

TEST REPORT

SPONSOR: RIVERBANK ACOUSTICAL LABORATORIES | GENEVA, IL



PRODUCT NAME:

VENTED PRESSED PAPER PULP EGG CARTONS – COMPLETE, STAGGERED LAYOUT
(VENTS UP AND INVERTED)

TEST DATE:

MARCH 28, 2023

TEST METHOD:

ASTM C423-22

STANDARD TEST METHOD FOR SOUND ABSORPTION AND SOUND ABSORPTION
COEFFICIENTS BY THE REVERBERATION ROOM METHOD

RATING:

NRC= 0.80

1512 S BATAVIA AVENUE
GENEVA, IL 60134
630-232-0104

Test Report

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WALLACE CLEMENT SABINE

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Geneva, IL

Sound Absorption
RAL™-A23-070

CONDUCTED: 2023-03-28

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ON: Vented Pressed Paper Pulp Egg Cartons - Complete, Staggered Layout (Vents Up and Inverted)

TEST METHODOLOGY

Riverbank Acoustical Laboratories™ is accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) as an ISO 17025:2017 Laboratory (NVLAP Lab Code: 100227-0) and for this test procedure. The test reported in this document conformed explicitly with ASTM C423-22: "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method." The specimen mounting was performed according to ASTM E795-23: "Standard Practices for Mounting Test Specimens During Sound Absorption Tests." A description of the measurement procedure and room specifications are available upon request. The results presented in this report apply to the sample as received from the test sponsor.

INFORMATION PROVIDED BY SPONSOR

The test specimen was designated by the sponsor as Vented Pressed Paper Pulp Egg Cartons - Complete, Staggered Layout Vent Up and Inverted. The following nominal product information was provided by the sponsor prior to testing. The accuracy of such sponsor-provided information can affect the validity of the test results.

Product Under Test

Product Name: Vented Pressed Paper Pulp Egg Cartons
Materials: 100% Reclaimed paper
Nominal Dimensions: 12" long by 4.25" wide by 2.75" high

SPECIMEN MEASUREMENTS & TEST CONDITIONS

Through a full external visual inspection performed on the test specimen, Riverbank personnel verified the following information:

Test Specimen

Material: egg cartoons (12 egg capacity)
Dimensions: 216 cartons @ 103 mm (4.0625 in.) by 298 mm (11.75 in.)
Depth: 67.51 mm (2.658 in.)
Overall Weight: 12.59 kg (27.75 lbs)

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Overall Specimen Properties

Size: 2.49 m (98.0 in) wide by 2.69 m (106.0 in) long
Thickness: 0.07 m (2.658 in)
Weight: 12.59 kg (27.75 lbs)
Mass per Unit Area: 1.88 kg/m² (0.38 lbs/ft²)
Calculation Area: 6.702 m² (72.14 ft²)

Test Environment

Room Volume: 291.98 m³
Temperature: 19.9 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity: 58.65 % ± 3.7 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure: 99.8 kPa (Requirement not defined)

MOUNTING METHOD

Type A Mounting: The test specimen was laid directly against the test surface. The specimen egg cartons were closed, and placed in a staggered pattern alternating between right side up, and upside down. The perimeter edges were left exposed to replicate a typical field installation.

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Figure 1 – Specimen mounted in test chamber



Figure 2 – Individual specimen egg carton

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Figure 3 – Detail of specimen material

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Figure 4 – Detail of specimen staggered pattern

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TEST RESULTS

Specimen total absorption and absorption coefficient are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages.

1/3 Octave Center Frequency (Hz)	Total Absorption (m ²)	Total Absorption (Sabins)	Absorption Coefficient
100	0.50	5.37	0.07
** 125	0.67	7.22	0.10
160	1.00	10.80	0.15
200	1.95	20.98	0.29
** 250	3.00	32.28	0.45
315	6.25	67.23	0.93
400	6.64	71.52	0.99
** 500	7.82	84.23	1.17
630	7.77	83.62	1.16
800	7.45	80.19	1.11
** 1000	6.10	65.63	0.91
1250	5.15	55.41	0.77
1600	4.59	49.39	0.68
** 2000	4.66	50.12	0.69
2500	4.85	52.15	0.72
3150	5.47	58.85	0.82
** 4000	4.75	51.10	0.71
5000	4.38	47.16	0.65

SAA = 0.82
NRC = 0.80

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TEST RESULTS (continued)

The sound absorption average (SAA) is defined in ASTM C423-17 Section 3.1.1 as the arithmetic average of the sound absorption coefficients of a material for the twelve one-third octave bands from 200 Hz through 2500 Hz, inclusive, rounded to the nearest integer multiple of 0.01.

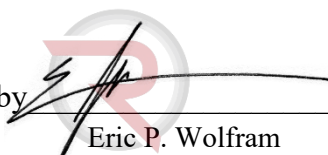
The noise reduction coefficient (NRC) is defined from previous versions of ASTM C423 as the arithmetic average of the sound absorption coefficients at 250 Hz, 500 Hz, 1000 Hz, and 2000 Hz, rounded to the nearest integer multiple of 0.05.

