

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

An ALION Technical Center

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WALLACE CLEMENT SABINE

Test Report

FOR: **Turf Design**
Elgin, IL

Sound Absorption
RAL™-A18-386

Page 1 of 8

CONDUCTED: 2018-11-21

ON: Urban tiles, weighted deep, 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 deep, 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

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

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: 7
Overall Thickness: 203.2 mm (8 in.)

Tile Type B

Quantity: 5
Overall Thickness: 152.4 mm (6 in.)

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Test Report

Turf Design
2018-11-21

RAL™-A18-386

Page 2 of 8

Test Specimen, Layer 2 (continued)

Tile Type C

Quantity: 3
Overall Thickness: 101.6 mm (4 in.)

Tile Type D

Quantity: 1
Overall Thickness: 50.8 mm (2 in.)

Overall Weight: 13.95 kg (30.75 lbs)
Installation: Loose laid over Layer 1

Specimen Configuration

(test chamber east wall)

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

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: 31.86 kg (70.25 lbs)
Mass per Unit Area: 5.35 kg/m² (1.1 lbs/ft²)
Calculation Area: 5.95 m² (64 ft²)

Test Environment

Room Volume: 291.98 m³
Temperature: 20.2 °C ± 0.0 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity: 63.2 % ± 0.2 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure: 99.7 kPa (Requirement not defined)

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Test Report

Turf Design
2018-11-21

RAL™-A18-386

Page 3 of 8

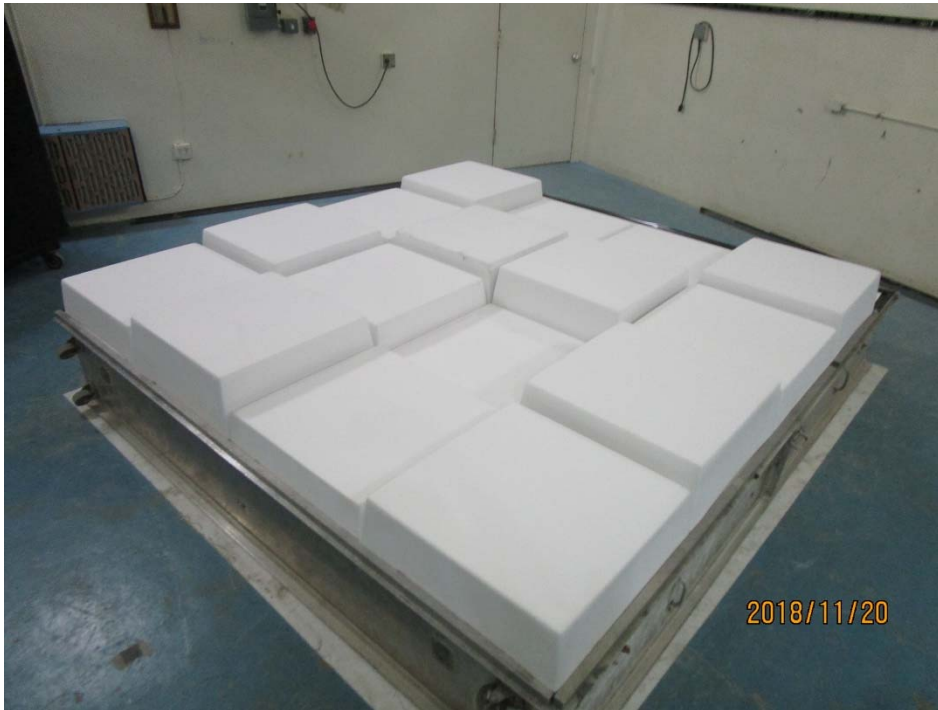


Figure 1 – Specimen mounted in test chamber, as viewed from southeast corner of test chamber

