

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™-A18-351**

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CONDUCTED: 2018-10-15

ON: Urban ceiling tiles, weighted deep

### 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 Urban ceiling tiles, weighted deep. A full external visual inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

#### Test Specimen

Trade Name:	Urban
Materials:	Formed polyethylene terephthalate felt
Tile Dimensions:	16 @ 609.6 mm (24 in.) x 609.6 mm (24 in.)
Wall Thickness:	5 mm (0.197 in.)
<b>Tile Type A</b>	
Material ID:	03856
Quantity:	6
Overall Thickness:	203.2 mm (8 in.)
Overall Weight:	6.12 kg (13.5 lbs)
<b>Tile Type B</b>	
Material ID:	03853
Quantity:	5
Overall Thickness:	152.4 mm (6 in.)
Overall Weight:	4.54 kg (10 lbs)
<b>Tile Type C</b>	
Material ID:	03798
Quantity:	3
Overall Thickness:	101.6 mm (4 in.)
Overall Weight:	2.04 kg (4.5 lbs)

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### Test Specimen (continued)

#### **Tile Type D**

Material ID: 03795  
Quantity: 2  
Overall Thickness: 50.8 mm (2 in.)  
Overall Weight: 1.25 kg (2.75 lbs)

#### **Specimen Configuration**

(test chamber east wall)

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

### Physical Measures

Size: 2.44 m (96 in) wide by 2.44 m (96 in) long  
Thickness: 203.2 mm (8 in.)  
Weight: 13.95 kg (30.75 lbs)  
Mass per Unit Area: 2.34 kg/m<sup>2</sup> (0.48 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: 20.9 °C ± 0.0 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)  
Relative Humidity: 61.05 % ± 0.7 % (Requirement: ≥ 40 % and ≤ 5 % change)  
Barometric Pressure: 99.4 kPa (Requirement not defined)

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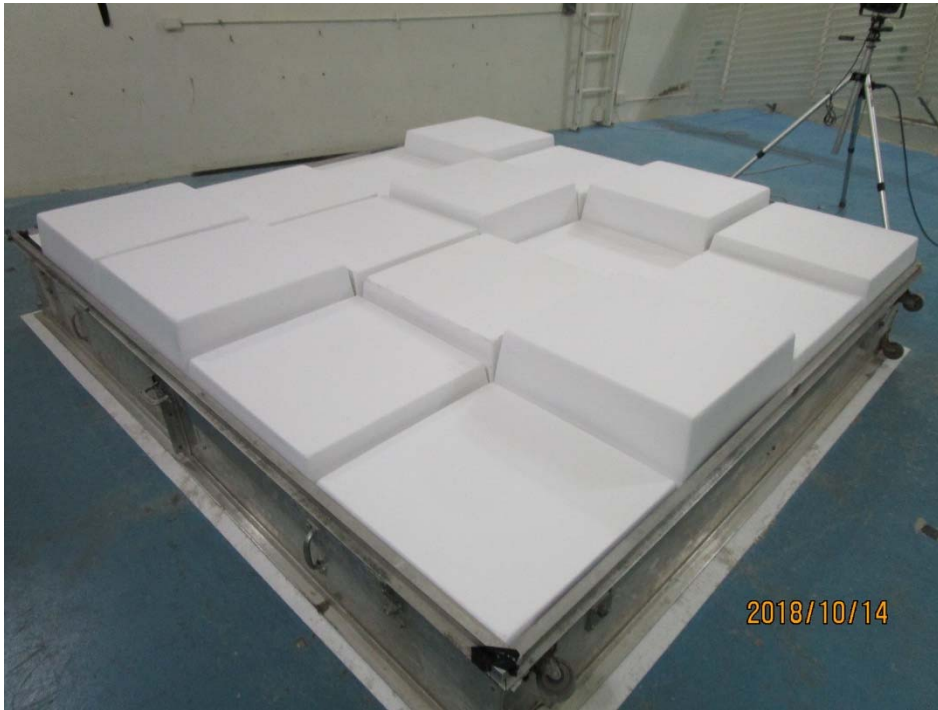


