

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

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: 5500 Vinyl

TYPE: Single Hung Window

Summary of Test Results			
ATI Data File No.	Glazing	STC	OITC
65795.01	11/16" IG (3/32" annealed, 1/2" air space, 3/32" annealed)	26	21

Reference should be made to ATI Report No. 65795.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.
P.O. Box 370
650 West Market Street
Gratz, PA 17030-0370

Report No: 65795.01-113-11
Test Date: 06/27/06
Report Date: 08/25/06
Expiration Date: 06/27/10

Test Sample Identification:

Series/Model: 5500 Vinyl

Type: Single Hung Window

Overall Size: 44" by 60"

Glazing: 11/16" IG (3/32" Annealed, 1/2" Air Space, 3/32" Annealed)

Project Scope: Architectural Testing, Inc. (ATI) was contracted by MI Windows and Doors, Inc. to conduct a sound transmission loss test on a Series/Model 5500 Vinyl, single 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 tests were 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 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 48" by 72" and 72" by 48" specimens. The filler wall achieved an STC rating of 64.

A filler wall reducing element (STC 64) was used to reduce the test opening size to 44-1/2" wide by 60-1/2" high. The reducing element consisted of a double 2x4 wood stud wall construction with two layers of 5/8" drywall on both sides. The stud cavities in the wall were insulated with two layers of R-13 fiberglass insulation. The window was placed on a foam isolation pad in the new 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 was opened and closed at least five times prior to testing.

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	44" by 60"
Thickness	2-7/8"
CORNERS	Mitered
Fasteners	Welds
Seal Method	None
MATERIAL	Vinyl
Reinforcement	Aluminum / Meeting rail
Thermal Break Material	N/A
Daylight Opening Size	40-3/4" by 27"

Sample Descriptions: (Continued)

Sash Construction:

		Active Sash
Size	41-1/2" by 30-1/8"	
Thickness	1"	
CORNERS	Mitered	
	Fasteners	Welds
	Seal Method	None
MATERIAL	Vinyl	
	Reinforcement	Aluminum / Meeting rail
	Thermal Break Material	N/A
Daylight Opening Size	38-1/4" by 26-7/8"	

Glazing:

Measured Overall Insulation Glass Unit Thickness	0.694"
Spacer Type	Steel U-Shape

	Exterior Sheet	Gap	Interior Sheet
MEASURED THICKNESS	0.087"	0.520"	0.087"
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	Double-sided adhesive foam tape
GLAZING BEAD MATERIAL	Vinyl

Sample Descriptions: (Continued)

Components:

	TYPE	QUANTITY	LOCATION
WEATHERSTRIP			
	0.187" by 0.210" Poly-pile with center fin	1 Row	Active sash perimeter and fixed meeting rail
HARDWARE			
	Block and tackle balance	2	Jambs
	Metal cam lock	2	Lock rail
	Metal keeper	2	Keeper rail
DRAINAGE			
	1-1/4" by 3/16" Weep slot	2	Sill
	1-1/4" by 3/16" Weep slot with cover	2	Sill
	1" by 3/16" Weep slot	2	Sill
	3/16" by 3/16" Weep slot	2	Sill

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

Comments: The weight of the sample was 54 lbs. The client did not supply drawings on the Series/Model 5500 Vinyl, single hung window. The window was disassembled, and the components will be retained by ATI for four years. Photographs of the test specimen are included in Appendix D.

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 5500 Vinyl, single hung window is listed below.

