T E S T R E P O R T

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**
Report Revision: **October 19, 2009**
Test Date: **March 13, 2008**
Test Number: **OL08-0324**

RESULT SUMMARY

STC=63

CLIENT ADDRESS
Green Glue Company
One Sealants Park
Granville, NY 12832
Phone: (866) 435-8893
email: help@greengluecompany.com

ACCREDITATION

For the scope of accreditation under NVLAP code 200248-0

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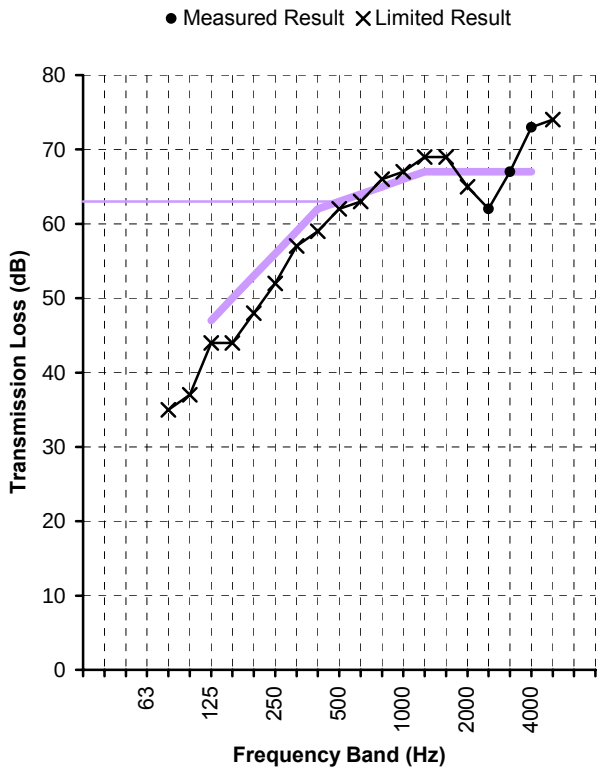
Signatures are required on this document for an official laboratory test report. Copies of this document without signatures are for reference only. This report revision is being issued due to a product name change.

Test Date March 13, 2008
Specimen Interior Wall Assembly
Method ASTM Standard E90
Technician D. Berg

Single Number Rating
STC = 63



Freq. (Hz)	TL (dB)	Def. (dB)
80	35*	
100	37*	
125	44*	3
160	44*	6
200	48*	5
250	52*	4
315	57*	2
400	59*	3
500	62*	1
630	63*	1
800	66*	-
1000	67*	-
1250	69*	-
1600	69*	-
2000	65*	2
2500	62	5
3150	67	-
4000	73	-
5000	74*	
Total Deficiencies		32

* Estimate of lower limit

Assembly Elements (listed in order from source room side to receiver room side)

0.625" (5/8") gypsum drywall type X; 2" screw @ 12" O.C.
0.625" (5/8") gypsum drywall type X; 1.625" screw @ 12" O.C.
7/8" hat channel
Green Glue® Noiseproofing Clip RC
2x4 wood studs @ 16" O.C.
6-1/2" R19 glass fiber insulation
0.625" (5/8") gypsum drywall type X; 1.625" screw @ 16" O.C.
0.625" (5/8") gypsum drywall type X; 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	50%

Specimen Area	
Specimen Area	64.5 ft² [5.99 m²]

Chamber Volume - Airborne Transmission	
Source Room Volume	3284 ft³ [93.0 m³]
Receiving Room Volume	8245 ft³ [233.5 m³]

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)
25				
31.5	**25.1**		40	
40	**17.1**		47	
50	**20.7**		43	
63	**29.6**		43	
80	**35.2** §	±1.63	42	
100	**37.1** §	±1.15	45	
125	**43.7** §	±0.95	46	3
160	**44.5** §	±1.27	52	6
200	**47.8** §	±1.24	53	5
250	**52.4** §	±0.65	56	4
315	**57.1** §	±0.65	60	2
400	**59.3** §	±0.62	61	3
500	**62.4** §	±0.40	65	1
630	**63.5** §	±0.50	66	1
800	**66.0** §	±0.40	69	-
1000	**67.4** §	±0.25	70	-
1250	**68.6** §	±0.25	72	-
1600	**69.0** §	±0.32	72	-
2000	**64.6** §	±0.44	74	2
2500	**62.4**	±0.35	79	5
3150	**66.8**	±0.31	83	-
4000	**72.6**	±0.49		-
5000	**73.7** *	±0.35		
6300	**71.9** *			
8000	**71.4** *			
10000	**66.4** *			
Total deficiencies below STC contour (dB)				32
STC contour [ASTM E413]				**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 = 676.8 lb [307.0 kg]
Overall Surface Density = 10.49 PSF [51.23 kg/m²]

