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An AL ION Technical Center

Test Report

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FOR: **Commercial Acoustics**
Tampa, FL

Sound Transmission Loss
RAL-TL17-046

CONDUCTED: 2017-02-07

ON: Dbl. metal std. wall, 18 ga. 6"studs 24"oc, 2" Air gap, 1 lyr 5/8" Type X and 1 lyr. dB-3 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, 2" Air gap, 1 lyr 5/8" Type X and 1 lyr. dB-3 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 50.8 mm (2 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.)

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.)

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. 0.91 kg (2 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.)

Physical Measures

Overall Dimensions:	4.27 m (168.00 in.) wide by 2.74 m (108.00 in.) high
Overall Thickness:	406.40 mm (16.00 in.)
Overall Weight:	537.52 kg (1185.00 lbs.)
Transmission Area:	11.71 m^2 (126.00 ft^2)
Mass per Unit Area:	45.89 kg/m^2 (9.40 $lbs./ft^2$)

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 m^3 (6254.5 ft^3)
Temperature:	22±0ºC (72±0ºF)
Humidity:	52±1%

Receive Room

Volume:	178.3 m^3 (6297.6 ft^3)
Temperature:	23±0ºC (74±1ºF)
Humidity:	51±1%

Requirements

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

Figure 1 – Specimen mounted in the test opening.

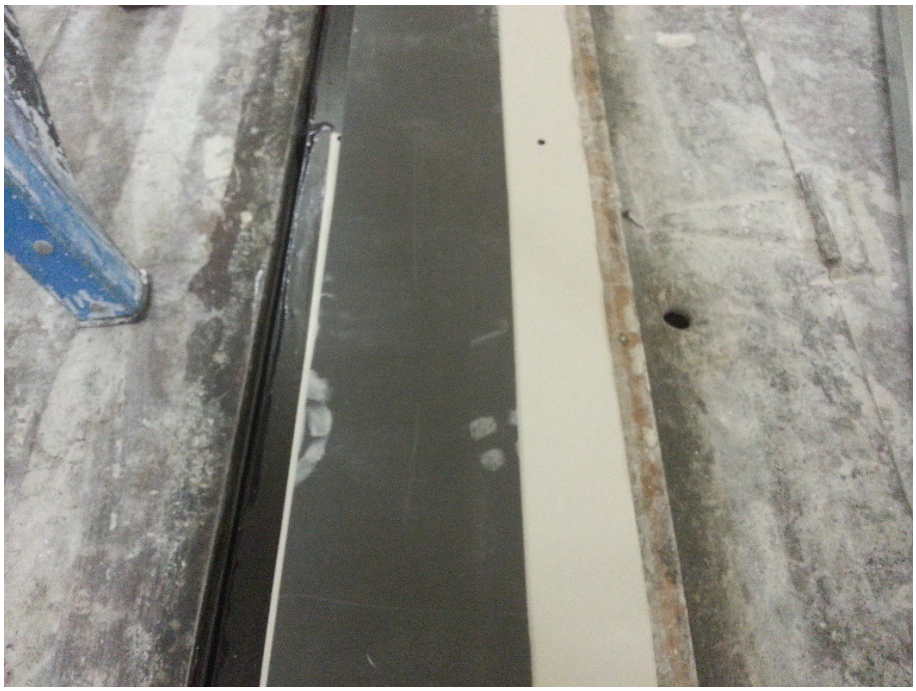
Figure 2 - Detail of Wall Blokker installed on test frame where the framing members will sit.

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

Figure 4 - Detail of insulation.

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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).

FREQ.	T.L.	C.L.	DEF.	FREQ.	T.L.	C.L.	DEF.
100	40	0.84		800	70	0.14	
125	44	0.58	1	1000	73	0.13	
160	48	0.60		1250	75	0.12	
200	51	0.35		1600	78	0.09	
250	52	0.34	2	2000	77	0.09	
315	50	0.26	7	2500	80	0.15	
400	52	0.36	8	3150	82	0.53	
500	59	0.16	2	4000	83	1.42	
630	65	0.27		5000	85	2.02	

STC=61

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 = 20)
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 _____
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Experimentalist