Figure 1 – Specimen mounted in test chamber, as viewed from southwest corner



Figure 2 – Detail of individual tile

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Figure 3 – Individual tile, inverted

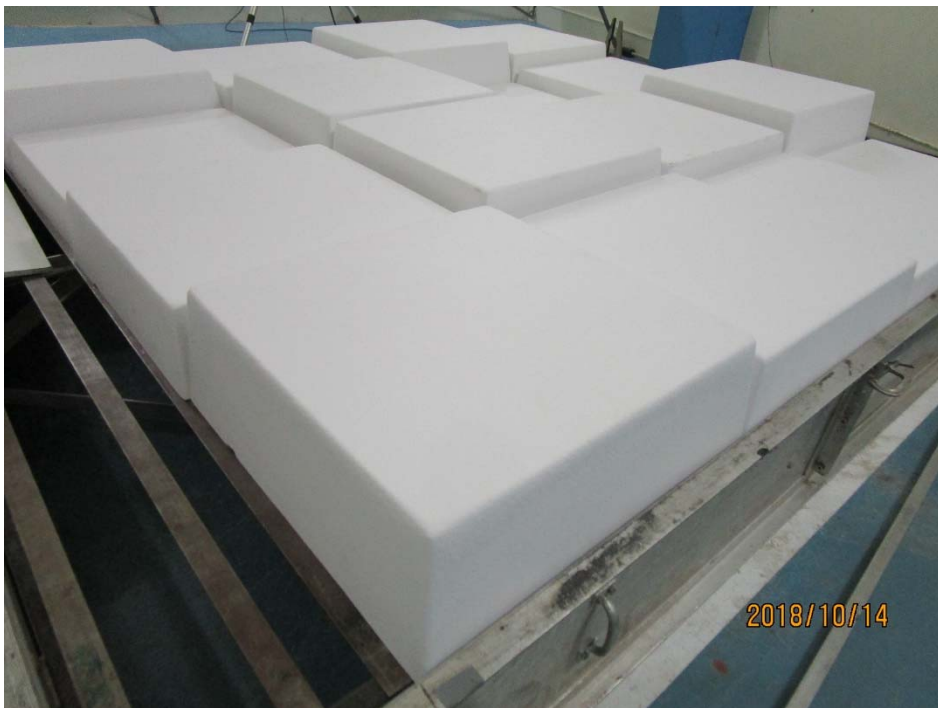


Figure 4 – Specimen prior to application of perimeter seal, as viewed from northwest corner



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### MOUNTING METHOD

Type E-415 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 point on the specimen face where minimum overall thickness was measured 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	4.43	47.65	0.74
** 125	6.72	72.36	1.13
160	5.30	57.02	0.89
200	5.93	63.78	1.00
** 250	5.65	60.80	0.95
315	5.06	54.49	0.85
400	5.09	54.82	0.86
** 500	5.78	62.23	0.97
630	6.00	64.58	1.01
800	6.10	65.66	1.03
** 1000	6.08	65.47	1.02
1250	6.19	66.58	1.04
1600	6.40	68.91	1.08
** 2000	6.39	68.78	1.07
2500	6.61	71.12	1.11
3150	6.69	71.98	1.12
** 4000	6.84	73.61	1.15
5000	6.95	74.79	1.17

