Architectural Testing

ASTM E 90 SOUND TRANSMISSION LOSS TEST REPORT

Rendered to:

ALL SEASONS DOOR & WINDOW, MFG

SERIES/MODEL: A500

TYPE: Horizontal Sliding Window

Summary of Test Results			
Data File No.	**Glazing Option (Nominal Dimensions)**	**STC**	**OITC**
96525.01A	1-1/8" IG (5/16" laminated, 1/2" air space, 5/16" laminated), Glass temperature 75°F	37	31
96525.01B	1" IG (1/4" annealed exterior, 1/2" air space, 1/4" laminated interior), Glass temperature 75°F	36	29

Reference should be made to Architectural Testing, Inc. Report No. 96525.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

ALL SEASONS DOOR & WINDOW, MFG
28 Edgeboro Road
East Brunswick, New Jersey 08816

Report No:	96525.01-113-11
Test Date:	12/10/09
Report Date:	12/18/09
Expiration Date:	12/10/13

Test Sample Identification:

Series/Model: A500

Type: Horizontal Sliding Window

Overall Size: 59" by 47-1/4"

Glazing Option A (Nominal Dimensions): 1-1/8" IG (5/16" Laminated, 1/2" Air Space, 5/16" Laminated), Glass Temperature 75°F

Glazing Option B (Nominal Dimensions): 1" IG (1/4" Annealed Exterior, 1/2" Air Space, 1/4" Laminated Interior), Glass Temperature 75°F

Project Scope: Architectural Testing, Inc. was contracted by All Seasons Door & Window, MFG to conduct sound transmission loss tests on a Series/Model A500, horizontal sliding window. A summary of the results is listed in the Test Results section and the complete test data is included as Appendix B of this report. The samples were provided by the client.

Test Methods: The acoustical tests were conducted in accordance with the following:

ASTM E 90-09, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*.

ASTM E 413-04, *Classification for Rating Sound Insulation*.

ASTM E 1332-90 (Re-approved 2003), *Standard Classification for Determination of Outdoor-Indoor Transmission Class.*

ASTM E 2235-04, *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*.

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Test Equipment: The equipment used to conduct these tests meets the requirements of ASTM E 90. The microphones were calibrated before conducting sound transmission loss tests. The test equipment and test chamber descriptions are listed in Appendix A.

Sample Installation: Sound transmission loss tests were initially performed on a filler wall that was designed to test 60" by 48" specimens. The filler wall achieved an STC rating of 69.

A double stud filler wall was constructed with 2x4 steel studs spaced 16" on center. Five layers of 5/8" type "X" gypsum board were fastened to the source side of the filler wall. Five layers of 5/8" type "X" gypsum board were fastened to the receive side of the filler wall. The cavity was filled with R-13 fiberglass insulation. The perimeter and seams were sealed with acoustical sealant. The test specimen was assembled in the test opening. The interior side of the window frame, when installed, was approximately 1/4" from being flush with the receiving room side of the filler wall. Duct seal was used to seal the perimeter of the sample to the test opening on both sides. A stethoscope was used to check for any abnormal air leaks before the test.

Test Procedure: The window was closed and locked for this test. The sound transmission loss test consisted of the following measurements: One background noise sound pressure level and five sound absorption measurements were conducted at each of the five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms, at each of the five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during the background, absorption, source, and receive room measurements.

Sample Descriptions:

Frame Construction:

		Frame
Size		59" by 47-1/4"
Thickness		5-3/8"
Corners		Coped
	Fasteners	Screws
	Seal Method	Sealant and foam pads
Material		Aluminum
	Reinforcement	N/A
	Thermal Break Material	Urethane

N/A-Non Applicable

Sample Descriptions: (Continued)

Sash Construction:

		Interior Sash	Exterior Sash
Size		29-3/8" by 42-7/8"	29-1/4" by 42-7/8"
Thickness		1-5/8"	1-5/8"
Corners		Coped	Coped
	Fasteners	Screws	Screws
	Seal Method	Sealant	Sealant
Material		Aluminum	Aluminum
	Reinforcement	N/A	N/A
	Thermal Break Material	Urethane	Urethane
Daylight Opening Size		25" by 38-1/2"	25" by 38-1/2"