Element	Mass lb [kg]	Surf. Dens. PSF [kg/m²]
0.625" (5/8") gypsum drywall type X; 2" screw @ 12" O.C.	144.0 [65.3]	2.23 [10.90]
0.625" (5/8") gypsum drywall type X; 1.625" screw @ 12" O.C.	143.0 [64.9]	2.22 [10.82]
7/8" hat channel	9.5 [4.3]	0.15 [0.72]
Green Glue® Noiseproofing Clip RC		
2x4 wood studs @ 16" O.C.	75.5 [34.2]	1.17 [5.72]
6-1/2" R19 glass fiber insulation	15.8 [7.1]	0.24 [1.19]
0.625" (5/8") gypsum drywall type X; 1.625" screw @ 16" O.C.	147.5 [66.9]	2.29 [11.17]
0.625" (5/8") gypsum drywall type X; 2" screw @ 16" O.C.	141.5 [64.2]	2.19 [10.71]

Green Glue® Noiseproofing Clip RCs supplied by client. All other materials purchased through retail channels. All materials were weighed prior to installation. Weights of fasteners are not represented in the above totals.

FRAMING

A wood 2x4 sill plate was laid on the floor and a wood 2x4 top plate was bolted to the top frame in the specimen opening. Wood 2x4 studs were fastened to the sill and top plates, spaced 16” apart, on-centers. The outermost wood 2x4 studs were also bolted to each side of the specimen opening frame. Seventeen (17) Green Glue® Noiseproofing Clip RCs were attached to the vertical studs on the source-room side using 1-5/8” drywall screws (see Figures 1 & 2 for clip layout). Five 8’-0” lengths of 25 gauge, 7/8” hat-channel were then attached to the Green Glue® Noiseproofing Clip RCs at 24” nominal spacing.

INSULATION

Insulation was R19 glass-fiber batt measuring 15” wide and 6.5” thick. Insulation batts were friction-fit into each entire stud cavity.

SHEETING

Both source-room side gypsum board layers were 5/8” thick 4’ by 8’ panels. The inner layer of gypsum board was fastened to the hat-channel with 1-5/8” drywall screws, spaced in a 12” x 24” pattern. The outer layer of gypsum board was fastened to the hat-channel with 2” drywall screws, spaced in a 12” x 24” pattern.

Both receiver-room side gypsum board were 5/8” thick 4’ by 8’ panels. The inner layer of gypsum board was fastened directly to the studs with 1-5/8” drywall screws, spaced in a 16” x 16” pattern. The outer layer of gypsum board was fastened directly to the studs with 2” drywall screws, spaced in a 16” x 16” pattern.

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 latex caulk and 7/8” wide by 1/8” thick putty tape. The seams between gypsum board panels were sealed with latex caulk on both the source and receiver side.