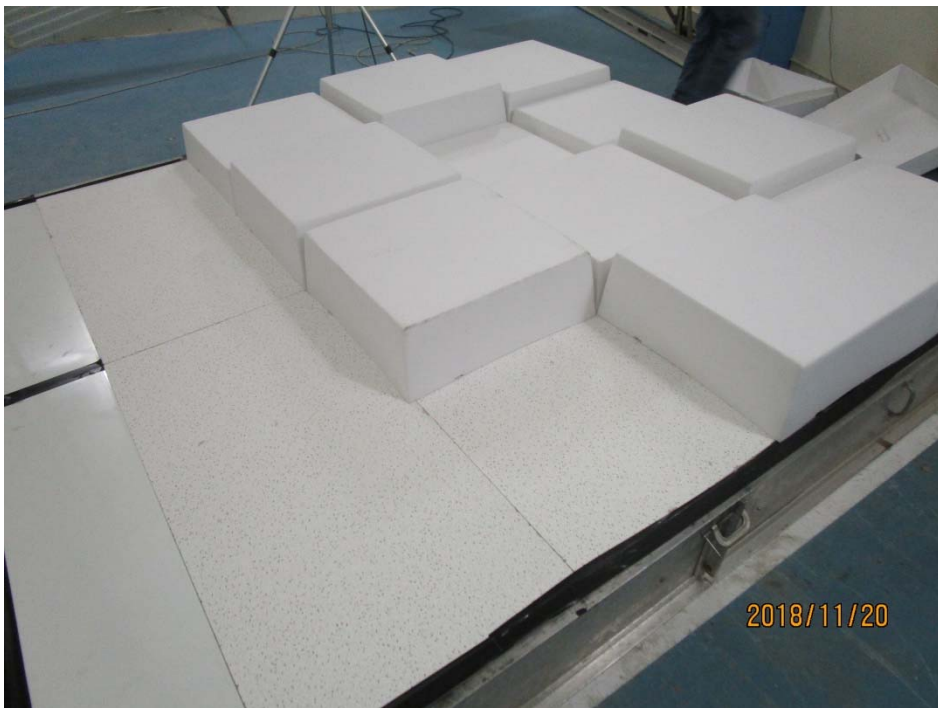


Figure 2 – Layer 2 partially installed over Layer 1

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Test Report

Turf Design
2018-11-21

RAL™-A18-386

Page 4 of 8

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 ²)	Total Absorption (Sabins)	Absorption Coefficient
100	4.80	51.65	0.81
** 125	5.08	54.71	0.85
160	5.43	58.46	0.91
200	6.06	65.22	1.02
** 250	6.53	70.26	1.10
315	6.95	74.77	1.17
400	7.79	83.85	1.31
** 500	7.97	85.76	1.34
630	7.74	83.27	1.30
800	7.54	81.15	1.27
** 1000	7.41	79.75	1.24
1250	7.62	82.07	1.28
1600	7.53	81.04	1.26
** 2000	7.54	81.15	1.27
2500	7.62	82.05	1.28
3150	7.76	83.50	1.30
** 4000	7.98	85.90	1.34
5000	7.91	85.13	1.33

