1512 S BATAVIA AVENUE
GENEVA, IL 60134

630-232-0104

An ALION Technical Center

# Test Report

RIVERBANK.ALIONSCIENCE.COM

FOUNDED 1918 BY
WALLACE CLEMENT SABINE

SPONSOR: **Sound Seal**
Agawam, MA

**Sound Absorption**
**RAL™-A20-369**

CONDUCTED: 2020-09-01



ON: Tri-Hex™ Panel

## 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 C423-17: "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method," with the single exception that the non-rectangular geometry of the specimen components precluded its installation in a rectangular patch, as specified in Section 9.1.1. 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 Tri-Hex™ Panel. 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: | Tri-Hex™ Panel |
| Material: | Polyethylene terephthalate felt |
| Manufacturer: | Sound Seal |

## SPECIMEN MEASUREMENTS & TEST CONDITIONS

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

**Test Specimen**

| | |
|---|---|
| Material: | Semirigid felt paneling |
| Quantity: | 80 |
| Geometry: | Regular hexagon base layer, 192 mm (7.56 in.) side length x 8 mm (0.315 in.) thick<br>Three (3) rhomboid bulges on one face, side length @ 174.62 mm (6.875 in.), spaced 18 mm (0.709 in.) apart at parallel edges<br>Maximum overall thickness at center of a bulge @ 16.51 mm (0.65 in.) |
| Overall Weight: | 20.98 kg (46.25 lbs) |
| Installation: | Bulges exposed to sound field, edges butted |

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM

Test Report

FOUNDED 1918 BY
WALLACE CLEMENT SABINE



## Overall Specimen Properties

| | |
|---|---|
| Size: | 2.84 m (112.0 in) wide by 3. m (118.0 in) long |
| Thickness: | 0.02 m (0.65 in.) |
| Weight: | 20.98 kg (46.25 lbs) |
| Mass per Unit Area: | 2.46 kg/m² (0.5 lbs/ft²) |
| Calculation Area: | 8.527 m² (91.78 ft²) |

*Note: Due to the inherently non-rectangular geometry of the specimen installation, the rectangular envelope used to determine the bounds of the specimen geometry includes approximately 0.75 $m^2$ (8.09 $ft^2$) of untreated horizontal test surface area. Testing a specimen of identical dimensions with this area treated by similarly-performing material will result in greater measured sound absorption.*

## Test Environment

| | |
|---|---|
| Room Volume: | 291.98 m³ |
| Temperature: | 22.9 °C ± 0.2 °C (Requirement: ≥ 10 °C and ≤ 5 °C change) |
| Relative Humidity: | 57.2 % ± 0.8 % (Requirement: ≥ 40 % and ≤ 5 % change) |
| Barometric Pressure: | 98.5 kPa (Requirement not defined) |

## MOUNTING METHOD

Type A Mounting: The test specimen was laid directly against the test surface. Per sponsor request, the perimeter edges were left exposed, as would be typical of a field installation of the product under test.


