1512 S BATAVIA AVENUE
GENEVA, IL 60134

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WALLACE CLEMENT SABINE

SPONSOR: **Turf Design**
Elgin, IL

Sound Absorption
RAL™-A19-052

CONDUCTED: 2019-02-14

ON: Torrent Tile

TEST METHODOLOGY

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 are available upon request. The results presented in this report apply to the sample as received from the test sponsor.

INFORMATION PROVIDED BY SPONSOR

The test specimen was designated by the sponsor as Torrent Tile. The following nominal product information was provided by the sponsor prior to testing. The accuracy of such sponsor-provided information can affect the validity of the test results.

Product Under Test

Trade Name:	Torrent Tile
Manufacturer:	Turf Design

SPECIMEN MEASUREMENTS & TEST CONDITIONS

Through a full external visual inspection performed on the test specimen, Riverbank personnel verified the following information:

Test Specimen

Material:	Polyethylene terephthalate felt
Dimensions:	12 tiles @ 762 mm (30 in.) x 762 mm (30 in.)
Key Geometry:	18 mm (0.709 in.) thick felt base
	Sixteen (16) felt fins per tile, each 9 mm (0.354 in.) thick
	Mounted in precut slots in base, spaced 47.5 mm (1.87 in.) on center
Depth Profile:	Sinusoidal, minimum and maximum at endpoints of outermost fins
	Range of depth varies sinusoidally from fin to fin
	Maximum protrusion from base @ 139 mm (5.472 in.)
	Minimum protrusion from base @ 37 mm (1.457 in.)
Overall Weight:	46.95 kg (103.5 lbs)

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Overall Specimen Properties

Size:	2.29 m (90.0 in) wide by 3.05 m (120.0 in) long
Thickness:	0.16 m (6.25 in)
Weight:	46.95 kg (103.5 lbs)
Mass per Unit Area:	6.74 kg/m² (1.38 lbs/ft²)
Calculation Area:	6.968 m² (75 ft²)

Test Environment

Room Volume:	291.98 m³
Temperature:	21.3 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity:	65.65 % ± 0.7 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure:	97.1 kPa (Requirement not defined)

MOUNTING METHOD

Type A Mounting: The test specimen was laid directly against the test surface. Perimeter edges were sealed with metal framing.

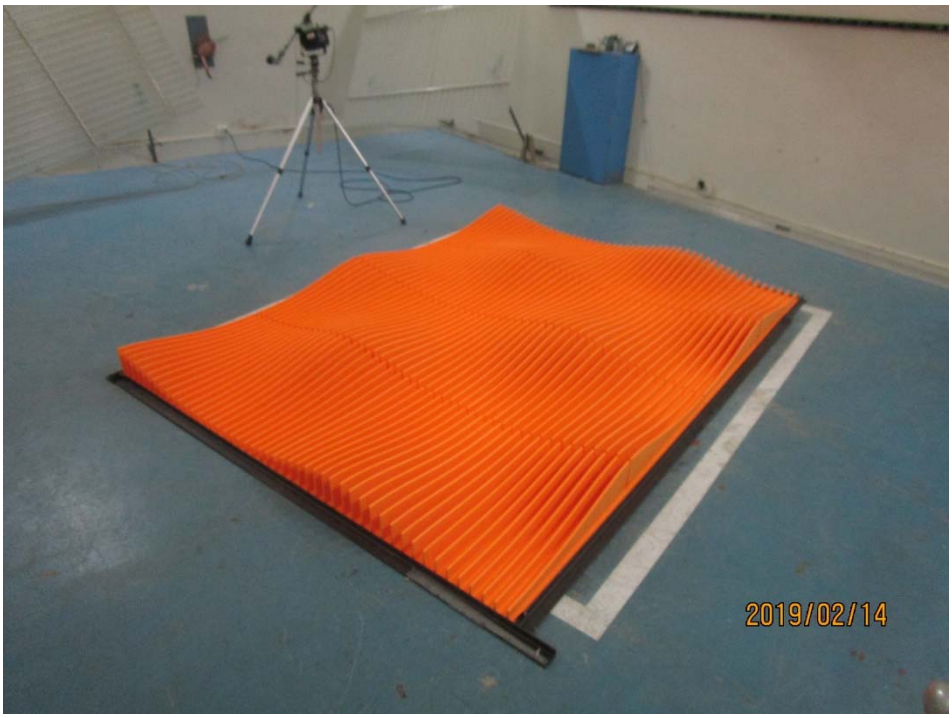

Figure 1 – Specimen mounted in test chamber

Figure 2 – Detail of specimen material

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Figure 3 – Individual fin depth profile, fin to fin endpoint depth profile

