

## Test Report

FOR: **Focal Point LLC**  
Chicago, IL

**Sound Absorption**  
**RAL-A18-165**

CONDUCTED: 2018-06-07

Page 1 of 9

ON: Seem 1 Acoustic, spaced 18 in. on center

### 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 Seem 1 Acoustic, spaced 18 in. on center. A full internal inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

#### **Spaced Baffles**

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Trade Name: Seem 1 Acoustic  
Materials: Polyethylene terephthalate felt facing @ 9 mm (0.354 in.) thick  
Internal steel frame  
Steel tray on top, acrylic lens on bottom  
Dimensions: 6 @ 2438.4 mm (96 in.) x 304.8 mm (12 in.)  
Thickness: 57.15 mm (2.25 in.)  
Overall Weight: 34.25 kg (75.5 lbs)  
Average Unit Weight: 5.72 kg (12.6 lbs)

#### **Physical Measures (per unit)**

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Dimensions: 2.44 m (96.00 in.) wide by 304.80 mm (12.00 in.) long  
Thickness: 57.15 mm (2.25 in.)  
Weight: 5.72 kg (12.60 lbs.)

#### **Test Environment**

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Volume: 292.0 m<sup>3</sup> (10,311.0 ft<sup>3</sup>)  
Temperature: 21.4±0.0°C (70.5±0.0°F)  
Humidity: 66.2±1.1%  
Barometric Pressure: 98.8 kPa.

## Test Report

**Focal Point LLC**  
2018-06-07

**RAL-A18-165**  
Page 2 of 9

Each sound absorbing unit had an absorptive area (all exposed surfaces) of 1.80 m<sup>2</sup> (19.37 ft<sup>2</sup>). The total absorptive area (all exposed surfaces) of all sound-absorbing units was 10.80 m<sup>2</sup> (116.25 ft<sup>2</sup>). The array of units covered 5.7 m<sup>2</sup> (61.33 ft<sup>2</sup>) of chamber floor surface (total treated area).

### MOUNTING METHOD

Type J Mounting: The specimen is an array of spaced sound absorbing baffles suspended from a cable such that the bottom surface of the baffles is spaced 927.1 mm (36.5 in.) from the horizontal test surface. This approximates the mounting method of a typical ceiling baffle installation. The baffles were evenly distributed in a single row, horizontally spaced 457.2 mm (18 in.) on center.

**Test Report**

**Focal Point LLC**  
2018-06-07

**RAL-A18-165**  
Page 3 of 9



Figure 1 - Specimen mounted in test chamber



Figure 2 - Detail of individual baffle

## Test Report

**Focal Point LLC**  
2018-06-07

**RAL-A18-165**

Page 4 of 9


### TEST RESULTS


Note: There is currently no standardized method for calculating Absorption Coefficients from spaced object absorbers. The sound absorption performance of spaced object absorbers should not be compared directly with specimens tested as a single rectangular area (e.g. mounting types A, E, etc.).

1/3 Octave Center Frequency (Hz)	Total Absorption (SI) (m <sup>2</sup> )	Total Absorption (IP) (Sabins)	Absorption (Sabins/Unit)
100	0.95	10.25	1.71
** 125	1.40	15.09	2.51
160	1.39	14.99	2.50
200	1.90	20.43	3.41
** 250	2.63	28.30	4.72
315	3.26	35.11	5.85
400	3.52	37.86	6.31
** 500	4.03	43.38	7.23
630	4.72	50.84	8.47
800	5.51	59.34	9.89
** 1000	6.08	65.42	10.90
1250	6.75	72.63	12.11
1600	7.11	76.59	12.76
** 2000	7.45	80.17	13.36
2500	7.38	79.43	13.24
3150	7.36	79.21	13.20
** 4000	7.40	79.68	13.28
5000	7.62	82.00	13.67

