

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

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WALLACE CLEMENT SABINE

Test Report

FOR: **ezoBord**
Elgin, IL

Sound Absorption
RAL-A18-327

CONDUCTED: 2018-10-03

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ON: Grid Canopy - 1/2 in. (12 mm)

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 Grid Canopy - 1/2 in. (12 mm). A full internal inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

Test Specimen

Material: Polyethylene terephthalate
Overall Dimensions: 2133.6 mm (84 in.) x 2133.6 mm (84 in.)
Assembly: Twelve (12) trapezoidal members arranged in square grid
Members spaced approximately 317.5 mm (12.5 in.) on center
Thickness: Individual members @ 12.19 mm (0.48 in.)
Assembled grid @ 254 mm (10 in.)
Overall Weight: 11.68 kg (25.75 lbs)

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Physical Measures

Dimensions: 2.13 m (84.0 in) wide by 2.13 m (84.0 in) long
Thickness: 0.25 m (10.0 in)
Weight: 11.68 kg (25.75 lbs)

Test Environment

Room Volume: 291.98 m³
Temperature: 20.9 °C ± 0.0 °C
Relative Humidity: 69.9 % ± 0.2 %
Barometric Pressure: 98.4 kPa

The total absorptive area (all exposed surfaces) of the specimen was 12.42 m² (133.69 ft²). The specimen covered 4.55 m² (49.0 ft²) of chamber floor surface (total treated area).

MOUNTING METHOD

Type J Mounting: The specimen is a single sound absorbing unit suspended atop an array of cables such that the bottom surface of the specimen is approximately 1346.2 mm (53 in.) from the horizontal test surface. This approximates the mounting method of a typical ceiling absorption product installation.

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Figure 1 - Specimen mounted in test chamber

