

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

An  ALION Technical Center

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FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

## Test Report

FOR: **TURF**  
Elgin, IL

**Sound Absorption**  
**RAL™-A19-034**

CONDUCTED: 2019-01-25

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ON: Switchblade BF 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 BF 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: BF  
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 @ 151 mm (5.945 in.)  
Minimum @ 63 mm (2.48 in.)  
Installation: Mounted vertically in square grid pattern, flat edge meeting Layer 1  
Overall Weight: 9.07 kg (20 lbs)

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### Physical Measures

Size: 2.74 m (108.0 in) wide by 2.43 m (95.5 in) long  
Thickness: 0.17 m (6.507 in)  
Weight: 29.37 kg (64.75 lbs)  
Mass per Unit Area: 4.41 kg/m<sup>2</sup> (0.9 lbs/ft<sup>2</sup>)  
Calculation Area: 6.655 m<sup>2</sup> (71.63 ft<sup>2</sup>)

### Test Environment

Room Volume: 291.98 m<sup>3</sup>  
Temperature: 21.3 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)  
Relative Humidity: 65.85 % ± 0.5 % (Requirement: ≥ 40 % and ≤ 5 % change)  
Barometric Pressure: 99.6 kPa (Requirement not defined)

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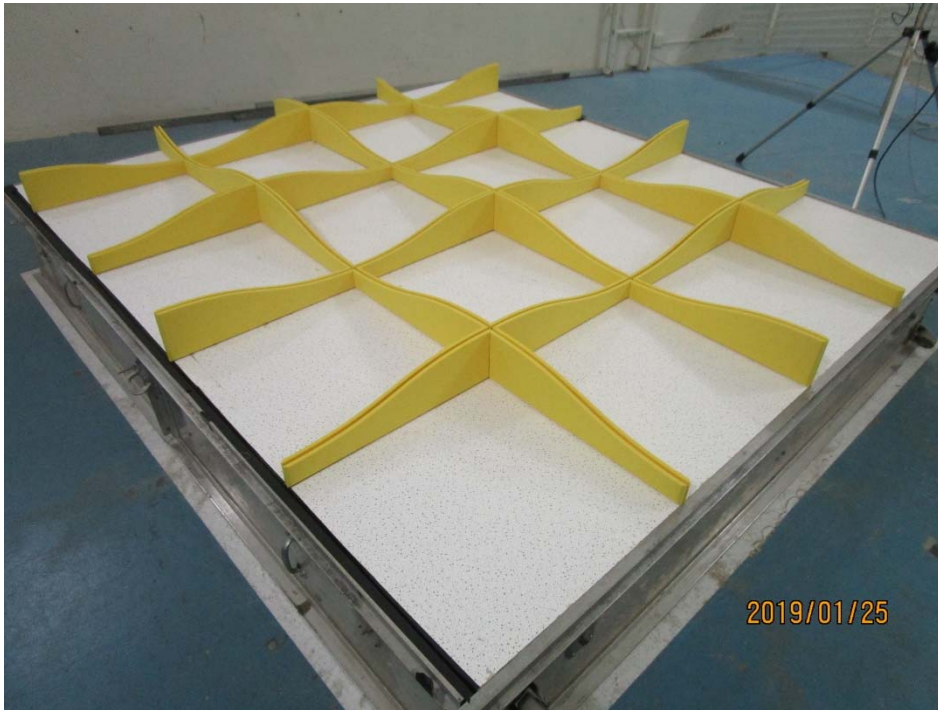