Glazing Option A:

Measured Overall Insulation Glass Unit Thickness	1.152"
Spacer Type	Azon

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.316"	0.520"	0.316"
Muntin Pattern	N/A	N/A	N/A
Material	Laminated	Air*	Laminated
Laminate Material	PVB	N/A	PVB

Glazing Method	Interior
Glazing Material	Double-sided adhesive foam tape and silicone in the corners
Glazing Bead Material	Aluminum with flexible wedge gasket

** - Stated per Client/Manufacturer, N/A-Non Applicable*

Sample Descriptions: (Continued)

Glazing Option B:

Measured Overall Insulation Glass Unit Thickness	1.018"
Spacer Type	Azon

	Exterior Sheet	**Gap**	**Interior Sheet**
Measured Thickness	0.225"	0.540"	0.253"
Muntin Pattern	N/A	N/A	N/A
Material	Annealed	Air*	Laminated
Laminate Material	N/A	N/A	PVB

Glazing Method	Interior
Glazing Material	Double-sided adhesive foam tape and silicone in the corners
Glazing Bead Material	Aluminum with flexible wedge gasket

* - *Stated per Client/Manufacturer, N/A-Non Applicable*

Sample Descriptions: (Continued)

Components:

TYPE	QUANTITY	LOCATION
Weatherstrip		
3/4" by 1" Open cell foam	3 Rows	Top and bottom rails of sash
Polypile with center fin	2 Rows	Perimeter of exterior sash Lock stile, top and bottom rails of interior sash
1/8" Foam-filled bulb gasket	1 Row	Meeting rail of interior sash
1/2" by 1" Polypile pad	8 (4 each sash)	Interior corners of both sash
Hardware		
Spring loaded lock bar	2	One on each jamb stile
Roller assembly set	4 (2 each sash)	Bottom rails
Drainage		
1/4" by 3/16" Weep slot	2	Sill track
3/4" by 3/8" Weep slot	2	Sill track
1-1/4" by 1/4" Weep slot with plastic flap cover	4	Sill face

Comments: The weight of the Option A was 170 lbs and the weight of Option B was 158 lbs. The client did not supply drawings on the Series/Model A500, horizontal sliding window. The test specimen was returned per the client's request. Photographs of the test specimen are included in Appendix C.

Test Results: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332. A summary of the sound transmission loss test results on the Series/Model A500, horizontal sliding window is listed below.

Summary of Test Results			
Data File No.	**Glazing Option (Nominal Dimensions)**	**STC**	**OITC**
96525.01A	1-1/8" IG (5/16" laminated, 1/2" air space, 5/16" laminated), Glass temperature 75°F	37	31
96525.01B	1" IG (1/4" annealed exterior, 1/2" air space, 1/4" laminated interior), Glass temperature 75°F	36	29

***Note**: Due to the calculations and sample size, transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. On each data sheet listed in Appendix B, cells highlighted in green indicate transmission loss values affected in this way.*

The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire. Results obtained are tested values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Digitally Signed by: Bradlay Hunt

Bradlay D. Hunt
Project Manager - Acoustical Testing

Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

BDH:jmcs

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (4)
- Appendix-C: Photographs (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	12/18/09	N/A	Original Report Issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Last Calibrated
Analyzer	Agilent Technologies	35670A	Dynamic signal analyzer	004112	06/08/09*
Data Acquisition Unit	Agilent Technologies	34970A	Data Acquisition Unit	62211	07/29/09
Receive Room Microphone	G.R.A.S.	40AR	1/2", Pressure type, condenser microphone	Y003246	08/18/09
Source Room Microphone	G.R.A.S.	40AR	1/2", Pressure type, condenser microphone	Y003245	08/18/09
Receive Room Preamp	G.R.A.S.	26AK	1/2" Preamplifier	Y003249	08/08/09
Source Room Preamp	G.R.A.S.	26AK	1/2" Preamplifier	Y003248	08/18/09
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002816	02/10/09
Noise Source	Delta Electronics	SNG-1	Two, Uncorrelated "Pink" noise signals	Y002181	N/A
Equalizer	Rane	RPE228	Programmable EQ	Y002180	N/A
Power Amplifiers	Renkus-Heinz	P2000	Two, Amplifiers	Y002179 Y001779	N/A
Receive Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	Two, Loudspeakers	Y001784 Y001785	N/A
Source Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	Two, Loudspeakers	Y002649 Y002650	N/A
Receiving Room Environmental Indicator	Vaisala	HMW60Y	Temperature / Humidity Indicator	Y002652	08/31/08
Source Room Environmental Indicator	Vaisala	HMW60Y	Temperature / Humidity Indicator	005066	08/18/09
Weather Station	Davis Instruments	6150C	Laboratory Barometric Pressure, Temperature, and Humidity	Y003257	03/26/09