**SAA = 1.00**

**NRC = 1.00**

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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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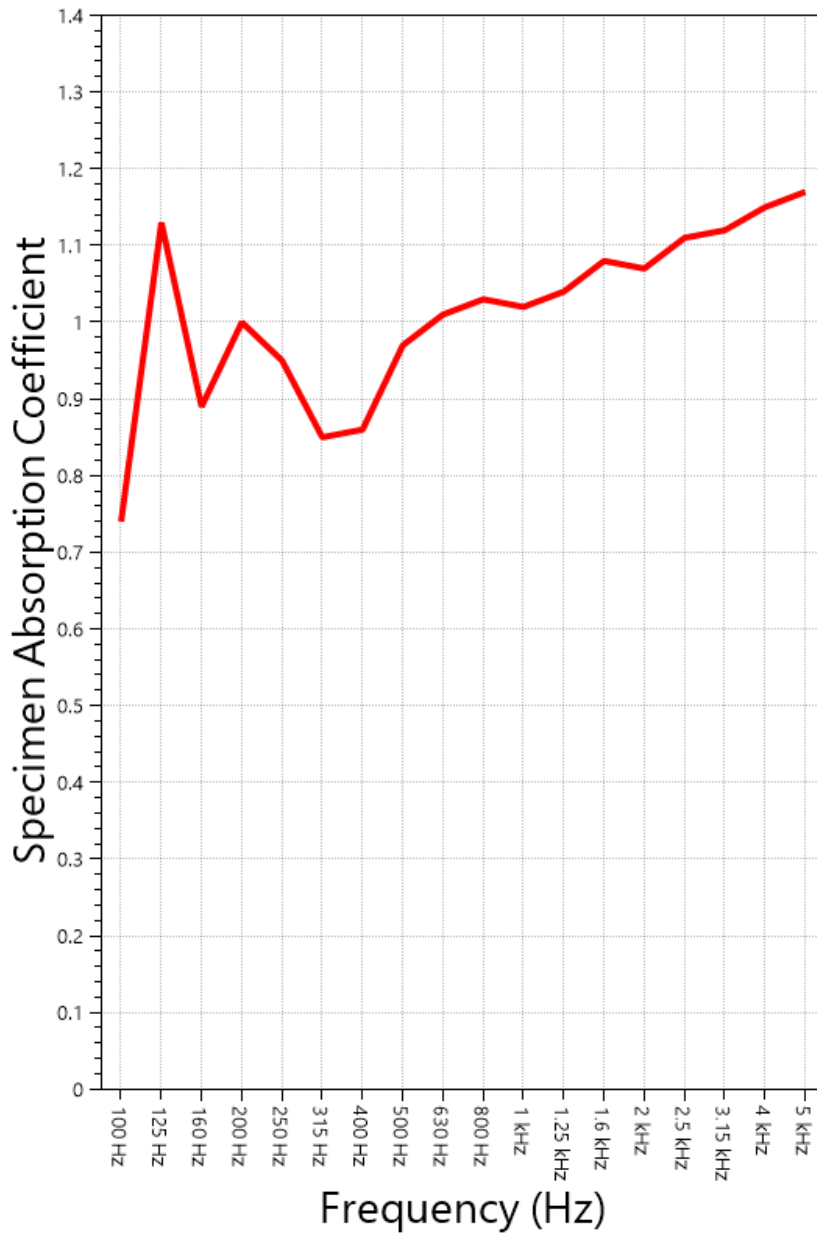
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### SOUND ABSORPTION REPORT

Urban ceiling tiles, weighted deep



**SAA = 1.00**

**NRC = 1.00**

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

Specimen: Urban ceiling tiles, weighted deep (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	14.54	0.23
40	41.45	0.65
50	29.66	0.46
63	47.91	0.75
80	23.59	0.37
100	47.65	0.74
125	72.36	1.13
160	57.02	0.89
200	63.78	1.00
250	60.80	0.95
315	54.49	0.85
400	54.82	0.86
500	62.23	0.97
630	64.58	1.01
800	65.66	1.03
1000	65.47	1.02
1250	66.58	1.04
1600	68.91	1.08
2000	68.78	1.07
2500	71.12	1.11
3150	71.98	1.12
4000	73.61	1.15
5000	74.79	1.17
6300	76.00	1.19
8000	80.75	1.26
10000	81.92	1.28
12500	84.91	1.33



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

Specimen: Urban ceiling tiles, weighted deep (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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