1512 S BATAVIA AVENUE
GENEVA, IL 60134

630-232-0104

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FOUNDED 1918 BY
WALLACE CLEMENT SABINE

SPONSOR: **Turf Design**
Elgin, IL

Sound Absorption
RAL™-A20-035

CONDUCTED: 2020-01-13

ON: 3D Hex Tiles

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 17025:2017 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 3D Hex Tiles. 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:	3D Hex Tile
Material:	Polyethylene terephthalate felt
Manufacturer:	Turf Design

SPECIMEN MEASUREMENTS & TEST CONDITIONS

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

Test Specimen

Material:	Notched and folded semirigid felt paneling
Dimensions:	80 regular hexagons, maximal diameter @ 342.9 mm (13.5 in.)
Depth:	Maximum @ 58.67 mm (2.31 in.) Minimum @ 18 mm (0.709 in.)
Overall Weight:	34.47 kg (76 lbs)
Installation:	Tiles oriented such that depth profile remains continuous across all joints

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Overall Specimen Properties

Size:	2.69 m (105.875 in) wide by 2.55 m (100.5 in) long
Thickness:	0.06 m (2.31 in)
Weight:	34.47 kg (76.0 lbs)
Mass per Unit Area:	5.02 kg/m² (1.03 lbs/ft²)
Calculation Area:	6.865 m² (73.89 ft²)

Test Environment

Room Volume:	291.98 m³
Temperature:	21.2 °C ± 0.0 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity:	64.15 % ± 3.3 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure:	99.9 kPa (Requirement not defined)

MOUNTING METHOD

Type A Mounting: The test specimen was laid directly against the test surface. Per sponsor request, the perimeter edges were left exposed, as would be typical of a field installation of the product under test.

