

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

Rendered to:

MI WINDOWS AND DOORS, INC.

SERIES/MODEL: 9770

TYPE: Casement Window

Summary of Test Results			
Data File No.	Glazing Option (Nominal Dimensions)	STC	OITC
A9047.01A	3/4" IG (1/8" annealed, 1/2" air space, 1/8" annealed)	28	23
A9047.01B	1-1/8" IG (1/8" annealed, 3/8" air space, 1/8" annealed, 3/8" air space, 1/8" annealed)	29	23
A9047.01C	1" IG (1/8" annealed exterior, 9/16" air space, 5/16" [0.090"] laminated interior), Glass temperature 75°F	37	31
A9047.01F	1" IG (1/8" annealed exterior, 5/8" air space, 1/4" [0.030"Q] laminated interior), Glass temperature 75°F	38	30

Reference should be made to Architectural Testing, Inc. Report No. A9047.02-113-11 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: A9047.02-113-11
Test Dates: 05/12/11
And: 05/13/11
Report Date: 06/10/11
Record Retention End Date: 05/13/15

Test Sample Identification:

Series/Model: 9770

Type: Casement Window

Overall Size: 23-5/8" by 59"

Glazing (Nominal Dimensions):

Option A: 3/4" IG (1/8" Annealed, 1/2" Air Space, 1/8" Annealed)

Option B: 1-1/8" IG (1/8" Annealed, 3/8" Air Space, 1/8" Annealed, 3/8" Air Space, 1/8" Annealed)

Option C: 1" IG (1/8" Annealed Exterior, 9/16" Air Space, 5/16" [0.090"] Laminated Interior), Glass Temperature 75°F

Option F: 1" IG (1/8" Annealed Exterior, 5/8" Air Space, 1/4" [0.030"Q] 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 Series/Model 9770, casement windows. 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.

Test Methods: The acoustical test was 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^{e1}, Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods.

Test Equipment: The equipment used to conduct this test meets the requirements of ASTM E 90. The microphones were calibrated before conducting the sound transmission loss test. 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 window specimens. The filler wall achieved an STC rating of 69.

A filler wall reducing element was used to reduce the test opening size. The reducing element consisted of two separate 2x6 wood frames filled with concrete to reduce the test opening size to 24-1/8" wide by 59-1/2" high. A dense neoprene gasket was placed between the two wood and concrete frames. The window was placed on an 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 vent 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 tests were conducted in accordance with the ASTM E 90 test method using a single direction of measurement. One background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms, at each of 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		23-5/8" by 59"
Thickness		3-1/4"
Corners		Mitered
	Fasteners	Welds
	Seal Method	None
Material		Vinyl
	Reinforcement	None
	Thermal Break Material	None

Vent Construction:

		Vent
Size		22" by 57-3/8"
Thickness		2-1/2"
Corners		Mitered
	Fasteners	Welds
	Seal Method	None
Material		Vinyl
	Reinforcement	None
	Thermal Break Material	None
Daylight Opening Size		16-3/4" by 52-1/4"

Sample Descriptions: (Continued)

Vent Glazing Option A:

Measured Overall Insulation Glass Unit Thickness	0.695"
Spacer Type	Reinforced butyl

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.121"	0.453"	0.121"
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	Silicone
Glazing Bead Material	Vinyl

Vent Glazing Option B:

Measured Overall Insulation Glass Unit Thickness	1.103"
Spacer Type	Reinforced butyl

	Exterior Sheet	Gap	Interior Sheet	Gap	Interior Sheet
Measured Thickness	0.121"	0.370"	0.121"	0.370"	0.121"
Muntin Pattern	N/A	N/A	N/A	N/A	N/A
Material	Annealed	Air*	Annealed	Air*	Annealed
Laminate Material	N/A	N/A	N/A	N/A	N/A

Glazing Method	Exterior
Glazing Material	Silicone
Glazing Bead Material	Vinyl

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

Sample Descriptions: (Continued)

Vent Glazing Option C:

Measured Overall Insulation Glass Unit Thickness	0.996"
Spacer Type	Reinforced butyl

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.121"	0.543"	0.121" - 0.090" - 0.121"
Muntin Pattern	N/A	N/A	N/A
Material	Annealed	Air*	Laminated
Laminate Material	N/A	N/A	PVB

Glazing Method	Exterior
Glazing Material	Silicone
Glazing Bead Material	Vinyl

Vent Glazing Option F:

Measured Overall Insulation Glass Unit Thickness	1.010"
Spacer Type	Reinforced butyl

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.121"	0.617"	0.121" - 0.030" - 0.121"
Muntin Pattern	N/A	N/A	N/A
Material	Annealed	Air*	Laminated
Laminate Material	N/A	N/A	Saflex® Q series acoustic interlayer

Glazing Method	Exterior
Glazing Material	Silicone
Glazing Bead Material	Vinyl

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

Sample Descriptions: (Continued)

Components:

	TYPE	QUANTITY	LOCATION
Weatherstrip			
	1/4" Diameter foam-filled bulb gasket	2 Rows	Perimeter of vent
	0.187" by 0.290" Polypile with center fin	1 Row	Perimeter of vent
Hardware			
	Multi-point hinge system	1	Head, sill
	Multi-point locking system	1	Lock jamb
	Keeper	3	Lock stile
	Snubber	4	Hinge stile, hinge jamb
	Rotary crank operator	1	Sill
Drainage			
	1/2" by 1/8" Weep slot	2	Bottom rail

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

Comments: The weight of Option A was 46 lbs. The weight of Option B was 58 lbs. The weight of Option C was 60 lbs. The weight of Option D was 60 lbs. The weight of Option E was 50 lbs. The weight of Option F was 58 lbs. The weight of Option G was 54 lbs. The client did not supply drawings on the Series/Model 9770, casement 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 9770, casement window is listed below.

Summary of Test Results			
Data File No.	Glazing Option (Nominal Dimensions)	STC	OITC
A9047.01A	3/4" IG (1/8" annealed, 1/2" air space, 1/8" annealed)	28	23
A9047.01B	1-1/8" IG (1/8" annealed, 3/8" air space, 1/8" annealed, 3/8" air space, 1/8" annealed)	29	23
A9047.01C	1" IG (1/8" annealed exterior, 9/16" air space, 5/16" [0.090"] laminated interior), Glass temperature 75°F	37	31
A9047.01F	1" IG (1/8" annealed exterior, 5/8" air space, 1/4" [0.030"Q] laminated interior), Glass temperature 75°F	38	30

Note: Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. On each data sheet listed in Appendix B, the cells are highlighted red for the transmission loss values limited in this way. 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 and the service life of this report will expire. 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 specimens tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:


Daniel P. Platts
Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

DPP:jmc

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)

	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.
---	---

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	06/10/11	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	06/08/09 *
Data Acquisition Unit	Agilent	34970A	Data Acquisition Unit	62211	07/24/10
Receive Room Microphone	GRAS	40 AR	1/2" Microphone	Y003246	08/17/10
Source Room Microphone	GRAS	40 AR	1/2" Microphone	Y003245	08/17/10
Receive Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003249	08/17/10
Source Room Preamplifier	GRAS	26 AK	1/2" Preamplifier	Y003248	08/17/10
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	005066	08/20/10
Source Room Environmental Indicator	Vaisala	HMW60Y	Temperature and Humidity Sensor	Y002652	09/15/10
Weather Station	Davis Instruments	VantagePRO 6150C	Weather Station	062247	02/04/11

*- 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.	A9047.01A	Date	05/12/11
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 9770, casement window with 3/4" IG (1/8" annealed, 1/2" air space, 1/8" annealed)		
Specimen Area	0.90 Square Meters		
Filler Area	12.09 Square Meters		
Operator	Daniel P. Platts		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp C	23.0	23.4	20.8	23.8	23.8	22.7
RH %	44.3	38.7	41.2	42.4	40.2	41.7

