

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

An  ALION Technical Center

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FOUNDED 1918 BY
WALLACE CLEMENT SABINE

Test Report

FOR: **SoftForm Lighting, LLC**
Boulder, CO

Sound Absorption
RAL™-A18-159

CONDUCTED: 2018-06-01
ON: SoftForm Lighting Units

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TEST METHOD

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 17025:2005 Laboratory (NVLAP Lab Code: 100227-0) and for this test procedure. The test reported in this document conformed explicitly with ASTM C423-17: "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method." The specimen mounting was performed according to ASTM E795-16: "Standard Practices for Mounting Test Specimens During Sound Absorption Tests." A description of the measuring procedure and room qualifications is available upon request.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as SoftForm Lighting Units. A full external visual inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

Test Specimen

Materials: Fabric-faced panel, steel perimeter frame and backing
Panel Dimensions: 8 @ 1206.5 mm (47.5 in.) x 596.9 mm (23.5 in.)
1 @ 2425.7 mm (95.5 in.) x 288.92 mm (11.375 in.)
Thickness: 73.02 mm (2.875 in.)
Overall Weight: 92.42 kg (203.75 lbs)

Physical Measures

Size: 2.41 m (94.88 in.) wide by 2.66 m (104.88 in.) long
Thickness: 73.03 mm (2.88 in.)
Weight: 92.42 kg (203.75 lbs.)
Mass per Unit Area: 14.40 kg/m² (2.95 lbs./ft²)
Area: 6.42 m² (69.10 ft²)

Test Environment

Volume: 292.0 m³ (10,311.0 ft³)
Temperature: 21.5±0.0°C (70.6±0.1°F) (Requirement: ≥10° C and ≤5° C change)
Humidity: 61.8±1.6% (Requirement: ≥40% RH and ≤5% change)
Barometric Pressure: 98.5 kPa. (Requirement not defined)

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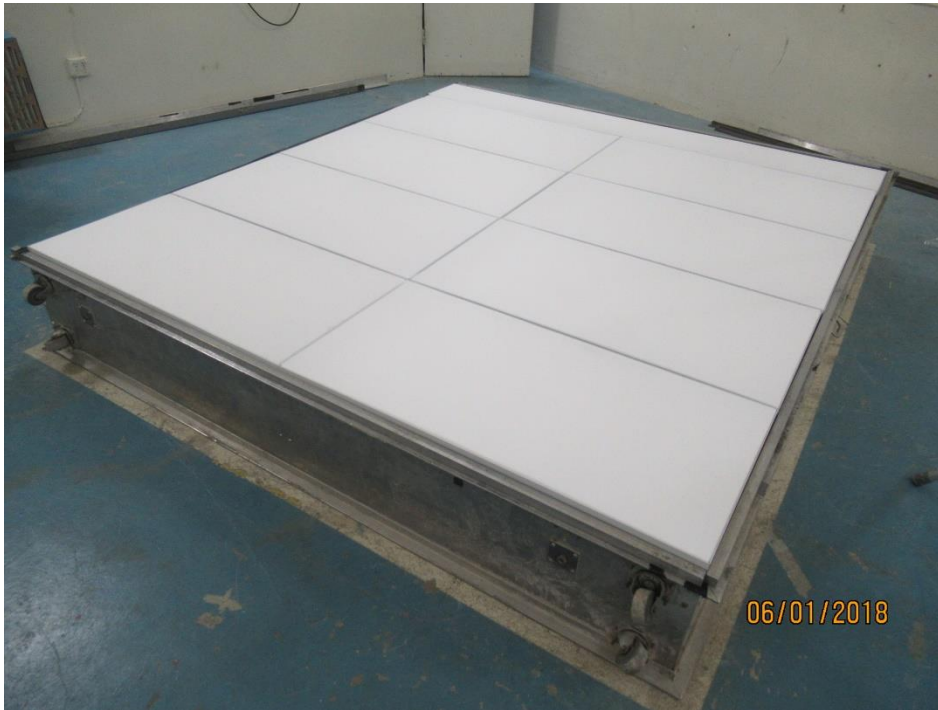


Figure 1 – Specimen mounted in test chamber



Figure 2 – Detail of individual panel

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Figure 3 – Individual panel back side



Figure 4 – Individual panel frame edges

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MOUNTING METHOD

Type E-430 Mounting: The test specimen was mounted with an airspace behind it. The numeral suffix in the mounting designation is the distance in millimeters from the exposed face of the test specimen to the test surface, rounded to the nearest integer multiple of 5. The perimeter was sealed using metal framing.

