

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

**Rendered to:**

**MI WINDOWS AND DOORS, INC.**

**SERIES/MODEL: HM-160 XO Slider**

**TYPE: Horizontal Sliding Window**

<b>Summary of Test Results</b>			
<b>Data File No.</b>	<b>Glazing (Nominal Dimensions)</b>	<b>STC</b>	<b>OITC</b>
C4185.01A	3/4" IG (3/32" annealed, 9/16" air space [steel U-shaped (Intercept)], 3/32" annealed)	26	21
C4185.01B	3/4" IG (1/8" annealed, 1/2" air space [silicone foam (Premium Enhanced)], 1/8" annealed)	27	22
C4185.01C	1-1/8" IG (1/8" annealed exterior, 13/16" air space [silicone foam (Premium Enhanced)], 3/16" annealed interior)	34	26
C4185.01D4	1-1/16" IG (3/16" annealed exterior, 5/8" air space [silicone foam (Premium Enhanced)], 1/4" ["Q" Series interlayer] laminated interior), Glass temperature 75°F	36	29

Reference should be made to Architectural Testing, Inc. Report No. C4185.01-113-11 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, Pennsylvania 17030-0370

Report No: C4185.01-113-11  
Test Date: 01/09/13  
Report Date: 02/04/13  
Record Retention End Date: 02/04/17

### Test Sample Identification:

**Series/Model:** HM-160 XO Slider

**Type:** Horizontal Sliding Window

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

### Glazing (Nominal Dimensions):

**Option A:** 3/4" IG (3/32" Annealed, 9/16" Air Space [Steel U-Shaped (Intercept)], 3/32" Annealed)

**Option B:** 3/4" IG (1/8" Annealed, 1/2" Air Space [Silicone Foam (Premium Enhanced)], 1/8" Annealed)

**Option C:** 1-1/8" IG (1/8" Annealed Exterior, 13/16" Air Space [Silicone Foam (Premium Enhanced)], 3/16" Annealed Interior)

**Option D:** 1-1/16" IG (3/16" Annealed Exterior, 5/8" Air Space [Silicone Foam (Premium Enhanced)], 1/4" ["Q" Series Interlayer] Laminated Interior), Glass Temperature 75°F

**Project Scope:** Architectural Testing, Inc. was contracted by MI Windows and Doors, Inc. to conduct sound transmission loss tests on a Series/Model HM-160 XO Slider, 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.

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**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 413-10, *Classification for Rating Sound Insulation.*

ASTM E 1332-10a, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation.*

ASTM E 2235-04 (Reapproved 2012), *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:** A double stud filler wall was constructed with 2-1/2" steel studs and 3-1/2" steel studs spaced 24" on center. Five layers of 5/8" Type "X" gypsum board were fastened to the receive side of the filler wall. Three layers of 1/2" cement board were fastened to the source side of the filler wall. The cavity was filled with two layers of R-13 fiberglass insulation. The perimeter and seams were sealed with acoustical sealant. A sound transmission loss test was then conducted on the filler wall. The filler wall achieved an STC rating of 71. The 59-1/2" by 47-3/4" filler wall plug was removed. The window system was placed on isolation pads in the test opening. Duct seal was used to seal the perimeter of the test specimen to the test opening on both sides. The interior side of the test specimen, 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 closed and locked for this test. The sound transmission loss tests were conducted in accordance with the ASTM E 90 test method using a single direction of measurement. 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:**

		<b>Frame</b>
<b>Size</b>		59" by 47-1/4"
<b>Thickness</b>		3-13/16"
<b>Corners</b>		Mitered
	Fasteners	Welds
	Seal Method	None
<b>Material</b>		Vinyl
	Reinforcement	Aluminum / Keeper stile
	Thermal Break Material	N/A
<b>Daylight Opening Size</b>		26-1/16" by 42-15/16"

**Sash Construction:**

		<b>Active Sash</b>
<b>Size</b>		29-5/8" by 44-3/8"
<b>Thickness</b>		1-9/16"
<b>Corners</b>		Mitered
	Fasteners	Welds
	Seal Method	None
<b>Material</b>		Vinyl
	Reinforcement	Aluminum / Lock stile
	Thermal Break Material	N/A
<b>Daylight Opening Size</b>		26-1/8" by 40-15/16"

*N/A-Non Applicable*

Sample Descriptions: (Continued)

**Glazing Option A:**

<b>Measured Overall Insulation Glass Unit Thickness</b>	0.752"		
<b>Spacer Type</b>	Steel U-shaped (Intercept)		
	<b>Exterior Sheet</b>	<b>Gap</b>	<b>Interior Sheet</b>
<b>Measured Thickness</b>	0.088"	0.576"	0.088"
<b>Muntin Pattern</b>	N/A	N/A	N/A
<b>Material</b>	Annealed	Air*	Annealed
<b>Laminate Material</b>	N/A	N/A	N/A
<b>Glazing Method</b>	Exterior		
<b>Glazing Material</b>	Double-sided adhesive foam tape		
<b>Glazing Bead Material</b>	Vinyl		

**Glazing Option B:**

<b>Measured Overall Insulation Glass Unit Thickness</b>	0.726"		
<b>Spacer Type</b>	Silicone foam (Premium Enhanced)		
	<b>Exterior Sheet</b>	<b>Gap</b>	<b>Interior Sheet</b>
<b>Measured Thickness</b>	0.117"	0.492"	0.117"
<b>Muntin Pattern</b>	N/A	N/A	N/A
<b>Material</b>	Annealed	Air*	Annealed
<b>Laminate Material</b>	N/A	N/A	N/A
<b>Glazing Method</b>	Exterior		
<b>Glazing Material</b>	Double-sided adhesive foam tape		
<b>Glazing Bead Material</b>	Vinyl		

