

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

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## Test Report

FOR: **ezoBord**  
Elgin, IL

**Sound Absorption**  
**RAL-A18-328**

CONDUCTED: 2018-10-03

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ON: Grid Canopy - 3/8 in. (9 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 - 3/8 in. (9 mm). A full internal inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description.

#### Test Specimen

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Material: Polyethylene terephthalate  
Overall Dimensions: 2133.6 mm (84 in.) x 2133.6 mm (84 in.)  
Assembly: Sixteen (16) trapezoidal members arranged in square grid  
Members spaced approximately 263.52 mm (10.375 in.) on center  
Thickness: Individual members @ 9.27 mm (0.365 in.)  
Assembled grid @ 152.4 mm (6 in.)  
Overall Weight: 6.12 kg (13.5 lbs)

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### Physical Measures

Dimensions: 2.13 m (84.0 in) wide by 2.13 m (84.0 in) long  
Thickness: 0.15 m (6.0 in)  
Weight: 6.12 kg (13.5 lbs)

### Test Environment

Room Volume: 291.98 m<sup>3</sup>  
Temperature: 21.0 °C ± 0.1 °C  
Relative Humidity: 69.95 % ± 0.9 %  
Barometric Pressure: 98.4 kPa

The total absorptive area (all exposed surfaces) of the specimen was 10.33 m<sup>2</sup> (111.19 ft<sup>2</sup>). The array of units covered 4.55 m<sup>2</sup> (49.0 ft<sup>2</sup>) 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 1473.2 mm (58 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

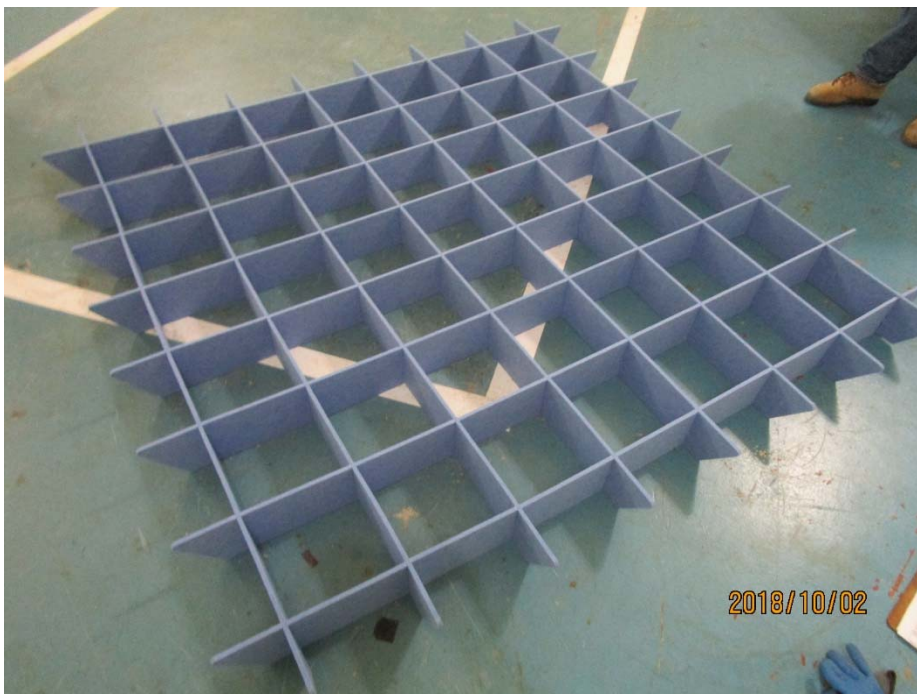


Figure 2 – Assembled specimen prior to mounting

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Figure 3 – Detail of specimen material



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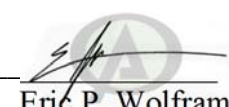
TEST RESULTS

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 <sup>2</sup> )	(Sabins)
100	0.20	2.18
** 125	-0.13	-1.42
160	0.69	7.45
200	1.10	11.80
** 250	1.38	14.90
315	1.71	18.41
400	1.77	19.10
** 500	2.23	24.02
630	2.43	26.18
800	2.52	27.14
** 1000	2.84	30.62
1250	3.21	34.60
1600	3.59	38.59
** 2000	3.89	41.83
2500	4.38	47.15
3150	4.67	50.32
** 4000	4.87	52.38
5000	4.98	53.63