ATI Data File No.	Glazing	STC	OITC
65795.01	11/16" IG (3/32" annealed, 1/2" air space, 3/32" annealed)	26	21

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 specimen that was 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. 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:

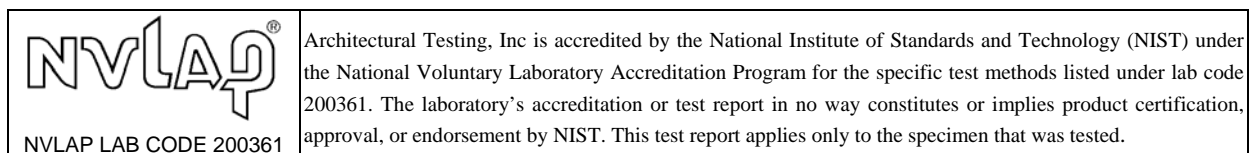
Kurt A. Golden
Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

KAG:dla

Attachments (pages):

- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (2)
- Appendix-C: Photographs (1)



Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	08/25/06	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	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003246
Source Room Microphone	ACO Pacific	7047	1/2", pressure type, condenser microphone	Y002757
Receive Room Preamp	G.R.A.S.	N-1201	1/2" preamplifier	Y003240
Source Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002756
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 (234m ³)	Rotating vane and stationary diffusers. Temperature and humidity controlled. Isolation pads under the floor.
Source Room	7296.3 ft ³ (206.6m 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.	65795.01	Date	06/27/06
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model 5500 vinyl single hung window with 11/16" IG (3/32" annealed, 1/2" air space, 3/32" annealed)		
Specimen Area	18.33 Sq Ft		
Filler Area	121.67 Sq Ft		
Operator	Kurt A. Golden		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	74.8	75.8	73.9	75.2	73.1	74.9
RH %	62.5	61.3	60.3	62.0	61.4	61.6

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	40.8	44.9	84.5	62.8	36.3	18	2.66	0	10.2
100	41.5	55.1	87.9	64.1	40.3	19	2.69	0	13.1
125	40.6	51.3	91.4	66.8	47.5	20	1.97	0	19.1
160	42.9	48.6	94.2	70.2	46.2	20	0.88	0	18.2
200	43.7	53.9	98.2	76.6	49.6	17	1.09	0	24.4
250	40.0	54.2	99.5	80.8	51.0	14	1.28	5	28.7
315	38.1	55.9	95.8	76.6	54.0	14	0.74	8	31.4
400	36.0	60.3	95.5	72.9	58.4	17	0.82	8	32.7
500	33.1	60.5	98.7	72.9	60.5	21	0.80	5	31.7
630	26.7	59.5	101.5	73.5	65.2	23	0.53	4	34.2
800	27.3	60.3	101.2	68.7	67.4	27	0.45	1	31.8
1000	26.1	63.5	100.8	65.4	72.2	30	0.47	0	33.9
1250	26.5	67.5	104.9	65.1	78.0	34	0.21	0	35.7
1600	21.9	71.0	111.3	70.3	81.8	35	0.38	0	38.5
2000	18.2	76.2	107.3	65.4	79.9	36	0.13	0	36.0
2500	15.1	88.2	105.6	62.3	74.8	36	0.26	0	30.1
3150	13.9	106.5	106.4	62.1	77.8	37	0.20	0	32.8
4000	12.3	131.0	105.0	60.5	81.1	36	0.35	0	36.9
5000	11.3	170.8	103.6	62.3	81.0	32	0.55	0	41.2

STC Rating = 26 *(Sound Transmission Class)*
Deficiencies = 31 *(Number of deficiencies versus contour curve)*
OITC Rating = 21 *(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.*

