

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: **Turf Design**  
Elgin, IL

**Sound Absorption**  
**RAL™-A18-387**

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CONDUCTED: 2018-11-21

ON: Urban tiles, weighted shallow, over fissured ceiling tiles

### 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 measurement procedure and room specifications is available upon request.

### DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as Urban tiles, weighted shallow, over fissured ceiling tiles. A full external visual inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

#### **Test Specimen, Layer 1**

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Materials: Fissured ceiling tile, wet-formed mineral fiber substrate  
Dimensions: 8 @ 1212.85 mm (47.75 in.) x 603.25 mm (23.75 in.)  
Thickness: 15.88 mm (0.625 in.)  
Overall Weight: 17.92 kg (39.5 lbs)

#### **Test Specimen, Layer 2**

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Trade Name: Urban  
Materials: Formed polyethylene terephthalate felt  
Tile Dimensions: 16 @ 609.6 mm (24 in.) x 609.6 mm (24 in.)  
Tile Wall Thickness: 5 mm (0.197 in.)

##### **Tile Type A**

Quantity: 2  
Overall Thickness: 203.2 mm (8 in.)

##### **Tile Type B**

Quantity: 4  
Overall Thickness: 152.4 mm (6 in.)

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### Test Specimen, Layer 2 (continued)

#### **Tile Type C**

Quantity: 4  
Overall Thickness: 101.6 mm (4 in.)

#### **Tile Type D**

Quantity: 6  
Overall Thickness: 50.8 mm (2 in.)

Overall Weight: 11.57 kg (25.5 lbs)  
Installation: Loose laid over Layer 1

### Specimen Configuration

(test chamber east wall)

D	A	D	C
D	C	B	D
B	A	B	C
D	B	D	C

### Physical Measures

Size: 2.44 m (96.0 in) wide by 2.44 m (96.0 in) long  
Thickness: 0.22 m (8.625 in)  
Weight: 29.48 kg (65.0 lbs)  
Mass per Unit Area: 4.95 kg/m<sup>2</sup> (1.02 lbs/ft<sup>2</sup>)  
Calculation Area: 5.95 m<sup>2</sup> (64 ft<sup>2</sup>)

### Test Environment

Room Volume: 291.98 m<sup>3</sup>  
Temperature: 20.2 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)  
Relative Humidity: 63.05 % ± 0.5 % (Requirement: ≥ 40 % and ≤ 5 % change)  
Barometric Pressure: 99.7 kPa (Requirement not defined)

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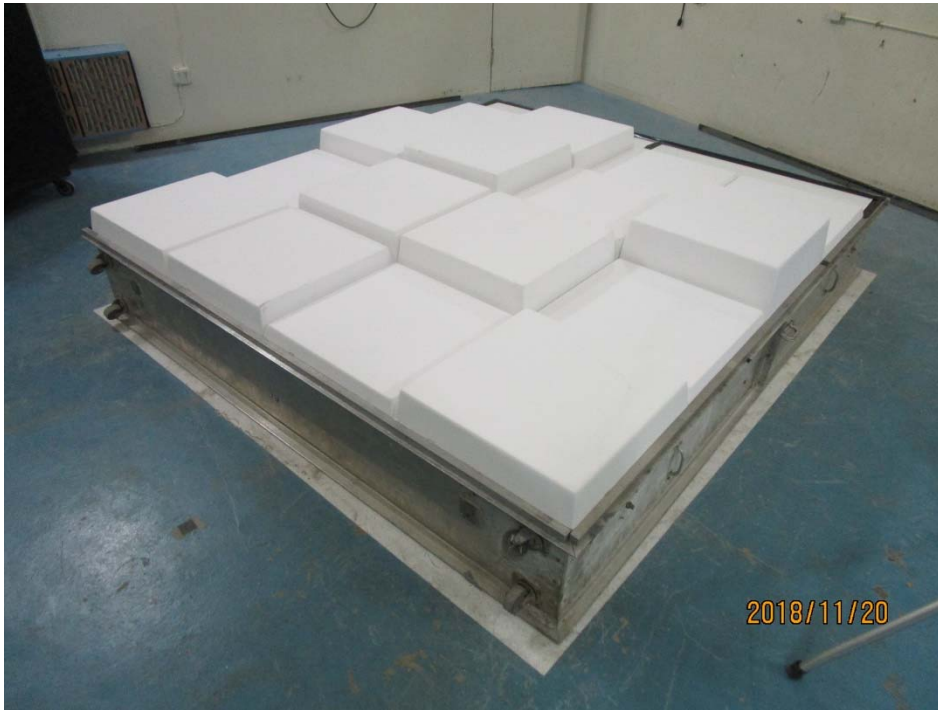


