TRANSMISSSION LOSS - OL 05-1049 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 1, 2005**
Test Date: **October 15, 2005**
Test Number: **OL 05-1049**

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

PREPARED BY
David M. Berg
Orfield Laboratories, Inc.
2709 East 25th Street
Minneapolis MN 55406
Voice: (612) 721-2455
FAX: (612) 721-2457
email: dave@orfieldlabs.com

Prepared by:

Electronically Reproduced Signatures

Reviewed by:

David M. Berg
Laboratory Manager

Elliott B. Dick
Quality Manager

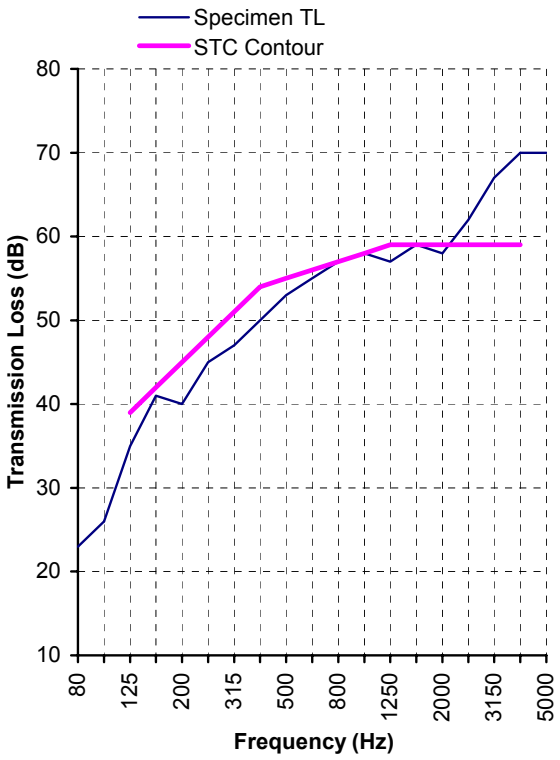
Signatures are required on this document for an official laboratory test report. Copies of this document without signatures are for reference only.

Orfield Laboratories Inc

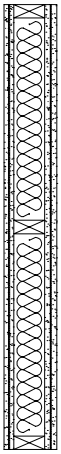
Client Audio Alloy
Project No. OL 05-1049
Specimen Interior Wall Assembly

Method ASTM Standard E90
Test Date October 15, 2005

Single Number Rating
STC=55



Freq. (Hz)	TL (dB)	Def. (dB)
80	23	
100	26	
125	35	4
160	41	1
200	40	5
250	45	3
315	47	4
400	50	4
500	53	2
630	55	1
800	57	0
1000	58	0
1250	57	2
1600	59	0
2000	58	1
2500	62	0
3150	67	0
4000	70	0
5000	70	
Total Deficiencies		27



Wall Assembly Description
(listed in order from source room side to reciever room side)
0.625" gypsum drywall; 2.5" screws @ 12" O.C.
Green Glue; 116 oz
0.625" gypsum drywall; 1.625" screws @ 24" O.C.
2x4 wood studs @ 24" O.C.
R13 glass fiber batt
0.625" gypsum drywall; 1.625" screws @ 24" O.C.
Green Glue; 116 oz
0.625" gypsum drywall; 1.625" screws @ 12" O.C.

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	20 °C
Relative Humidity	55%
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	1.80E-03	27			40	
40	n/a	4.02E-03	24			47	
50	n/a	2.82E-03	26			43	
63	n/a	7.13E-03	21			43	
80	n/a	4.59E-03	23		±1.63	42	
100	n/a	2.63E-03	26		±1.15	45	
125	n/a	3.51E-04	35	‡	±0.95	44	4
160	n/a	8.17E-05	41	‡	±1.27	44	1
200	n/a	1.10E-04	40	‡	±1.24	49	5
250	n/a	3.10E-05	45	‡	±0.65	51	3
315	n/a	1.95E-05	47	‡	±0.65	53	4
400	n/a	1.12E-05	50	‡	±0.62	56	4
500	n/a	5.35E-06	53	‡	±0.40	58	2
630	n/a	3.11E-06	55	‡	±0.50	59	1
800	n/a	1.83E-06	57	‡	±0.40	58	0
1000	n/a	1.46E-06	58	‡	±0.25	58	0
1250	n/a	1.84E-06	57	‡	±0.25	60	2
1600	n/a	1.41E-06	59	‡	±0.32	64	0
2000	n/a	1.64E-06	58	‡	±0.44	63	1
2500	n/a	6.41E-07	62	‡	±0.35	64	0
3150	n/a	1.79E-07	67	‡	±0.31	64	0
4000	n/a	9.18E-08	70	‡	±0.49	65	0
5000	n/a	9.58E-08	70	‡	±0.35	66	
6300	n/a	1.04E-07	70	†			
8000	n/a	1.37E-07	69	†			
10000	n/a	4.66E-07	63	†			

