

# RIVERBANK ACOUSTICAL LABORATORIES

1512 S. BATAVIA AVENUE  
GENEVA, ILLINOIS 60134

Alion Science and Technology

630/232-0104  
FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

## TEST REPORT

FOR: Nucor / Vulcraft Group  
Norfolk, NE.

Sound Absorption  
RAL™-A14-170

CONDUCTED: 2014-08-07 (Revised 2016-10-06)

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ON: 2.0 DA 20 ga. Perforated Metal Deck (Plastic Mesh) Insulated with 3.0 pcf Plain  
Fiberglass - 2 inch thick Polyiso Backer

### TEST METHOD

The test method conformed explicitly with the requirements of the ASTM Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method: ASTM C423-09a and E795-05. Riverbank Acoustical Laboratories has been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure (NVLAP Lab Code: 100227-0). A description of the measuring procedure and room qualifications is available separately.

### DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as 2.0 DA 20 ga. Perforated Metal Deck (Plastic Mesh) Insulated with 3.0 pcf Plain Fiberglass - 2 inch thick Polyiso Insulation Backer. A visual inspection by Riverbank staff verified the manufacturer's description. The specimen consisted of a metal deck with perforations on the top of each flute. The thickness of the metal was measured as 0.94 mm (0.037 in.). The perforation specifications were as follows: 4.0 mm diameter round perforations at 60° staggered center pitch, 9.5 mm on center = 16.1% open area in the perforated region. Each flute was measured as 123.83mm (4-7/8 in) wide (bottom), 136.53 mm (5-3/8 in) wide (top), and 50.80 mm (2.0 in.) thick. Inserted into each flute was 120.65 mm (4-3/4 in.) wide by 50.80 mm (2.0 in.) thick, rigid fiberglass insulation. A 127.0 mm (5.0 in.) wide by 2.54 mm (0.10 in.) thick, plastic mesh spacer was placed between the fiberglass insulation and the perforated region of the flute. The entire specimen was backed by 50.80 mm (2.0 in.) thick polyisocyanurate roof board (dense foam panels with reinforced felt facing).

The specimen consisted of 4 pieces laid as a single rectangular patch. The overall dimensions of the specimen as measured were 2.74 m (108.00 in.) wide by 2.44 m (96.00 in.) long and 101.60 mm (4.00 in.) thick. The area used in the calculations was 6.69 m<sup>2</sup> (72.00 ft<sup>2</sup>). The weight of the entire specimen as measured was 109.20 kg (240.75 lbs), an average of 16.31 kg/m<sup>2</sup> (3.34 lbs/ft<sup>2</sup>).

The specimen was tested in the laboratory's 292.0 m<sup>3</sup> (10,311.0 ft<sup>3</sup>) test chamber. The room temperature at the time of the test was 22.4±0.0°C (72.4±0.0°F) and 58.6±0.2% relative humidity. The atmospheric pressure was 98.9 kPa.



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Figure 1 - Specimen mounted in the test chamber.



Figure 2 - Detail of the test specimen.



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### MOUNTING A

The test specimen was laid directly against the test surface. The perimeter was sealed using wood and metal framing.

### TEST RESULTS

1/3 Octave Center Frequency (Hz)	Absorption Coefficient	Total Absorption In Sabins
100	0.16	11.64
** 125	0.19	13.51
160	0.29	20.66
200	0.37	26.51
** 250	0.54	38.74
315	0.93	67.07
400	1.12	80.60
** 500	1.15	82.51
630	1.18	84.77
800	1.17	84.03
** 1000	1.07	77.25
1250	0.93	67.15
1600	0.93	66.79
** 2000	1.01	72.37
2500	1.00	71.96
3150	0.88	63.68
** 4000	0.79	56.77
5000	0.69	49.46

**SAA = 0.95**  
**NRC = 0.95**



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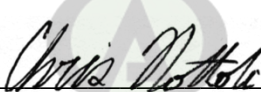
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### TEST RESULTS (Continued)

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   
Marc Sciaky  
Experimentalist

