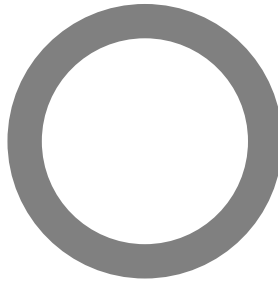


ASTM E 90: Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements

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 05-1056**

ACCREDITATION



For the scope of accreditation under NVLAP code 200248-0

RESULT SUMMARY

STC=46

CLIENT ADDRESS

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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.

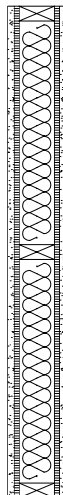
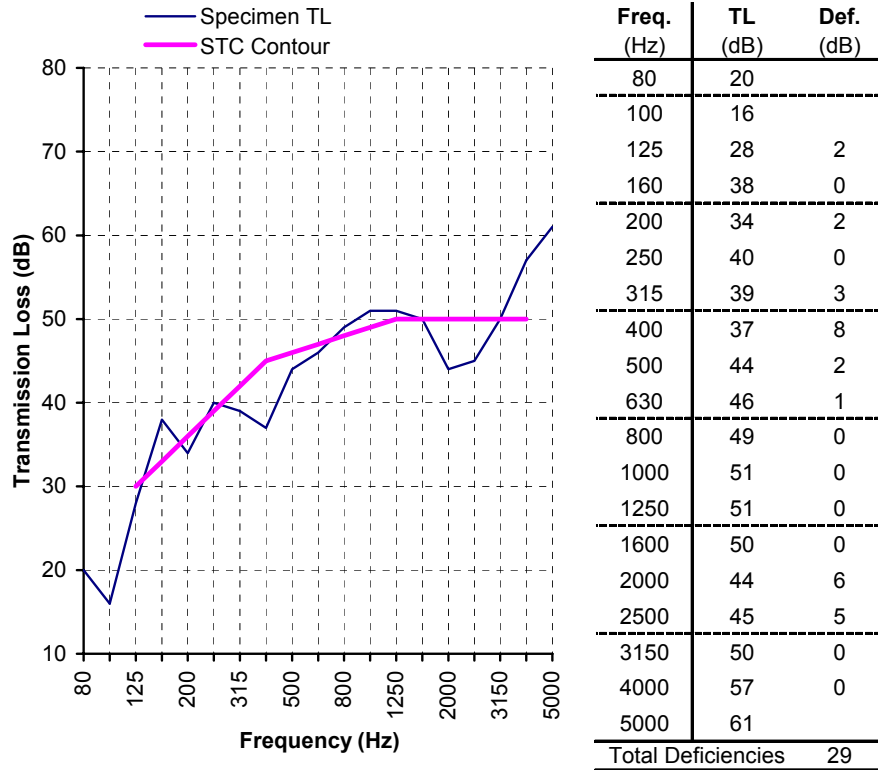




Client Audio Alloy
Project No. OL 05-1056
Specimen Interior Wall Assembly

Method ASTM Standard E90
Test Date October 15, 2005

Single Number Rating
STC=46



Wall Assembly Description

(listed in order from source room side to receiver room side)
 0.625" gypsum drywall; 2" screws @ 12" O.C.
 0.5" sound-deadening fiberboard; 1.625" screws @ 48" O.C.
 2x4 wood studs @ 24" O.C.
 R13 glass fiber batt
 0.5" sound-deadening fiberboard; 1.625" screws @ 48" O.C.
 0.625" gypsum drywall; 2" screws @ 12" O.C.





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

Temperature	20 °C
Relative Humidity	55%
Source Room Volume	117.5 m ³
Receiving Room Volume	234.5 m ³
Specimen Area	5.99 m ²

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	2.26E-03	26		40	
40	n/a	8.40E-03	21		47	
50	n/a	3.89E-03	24		43	
63	n/a	1.12E-02	20		43	
80	n/a	1.09E-02	20	±1.63	42	
100	n/a	2.59E-02	16	±1.15	45	
125	n/a	1.68E-03	28	±0.95	44	2
160	n/a	1.66E-04	38 †	±1.27	44	0
200	n/a	3.61E-04	34	±1.24	49	2
250	n/a	9.27E-05	40	±0.65	51	0
315	n/a	1.16E-04	39	±0.65	53	3
400	n/a	1.85E-04	37	±0.62	56	8
500	n/a	4.28E-05	44	±0.40	58	2
630	n/a	2.71E-05	46	±0.50	59	1
800	n/a	1.22E-05	49 ‡	±0.40	58	0
1000	n/a	8.05E-06	51 ‡	±0.25	58	0
1250	n/a	7.99E-06	51 ‡	±0.25	60	0
1600	n/a	1.10E-05	50	±0.32	64	0
2000	n/a	3.72E-05	44	±0.44	63	6
2500	n/a	3.46E-05	45	±0.35	64	5
3150	n/a	8.97E-06	50	±0.31	64	0
4000	n/a	2.14E-06	57 ‡	±0.49	65	0
5000	n/a	8.60E-07	61 ‡	±0.35	66	
6300	n/a	6.75E-07	62			
8000	n/a	6.14E-07	62			
10000	n/a	1.80E-06	57			

† 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 = 469.3 lb [212.9 kg]

Overall Surface Density = 7.28 PSF [35.52 kg/m²]

Element	Mass		Surf. Dens.	
	lb	[kg]	PSF	[kg/m ²]
0.625" gypsum drywall; 2" screws @ 12" O.C.	149.2	[67.7]	2.31	[11.29]
0.5" sound-deadening fiberboard; 1.625" screws @ 48" O.C.	48.6	[22.0]	0.75	[3.68]
2x4 wood studs @ 24" O.C.	63.4	[28.8]	0.98	[4.80]
R13 glass fiber batt	13.8	[6.3]	0.21	[1.04]
0.5" sound-deadening fiberboard; 1.625" screws @ 48" O.C.	49.5	[22.5]	0.77	[3.75]
0.625" gypsum drywall; 2" screws @ 12" O.C.	144.8	[65.7]	2.24	[10.96]

Sound-deadening fiberboard, sometimes called 'soundboard', was a wood/cellulose fiber board with a density of 15-20 pounds per cubic foot and was installed according to manufacturer's instructions. Seams were sealed with caulk. The perimeter of each face was sealed with 7/8" wide strips of rope-caulk.



Figure 1: Installed Base Layer of Sound-Deadening Fiberboard