Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: 4300

TYPE: Fixed Window

Summary of Test Results				
ATI Data File No.	**Glazing Description**	**Air Infiltration**	**STC**	**OITC**
52461.01	7/8" IG (1/8" Annealed Exterior, 9/16" Air Space, 3/16" Annealed Interior)	Pass	31	25

Reference should be made to ATI Report No. 52461.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

130 Derry Court
York, PA 17402-9405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

MI WINDOWS AND DOORS, INC.
P. O. Box 370
Gratz, Pennsylvania 17030-0370

Report No:	52461.01-113-11
Test Date:	07/28/04
Report Date:	08/10/04
Expiration Date:	07/28/08

Test Sample Identification:

Series/Model: 4300

Type: Fixed Window

Overall Size: 48" by 48"

Glazing: 7/8" IG (1/8" Annealed Exterior, 9/16" Air Space, 3/16" Annealed Interior)

Project Scope: Architectural Testing, Inc. (ATI) was contracted by MI Windows And Doors, Inc. to conduct air leakage and sound transmission loss tests on a Series/Model 4300, fixed 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:

AAMA 1801-97, *Acoustical Rating of Windows, Doors, and Glazed Wall Sections*.

ASTM E 1425-91 (Re-approved 1999), *Standard Practice for Determining the Acoustical Performance of Exterior Windows and Doors.*

ASTM E 90-02, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*.

ASTM E 413-87 (Re-approved 1999), *Classification for Rating Sound Insulation*.

ASTM E 1332-90 (Re-approved 1998), *Standard Classification for Determination of Outdoor-Indoor Transmission Class.*

ASTM E 283-91 (Re-approved 1999), *Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.*

130 Derry Court
York, PA 17402-9405
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 90-02. The microphones were calibrated before conducting sound transmission loss tests. The test equipment and test chamber descriptions are listed in Appendix A.

Test Procedure:

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 63.

The 72" by 48" plug was removed from the filler wall assembly and a 24" by 48" filler wall, reducing element was installed. The reducing element utilized the same construction as the filler wall. A 2x6 wood frame was placed into the 48" by 48" opening. A dense neoprene gasket and duct seal were used to seal the wood frame to the inside perimeter of the filler wall opening. The test specimen was then installed in the wood frame opening. Duct seal was used to seal the window perimeter to the wood frame 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 before the test.

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:

	Main Frame
Size	48" by 48"
Thickness	3-1/8"
CORNERS	Mitered
Fasteners	Welds
Seal Method	N/A
MATERIAL	Vinyl
Reinforcement	N/A
Thermal Break Material	N/A
Day Light Opening Size	43-1/4" by 43-3/8"

Sample Descriptions: (Continued)

Glazing:

Measured Overall Insulation Glass Unit Thickness	0.854"
Spacer Type	Steel U shape

	Exterior Sheet	**Gap**	**Interior Sheet**
MEASURED THICKNESS	0.120"	0.552"	0.182"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Annealed	Air*	Annealed
LAMINATE MATERIAL	N/A	N/A	N/A

The glazing was interior glazed onto double-sided adhesive foam tape and held-in-place with vinyl glazing beads.

Components:

	TYPE	**QUANTITY**	**LOCATION**
WEATHERSTRIP			
	No weatherstrip		
HARDWARE			
	No hardware		
DRAINAGE			
	No drainage		

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

Comments: The weight of the sample was 67.0 lbs. The client did not supply drawings on the Series/Model 4300, fixed window. The fixed window was disassembled and the components will be retained by ATI for four years.

Test Results: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413-87 (Re-approved 1999). The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332-90 (Re-approved 1998). A summary of the air leakage and sound transmission loss test results on the fixed window is listed below.

ATI Data File No.	Sample Description	* Air Leakage Pass/Fail	STC	OITC
52461.01	Series/Model 4300, fixed window with 7/8" IG (1/8" Annealed Exterior, 9/16" Air Space, 3/16" Annealed Interior)	Pass	31	25

**The maximum allowable air leakage rate, according to AAMA/NWWDA 101/I.S.2-97, is 0.3 cfm/ft^2 when the test pressure is 1.57 psf for residential.*

The complete test results are listed in Appendix B.

