

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

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: 390

TYPE: Sliding Glass Door

Summary of Test Results			
Data File No.	Glazing (Nominal Dimensions)	STC	OITC
B5024.01	1" IG (1/4" [0.030"Q] laminated exterior, 9/16" air space, 3/16" tempered interior), Glass temperature 75°F	35	29

Reference should be made to Architectural Testing, Inc. Report No. B5024.01-113-11 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: B5024.01-113-11
Revision 1: 01/17/12
Test Date: 12/01/11
Report Date: 12/14/11
Record Retention End Date: 12/01/15

Test Sample Identification:

Series/Model: 390

Type: Sliding Glass Door

Overall Frame Size: 72" by 80"

Glazing (Nominal Dimensions): 1" IG (1/4" [0.030"Q] Laminated Exterior, 9/16" Air Space, 3/16" Tempered 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 390, sliding glass door. 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 sample was provided by the client.

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, 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 40" by 86" and 80" by 86" test specimens. The filler wall achieved an STC rating of 68.

The 80" by 86" plug was removed from the filler wall assembly. A wood buck was used to reduce the test opening size to 72" wide by 80" high. The sliding glass door was placed on a foam isolation pad 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 sliding glass door 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 operable panel 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 was 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:

		Frame
Size		72" by 80"
Thickness		4-7/8"
Corners		Mitered
	Fasteners	Welds
	Seal Method	None
Material		Vinyl
	Reinforcement	Aluminum / Fixed meeting stile
	Thermal Break Material	N/A
Daylight Opening Size		32-1/2" by 73"

N/A-Non Applicable

Sample Descriptions: (Continued)

Panel Construction:

		Active Panel
Size		37-1/4" by 77-5/8"
Thickness		1-5/8"
Corners		Mitered
	Fasteners	Welds
	Seal Method	None
Material		Vinyl
	Reinforcement	Steel / Meeting and lock stile
	Thermal Break Material	N/A
Daylight Opening Size		32-1/2" by 73"

Glazing:

Measured Overall Insulation Glass Unit Thickness	0.983"
Spacer Type	Polycarbonate reinforced butyl

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.104", 0.030", 0.104"	0.561"	0.184"
Muntin Pattern	N/A	N/A	N/A
Material	Laminated	Air*	Tempered
Laminate Material	Saflex® Q series acoustic interlayer*	N/A	N/A

Glazing Method	Exterior
Glazing Material	Double-sided adhesive foam tape
Glazing Bead Material	Vinyl

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

Sample Descriptions: (Continued)

Components:

TYPE	QUANTITY	LOCATION
Weatherstrip		
0.187" by 0.270" Polypile with a center fin	2 Rows	Top and bottom rails, lock stile
0.187" by 0.270" Polypile with center fin	1 Row	Meeting stiles
Hardware		
Lock and handle set	1	Lock stile
Keeper	1	Lock jamb
Roller assembly set	2	Bottom rail
Drainage		
1-1/4" by 1/8" Weep slot	4	Sill face and hollow
1-1/4" by 1/4" Weep slot	4	Sill at active channel wall and hollow
3/16" Diameter weep hole	2	Sill track at fixed lite

Comments: The weight of the sample was 242 lbs. The client did not supply drawings on the Series/Model 390, sliding glass door. The sliding glass door 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 390, sliding glass door is listed below.

Summary of Test Results			
Data File No.	Glazing (Nominal Dimensions)	STC	OITC
B5024.01	1" IG (1/4" [0.030"Q] laminated exterior, 9/16" air space, 3/16" tempered interior), Glass temperature 75°F	35	29

Note: Due to the calculations and sample size, transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. On each data sheet listed in Appendix B, cells highlighted in green indicate transmission loss values affected in this way.