Tested by   
Marc Sciaky  
Experimentalist

Report by   
Malcolm Kelly  
Acoustical Test Engineer

Approved by   
Eric P. Wolfram  
Laboratory Manager

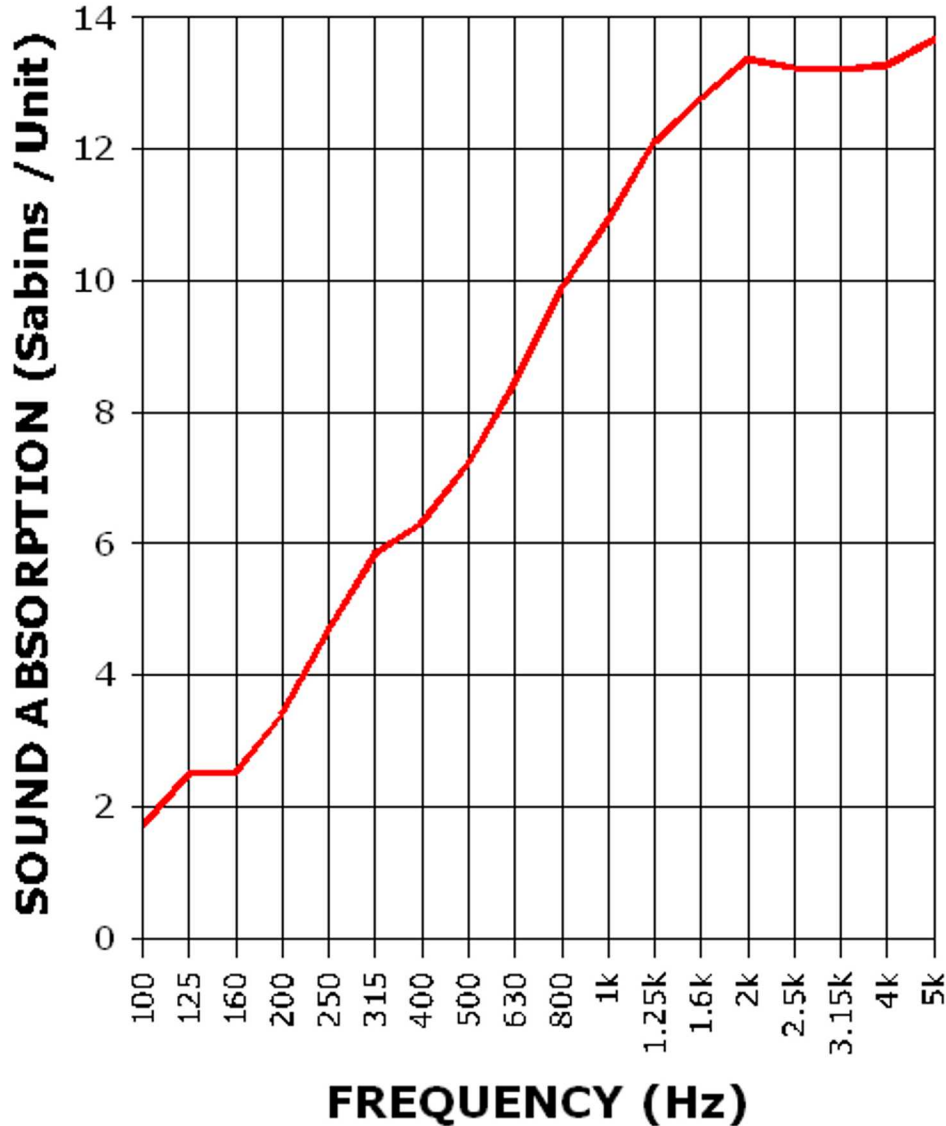
  
Digitally signed by Eric P. Wolfram  
DN: cn=Eric P. Wolfram, o=Allion Science &  
Technology, ou=Riverbank Acoustical  
Laboratories,  
email=ewolfram@allionscience.com, c=US  
Date: 2018.06.19 16:56:55 -0500

Test Report

Focal Point LLC  
2018-06-07

RAL-A18-165  
Page 5 of 9

**SOUND ABSORPTION REPORT**  
Seem I Acoustic, spaced 18 in. on center



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**Test Report**

**Focal Point LLC**  
 2018-06-07

**RAL-A18-165**  
 Page 6 of 9

**APPENDIX A: Extended Frequency Range Data**

Specimen: Seem 1 Acoustic, spaced 18 in. on center (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)	Sabins per Unit
31.5	6.12	1.02
40	12.21	2.03
50	4.35	0.72
63	11.51	1.92
80	6.84	1.14
100	10.25	1.71
125	15.09	2.51
160	14.99	2.50
200	20.43	3.41
250	28.30	4.72
315	35.11	5.85
400	37.86	6.31
500	43.38	7.23
630	50.84	8.47
800	59.34	9.89
1000	65.42	10.90
1250	72.63	12.11
1600	76.59	12.76
2000	80.17	13.36
2500	79.43	13.24
3150	79.21	13.20
4000	79.68	13.28
5000	82.00	13.67
6300	83.78	13.96
8000	84.72	14.12
10000	86.23	14.37
12500	91.46	15.24

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

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## Test Report

**Focal Point LLC**  
2018-06-07

**RAL-A18-165**  
Page 7 of 9

### APPENDIX B: Instruments of Traceability

Specimen: Seem 1 Acoustic, spaced 18 in. on center (See Full Report)

<u>Description</u>	<u>Model</u>	<u>Serial Number</u>	<u>Date of Certification</u>	<u>Calibration Due</u>
Bruel & Kjaer Pulse Analyzer - System3	Type 3560-C	2647140	2018-04-20	2019-04-20
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2017-09-22	2018-09-22
Bruel & Kjaer Pistonphone	Type 4228	2781248	2017-08-02	2018-08-02
Omega Digital Temp., Humid. And Pressure Recorder	OM-CP-PRHTemp2000	P97844	2018-02-03	2019-02-03

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Page 1 of 2

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### **Appendix C to ASTM C423 Sound Absorption Test**

Non-standard calculation of equivalent NRC Rating and Absorption Coefficients from spaced absorbers.