SAA = 1.24

NRC = 1.25

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Test Report

Turf Design

2018-11-21

RAL™-A18-386


Page 5 of 8

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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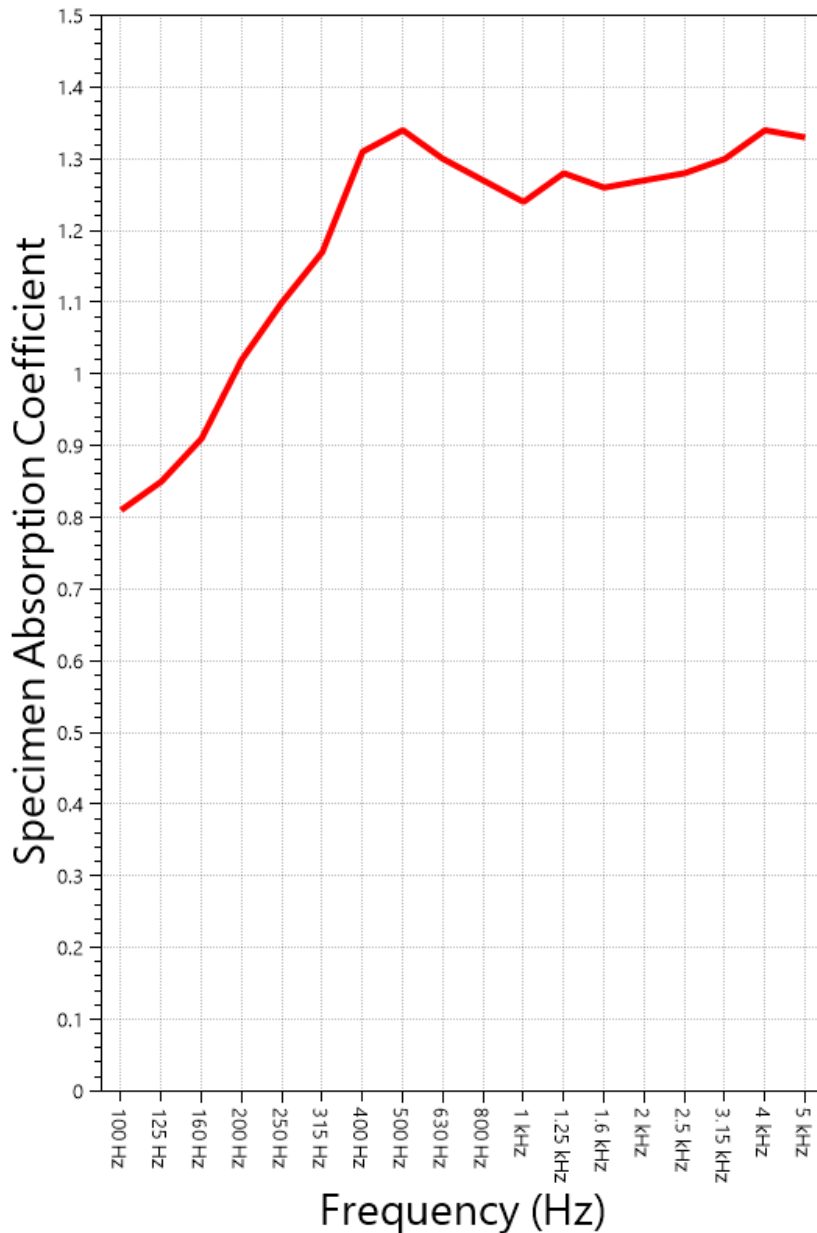
Turf Design
2018-11-21

RAL™-A18-386

Page 6 of 8

SOUND ABSORPTION REPORT

Urban tiles, weighted deep, over fissured ceiling tiles



SAA = 1.24

NRC = 1.25

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Test Report

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Turf Design
2018-11-21

RAL™-A18-386

Page 7 of 8

APPENDIX A: Extended Frequency Range Data

Specimen: Urban tiles, weighted deep, 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	27.03	0.42
40	27.89	0.44
50	15.95	0.25
63	28.54	0.45
80	53.43	0.83
100	51.65	0.81
125	54.71	0.85
160	58.46	0.91
200	65.22	1.02
250	70.26	1.10
315	74.77	1.17
400	83.85	1.31
500	85.76	1.34
630	83.27	1.30
800	81.15	1.27
1000	79.75	1.24
1250	82.07	1.28
1600	81.04	1.26
2000	81.15	1.27
2500	82.05	1.28
3150	83.50	1.30
4000	85.90	1.34
5000	85.13	1.33
6300	86.93	1.36
8000	90.41	1.41
10000	88.68	1.38
12500	97.58	1.52

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Test Report

Turf Design
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RAL™-A18-386

Page 8 of 8

APPENDIX B: Instruments of Traceability

Specimen: Urban tiles, weighted deep, over fissured ceiling tiles (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-4/2	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
Omega Digital Temp., Humid. And Pressure Recorder	OM-CP- PRHTemp2000	P97844	2018-02-03	2019-02-03

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