**- Note: The calibration frequency for this equipment is every two years per the manufacturer's recommendation.*

Test Chamber:

	Volume	Description
Receiving Room	234 m^3 (8291.3 ft^3)	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
Source Room	206.6 m^3 (7296.3 ft^3)	Stationary diffusers only Temperature and humidity controlled

	Maximum Size	Description
TL Test Opening	4.27 m (14 ft) wide by 3.05 m (10 ft) high	Vibration break between source and receive rooms

N/A-Non Applicable

Appendix B

Complete Test Results

SOUND TRANSMISSION LOSS

ASTM E 90

Architectural Testing

ATI No.	96525.01A	**Date**	12/10/09
Client	All Seasons Door & Window, MFG		
Specimen	Series/Model: A500, horizontal sliding window with 1-1/8" IG (5/16" laminated, 1/2" air space, 5/16" laminated), Glass temperature 75°F		
Specimen Area	19.36 Sq Ft		
Filler Area	120.64 Sq Ft		
Operator	Bradlay Hunt		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	73.0	74.0	75.3	73.5	72.0	73.9
RH %	45.0	43.3	44.2	44.1	63.8	44.2

Freq (Hz)	Bkgrd SPL (dB)	Absorp (Sabines /Sq Ft)	Source SPL (dB)	Receive SPL (dB)	Filler TL (dB)	Specimen TL (dB)	95% Conf Limit	No. of Defici-encies	Trans Coef Diff
80	44.2	41.7	83.6	57.0	45.3	23	2.15	0	14.2
100	43.4	49.7	87.1	59.7	48.9	23	2.92	0	17.7
125	42.3	55.2	90.3	62.6	49.8	23	1.73	0	18.7
160	43.9	53.0	92.1	68.1	50.9	20	2.12	4	23.4
200	42.5	55.1	97.4	63.6	55.8	29	0.81	0	18.6
250	40.2	59.2	98.3	64.5	59.2	29	1.15	1	22.3
315	39.4	64.3	96.5	59.0	64.0	32	0.41	1	23.8
400	38.8	67.1	96.1	59.5	68.1	31	0.55	5	28.9
500	38.3	67.1	97.8	57.3	70.7	35	0.53	2	27.6
630	34.8	67.0	100.4	58.7	74.1	36	0.31	2	29.8
800	36.1	66.2	100.1	56.5	76.7	38	0.36	1	30.6
1000	33.5	70.6	99.6	55.9	79.1	38	0.18	2	33.1
1250	33.1	77.4	102.7	57.8	82.2	39	0.33	2	35.4
1600	30.5	80.0	109.6	63.2	83.1	40	0.42	1	34.9
2000	21.6	85.7	105.2	56.5	78.7	42	0.41	0	28.5
2500	12.8	95.9	103.7	54.2	77.3	43	0.40	0	26.8
3150	11.8	112.0	104.9	56.7	81.2	41	0.33	0	32.7
4000	9.6	135.5	103.6	56.8	82.7	38	0.25	3	36.5
5000	7.8	175.3	101.8	54.2	82.7	38	0.63	0	36.7

STC Rating =	**37**	*(Sound Transmission Class)*
Deficiencies =	**24**	*(Number of deficiencies versus contour curve)*
OITC Rating =	**31**	*(Outdoor/Indoor Transmission Class)*

Notes:

1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.