Figure 1 – Specimen mounted in test chamber, as viewed from southeast corner of test chamber



Figure 2 – Specimen mounted in test chamber, as viewed from northeast corner of test chamber

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Figure 3 – Layer 2 partially installed over Layer 1

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### MOUNTING METHOD

Type E-400 Mounting: The test specimen was mounted with an airspace behind it. The number designates the distance in mm from the exposed face of the test specimen to the test surface, rounded to the nearest integer multiple of 5. For the purposes of this report, the mounting designation uses the top face of Layer 1 for reference. Perimeter edges were sealed with metal framing.

### TEST RESULTS

1/3 Octave Center

Frequency (Hz)	Total Absorption (m <sup>2</sup> )	Total Absorption (Sabins)	Absorption Coefficient
100	3.75	40.35	0.63
** 125	4.53	48.75	0.76
160	4.03	43.33	0.68
200	4.66	50.14	0.78
** 250	5.00	53.86	0.84
315	5.58	60.11	0.94
400	6.33	68.15	1.06
** 500	6.91	74.42	1.16
630	7.02	75.58	1.18
800	7.36	79.22	1.24
** 1000	7.31	78.68	1.23
1250	7.30	78.55	1.23
1600	7.30	78.53	1.23
** 2000	7.26	78.12	1.22
2500	7.21	77.65	1.21
3150	7.10	76.42	1.19
** 4000	7.08	76.26	1.19
5000	7.30	78.53	1.23

**SAA = 1.11**

**NRC = 1.10**



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### TEST RESULTS (Continued)


