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

An ALION Technical Center

Test Report

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WALLACE CLEMENT SABINE

FOR: **TURF**
Elgin, IL

Sound Absorption
RAL™-A19-036

CONDUCTED: 2019-01-25

ON: Switchblade AF 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 are available upon request.

DESCRIPTION OF THE SPECIMEN

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

Test Specimen (in order of installation)

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.)
	2 @ 1212.85 mm (47.75 in.) x 330.2 mm (13 in.)
Thickness:	14.27 mm (0.562 in.)
Overall Weight:	20.3 kg (44.75 lbs)
Layer 2	
Trade Name:	Switchblade
Material ID:	AF
Materials:	Polyethylene terephthalate felt
Tile Dimensions:	28 @ 598 mm (23.543 in.) x 28.7 mm (1.13 in.)
	3 @ 295.27 mm (11.625 in.) x 28.7 mm (1.13 in.)
Key Geometry:	Center felt piece @ 9 mm (0.354 in.) thick x 49 mm (1.929 in.) deep
	9 mm (0.354 in.) thick felt adhered to both sides of center piece
	Sinusoidal depth profile, maximum/minimum at ends
	Three (3) pieces cut to fit mounting area dimensions
Depth:	Maximum @ 236 mm (9.291 in.)
	Minimum @ 62 mm (2.441 in.)
Installation:	Mounted vertically in square grid pattern, flat edge facing Layer 1
Overall Weight:	12.25 kg (27 lbs)

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Physical Measures

Size:	2.74 m (108.0 in) wide by 2.43 m (95.5 in) long
Thickness:	0.25 m (9.893 in)
Weight:	32.55 kg (71.75 lbs)
Mass per Unit Area:	4.89 kg/m² (1.0 lbs/ft²)
Calculation Area:	6.655 m² (71.63 ft²)

Test Environment

Room Volume:	291.98 m³
Temperature:	21.3 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity:	65.4 % ± 0.6 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure:	99.5 kPa (Requirement not defined)