TEST RESULTS

| 1/3 Octave Center Frequency (Hz) | Total Absorption (SI) (m ²) | Total Absorption (IP) (Sabins) | Absorption Coefficient (Sabins / ft ²) |
|--|--|-----------------------------------|--|
| 100 | 4.13 | 44.48 | 0.64 |
| ** 125 | 2.52 | 27.16 | 0.39 |
| 160 | 2.15 | 23.12 | 0.33 |
| 200 | 1.45 | 15.60 | 0.23 |
| ** 250 | 1.54 | 16.57 | 0.24 |
| 315 | 1.42 | 15.23 | 0.22 |
| 400 | 1.56 | 16.74 | 0.24 |
| ** 500 | 2.22 | 23.93 | 0.35 |
| 630 | 2.18 | 23.47 | 0.34 |
| 800 | 2.00 | 21.51 | 0.31 |
| ** 1000 | 1.77 | 19.01 | 0.28 |
| 1250 | 1.63 | 17.50 | 0.25 |
| 1600 | 1.21 | 13.05 | 0.19 |
| ** 2000 | 0.90 | 9.65 | 0.14 |
| 2500 | 0.80 | 8.65 | 0.13 |
| 3150 | 0.94 | 10.12 | 0.15 |
| ** 4000 | 1.00 | 10.74 | 0.16 |
| 5000 | 0.62 | 6.68 | 0.10 |

SAA = 0.24

NRC = 0.25

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TEST RESULTS (Continued)

The sound absorption average (SAA) is defined as a single number rating, the average, rounded to the nearest 0.01, of the sound absorption coefficient of a material for the twelve one-third octave bands from 200 through 2500 Hz, inclusive.

The noise reduction coefficient (NRC) is defined from previous versions of this same test method as the average of the coefficients at 250, 500, 1000, and 2000 Hz, expressed to the nearest integral multiple of 0.05.

Tested by


Dean Victor
Senior Experimentalist

Report by


Malcolm Kelly
Acoustician

Approved by


Eric P. Wolfram
Laboratory Manager



NVLAP LAB CODE 100227-0

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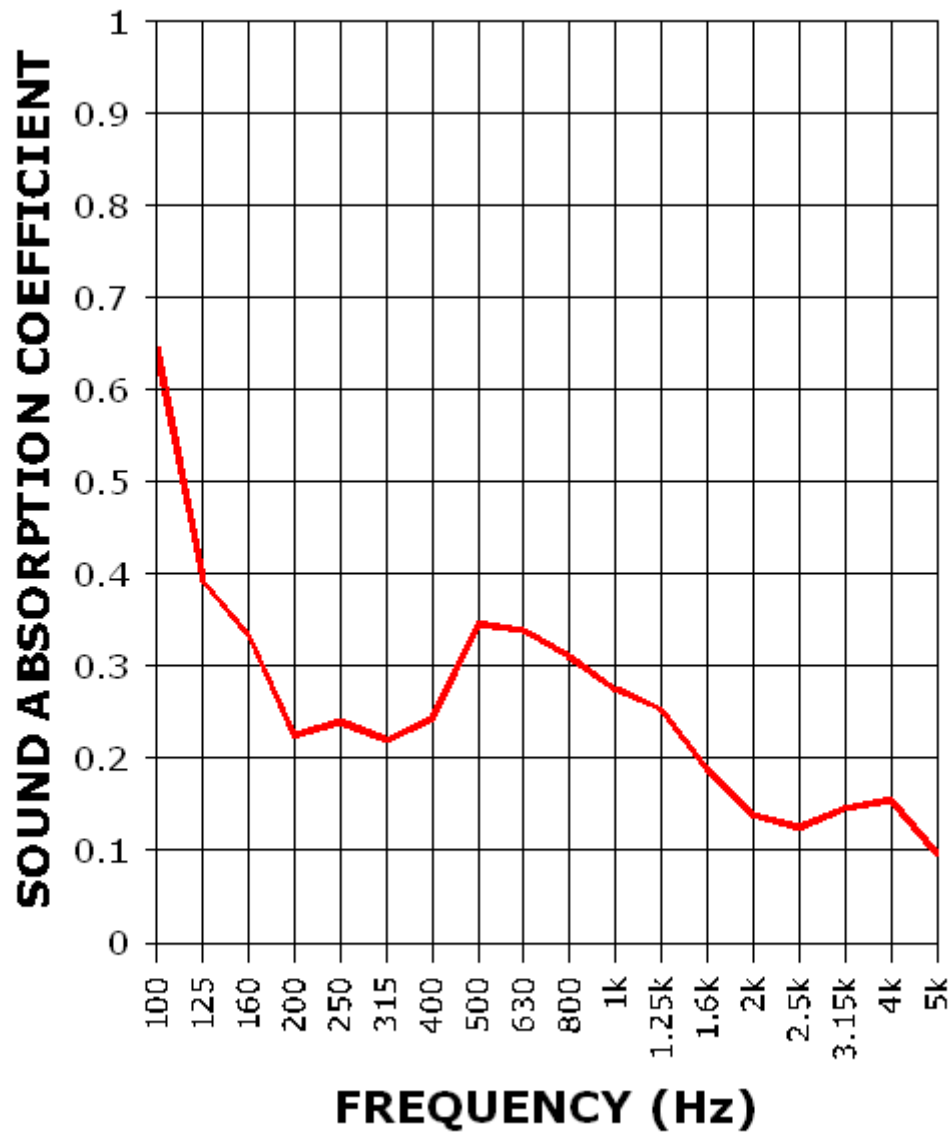
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SOUND ABSORPTION REPORT