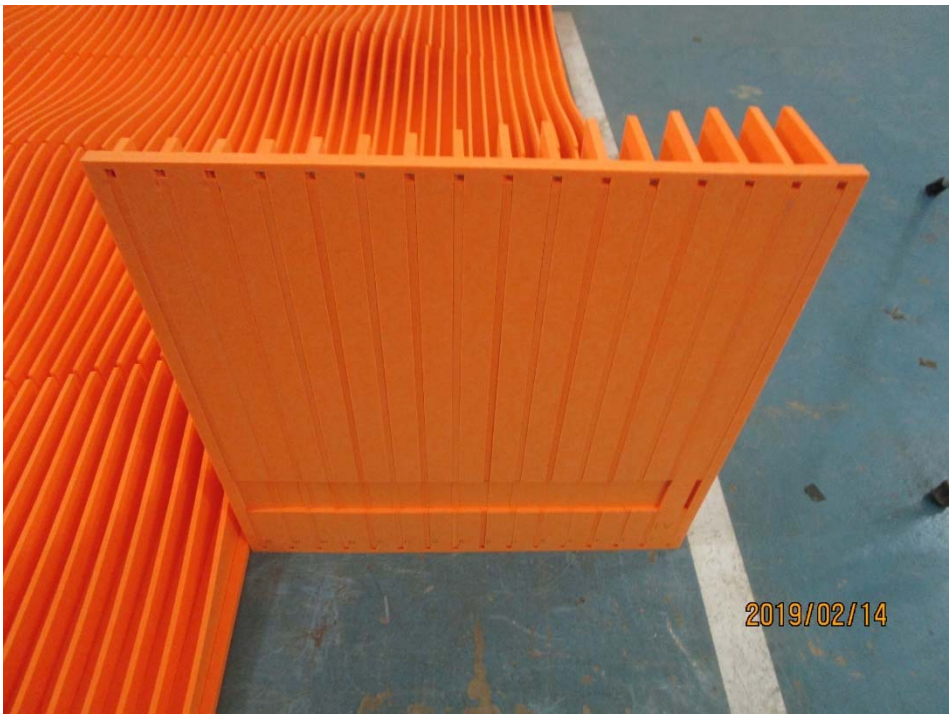

Figure 4 – Individual tile base

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TEST RESULTS

Specimen total absorption and absorption coefficient are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages.

1/3 Octave Center Frequency (Hz)	Total Absorption (m^2)	Total Absorption (Sabins)	Absorption Coefficient
100	0.48	5.22	0.07
** 125	0.78	8.40	0.11
160	0.86	9.23	0.12
200	1.59	17.10	0.23
** 250	2.38	25.61	0.34
315	3.90	41.94	0.56
400	4.83	51.96	0.69
** 500	5.97	64.31	0.86
630	6.34	68.26	0.91
800	6.57	70.75	0.94
** 1000	6.68	71.90	0.96
1250	7.26	78.18	1.04
1600	7.45	80.19	1.07
** 2000	7.42	79.87	1.06
2500	7.60	81.85	1.09
3150	7.63	82.09	1.09
** 4000	7.72	83.14	1.11
5000	7.97	85.74	1.14

SAA = 0.81
NRC = 0.80

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TEST RESULTS (continued)

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

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

Tested by _____
Marc Sciaky
Senior Experimentalist

Report by _____
Malcolm Kelly
Test Engineer, Acoustician

Approved by _____
Eric P. Wolfram
Laboratory Manager

Digitally signed by Eric P Wolfram
DN: cn=Eric P Wolfram, o=Alion Science & Technology, ou=Riverbank Acoustical Laboratories, email=ewolfram@alionscience.com, c=US
Date: 2019.04.16 13:38:05 -05'00'