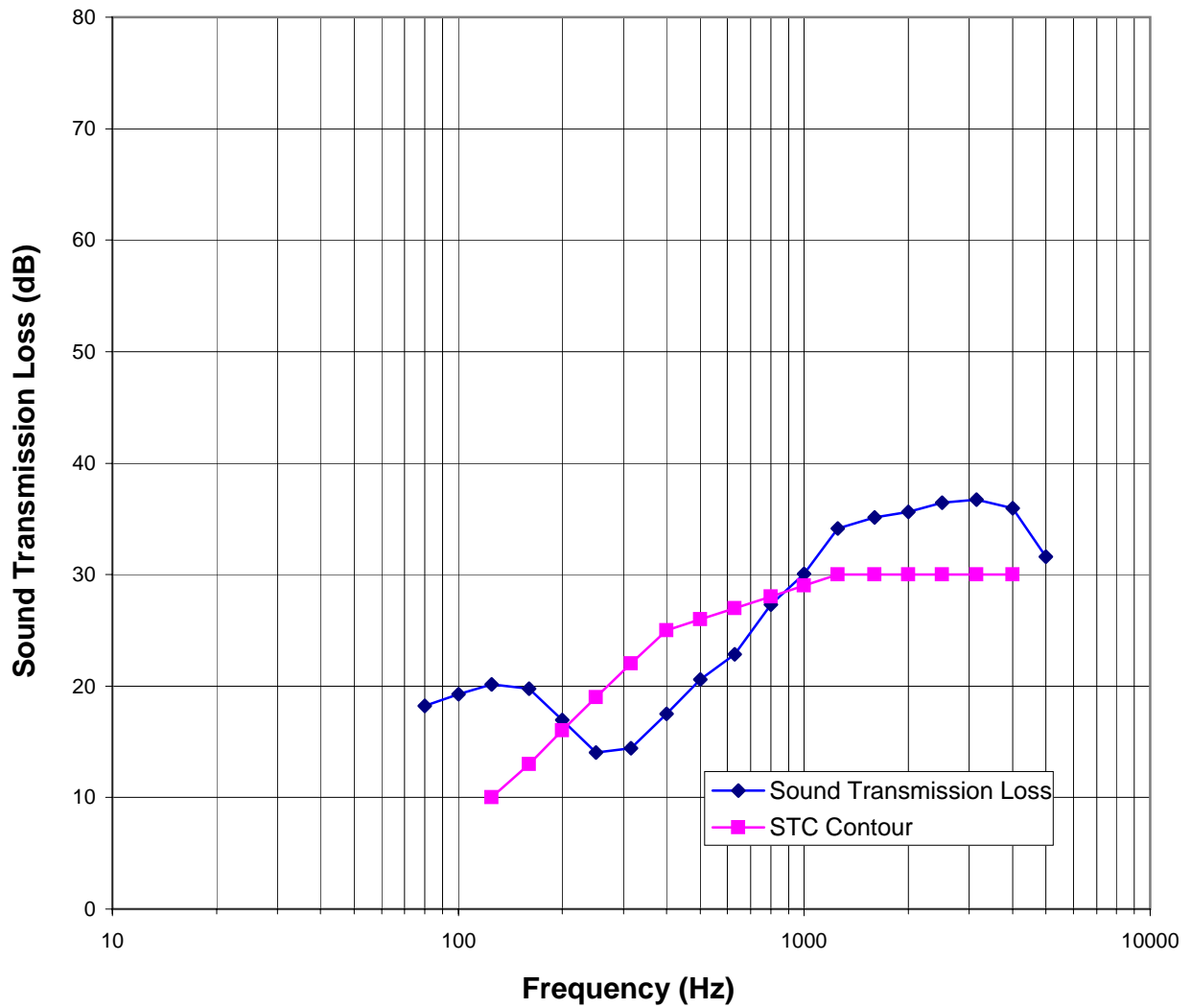
 NVLAP LAB CODE 200361	Architectural Testing, Inc is accredited by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program for the specific test methods listed under lab code 200361. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by NIST. This test report applies only to the specimen that was tested.
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Architectural Testing

ATI No. 65795.01 Date 06/27/06
Client MI Windows and Doors, Inc.
Specimen Series/Model 5500 vinyl single hung window with 1 1/16" IG (3/32" annealed, 1/2" air space, 3/32" annealed)
Specimen Area 18.33 Sq Ft
Filler Area 121.67 Sq Ft
Operator Kurt A. Golden

Sound Transmission Loss



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Appendix C
Photographs



View of Specimen Installed in Receive Room



View of Specimen Installed in Source Room