

Johns Manville Technical Center Acoustical Laboratories

Contract Report 500-2278 (A2002-225-2)

November 4, 2002

Subject:

**Random Incidence Sound
Absorption of
a Whisper Walls' Wall Panel**

For:

**Whisper Walls
10957 East Bethany Drive
Aurora, CO 80014**

Submitted by:

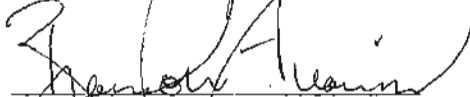
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INTRODUCTION

A series of measurements were made on November 1, 2002 at the Johns Manville Technical Center (JMTC) Acoustical Laboratories to determine the random incidence sound absorption of a Whisper Walls' wall panel. 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 October 18, 2002 and is described as follows:

A2002-225-2: Test Sample 1, Whisper Walls 1.5 in. square edge stretching system, 1 in. Acoustitherm 600 fiberglass core covered with Whisper Walls 100% polyester WhisperSpan wide span fabric, mounted on 0.5 in. gypsum board. Measured thickness = 57.2 mm [2.25 in.]. Measured weight = 79.38 kg [175.00 lbs.]. Measured area = 6.68 m² [71.92 ft²]. Area density = 11.88 kg/m² [2.43 lbs/ft²]. Bulk density = 207.89 kg/m³ [12.98 lbs/ft³].

The sample was provided as two 1.22 x 2.74 m [4.0 x 9.0 ft.] sections.

TEST METHOD

The test was 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. Sample 1 was placed directly on the JMTC reverberation room floor and secured with 2.0 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, are presented on page 4 of this document. A graph displaying the sound absorption results of the specimen is located on page 5. 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 Whisper Walls Sample 1

Test Number: A2002-225-2

Frequency (Hz)	Absorption Coefficient, α (Sabins/m ²)
100	0.06
125	0.11
160	0.15
200	0.24
250	0.38
315	0.57
400	0.70
500	0.85
630	0.90
800	0.97
1000	1.01
1250	1.02
1600	1.03
2000	1.04
2500	1.04
3150	1.06
4000	1.08
5000	1.12
SAA	0.81
NRC	0.80

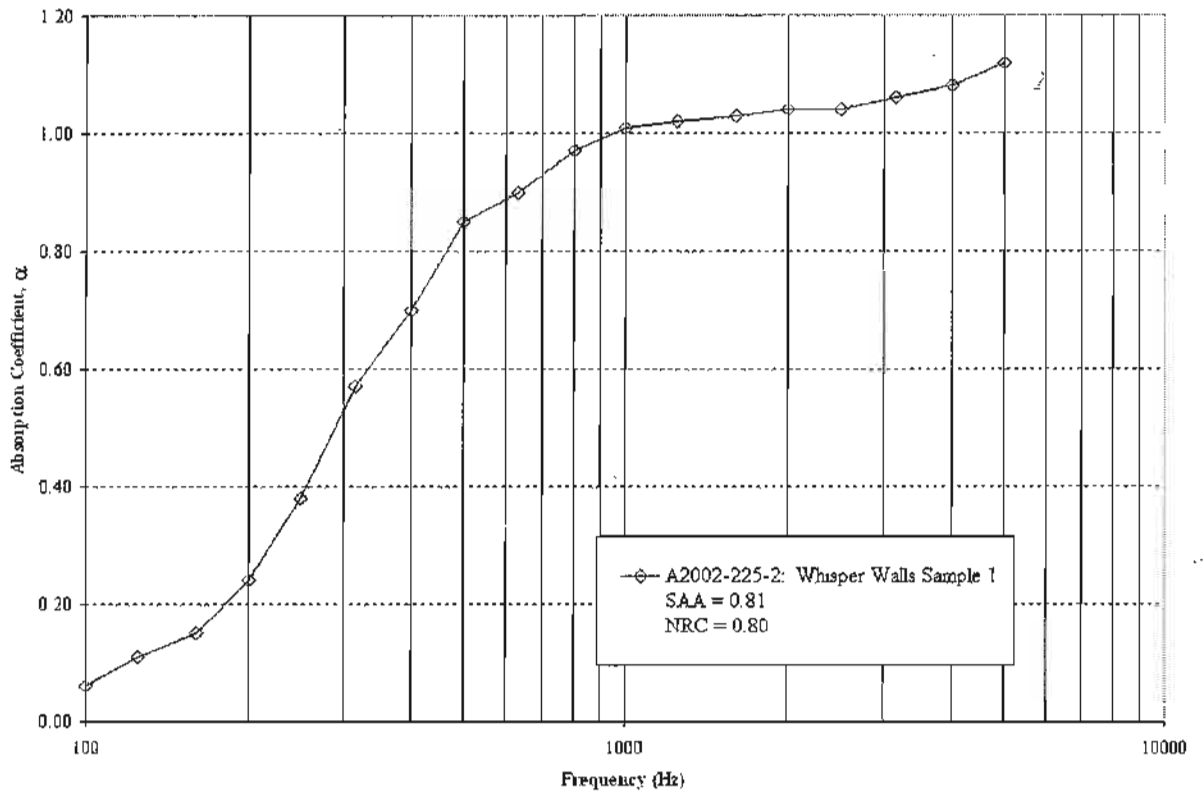
Note on Single Number Ratings: The Sound Absorption Average (SAA) is calculated as the arithmetic average of the all absorption coefficients from 200 - 2500 Hz, inclusive. The Noise Reduction Coefficient (NRC) is calculated as the arithmetic average (rounded to the nearest 0.05) of the absorption coefficients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



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Graph 1. Sound Absorption Performance of Whisper Walls Sample 1



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