

SPONSOR: **Kirei USA**  
San Diego, CA

CONDUCTED: 2022-04-04

ON: 24mm Simple Baffle (7 objects in a single row, spaced 28" on center)

**Sound Absorption**  
**RAL™-A22-154**

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### TEST METHODOLOGY

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 17025:2017 Laboratory (NVLAP Lab Code: 100227-0) and for this test procedure. The test reported in this document conformed explicitly with ASTM C423-23: "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. The results presented in this report apply to the sample as received from the test sponsor.

### INFORMATION PROVIDED BY SPONSOR

The test specimen was designated by the sponsor as 24mm Simple Baffle (7 objects in a single row, spaced 28" on center). The following nominal product information was provided by the sponsor prior to testing. The accuracy of such sponsor-provided information can affect the validity of the test results.

#### **Product Under Test**

Product Name: 24mm Simple Baffle (7 objects in a single row, spaced 28" on center)  
Manufacturer: Kirei USA

### SPECIMEN MEASUREMENTS & TEST CONDITIONS

Through a full external visual inspection performed on the test specimen, Riverbank personnel verified the following information:

#### **Test Specimen**

Product Type: PET felt baffles  
Dimensions: 7 baffles @ 294 mm (11.5625 in.) by 2362 mm (93 in.)  
Thickness: 23.16 mm (0.912 in.)  
Overall Weight: 14.7 kg (32.5 lbs)  
Mass per Unit Volume: 131.0 kg/m<sup>3</sup> (8.18 lbs/ft<sup>3</sup>)

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### SPECIMEN MEASUREMENTS & TEST CONDITIONS (continued)

#### Physical Measurements (per object)

Dimensions: 0.29 m (11.5625 in) wide by 2.36 m (93.0 in) long

Thickness: 0.02 m (0.912 in)

Weight: 2.1 kg (4.64 lbs)

#### Test Environment

Room Volume: 291.98 m<sup>3</sup>

Temperature: 21.0 °C ± 0.2 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)

Relative Humidity: 59.3 % ± 1.3 % (Requirement: ≥ 40 % and ≤ 5 % change)

Barometric Pressure: 98.1 kPa (Requirement not defined)

Each sound absorbing object had an exposed surface area of 1.495 m<sup>2</sup> (16.10 ft<sup>2</sup>). The total exposed surface area of all sound-absorbing objects was 10.47 m<sup>2</sup> (112.7 ft<sup>2</sup>).

### MOUNTING METHOD

Type JV-MOD Mounting: The specimen is an array of 7 spaced sound absorbing objects suspended from cables such that the closest face is located approximately 1143 mm (45 in.) from the horizontal test surface. This approximates the mounting method of a typical ceiling baffle installation. The objects were evenly distributed in a single row, spaced 711 mm (28 in.) on center. The width of the installed object array was 2362 mm (93 in.) and the length of the installed object array was 4283 mm (168.625 in.). The area of extended continuous surface attributed to the object array was 13.2 m<sup>2</sup> (142 ft<sup>2</sup>).

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Figure 1 – Specimen mounted in test chamber

