

## Test Report

SPONSOR: **Vulcraft-Verco Group**  
Norfolk, NE

**Sound Absorption**  
**RAL™-A19-101**

CONDUCTED: 2019-03-12

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ON: Roof Deck Assembly - 2.0DA, plastic mesh, 3.0 pcf fiberglass insulation, DensDeck

### 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 17025:2005 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 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 Roof Deck Assembly - 2.0DA, plastic mesh, 3.0 pcf fiberglass insulation, DensDeck. 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**

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##### **Corrugated Metal**

Designation: 2.0DA  
Manufacturer: Vulcraft-Verco Group

##### **Insulation**

Density: 48.1 kg/m<sup>3</sup> (3.0 lbs/ft<sup>3</sup>)

### SPECIMEN MEASUREMENTS & TEST CONDITIONS

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

#### **Roofing Board**

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Trade Name: DensDeck  
Materials: Gypsum board with glass mat facing  
Dimensions: 4 @ 1219.2 mm (48 in.) x 1219.2 mm (48 in.)  
2 @ 1219.2 mm (48 in.) x 304.8 mm (12 in.)  
Thickness: 12.7 mm (0.5 in.)  
Overall Weight: 69.85 kg (154 lbs)  
Mass per Unit Area: 10.44 kg/m<sup>2</sup> (2.14 lbs/ft<sup>2</sup>)

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### Insulation

Materials: Fiberglass insulation  
Dimensions: 16 @ 2743.2 mm (108 in.) x 120.65 mm (4.75 in.)  
Thickness: 50.8 mm (2 in.)  
Installation: Inserted in ribs of corrugated metal (see below)  
Overall Weight: 12.7 kg (28 lbs)  
Density: 47.2 kg/m<sup>3</sup> (2.95 lbs/ft<sup>3</sup>)

### Corrugated Metal

Dimensions: 4 @ 647.7 mm (25.5 in.) x 2743.2 mm (108 in.)  
Depth: 50.8 mm (2 in.)  
Metal Thickness: 0.79 mm (0.031 in.)  
Top Rib Opening: 25.4 mm (1 in.)  
Bottom Rib Opening: 34.92 mm (1.375 in.)  
Pitch: 157.23 mm (6.19 in.)  
Perforations: Long flanges perforated  
Circular holes @ 3.96 mm (0.156 in.) diameter  
Triangular pitch @ 9.52 mm (0.375 in.) on center  
Approximately 15.7 % open area  
Installation: Loose laid over roofing board, perforations exposed to sound field  
Joints overlapped at short flange, no fasteners  
Overall Weight: 69.17 kg (152.5 lbs)

### Plastic Mesh

Material: Plastic fibers bonded in square mesh  
Dimensions: 13 @ 2743.2 mm (108 in.) x 127 mm (5 in.)  
Thickness: 2.54 mm (0.1 in.)  
Spacing: 1.5 mm (0.059 in.) thick fibers spaced 8.5 mm (0.335 in.) on center  
Installation: Inserted between insulation and perforated metal flanges  
Overall Weight: 1.81 kg (4 lbs)

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### Overall Specimen Properties

Size: 2.74 m (108.0 in) wide by 2.5 m (98.5 in) long  
Thickness: 0.06 m (2.5 in)  
Weight: 153.54 kg (338.5 lbs)  
Mass per Unit Area: 22.37 kg/m<sup>2</sup> (4.58 lbs/ft<sup>2</sup>)  
Calculation Area: 6.864 m<sup>2</sup> (73.88 ft<sup>2</sup>)

### Test Environment

Room Volume: 291.98 m<sup>3</sup>  
Temperature: 21.5 °C ± 0.3 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)  
Relative Humidity: 67.2 % ± 1.0 % (Requirement: ≥ 40 % and ≤ 5 % change)  
Barometric Pressure: 99.9 kPa (Requirement not defined)

### MOUNTING METHOD

Type A Mounting: The test specimen was laid directly against the test surface. Perimeter edges were sealed with wood, metal framing, and tape.

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Figure 1 – Specimen mounted in test chamber



Figure 2 – Detail of specimen composition



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Figure 3 – Plastic mesh installed over perforated flanges

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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 <sup>2</sup> )	Total Absorption (Sabins)	Absorption Coefficient
100	0.84	8.99	0.12
** 125	1.15	12.36	0.17
160	1.80	19.33	0.26
200	2.52	27.12	0.37
** 250	3.49	37.57	0.51
315	5.31	57.13	0.77
400	6.11	65.79	0.89
** 500	7.21	77.59	1.05
630	7.40	79.68	1.08
800	7.52	80.93	1.10
** 1000	7.21	77.64	1.05
1250	5.99	64.43	0.87
1600	5.82	62.65	0.85
** 2000	5.87	63.17	0.85
2500	5.89	63.36	0.86
3150	5.77	62.12	0.84
** 4000	5.26	56.61	0.77
5000	4.73	50.86	0.69

**SAA = 0.85**  
**NRC = 0.85**

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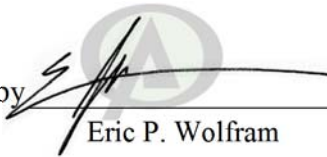
### TEST RESULTS (continued)

