TRANSMISSSION LOSS - OL 05-0830 TEST REPORT - GREEN GLUE

ASTM E 90: Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements

Orfield Laboratories Inc

Design Research Testing
Acoustics / Vibration / Vision / Lighting / Architecture / Market Research

TEST
Manufacturer: **Audio Alloy L.L.C.**
Report Date: **December 6, 2005**
Test Date: **August 26, 2005**
Test Number: **OL 05-0830**

RESULT SUMMARY

STC=55

CLIENT
ADDRESS
Audio Alloy, L.L.C.
Fargo, ND USA
Phone: (989) 832-1602
email: tedwhite@audioalloy.com

ACCREDITATION
NVLAP
For the scope of accreditation under NVLAP code 200248-0

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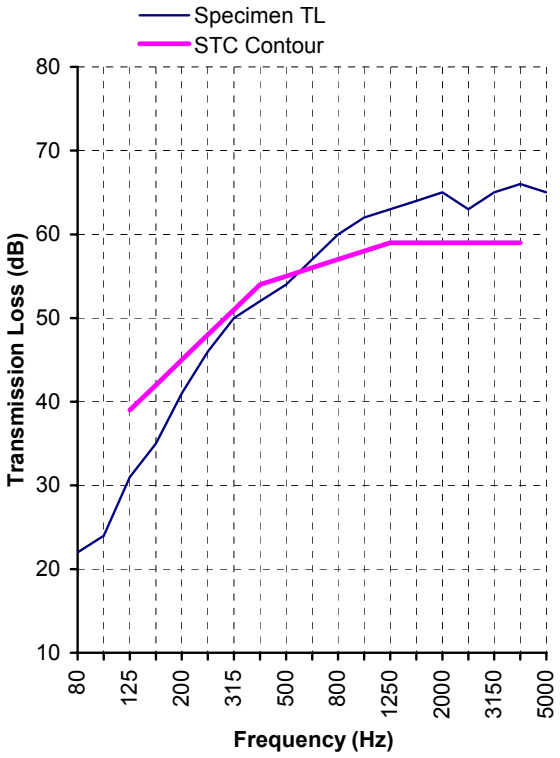
Signatures are required on this document for an official laboratory test report. Copies of this document without signatures are for reference only.

Orfield Laboratories Inc

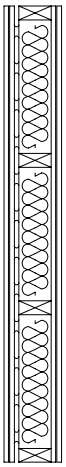
Client Audio Alloy
Project No. OL 05-0830
Specimen Interior Wall Assembly

Method ASTM Standard E90
Test Date August 26, 2005

Single Number Rating
STC=55



Freq. (Hz)	TL (dB)	Def. (dB)
80	22	
100	24	
125	31	8
160	35	7
200	41	4
250	46	2
315	50	1
400	52	2
500	54	1
630	57	0
800	60	0
1000	62	0
1250	63	0
1600	64	0
2000	65	0
2500	63	0
3150	65	0
4000	66	0
5000	65	
Total Deficiencies		25



Wall Assembly Description
(listed in order from source room side to reciever room side)
0.5" gypsum drywall; 2" screws @ 16" O.C.
Green Glue; 116 fl. oz.
0.5" gypsum drywall; 1.625" screws @ 24" O.C.
Resilient channel @ 24" O.C.
2x4 wood studs @ 16" O.C.
R13 glass fiber batt
0.5" gypsum drywall; 1.625" screws @ 24" O.C.
Green Glue; 116 fl. oz.
0.5" gypsum drywall; 2" screws @ 16" O.C.

* [16 screws short-circuit through resilient channel]

NVLAP

NVLAP Lab Code 200248-0

SPECIMEN DESCRIPTION

The specimen under test was one interior wall assembly. The elements in the assembly are described below the results table and chart. Additional information regarding the specimen may be found in the appendices.

Test results pertain to this specimen only.

INSTALLATION AND DISPOSITION

Representatives of the client constructed and installed the specimen wall assembly. A qualified representative of Orfield Laboratories observed the installation and visually inspected the specimen. The specimen was disposed of after testing.

TEST METHODS

The methods followed these published standards:

ASTM E90*: *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

ASTM E413: *Classification for Rating Sound Insulation*

** Orfield Laboratories, Inc. has been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under their National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure. This report shall not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.*

CONFIDENTIALITY

The client has full control over this information and any release of information will be only to the client. The specific testing results are deemed to be confidential exclusively for the client's use. Reproduction of this report, except in full, is prohibited.

APPENDIX A: MEASUREMENT SETUP

ENVIRONMENT

Tempurature	21 °C
Relative Humidity	50%
Source Room Volume	117.5 m³
Receiving Room Volume	234.5 m³
Specimen Area	5.99 m²

INSTRUMENTATION

Description	Brand	Model	S/N
Microphone	Brüel & Kjær	Type 4134	1478843
Preamplifier	Brüel & Kjær	Type 2639	1202479
Microphone	Brüel & Kjær	Type 4134	558007
Preamplifier	Brüel & Kjær	Type 2639	1312237
Analyzer	Brüel & Kjær	Type 2133	1389369