Tested by   
 Dean Victor  
 Senior Experimentalist

Report by   
 Malcolm Kelly  
 Acoustical Test Engineer

Approved by   
 Eric P. Wolfram  
 Laboratory Manager



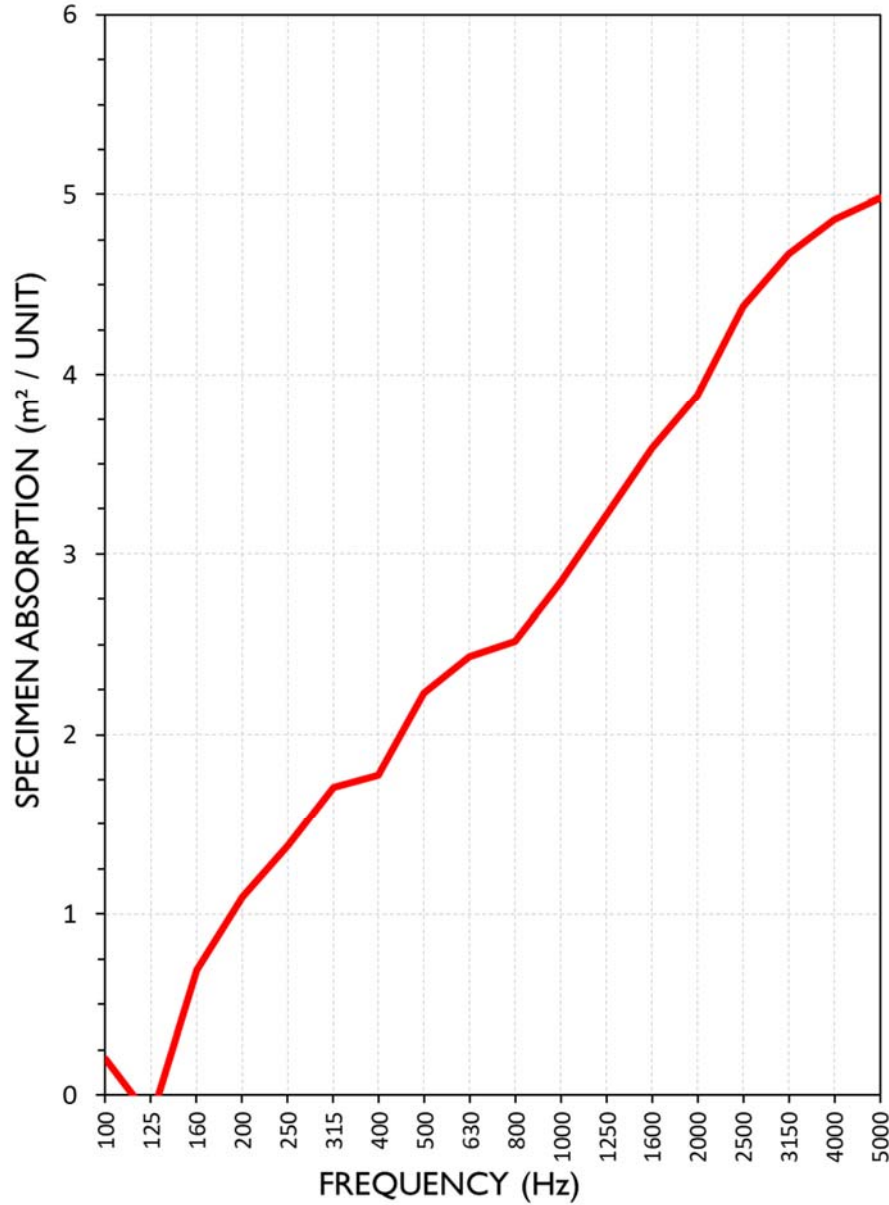
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**SOUND ABSORPTION REPORT**  
Grid Canopy - 3/8 in. (9 mm)



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### APPENDIX A: Extended Frequency Range Data

Specimen: Grid Canopy - 3/8 in. (9 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 <sup>2</sup> )	(Sabins)
31.5	-1.05	-11.35
40	-0.63	-6.82
50	-0.30	-3.19
63	0.60	6.45
80	0.28	2.97
100	0.20	2.18
125	-0.13	-1.42
160	0.69	7.45
200	1.10	11.80
250	1.38	14.90
315	1.71	18.41
400	1.77	19.10
500	2.23	24.02
630	2.43	26.18
800	2.52	27.14
1000	2.84	30.62
1250	3.21	34.60
1600	3.59	38.59
2000	3.89	41.83
2500	4.38	47.15
3150	4.67	50.32
4000	4.87	52.38
5000	4.98	53.63
6300	5.08	54.70
8000	5.28	56.84
10000	5.23	56.31
12500	4.60	49.47

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### APPENDIX B: Instruments of Traceability

Specimen: Grid Canopy - 3/8 in. (9 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

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END



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ON: Grid Canopy - 3/8 in. (9 mm) (See Full Test Report for Details)

### **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. Multiple 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 specimen, including intermediate spaces. The specimen rigging covered 4.55 m<sup>2</sup> (49.0 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 specimen 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 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 obtained from client CAD drawings (10.33 m<sup>2</sup> (111.19 ft<sup>2</sup>)). 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	-11.35	-0.23	-0.10
40	-6.82	-0.14	-0.06
50	-3.19	-0.07	-0.03
<b>63</b>	6.45	0.13	0.06
80	2.97	0.06	0.03
100	2.18	0.04	0.02
<b>125</b>	-1.42	-0.03	-0.01
160	7.45	0.15	0.07
200	11.80	0.24	0.11
<b>250</b>	14.90	0.30	0.13
315	18.41	0.38	0.17
400	19.10	0.39	0.17
<b>500</b>	24.02	0.49	0.22
630	26.18	0.53	0.24
800	27.14	0.55	0.24
<b>1,000</b>	30.62	0.62	0.27
1,250	34.60	0.71	0.31
1,600	38.59	0.79	0.35
<b>2,000</b>	41.83	0.85	0.38
2,500	47.15	0.96	0.42
3,150	50.32	1.03	0.45
<b>4,000</b>	52.38	1.07	0.47
5,000	53.63	1.09	0.48
6,300	54.70	1.12	0.49
<b>8,000</b>	56.84	1.16	0.51
10,000	56.31	1.15	0.51
12,500	49.47	1.01	0.45
<b>Apparent NRC:</b>		<b>0.55</b>	<b>0.25</b>
<b>Apparent SAA:</b>		<b>0.57</b>	<b>0.25</b>

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