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	44.6	5.7	82.4	57.3	35.8	18	1.87	0	7.4
100	42.0	4.8	85.2	54.6	40.4	25	3.78	0	5.7
125	44.6	4.5	88.6	55.9	48.4	26	2.05	0	11.3
160	45.8	4.8	90.9	61.4	48.1	22	0.68	0	14.6
200	44.4	5.0	94.1	72.9	52.9	14	1.16	4	27.8
250	42.9	4.9	94.4	72.8	59.0	14	1.24	7	33.4
315	41.5	5.1	94.5	62.8	63.3	24	0.77	0	27.8
400	41.5	5.4	94.6	64.8	68.1	22	0.76	5	34.8
500	39.5	5.8	96.3	63.3	70.3	25	0.33	3	34.0
630	37.2	5.3	98.0	64.6	70.9	26	0.55	3	33.9
800	38.4	5.5	98.3	62.6	73.5	28	0.31	2	34.3
1000	33.6	5.8	97.6	59.3	78.2	30	0.39	1	36.7
1250	33.8	6.2	97.2	55.5	78.9	33	0.34	0	34.3
1600	28.9	6.4	99.4	57.0	84.9	34	0.31	0	39.8
2000	22.4	6.9	99.6	54.7	86.1	36	0.26	0	38.8
2500	18.8	8.0	100.2	52.0	84.8	39	0.29	0	34.9
3150	14.0	9.8	101.3	55.8	86.5	35	0.20	0	40.1
4000	7.9	12.0	100.8	57.8	84.8	32	0.28	0	41.8
5000	7.0	16.2	99.4	52.7	83.8	34	0.57	0	38.3

STC Rating = 28 (Sound Transmission Class)
Deficiencies = 25 (Number of deficiencies versus contour curve)
OITC Rating = 23 (Outdoor/Indoor Transmission Class)

Notes:

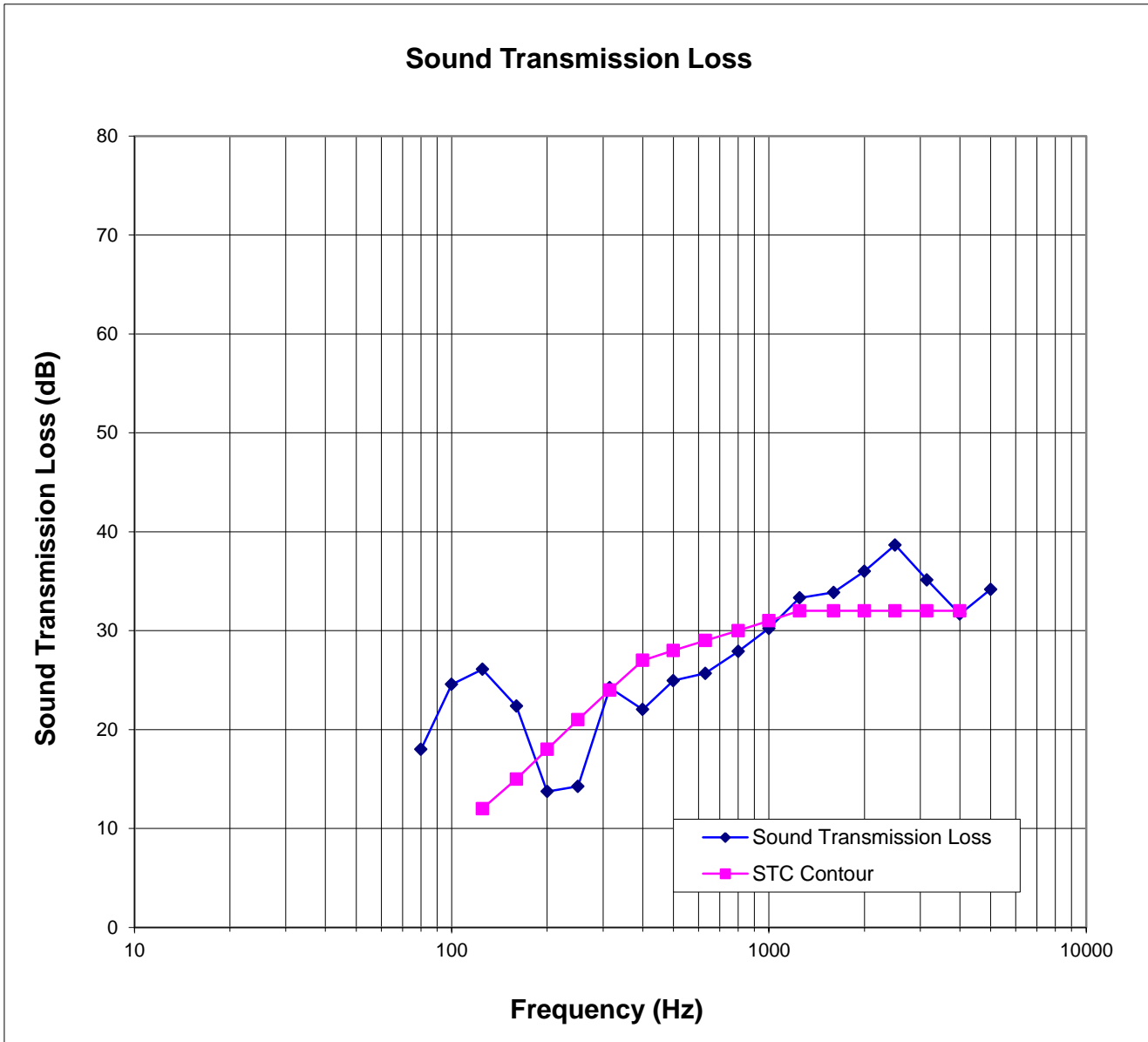
- 1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.
- 2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.
- 3) Transmission 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.