SoftForm Lighting Units



SAA = 0.24

NRC = 0.25

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APPENDIX A: Extended Frequency Range Data

Specimen: SoftForm Lighting Units (See Full Report)

The following non-accredited data were obtained in accordance with ASTM C423-17, 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 (Sabins / ft ²) |
|---|------------------------------|--|
| 31.5 | 26.68 | 0.39 |
| 40 | -3.26 | -0.05 |
| 50 | 73.32 | 1.06 |
| 63 | 31.55 | 0.46 |
| 80 | 37.58 | 0.54 |
| 100 | 44.48 | 0.64 |
| 125 | 27.16 | 0.39 |
| 160 | 23.12 | 0.33 |
| 200 | 15.60 | 0.23 |
| 250 | 16.57 | 0.24 |
| 315 | 15.23 | 0.22 |
| 400 | 16.74 | 0.24 |
| 500 | 23.93 | 0.35 |
| 630 | 23.47 | 0.34 |
| 800 | 21.51 | 0.31 |
| 1000 | 19.01 | 0.28 |
| 1250 | 17.50 | 0.25 |
| 1600 | 13.05 | 0.19 |
| 2000 | 9.65 | 0.14 |
| 2500 | 8.65 | 0.13 |
| 3150 | 10.12 | 0.15 |
| 4000 | 10.74 | 0.16 |
| 5000 | 6.68 | 0.10 |
| 6300 | 3.19 | 0.05 |
| 8000 | 0.00 | 0.00 |
| 10000 | 0.00 | 0.00 |
| 12500 | 0.00 | 0.00 |

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APPENDIX B: Instruments of Traceability

Specimen: SoftForm Lighting Units (See Full Report)

| <u>Description</u> | <u>Model</u> | <u>Serial Number</u> | <u>Date of Certification</u> | <u>Calibration Due</u> |
|--|-----------------------|---------------------------------|---|-----------------------------------|
| Bruel & Kjaer Pulse Analyzer - System3 | Type 3560-C | 2647140 | 2018-04-20 | 2019-04-20 |
| Bruel & Kjaer Mic And Preamp A | Type 4943-B-001 | 2311428 | 2017-09-22 | 2018-09-22 |
| Bruel & Kjaer Pistonphone | Type 4228 | 2781248 | 2017-08-02 | 2018-08-02 |
| Omega Digital Temp., Humid. And Pressure Recorder | OM-CP- PRHTemp2000 | P97844 | 2018-02-03 | 2019-02-03 |

END