Figure 1 – Specimen mounted in test chamber

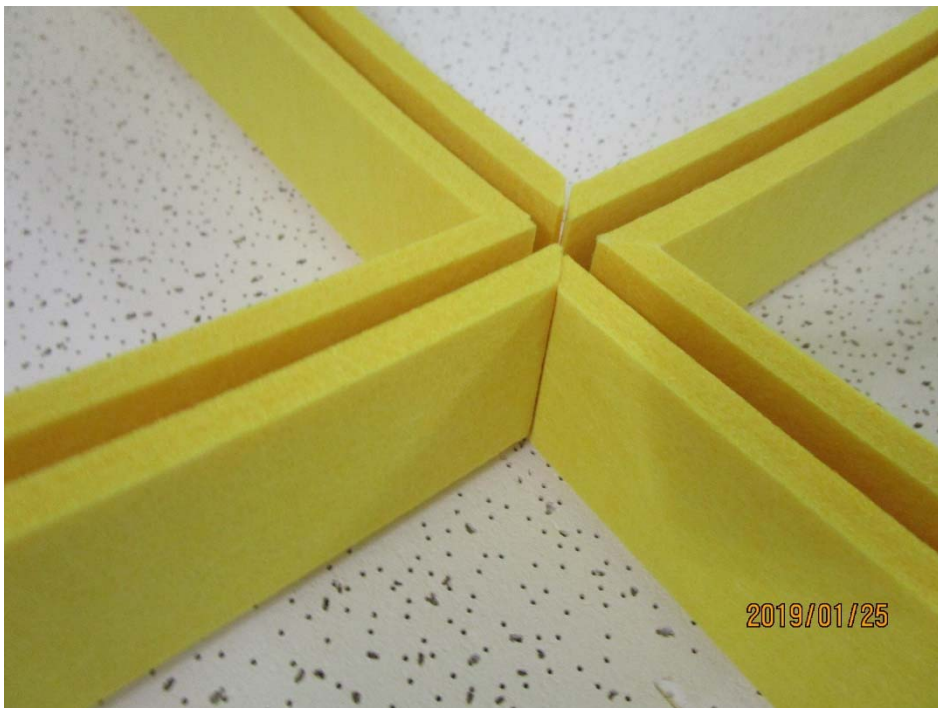


Figure 2 – Detail of fissured ceiling tile, typical Switchblade joint



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Figure 3 – Shortened Switchblade piece



Figure 4 – Detail of Switchblade material and chamfered edges

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### 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 <sup>2</sup> )	Total Absorption (Sabins)	Absorption Coefficient
100	3.55	38.24	0.53
** 125	3.77	40.59	0.57
160	3.37	36.32	0.51
200	3.23	34.72	0.48
** 250	3.42	36.85	0.51
315	3.98	42.85	0.60
400	4.22	45.39	0.63
** 500	5.23	56.30	0.79
630	5.56	59.85	0.84
800	5.76	61.97	0.87
** 1000	6.12	65.87	0.92
1250	6.11	65.77	0.92
1600	6.22	66.95	0.93
** 2000	6.14	66.07	0.92
2500	6.17	66.40	0.93
3150	6.14	66.13	0.92
** 4000	6.13	65.99	0.92
5000	5.93	63.83	0.89

