

Test Report

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

Sound Absorption
RAL-A18-166

CONDUCTED: 2018-06-07

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ON: Seem 1 Acoustic, spaced 24 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 24 in. on center. A full internal inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

Spaced Baffles

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)

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

Volume: 292.0 m³ (10,311.0 ft³)
Temperature: 21.4±0.1°C (70.6±0.1°F)
Humidity: 65.9±0.5%
Barometric Pressure: 98.8 kPa.

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Each sound absorbing unit had an absorptive area (all exposed surfaces) of 1.80 m² (19.37 ft²). The total absorptive area (all exposed surfaces) of all sound-absorbing units was 10.80 m² (116.25 ft²). The array of units covered 7.56 m² (81.33 ft²) 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 609.6 mm (24 in.) on center.

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Figure 1 - Specimen mounted in test chamber



Figure 2 - Detail of individual baffle

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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 ²)	Total Absorption (IP) (Sabins)	Absorption (Sabins/Unit)
100	1.03	11.07	1.84
** 125	1.34	14.39	2.40
160	1.37	14.79	2.46
200	1.95	21.04	3.51
** 250	2.75	29.55	4.93
315	3.12	33.58	5.60
400	3.46	37.25	6.21
** 500	4.42	47.61	7.94
630	5.17	55.70	9.28
800	5.60	60.31	10.05
** 1000	6.26	67.38	11.23
1250	6.86	73.87	12.31
1600	7.46	80.29	13.38
** 2000	7.67	82.53	13.75
2500	7.69	82.81	13.80
3150	7.74	83.31	13.89
** 4000	7.91	85.12	14.19
5000	8.21	88.43	14.74

Tested by 
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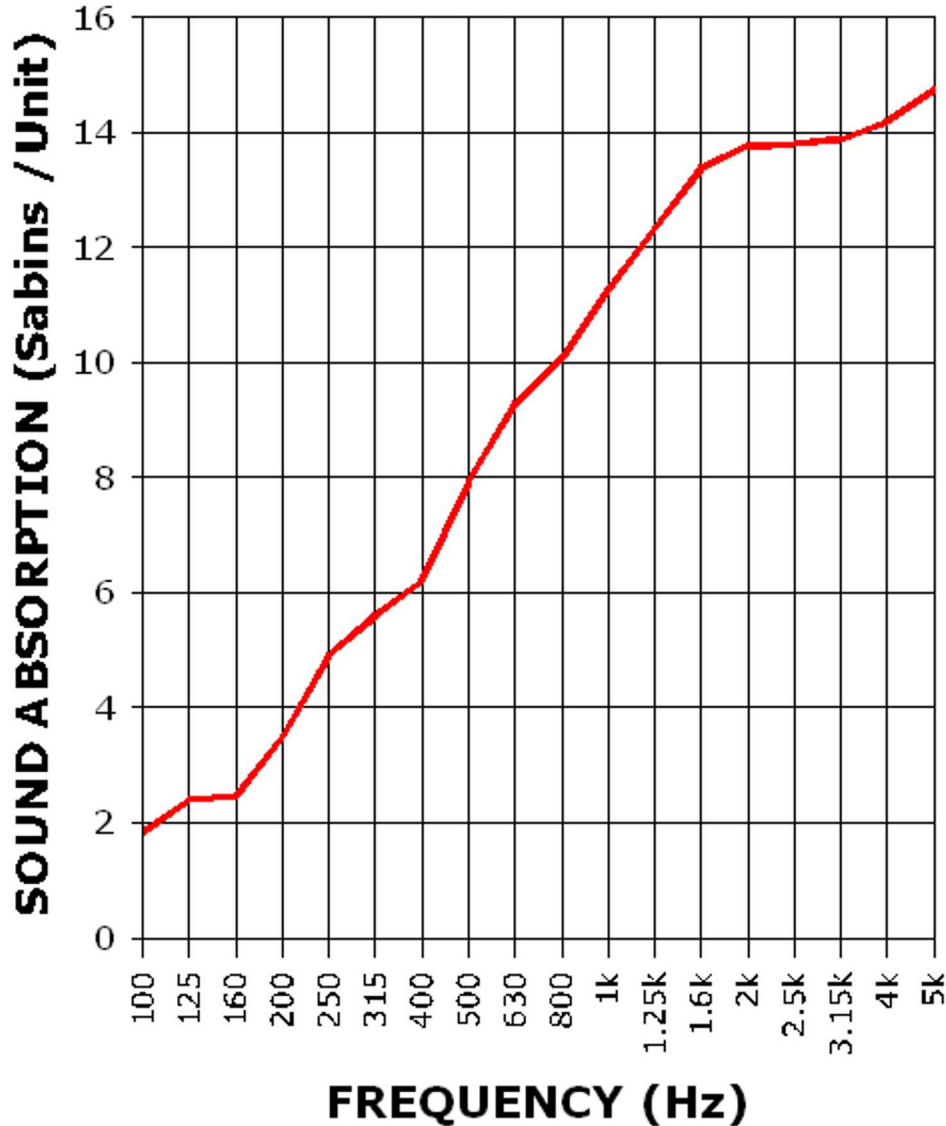
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SOUND ABSORPTION REPORT
Seem I Acoustic, spaced 24 in. on center