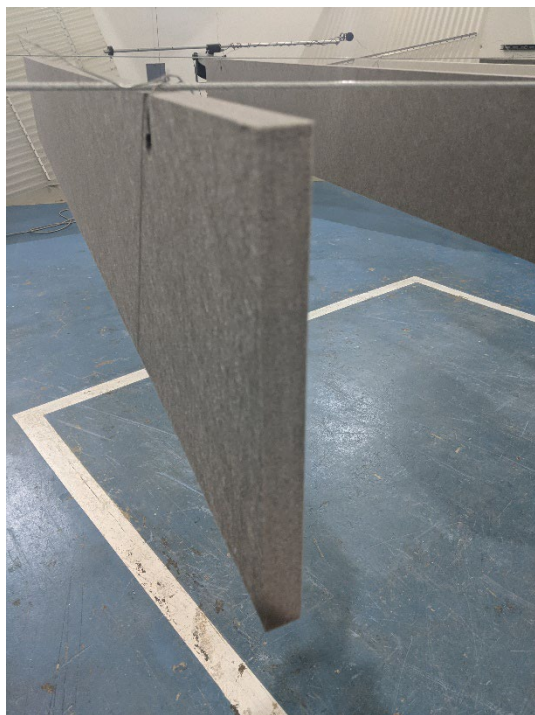


Figure 2 – Detail of specimen material

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Page 4 of 8**TEST RESULTS**

The preferred presentation of sound absorption test results for arrays of spaced objects is sound absorption ( $\text{m}^2$ ) per object and total sound absorption ( $\text{m}^2$ ) at each one-third-octave band

ASTM C423-23 Appendix X2 allows calculation of sound absorption per  $\text{m}^2$  ( $\text{SA}/\text{m}^2$ ) based on the projected horizontal surface area attributable to an array of objects. The extended continuous surface area used in this calculation is to be determined using the following procedure:

$S_{\text{array}} = (w + w_1) \times (l + 0.3)$  If the set of objects consists of a single row of equal sized objects with equal space between each. (ASTM E423-23 X.2.3.2)

(Choose 1 from above)

Where:

$S_{\text{array}}$  = area of extended continuous surface attributed to the object array,  $\text{m}^2$

$w$  = the measured width of the installed object array, in meters

$w_1$  = the distance between objects in the array along the width, in meters

$l$  = the measured length of the object array, in meters

Note: A standard distance of 0.3 meters is added to the array length to account for the assumed area between this set of objects and an adjacent array of objects.

The sound absorption per  $\text{m}^2$  ( $\text{SA}/\text{m}^2$ ) is calculated based on the following formula:

$$\alpha_{\text{array}} = (A_2 - A_1)/S_{\text{array}}$$

Where:

$\alpha_{\text{array}}$  = sound absorption per  $\text{m}^2$  ( $\text{SA}/\text{m}^2$ ) of extended continuous surface, no units,

$A_1$  = absorption of the empty reverberation room,  $\text{m}^2$  and

$A_2$  = absorption of the room after the specimen has been installed,  $\text{m}^2$ .

$S_{\text{array}}$  = area of extended continuous surface attributed to the test specimen,  $\text{m}^2$

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### TEST RESULTS (continued)

1/3 Octave Center Frequency (Hz)	Total Absorption		Absorption per Object		$\alpha_{array}$ (Sabins/ft <sup>2</sup> ) (SA/m <sup>2</sup> )
	(m <sup>2</sup> )	(Sabins)	(m <sup>2</sup> / Object)	(Sabins / Object)	
100	0.64	6.93	0.09	0.99	0.05
** 125	1.04	11.15	0.15	1.59	0.08
160	1.15	12.36	0.16	1.77	0.09
200	1.46	15.76	0.21	2.25	0.11
** 250	2.02	21.77	0.29	3.11	0.15
315	2.87	30.93	0.41	4.42	0.22
400	3.36	36.13	0.48	5.16	0.25
** 500	4.24	45.66	0.61	6.52	0.32
630	5.22	56.21	0.75	8.03	0.39
800	6.21	66.87	0.89	9.55	0.47
** 1000	7.18	77.29	1.03	11.04	0.54
1250	8.15	87.72	1.16	12.53	0.62
1600	8.81	94.87	1.26	13.55	0.67
** 2000	9.35	100.61	1.34	14.37	0.71
2500	9.44	101.64	1.35	14.52	0.71
3150	9.49	102.18	1.36	14.60	0.72
** 4000	9.21	99.17	1.32	14.17	0.70
5000	9.23	99.32	1.32	14.19	0.70