**SAA = 0.78**

**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 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.

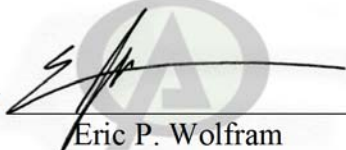
Tested by

  
Marc Sciaky  
Experimentalist

Report by

  
Malcolm Kelly  
Acoustician

Approved by

  
Eric P. Wolfram  
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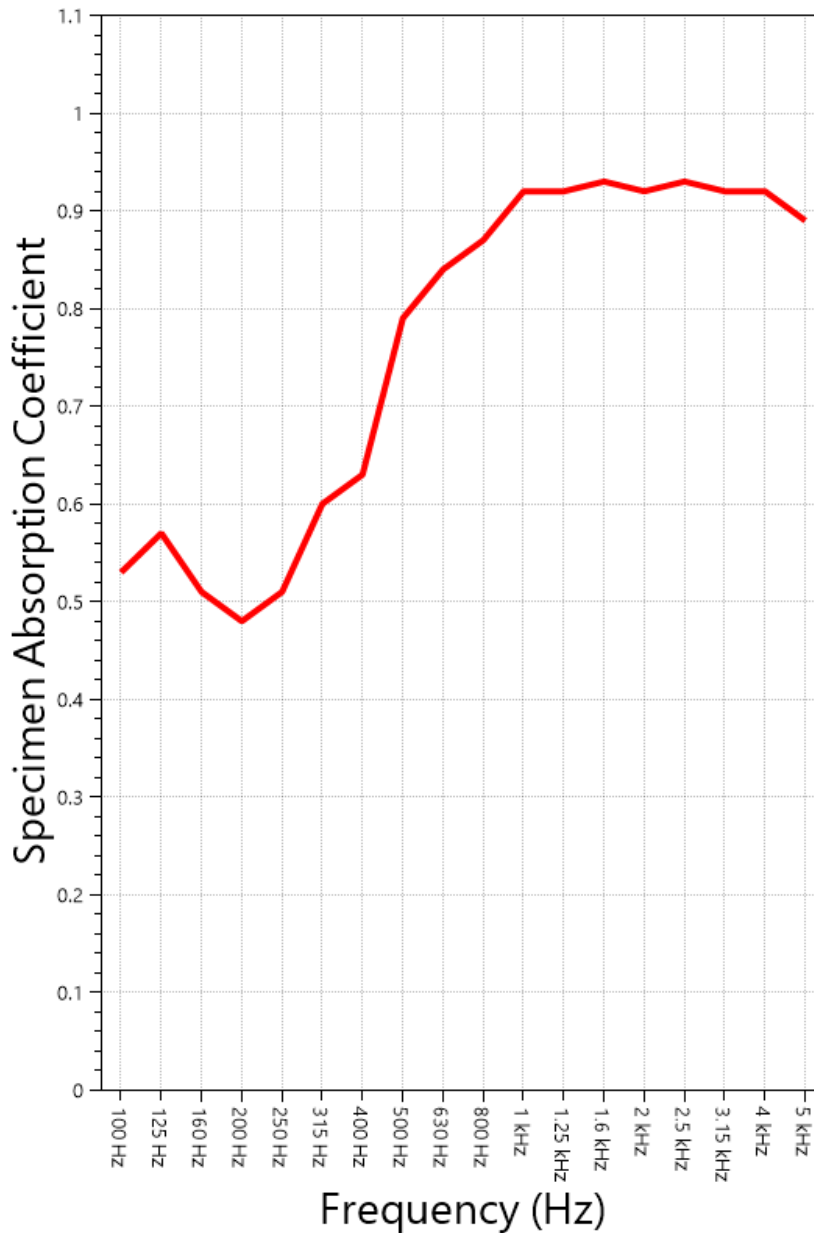
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### SOUND ABSORPTION REPORT

Switchblade BF over fissured ceiling tiles



**SAA = 0.78**

**NRC = 0.80**

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### **APPENDIX A: Extended Frequency Range Data**

Specimen: Switchblade BF 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	34.82	0.49
40	19.10	0.27
50	28.28	0.39
63	22.81	0.32
80	38.87	0.54
100	38.24	0.53
125	40.59	0.57
160	36.32	0.51
200	34.72	0.48
250	36.85	0.51
315	42.85	0.60
400	45.39	0.63
500	56.30	0.79
630	59.85	0.84
800	61.97	0.87
1000	65.87	0.92
1250	65.77	0.92
1600	66.95	0.93
2000	66.07	0.92
2500	66.40	0.93
3150	66.13	0.92
4000	65.99	0.92
5000	63.83	0.89
6300	64.31	0.90
8000	65.58	0.92
10000	59.64	0.83
12500	63.09	0.88



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### APPENDIX B: Instruments of Traceability

Specimen: Switchblade BF 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-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

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