

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

An  ALION Technical Center

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FOUNDED 1918 BY
WALLACE CLEMENT SABINE

Test Report

SPONSOR: **dB Sound Control**
Mt. Airy, NC

Sound Transmission Loss
RAL™-TL19-040

CONDUCTED: 2019-02-27

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ON: Wall assembly - wood studs, 1 layer gypsum board on receive side, dB-3 Lite behind 1 layer gypsum board on source side, stud cavities insulated

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 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 measurement procedure and room specifications is available upon request. The transmission loss values are for a single direction of measurement. The results presented in this report apply to the sample as received from the test sponsor.

SPECIMEN CONSTRUCTION & TEST CONDITIONS

The test specimen was designated by the sponsor as Wall assembly - wood studs, 1 layer gypsum board on receive side, dB-3 Lite behind 1 layer gypsum board on source side, stud cavities insulated. The building contractor and RAL staff compiled a detailed construction specification as follows, in order of installation.

Plates / Base Track

Material: 2x4 SPF framing lumber
Dimensions: 2 @ 2438.4 mm (96 in.) x 38.1 mm (1.5 in.)
Depth: 88.9 mm (3.5 in.)
Installation: Friction fit in test frame over foam sill sealer
Overall Weight: 7.03 kg (15.5 lbs)
Mass per Unit Length: 1.44 kg/m (0.97 lbs/ft)

Studs

Material: 2x4 SPF framing lumber
Dimensions: 7 @ 2667 mm (105 in.) x 38.1 mm (1.5 in.)
Depth: 88.9 mm (3.5 in.)
Installation: Fastened to tracks at top and bottom, foam sill sealer at sides
Fasteners 3.33 mm (0.131 in.) full head pneumatic gun nails, 3 per joint
Stud Spacing: 406.4 mm (16 in.) on center
Overall Weight: 24.95 kg (55 lbs)
Mass per Unit Length: 1.34 kg/m (0.90 lbs/ft)

Note: A 9.52 mm (0.375 in.) diameter bead of non-hardening acoustical caulk was used to seal both sides of the specimen where framing members met the test frame (1.81 kg (4 lbs) total).



NVLAP LAB CODE 100227-0

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Layer 1

Trade Name: dB-3 Lite
Manufacturer: dB Sound Control
Material: Mass-loaded vinyl
Dimensions: 2 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
Thickness: 1.57 mm (0.062 in.)
Installation: Screwed to top track at 4 points per sheet
One screw on each side of sheet, 1219.2 mm (48 in.) and 1828.8 mm (72 in.) from top row of fasteners
Sheets butted together, joint sealed with duct tape
Fasteners: #8 wafer head stud screw, 12.7 mm (0.5 in.) length
Overall Weight: 19.96 kg (44 lbs)
Mass per Unit Area: 2.98 kg/m² (0.61 lbs/ft²)

Layer 2

Material: Type X gypsum board
Dimensions: 1 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
1 @ 406.4 mm (16 in.) x 2743.2 mm (108 in.)
1 @ 812.8 mm (32 in.) x 2743.2 mm (108 in.)
Thickness: 15.88 mm (0.625 in.)
Installation: Screwed through layer 1 to studs
Fasteners: Type W bugle head drywall screws, 41.28 mm (1.625 in.) length
Fastener Spacing: 406.4 mm (16 in.) on center
Overall Weight: 71.44 kg (157.5 lbs)
Mass per Unit Area: 10.68 kg/m² (2.19 lbs/ft²)

Cavity

Materials: R-13 unfaced fiberglass insulation
Dimensions: 6 @ 381 mm (15 in.) x 2667 mm (105 in.)
Thickness: 88.9 mm (3.5 in.)
Overall Weight: 7.26 kg (16 lbs)
Density: 13.39 kg/m³ (0.84 lbs/ft³)
Installation: Friction fit into cavities between studs

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Receive Side

Material: Type X gypsum board
Dimensions: 2 @ 1219.2 mm (48 in.) x 2743.2 mm (108 in.)
Thickness: 15.88 mm (0.625 in.)
Installation: Screwed to studs
Fasteners: Type W bugle head drywall screws, 41.28 mm (1.625 in.) length
Fastener Spacing: 406.4 mm (16 in.)
Overall Weight: 73.03 kg (161 lbs)
Mass per Unit Area: 10.92 kg/m² (2.24 lbs/ft²)

Note: Joints and screw heads on the outermost layers of both sides of the partition were sealed with caulk and metal tape (0.34 kg (0.75 lbs) total).

