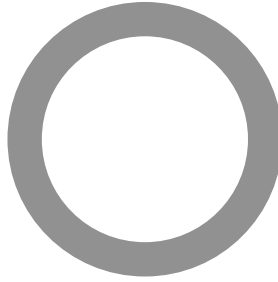


ASTM E 90: Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements

Orfield Laboratories Inc



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

TEST

Manufacturer: **Audio Alloy L.L.C.**
Report Date: **October 28, 2005**
Test Date: **October 14, 2005**
Test Number: **OL 05-1054b**

ACCREDITATION



For the scope of accreditation under NVLAP code 200248-0

RESULT SUMMARY

STC=44

CLIENT ADDRESS

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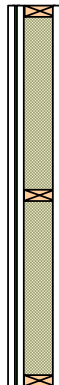
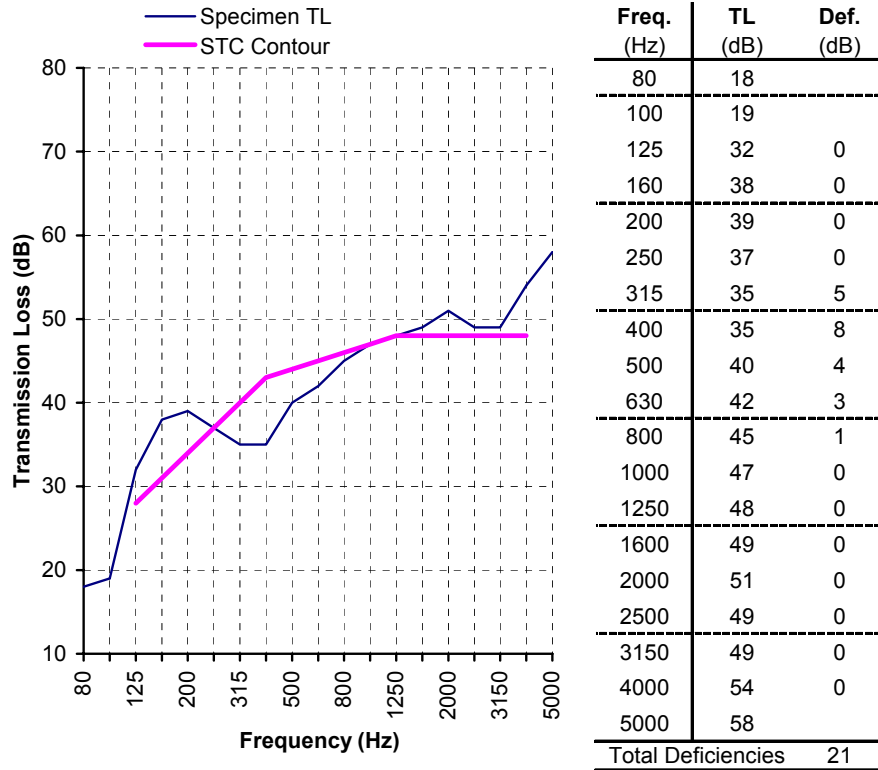




Client Audio Alloy
Project No. OL 05-1054
Specimen Interior Wall Assembly

Method ASTM Standard E90
Test Date October 14, 2005

Single Number Rating
STC=44



Wall Assembly Description

(listed in order from source room side to receiver room side)
 0.5" Gypsum Board; 2" screws @ 12" O.C.
 Mass-loaded vinyl sheet
 0.5" Gypsum Board; 1.625" screws @ 48" O.C.
 2x4 wood studs @ 24" O.C.
 R13 glass fiber batts
 0.5" Gypsum Board; 1.625" 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 | 20.0 °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 | 2.35E-03 | 26 | | 40 | |
| 40 | n/a | 6.01E-03 | 22 | | 47 | |
| 50 | n/a | 3.99E-03 | 24 | | 43 | |
| 63 | n/a | 1.99E-02 | 17 | | 43 | |
| 80 | n/a | 1.74E-02 | 18 | ±1.63 | 42 | |
| 100 | n/a | 1.22E-02 | 19 | ±1.15 | 45 | |
| 125 | n/a | 6.04E-04 | 32 | ±0.95 | 44 | 0 |
| 160 | n/a | 1.77E-04 | 38 | ±1.27 | 44** | 0 |
| 200 | n/a | 1.32E-04 | 39 | ±1.24 | 49 | 0 |
| 250 | n/a | 2.02E-04 | 37 | ±0.65 | 51 | 0 |
| 315 | n/a | 3.48E-04 | 35 | ±0.65 | 53 | 5 |
| 400 | n/a | 3.40E-04 | 35 | ±0.62 | 56 | 8 |
| 500 | n/a | 9.43E-05 | 40 | ±0.40 | 58 | 4 |
| 630 | n/a | 6.24E-05 | 42 | ±0.50 | 59 | 3 |
| 800 | n/a | 3.40E-05 | 45 | ±0.40 | 58 | 1 |
| 1000 | n/a | 2.14E-05 | 47 | ±0.25 | 58 | 0 |
| 1250 | n/a | 1.63E-05 | 48 | ±0.25 | 60 | 0 |
| 1600 | n/a | 1.20E-05 | 49 | ±0.32 | 64 | 0 |
| 2000 | n/a | 7.30E-06 | 51 | ±0.44 | 63 | 0 |
| 2500 | n/a | 1.15E-05 | 49 | ±0.35 | 64 | 0 |
| 3150 | n/a | 1.15E-05 | 49 | ±0.31 | 64 | 0 |
| 4000 | n/a | 4.45E-06 | 54 | ±0.49 | 65 | 0 |
| 5000 | n/a | 1.56E-06 | 58 | ±0.35 | 66** | |
| 6300 | n/a | 1.02E-06 | 60 | | | |
| 8000 | n/a | 9.21E-07 | 60 | | | |
| 10000 | n/a | 1.94E-06 | 57 | | | |

* 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 = 474.4 lb [215.2 kg]
 Overall Surface Density = 7.4 PSF [35.9 kg/m²]

| Element | Mass lb [kg] | Surf. Dens. PSF [kg/m ²] |
|---|-----------------|---|
| 0.5" Gypsum Board; 2" screws @ 12" O.C. | 111.0 [50.3] | 1.7 [8.4] |
| Mass-loaded vinyl sheet | 64.2 [29.1] | 1.0 [4.9] |
| 0.5" Gypsum Board; 1.625" screws @ 48" O.C. | 111.0 [50.3] | 1.7 [8.4] |
| 2x4 wood studs @ 24" O.C. | 63.4 [28.8] | 1.0 [4.8] |
| R13 glass fiber batts | 13.8 [6.3] | 0.2 [1.0] |
| 0.5" Gypsum Board; 1.625" screws @ 12" O.C. | 111.0 [50.3] | 1.7 [8.4] |

The mass-loaded vinyl sheets were adhered to the base layer with carpet adhesive, and sealed at the seams and perimeter with lead tape. Other seams were sealed with caulk. The outside perimeter was sealed with 7/8" wide strips of rope-caulk on each side.



Figure 1: Mass-Loaded Vinyl Sheets on Unfinished Wall Assembly Interior