Figure 1 – Specimen mounted in test chamber

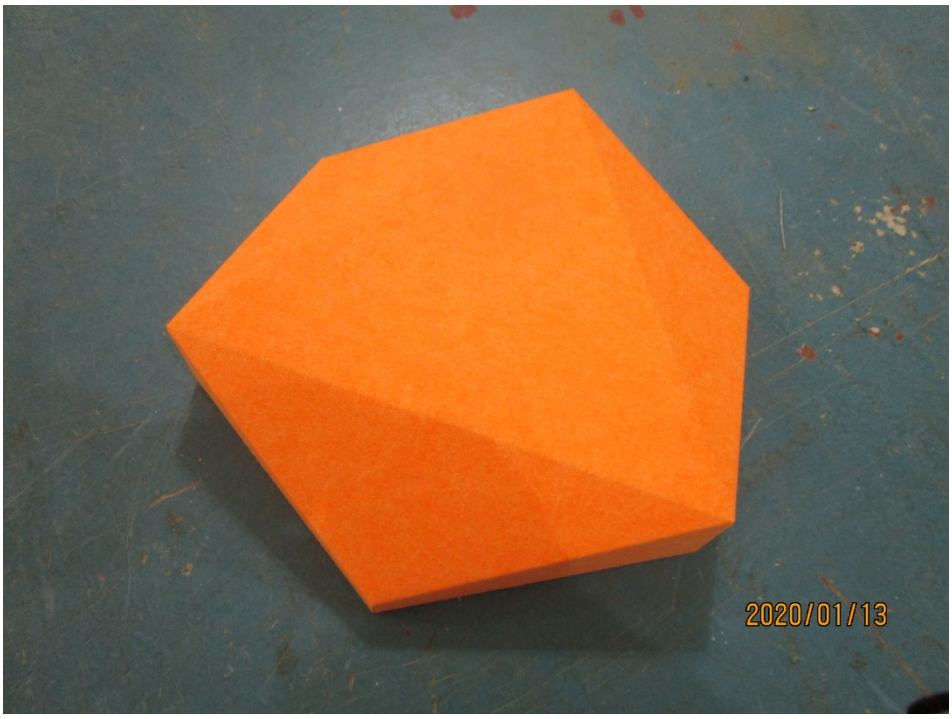

Figure 2 – Detail of individual tile

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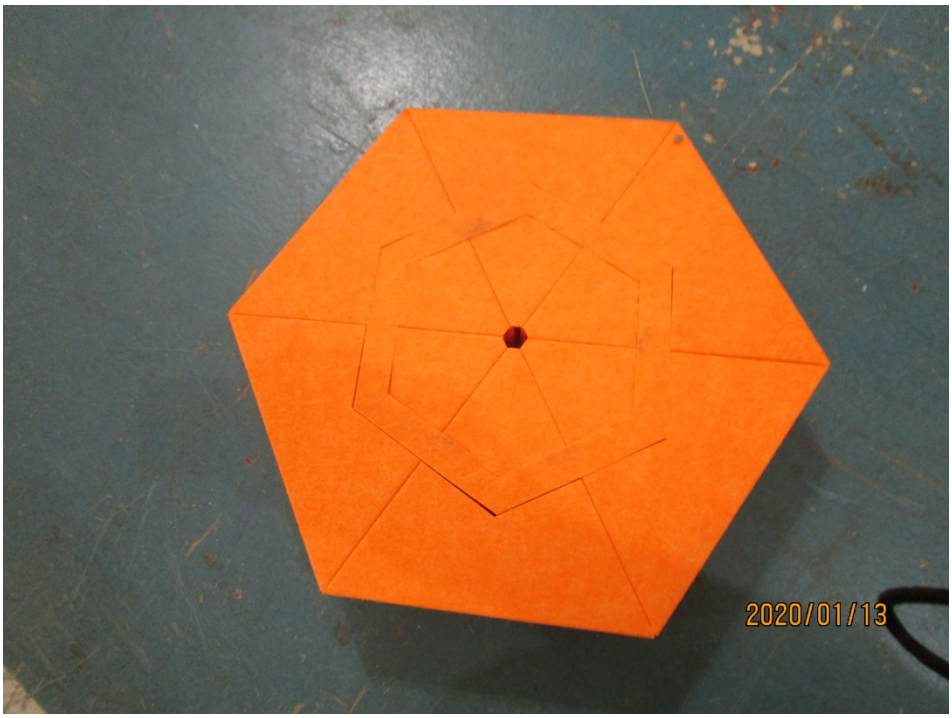

Figure 3 – Underside of individual tile, folded felt panel construction

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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	1.13	12.17	0.16
** 125	1.01	10.82	0.15
160	1.29	13.87	0.19
200	2.30	24.73	0.33
** 250	2.95	31.73	0.43
315	4.31	46.39	0.63
400	5.27	56.72	0.77
** 500	6.50	69.96	0.95
630	7.15	76.91	1.04
800	7.37	79.31	1.07
** 1000	7.43	79.97	1.08
1250	7.38	79.45	1.08
1600	7.56	81.37	1.10
** 2000	7.40	79.60	1.08
2500	7.08	76.21	1.03
3150	7.07	76.12	1.03
** 4000	7.28	78.35	1.06
5000	7.20	77.55	1.05

SAA = 0.88
NRC = 0.90

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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