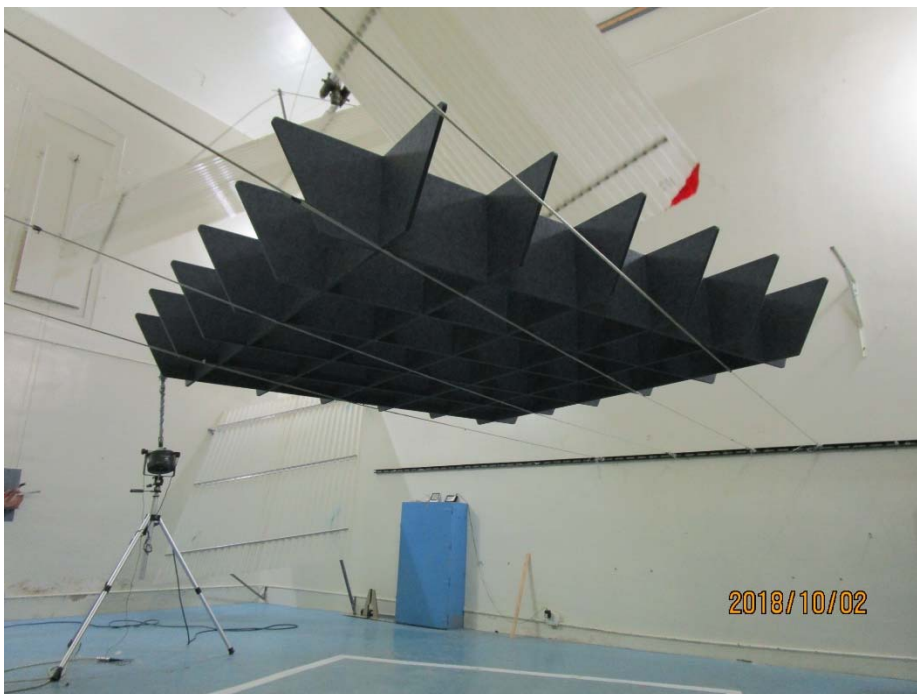


Figure 2 - Underside of specimen

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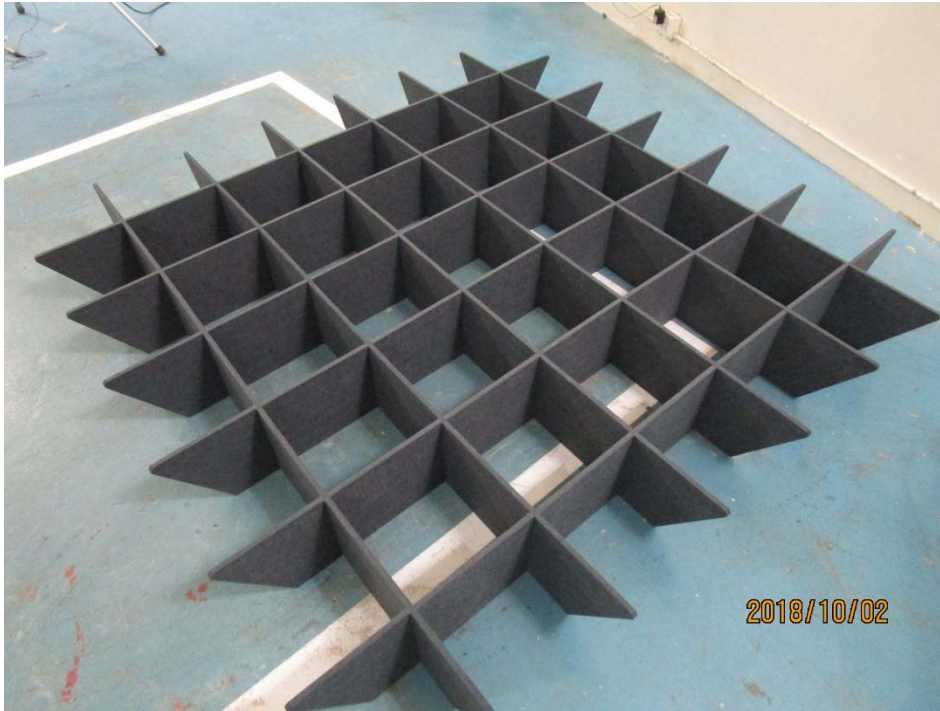


Figure 3 – Specimen prior to mounting



Figure 4 – Detail of specimen material

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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	
	(m ²)	(Sabins)
100	0.77	8.27
** 125	0.63	6.78
160	0.88	9.42
200	1.78	19.19
** 250	2.44	26.27
315	2.76	29.72
400	3.00	32.32
** 500	3.16	34.04
630	3.42	36.78
800	3.70	39.81
** 1000	4.27	45.95
1250	4.62	49.69
1600	5.09	54.83
** 2000	5.56	59.89
2500	5.98	64.41
3150	6.19	66.65
** 4000	6.25	67.29
5000	6.21	66.85

Tested by 
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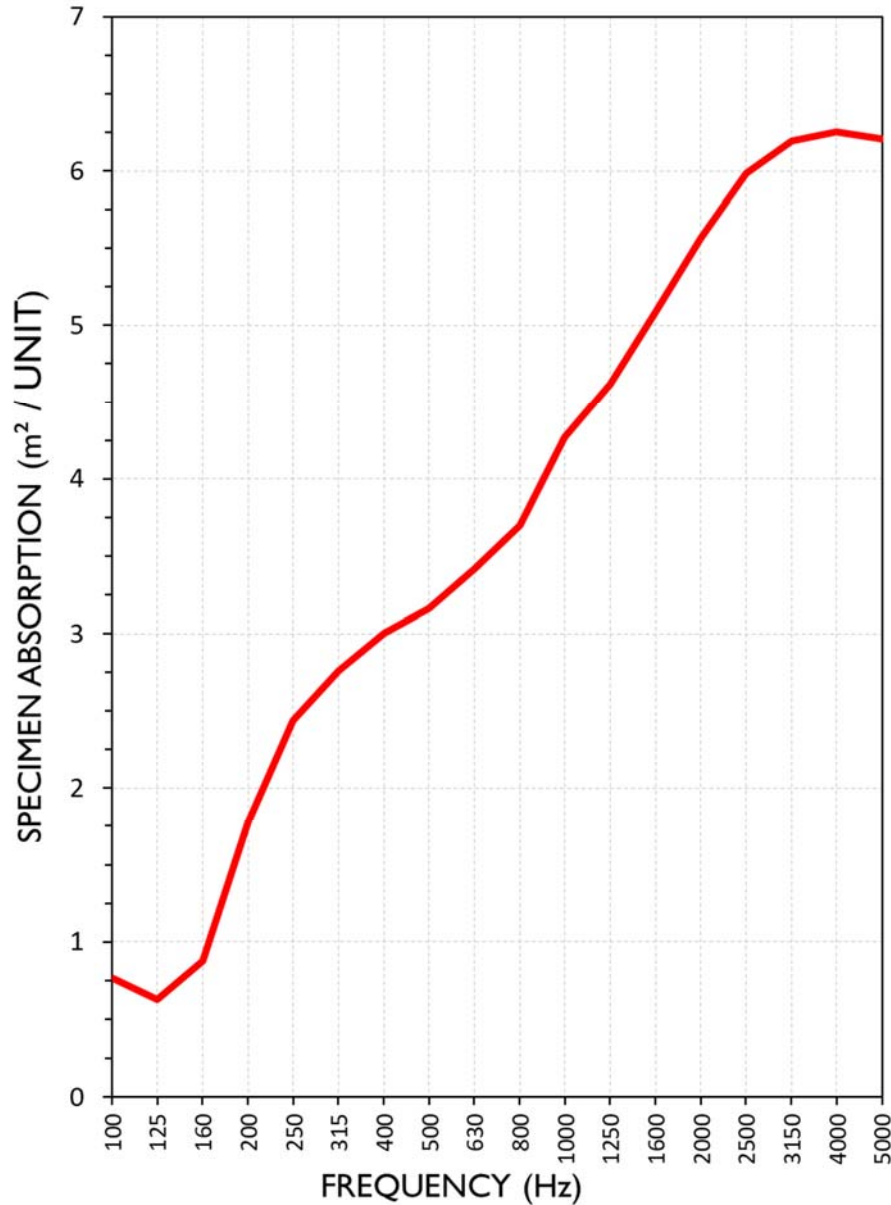
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SOUND ABSORPTION REPORT
Grid Canopy - 1/2 in. (12 mm)



