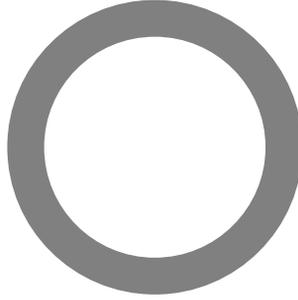


ASTM E 90: Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements

Orfield Laboratories Inc



Design Research Testing

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

TEST

Client: **Green Glue Company, L.L.C.**
Report Date: **November 27, 2007**
Test Date: **December 22, 2006**
Test Number: **OL06-1222**

ACCREDITATION



For the scope of accreditation under NVLAP code 200248-0

RESULT SUMMARY

STC=56

CLIENT

ADDRESS
Green Glue Company, L.L.C.
710 11th Avenue Northeast
West Fargo, ND 58078
Phone: (866) 435-8893
email: info@greengluecompany.com

PREPARED BY

David M. Berg
Orfield Laboratories, Inc.
2709 East 25th Street
Minneapolis MN 55406
Voice (612) 721-2455
FAX (612) 721-2457
e-mail 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.



Project Sound Transmission 2
 Client Green Glue Company, L.L.C. of 7
 Test OL06-1222

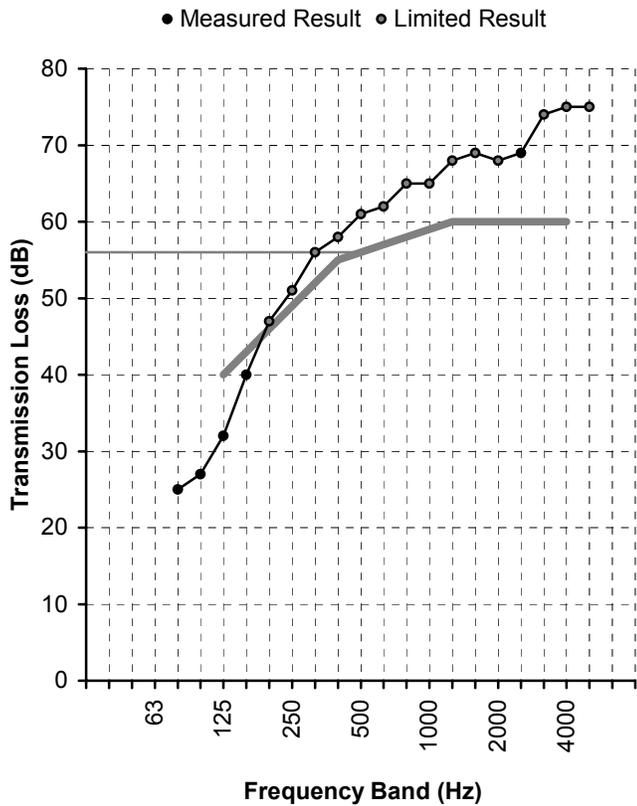


Orfield Laboratories Inc

Client Green Glue Company
Project No. OL06-1222
Specimen Interior Wall Assembly

Method ASTM Standard E90
Test Date December 22, 2006

Single Number Rating
STC=56



Freq. (Hz)	TL (dB)	Def. (dB)
80	25	
100	27	
125	32	8
160	40	3
200	47*	-
250	51*	-
315	56*	-
400	58*	-
500	61*	-
630	62*	-
800	65*	-
1000	65*	-
1250	68*	-
1600	69*	-
2000	68*	-
2500	69	-
3150	74*	-
4000	75*	-
5000	75*	-

Total Deficiencies 11

* Estimate of lower limit

Wall Assembly Description

(listed in order from source room side to receiver room side)
 0.625" (5/8") gypsum board; 2" screw @ 16" O.C.
 Green Glue @ 58 oz. (2 tubes) per 4x8 sheet (116 oz. total)
 0.625" (5/8") gypsum board; 1.63" screw @ 24" O.C.
 3-5/8" 25 gauge steel studs @ 16" O.C.
 3.5" (R13) glass fiber insulation
 0.625" (5/8") gypsum board; 1.63" screw @ 24" O.C.
 Green Glue @ 58 oz. (2 tubes) per 4x8 sheet (116 oz. total)
 0.625" (5/8") gypsum board; 2" screw @ 16" 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

Independent contractors fabricated the wall assembly in the specimen opening. Qualified representatives of Orfield Laboratories observed the installation progress, and visually inspected the specimen prior to 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