Overall Specimen Measurements

Dimensions: 2.44 m (96.0 in) wide by 2.74 m (108.0 in) high
Thickness: 0.12 m (4.81 in.)
Weight: 205.25 kg (452.5 lbs)
Transmission Area: 6.689 m² (72 ft²)
Mass per Unit Area: 30.68 kg/m² (6.28 lbs/ft²)

Test Aperture

Size: 2.74 m (9.0 ft.) by 4.27 m (14.0 ft.)
Filler Wall: Yes
Sealed: Entire periphery (both sides) with dense mastic

Test Environment

Source Room

Volume: 177.11 m³
Temperature: 21.1 °C ± 0.0 °C
Relative Humidity: 51.0 % ± 0.0 %

Receive Room

Volume: 178.33 m³
Temperature: 21.9 °C ± 0.6 °C
Relative Humidity: 50.0 % ± 0.0 %

Requirements

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



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Figure 1 – Specimen mounted in test opening, as viewed from source room



Figure 2 – Framing members installed in test opening

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Figure 3 – Stud cavity insulation installed, receive side gypsum board partially installed



Figure 4 – dB-3 Lite layer partially installed, as viewed from source room

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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>TL</u>	<u>ΔTL</u>	<u>DEF.</u>	<u>FREQ.</u>	<u>TL</u>	<u>ΔTL</u>	<u>DEF.</u>
100	18	0.58	0	800	46	0.15	0
125	18	0.40	4	1000	48	0.14	0
160	17	0.50	8	1250	50	0.10	0
200	28	0.66	0	1600	49	0.10	0
250	37	0.29	0	2000	46	0.10	0
315	36	0.30	0	2500	47	0.10	0
400	36	0.31	1	3150	52	0.08	0
500	41	0.25	0	4000	56	0.09	0
630	45	0.21	0	5000	59	0.07	0

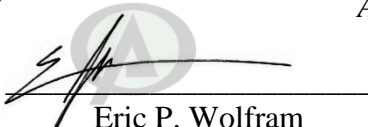
STC=38

ABBREVIATION INDEX

- FREQ. = FREQUENCY, HERTZ
- TL = TRANSMISSION LOSS, dB
- ΔTL = 95% CONFIDENCE INTERVAL FOR TL MEAUREMENTS, dB
- DEF. = DEFICIENCIES, dB BELOW STC CONTOUR (SUM OF DEF = 13)
- STC = SOUND TRANSMISSION CLASS