	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.
--	---



Architectural Testing

ATI No. A9047.01A **Date** 05/12/11
Client MI Windows and Doors, Inc.
Specimen Series/Model: 9770, casement window with 3/4" IG (1/8" annealed, 1/2" air space, 1/8" annealed)
Specimen Area 0.90 Square Meters
Filler Area 12.09 Square Meters
Operator Daniel P. Platts



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.



SOUND TRANSMISSION LOSS

ASTM E 90

Architectural Testing

ATI No.	A9047.01B	Date	05/13/11
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 9770, casement window with 1-1/8" IG (1/8" annealed, 3/8" air space, 1/8" annealed, 3/8" air space, 1/8" annealed)		
Specimen Area	0.90 Square Meters		
Filler Area	12.09 Square Meters		
Operator	Daniel P. Platts		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp C	24.1	26.2	23.6	25.1	23.8	24.8
RH %	46.5	43.4	44.2	45.1	40.2	44.8

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	41.4	6.4	82.3	54.2	35.8	21	2.28	0	5.0
100	41.0	5.2	84.7	52.6	40.4	26	2.85	0	4.6
125	40.4	4.8	88.4	54.6	48.4	27	2.38	0	10.6
160	42.3	4.2	90.3	62.5	48.1	21	0.84	0	15.7
200	42.5	4.6	93.7	74.5	52.9	12	0.97	7	29.5
250	43.0	5.0	94.0	69.8	59.0	17	1.25	5	30.9
315	41.3	5.3	94.3	61.0	63.3	26	0.94	0	26.4
400	41.0	5.5	94.4	62.9	68.1	24	0.44	4	33.2
500	38.6	5.6	95.8	61.7	70.3	26	0.40	3	32.8
630	35.5	5.5	97.6	63.3	70.9	26	0.41	4	33.2
800	37.2	5.6	97.8	62.8	73.5	27	0.33	4	35.2
1000	33.5	6.0	97.6	59.7	78.2	30	0.36	2	37.3
1250	33.9	6.4	96.9	55.4	78.9	33	0.29	0	34.7
1600	28.5	6.3	99.3	56.8	84.9	34	0.40	0	39.6
2000	22.1	6.6	99.4	54.1	86.1	37	0.24	0	38.2
2500	18.5	7.6	100.1	50.7	84.8	40	0.31	0	33.5
3150	14.0	9.5	101.3	54.1	86.5	37	0.32	0	38.2
4000	8.0	11.2	100.9	56.5	84.8	33	0.39	0	40.1
5000	7.1	14.6	99.7	52.7	83.8	35	0.40	0	37.6

STC Rating = 29 (Sound Transmission Class)
Deficiencies = 29 (Number of deficiencies versus contour curve)
OITC Rating = 23 (Outdoor/Indoor Transmission Class)

Notes:

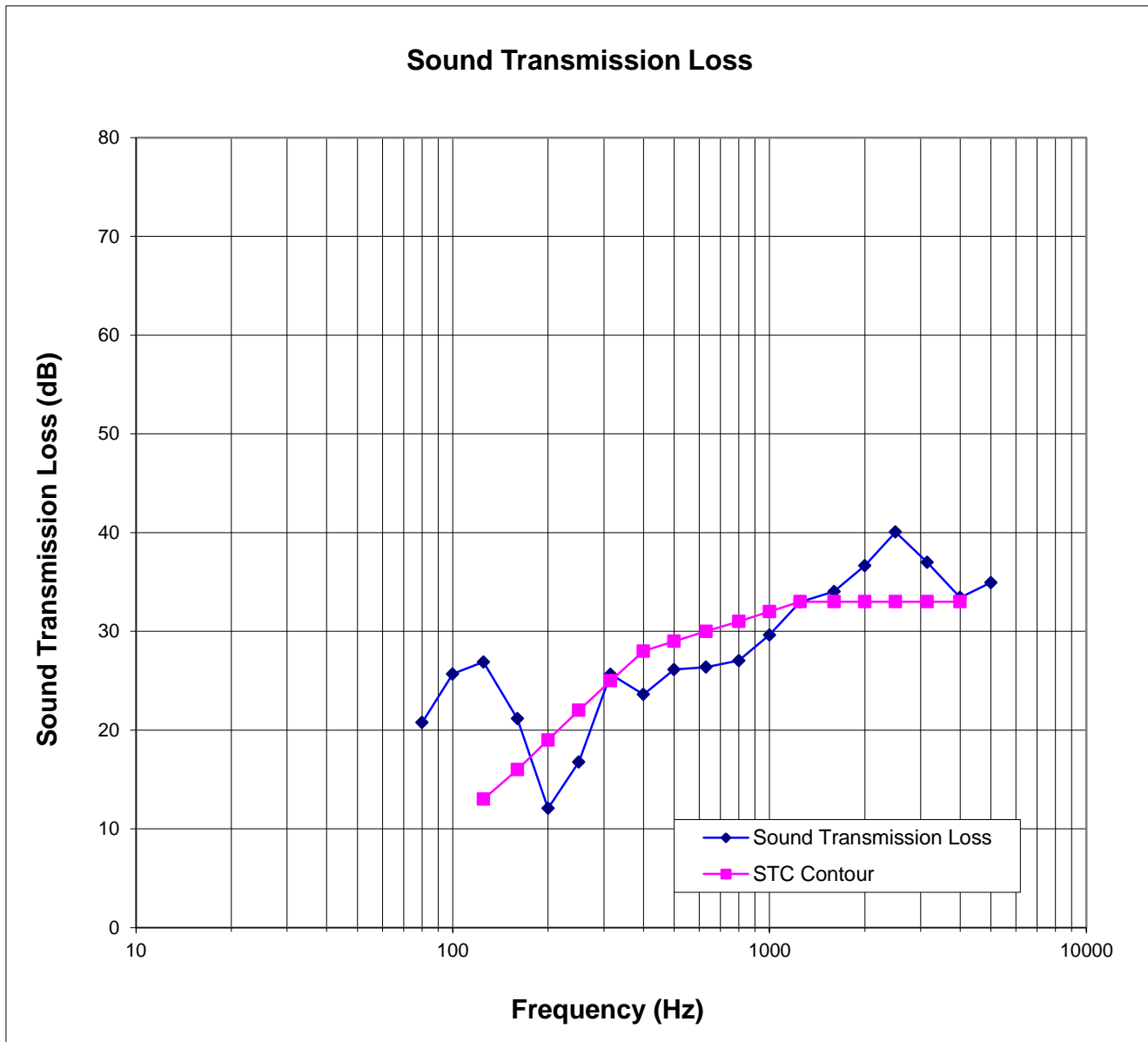
- 1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.
- 2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.
- 3) Transmission 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.

	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.
--	---



Architectural Testing

ATI No. A9047.01B Date 05/13/11
Client MI Windows and Doors, Inc.
Specimen Series/Model: 9770, casement window with 1-1/8" IG (1/8" annealed, 3/8" air space, 1/8" annealed, 3/8" air space, 1/8" annealed)
Specimen Area 0.90 Square Meters
Filler Area 12.09 Square Meters
Operator Daniel P. Platts



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.



SOUND TRANSMISSION LOSS

ASTM E 90

Architectural Testing

ATI No.	A9047.01C	Date	05/13/11
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 9770, casement window with 1" IG (1/8" annealed, 9/16" air space, 5/16" [0.090"] laminated interior), Glass temperature 75°F		
Specimen Area	0.90 Square Meters		
Filler Area	12.09 Square Meters		
Operator	Daniel P. Platts		


	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp C	25.0	25.5	23.5	25.9	23.8	25.0
RH %	47.3	44.4	42.8	45.3	40.2	44.9