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

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

Tested by

  
Dean Victor  
Senior Experimentalist

Report by

  
Malcolm Kelly  
Acoustician

Approved by

  
Eric P. Wolfram  
Laboratory Manager

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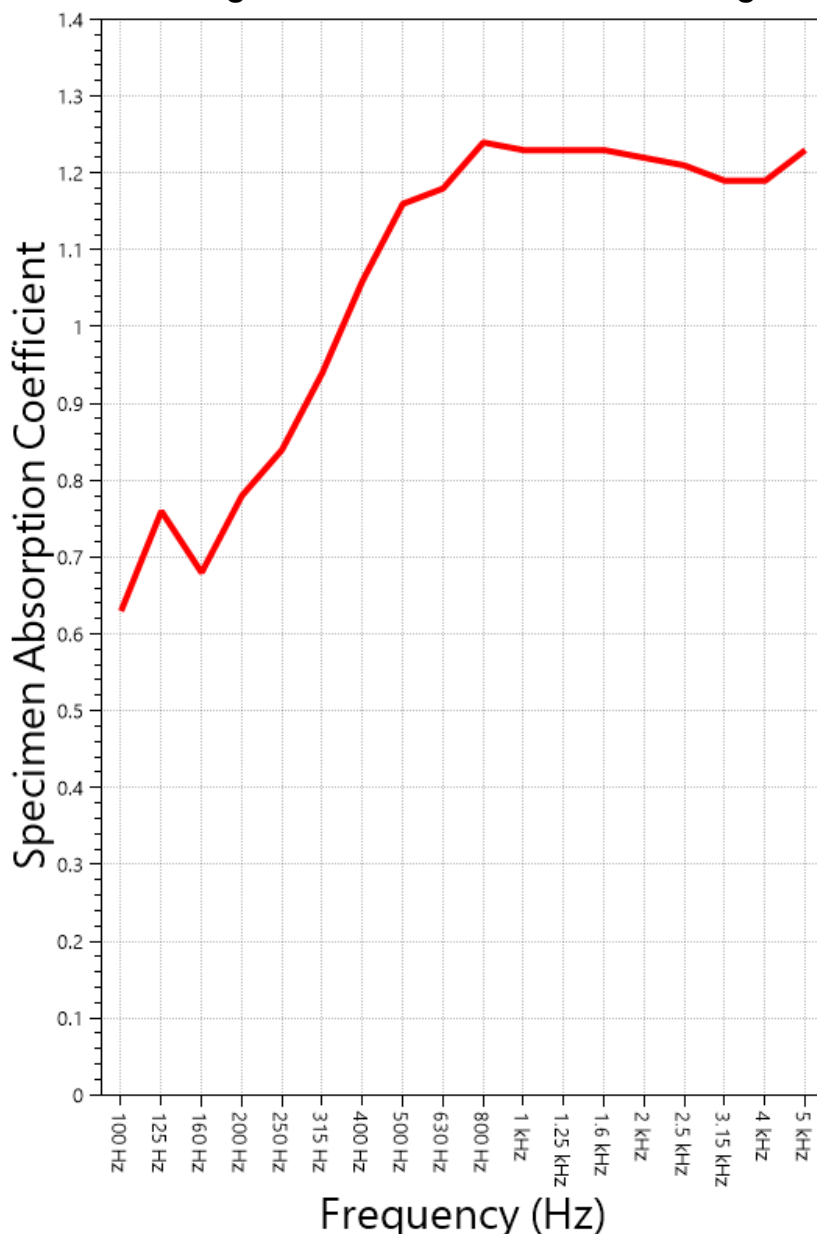
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### SOUND ABSORPTION REPORT

Urban tiles, weighted shallow, over fissured ceiling tiles



**SAA = 1.11**

**NRC = 1.10**

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### **APPENDIX A: Extended Frequency Range Data**

Specimen: Urban tiles, weighted shallow, over fissured ceiling tiles (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	31.61	0.49
40	27.44	0.43
50	19.76	0.31
63	23.45	0.37
80	39.80	0.62
100	40.35	0.63
125	48.75	0.76
160	43.33	0.68
200	50.14	0.78
250	53.86	0.84
315	60.11	0.94
400	68.15	1.06
500	74.42	1.16
630	75.58	1.18
800	79.22	1.24
1000	78.68	1.23
1250	78.55	1.23
1600	78.53	1.23
2000	78.12	1.22
2500	77.65	1.21
3150	76.42	1.19
4000	76.26	1.19
5000	78.53	1.23
6300	81.12	1.27
8000	83.41	1.30
10000	84.81	1.32
12500	94.10	1.47



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### **APPENDIX B: Instruments of Traceability**

Specimen: Urban tiles, weighted shallow, over fissured ceiling tiles (See Full Report)

<b><u>Description</u></b>	<b><u>Model</u></b>	<b><u>Serial Number</u></b>	<b><u>Date of Certification</u></b>	<b><u>Calibration Due</u></b>
System 1	Type 3160-A-4/2	3160- 106968	2018-08-09	2019-08-09
Brüel & Kjær Mic And Preamp A	Type 4943-B-001	2311428	2018-09-28	2019-09-28
Brüel & Kjær Pistonphone	Type 4228	2781248	2018-08-06	2019-08-06
Omega Digital Temp., Humid. And Pressure Recorder	OM-CP- PRHTemp2000	P97844	2018-02-03	2019-02-03

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