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 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:

Digitally Signed by: Kurt A. Golden

Kurt A. Golden
Technician - Acoustical Testing

Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

KAG:vlm

Attachments (pages):
Appendix A: Equipment description (1)
Appendix B: Complete test results (3)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	08/10/04	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	Y001775
Source Room Microphone	ACO Pacific	7047	1/2", pressure type, condenser microphone	Y002757
Receive Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002185
Source Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002756
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002186
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 Sound Transmission Loss Test Results

Architectural Testing

SOUND TRANSMISSION LOSS

ASTM E90

ATI No.	52461.01	**Date**	07/28/04
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 4300, fixed window with 7/8" IG (1/8" annealed exterior, 9/16" air space, 3/16" annealed interior)		
Specimen Area	16.00 Sq Ft		
Filler Area	124.00 Sq Ft		
Operator	Ben Green		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	72.7	74.1	70.6	73.2	72.2	72.7
RH %	63.7	61.4	60.6	62.8	65.4	62.1

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	39.7	52.9	84.9	57.1	33.8	24	2.66	0	2.3
100	40.5	56.8	88.1	61.5	37.8	22	2.11	0	7.9
125	39.4	44.4	92.0	63.0	44.1	25	1.58	0	10.7
160	46.5	45.2	95.9	69.0	45.6	23	1.35	0	14.3
200	47.0	53.9	100.8	77.8	48.8	18	1.27	3	22.3
250	41.4	55.8	102.1	79.7	49.6	17	1.11	7	23.8
315	38.6	58.5	100.8	73.6	52.5	22	0.95	5	22.1
400	36.2	58.3	100.2	71.8	56.8	23	0.45	7	25.2
500	34.0	57.5	101.5	70.1	60.5	26	0.59	5	25.7
630	29.5	60.0	104.5	70.0	65.4	29	0.55	3	27.7
800	27.1	61.4	106.1	67.3	68.0	33	0.50	0	26.2
1000	24.9	64.5	105.7	63.9	72.8	36	0.24	0	28.2
1250	24.1	71.9	107.4	61.7	79.7	39	0.23	0	31.6
1600	19.1	74.4	111.9	65.3	82.6	40	0.43	0	33.8
2000	11.9	79.2	109.6	65.0	79.6	38	0.35	0	33.0
2500	8.2	95.0	107.8	63.0	76.7	37	0.37	0	30.7
3150	7.4	112.7	107.8	63.9	80.1	35	0.34	0	35.8
4000	6.4	137.4	106.8	62.6	83.1	35	0.42	0	39.3
5000	6.3	180.2	104.3	55.1	82.5	39	0.66	0	34.9