† Actual transmission loss of specimen may be higher than measured at this frequency band. Signal-to-noise in the receiving room less than 5 dB, therefore the result is “an estimate of the lower limit”.

‡ Actual transmission loss of specimen may be higher than measured at this frequency band. Result within 10 dB of flanking limit found in separate study, therefore the result may be “potentially limited by the laboratory” due to flanking around the specimen.

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 = 644.6 lb [292.4 kg]
Overall Surface Density = 9.99 PSF [48.79 kg/m²]

	Mass		Surf. Dens.	
Element	**lb**	**[kg]**	**PSF**	**[kg/m²]**
0.625" gypsum drywall; 2.5" screws @ 12" O.C.	140.0	[63.5]	2.17	[10.60]
Green Glue; 116 oz	5.0	[2.3]	0.08	[0.38]
0.625" gypsum drywall; 1.625" screws @ 24" O.C.	141.0	[64.0]	2.19	[10.67]
2x4 wood studs @ 24" O.C.	59.8	[27.1]	0.93	[4.53]
R13 glass fiber batt	13.8	[6.3]	0.21	[1.04]
0.625" gypsum drywall; 1.625" screws @ 24" O.C.	140.0	[63.5]	2.17	[10.60]
Green Glue; 116 oz	5.0	[2.3]	0.08	[0.38]
0.625" gypsum drywall; 1.625" screws @ 12" O.C.	140.0	[63.5]	2.17	[10.60]

The gypsum board panels were laminated together with green glue. The client reported that the green glue was applied from adhesive cartridges in 3/16" beads in a random pattern over the whole panel. The aging period was over 40 days, greater than the 14 days period stated in ASTM Standard E90 for water-base adhesives. The assemblies were dried on 4' x 8' wood-stud frames, spaced out and with forced air ventilation according to the client.

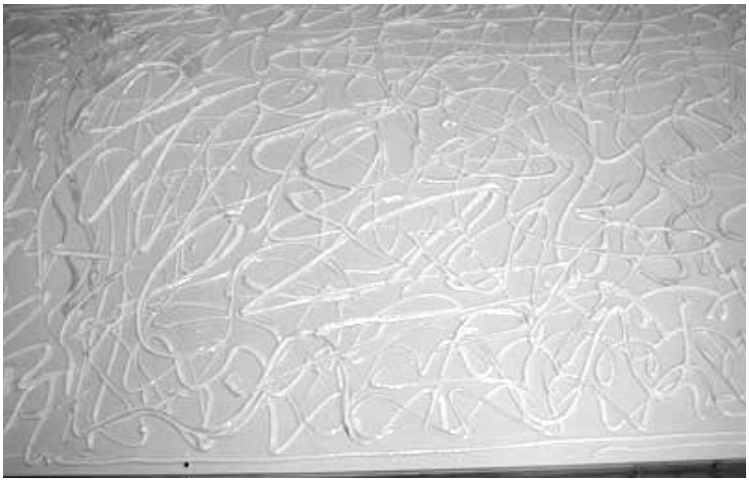


Figure 1: Typical Green Glue Random Application Pattern (photo by client)

Figure 2: Wood-stud Specimen Frame in Opening

The specimen arrived at the laboratory still mounted on the wood stud frames. Fastener heads on the base layer panel were accessible via pre-drilled holes through the face layer, approximately 1/2" in diameter. A new wood-stud frame was erected in the specimen opening. The glued wall panels were demounted from the drying frames, and then remounted on the frame in the opening.

Seams were sealed with caulk. The perimeter of each face was sealed with 7/8" wide strips of putty rope-caulk. Screw holes in the face were filled with putty.