

**ASTM E 90 SOUND TRANSMISSION LOSS
TEST REPORT**

Rendered to:

STERGIS ALUMINUM PRODUCTS CORP.

SERIES/MODEL: 6002A

**TYPE: Double Hung Window With Storm
With Two Glazing Options**

Summary of Test Results			
ATI Data File No.	Glazing Option	STC	OITC
63957.01A	3/4" IG (1/8" annealed, 1/2" air space, 1/8" annealed) 1/8" annealed storm	38	28
63957.01B	3/4" IG (1/8" annealed exterior, 3/8" air space, 1/4" laminated interior) 1/8" annealed storm Glass temperature was 72°F	40	30

Reference should be made to ATI Report No. 63957.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

STERGIS ALUMINUM PRODUCTS CORP.
1167 Main Street
Walpole, Massachusetts 02081

Report No: 63957.01-113-11
Test Date: 04/06/06
Report Date: 04/10/06
Expiration Date: 04/06/10

Test Sample Identification:

Series/Model: 6002A

Type: Double Hung Window with Storm

Performance Class: Residential

Overall Size: 48" by 72"

Glazing Option A: 3/4" IG (1/8" Annealed, 1/2" Air Space, 1/8" Annealed)

Glazing Option B: 3/4" IG (1/8" Annealed Exterior, 3/8" Air Space,
1/4" Laminated Interior)

Storm Glazing: 1/8" Annealed

Project Scope: Architectural Testing, Inc. (ATI) was contracted by Stergis Aluminum Products Corp. to conduct a sound transmission loss test on a Series/Model 6002A, double hung 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.

Test Methods: The acoustical test was conducted in accordance with the following:

ASTM E 90-04, *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.*

Test Equipment: The equipment used to conduct this test meets the requirements of ASTM E 90. The microphones were calibrated before conducting the sound transmission loss test. 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 48" by 72" and 72" by 48" test specimens. The filler wall achieved an STC rating of 68.

The 48" by 72" plug was removed from the filler wall assembly. The window was placed on a foam isolation pad in the test opening. Duct seal was used to seal the perimeter of the window to the test opening on both sides. 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. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. The sash were opened and closed at least five times prior to testing.

Test Procedure: The window was also 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:

Primary Frame Construction:

	Frame
Size	48" by 72"
Thickness	3-5/8"
CORNERS	Mitered
Fasteners	Welds
Seal Method	None
MATERIAL	Vinyl
Reinforcement	N/A
Thermal Break Material	N/A

Sample Descriptions: (Continued)

Primary Sash Construction:

	Bottom Sash	Top Sash
Size	44-3/4" by 35-7/8"	43-3/4" by 34-7/8"
Thickness	1-5/16"	1-5/16"
CORNERS	Mitered	Mitered
Fasteners	Welds	Welds
Seal Method	None	None
MATERIAL	Vinyl	Vinyl
Reinforcement	N/A	N/A
Thermal Break Material	N/A	N/A
Daylight Opening Size	41-1/4" by 32-1/4"	41-1/4" by 32-1/4"

Storm Frame Construction:

	Frame
Size	44-1/2" by 69-3/4"
Thickness	1-1/2"
CORNERS	Mitered
Fasteners	Screws
Seal Method	None
MATERIAL	Aluminum
Reinforcement	N/A
Thermal Break Material	N/A

Sample Descriptions: (Continued)

Storm Sash Construction:

	Bottom Sash	Top Sash
Size	41-5/16" by 33"	40-13/16" by 34-1/4"
Thickness	7/16"	7/16"
CORNERS	Mitered	Mitered
Fasteners	Keyed / Staked	Keyed /Staked
Seal Method	None	None
MATERIAL	Aluminum	Aluminum
Reinforcement	N/A	N/A
Thermal Break Material	N/A	N/A
Daylight Opening Size	39-5/8" by 30-7/8"	39-5/8" by 31-3/4"

Primary Glazing Option A:

Measured Overall Insulation Glass Unit Thickness	0.77"
Spacer Type	Reinforced butyl

	Exterior Sheet	Gap	Interior Sheet
MEASURED THICKNESS	0.12"	0.52"	0.13"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Annealed	Air*	Annealed
LAMINATE MATERIAL	N/A	N/A	N/A

GLAZING METHOD	Exterior
GLAZING MATERIAL	Silicone
GLAZING BEAD MATERIAL	Vinyl

Sample Descriptions: (Continued)

Primary Glazing Option B:

Measured Overall Insulation Glass Unit Thickness	0.72"
Spacer Type	Reinforced butyl

	Exterior Sheet	Gap	Interior Sheet
MEASURED THICKNESS	0.11"	0.37"	0.24"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Annealed / Low E	Air*	Annealed
LAMINATE MATERIAL	N/A	N/A	PVB

GLAZING METHOD	Exterior
GLAZING MATERIAL	Silicone
GLAZING BEAD MATERIAL	Vinyl

Storm Glazing:

MEASURED THICKNESS	0.12"
MUNTIN PATTERN	N/A
MATERIAL	Annealed
LAMINATE MATERIAL	N/A
GLAZING METHOD	Channel

Sample Descriptions: (Continued)

Components:

TYPE	QUANTITY	LOCATION
WEATHERSTRIP		
Poly pile	1 Row	Storm: sash stiles and bottom rail
Poly pile with center fin	1 Row	Primary: sill, top and keeper rail
Poly pile with center fin	2 Rows	Primary: stiles and lock rail
5/16" Diameter foam filled bulb gasket with 3/16" leaf	1 Row	Primary: bottom rail
HARDWARE		
Metal cam lock	2	Primary: lock rail
Metal lock keeper	2	Primary: keeper rail
Child safety lock	2	Primary: top sash stiles
Plastic tilt latch	4	Primary: sash top corners
Metal tilt bar	4	Primary: sash bottom corners Storm: sash top corners
Spring loaded latch	4	Storm: sash bottom corners
DRAINAGE		
1" by 1/8" Weep slot	2	Primary: sill
5/8" Weep notch	4	Storm: sill

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

Comments: The weight of the sample with glazing option A was 128 lbs. The weight of the sample with glazing option B was 154 lbs. The client did not supply drawings on the Series/Model 6002A, double hung 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 6002A, double hung window is listed below.

ATI Data File No.	Glazing Option	STC	OITC
63957.01A	3/4" IG (1/8" annealed, 1/2" air space, 1/8" annealed) 1/8" annealed storm	38	28
63957.01B	3/4" IG (1/8" annealed exterior, 3/8" air space, 1/4" laminated interior) 1/8" annealed storm Glass temperature was 72°F	40	30

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

This report is prepared for the convenience of our customer and endeavors to provide accurate and timely project information. It contains a summary of observations made by a qualified representative of Architectural Testing, Inc. The results of this report apply only to the specimens that were tested. The statements made herein do not constitute approval, disapproval, certification or acceptance of performance or materials.

A copy of this report will be retained by ATI for a period of four years from the original test date. This report is the exclusive property of the client so named herein. This report shall not be reproduced, except in full, without written approval by Architectural Testing, Inc.


For ARCHITECTURAL TESTING, INC:

Kurt A. Golden
Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

KAG:dla

- Attachments (pages):
- Appendix-A: Equipment description (1)
 - Appendix-B: Complete test results (4)
 - Appendix-C: Photographs (1)

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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	04/10/06	N/A	Original report issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number
Analyzer	Agilent Technologies	35670A	Dynamic signal analyzer	Y002929
Receive Room Microphone	ACO Pacific	7047	1/2", pressure type, condenser microphone	Y002818
Source Room Microphone	ACO Pacific	7047	1/2", pressure type, condenser microphone	Y002820
Receive Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002752
Source Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002185
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002816
Noise Source	Delta Electronics	SNG-1	Two, non-coherelated "Pink" noise signals	Y002181
Equalizer	Rane	RPE228	Programmable EQ	Y002180
Power Amplifiers	Renkus-Heinz	P2000	2 - Amplifiers	Y002179 Y001779
Receive Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	2 - Loudspeakers	Y001784 Y001785
Source Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	2 - Loudspeakers	Y002649 Y002650

Test Chamber:

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

	Maximum Size	Description
TL Test Opening	14 ft wide by 10 ft high	Vibration break between source and receive rooms.