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   
Malcolm Kelly  
Acoustical Test Engineer

Approved by   
Eric P. Wolfram  
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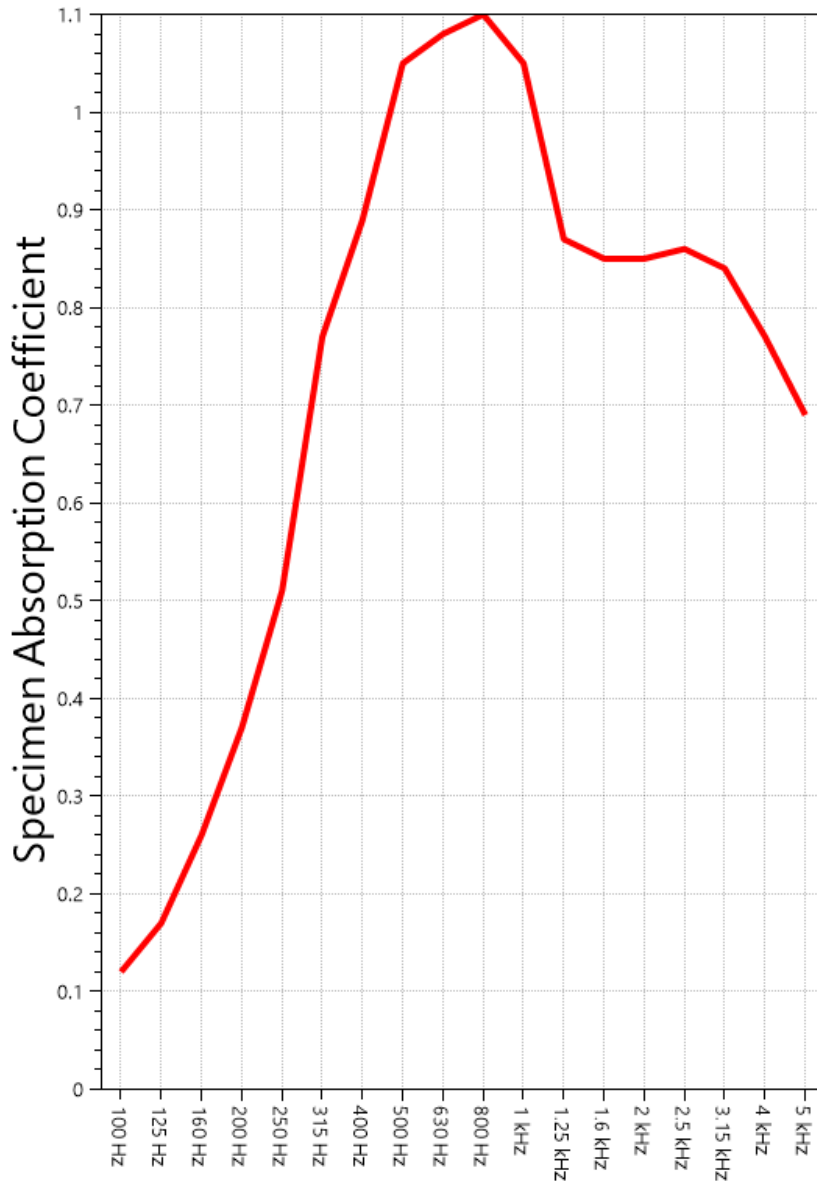
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SOUND ABSORPTION REPORT

Roof Deck Assembly - 2.0DA, plastic mesh, 3.0 pcf fiberglass insulation, DensDeck



Frequency (Hz)

**SAA = 0.85**

**NRC = 0.85**



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### APPENDIX A: Extended Frequency Range Data

Specimen: Roof Deck Assembly - 2.0DA, plastic mesh, 3.0 pcf fiberglass insulation, DensDeck (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
31.5	12.14	0.16
40	2.31	0.03
50	5.90	0.08
63	4.08	0.06
80	3.61	0.05
100	8.99	0.12
125	12.36	0.17
160	19.33	0.26
200	27.12	0.37
250	37.57	0.51
315	57.13	0.77
400	65.79	0.89
500	77.59	1.05
630	79.68	1.08
800	80.93	1.10
1000	77.64	1.05
1250	64.43	0.87
1600	62.65	0.85
2000	63.17	0.85
2500	63.36	0.86
3150	62.12	0.84
4000	56.61	0.77
5000	50.86	0.69
6300	48.61	0.66
8000	39.56	0.54
10000	38.52	0.52
12500	29.53	0.40



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### APPENDIX B: Instruments of Traceability

Specimen: Roof Deck Assembly - 2.0DA, plastic mesh, 3.0 pcf fiberglass insulation, DensDeck (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	2018-08-09	2019-08-09
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2018-09-28	2019-09-28
Bruel & Kjaer Pistonphone	Type 4228	2781248	2018-08-06	2019-08-06
EXTECH Hygro 662	SD700	A083662	2018-11-29	2019-11-29

### APPENDIX C: Revisions to Original Test Report

Specimen: Roof Deck Assembly - 2.0DA, plastic mesh, 3.0 pcf fiberglass insulation, DensDeck (See Full Report)

<u>Date</u>	<u>Revision</u>
2019-06-06	Original report issued

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END