



Johns Manville

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*Product Testing Laboratories
Test Report*

Report Number: A2021-054

Date: December 13, 2021

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**JOHNS MANVILLE TECHNICAL CENTER
Acoustics Laboratory**

Subject:

Random Incidence Sound Absorption of A-Mounted Kinetics 2-1/8" VersaTune Low Frequency Acoustical Panel

Test Method:

ASTM C423-17 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

For:



Kinetics Noise Control Inc.
6300 Irelan Place
Dublin, Ohio 43016

Submitted by:

Johns Manville Technical Center
10100 West Ute Avenue
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Reported by:

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TESTING
NVLAP LAB CODE 100425-0

**NATIONAL VOLUNTARY LABORATORY ACCREDITATION
PROGRAM FOR SELECTED TEST METHODS FOR ACOUSTICS.**

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Introduction

Measurements were conducted on May 11, 2021. The sample was received on January 19, 2021. Testing was completed at the Johns Manville Technical Center (JMTC) Acoustics Laboratory in order to determine the A-mounted random incidence sound absorption of Kinetics 2-1/8" VersaTune Low Frequency Acoustical Panel. All measurements were made in full accordance with the requirements of current ASTM standard test methods C423.

Sample Description

One set of three specimens were nominally 48 in. [1.22 m] wide, 72 in. [1.83 m] long, and 2.125 in. [54.0 mm] thick. The panels were made of 6 – 7 lb/ft³ [96 – 112 kg/m³] fiberglass board, topped with a 1/8 in. [6 mm] thick vinyl and high-density fiberglass laminated on top with a polyester fabric-wrapped face. Table 1 shows the measured parameters of the received samples.

Table 1: Description of Received Kinetics 2-1/8" VersaTune Low Frequency Acoustical Panel Samples

Mass	117. lb	53.1 kg
Area	72.02 ft ²	6.690 m ²
Thickness	2.125 in	54.0 mm
Area Density	1.63 lbs/ft ²	7.93 kg/m ²
Density	9.17 lbs/ft ³	147. kg/m ³

Test Method

These tests were conducted in full accordance with ASTM method C423-17, "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method."

C423-17

The specimens were tested using Type A-mounting, as defined by ASTM Practice E795. The specimens were placed directly onto the reverberation room floor in an approximate 6 ft. by 12 ft. [1.83 m by 3.66 m] rectangle; the edges were left exposed. Photos of the test specimens' mounting are shown in Appendix A.

Test Chambers

The JMTC reverberation room is constructed of 305 mm [12.00 in.] thick reinforced concrete surrounded by 203 mm [8.00 in.] thick solid concrete block walls, which are spaced from the reinforced concrete walls by a distance of 203 mm [8.00 in.]. The reverberation room has interior dimensions of 8.66 m [28 ft.-5 in.] in length by 5.49 m [18.00 ft.] in width with a height of 6.71 m [22.00 ft.], for a total volume of 319 m³ [11,253 ft³].



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Instrumentation

All sound pressure levels were measured using a 12.7 mm [0.5 in.] G.R.A.S. Type 40AD prepolarized random-incidence microphone operating on a Norsonic 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 National Instruments PXI-4461 digital frequency analyzer that was configured to average the microphone output over multiple sample/decay periods of broadband pink noise excitation. The sound field decay was measured by taking 500 8-millisecond measurements over 50 decays. Each 8-millisecond period was linearly averaged, and 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 the method specified in C423-09a. This method suggests using a regressive fit to find the decay rate, which is also adjusted for the decay rate due to air absorption for frequencies above 1,000 Hz.

Results

The atmospheric conditions at the time of C423 testing were a temperature of $23.9 \pm 0.1^\circ\text{C}$, a relative humidity of $62.6 \pm 0.5\%$ and an ambient pressure of 82.9 ± 0.1 kPa. The detailed results of the tests, including third-octave band absorption data, Sound Absorption Average (SAA), and Noise Reduction Coefficient (NRC) single number ratings are presented in Table 2 and graphically in Figure 1. The results of this test series are kept on record within the laboratory.