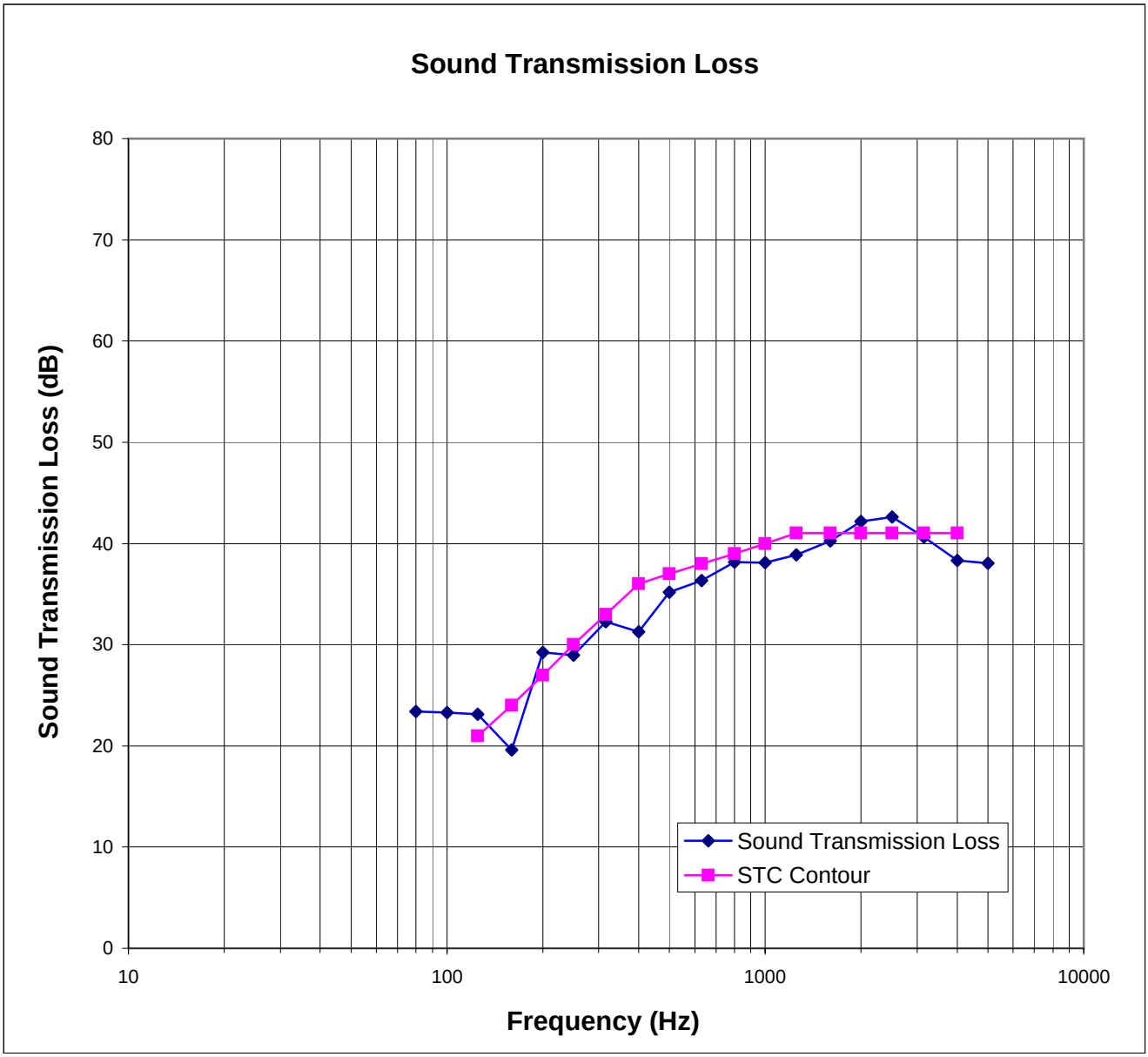
2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.

3) Transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. These cells are highlighted green.