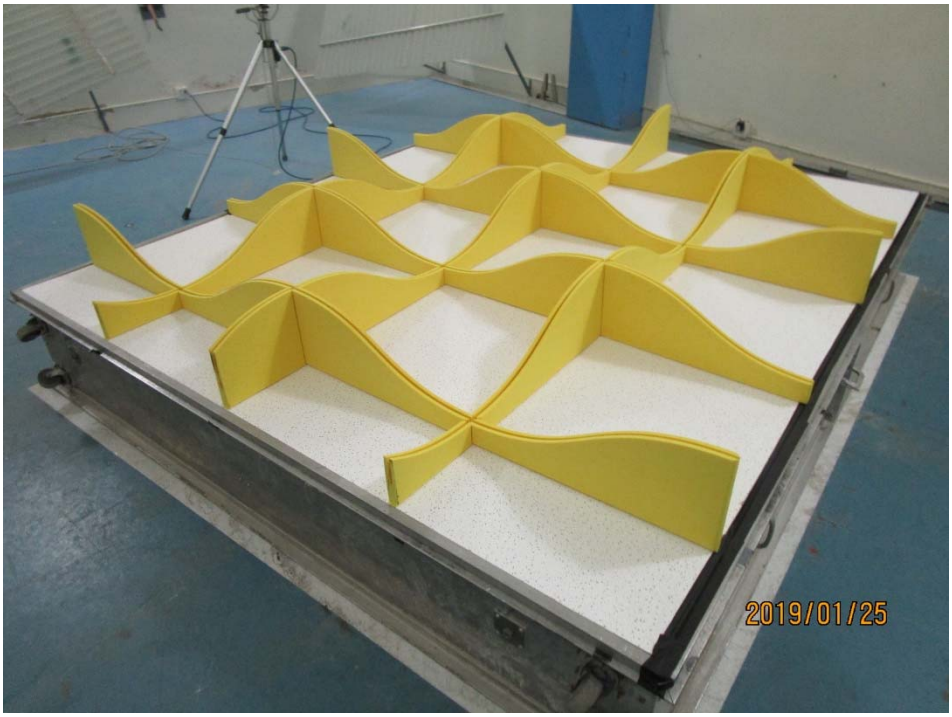

Figure 1 – Specimen mounted in test chamber

Figure 2 – Detail of fissured ceiling tile, typical Switchblade joint

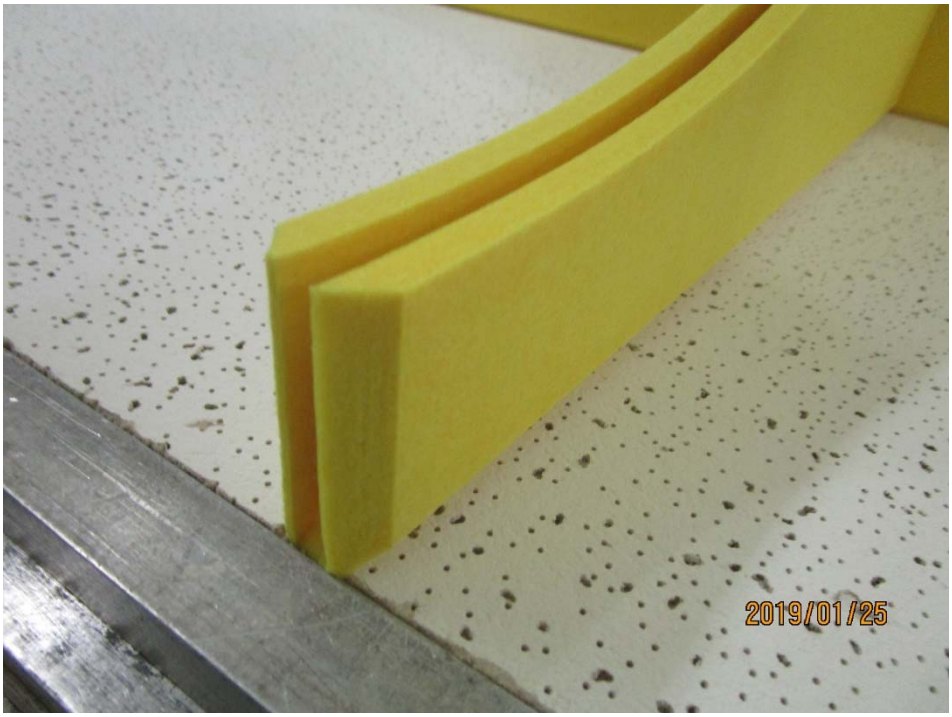

Figure 3 – Detail of Switchblade material and chamfered edges

MOUNTING METHOD

Type E-400 Mounting: The test specimen was mounted with an airspace behind it. The numeral suffix in the designation is the distance in millimeters from the test surface to the exposed face of the test specimen, 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 of Layer 1 were sealed with metal framing.

TEST RESULTS

1/3 Octave Center Frequency (Hz)	Total Absorption (m^2)	Total Absorption (Sabins)	Absorption Coefficient
100	4.66	50.13	0.70
** 125	3.70	39.88	0.56
160	3.72	40.03	0.56
200	3.85	41.39	0.58
** 250	4.18	44.99	0.63
315	4.58	49.31	0.69
400	4.72	50.78	0.71
** 500	5.40	58.16	0.81
630	5.71	61.49	0.86
800	6.00	64.58	0.90
** 1000	6.39	68.81	0.96
1250	6.67	71.80	1.00
1600	6.73	72.48	1.01
** 2000	6.70	72.08	1.01
2500	6.70	72.12	1.01
3150	6.67	71.82	1.00
** 4000	6.66	71.67	1.00
5000	6.40	68.94	0.96