APPENDIX B: CALCULATION RESULTS

Freq. Band (Hz)	Filler T.C. (τ_f) (dim'less)	Specimen T.C. (τ_s) (dim'less)	Specimen T.L. (dB)	95% Conf. (dB)	Flanking Limit (dB)	STC Defic. (dB)
25						
31.5	n/a	1.14E-03	29		40	
40	n/a	5.30E-03	23		47	
50	n/a	2.88E-03	25		43	
63	n/a	9.10E-03	20		43	
80	n/a	6.14E-03	22	±1.63	42	
100	n/a	4.43E-03	24	±1.15	45	
125	n/a	8.60E-04	31	±0.95	44	8
160	n/a	3.06E-04	35‡	±1.27	44	7
200	n/a	8.54E-05	41‡	±1.24	49	4
250	n/a	2.42E-05	46‡	±0.65	51	2
315	n/a	9.72E-06	50‡	±0.65	53	1
400	n/a	6.05E-06	52‡	±0.62	56	2
500	n/a	4.26E-06	54‡	±0.40	58	1
630	n/a	1.90E-06	57‡	±0.50	59	0
800	n/a	1.09E-06	60‡	±0.40	58	0
1000	n/a	6.64E-07	62‡	±0.25	58	0
1250	n/a	5.51E-07	63‡	±0.25	60	0
1600	n/a	3.82E-07	64‡	±0.32	64	0
2000	n/a	3.20E-07	65‡	±0.44	63	0
2500	n/a	5.03E-07	63‡	±0.35	64	0
3150	n/a	3.06E-07	65‡	±0.31	64	0
4000	n/a	2.52E-07	66‡	±0.49	65	0
5000	n/a	3.48E-07	65‡	±0.35	66	
6300	n/a	2.52E-07	66			
8000	n/a	4.92E-07	63			
10000	n/a	1.40E-06	59			

† Result at identified frequency band is an estimate of lower limit due to low signal-to-noise in the receiving room. Actual transmission loss may be higher.

‡ Result at identified frequency band may be potentially limited by laboratory flanking. Actual transmission loss may be higher.

Note: 95% Confidence from room qualification data. Flanking Limit from chamber flanking measurements. Data available upon request. Extended frequency results below 80Hz and above 5000Hz for reference only.

APPENDIX C: SPECIMEN ASSEMBLY DESCRIPTION

The following table shows the elements in the wall assembly, with the source-room-side element first and the receiving-room-side element last.

Overall Mass = 559.0 lb [253.6 kg]
Overall Surface Density = 8.67 PSF [42.31 kg/m²]

Element	Mass lb[kg]	Surf. Dens. PSF[kg/m²]
0.5" gypsum drywall; 2" screws @ 16" O.C.	116.0[52.6]	1.80[8.78]
Green Glue; 116 fl. oz.	5.0[2.3]	0.08[0.38]
0.5" gypsum drywall; 1.625" screws @ 24" O.C.	117.0[53.1]	1.81[8.86]
Resilient channel @ 24" O.C.	6.0[2.7]	0.09[0.45]
2x4 wood studs @ 16" O.C.	68.0[30.8]	1.05[5.15]
R13 glass fiber batt	13.0[5.9]	0.20[0.98]
0.5" gypsum drywall; 1.625" screws @ 24" O.C.	115.0[52.2]	1.78[8.71]
Green Glue; 116 fl. oz.	5.0[2.3]	0.08[0.38]
0.5" gypsum drywall; 2" screws @ 16" O.C.	114.0[51.7]	1.77[8.63]

The client pre-manufactured panel assemblies with gypsum board sandwiching the Green Glue. According to the client, Green Glue was applied from adhesive cartridges in 3/16” beads in a random pattern over the whole gypsum board panel.

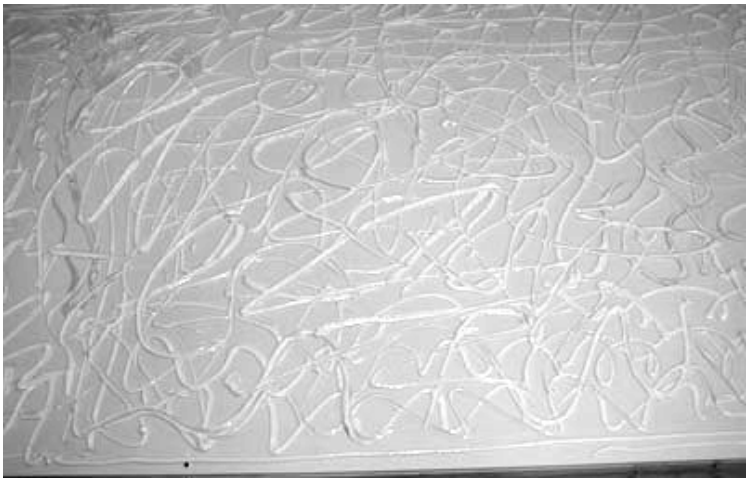


Figure 1: Typical Green Glue Random Application Pattern (photo by client)

The assemblies were dried spaced out and with forced air ventilation. The aging period was 21 days, greater than the 14 days period stated in ASTM Standard E90 for water-base adhesives. However a slight odor remained indicating the adhesive was not completely dry.

The resilient channel is designed to partially decouple the wall paneling from the wall framing. Great care was exercised in fastening the gypsum drywall paneling to the resilient channel to ensure “short circuits” did not occur by accident. Prior to testing, sixteen (16) fasteners were intentionally placed to “short circuit” through the resilient channel.

Figure 2: Finished Specimen
(fasteners at numbered locations 1-16 intentionally short-circuit the resilient channel)

Seams were sealed with caulk. The perimeter was sealed with 7/8” wide strips of rope-caulk on each side.