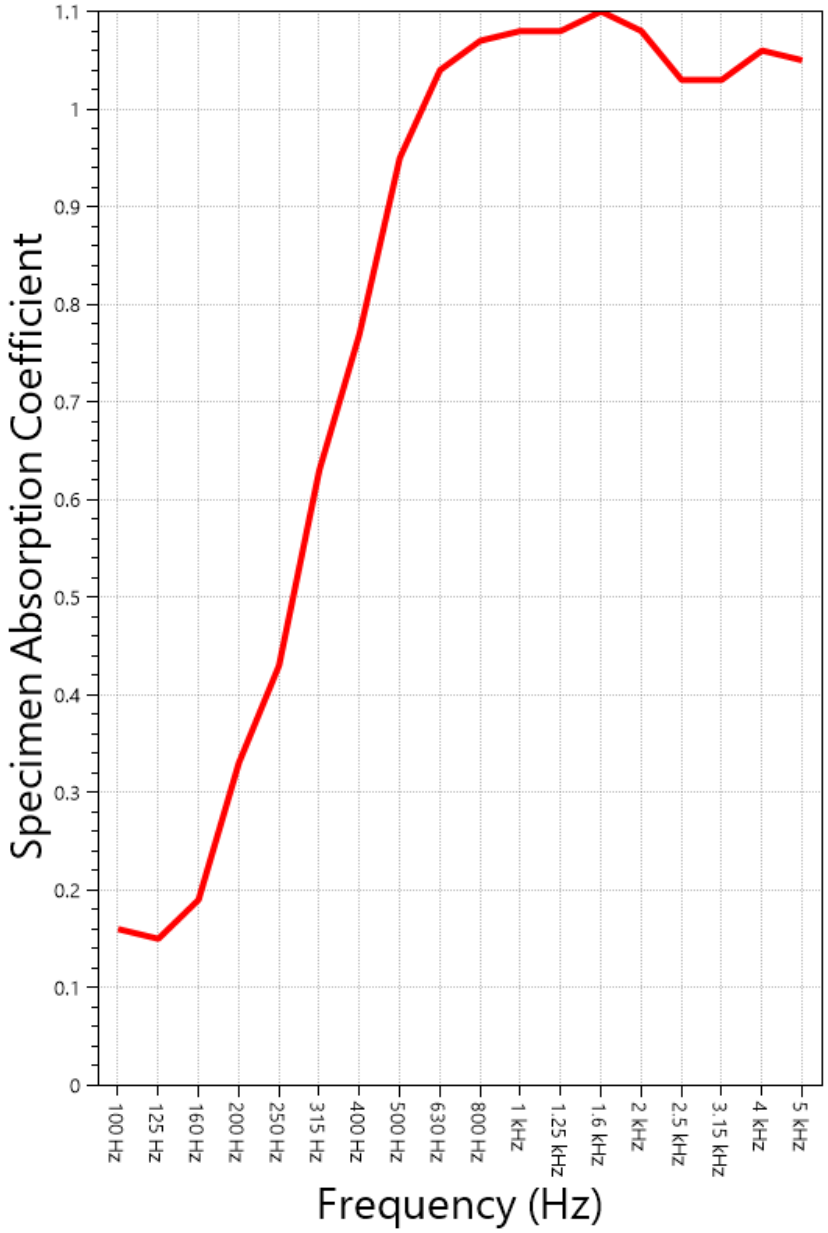
Report by_____
Malcolm Kelly
Acoustical Test Engineer

Approved by_____
Eric P. Wolfram
Laboratory Manager

Digitally signed by Eric P Wolfram
Location: Geneva, IL
Date: 2020.01.20 15:01:47 -06'00'

SOUND ABSORPTION REPORT

3D Hex Tiles



SAA = 0.88
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APPENDIX A: Extended Frequency Range Data

Specimen: 3D Hex 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	-0.50	-0.01
40	1.71	0.02
50	5.60	0.08
63	-1.10	-0.01
80	10.79	0.15
100	12.17	0.16
125	10.82	0.15
160	13.87	0.19
200	24.73	0.33
250	31.73	0.43
315	46.39	0.63
400	56.72	0.77
500	69.96	0.95
630	76.91	1.04
800	79.31	1.07
1000	79.97	1.08
1250	79.45	1.08
1600	81.37	1.10
2000	79.60	1.08
2500	76.21	1.03
3150	76.12	1.03
4000	78.35	1.06
5000	77.55	1.05
6300	74.84	1.01
8000	67.22	0.91
10000	60.36	0.82
12500	42.62	0.58

APPENDIX B: Instruments of Traceability

Specimen: 3D Hex Tiles (See Full Report)

Description	Model	Serial Number	Date of Certification	Calibration Due
System 1	Type 3160-A-042	3160-106968	2019-06-25	2020-06-25
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2019-09-27	2020-09-27
Bruel & Kjaer Pistonphone	Type 4228	2781248	2019-08-09	2020-08-09
EXTECH Hygro 662	SD700	A083662	2019-12-04	2020-12-04

APPENDIX C: Revisions to Original Test Report

Specimen: 3D Hex Tiles (See Full Report)

Date	Revision
2020-01-17	Original report issued

END

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