Report by _____
Miles Possing
Acoustician

Approved by _____
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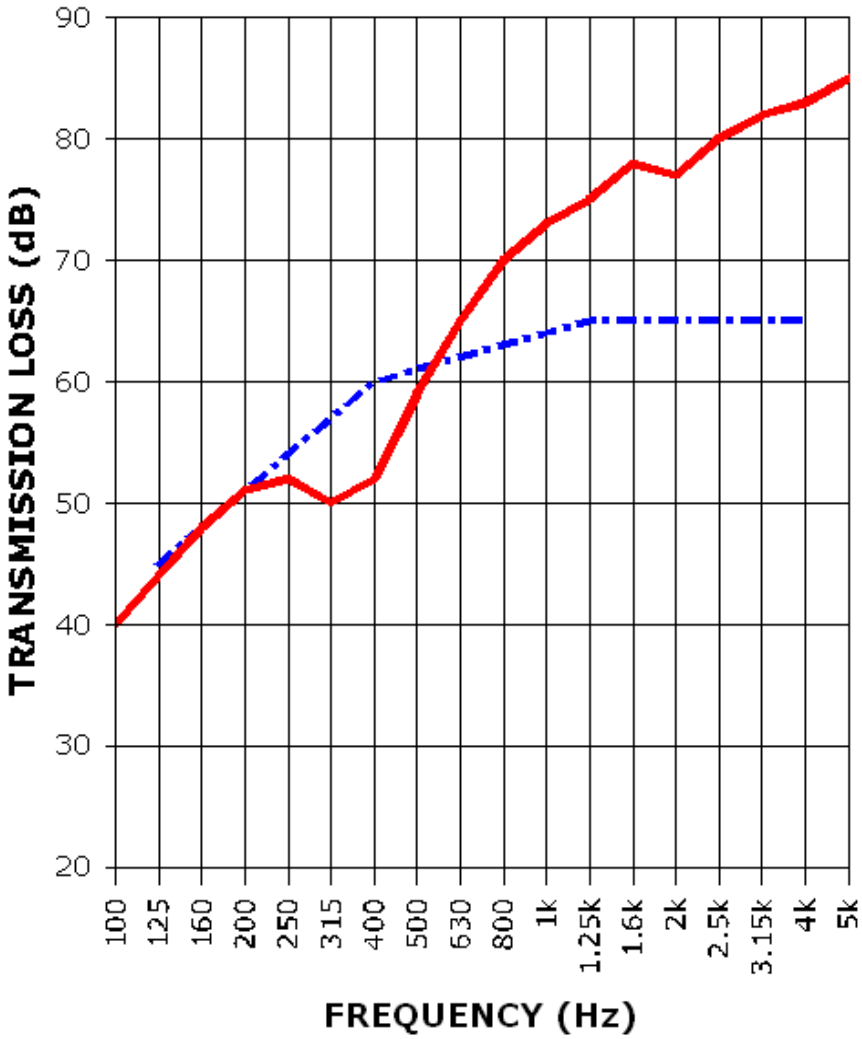
Date: 2017.03.01 14:40:29 -06'00'

SOUND TRANSMISSION REPORT

Dbl. metal std. wall, 18 ga. 6"studs 24"oc, 2" Air gap, 1 lyr 5/8" Type X and 1 lyr. dB-3 each side, 6" insulation each wall



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TRANSMISSION LOSS
SOUND TRANSMISSION LOSS CONTOUR

APPENDIX A: Extended Frequency Range Data

Specimen: Dbl. metal std. wall, 18 ga. 6"studs 24"oc, 2" Air gap, 1 lyr 5/8" Type X and 1 lyr. dB-3 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	21	2.35
40	28	0.82
50	28	0.74
63	28	0.47
80	37	0.50
100	40	0.84
125	44	0.58
160	48	0.60
200	51	0.35
250	52	0.34
315	50	0.26
400	52	0.36
500	59	0.16
630	65	0.27
800	70	0.14
1000	73	0.13
1250	75	0.12
1600	78	0.09
2000	77	0.09
2500	80	0.15
3150	82	0.53
4000	83	1.42
5000	85	2.02
6300	80	0.83
8000	72	0.52
10000	63	0.10
12500	57	0.05

APPENDIX B: Instruments of Traceability

Specimen: Dbl. metal std. wall, 18 ga. 6"studs 24"oc, 2" Air gap, 1 lyr 5/8" Type X and 1 lyr. dB-3 each side, 6" insulation each wall (See Full Report)

Description	Model	Serial Number	Date of Certification	Calibration Due
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