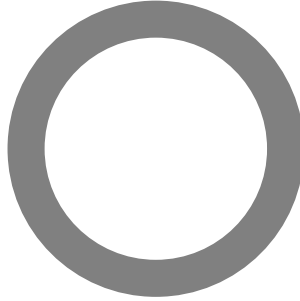


**ASTM E 90: Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements**

**Orfield** Laboratories Inc



**Design Research Testing**

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

**TEST**

Client: **Green Glue Company, L.L.C.**  
 Report Date: **November 20, 2006**  
 Test Date: **September 29, 2006**  
 Test Number: **OL 06-0940**

**ACCREDITATION**



For the scope of accreditation under NVLAP code 200248-0

**RESULT SUMMARY**

**STC=45**

**CLIENT**

**ADDRESS**  
 Green Glue Company, L.L.C.  
 2441 Great Northern Drive  
 Fargo, ND 58102  
 Phone: (989) 832-1602  
 email: info@greengluecompany.com

**PREPARED BY**

David M. Berg  
 Orfield Laboratories, Inc.  
 2709 East 25<sup>th</sup> 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 OL06-0940

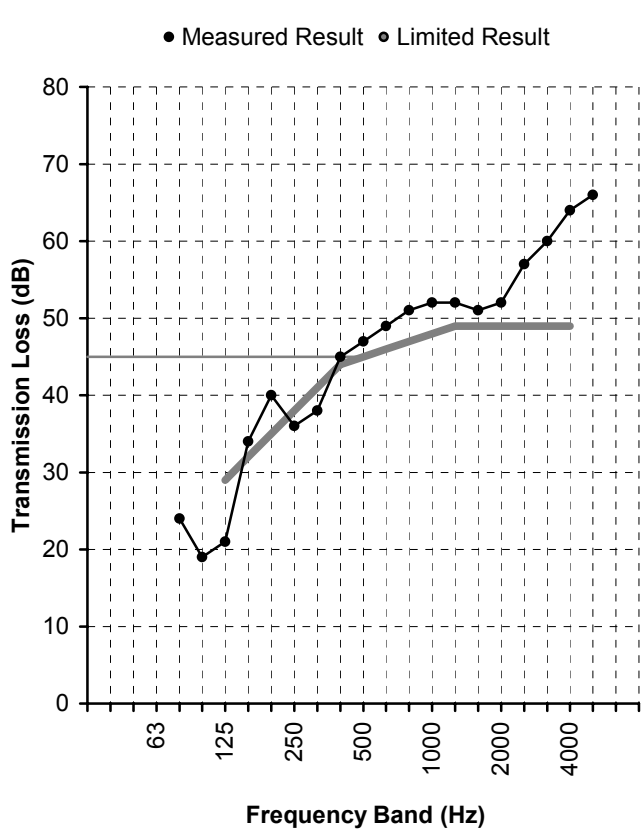


Orfield Laboratories Inc

Client Green Glue Company  
 Project No. OL06-0940  
 Specimen Interior Wall Assembly

Method ASTM Standard E90  
 Test Date September 29, 2006

**Single Number Rating**  
 STC=45



Freq. (Hz)	TL (dB)	Def. (dB)
80	24	
100	19	
125	21	8
160	34	-
200	40	-
250	36	2
315	38	3
400	45	-
500	47	-
630	49	-
800	51	-
1000	52	-
1250	52	-
1600	51	-
2000	52	-
2500	57	-
3150	60	-
4000	64	-
5000	66	-
Total Deficiencies		13

**Wall Assembly Description**

(listed in order from source room side to receiver room side)  
 0.625" gypsum drywall; 1.625" Screws @ 12" O.C.  
 \*Glue 2.5 tubes per sheet 145 oz per side  
 0.625" gypsum drywall  
 2x4 wood studs @ 24" O.C.  
 R13 glass fiber batts  
 0.625" gypsum drywall  
 \*Glue 2.5 tubes per sheet 145 oz per side  
 0.625" gypsum drywall; 1.625" Screws @ 12" O.C.

**Notes:**

1/8" rope caulk at seam  
 7/8" Mortite brand heavy putty tape at perimeter  
 \* Yellow visco-elastic damping glue commercially marketed by another manufacturer. Glue troweled on with 1/8" v-notch trowel. Glue purchased and panels fabricated by independent contractor.