Environment

Temperature	70°F [21.1°C]
Relative Humidity	55%

Specimen Area

Specimen Area	64.5 ft ² [5.99 m ²]
---------------	---

Chamber Volume - Airborne Transmission

Source Room Volume	3284 ft ³ [93.0 m ³]
Receiving Room Volume	8281 ft ³ [234.5 m ³]

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)	Specimen T.L. (dB)	95% Conf. (dB)	Flanking Limit (dB)	STC Defic. (dB)	R _w Defic. (dB)
25					
31.5	29.5		40		
40	20.8		47		
50	19.6		43		
63	17.2		43		
80	24.6	±1.63	42		
100	27.1	±1.15	45		
125	31.5	±0.95	46	8	12.5
160	39.5	±1.27	52	3	7.5
200	47.1 ‡	±1.24	53	-	2.9
250	50.7 ‡	±0.65	56	-	2.3
315	55.6 ‡	±0.65	60	-	0.4
400	58.2 ‡	±0.62	61	-	0.8
500	60.8 ‡	±0.40	65	-	-
630	62.1 ‡	±0.50	66	-	-
800	64.6 ‡	±0.40	69	-	-
1000	65.4 ‡	±0.25	70	-	-
1250	67.6 ‡	±0.25	72	-	-
1600	68.8 ‡	±0.32	72	-	-
2000	67.9 ‡	±0.44	74	-	-
2500	68.5	±0.35	79	-	-
3150	74.2 ‡	±0.31	83	-	-
4000	75.0 †	±0.49		-	-
5000	74.8 †	±0.35			
6300	72.7 †				
8000	73.0 †				
10000	68.0 †				
Total deficiencies below STC contour (dB)				11	
STC contour [ASTM E413]				56	
Average deficiencies below R _w contour (dB)					1.7
R _w contour [ISO 717/1]					60

† 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 = 676.7 lb [307.0 kg]

Overall Surface Density = 10.49 PSF [51.22 kg/m²]

Element	Mass		Surf. Dens.	
	lb	[kg]	PSF	[kg/m ²]
0.625" (5/8") gypsum board; 2" screw @ 16" O.C. Green Glue @ 58 oz. (2 tubes) per 4x8 sheet (116 oz. total)	318.5	[144.5]	4.94	[24.11]
0.625" (5/8") gypsum board; 1.63" screw @ 24" O.C. 3-5/8" 25 gauge steel studs @ 16" O.C. 3.5" (R13) glass fiber insulation	25.7	[11.7]	0.40	[1.95]
0.625" (5/8") gypsum board; 1.63" screw @ 24" O.C. Green Glue @ 58 oz. (2 tubes) per 4x8 sheet (116 oz. total)	14.5	[6.6]	0.22	[1.10]
0.625" (5/8") gypsum board; 2" screw @ 16" O.C.	318.0	[144.2]	4.93	[24.07]

All materials were weighed prior to installation. Weights of fasteners are not represented in the above totals.

FRAMING

A 3-5/8" wide steel track was laid on the floor and a 3-5/8" wide steel track was bolted to the top frame in the specimen opening. Steel 3-5/8" studs were fastened to the bottom and top tracks, spaced 16" apart, on-centers. The outermost steel 3-5/8" studs were also bolted to each side of the specimen opening frame.

INSULATION

Insulation was R13 glass-fiber un-faced batt measuring 15" wide and 3.5" thick. Batts were friction-fit into each entire stud cavity.

SHEETING

The Green Glue adhesive was pre-laminated into sandwiches, between two gypsum board panels. Each sandwich was assembled by the client off-site. According to the client, Green Glue was applied in 3/16" beads in a random pattern. Two entire 29 oz. adhesive cartridges were applied over one whole gypsum board panel. A second sheet of gypsum board was applied to the adhesive. The sandwich was thoroughly compressed by methodically walking over the entire face.



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

The assemblies were dried spaced out and with forced air ventilation. The adhesive aged from the assembly date, December 1, to the test date, December 22, according to the client. This is greater than the 14 days period stated in ASTM Standard E90 for water-based adhesives.

The base layer of gypsum board in each sandwich was fastened to the studs with 1-5/8" drywall screws, spaced 24" apart, by counter-boring through the face layer of gypsum board. Bores were sealed by filling with Mortite-brand rope-caulk. The face layer of gypsum board in each sandwich was fastened to the studs with 2" drywall screws, spaced 16" apart, driven through both layers of gypsum board at once. The seams were sealed with 1/8" strips of rope-caulk.

Panels were shimmed at installation so equal gaps were at the top and bottom. Gaps were less than 1/2" in all cases. Shims were removed after sheeting was fastened and the perimeter was sealed on the source and receiver room sides with 7/8" Mortite-brand rope-caulk.