

627 RIVERBANK DRIVE
GENEVA, IL 60134
630-232-0104

Test Report

www.riverbankacoustics.com

FOUNDED 1918 BY
WALLACE CLEMENT SABINE

SPONSOR: **Decorative Ceiling Tiles**
Margate, FL

Sound Absorption
RAL™-A24-428

CONDUCTED: 2024-10-30

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ON: EPS (polystyrene) tiles adhered to gypsum board

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 C423-23: "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 EPS (polystyrene) tiles adhered to gypsum board. 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: EPS (polystyrene) tiles
Manufacturer: Decorative Ceiling Tiles

SPECIMEN MEASUREMENTS & TEST CONDITIONS

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

Base Layer Gypsum

Material: Type X gypsum board
Dimensions: 2 pieces @ 1219 mm (48 in.) by 2743 mm (108 in.)
Thickness: 16 mm (0.625 in.)
Overall Weight: 73.03 kg (161 lbs)
Mass per Unit Area: 10.92 kg/m² (2.24 lbs/ft²)

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SPECIMEN MEASUREMENTS & TEST CONDITIONS (continued)

Fabric (Product Under Test) and Adhesive

Materials: Polystyrene tiles, applied with instant grab adhesive

Tile Dimensions: 20 tiles @ 498 mm (19.625 in.) by 498 mm (19.625 in.)
4 tiles @ 498 mm (19.625 in.) by 251 mm (9.875 in.)
10 tiles @ 222 mm (8.75 in.) by 498 mm (19.625 in.)
2 tile @ 222 mm (8.75 in.) by 251 mm (9.875 in.)

Tile Thickness: 6.53 mm (0.257 in.)

Overall Weight: Adhesive @ 2.72 kg (6 lbs)
Tiles @ 0.91 kg (2 lbs)
Total @ 3.63 kg (8 lbs)

Mass per Unit Area: 0.54 kg/m² (0.11 lbs/ft²)

Installation: Adhesive applied to gypsum boards using caulk tube, zig zag pattern
Adhesive also applied to backsides of tiles in dot pattern
Tiles then pressed firmly into place onto gypsum boards

Note: Installation of tiles with adhesive to gypsum boards completed on 2024-10-28

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SPECIMEN MEASUREMENTS & TEST CONDITIONS (continued)

Overall Specimen Properties

Size: 2.74 m (108.0 in) wide by 2.44 m (96.0 in) long
Thickness: 0.02 m (0.882 in)
Weight: 76.32 kg (168.25 lbs)
Mass per Unit Area: 11.41 kg/m² (2.34 lbs/ft²)
Calculation Area: 6.689 m² (72. ft²)

Test Environment

Room Volume: 291.98 m³
Temperature: 21.6 °C ± 0.0 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity: 60.1 % ± 1.6 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure: 98.8 kPa (Requirement not defined)

MOUNTING METHOD

Type B Mounting: The test specimen tiles were applied to the surface of one layer of 5/8" type X gypsum board which was laid directly over the horizontal test surface. Due to there being no apparent air gap between the tiles and adhesive, shims were not used at the four corners of each specimen tile, as described in section 7.3 of ASTM E795-23. Perimeter edges were sealed with tape.

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Figure 1 – Specimen mounted in test chamber



Figure 2 – Individual gypsum board (1 of 2) with adhesive applied to panel

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Figure 3 – Gypsum board (1 of 2) with specimen tiles partially installed



Figure 4 – Detail of specimen materials

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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	0.53	5.68	0.08
** 125	0.30	3.18	0.04
160	0.17	1.80	0.02
200	0.15	1.59	0.02
** 250	0.27	2.96	0.04
315	0.42	4.48	0.06
400	0.57	6.12	0.09
** 500	0.78	8.42	0.12
630	0.79	8.45	0.12
800	0.94	10.08	0.14
** 1000	0.81	8.76	0.12
1250	0.79	8.55	0.12
1600	0.86	9.21	0.13
** 2000	1.18	12.69	0.18
2500	1.87	20.13	0.28
3150	2.59	27.91	0.39
** 4000	2.66	28.60	0.40
5000	2.69	28.97	0.40

SAA = 0.12
NRC = 0.10

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TEST RESULTS (continued)

The sound absorption average (SAA) is defined in ASTM C423-23 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.

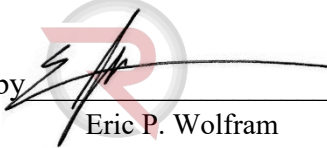
The noise reduction coefficient (NRC) is defined from previous versions of ASTM C423 as the arithmetic average of the sound absorption coefficients at 250 Hz, 500 Hz, 1000 Hz, and 2000 Hz, rounded to the nearest integer multiple of 0.05.