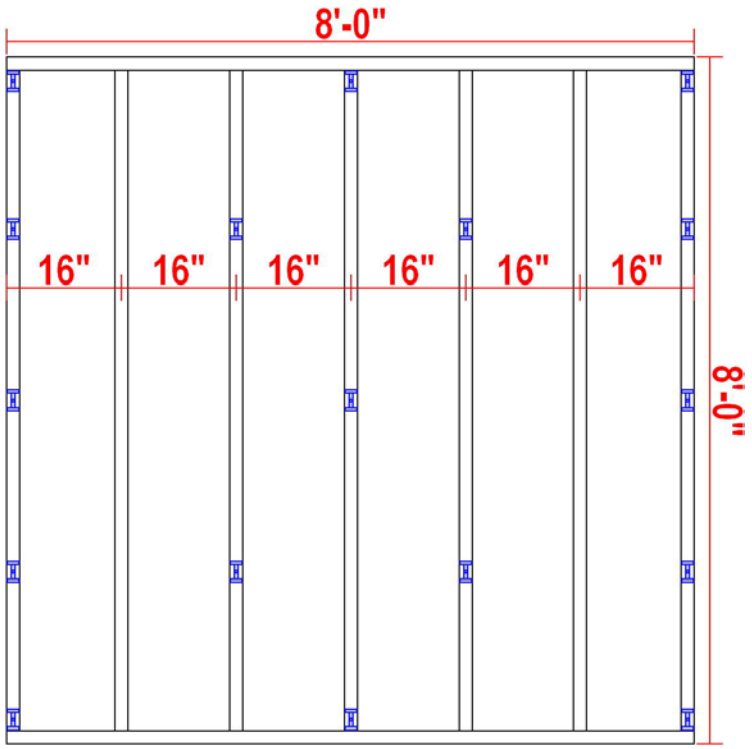


Figure 1: Green Glue® Noiseproofing Clip RC Layout Diagram

Figure 2: Green Glue® Noiseproofing Clip RC Layout Photo

APPENDIX D: SINGLE-NUMBER CALCULATION TO ISO 717-1

Freq. Band (Hz)	R_i (R_i = TL) (dB)	Ref Curve (dB)	Unfav. Deviat. (dB)	L_{i1} Spectrum (dB)	$L_{i1} - R_i$ Level (dB)	L_{i2} Spectrum (dB)	$L_{i2} - R_i$ Level (dB)
50	**20.7**						
63	**29.6**						
80	**35.2**						
100	**37.1**	43	5.9	-29.0	-66.1	-20.0	-57.1
125	**43.7**	46	2.3	-26.0	-69.7	-20.0	-63.7
160	**44.5**	49	4.5	-23.0	-67.5	-18.0	-62.5
200	**47.8**	52	4.2	-21.0	-68.8	-18.0	-65.8
250	**52.4**	55	2.6	-19.0	-71.4	-15.0	-67.4
315	**57.1**	58	0.9	-17.0	-74.1	-14.0	-71.1
400	**59.3**	61	1.7	-15.0	-74.3	-13.0	-72.3
500	**62.4**	62	-	-13.0	-75.4	-12.0	-74.4
630	**63.5**	63	-	-12.0	-75.5	-11.0	-74.5
800	**66.0**	64	-	-11.0	-77.0	-9.0	-75.0
1000	**67.4**	65	-	-10.0	-77.4	-8.0	-75.4
1250	**68.6**	66	-	-9.0	-77.6	-9.0	-77.6
1600	**69.0**	66	-	-9.0	-78.0	-10.0	-79.0
2000	**64.6**	66	1.4	-9.0	-73.6	-11.0	-75.6
2500	**62.4**	66	3.6	-9.0	-71.4	-13.0	-75.4
3150	**66.8**	66	-	-9.0	-75.8	-15.0	-81.8
4000	**72.6**						
5000	**73.7**						
		Sum =	27.1	$R_{A,1}$ =	59.7	$R_{A,2}$ =	54.3
		R_W =	**62**	**C =**	**-2**	**C_{tr} =**	**-8**

$Rw\ (C\ ;\ Ctr) = 62\ (-2\ ;\ -8)$

$Rw\ (C\ ;\ Ctr\ ;\ C\,50\text{-}3150\ ;\ Ctr,50\text{-}3150) = 62\ (-2\ ;\ -8\ ;\ -6\ ;\ -18)$

$Rw\ (C\ ;\ Ctr\ ;\ C\,100\text{-}5000\ ;\ Ctr,100\text{-}5000) = 62\ (-2\ ;\ -8\ ;\ -1\ ;\ -8)$

$Rw\ (C\ ;\ Ctr\ ;\ C\,50\text{-}5000\ ;\ Ctr,50\text{-}5000) = 62\ (-2\ ;\ -8\ ;\ -5\ ;\ -18)$

Note: The calculations in ISO 717-1 are performed based on assumed equivalency of the ASTM and the corresponding ISO test methods. The test herein is performed according to ASTM standards.

The spectrum adaptation terms C and C_{tr} characterize performance against two specific sound sources, A-weighted pink noise and A-weighted traffic noise respectively. The standard ISO 717-1 includes a discussion of “Use of Spectrum Adaptation Terms” in Annex A (informative).

Each spectrum adaptation term may additionally be reported with extended frequency bands included. A calculation for the primary frequency range is shown above, but all available extended-frequency calculations were performed to compare against corresponding ratings of other specimens.