

## Test Report

SPONSOR: **Kirei**  
Solana Beach, CA

Sound Absorption  
**RAL™-A19-151**

CONDUCTED: 2019-04-03

Page 1 of 8

ON: EchoLine Groovy 0.5 panels

### 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 17025:2005 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 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 EchoLine Groovy 0.5 panels. 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

Trade Name: EchoLine Groovy  
Manufacturer: Kirei  
Thickness: 12 mm (0.472 in.)

### SPECIMEN MEASUREMENTS & TEST CONDITIONS

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

#### Test Specimen

Material: Rigid felt panels  
Dimensions: 8 @ 584.2 mm (23 in.) x 1168.4 mm (46 in.)  
4 @ 101.6 mm (4 in.) x 590.55 mm (23.25 in.)  
2 @ 1168.4 mm (46 in.) x 406.4 mm (16 in.)  
1 @ 101.6 mm (4 in.) x 374.65 mm (14.75 in.)  
Key Geometry: Grooves spaced 12.5 mm (0.492 in.) on center, linear depth profile  
Maximum groove depth @ 6 mm (0.236 in.)  
Maximum groove width @ 6 mm (0.236 in.)  
Overall Thickness: 12.29 mm (0.484 in.)  
Overall Weight: 13.83 kg (30.5 lbs)

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

## Test Report

**Kirei**  
2019-04-03

**RAL™-A19-151**

Page 2 of 8

### Overall Specimen Properties

Size: 2.74 m (108.0 in) wide by 2.44 m (96.0 in) long  
Thickness: 0.01 m (0.484 in)  
Weight: 13.83 kg (30.5 lbs)  
Mass per Unit Area: 2.07 kg/m<sup>2</sup> (0.42 lbs/ft<sup>2</sup>)  
Calculation Area: 6.689 m<sup>2</sup> (72 ft<sup>2</sup>)

### Test Environment

Room Volume: 291.98 m<sup>3</sup>  
Temperature: 21.4 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)  
Relative Humidity: 64.15 % ± 1.3 % (Requirement: ≥ 40 % and ≤ 5 % change)  
Barometric Pressure: 99.6 kPa (Requirement not defined)

### MOUNTING METHOD

Type A Mounting: The test specimen was laid directly against the test surface. Perimeter edges were sealed with metal framing.

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

Test Report

Kirei  
2019-04-03

RAL™-A19-151  
Page 3 of 8



Figure 1 – Specimen mounted in test chamber



Figure 2 – Detail of specimen material cross section

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

An  ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
 WALLACE CLEMENT SABINE

## Test Report

**Kirei**  
 2019-04-03

**RAL™-A19-151**  
 Page 4 of 8

### TEST RESULTS

Specimen total absorption and absorption coefficient are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages.

1/3 Octave Center Frequency (Hz)	Total Absorption (m <sup>2</sup> )	Total Absorption (Sabins)	Absorption Coefficient
100	0.13	1.37	0.02
** 125	0.11	1.22	0.02
160	0.30	3.18	0.04
200	0.26	2.85	0.04
** 250	0.34	3.66	0.05
315	0.57	6.16	0.09
400	0.60	6.42	0.09
** 500	0.88	9.44	0.13
630	1.21	12.98	0.18
800	1.96	21.13	0.29
** 1000	2.73	29.35	0.41
1250	3.47	37.40	0.52
1600	4.15	44.72	0.62
** 2000	4.47	48.15	0.67
2500	5.05	54.32	0.75
3150	5.60	60.26	0.84
** 4000	6.18	66.56	0.92
5000	6.54	70.38	0.98

**SAA = 0.32**  
**NRC = 0.30**

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

## Test Report


**Kirei**  
2019-04-03

**RAL™-A19-151**  
Page 5 of 8

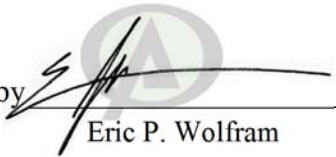
### TEST RESULTS (continued)

The sound absorption average (SAA) is defined in ASTM C423-17 Section 3.1.1 as the arithmetic average of the sound absorption coefficients of a material for the twelve one-third octave bands from 200 Hz through 2500 Hz, inclusive, rounded to the nearest integer multiple of 0.01.

The noise reduction coefficient (NRC) is defined from previous versions of ASTM C423 as the arithmetic average of the sound absorption coefficients at 250 Hz, 500 Hz, 1000 Hz, and 2000 Hz, rounded to the nearest integer multiple of 0.05.