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Table 2: Random Incidence Sound Absorption Performance of A-Mounted Kinetics 2-1/8" VersaTune Low Frequency Acoustical Panel Sample

Frequency (Hz)	Absorption Coefficient, α
100	0.48
125	0.43
160	0.38
200	0.35
250	0.43
315	0.63
400	0.51
500	0.38
630	0.39
800	0.39
1000	0.34
1250	0.31
1600	0.29
2000	0.26
2500	0.24
3150	0.25
4000	0.26
5000	0.29
SAA	0.38
NRC	0.35

Note on Single Number Ratings: The Sound Absorption Average (SAA) is calculated as the arithmetic average of 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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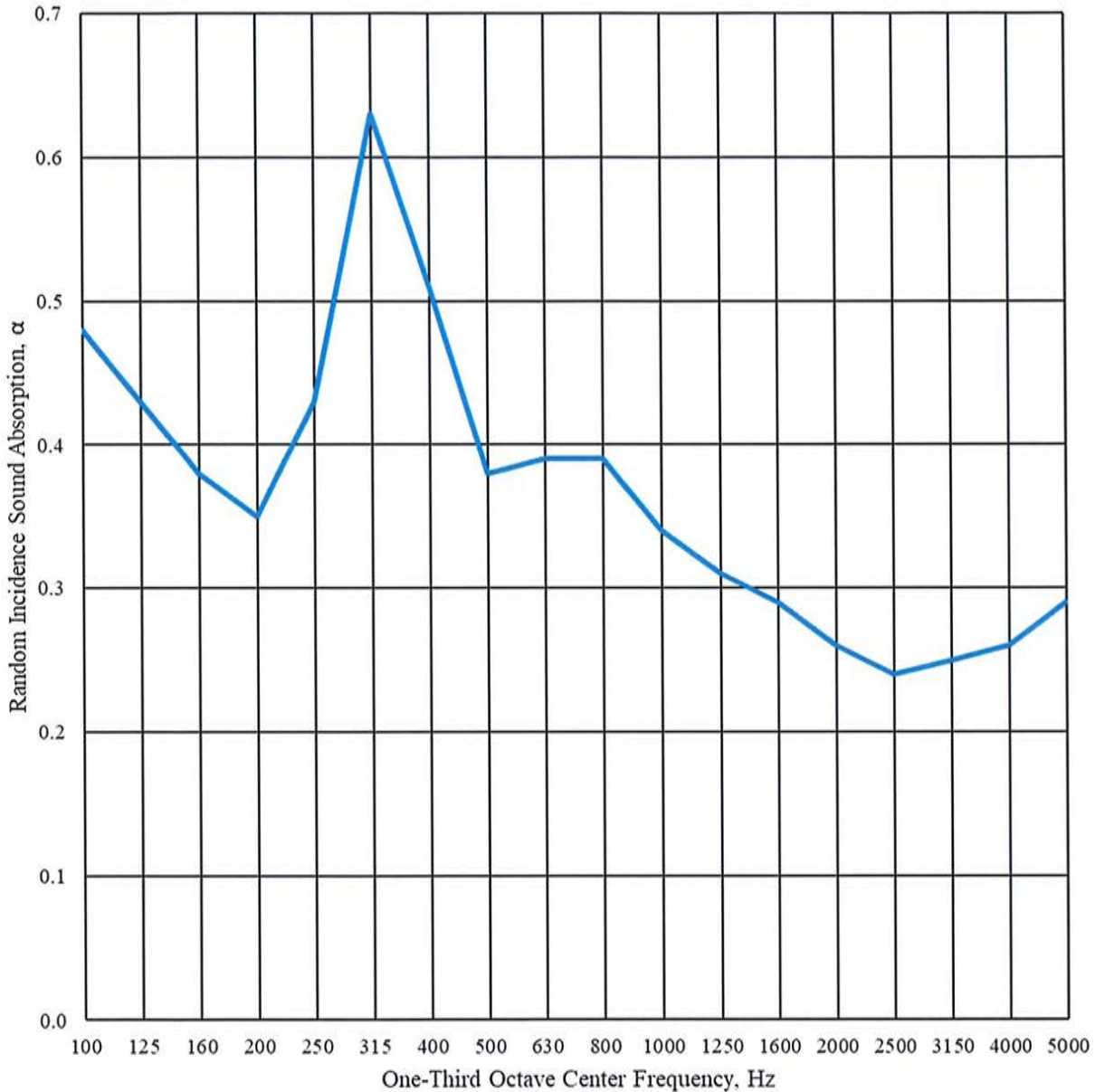


Figure 1. Plot of Random Incidence Sound Absorption Performance for A-Mounted Kinetics 2-1/8" VersaTune Low Frequency Acoustical Panel Sample



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Appendix A: Photos of Samples in Test Chamber

