

Test Report

FOR: **Commercial Acoustics**
Tampa, FL

Sound Transmission Loss
RAL-TL17-049

CONDUCTED: 2017-02-08 Page 1 of 10

ON: Dbl. metal std. wall, 18 ga. 6" studs 24" oc, 3" Air gap, Dbl lyr 5/8" Type X (Sor.) and 1 lyr 5/8" Type X (Rec.), 1 lyr. Wall Blokker each side, 6" insulation each wall

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 E90-09 (2016): "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements." The single number rating of the specimen was calculated according to ASTM E413-16: "Classification for Rating Sound Insulation." 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 Dbl. metal std. wall, 18 ga. 6" studs 24" oc, 3" Air gap, Dbl lyr 5/8" Type X (Sor.) and 1 lyr 5/8" Type X (Rec.), 1 lyr. Wall Blokker each side, 6" insulation each wall.

The building contractor and RAL staff compiled a detailed construction specification as follows:

Plates/Base Track

Material: 18g Steel Track
Dimensions: 4267.2 mm (168 in.) wide x 31.75 mm (1.25 in.) high
x 158.75 mm (6.25 in.) deep
Fastened: Friction Fit
Weight (Both Tracks): 36.29 kg (80 lbs.)
Isolation (Receive Side): Wall Blokker
Isolation Thickness: 3.18 mm (0.125 in.)
Isolation Weight: 18.48 kg (40.75 lbs.)

Note: Two sets of tracks and studs were used and had a 76.2 mm (3 in.) air gap between the two tracks.

152.4 mm (6 in.) strips of dB-3 Barrier were cut and added between the test frame and the framing members of the receive side (See Figure 2)

Studs

Material: 18g Steel Studs
Dimensions: 41.4 mm (1.63 in.) wide x 2743.2 mm (108 in.) high
x 158.75 mm (6.25 in.) deep
Stud Spacing: 609.6 mm (24 in.) on center
Fasteners: #8 Wafer head stud screw S12 Top and Bottom
Friction Fit on Sides
Weight (Overall): 93.89 kg (207 lbs.)



NVLAP LAB CODE 100227-0

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 2 of 10

Source Side

Layer 1

Material: Wall Blokker
Dimensions: 3 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
1 @ 609.6 mm (24 in.) x 2743.2 mm (108 in.)
Thickness: 3.18 mm (0.125 in.)
Fasteners: #8 Wafer head stud screw S12
(3 on top, 2 on sides, 2 on bottom per sheet – 7 total)
Overall Weight: 49.9 kg (110 lbs.)

Layer 2

Material: Type X Gypsum
Dimensions: 3 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
1 @ 609.6 mm (24 in.) x 2743.2 mm (108 in.)
Thickness: 16 mm (0.63 in.)
Fasteners: Type S12 Bugle head drywall screws
Fastener Spacing: 406.4 mm (16 in.) On Center
Overall Weight: 127.91 kg (282 lbs.)

Layer 3

Material: Type X Gypsum
Dimensions: 3 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
1 @ 609.6 mm (24 in.) x 2743.2 mm (108 in.)
Thickness: 16 mm (0.63 in.)
Fasteners: Type S12 Bugle head drywall screws
Fastener Spacing: 406.4 mm (16 in.) On Center
Overall Weight: 127.8 kg (281.75 lbs.)



NVLAP LAB CODE 100227-0

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 3 of 10

Receive Side

- Layer 1
 - Material: Wall Blokker
 - Dimensions: 3 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
1 @ 609.6 mm (24 in.) x 2743.2 mm (108 in.)
 - Thickness: 3.18 mm (0.125 in.)
 - Fasteners: #8 Wafer head stud screw S12
(3 on top, 2 on sides, 2 on bottom per sheet – 7 total)
 - Overall Weight: 49.9 kg (110 lbs.)
- Layer 2
 - Material: Type X Gypsum
 - Dimensions: 3 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
1 @ 609.6 mm (24 in.) x 2743.2 mm (108 in.)
 - Thickness: 16 mm (0.63 in.)
 - Fasteners: Type S12 Bugle head drywall screws
 - Fastener Spacing: 406.4 mm (16 in.) On Center
 - Overall Weight: 126.89 kg (279.75 lbs.)