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

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice. Results obtained are tested values and were secured by using the designated test methods. 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:

Kurt A. Golden
Senior Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing


KAG:jmc

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)

	<p>Architectural Testing, Inc. is accredited by the International Accreditation Service, Inc. (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS. This test report applies only to the specimen that was tested.</p>
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	12/14/11	N/A	Original Report Issue
1	01/17/12	3	Changed N/A under exterior sheet to Saflex® Q series acoustic interlayer
1	01/17/12	3	Changed PVB under interior sheet to N/A
1	01/17/12	Cover, Pages 1, 2, 3, and 5, Appendix B	Changed interlayer of exterior glass measurement from 0.029" to 0.030" Included [0.030"Q] in laminate description

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Date of Calibration
Analyzer	Hewlett Packard	HP35670A	Real time analyzer	Y002929	06/14/11 *
Data Acquisition Unit	Agilent	34970A	Data Acquisition Unit	62211	07/13/11
Receive Room Microphone	GRAS	40 AR	1/2" Microphone	Y003246	08/22/11
Source Room Microphone	GRAS	40 AR	1/2" Microphone	Y003245	08/22/11
Receive Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003249	08/22/11
Source Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003248	08/22/11
Microphone Calibrator	Bruel & Kjaer	Type 4228	Pistonphone Calibrator	Y002816	02/17/11
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	Y002653	03/01/11
Source Room Environmental Indicator	Vaisala	HMW60Y	Temperature and Humidity Sensor	005066	09/07/11
Weather Station	Davis Instruments	VantagePRO 6150C	Weather Station	Y003257	05/16/11

*- 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



SOUND TRANSMISSION LOSS

ASTM E 90

Architectural Testing

ATI No.	B5024.01	Date	12/01/11
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 390, sliding glass door with 1" IG (1/4" [0.030"Q] laminated exterior, 9/16" air space, 3/16" tempered interior), Glass temperature 75°F		
Specimen Area	3.71 Square Meters		
Filler Area	9.28 Square Meters		
Operator	Kurt Golden		


	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp C	23.3	23.5	22.6	23.5	23.7	23.2
RH %	48.4	47.7	44.5	48.3	44.5	47.2

Freq (Hz)	Bkgrd SPL (dB)	Absorp (Square Meters)	Source SPL (dB)	Receive SPL (dB)	Filler TL (dB)	Specimen TL (dB)	95% Conf Limit	No. of Deficiencies	Trans Coef Diff
80	44.8	5.3	88.2	66.6	30.5	21	2.84	0	6.4
100	41.8	5.0	91.4	63.8	36.6	27	2.62	0	6.3
125	39.3	5.4	96.0	66.7	44.2	28	1.55	0	12.6
160	40.4	5.0	96.5	71.6	48.1	24	0.94	0	20.5
200	34.3	5.6	101.9	81.6	56.7	18	1.05	7	34.2
250	31.9	5.7	101.7	77.2	59.1	23	1.18	5	32.5
315	29.7	5.6	101.1	73.3	61.4	26	0.95	5	31.4
400	27.7	5.9	102.0	68.4	62.6	32	0.79	2	26.9
500	23.8	6.0	102.4	65.6	64.9	35	1.08	0	26.2
630	21.6	5.8	104.1	66.7	68.1	35	0.55	1	28.6
800	20.1	5.9	104.5	66.6	68.7	36	0.73	1	28.9
1000	15.3	6.2	104.1	65.2	71.6	37	0.39	1	30.9
1250	14.4	6.6	103.3	62.9	71.3	38	0.49	1	29.5
1600	11.6	7.1	105.2	65.9	73.6	36	0.32	3	33.2
2000	7.4	7.4	105.2	64.0	74.6	38	0.22	1	32.3
2500	6.4	8.4	105.0	62.1	78.3	39	0.23	0	34.9
3150	5.9	9.8	106.0	62.3	80.0	40	0.25	0	36.5
4000	6.2	11.5	106.2	60.2	82.3	41	0.49	0	37.2
5000	6.5	14.6	105.1	56.7	84.3	42	0.48	0	37.8

STC Rating = 35 (Sound Transmission Class)
Deficiencies = 27 (Number of deficiencies versus contour curve)
OITC Rating = 29 (Outdoor/Indoor Transmission Class)

Notes:

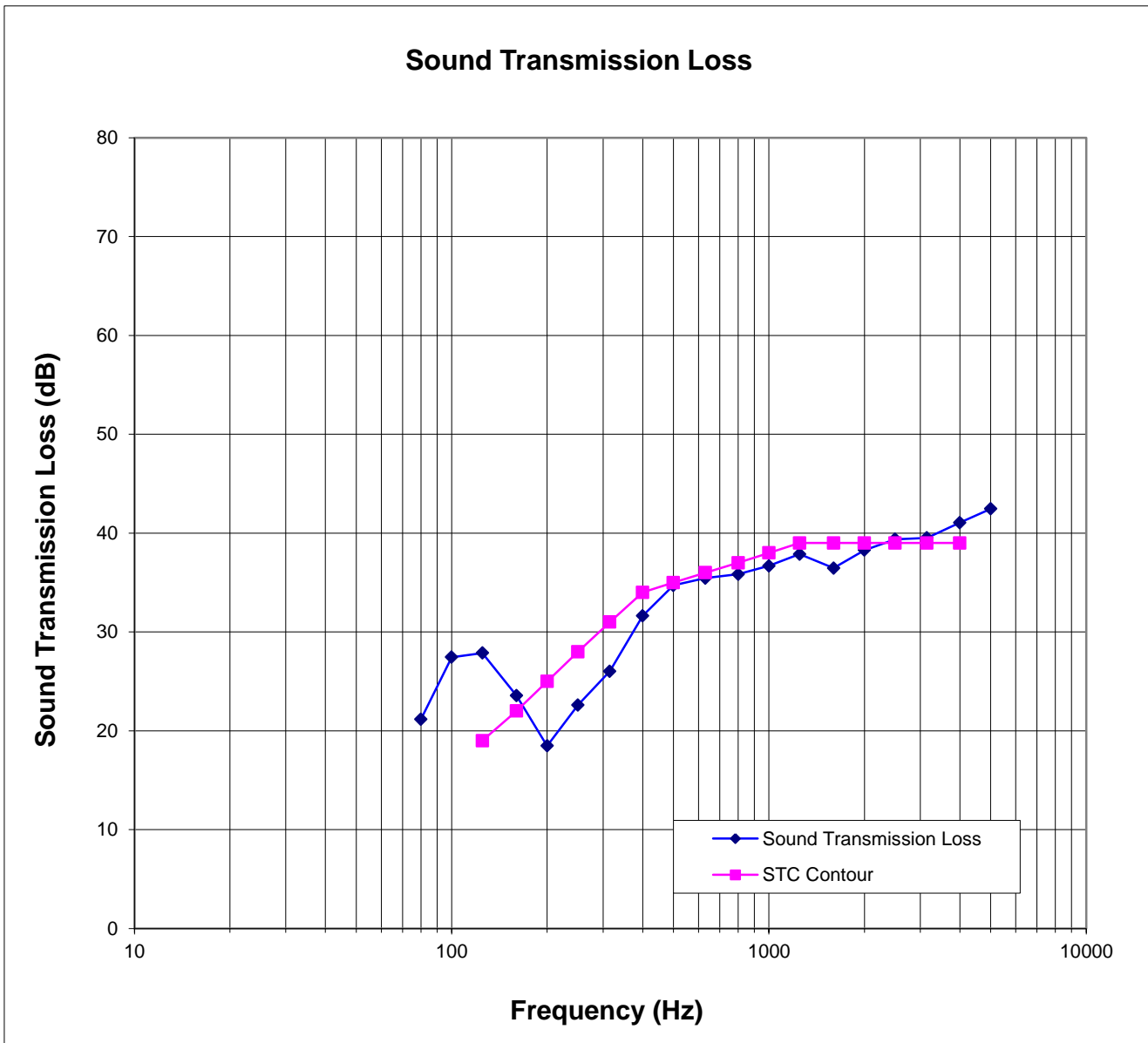
- 1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.
- 2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.
- 3) Transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. These cells are highlighted green.
- 4) Receive Room levels less than 5dB above the Background levels are highlighted in yellow.

 ACCREDITED	Architectural Testing, Inc. is accredited by the International Accreditation Service, Inc. (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS. This test report applies only to the specimen that was tested.
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Architectural Testing

ATI No. B5024.01 **Date** 12/01/11
Client MI Windows and Doors, Inc.
Specimen Series/Model: 390, sliding glass door with 1" IG (1/4" [0.030"Q] laminated exterior, 9/16" air space, 3/16" tempered interior), Glass temperature 75°F
Specimen Area 3.71 Square Meters
Filler Area 9.28 Square Meters
Operator Kurt Golden



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Appendix C

Photographs



Receive Room View of Installed Test Specimen



Receive Room View of Installed Test Specimen