0.05) of the absorption coefficients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



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Graph 1. Sound Absorption Performance of Whisper Walls Test Sample # 3





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