Figure 1 – Specimen mounted in test chamber


Figure 2 – Individual panel specimen, face exposed to sound field

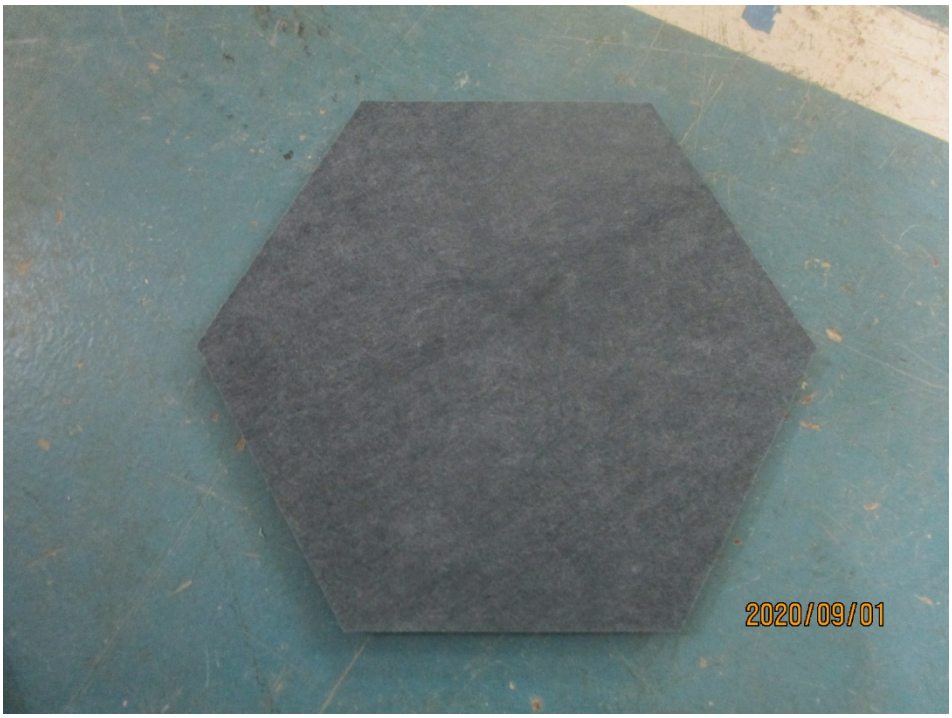



Figure 3 –Individual panel specimen, face mated to horizontal test surface


Figure 4 – Detail of specimen material, bulge profile

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

An ALION Technical Center

Test Report

RIVERBANK.ALIONSCIENCE.COM
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

**Sound Seal**
2020-09-01

**RAL™-A20-369**


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 ($m^2$) | Total Absorption (Sabins) | Absorption Coefficient |
|---|---|---|---|
| 100 | 0.06 | 0.64 | 0.01 |
| ** 125 | 0.22 | 2.39 | 0.03 |
| 160 | 0.24 | 2.63 | 0.03 |
| 200 | 0.53 | 5.71 | 0.06 |
| ** 250 | 0.59 | 6.38 | 0.07 |
| 315 | 1.06 | 11.39 | 0.12 |
| 400 | 1.52 | 16.35 | 0.18 |
| ** 500 | 2.48 | 26.65 | 0.29 |
| 630 | 3.23 | 34.76 | 0.38 |
| 800 | 4.17 | 44.87 | 0.49 |
| ** 1000 | 5.09 | 54.74 | 0.60 |
| 1250 | 5.90 | 63.53 | 0.69 |
| 1600 | 6.18 | 66.54 | 0.73 |
| ** 2000 | 6.52 | 70.19 | 0.76 |
| 2500 | 6.96 | 74.96 | 0.82 |
| 3150 | 7.13 | 76.73 | 0.84 |
| ** 4000 | 7.32 | 78.79 | 0.86 |
| 5000 | 7.58 | 81.64 | 0.89 |

**SAA = 0.43**
**NRC = 0.45**

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*

Digitally signed by
Eric P Wolfram
Location: Geneva, IL
Date: 2020.09.24
17:05:34 -05'00'