**Array-NRC 0.45** over 13.2 m<sup>2</sup> of extended continuous surface area

**Array-SAA 0.43** over 13.2 m<sup>2</sup> of extended continuous surface area

Tested by

Marc Sciaky  
Senior Experimentalist

Report by

Keith Kimberling  
Test Engineer

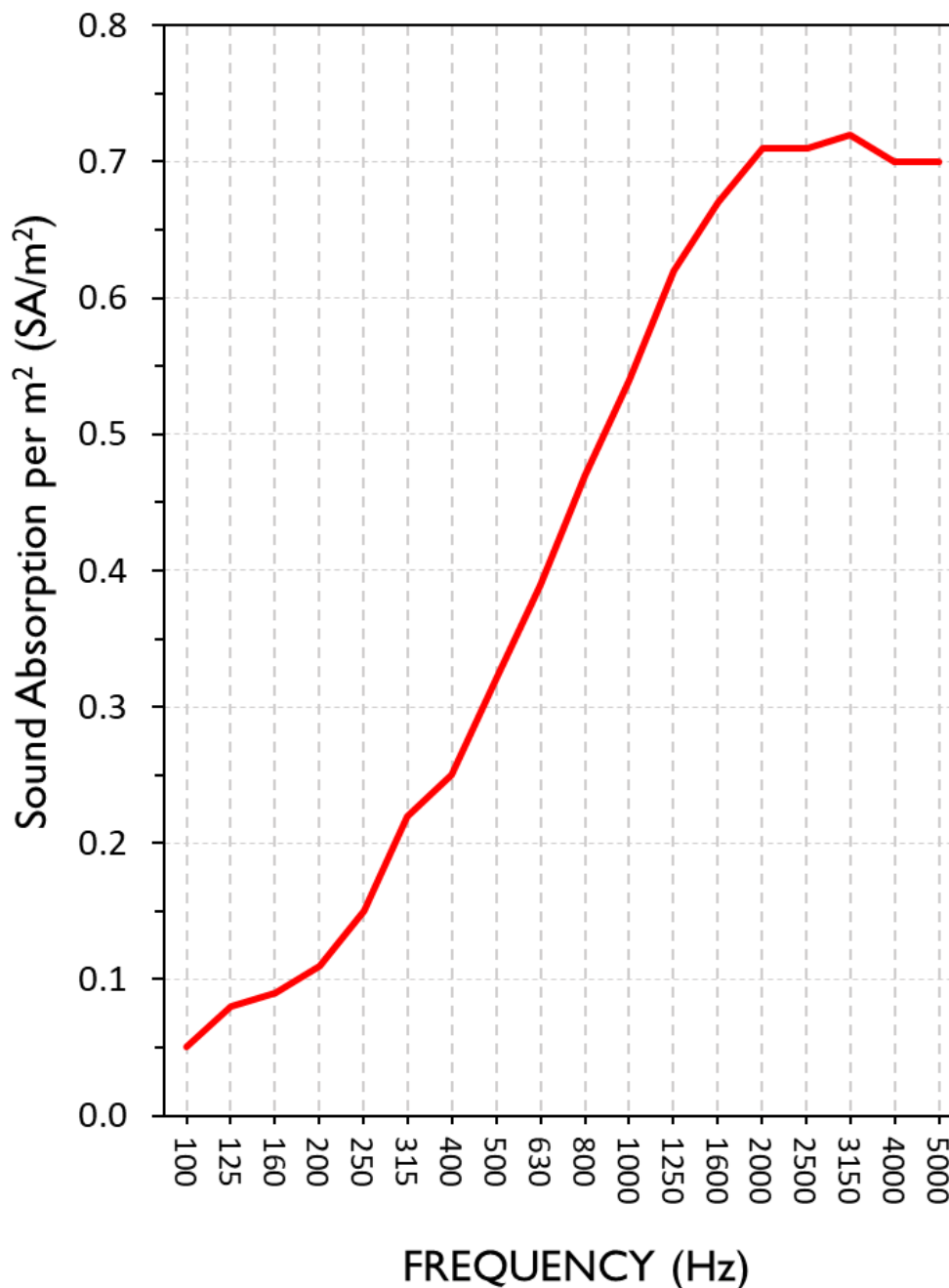
Approved by

Eric P. Wolfram  
Laboratory Manager

*Note: Sound absorption per m<sup>2</sup> (SA/m<sup>2</sup>), and therefore the reported Single Number Ratings, are highly dependent on the exact sample shape, size, spacing, and extended continuous surface area present in the test and subsequent calculations. Changes to any of these parameters will change the resulting values. These presented results are valid only for the specific configuration present in this test.*