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

Sample Descriptions: (Continued)

Glazing Option C:

<b>Measured Overall Insulation Glass Unit Thickness</b>	1.133"		
<b>Spacer Type</b>	Silicone foam (Premium Enhanced)		
	<b>Exterior Sheet</b>	<b>Gap</b>	<b>Interior Sheet</b>
<b>Measured Thickness</b>	0.115"	0.836"	0.182"
<b>Muntin Pattern</b>	N/A	N/A	N/A
<b>Material</b>	Annealed	Air*	Annealed
<b>Laminate Material</b>	N/A	N/A	N/A
<b>Glazing Method</b>	Exterior		
<b>Glazing Material</b>	Double-sided adhesive foam tape		
<b>Glazing Bead Material</b>	Vinyl		

Glazing Option D:

<b>Measured Overall Insulation Glass Unit Thickness</b>	1.056"		
<b>Spacer Type</b>	Silicone foam (Premium Enhanced)		
	<b>Exterior Sheet</b>	<b>Gap</b>	<b>Interior Sheet</b>
<b>Measured Thickness</b>	0.182"	0.637"	0.105", 0.027", 0.105"
<b>Muntin Pattern</b>	N/A	N/A	N/A
<b>Material</b>	Annealed	Air*	Laminated
<b>Laminate Material</b>	N/A	N/A	Saflex® "Q" Series acoustical interlayer*
<b>Glazing Method</b>	Exterior		
<b>Glazing Material</b>	Double-sided adhesive foam tape		
<b>Glazing Bead Material</b>	Vinyl		

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

**Sample Descriptions: (Continued)**

**Components:**

TYPE	QUANTITY	LOCATION
<b>Weatherstrip</b>		
0.187" by 0.250" Polypile with center fin	1 Row	Frame perimeter, bottom and top rail, and jamb stile
3/8" Diameter foam-lined bulb gasket	1 Row	Keeper stile
0.187" by 0.450" Polypile	1 Row	Lock stile (Options A, B, C only)
0.187" by 0.600" Polypile with center fin	1 Row	Lock stile (Option D only)
<b>Hardware</b>		
Roller assembly set	2	Bottom rail
Cam lock	1	Lock stile
Keeper	1	Keeper stile
<b>Drainage</b>		
1-1/2" by 1/4" Weep slot with cover	2	Sill face
1-1/2" by 1/4" Weep slot	2	Sill track

**Sample Weights:**

Overall Sample Area:	m <sup>2</sup>	ft <sup>2</sup>
	1.799	19.36

  

Sample Identification:	Total Weight		Weight Per Unit Area	
	kg	lbs	kg / m <sup>2</sup>	lbs / ft <sup>2</sup>
A	30	66	16.68	3.42
B	35.50	78	19.73	4.04
C	41.75	92	23.21	4.75
D	51.50	114	28.63	5.86

**Comments:** The client did not supply drawings on the Series/Model HM-160 XO Slider, horizontal sliding window. The window was disassembled, and the components will be retained by Architectural Testing for four years. 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 HM-160 XO Slider, horizontal sliding window is listed below.

Summary of Test Results			
Data File No.	Glazing (Nominal Dimensions)	STC	OITC
C4185.01A	3/4" IG (3/32" annealed, 9/16" air space [steel U-shaped (Intercept)], 3/32" annealed)	26	21
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The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

Architectural Testing 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 Architectural Testing for the entire test record retention period.

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 may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

  
Digital Signed by: Kurt A. Golden

Kurt A. Golden  
Senior Technician - Acoustical Testing

  
Digital Signed by: Todd D. Kister

Todd D. Kister  
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Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Equipment description (1)

Appendix-B: Complete test results (8)

Appendix-C: Photographs (1)



**Revision Log**

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	02/04/13	N/A	Original Report Issue

## Appendix A

### Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Date of Calibration
Analyzer	Hewlett Packard	HP35670A	Real time analyzer	004112	07/11 *
Data Acquisition Unit	Agilent	34970A	Data Acquisition Unit	62211	07/12
Receive Room Microphone	GRAS	40 AR	1/2" Microphone	Y003246	08/12
Source Room Microphone	GRAS	40 AR	1/2" Microphone	Y003245	08/12
Receive Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003249	08/12
Source Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003248	08/12
Microphone Calibrator	Bruel & Kjaer	Type 4228	Pistonphone Calibrator	Y002816	02/12
Noise Source	Delta Electronics	SNG-1	Noise Generator	Y002181	N/A
Equalizer	Rane	RPE 228	Programmable Equalizer	Y002180	N/A
Power Amplifiers	Crown	Xti 2000	Two, Amplifiers	005769 005770	N/A
Receive Room Loudspeakers	Renkus-Heinz Inc.	Trap Jr./9	Two, Loudspeakers	Y001784 Y001785	N/A
Source Room Loudspeakers	Renkus-Heinz Inc.	Trap Jr./9	Two, Loudspeakers	Y002649 Y002650	N/A
Receive Room Environmental Indicator	Vaisala	HMW60Y	Temperature and Humidity Sensor	005066	09/12
Source Room Environmental Indicator	Vaisala	HMW60Y	Temperature and Humidity Sensor	Y002653	03/12
Weather Station	Davis Instruments	VantagePRO 6150C	Weather Station	Y003257	05/12

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

### Test Chamber:

	Volume	Description
Receive Room	234 m <sup>3</sup> (8291.3 ft <sup>3</sup> )	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
Source Room	206.6 m <sup>3</sup> (7296.3 ft <sup>3</sup> )	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