Report by   
Chris Nottoli  
Acoustician

Approved by   
Eric P. Wolfram  
Laboratory Manager



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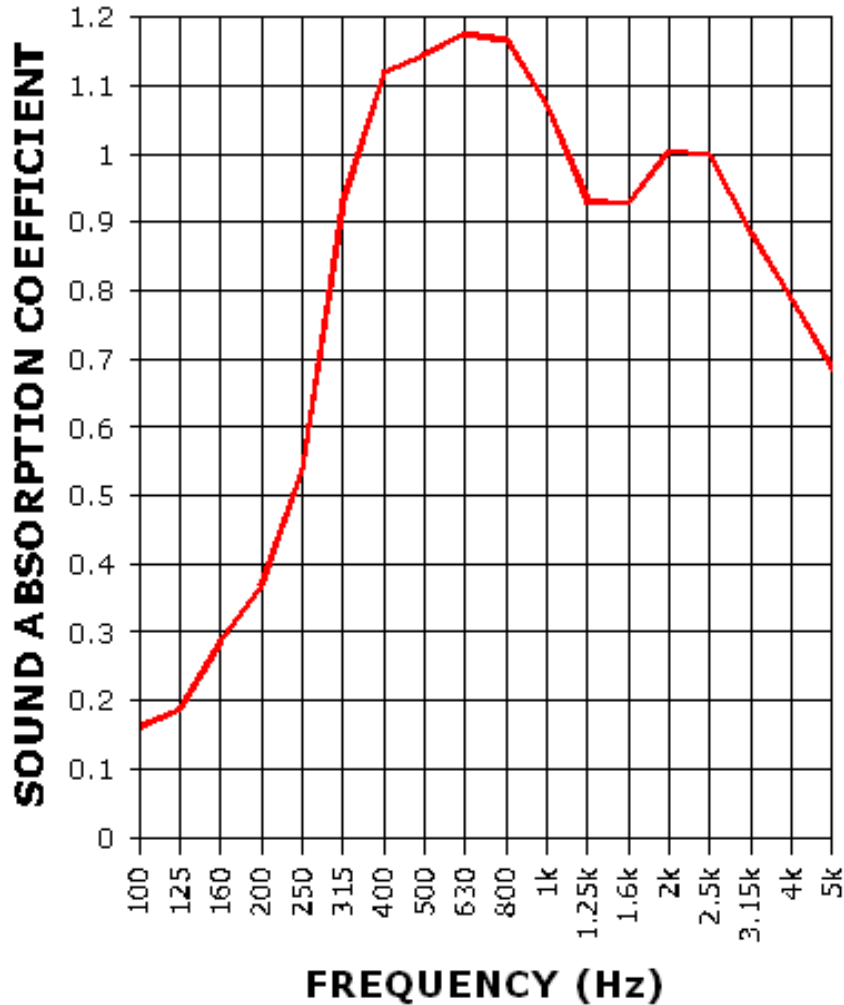
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### SOUND ABSORPTION REPORT

2.0 DA 20 ga. Perforated Metal Deck (Plastic Mesh) Insulated with 3.0 pcf Plain  
Fiberglass - 2 inch thick Polyiso Insulation Backer



**SAA = 0.95**

**NRC = 0.95**



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### Appendix to ASTM C423 Sound Absorption Test **Extended Frequency Range Data**

Product Description: 2.0 DA 20 ga. Perforated Metal Deck (Plastic Mesh) Insulated with 3.0 pcf Plain Fiberglass - 2 inch thick Polyiso Insulation Backer (See Full Report)

Riverbank Acoustical Laboratories is accredited to perform sound absorption coefficient measurements for the frequency range of 100Hz to 5,000Hz. However, we calculate sound absorption values at additional test frequencies as a service to our clients.

Although these measurements were made in accordance with the procedures described in ASTM C423-09a, 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 sound absorption values at additional frequencies were as follows:

#### **RAL-A14-170**

1/3 Octave Center Frequency (Hz)	<u>Absorption Coefficient</u>	<b>Total Absorption</b> (Sabins)
40	-0.06	-4.18
50	-0.19	-13.60
63	0.05	3.50
80	0.13	9.39
6300	0.63	45.14
8000	0.45	32.53
10000	0.39	27.78



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### APPENDIX B: Revisions to Original Test Report

Specimen: 2.0 DA 20 ga. Perforated Metal Deck (Plastic Mesh) Insulated with 3.0 pcf Plain Fiberglass - 2" Poly ISO Backer (See Full Report)

<u>Date</u>	<u>Revision</u>
2016-10-06	Page 1, 5, 6: The phrase " 2" Rigid Fiberglass Backer " was replaced with the correct " 2 inch thick Polyiso Insulation Backer. "
2016-10-06	Page 1: The phrase " 2" Poly ISO " was replaced with the correct " 2 inch thick Polyiso "

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END



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