## 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 purchased the visco-elastic damping glue directly from the glue manufacturer and fabricated the wall panel sheeting in the laboratory work area to cure. Independent contractor returned to install the wall assembly in the specimen opening. Orfield Laboratories video-tape recorded wall construction. Assembly of panels was also video tape recorded. Qualified representatives of Orfield Laboratories observed the installation and visually inspected the specimen prior to testing. A portion of the specimen sheeting was retained on file for reference.

## 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	70°F [21.1°C]
Relative Humidity	55%
Source Room Volume	3284.1 ft <sup>3</sup> [93.0 m <sup>3</sup> ]
Receiving Room Volume	8281.2 ft <sup>3</sup> [234.5 m <sup>3</sup> ]
Specimen Area	64.5 ft <sup>2</sup> [5.99 m <sup>2</sup> ]

**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)	STC Defic. (dB)	R <sub>w</sub> Defic. (dB)
25				
31.5	<b>28.4</b>			
40	<b>24.4</b>			
-----				
50	<b>23.2</b>			
63	<b>23.5</b>			
80	<b>24.2</b>	±1.63		
-----				
100	<b>19.0</b>	±1.15		
125	<b>21.1</b>	±0.95	8	10.9
160	<b>34.4</b>	±1.27	-	0.6
-----				
200	<b>39.7</b>	±1.24	-	-
250	<b>35.9</b>	±0.65	2	5.1
315	<b>38.0</b>	±0.65	3	6.0
-----				
400	<b>44.7</b>	±0.62	-	2.3
500	<b>47.0</b>	±0.40	-	1.0
630	<b>48.7</b>	±0.50	-	0.3
-----				
800	<b>51.3</b>	±0.40	-	-
1000	<b>51.7</b>	±0.25	-	-
1250	<b>51.6</b>	±0.25	-	0.4
-----				
1600	<b>51.2</b>	±0.32	-	0.8
2000	<b>52.5</b>	±0.44	-	-
2500	<b>56.6</b>	±0.35	-	-
-----				
3150	<b>60.5</b>	±0.31	-	-
4000	<b>64.0</b>	±0.49	-	-
5000	<b>66.2</b>	±0.35	-	-
-----				
6300	<b>67.4</b>			
8000	<b>68.1</b>			
10000	<b>64.8</b> †			
Total deficiencies below STC contour (dB)			13	
STC contour [ASTM E413]			<b>45</b>	
Average deficiencies below R <sub>w</sub> contour (dB)				1.7
R <sub>w</sub> contour [ISO 717/1]				<b>48</b>

† 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”.

Note: 95% Confidence from room qualification data. 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 = 652.5 lb [296.0 kg]

Overall Surface Density = 10.12 PSF [49.39 kg/m<sup>2</sup>]

Element	Mass lb [kg]	Surf. Dens. PSF [kg/m <sup>2</sup> ]
0.625" gypsum drywall; 1.625" Screws @ 12" O.C. *Glue 2.5 tubes per sheet 145 oz per side	287.0 [130.2]	4.45 [21.72]
0.625" gypsum drywall		
2x4 wood studs @ 24" O.C.	63.0 [28.6]	0.98 [4.77]
R13 glass fiber batts	16.0 [7.3]	0.25 [1.21]
0.625" gypsum drywall *Glue 2.5 tubes per sheet 145 oz per side		
0.625" gypsum drywall; 1.625" Screws @ 12" O.C.	286.5 [130.0]	4.44 [21.69]

\* Yellow visco-elastic damping glue commercially marketed by another manufacturer.

Independent contractors purchased the visco-elastic damping glue directly from the glue’s manufacturer and fabricated the wall panel sheeting in the laboratory work area to cure. The glue was troweled on with 1/8" v-notch trowel. Each fabricated panel was thoroughly and methodically compressed by walking on the freshly constructed sandwiches. The aging period was 14 days. The assemblies were dried at room temperature in a stack with 2x4 spacers and forced-air ventilation.



Figure 1: Glue Application



The same contractor returned to build the 24" O.C. 2x4 wood stud frame and install the wall assembly in the laboratory specimen opening. Fabricated panel sandwiches were weighed just before fastening to the frame. Individual components of the sandwich are listed separately; weights for the entire sandwich are shown on one line of the assembly description.



Figure 2: Specimen Installation

The seam was sealed with 1/8" rope caulk. The outside perimeter of the specimen was sealed with 7/8" wide strips of Mortite brand putty tape on the source side and the receiver side of the partition. Figures 1 and 2 are still frames from the video recording of the panel assembly and installation.