Appendix B
Complete Test Results



SOUND TRANSMISSION LOSS

ASTM E90

Architectural Testing

ATI No.	63957.01A	Date	04/06/06
Client	Stergis Aluminum Products Corp.		
Specimen	Series/Model 6002A double hung window with 3/4" IG(1/8" annealed, 1/2" air space, 1/8" annealed) with 1/8" annealed storm		
Specimen Area	24.00 Sq Ft		
Filler Area	116.00 Sq Ft		
Operator	Kurt A. Golden		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	73.2	72.8	72.3	73.0	71.4	72.8
RH %	64.0	64.8	64.4	64.4	64.6	64.4

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 Deficiencies	Trans Coef Diff
80	37.7	55.2	92.3	73.2	36.2	16	4.30	0	13.9
100	40.9	51.6	99.5	77.8	40.5	18	2.74	0	15.2
125	41.5	53.8	103.4	80.1	46.8	20	2.64	2	20.1
160	38.5	51.2	105.7	82.1	49.0	20	1.31	5	21.8
200	38.6	54.8	110.6	81.7	51.5	25	0.81	3	19.4
250	34.4	58.1	110.3	83.6	56.1	23	1.31	8	26.3
315	31.0	58.0	106.4	74.4	60.4	28	0.81	6	25.3
400	28.0	57.7	105.5	70.0	64.8	32	0.66	5	26.2
500	26.8	58.8	108.7	69.7	69.4	35	0.66	3	27.4
630	22.9	58.0	111.0	68.5	76.5	39	0.63	0	31.0
800	23.3	60.7	110.4	65.3	81.1	41	0.33	0	33.1
1000	21.5	62.9	109.2	64.2	84.1	41	0.55	0	36.5
1250	21.5	67.5	111.5	65.1	86.5	42	0.22	0	37.7
1600	17.5	70.9	115.8	67.1	88.3	44	0.21	0	37.4
2000	14.4	76.5	109.1	59.8	89.1	44	0.19	0	38.0
2500	6.7	87.8	106.0	54.0	88.5	46	0.31	0	35.3
3150	7.2	103.8	106.4	54.0	90.2	46	0.33	0	37.4
4000	7.0	128.7	104.2	54.6	90.5	42	0.32	0	41.4
5000	7.4	168.6	100.8	46.1	88.5	46	0.47	0	35.3

STC Rating = 38 *(Sound Transmission Class)*
Deficiencies = 32 *(Number of deficiencies versus contour curve)*
OITC Rating = 28 *(Outdoor/Indoor Transmission Class)*

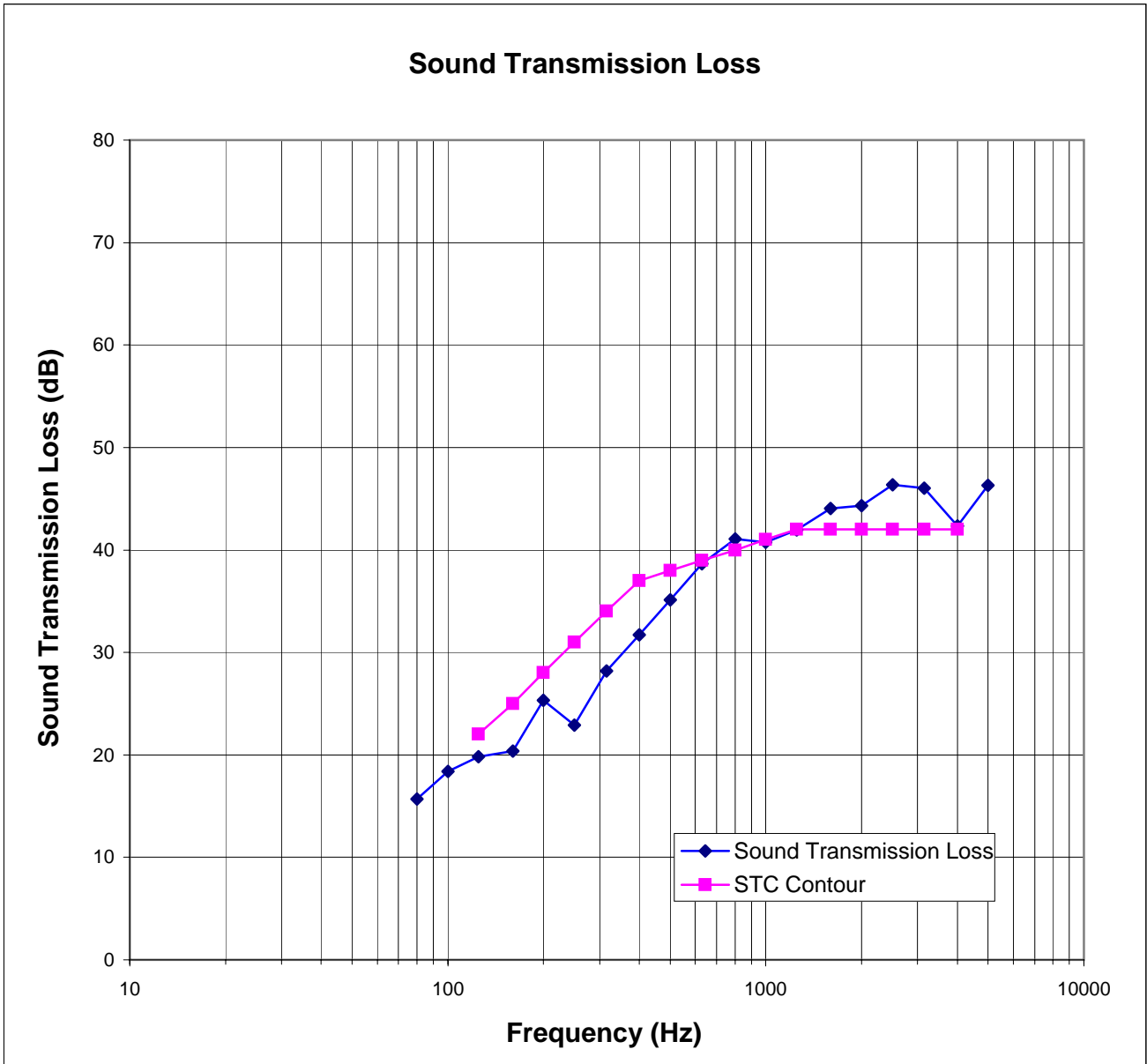
Note: *The acoustical chambers are qualified for measurements down to 80 hertz.
Data reported below 80 hertz is for reference only.*