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	42.9	6.6	82.6	54.6	35.8	21	2.11	0	5.2
100	41.8	5.2	85.1	52.5	40.4	26	2.21	0	4.1
125	41.1	5.0	88.6	54.4	48.4	27	2.51	0	10.4
160	43.6	4.5	90.6	58.9	48.1	25	1.08	0	12.1
200	43.7	4.9	94.1	63.8	52.9	23	1.35	4	18.7
250	44.1	5.0	94.4	61.1	59.0	26	0.91	4	21.9
315	42.3	5.4	94.5	56.8	63.3	30	0.70	3	22.0
400	41.5	5.4	94.6	56.0	68.1	31	0.61	5	25.9
500	39.2	5.6	96.2	55.4	70.3	33	0.42	4	26.1
630	35.9	5.4	97.9	55.3	70.9	35	0.60	3	24.7
800	37.9	5.7	98.2	51.9	73.5	38	0.27	1	23.9
1000	35.2	6.0	97.9	50.0	78.2	40	0.28	0	27.2
1250	34.0	6.5	97.3	48.7	78.9	40	0.28	1	27.6
1600	28.7	6.4	99.6	52.7	84.9	38	0.23	3	35.2
2000	22.6	6.8	99.8	50.2	86.1	41	0.22	0	34.0
2500	18.2	7.8	100.5	47.3	84.8	44	0.35	0	29.7
3150	14.0	9.4	101.6	48.8	86.5	43	0.29	0	32.6
4000	8.3	11.1	101.2	49.0	84.8	41	0.20	0	32.2
5000	7.2	14.6	100.0	43.9	83.8	44	0.32	0	28.5

STC Rating = 37 (Sound Transmission Class)
Deficiencies = 28 (Number of deficiencies versus contour curve)
OITC Rating = 31 (Outdoor/Indoor Transmission Class)

Notes:

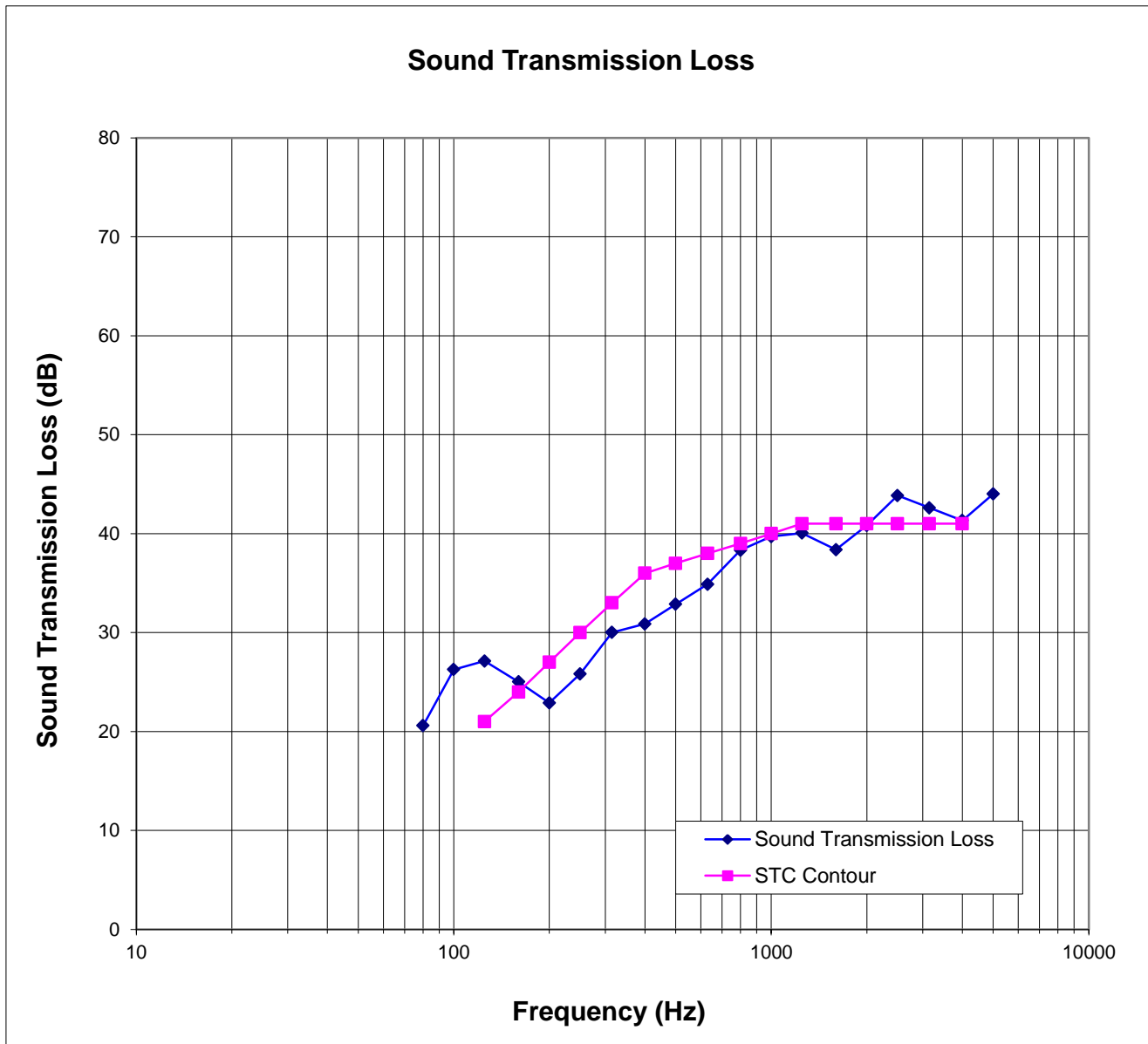
- 1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.
- 2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.
- 3) Transmission 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.