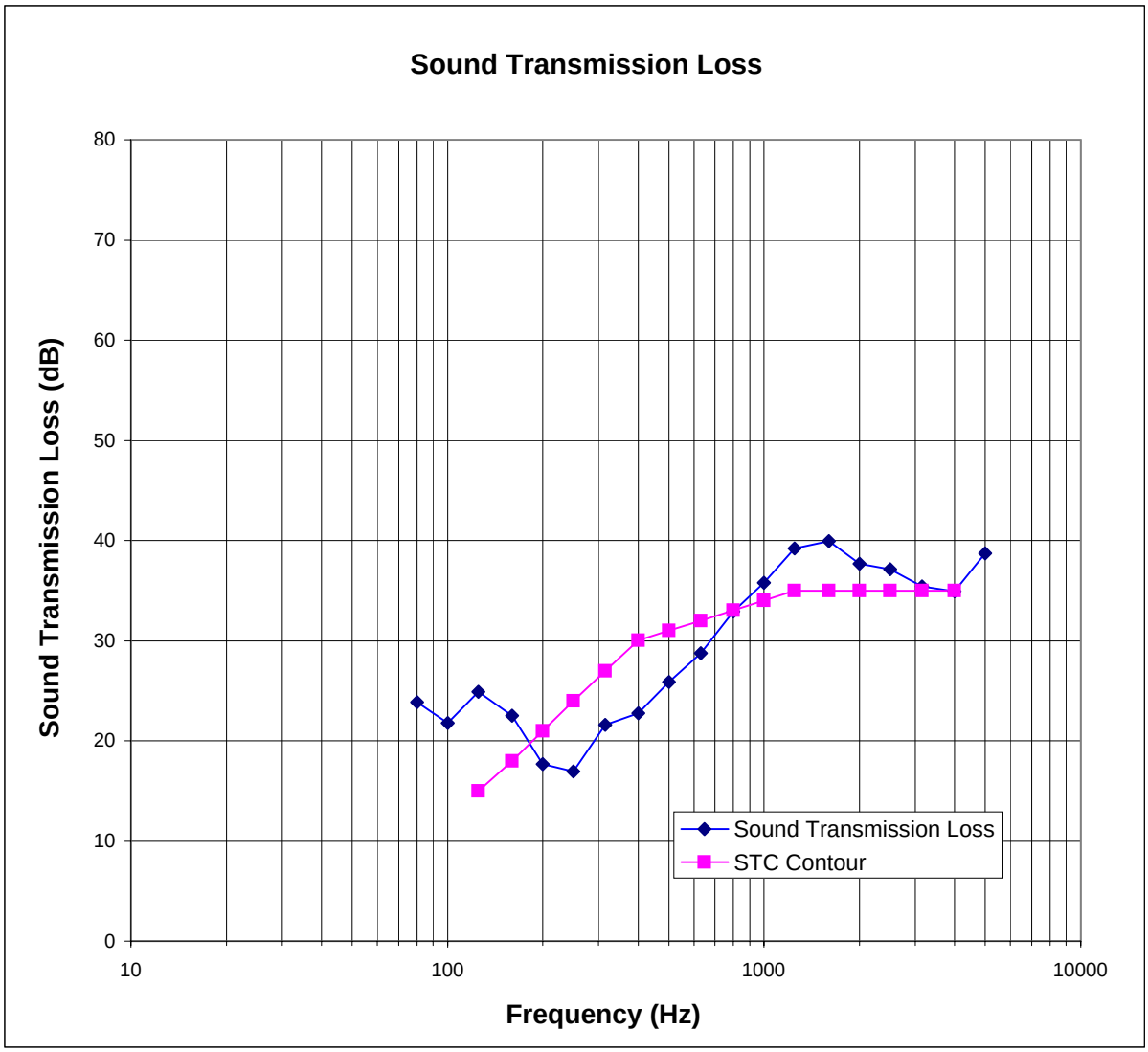
STC Rating	31	*(Sound Transmission Class)*
Deficiencies	30	*(Number of deficiencies versus contour curve)*
OITC Rating	25	*(Outdoor/Indoor Transmission Class)*

NVLAP

Accredited by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program for the specific test methods 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.

Architectural Testing

ATI No.	52461.01	**Date**	07/28/04
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 4300, fixed window with 7/8" IG (1/8" annealed exterior, 9/16" air space, 3/16" annealed interior)		
Specimen Area	16.00 Sq Ft		
Filler Area	124.00 Sq Ft		
Operator	Ben Green		



ATI Job Number :	52461.01
Client Name :	MI Windows and Doors Inc.
Test Date :	7/28/2004
Tests Performed by:	Ben Green
Specimen Type :	Fixed Window
Series/Model Number :	4300
Sample Size :	48" x 48"

Architectural Testing

Air Leakage per ASTM test method ASTM E283

Total Air flow (ft^3/min) :	7.3		
Extraneous Leakage (ft3/min) :	7.25		
Temperature (^oF) at Specimen:	73		
Barometric Pressure at Specimen (in mbar):	997	(Inches of Hg) :	29.44
Specimen Area in square feet :	16.00		
Density of air at reference standard conditions (lb/ft^3)	0.075		

Total air flow w/ air density correction (ft3/min)	Extraneous leakage with air density correction (ft3/min)	Air leakage through the specimen with air density correction (ft3/min)	Rate of air leakage per unit area (ft3/min)/sq.ft.
7.165	7.165	0.000	<0.01