Tested by   
Marc Sciaky  
Senior Experimentalist

Report by   
Malcolm Kelly  
Acoustical Test Engineer

Approved by   
Eric P. Wolfram  
Laboratory Manager

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

Test Report

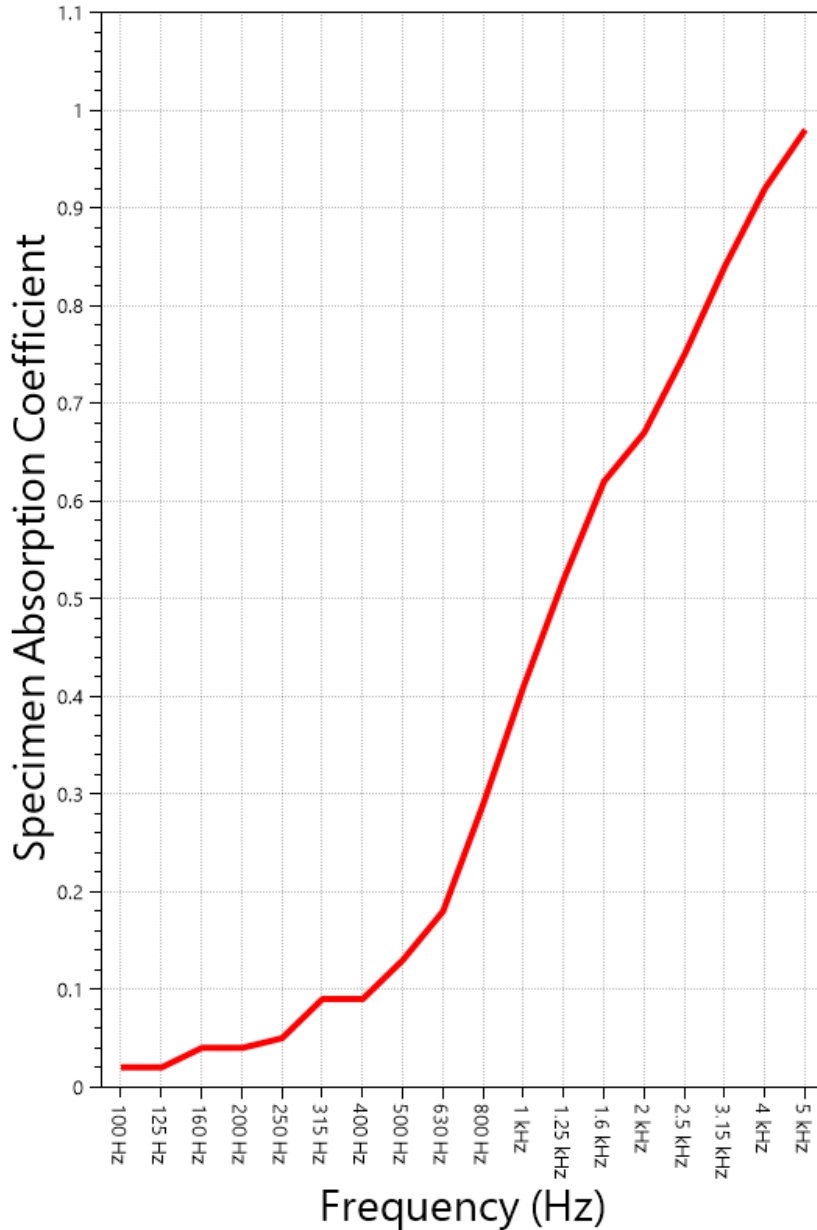
RAL™-A19-151

Page 6 of 8

Kirei  
2019-04-03

SOUND ABSORPTION REPORT

EchoLine Groovy 0.5 panels



**SAA = 0.32**  
**NRC = 0.30**



RIVERBANK ACOUSTICAL LABORATORIES IS ACCREDITED BY NVLAP (LAB CODE 100227-0) FOR ACOUSTICAL TESTING SERVICES IN ACCORDANCE WITH ISO/IEC 17025:2005 AND FOR THIS PROCEDURE. THIS REPORT MUST NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY RAL, NVLAP, NIST, OR ANY AGENCY OF THE U.S. GOVERNMENT. THIS REPORT SHALL NOT BE MODIFIED WITHOUT THE WRITTEN APPROVAL OF RAL. THE RESULTS REPORTED APPLY ONLY TO THE SPECIFIC SAMPLE SUBMITTED FOR TESTING; RAL ASSUMES NO RESPONSIBILITY FOR THE PERFORMANCE OF ANY OTHER SAMPLE.

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
 WALLACE CLEMENT SABINE

## Test Report

**Kirei**  
 2019-04-03

**RAL™-A19-151**  
 Page 7 of 8

### **APPENDIX A: Extended Frequency Range Data**

Specimen: EchoLine Groovy 0.5 panels (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)	Absorption Coefficient
31.5	6.39	0.09
40	-4.40	-0.06
50	-7.96	-0.11
63	3.60	0.05
80	-1.30	-0.02
100	1.37	0.02
125	1.22	0.02
160	3.18	0.04
200	2.85	0.04
250	3.66	0.05
315	6.16	0.09
400	6.42	0.09
500	9.44	0.13
630	12.98	0.18
800	21.13	0.29
1000	29.35	0.41
1250	37.40	0.52
1600	44.72	0.62
2000	48.15	0.67
2500	54.32	0.75
3150	60.26	0.84
4000	66.56	0.92
5000	70.38	0.98
6300	72.91	1.01
8000	77.94	1.08
10000	78.70	1.09
12500	84.47	1.17

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY  
WALLACE CLEMENT SABINE

## Test Report

**Kirei**  
2019-04-03

**RAL™-A19-151**  
Page 8 of 8

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

Specimen: EchoLine Groovy 0.5 panels (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	2018-08-09	2019-08-09
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2018-09-28	2019-09-28
Bruel & Kjaer Pistonphone	Type 4228	2781248	2018-08-06	2019-08-06
EXTECH Hygro 662	SD700	A083662	2018-11-29	2019-11-29

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

Specimen: EchoLine Groovy 0.5 panels (See Full Report)

<b><u>Date</u></b>	<b><u>Revision</u></b>
2019-04-18	Original report issued

---

END