Tested by 

Marc Sciaky
Senior Experimentalist

Report by 

Keith Kimberling
Test Engineer

Approved by 

Eric P. Wolfram
Laboratory Manager

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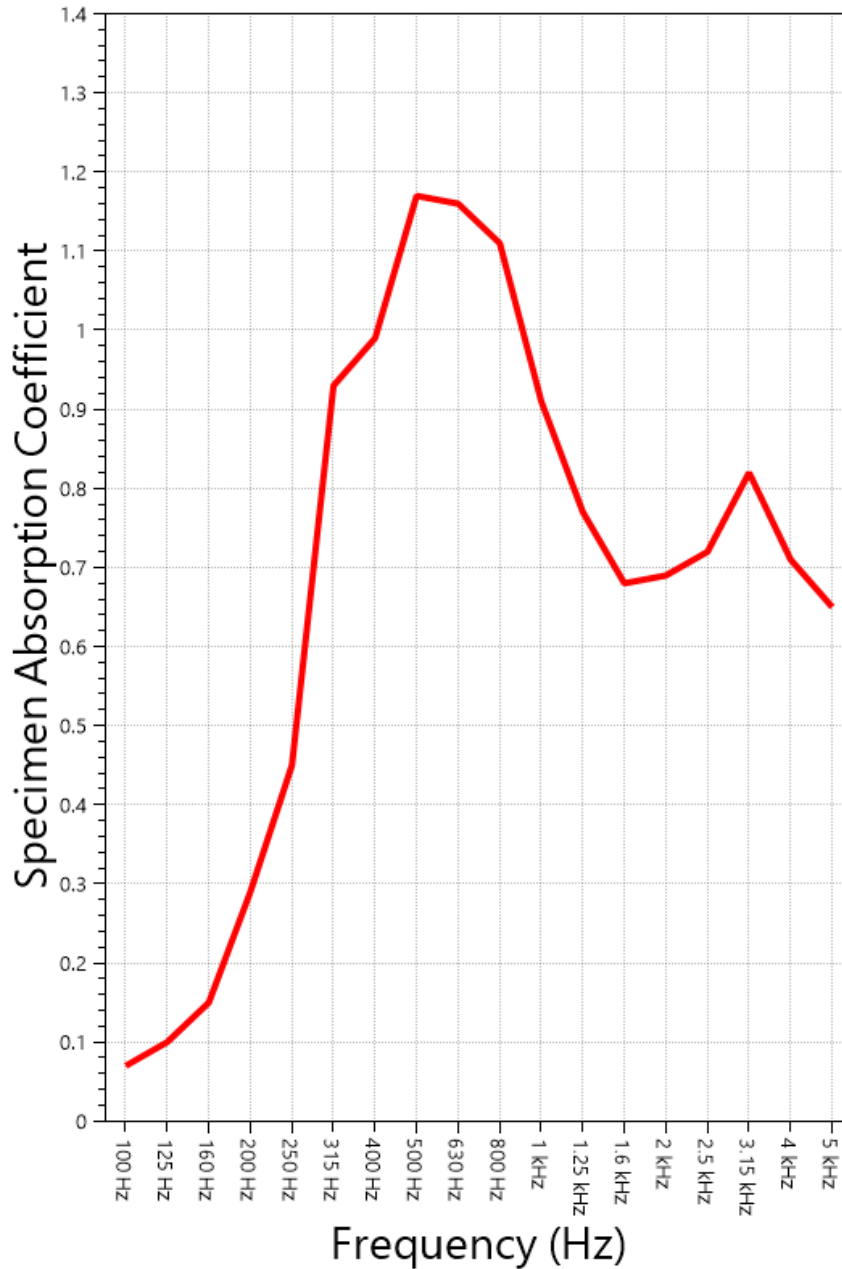
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SOUND ABSORPTION REPORT

Vented Pressed Paper Pulp Egg Cartons - Complete, Staggered Layout Vent Up and Inverted



SAA = 0.82
NRC = 0.80



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APPENDIX A: Extended Frequency Range Data

Specimen: Vented Pressed Paper Pulp Egg Cartons - Complete, Staggered Layout Vent Up and Inverted
 (See Full Report)

The following non-accredited data were obtained in accordance with ASTM C423-22, but extend beyond the defined frequency range of 100Hz to 5,000Hz. These unofficial results are representative of the RAL test environment only and intended for research & comparison purposes.

1/3 Octave Band Center Frequency (Hz)	Total Absorption (Sabins)	Absorption Coefficient
31.5	3.26	0.05
40	-4.63	-0.06
50	5.90	0.08
63	-3.70	-0.05
80	1.88	0.03
100	5.37	0.07
125	7.22	0.10
160	10.80	0.15
200	20.98	0.29
250	32.28	0.45
315	67.23	0.93
400	71.52	0.99
500	84.23	1.17
630	83.62	1.16
800	80.19	1.11
1000	65.63	0.91
1250	55.41	0.77
1600	49.39	0.68
2000	50.12	0.69
2500	52.15	0.72
3150	58.85	0.82
4000	51.10	0.71
5000	47.16	0.65
6300	48.03	0.67
8000	49.78	0.69
10000	48.24	0.67
12500	56.66	0.79



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APPENDIX B: Instruments of Traceability

Specimen: Vented Pressed Paper Pulp Egg Cartons - Complete, Staggered Layout Vent Up and Inverted
(See Full Report)

<u>Description</u>	<u>Model</u>	<u>Serial Number</u>	<u>Date of Certification</u>	<u>Calibration Due</u>
System 1	Type 3160-A-042	3160-106968	2022-07-12	2023-07-12
Bruel & Kjaer Mic And Preamp D	Type 4943-B-001	2311440	2022-09-28	2023-09-28
Bruel & Kjaer Pistonphone	Type 4228	2781248	2022-07-22	2023-07-22
EXTECH Hygro 639	SD700	A.103639	2022-12-07	2023-12-07

APPENDIX C: Revisions to Original Test Report

Specimen: Vented Pressed Paper Pulp Egg Cartons - Complete, Staggered Layout Vent Up and Inverted
(See Full Report)

<u>Date</u>	<u>Revision</u>
2023-03-30	Original report issued

END