	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.
---	---



Architectural Testing

ATI No. A9047.01C **Date** 05/13/11
Client MI Windows and Doors, Inc.
Specimen Series/Model: 9770, casement window with 1" IG (1/8" annealed, 9/16" air space, 5/16" [0.090"] laminated interior), Glass temperature 75°F
Specimen Area 0.90 Square Meters
Filler Area 12.09 Square Meters
Operator Daniel P. Platts



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.



SOUND TRANSMISSION LOSS

ASTM E 90

Architectural Testing

ATI No.	A9047.01F	Date	05/13/11
Client	MI Windows and Doors, Inc.		
Specimen	Series/Model: 9770, casement window with 1" IG (1/8" annealed exterior, 5/8" air space, 1/4" [0.030Q"] laminated interior), Glass temperature 75°F		
Specimen Area	0.90 Square Meters		
Filler Area	12.09 Square Meters		
Operator	Daniel P. Platts		


	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp C	24.4	26.1	23.3	24.9	23.8	24.7
RH %	50.7	47.0	45.7	48.6	40.2	48.0

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	47.2	5.4	83.1	55.1	35.8	21	2.56	0	4.3
100	42.6	4.9	85.6	53.4	40.4	26	3.81	0	4.2
125	40.8	4.7	88.7	54.5	48.4	27	1.92	0	10.1
160	45.3	4.5	90.8	61.3	48.1	23	0.80	2	14.3
200	43.5	4.7	94.0	65.4	52.9	21	1.23	7	20.2
250	43.3	5.3	94.4	61.1	59.0	26	0.78	5	22.1
315	41.4	5.2	94.5	55.6	63.3	31	0.76	3	20.7
400	41.3	5.6	94.6	55.5	68.1	31	0.52	6	25.6
500	39.4	5.6	96.0	53.3	70.3	35	0.43	3	24.2
630	35.9	5.4	97.9	53.5	70.9	37	0.39	2	23.0
800	37.8	5.6	98.1	50.2	73.5	40	0.29	0	22.2
1000	34.8	6.1	97.9	47.7	78.2	42	0.32	0	25.0
1250	33.8	6.5	97.3	46.1	78.9	43	0.25	0	25.0
1600	28.4	6.6	99.6	49.2	84.9	42	0.38	0	31.9
2000	22.5	6.6	99.7	46.5	86.1	45	0.32	0	30.3
2500	18.3	7.8	100.3	43.2	84.8	48	0.37	0	25.9
3150	14.4	9.2	101.6	46.6	86.5	45	0.26	0	30.3
4000	8.6	11.0	101.1	47.9	84.8	42	0.25	0	31.1
5000	7.3	14.0	100.0	42.9	83.8	45	0.29	0	27.3

STC Rating = 38 (Sound Transmission Class)
Deficiencies = 28 (Number of deficiencies versus contour curve)
OITC Rating = 30 (Outdoor/Indoor Transmission Class)

Notes:

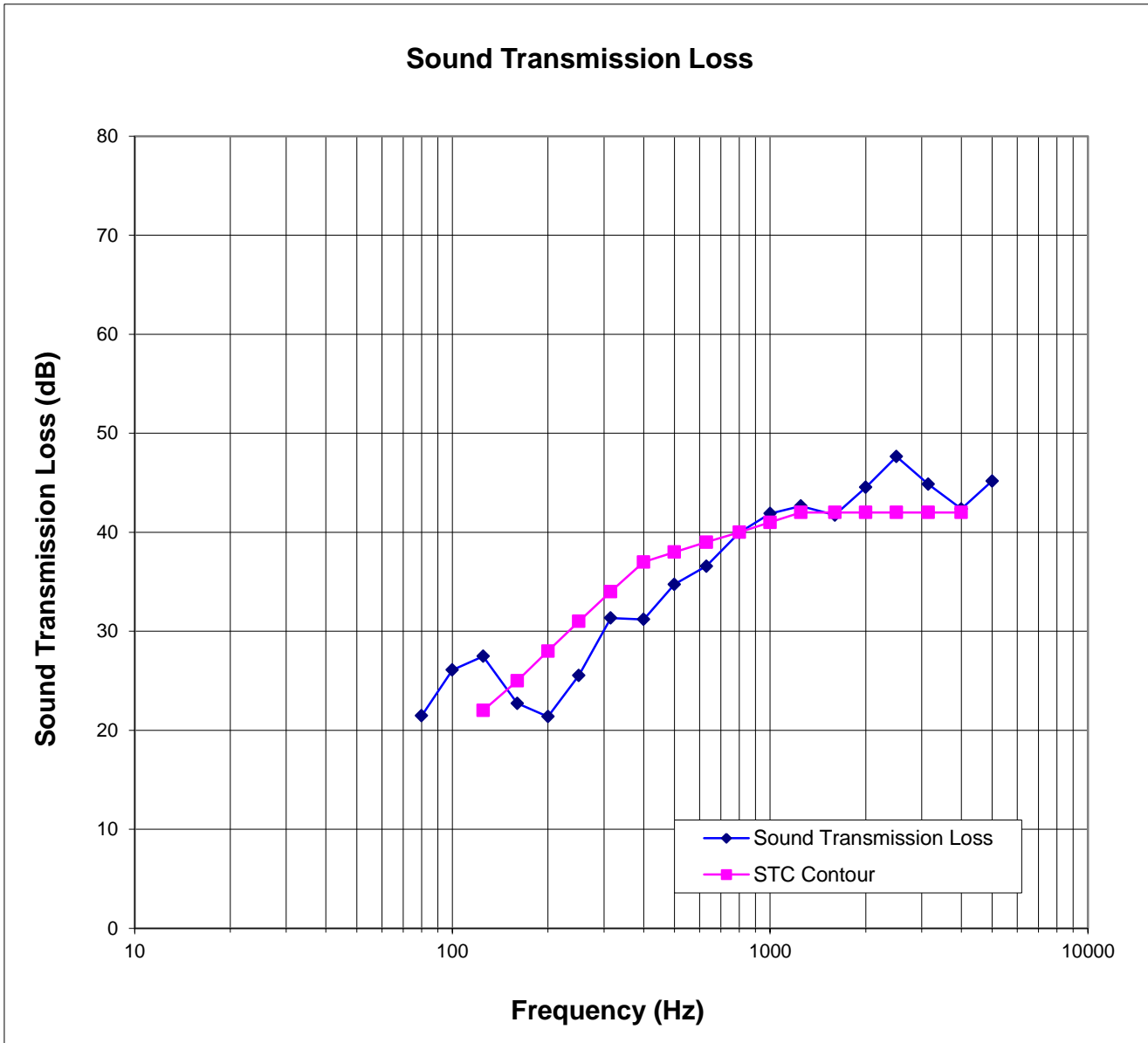
- 1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.
- 2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.
- 3) Transmission 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.

	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.
---	---



Architectural Testing

ATI No. A9047.01F Date 05/13/11
Client MI Windows and Doors, Inc.
Specimen Series/Model: 9770, casement window with 1" IG (1/8" annealed exterior, 5/8" air space, 1/4" [0.030Q"] laminated interior), Glass temperature 75°F
Specimen Area 0.90 Square Meters
Filler Area 12.09 Square Meters
Operator Daniel P. Platts



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.

Appendix C

Photographs



Receive Room View of Installed Specimen



Source Room View of Installed Specimen