4) Receive Room levels less than 5dB above the Background levels are highlighted in yellow.

Architectural Testing

ATI No.	96525.01A	**Date**	12/10/09
Client	All Seasons Door & Window, MFG		
Specimen	Series/Model: A500, horizontal sliding window with 1-1/8" IG (5/16" laminated, 1/2" air space, 5/16" laminated), Glass temperature 75°F		
Specimen Area	19.36 Sq Ft		
Filler Area	120.64 Sq Ft		
Operator	Bradlay Hunt		



ACCREDITED

Architectural Testing, Inc. is accredited by the International Accreditation Service, Inc. (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS. This test report applies only to the specimen that was tested.

Architectural Testing

SOUND TRANSMISSION LOSS

ASTM E 90

ATI No.	96525.01B	**Date**	12/10/09
Client	All Seasons Door & Window, MFG		
Specimen	Series/Model: A500, horizontal sliding window with 1" IG (1/4" annealed exterior, 1/2" air space, 1/4" laminated interior), Glass temperature 75°F		
Specimen Area	19.36 Sq Ft		
Filler Area	120.64 Sq Ft		
Operator	Bradlay Hunt		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	72.1	73.6	75.2	72.7	72.0	73.4
RH %	43.2	41.5	41.8	42.7	63.8	42.3

Freq (Hz)	Bkgrd SPL (dB)	Absorp (Sabines /Sq Ft)	Source SPL (dB)	Receive SPL (dB)	Filler TL (dB)	Specimen TL (dB)	95% Conf Limit	No. of Defici-encies	Trans Coef Diff
80	41.9	44.8	83.9	58.5	45.3	22	2.14	0	15.6
100	40.9	46.3	87.3	61.2	48.9	22	3.24	0	18.6
125	41.0	51.6	91.0	67.4	49.8	19	1.97	1	22.4
160	44.0	54.0	92.9	63.9	50.9	25	0.79	0	18.4
200	41.8	61.0	97.7	69.1	55.8	24	1.12	2	24.3
250	40.6	60.7	98.4	64.2	59.2	29	1.38	0	22.0
315	39.9	62.9	96.7	63.3	64.0	28	0.48	4	27.8
400	39.1	67.9	96.4	60.5	68.1	31	0.62	4	29.7
500	38.1	67.1	97.9	58.9	70.7	34	0.36	2	29.1
630	34.5	66.9	100.7	60.9	74.1	34	0.65	3	31.7
800	35.6	67.8	100.1	58.3	76.7	36	0.46	2	32.4
1000	33.5	70.0	99.8	57.4	79.1	37	0.29	2	34.3
1250	33.5	78.4	103.0	58.5	82.2	38	0.34	2	36.0
1600	31.0	80.0	109.5	64.4	83.1	39	0.25	1	36.2
2000	22.2	85.2	105.4	60.5	78.7	38	0.47	2	32.3
2500	14.5	97.5	103.9	59.1	77.3	38	0.40	2	31.5
3150	12.1	114.2	104.9	59.4	81.2	38	0.37	2	35.5
4000	9.6	138.2	103.5	57.8	82.7	37	0.51	3	37.5
5000	7.6	181.7	101.4	52.9	82.7	39	0.41	0	36.0

STC Rating =	**36**	*(Sound Transmission Class)*
Deficiencies =	**32**	*(Number of deficiencies versus contour curve)*
OITC Rating =	**29**	*(Outdoor/Indoor Transmission Class)*

Notes:

1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.

