

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™-A18-323

Page 1 of 7

CONDUCTED: 2018-09-28

ON: Pyramid 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 measuring procedure and room qualifications is available upon request.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as Pyramid ceiling tiles. A full external visual inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

Panel

Trade Name:	Pyramid
Material ID:	03862
Materials:	Formed polyethylene terephthalate felt
Dimensions:	16 @ 609.6 mm (24 in.) x 609.6 mm (24 in.)
Wall Thickness:	5 mm (0.197 in.)
Overall Thickness:	Minimum @ 50.29 mm (1.98 in.) Maximum @ 196.85 mm (7.75 in.)
Overall Weight:	10.77 kg (23.75 lbs)
Installation:	Arranged such that divot feature on all tiles is oriented toward south wall of test chamber

Physical Measures

Size:	2.44 m (96.0 in) wide by 2.44 m (96.0 in) long
Thickness:	0.2 m (7.75 in)
Weight:	10.77 kg (23.75 lbs)
Mass per Unit Area:	1.81 kg/m² (0.37 lbs/ft²)
Calculation Area:	5.946 m² (64 ft²)

Test Environment

Room Volume:	291.98 m³
Temperature:	20.9 °C ± 0.0 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity:	67.35 % ± 0.1 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure:	99.1 kPa (Requirement not defined)



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Test Report

Turf Design
2018-09-28

RAL™-A18-323

Page 2 of 7



Figure 1 – Specimen mounted in test chamber



Figure 2 – Detail of individual tile

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Test Report

Turf Design
2018-09-28

RAL™-A18-323

Page 3 of 7

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 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 ²)	Total Absorption (Sabins)	Absorption Coefficient
100	5.21	56.08	0.88
** 125	6.98	75.09	1.17
160	4.57	49.20	0.77
200	5.44	58.57	0.92
** 250	5.83	62.79	0.98
315	5.21	56.12	0.88
400	4.83	51.97	0.81
** 500	5.10	54.86	0.86
630	5.52	59.43	0.93
800	5.52	59.47	0.93
** 1000	5.63	60.62	0.95
1250	5.58	60.06	0.94
1600	5.76	61.96	0.97
** 2000	5.86	63.08	0.99
2500	5.70	61.36	0.96
3150	5.80	62.43	0.98
** 4000	6.04	65.00	1.02
5000	6.23	67.05	1.05

SAA = 0.93

NRC = 0.95

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Test Report

Turf Design

2018-09-28

RAL™-A18-323


Page 4 of 7

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


Marc Sciaky
Experimentalist

Report by


Malcolm Kelly
Acoustician

Approved by


Eric P. Wolfram
Laboratory Manager

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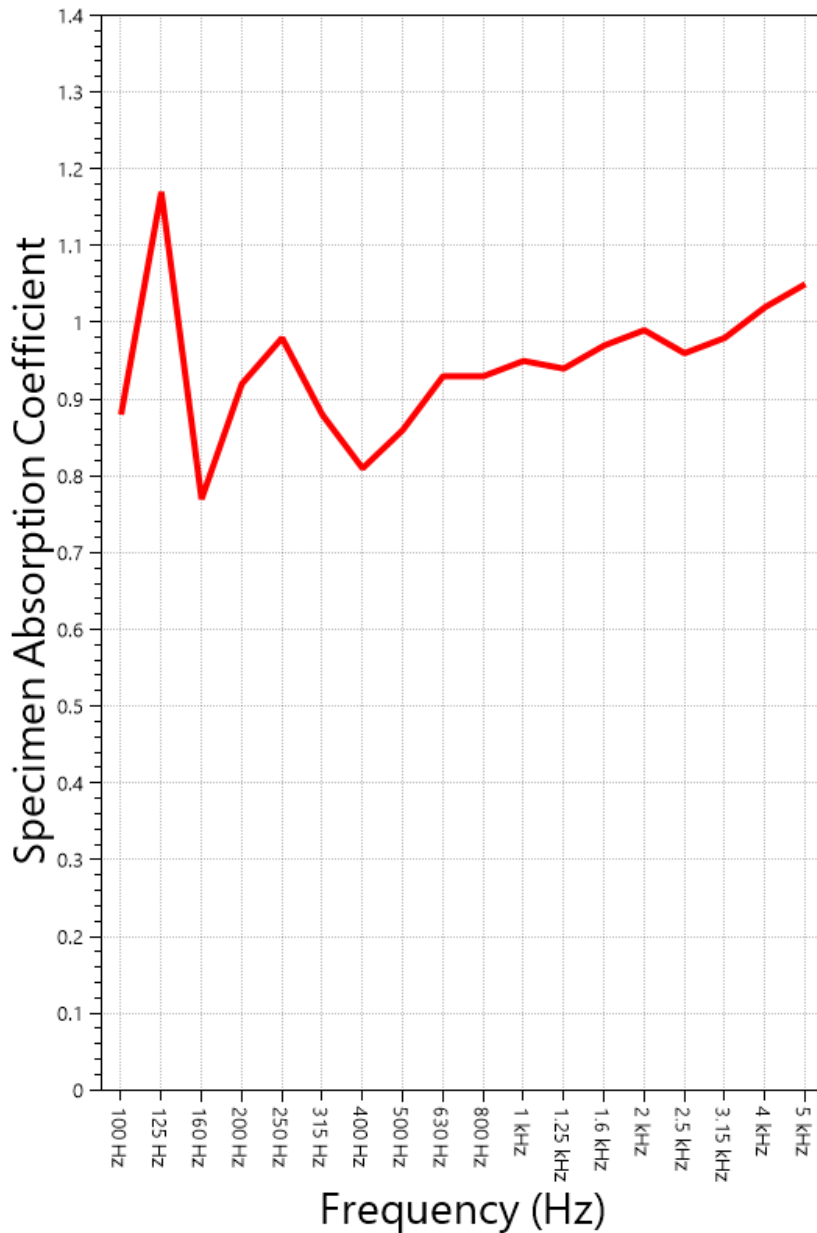
Turf Design
2018-09-28

RAL™-A18-323

Page 5 of 7

SOUND ABSORPTION REPORT

Pyramid ceiling tiles



SAA = 0.93

NRC = 0.95

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Test Report

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Turf Design
2018-09-28

RAL™-A18-323

Page 6 of 7

APPENDIX A: Extended Frequency Range Data

Specimen: Pyramid 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	14.68	0.23
40	14.62	0.23
50	26.48	0.41
63	41.23	0.64
80	29.88	0.47
100	56.08	0.88
125	75.09	1.17
160	49.20	0.77
200	58.57	0.92
250	62.79	0.98
315	56.12	0.88
400	51.97	0.81
500	54.86	0.86
630	59.43	0.93
800	59.47	0.93
1000	60.62	0.95
1250	60.06	0.94
1600	61.96	0.97
2000	63.08	0.99
2500	61.36	0.96
3150	62.43	0.98
4000	65.00	1.02
5000	67.05	1.05
6300	66.04	1.03
8000	70.74	1.11
10000	70.80	1.11
12500	70.77	1.11

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Turf Design
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RAL™-A18-323

Page 7 of 7

APPENDIX B: Instruments of Traceability

Specimen: Pyramid 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 C	Type 4943-B-001	2311439	2018-03-27	2019-03-27
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

END