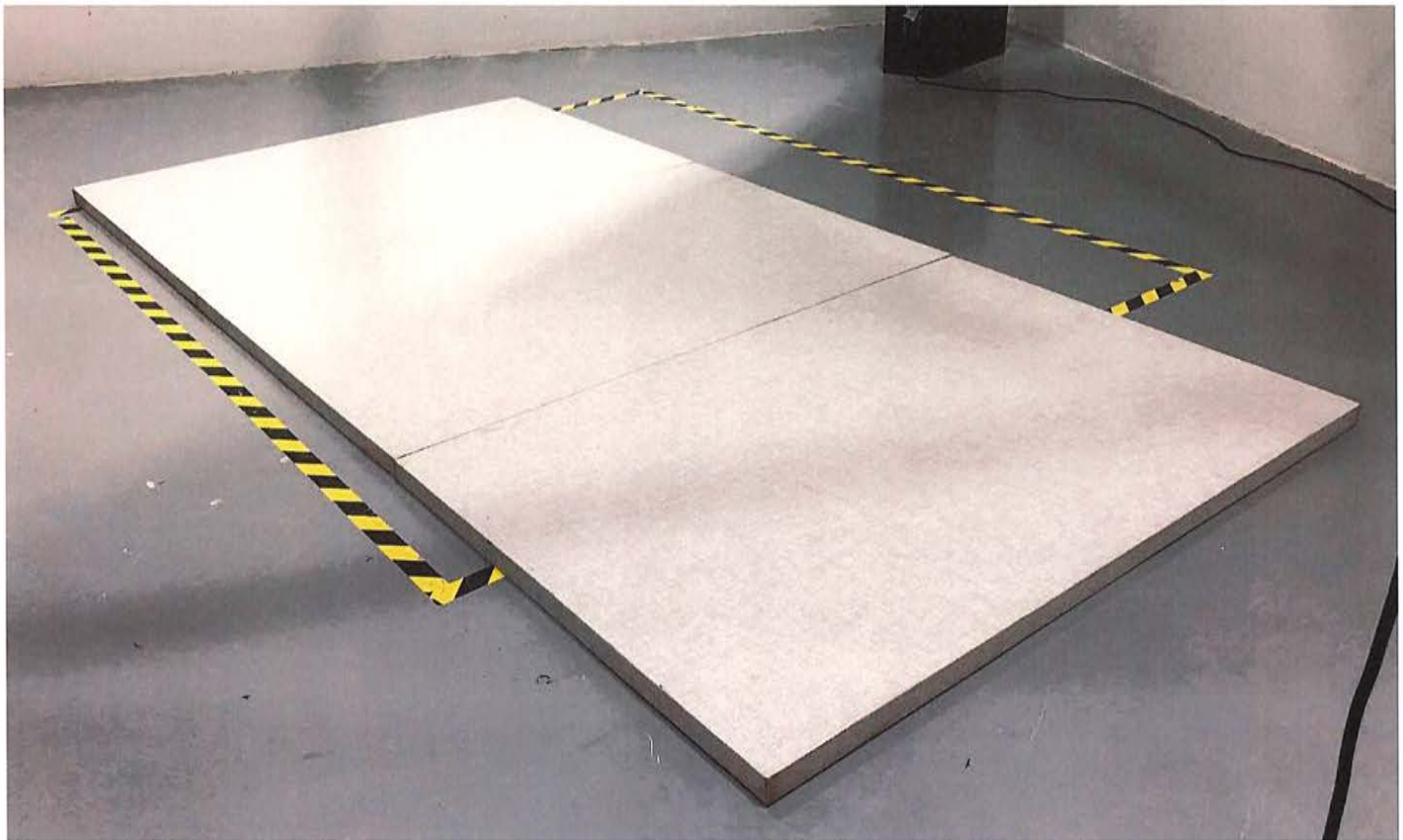


Figure A1: Kinetics 2-1/8" VersaTune Low Frequency Acoustical Panel sample laid on the floor.



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Kinetics Noise Control Inc.
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2022 March 29

Subject: A2021-054 ASTM C423 A-Mount Kinetics 2-1/8” VersaTune Low Frequency Acoustical Panel – Additional Frequency for Sound Absorption Coefficient Data Testing, Tested 2021-05-11 at Johns Manville Technical Center

As requested by the client, absorption coefficient values were calculated at additional test frequencies. Although the measurements were made in accordance with the procedures described in ASTM C423-17, they do not qualify as part of the standard. Since the results are representative of the test environment only, they are unofficial and intended for research and development guidelines rather than for commercial purposes. The absorption coefficient values at the additional frequencies were as follows:

One-Third Center Frequency, Hz	A2021-054, Kinetics 2-1/8” VersaTune Low Frequency Acoustical Panel A-Mount Random Incidence Sound Absorption, α
50	0.14
63	0.33
80	0.85
6,300	0.31
8,000	0.32
10,000	0.30

Reported by:

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