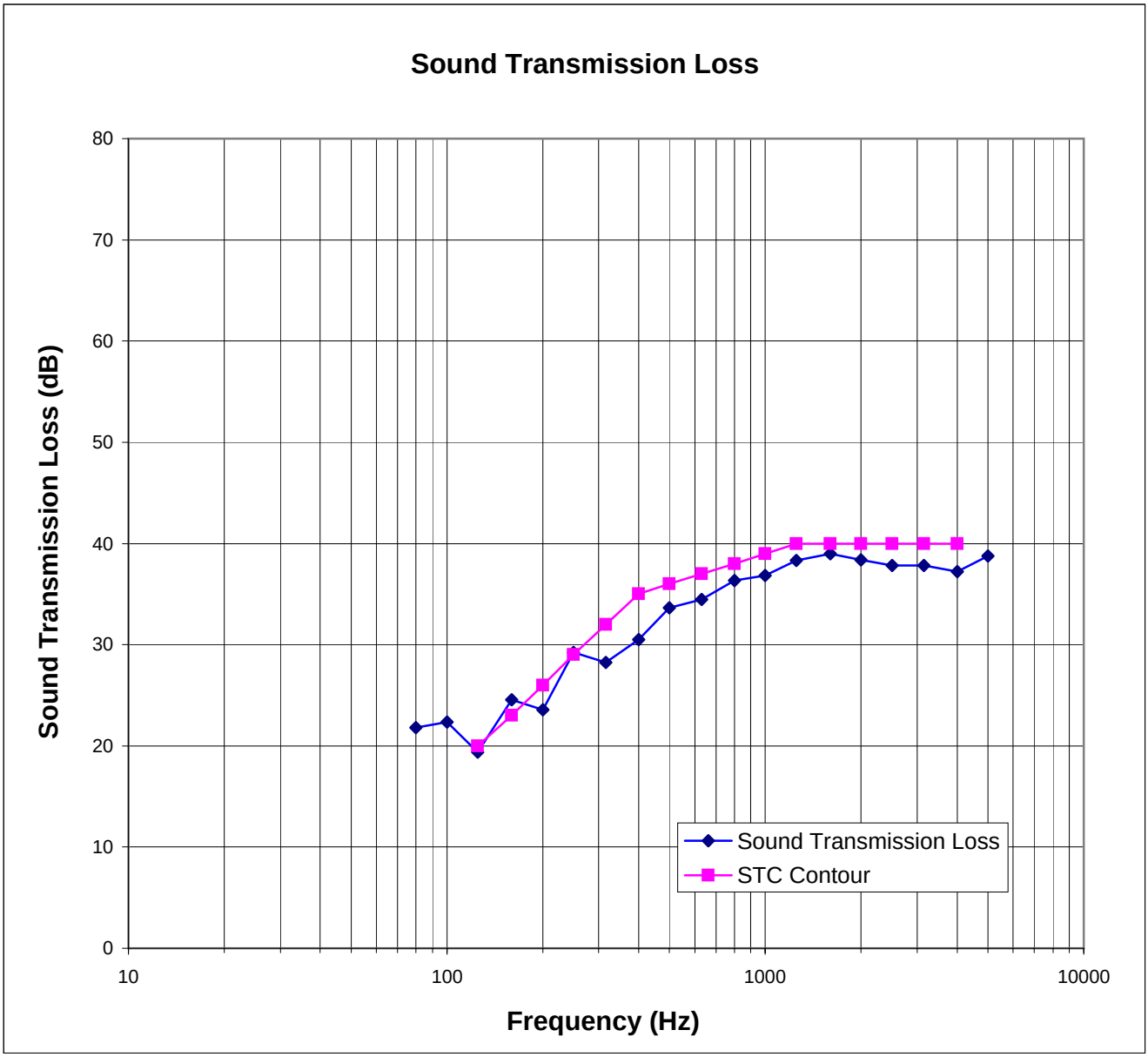
2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.

3) Transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. These cells are highlighted green.

4) Receive Room levels less than 5dB above the Background levels are highlighted in yellow.

Architectural Testing

ATI No.	96525.01B	**Date**	12/10/09
Client	All Seasons Door & Window, MFG		
Specimen	Series/Model: A500, horizontal sliding window with 1" IG (1/4" annealed exterior, 1/2" air space, 1/4" laminated interior), Glass temperature 75°F		
Specimen Area	19.36 Sq Ft		
Filler Area	120.64 Sq Ft		
Operator	Bradlay Hunt		



ACCREDITED

Architectural Testing, Inc. is accredited by the International Accreditation Service, Inc. (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS. This test report applies only to the specimen that was tested.

Appendix C
Photographs

Receive Room View of Installed Specimen

Source Room View of Installed Specimen