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Architectural Testing

ATI No. 63957.01A Date 04/06/06
Client Stergis Aluminum Products Corp.
Specimen Series/Model 6002A double hung window with 3/4" IG(1/8" annealed, 1/2" air space, 1/8" annealed) with 1/8" annealed storm
Specimen Area 24.00 Sq Ft
Filler Area 116.00 Sq Ft
Operator Kurt A. Golden



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SOUND TRANSMISSION LOSS

ASTM E90

Architectural Testing


ATI No.	63957.01B	Date	04/06/06
Client	Stergis Aluminum Products Corp.		
Specimen	Series/Model 6002A double hung window with 3/4" IG(1/8" annealed exterior, 3/8" air space, 1/4" laminated interior) with 1/8" annealed storm, Glass temperature 72F		
Specimen Area	24.00 Sq Ft		
Filler Area	116.00 Sq Ft		
Operator	Kurt A. Golden		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	73.2	72.8	72.4	73.0	71.4	72.9
RH %	64.0	64.7	63.0	64.4	64.6	64.0

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 Deficiencies	Trans Coef Diff
80	39.3	47.8	93.3	73.7	36.2	17	3.20	0	12.8
100	40.8	55.8	99.8	77.6	40.5	19	2.48	0	15.1
125	42.5	48.9	104.5	78.3	46.8	23	2.55	1	16.8
160	40.6	51.0	106.7	78.3	49.0	25	1.03	2	17.1
200	40.3	52.4	110.6	77.9	51.5	29	0.55	1	15.4
250	36.5	56.9	110.4	76.8	56.1	30	0.96	3	19.3
315	34.3	57.6	106.9	70.6	60.4	33	0.83	3	21.0
400	31.9	57.7	105.6	66.7	64.8	35	0.69	4	22.8
500	29.8	58.9	108.8	67.1	69.4	38	0.48	2	24.7
630	24.1	57.2	110.7	66.1	76.5	41	0.78	0	28.8
800	24.5	59.8	110.5	64.0	81.1	42	0.17	0	31.7
1000	22.9	63.7	109.1	62.8	84.1	42	0.56	1	35.3
1250	22.7	67.9	111.2	64.7	86.5	42	0.36	2	37.7
1600	19.1	70.6	115.7	67.7	88.3	43	0.16	1	38.1
2000	15.4	75.6	109.1	60.8	89.1	43	0.23	1	39.0
2500	7.5	87.7	106.2	53.9	88.5	47	0.35	0	35.0
3150	8.0	105.1	106.5	52.1	90.2	48	0.24	0	35.3
4000	7.2	129.1	104.3	48.7	90.5	48	0.37	0	35.4
5000	7.6	169.1	100.7	41.7	88.5	51	0.71	0	31.1

STC Rating = 40 *(Sound Transmission Class)*
Deficiencies = 21 *(Number of deficiencies versus contour curve)*
OITC Rating = 30 *(Outdoor/Indoor Transmission Class)*