Note: A thin bead of acoustical sealant and metal tape were applied over each joint and screw head on both sides. 1.36 kg (3 lbs.)

Cavity

- Material: R-19 Unfaced Fiberglass Insulation (both rows)
- Thickness: 6.25 inches (nominal)
- Fastened: Friction Fit
- Weight: 31.98 kg (70.5 lbs.)



NVLAP LAB CODE 100227-0

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 4 of 10

Physical Measures

Overall Dimensions: 4.27 m (168.00 in.) wide by 2.74 m (108.00 in.) high
Overall Thickness: 447.67 mm (17.63 in.)
Overall Weight: 615.88 kg (1357.75 lbs.)
Transmission Area: 11.71 m² (126.00 ft²)
Mass per Unit Area: 52.63 kg/m² (10.78 lbs./ft²)

Test Aperture

Size: 2.74 m (9.0 ft.) by 4.27 m (14.0 ft.)
Filler Wall: None
Sealed: Entire periphery (both sides) with dense mastic

Test Environment

Source Room

Volume: 177.1 m³ (6254.5 ft³)
Temperature: 22±0°C (72±0°F)
Humidity: 52±0%

Receive Room

Volume: 178.3 m³ (6297.6 ft³)
Temperature: 23±0°C (73±0°F)
Humidity: 52±1%

Requirements

Temperature: 22° C +/- 2° C, not more than 3° C change over all tests.
Humidity: ≥ 30% RH, not more than +/- 3% change over all tests.



NVLAP LAB CODE 100227-0

THE RESULTS REPORTED APPLY ONLY TO

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 5 of 10



Figure 1 – Specimen mounted in the test opening.



Figure 2 - Detail of Wall Blocker installed on test frame where the framing members will sit.



NVLAP LAB CODE 100227-0

THE RESULTS REPORTED APPLY ONLY TO

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 6 of 10



Figure 3 – Detail of studs and Wall Blokker installed on studs on one side.



Figure 4 - Detail of insulation.



NVLAP LAB CODE 100227-0

THE RESULTS REPORTED APPLY ONLY TO

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 7 of 10

TEST RESULTS

Sound transmission loss values are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages. The precision of the transmission loss test data is within the limits set by the ASTM Standard E90-09 (2016).

| <u>FREQ.</u> | <u>T.L.</u> | <u>C.L.</u> | <u>DEF.</u> | <u>FREQ.</u> | <u>T.L.</u> | <u>C.L.</u> | <u>DEF.</u> |
|--------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
| 100 | 40 | 0.76 | | 800 | 73 | 0.17 | |
| 125 | 46 | 0.73 | 5 | 1000 | 75 | 0.12 | |
| 160 | 50 | 0.56 | 4 | 1250 | 77 | 0.14 | |
| 200 | 54 | 0.58 | 3 | 1600 | 79 | 0.12 | |
| 250 | 56 | 0.31 | 4 | 2000 | 79 | 0.09 | |
| 315 | 57 | 0.35 | 6 | 2500 | 81 | 0.11 | |
| 400 | 59 | 0.30 | 7 | 3150 | 84 | 0.08 | |
| 500 | 64 | 0.19 | 3 | 4000 | 86 | 0.06 | |
| 630 | 68 | 0.13 | | 5000 | 87 | 0.07 | |

STC=67

ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)

T.L. = TRANSMISSION LOSS, dB

C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT

DEF. = DEFICIENCIES, dB<STC CONTOUR (SUM OF DEF = 32)

STC = SOUND TRANSMISSION CLASS

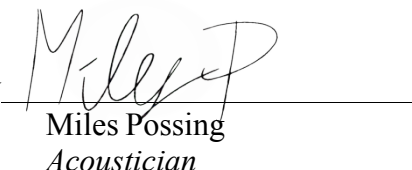
* = FILLER WALL CORRECTION APPLIED; T.L. COEFFICIENT DIFFERENCE BETWEEN 6 AND 15.