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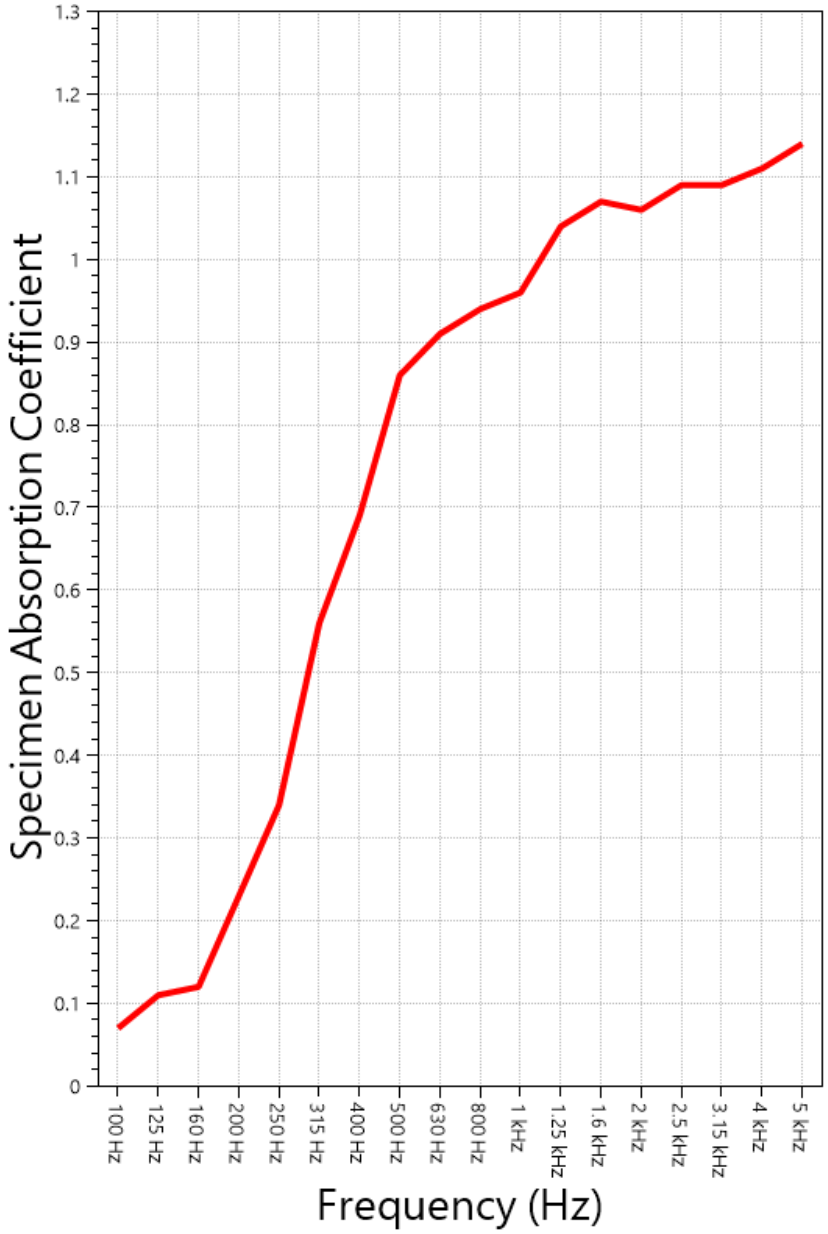
SOUND ABSORPTION REPORT

Torrent Tile



SAA = 0.81
NRC = 0.80

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APPENDIX A: Extended Frequency Range Data

Specimen: Torrent Tile (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	9.95	0.13
40	-1.62	-0.02
50	4.41	0.06
63	0.14	0.00
80	0.19	0.00
100	5.22	0.07
125	8.40	0.11
160	9.23	0.12
200	17.10	0.23
250	25.61	0.34
315	41.94	0.56
400	51.96	0.69
500	64.31	0.86
630	68.26	0.91
800	70.75	0.94
1000	71.90	0.96
1250	78.18	1.04
1600	80.19	1.07
2000	79.87	1.06
2500	81.85	1.09
3150	82.09	1.09
4000	83.14	1.11
5000	85.74	1.14
6300	88.49	1.18
8000	86.73	1.16
10000	88.04	1.17
12500	89.43	1.19

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APPENDIX B: Instruments of Traceability

Specimen: Torrent Tile (See Full Report)

Description	Model	Serial Number	Date of Certification	Calibration Due
System 1	Type 3160-A-042	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
EXTECH Hygro 662	SD700	A083662	2018-11-29	2019-11-29

APPENDIX C: Revisions to Original Test Report

Specimen: Torrent Tile (See Full Report)

Date	Revision
2019-02-18	Original report issued

END

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