F0213.02-113-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E90

Rendered to:

MI WINDOWS AND DOORS, LLC

Series/Model: 4340
This product also is labeled under the following Series/Model names:
4340SPSH, S-4340, S-4340SPSH

Type: Polyvinyl Chloride (PVC) Single Hung Window

Summary of Test Results			
Data File No.	**Glazing (Nominal Dimensions)**	**STC**	**OITC**
F0213.01F	3/4" IG (3/32" annealed, 9/16" air space, 3/32" annealed)	28	24

Reference should be made to Intertek-ATI Report No. F0213.02-113-11 for complete test specimen description. This page alone is not a complete report. Flanking limit tests and reference specimen tests are available upon request.

Acoustical Performance Test Report

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

Report No	F0213.02-113-11
Test Date	08/28/15
Report Date	09/30/15

Project Scope
Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by MI Windows and Doors LLC. to conduct sound transmission loss tests. The complete test data is included as Appendix B of this report. The client provided the test specimen.

Test Methods
Testing for this project was conducted in accordance with the following standards. The equipment listed in the attachments meets the requirements of the following standards.

ASTM E90-09, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*
ASTM E413-10, *Classification for Rating Sound Insulation*
ASTM E1332-10a, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation*
ASTM E2235-04 (2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

Test Procedure
All measurements were conducted in the HT test chambers at Intertek-ATI located in York, Pennsylvania. The sensitivity of the microphones was checked before measurements were conducted.

The transmission loss values were obtained for a single direction of measurement. Two background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions.

Two sound pressure levels were made simultaneously in the receive and source rooms at each of five microphone positions.

The air temperature and relative humidity conditions were monitored and recorded during all measurements.

Specimen Installation
A sound transmission loss test was initially performed on a filler wall.

The specimen plug was removed from the filler wall assembly. A filler wall-reducing element, consisting of two separate 2x6 wood frames filled with concrete, was used to adjust the test opening size to accommodate the test specimen. A dense neoprene gasket was placed between the two wood and concrete frames. The specimen was placed on an isolation pad in the custom test opening. Duct seal was used to seal the perimeter of the specimen to the test opening on both sides. The interior side of the specimen, when installed, was approximately 1/4" from being flush with the receive room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. Operable portions of the test specimen, if any, were cycled at least five times prior to testing.

Test Calculations
Transmission loss (TL) at each 1/3 octave frequency is the average source room sound pressure level minus the average receive room sound pressure level, plus, 10 times the log of the specimen area divided by the sound absorption of the receive room with the sample in place.

STC Rating
To obtain the Sound Transmission Class (STC), read the TL of the contour curve at 500 Hz. The sum of the deficiencies below the contour curve must not exceed 32. The maximum deficiency at any one frequency must not exceed 8.

OITC Rating
The Outdoor-Indoor Transmission Class (OITC) is calculated by subtracting the logarithmic summation of the TL values from the logarithmic summation of the A-weighted transportation noise spectrum stated in ASTM E1332.

Specimen Descriptions

		Frame	Bottom Sash
Size		47-1/4" by 59"	44-3/4" by 29"
Thickness		3-1/8"	1-1/4"
	Corners	Mitered	Mitered
	Fasteners	Welds	Welds
	Seal Method	N/A	N/A
Material		Vinyl	Vinyl
	Reinforcement	N/A	N/A
	Thermal Break Material	N/A	N/A
Daylight Opening Size		42-1/2" by 26"	41-3/4" by 26-1/8"

Glazing

Measured Overall Insulation Glass Unit Thickness	0.745"
Spacer Type	Metal Reinforced butyl (A8-S) Duraseal

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.089"	0.567"	0.089"
Muntin Pattern	N/A	N/A	N/A
Material	Annealed	Air*	Annealed
Laminate Material	N/A	N/A	N/A

Glazing Method	Interior
Glazing Material	Foam tape
Glazing Bead Material	Vinyl

** - Stated per Client/Manufacturer, N/A-Not Applicable*

Specimen Descriptions (Continued)

Components

	Type	Quantity	Location
Weatherstrip			
	0.187" Backed by 0.150" high polypile with center fin	1 Row	Interior sill leg
	0.187" Backed by 0.310" high polypile with center fin	1 Row	Sash stiles
	0.187" Backed by 0.240" high polypile with center fin	1 Row	Sash stiles and interior meeting rail
	0.187" Backed by 3/8" diameter foam-filled vinyl bulb	1 Row	Bottom rail
	0.187" Backed by 5/32" diameter foam-filled vinyl bulb	1 Row	Fixed meeting rail
Hardware			
	Composite cam locks with adjacent composite keepers	2	Interior meeting rail, 7" from each end
	Inverted coil spring balance	2	One in each jamb
	Recessed mount plastic tilt latch	2	Each end of the interior meeting rail
	Metal tilt pins	2	Each end of bottom rail
Drainage			
	Weep notch 1" wide by 1/8" high	2	Sill, at each end
	Slop sill weep notch 1" wide by 1/4" high	2	Sill, at each end

Total Weight (lbs)	**Average Weight** (lbs/ft^2)
54	2.78

Comments

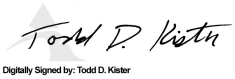
The client did not supply a report drawing of the test specimen. Intertek-ATI will store samples of test specimens for four years.