Tested by 
 Marc Sciaky
 Senior Experimentalist

Report by 
 Malcolm Kelly
 Acoustician

Approved by 
 Eric P. Wolfram
 Laboratory Manager



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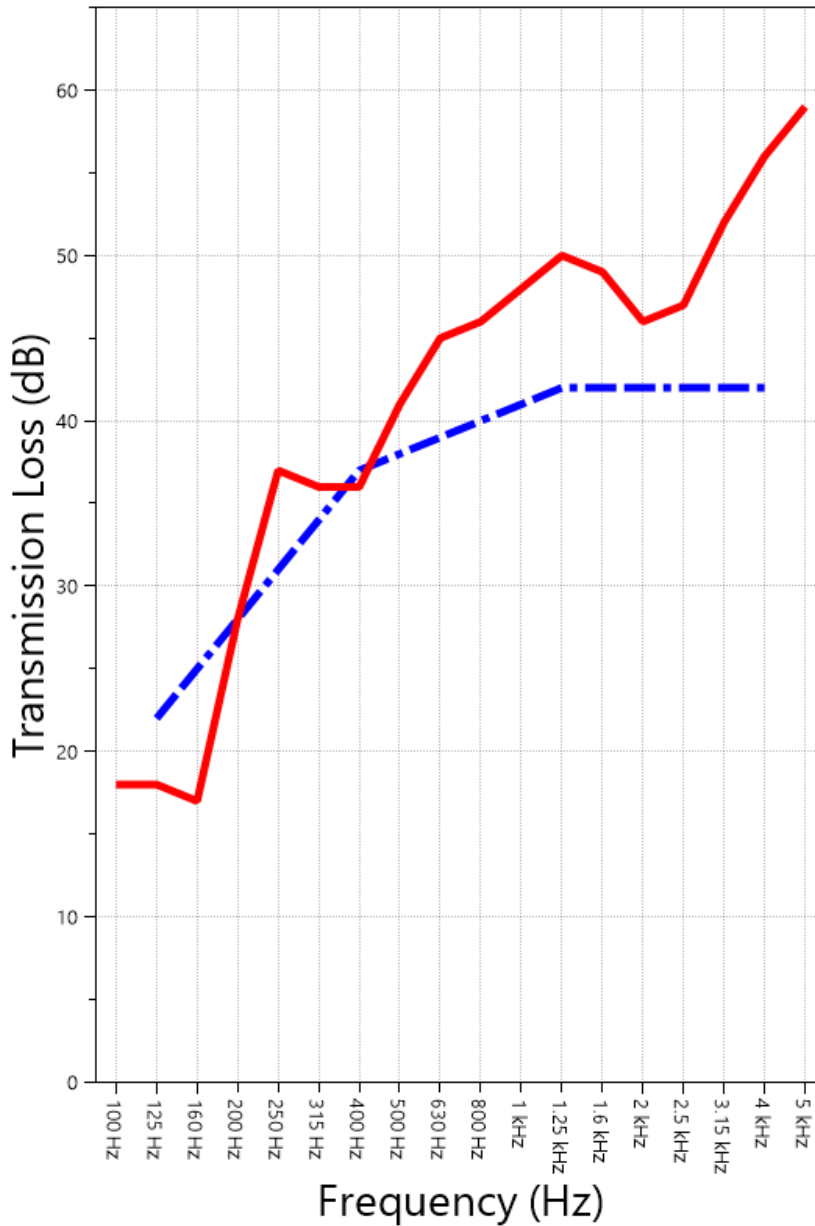
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SOUND TRANSMISSION REPORT

Wall assembly - wood studs, 1 layer gypsum board on receive side, dB-3 Lite behind 1 layer gypsum board on source side, stud cavities insulated



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TRANSMISSION LOSS
SOUND TRANSMISSION CLASS CONTOUR



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APPENDIX A: Extended Frequency Range Data

Specimen: Wall assembly - wood studs, 1 layer gypsum board on receive side, dB-3 Lite behind 1 layer gypsum board on source side, stud cavities insulated (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. Sampling precision observed during this procedure is reported below.

1/3 Octave Band Center Frequency (Hz)	Sound Transmission Loss (dB)	Δ TL (Eq. A2.5) (dB)
31.5	19	1.43
40	29	0.84
50	23	0.63
63	18	0.49
80	20	0.72
100	18	0.58
125	18	0.40
160	17	0.50
200	28	0.66
250	37	0.29
315	36	0.30
400	36	0.31
500	41	0.25
630	45	0.21
800	46	0.15
1000	48	0.14
1250	50	0.10
1600	49	0.10
2000	46	0.10
2500	47	0.10
3150	52	0.08
4000	56	0.09
5000	59	0.07
6300	63	0.08
8000	65	0.11
10000	60	0.09
12500	54	0.10

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APPENDIX B: Instruments of Traceability

Specimen: Wall assembly - wood studs, 1 layer gypsum board on receive side, dB-3 Lite behind 1 layer gypsum board on source side, stud cavities insulated (See Full Report)

<u>Description</u>	<u>Model</u>	<u>Serial Number</u>	<u>Date of Certification</u>	<u>Calibration Due</u>
System 2	Type 3160-A-042	3160-106974	2018-08-09	2019-08-09
Bruel & Kjaer Mic And Preamp D	Type 4943-B-001	2311440	2018-09-28	2019-09-28
Bruel & Kjaer Pistonphone	Type 4228	2781248	2018-08-06	2019-08-06
EXTECH Hygro 330	SD700	A083330	2018-09-07	2019-09-07
EXTECH Hygro 322	SD700	A083322	2018-09-07	2019-09-07

APPENDIX C: Revisions to Original Test Report

Specimen: Wall assembly - wood studs, 1 layer gypsum board on receive side, dB-3 Lite behind 1 layer gypsum board on source side, stud cavities insulated (See Full Report)

<u>Date</u>	<u>Revision</u>
2019-03-15	Original report issued

END