SAA = 0.85
NRC = 0.85

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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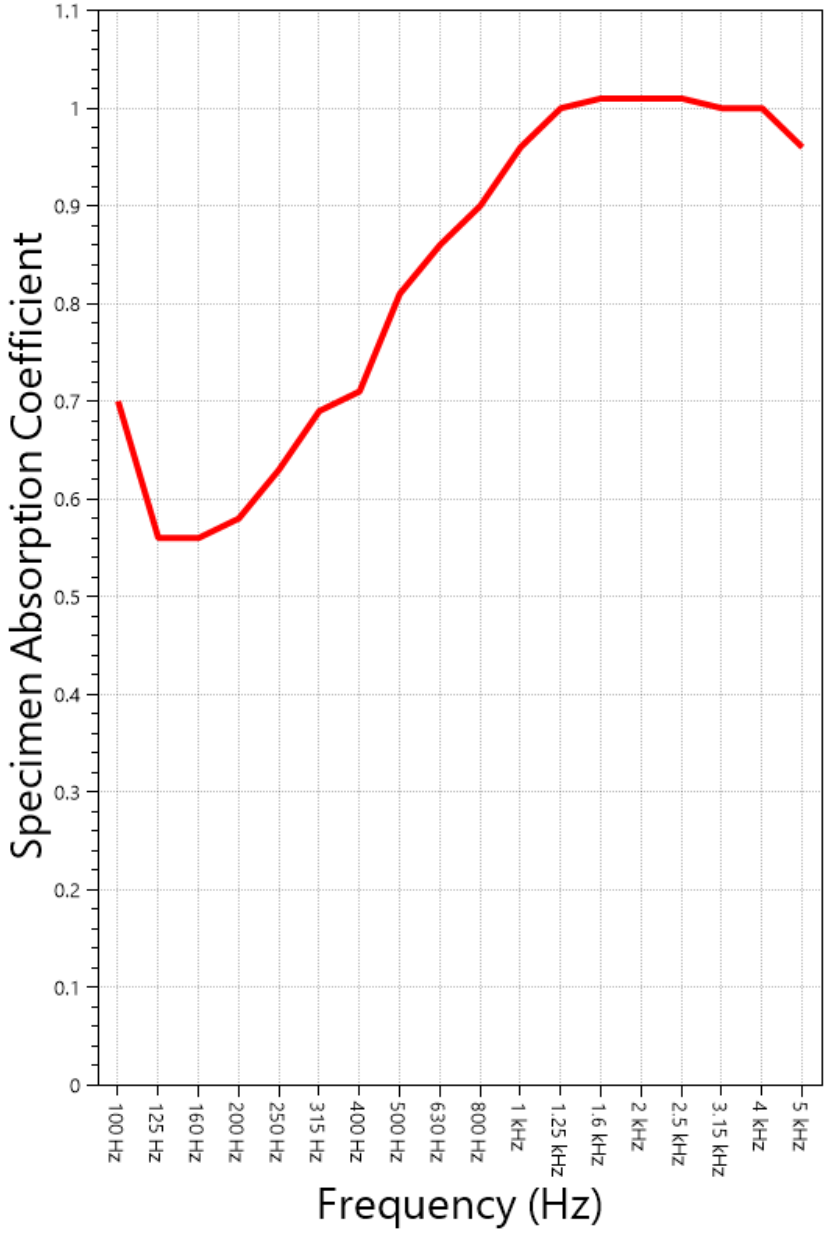
DN: cn=Eric P Wolfram, o=Alion Science & Technology, ou=Riverbank Acoustical Laboratories, email=ewolfram@alionscience.com, c=US
Date: 2019.01.28 13:04:07 -06'00'

SOUND ABSORPTION REPORT

Switchblade AF over fissured ceiling tiles



SAA = 0.85
NRC = 0.85

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APPENDIX A: Extended Frequency Range Data

Specimen: Switchblade AF 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	32.02	0.45
40	45.08	0.63
50	52.76	0.74
63	29.96	0.42
80	59.49	0.83
100	50.13	0.70
125	39.88	0.56
160	40.03	0.56
200	41.39	0.58
250	44.99	0.63
315	49.31	0.69
400	50.78	0.71
500	58.16	0.81
630	61.49	0.86
800	64.58	0.90
1000	68.81	0.96
1250	71.80	1.00
1600	72.48	1.01
2000	72.08	1.01
2500	72.12	1.01
3150	71.82	1.00
4000	71.67	1.00
5000	68.94	0.96
6300	69.16	0.97
8000	68.15	0.95
10000	63.86	0.89
12500	61.70	0.86

APPENDIX B: Instruments of Traceability

Specimen: Switchblade AF over fissured ceiling tiles (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
Omega Digital Temp., Humid. And Pressure Recorder	OM-CP-PRHTemp2000	P97844	2018-02-03	2019-02-03

END