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APPENDIX A: Extended Frequency Range Data

Specimen: Grid Canopy - 1/2 in. (12 mm) (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	
	(m ²)	(Sabins)
31.5	0.22	2.38
40	0.07	0.74
50	0.31	3.32
63	0.43	4.62
80	0.73	7.84
100	0.77	8.27
125	0.63	6.78
160	0.88	9.42
200	1.78	19.19
250	2.44	26.27
315	2.76	29.72
400	3.00	32.32
500	3.16	34.04
630	3.42	36.78
800	3.70	39.81
1000	4.27	45.95
1250	4.62	49.69
1600	5.09	54.83
2000	5.56	59.89
2500	5.98	64.41
3150	6.19	66.65
4000	6.25	67.29
5000	6.21	66.85
6300	6.26	67.33
8000	6.33	68.11
10000	6.27	67.47
12500	5.83	62.78

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APPENDIX B: Instruments of Traceability

Specimen: Grid Canopy - 1/2 in. (12 mm) (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-4/2	System 1	2018-08-09	2019-08-09
Bruel & Kjaer Mic And Preamp C	Type 4943-B-001	2311439	2018-03-27	2019-03-27
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

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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. Two 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 specimen, including intermediate spaces. The specimen rigging covered 4.55 m² (49.0 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 a comparison to ceiling tile products. In acoustical modeling applications, the apparent sound absorption coefficient data can be assigned to a single horizontal surface or plane for approximation of specimen array performance (assuming specimen 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, as determined from client CAD drawings (12.42 m² (133.69 ft²)). 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).

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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		Method 1	Method 2
		Apparent Abs. Coefficient From Total Coverage Area	Apparent Abs. Coefficient From Total Exposed Surface Area
Freq. (Hz)	Sabins		
31.5	2.38	0.05	0.02
40	0.74	0.02	0.01
50	3.32	0.07	0.02
63	4.62	0.09	0.03
80	7.84	0.16	0.06
100	8.27	0.17	0.06
125	6.78	0.14	0.05
160	9.42	0.19	0.07
200	19.19	0.39	0.14
250	26.27	0.54	0.20
315	29.72	0.61	0.22
400	32.32	0.66	0.24
500	34.04	0.69	0.25
630	36.78	0.75	0.28
800	39.81	0.81	0.30
1,000	45.95	0.94	0.34
1,250	49.69	1.01	0.37
1,600	54.83	1.12	0.41
2,000	59.89	1.22	0.45
2,500	64.41	1.31	0.48
3,150	66.65	1.36	0.50
4,000	67.29	1.37	0.50
5,000	66.85	1.36	0.50
6,300	67.33	1.38	0.50
8,000	68.11	1.39	0.51
10,000	67.47	1.38	0.50
12,500	62.78	1.28	0.47
Apparent NRC:		0.85	0.30
Apparent SAA:		0.84	0.31

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