At this time ASTM C423 does not provide a standard method for determining absorption coefficients of spaced object absorbers. Tests of a set of sound absorbing objects spaced apart from each other will yield higher absorption rates than a specimen joined together as a single patch (A-Mount or E-Mount). For this reason it is unfair to provide NRC or absorption coefficient ratings for specimens that consist of a spaced set of absorbers. Despite this, the architectural industry has expressed great demand for a simple "single number" rating for these treatments. Likewise, acoustical consultants desire equivalent absorption coefficient data for use in acoustical modeling programs. The following is an attempt to appease these demands until ASTM develops a standard method for calculation. Several alternate non-standard calculation methods are provided. Riverbank Acoustical Laboratories prefers method 1.

#### **Method 1) Apparent Sound Absorption Coefficient calculated from total test surface area covered.**

The total sound absorption yielded by the specimen is divided by the total surface area of the test surface covered by the suspended baffles, including intermediate spaces. The baffle rigging covered 5.70 m<sup>2</sup> (61.33 ft<sup>2</sup>) of horizontal test surface area. Apparent Noise Reduction Coefficient (NRC) rating and Sound Absorption Average (SAA) figures are calculated from this data based on the methods described in ASTM C423-17. This may be the most accurate method for comparing baffle arrays to ceiling tile products. In acoustical modeling applications, the apparent sound absorption coefficient data can be assigned to a single horizontal surface or plane in acoustical modeling software for approximation of baffle array performance (assuming baffle spacing is similar to that tested).

#### **Method 2) Apparent Sound Absorption Coefficient calculated from total exposed surface area of specimen.**

The total sound absorption yielded by the specimen is divided by the total surface area of all exposed specimen faces (1.80 m<sup>2</sup> (19.37 ft<sup>2</sup>) per baffle x 6 baffles = 10.80 m<sup>2</sup> (116.25 ft<sup>2</sup>) total surface area). Apparent Noise Reduction Coefficient (NRC) rating and Sound Absorption Average (SAA) figures are calculated from this data based on the methods described in ASTM C423-17. This method shows the actual absorption occurring at the exposed surfaces, but does not provide a fair comparison with materials mounted as a uniform patch (in A-mount or E-mount).

#### **Method 3) Apparent Sound Absorption Coefficient calculated from one face per baffle.**

The total sound absorption yielded by the specimen is divided by the surface area of one side of one large face for each baffle in the specimen (0.74 m<sup>2</sup> (8.0 ft<sup>2</sup>) per baffle x 6 baffles = 4.46 m<sup>2</sup> (48.0 ft<sup>2</sup>) total surface area). Apparent Noise Reduction Coefficient (NRC) rating and Sound Absorption Average (SAA) figures are calculated from this data based on the methods described in ASTM C423-17. This method is favored by some material manufacturers since it yields very high NRC figures, but does not provide a fair comparison with other ceiling tile or wall panel products.



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Report Referenced: **RAL-A18-165**  
Page 2 of 2

**Appendix D: Data** Note: See full test report for details of mounting position, spacing and configuration as these parameters greatly affect sound absorption performance.

Specimen Absorption (US)			Method 1	Method 2	Method 3
Freq. (Hz)	Sabins	Sabins/Unit	Apparent Abs. Coefficient From Total Coverage Area	Apparent Abs. Coefficient From Total Exposed Surface Area	Apparent Abs. Coefficient From One Face/Baffle
31.5	6.12	1.02	0.10	0.05	0.13
40	12.21	2.03	0.20	0.11	0.25
50	4.35	0.72	0.07	0.04	0.09
<b>63</b>	11.51	1.92	0.19	0.10	0.24
80	6.84	1.14	0.11	0.06	0.14
100	10.25	1.71	0.17	0.09	0.21
<b>125</b>	15.09	2.51	0.25	0.13	0.31
160	14.99	2.50	0.24	0.13	0.31
200	20.43	3.41	0.33	0.18	0.43
<b>250</b>	28.30	4.72	0.46	0.24	0.59
315	35.11	5.85	0.57	0.30	0.73
400	37.86	6.31	0.62	0.33	0.79
<b>500</b>	43.38	7.23	0.71	0.37	0.90
630	50.84	8.47	0.83	0.44	1.06
800	59.34	9.89	0.97	0.51	1.24
<b>1,000</b>	65.42	10.90	1.07	0.56	1.36
1,250	72.63	12.11	1.18	0.62	1.51
1,600	76.59	12.76	1.25	0.66	1.60
<b>2,000</b>	80.17	13.36	1.31	0.69	1.67
2,500	79.43	13.24	1.30	0.68	1.65
3,150	79.21	13.20	1.29	0.68	1.65
<b>4,000</b>	79.68	13.28	1.30	0.69	1.66
5,000	82.00	13.67	1.34	0.71	1.71
6,300	83.78	13.96	1.37	0.72	1.75
<b>8,000</b>	84.72	14.12	1.38	0.73	1.77
10,000	86.23	14.37	1.41	0.74	1.80
12,500	91.46	15.24	1.49	0.79	1.91
<b>Apparent NRC:</b>			0.90	0.45	1.15
<b>Apparent SAA:</b>			0.88	0.47	1.13

Prepared by   
Malcolm Kelly  
Acoustical Test Engineer