Intertek-ATI will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period. The test record retention period ends four years after the test date.

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 specimen tested. This report is intended to help in the client's quality assurance program, but it does not represent a continuous or exhaustive evaluation of the specimen tested or of other products or materials that were not evaluated. The statements and data provided herein do not constitute approval, disapproval, certification, or acceptance of performance or materials.

For INTERTEK-ATI:

Leeland S Hoover
Technician - Acoustical Testing



Todd D. Kister
Laboratory Supervisor – Acoustical Testing

LSH:jmcs

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix A: Equipment description (1)
- Appendix B: Complete test results (2)
- Appendix C: Photographs (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
R0	09/30/15	N/A	Original Report Issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-1033	Data Acquisition card	65127	04/14 *
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64902	12/14
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64903	12/14
Source Room Microphone	PCB Electronics	378B20	Microphone and Preamplifier	65103	12/14
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64905	12/14
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64906	12/14
Receive Room Microphone	PBC Piezotronics	378B20	Microphone and Preamplifier	64907	11/14
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64908	11/14
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64909	11/14
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64912	11/14
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64911	11/14
Receive Room Environmental Indicator	Comet	T7510	Receive Room	64915	02/15
Source Room Environmental Indicator	Comet	T7510	Source Room	64914	02/15
Microphone Calibrator	Norsonic	1251	Pistonphone Calibrator	65105	04/15

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

Test Chamber:

	Volume	Description
Receive 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

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IAS ACCREDITED TL-144

AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

Test Date	08/28/15					
Data File No.	F0213.01F					
Client	MI Windows and Doors, LLC					
Description	Series/Model: 4340, Polyvinyl Chloride (PVC) Single Hung Window with 3/4" IG (3/32" annealed, 9/16" air space, 3/32" annealed)					
Specimen Area	1.80 m²	Receive Temp.	21.7 °C		Source Temp.	21.1 °C
Technician	James S. Butler	Receive Humidity	44%		Source Humidity	45%

Freq (Hz)	Background SPL (dB)	Absorption (m²)	Source SPL (dB)	Receive SPL (dB)	Specimen TL (dB)	95% Confidence Limit	Number of Deficiencies
80	39.9	5.1	108	87	16.9	2.12	-
100	37.3	5.0	108	81	23.0	1.99	-
125	40.8	4.7	107	81	21.9	1.07	0
160	42.5	4.5	107	83	20.5	1.05	0
200	42.5	4.6	109	88	17.7	0.57	0
250	38.1	5.1	108	85	18.1	0.75	3
315	31.0	5.6	102	78	19.3	0.46	5
400	26.6	5.9	99	74	19.2	0.49	8
500	23.2	6.0	99	71	23.5	0.45	5
630	20.2	5.6	103	73	25.5	0.45	3
800	18.9	5.6	103	69	28.5	0.28	1
1000	15.3	5.9	99	62	31.8	0.36	0
1250	12.4	6.6	100	60	34.8	0.20	0
1600	8.5	7.1	105	65	34.7	0.20	0
2000	5.7	7.4	98	57	34.1	0.20	0
2500	5.1	8.6	95	51	37.1	0.18	0
3150	5.1	10.5	97	49	41.0	0.22	0
4000	5.5	13.2	96	47	40.3	0.19	0
5000	5.9	17.4	95	52	32.9	0.23	-

STC Rating	**28**	*(Sound Transmission Class)*
Deficiencies	25	*(Sum of Deficiencies)*
OITC Rating	**24**	*(Outdoor-Indoor Transmission Class)*

Notes:

1) Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.
2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

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AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

Test Date	08/28/15					
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Description	Series/Model: 4340, Polyvinyl Chloride (PVC) Single Hung Window with 3/4" IG (3/32" annealed, 9/16" air space, 3/32" annealed)					
Specimen Area	1.80 m²	Receive Temp.	21.7 °C		Source Temp.	21.1 °C
Technician	James S. Butler	Receive Humidity	44%		Source Humidity	45%

Appendix C

Photographs

Receive Room View of Installed Test Specimen

Source Room View of Installed Test Specimen