** = LOWER LIMITS OF THE T.L. FOR SPECIMEN; T.L. COEFFICIENT DIFFERENCE LESS THAN 6.

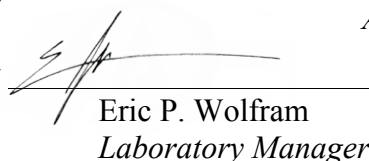
Tested by


Marc Sciaky
Experimentalist

Report by


Miles Possing
Acoustician

Approved by


Eric P. Wolfram
Laboratory Manager

Digitally signed by Eric Wolfram
DN: cn=Eric Wolfram, o=Alion Science
and Technology, ou=Riverbank
Acoustical Laboratories,
email=ewolfram@alionscience.com,
c=US
Date: 2017.03.01 14:39:57 -06'00'



RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

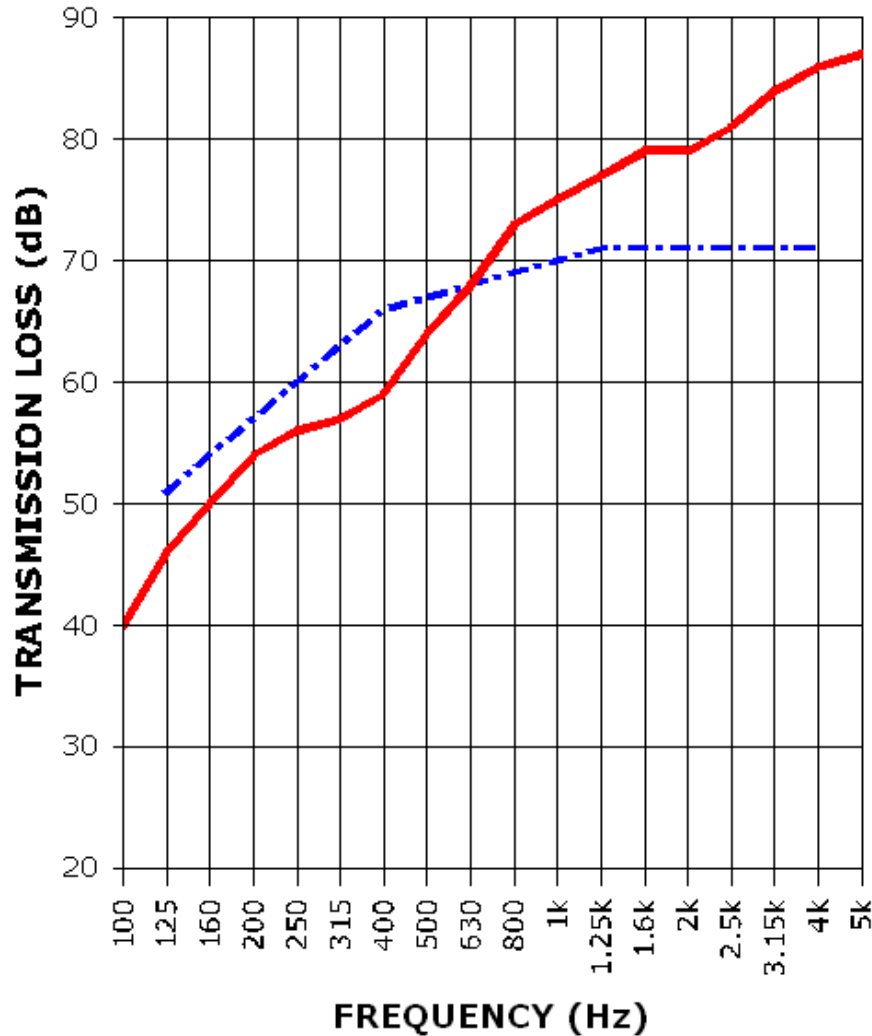
Test Report

Commercial Acoustics
 2017-02-08

RAL-TL17-049
 Page 8 of 10

SOUND TRANSMISSION REPORT

Dbl. metal std. wall, 18 ga. 6" studs 24" oc, 3" Air gap, Dbl lyr 5/8" Type X (Sor.) and
 1 lyr 5/8" Type X (Rec.), 1 lyr. Wall Blokker each side, 6" insulation each wall