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

An ALION Technical Center

RIVERBANK.ALIONSCIENCE.COM
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

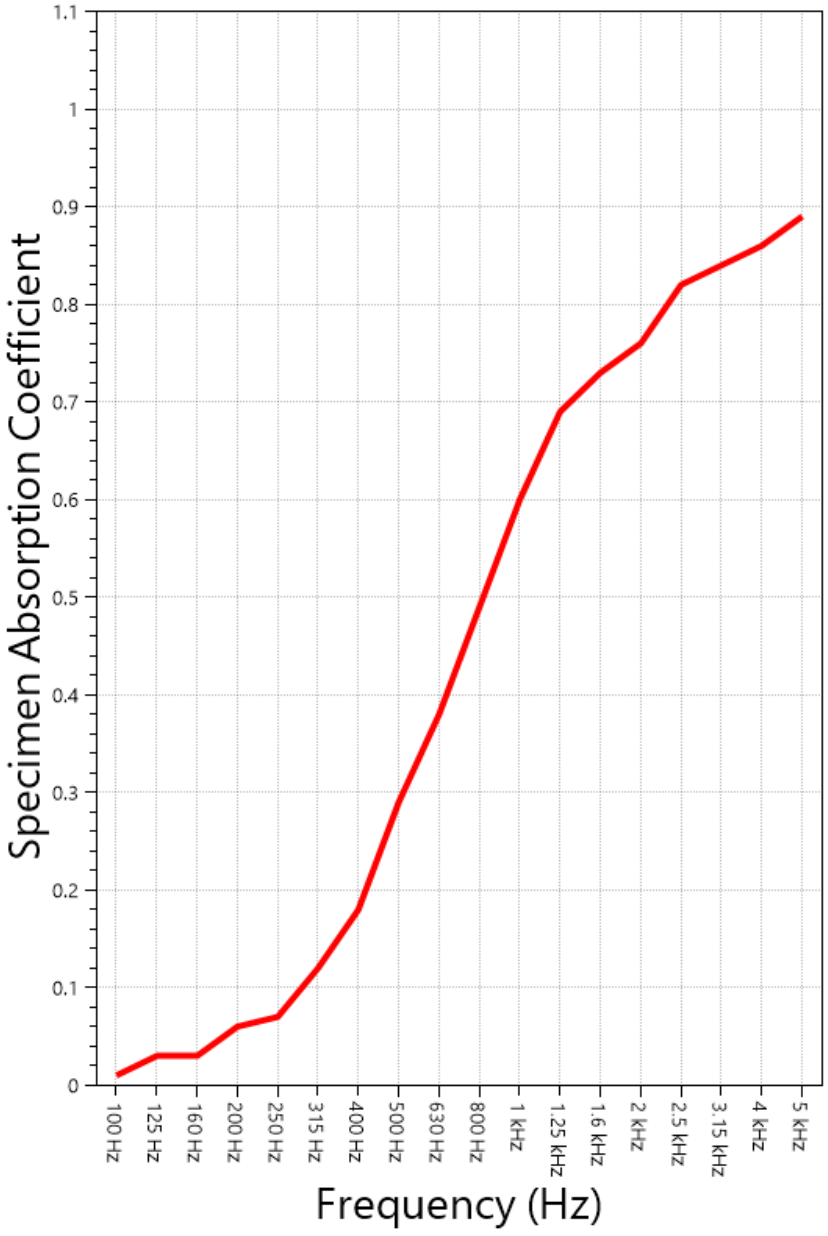
Test Report

**Sound Seal**
2020-09-01

**RAL™-A20-369**


## SOUND ABSORPTION REPORT

Tri-Hex™ Panel




**SAA = 0.43**
**NRC = 0.45**

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

RIVERBANK.ALIONSCIENCE.COM
FOUNDED 1918 BY
WALLACE CLEMENT SABINE



## APPENDIX A: Extended Frequency Range Data

Specimen: Tri-Hex™ Panel (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 | 4.21 | 0.05 |
| 40 | -2.71 | -0.03 |
| 50 | 15.03 | 0.16 |
| 63 | 10.63 | 0.12 |
| 80 | 8.58 | 0.09 |
| 100 | 0.64 | 0.01 |
| 125 | 2.39 | 0.03 |
| 160 | 2.63 | 0.03 |
| 200 | 5.71 | 0.06 |
| 250 | 6.38 | 0.07 |
| 315 | 11.39 | 0.12 |
| 400 | 16.35 | 0.18 |
| 500 | 26.65 | 0.29 |
| 630 | 34.76 | 0.38 |
| 800 | 44.87 | 0.49 |
| 1000 | 54.74 | 0.60 |
| 1250 | 63.53 | 0.69 |
| 1600 | 66.54 | 0.73 |
| 2000 | 70.19 | 0.76 |
| 2500 | 74.96 | 0.82 |
| 3150 | 76.73 | 0.84 |
| 4000 | 78.79 | 0.86 |
| 5000 | 81.64 | 0.89 |
| 6300 | 83.84 | 0.91 |
| 8000 | 88.62 | 0.97 |
| 10000 | 87.65 | 0.96 |
| 12500 | 90.39 | 0.98 |

## APPENDIX B: Instruments of Traceability

Specimen: Tri-Hex™ Panel (See Full Report)

| Description | Model | Serial Number | Date of Certification | Calibration Due |
|---|---|---|---|---|
| System 1 | Type 3160-A-042 | 3160-106968 | 2020-06-26 | 2021-06-26 |
| Bruel & Kjaer Mic And Preamp A | Type 4943-B-001 | 2311428 | 2019-09-27 | 2020-09-27 |
| Bruel & Kjaer Sound Level Calibrator | Type 4230 | 861609 | 2019-11-19 | 2020-11-19 |
| Omega Digital Temp., Humid. And Pressure Recorder | OM-CP-PRHTemp2000 | P97844 | 2020-02-18 | 2021-02-18 |

## APPENDIX C: Revisions to Original Test Report

Specimen: Tri-Hex™ Panel (See Full Report)

| Date | Revision |
|---|---|
| 2020-09-04 | Original report issued |
| 2020-09-24 | Page 1-9: The original manufacturer/requester identification and specimen designation were changed to facilitate a private label sales agreement. The original requester has provided a letter to RAL on their company letterhead certifying that the product identified has not changed in materials, composition, or manufacturing methods since the original test date and the product sold under the private label agreement is exactly identical to the original specimen described in the test report and sourced from the same manufacturing process. –MP, approved by EPW. |

END