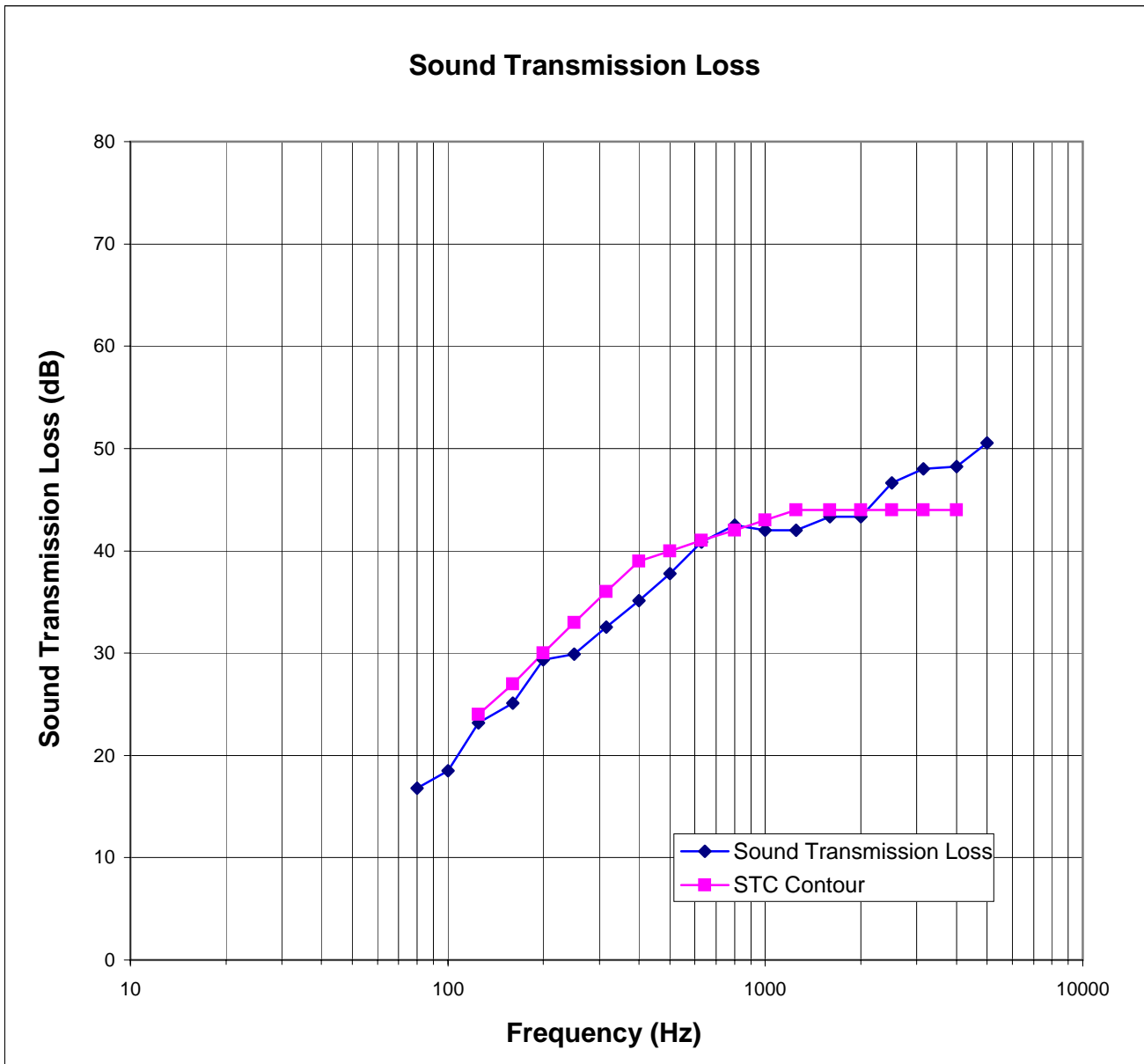
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Architectural Testing

ATI No. 63957.01B Date 04/06/06
Client Stergis Aluminum Products Corp.
Specimen Series/Model 6002A double hung window with 3/4" IG(1/8" annealed exterior, 3/8" air space, 1/4" laminated interior) with 1/8" annealed storm, Glass temperature 72F
Specimen Area 24.00 Sq Ft
Filler Area 116.00 Sq Ft
Operator Kurt A. Golden



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Appendix C
Photographs



Installed View of Specimen in Receive Room



Installed View of Specimen in Receive Room