### SOUND ABSORPTION REPORT

24mm Simple Baffle (7 objects in a single row, spaced 28" on center)



**Array-NRC 0.45** over 13.2 m² of extended continuous surface area

**Array-SAA 0.43** over 13.2 m² of extended continuous surface area



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### APPENDIX A: Extended Frequency Range Data

Specimen: 24mm Simple Baffle (7 objects in a single row, spaced 28" on center) (See Full Report)

*The following non-accredited data were obtained in accordance with ASTM C423-23, 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	Total Absorption		Absorption per Object		$\alpha_{array}$ (Sabins/ft <sup>2</sup> )
(Hz)	(m <sup>2</sup> )	(Sabins)	(m <sup>2</sup> / Object)	(Sabins / Object)	(SA/m <sup>2</sup> )
31.5	0.00	-0.04	0.00	-0.01	0.00
40	0.35	3.77	0.05	0.54	0.03
50	-0.78	-8.41	-0.11	-1.20	-0.06
63	-0.15	-1.62	-0.02	-0.23	-0.01
80	0.20	2.13	0.03	0.30	0.01
100	0.64	6.93	0.09	0.99	0.05
125	1.04	11.15	0.15	1.59	0.08
160	1.15	12.36	0.16	1.77	0.09
200	1.46	15.76	0.21	2.25	0.11
250	2.02	21.77	0.29	3.11	0.15
315	2.87	30.93	0.41	4.42	0.22
400	3.36	36.13	0.48	5.16	0.25
500	4.24	45.66	0.61	6.52	0.32
630	5.22	56.21	0.75	8.03	0.39
800	6.21	66.87	0.89	9.55	0.47
1000	7.18	77.29	1.03	11.04	0.54
1250	8.15	87.72	1.16	12.53	0.62
1600	8.81	94.87	1.26	13.55	0.67
2000	9.35	100.61	1.34	14.37	0.71
2500	9.44	101.64	1.35	14.52	0.71
3150	9.49	102.18	1.36	14.60	0.72
4000	9.21	99.17	1.32	14.17	0.70
5000	9.23	99.32	1.32	14.19	0.70
6300	9.15	98.46	1.31	14.07	0.69
8000	8.84	95.19	1.26	13.60	0.67
10000	8.74	94.04	1.25	13.43	0.66
12500	8.59	92.44	1.23	13.21	0.65

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### **APPENDIX B: Instruments of Traceability**

Specimen: 24mm Simple Baffle (7 objects in a single row, spaced 28" on center) (See Full Report)

<b><u>Description</u></b>	<b><u>Model</u></b>	<b><u>Serial Number</u></b>	<b><u>Date of Certification</u></b>	<b><u>Calibration Due</u></b>
System 1	Type 3160-A-042	3160-106968	2021-07-01	2022-07-01
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2021-07-13	2022-07-13
Bruel & Kjaer Pistonphone	Type 4228	2781248	2021-08-13	2022-08-13
EXTECH Hygro 999	SD700	A.106999	2021-05-11	2022-05-11

### **APPENDIX C: Revisions to Original Test Report**

Specimen: 24mm Simple Baffle (7 objects in a single row, spaced 28" on center) (See Full Report)

<b><u>Date</u></b>	<b><u>Revision</u></b>
2022-04-08	Original report issued
2026-03-04	Revision A issued with updated data calculations in order to conform to ASTM E423-23 methods for Array-NRC calculation and reporting.

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END