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APPENDIX A: Extended Frequency Range Data

Specimen: Seem 1 Acoustic, spaced 24 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	7.66	1.28
40	12.33	2.05
50	6.99	1.17
63	8.45	1.41
80	13.56	2.26
100	11.07	1.84
125	14.39	2.40
160	14.79	2.46
200	21.04	3.51
250	29.55	4.93
315	33.58	5.60
400	37.25	6.21
500	47.61	7.94
630	55.70	9.28
800	60.31	10.05
1000	67.38	11.23
1250	73.87	12.31
1600	80.29	13.38
2000	82.53	13.75
2500	82.81	13.80
3150	83.31	13.89
4000	85.12	14.19
5000	88.43	14.74
6300	90.85	15.14
8000	94.71	15.78
10000	96.45	16.08
12500	103.01	17.17



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APPENDIX B: Instruments of Traceability

Specimen: Seem 1 Acoustic, spaced 24 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

END

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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 7.56 m² (81.33 ft²) 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 m² (19.37 ft²) per baffle x 6 baffles = 10.80 m² (116.25 ft²) 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 m² (8.0 ft²) per baffle x 6 baffles = 4.46 m² (48.0 ft²) 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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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
			Apparent Abs. Coefficient From Total Coverage Area	Apparent Abs. Coefficient From Total Exposed Surface Area	Apparent Abs. Coefficient From One Face/Baffle
Freq. (Hz)	Sabins	Sabins/Unit			
31.5	7.66	1.28	0.09	0.07	0.16
40	12.33	2.05	0.15	0.11	0.26
50	6.99	1.17	0.09	0.06	0.15
63	8.45	1.41	0.10	0.07	0.18
80	13.56	2.26	0.17	0.12	0.28
100	11.07	1.84	0.14	0.10	0.23
125	14.39	2.40	0.18	0.12	0.30
160	14.79	2.46	0.18	0.13	0.31
200	21.04	3.51	0.26	0.18	0.44
250	29.55	4.93	0.36	0.25	0.62
315	33.58	5.60	0.41	0.29	0.70
400	37.25	6.21	0.46	0.32	0.78
500	47.61	7.94	0.59	0.41	0.99
630	55.70	9.28	0.68	0.48	1.16
800	60.31	10.05	0.74	0.52	1.26
1,000	67.38	11.23	0.83	0.58	1.40
1,250	73.87	12.31	0.91	0.64	1.54
1,600	80.29	13.38	0.99	0.69	1.67
2,000	82.53	13.75	1.01	0.71	1.72
2,500	82.81	13.80	1.02	0.71	1.73
3,150	83.31	13.89	1.02	0.72	1.74
4,000	85.12	14.19	1.05	0.73	1.77
5,000	88.43	14.74	1.09	0.76	1.84
6,300	90.85	15.14	1.12	0.78	1.89
8,000	94.71	15.78	1.16	0.81	1.97
10,000	96.45	16.08	1.19	0.83	2.01
12,500	103.01	17.17	1.27	0.89	2.15
Apparent NRC:			0.70	0.50	1.20
Apparent SAA:			0.69	0.48	1.17

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