Tested by 

Marc Sciaky
Senior Experimentalist

Report by 

Keith Kimberling
Test Engineer

Approved by 

Eric P. Wolfram
Laboratory Manager

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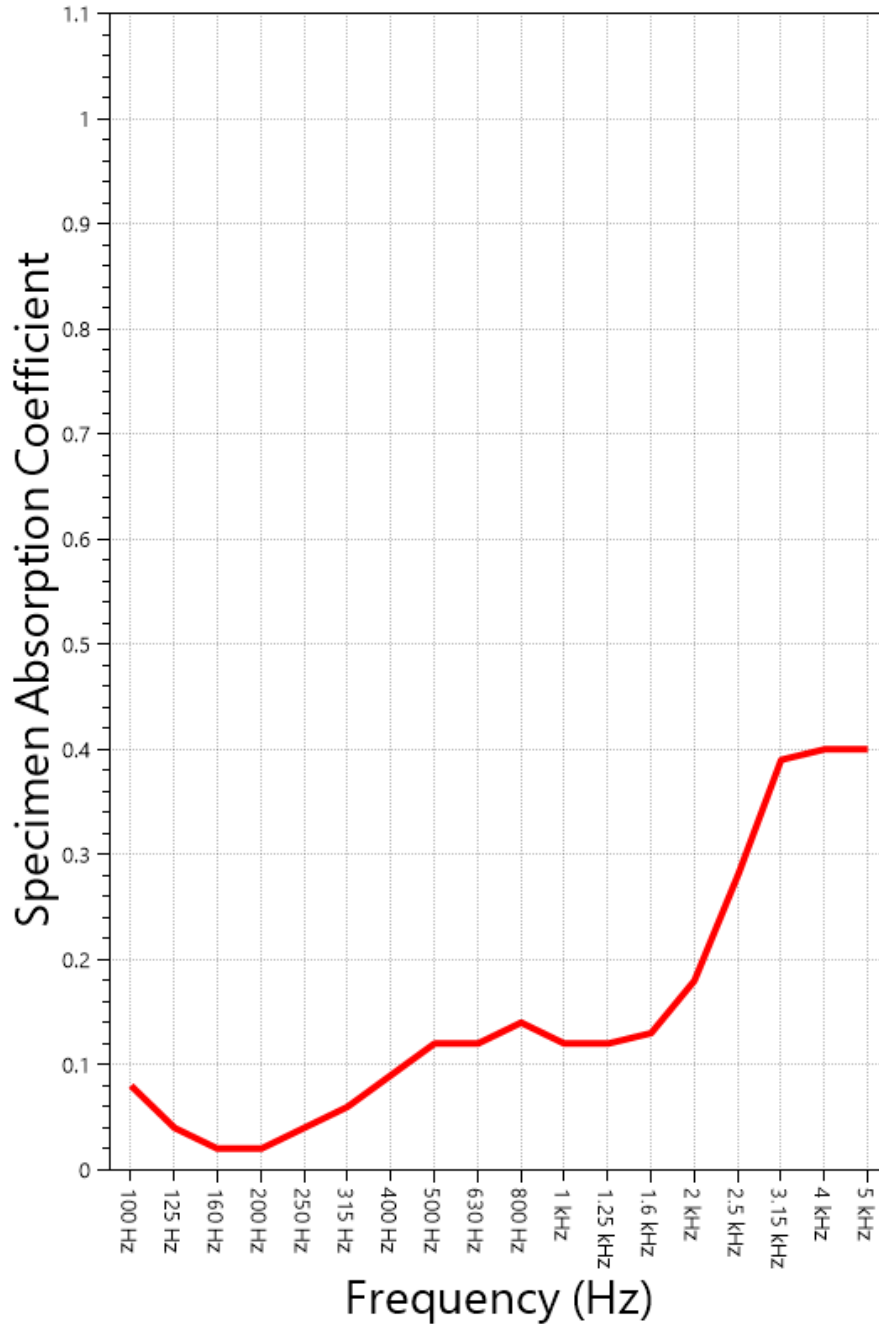
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SOUND ABSORPTION REPORT

EPS (polystyrene) tiles adhered to gypsum board



SAA = 0.12

NRC = 0.10



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APPENDIX A: Extended Frequency Range Data

Specimen: EPS (polystyrene) tiles adhered to gypsum board (See Full Report)

The following non-accredited data were obtained in accordance with ASTM C423-23, 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	1.40	0.02
40	-7.36	-0.10
50	2.34	0.03
63	-0.13	0.00
80	5.21	0.07
100	5.68	0.08
125	3.18	0.04
160	1.80	0.02
200	1.59	0.02
250	2.96	0.04
315	4.48	0.06
400	6.12	0.09
500	8.42	0.12
630	8.45	0.12
800	10.08	0.14
1000	8.76	0.12
1250	8.55	0.12
1600	9.21	0.13
2000	12.69	0.18
2500	20.13	0.28
3150	27.91	0.39
4000	28.60	0.40
5000	28.97	0.40
6300	27.66	0.38
8000	26.04	0.36
10000	22.81	0.32
12500	24.54	0.34

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APPENDIX B: Instruments of Traceability

Specimen: EPS (polystyrene) tiles adhered to gypsum board (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	3160-106974	2024-08-15	2025-08-15
Bruel & Kjaer Mic And Preamp G	Type 4943-B-001	2525858	2024-05-07	2025-05-07
Bruel & Kjaer Pistonphone	Type 4228	2781248	2024-07-19	2025-07-19
EXTECH Hygro 959	SD700	A099959	2024-03-29	2025-03-29

APPENDIX C: Revisions to Original Test Report

Specimen: EPS (polystyrene) tiles adhered to gypsum board (See Full Report)

<u>Date</u>	<u>Revision</u>
2024-11-08	Original report issued

END