STC=67



TRANSMISSION LOSS
SOUND TRANSMISSION LOSS CONTOUR



NVLAP LAB CODE 100227-0

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics

2017-02-08

RAL-TL17-049

Page 9 of 10

APPENDIX A: Extended Frequency Range Data

Specimen: Dbl. metal std. wall, 18 ga. 6" studs 24" oc, 3" Air gap, Dbl lyr 5/8" Type X (Sor.) and 1 lyr 5/8" Type X (Rec.), 1 lyr. Wall Blokker each side, 6" insulation each wall (See Full Report)

The following non-accredited data were obtained in accordance with ASTM E90-09 (2016), 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) | Sound Transmission Loss (dB) | Uncertainty (95% ±) |
|---|------------------------------------|------------------------|
| 31.5 | 18 | 1.07 |
| 40 | 30 | 1.02 |
| 50 | 32 | 0.64 |
| 63 | 33 | 0.59 |
| 80 | 39 | 0.55 |
| <hr/> | | |
| 100 | 40 | 0.76 |
| 125 | 46 | 0.73 |
| 160 | 50 | 0.56 |
| 200 | 54 | 0.58 |
| 250 | 56 | 0.31 |
| 315 | 57 | 0.35 |
| 400 | 59 | 0.30 |
| 500 | 64 | 0.19 |
| 630 | 68 | 0.13 |
| 800 | 73 | 0.17 |
| 1000 | 75 | 0.12 |
| 1250 | 77 | 0.14 |
| 1600 | 79 | 0.12 |
| 2000 | 79 | 0.09 |
| 2500 | 81 | 0.11 |
| 3150 | 84 | 0.08 |
| 4000 | 86 | 0.06 |
| 5000 | 87 | 0.07 |
| <hr/> | | |
| 6300 | 81 | 0.07 |
| 8000 | 73 | 0.06 |
| 10000 | 64 | 0.05 |
| 12500 | 57 | 0.04 |



NVLAP LAB CODE 100227-0

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.

Test Report

Commercial Acoustics
2017-02-08

RAL-TL17-049
Page 10 of 10

APPENDIX B: Instruments of Traceability

Specimen: Dbl. metal std. wall, 18 ga. 6" studs 24" oc, 3" Air gap, Dbl lyr 5/8" Type X (Sor.) and 1 lyr 5/8" Type X (Rec.), 1 lyr. Wall Blokker each side, 6" insulation each wall (See Full Report)

| <u>Description</u> | <u>Model</u> | <u>Serial Number</u> | <u>Date of Certification</u> | <u>Calibration Due</u> |
|--|-----------------|----------------------|------------------------------|------------------------|
| Bruel & Kjaer Pulse Analyzer - System4 | Type 3560-C | 2639093 | 2016-07-26 | 2017-07-26 |
| Bruel & Kjaer Mic And Preamp E | Type 4943-B-001 | 2311441 | 2016-03-17 | 2017-03-17 |
| Bruel & Kjaer Pistonphone | Type 4228 | 2781248 | 2016-07-25 | 2017-07-25 |
| Omega Digital Thermo-Hygrometer A | Model # RH411 | H0102487 | 2016-08-12 | 2017-08-12 |
| Omega Digital Thermo-Hygrometer D | Model # RH411 | H0102210 | 2016-07-13 | 2017-07-13 |

END



NVLAP LAB CODE 100227-0

RAL IS ACCREDITED BY THE US DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM TO ISO 17025:2005 LABORATORY QUALITY MANAGEMENT AND SPECIFIC ACOUSTICAL TEST STANDARDS. THIS TEST REPORT IN NO WAY CLAIMS OR IMPLIES PRODUCT CERTIFICATION, APPROVAL OR ENDORSEMENT BY NVLAP, NIST, OR RAL.

THIS REPORT SHALL NOT BE MODIFIED OR PARTIALLY REPRODUCED 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 SPECIMEN.