

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

ODL, INC.

SERIES/MODEL: Harmony Blind with Internal Muntins

TYPE: Triple Pane Insulated Door Glass Unit

**GLAZING: 1-11/16" IG (1/8" tempered exterior, 1/2" air space,
1/8" tempered, 13/16" air space, 1/8" tempered interior)**

Summary of Test Results			
ATI Data File No.	Test Option (Nominal Dimensions)	STC	OITC
75652.01A	Blinds raised and stacked at the top	35	26
75652.01B	Blinds lowered and closed	35	26

Reference should be made to ATI Report No. 75652.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

ODL, INC.
215 East Roosevelt Avenue
Zeeland, Michigan 49464

Report No: 75652.01-113-11
Test Date: 08/17/07
Report Date: 08/28/07
Expiration Date: 08/17/11

Series/Model: Harmony Blind with Internal Muntins

Type: Triple Pane Insulating Door Glass Unit

Size: 23-3/4" by 37-3/4"

Glazing: 1-11/16" IG (1/8" Tempered Exterior, 1/2" Air Space, 1/8" Tempered, 13/16" Air Space, 1/8" Tempered Interior)

Test A: Blinds Raised and Stacked

Test B: Blinds Lowered and Closed

Project Scope: Architectural Testing, Inc. (ATI) was contracted by ODL, Inc. to conduct sound transmission loss tests on a Series/Model Harmony Blind with Internal Muntins, triple pane insulating door glass unit. 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 90-04, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

ASTM E 413-04, Classification for Rating Sound Insulation.

ASTM E 1332-90 (Re-approved 2003), Standard Classification for Determination of Outdoor-Indoor Transmission Class.

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 48" by 72" and 72" by 48" specimens. The filler wall achieved an STC rating of 63.

The 48" by 72" plug was removed from the filler wall assembly and a custom adapter plug was constructed to reduce the test opening size to 24-1/4" wide by 38-1/4" high. The adapter plug consisted of a double 2x4 wood stud wall with three layers of 5/8" gypsum board covering both sides. The double wood stud wall was insulated with two layers of 3-1/2" thick fiberglass insulation. A dense neoprene gasket and duct seal was used to seal the custom adapter plug to the inside perimeter of the filler wall opening. The door glass unit was installed in the test opening. Duct seal was used to seal the frame of the door glass unit to the test opening. The interior side of the door glass unit, 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.

Test Procedure: One background noise sound pressure level and five sound absorption measurements were conducted at each of the five microphone positions under ambient conditions. Two Sound Pressure Level (SPL) 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. The glass temperature was monitored and recorded, before and after the source and receiving room SPL measurements.

Sample Descriptions:

Sample Size: 27-3/4" by 37-3/4"

OVERAL INSULATING GLASS UNIT THICKNESS	1.660"
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EXTERIOR GLASS	
MEASURED THICKNESS	0.123"
MATERIAL	Tempered
AIR SPACE / GAS	0.485" / air*
MUNTIN PATTERN	2V/2H

SPACER TYPE	Aluminum box
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CENTER GLASS	
MEASURED THICKNESS	0.123"
MATERIAL	Tempered
AIR SPACE with Blind System	0.806" / air*
SPACER TYPE	Aluminum box

INTERIOR GLASS	
MEASURED THICKNESS	0.123"
MATERIAL	Tempered
TOTAL WEIGHT	38 lbs.

*- As stated by Client/Manufacturer

Comments: The triple pane insulating door glass unit contained an internal blind system located in the 0.806", interior air space. For option A the blinds were fully raised and stacked. For option B the blinds were fully lowered and closed. The triple pane insulating door glass unit was sampled and will be retained by ATI for four years. Drawings of the test sample are located in Appendix C. Photographs of the test sample are located in Appendix D.

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 Harmony Blinds with Internal Muntins triple pane insulating door glass unit is listed below.

Summary of Test Results			
ATI Data File No.	Test Option (Nominal Dimensions)	STC	OITC
75652.01A	Blinds raised and stacked at the top	35	26
75652.01B	Blinds lowered and closed	35	26

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, Inc. 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 specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC:


Brandon C. Ward
Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

BCW:crc

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

- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (4)
- Appendix-C: Drawings (1)
- Appendix-D: Photographs (1)

 <p>NVLAP LAB CODE 200361</p>	<p>Architectural Testing, Inc is accredited by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program for the specific test methods listed 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.</p>
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	08/28/07	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	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003246
Source Room Microphone	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003245
Receive Room Preamp	G.R.A.S.	26AK	1/2" preamplifier	Y003249
Source Room Preamp	G.R.A.S.	26AK	1/2" preamplifier	Y003248
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002816
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 (234 m ³)	Rotating vane and stationary diffusers. Temperature and humidity controlled. Isolation pads under the floor.
Source Room	7296.3 ft ³ (206.6 m 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 Test Results



SOUND TRANSMISSION LOSS

ASTM E90

Architectural Testing

ATI No.	75652.01A	Date	08/17/07
Client	ODL, Inc		
Specimen	Series/Model Harmony blind glass unit with internal muntins. Triple glazed with 1/8" tempered, blinds raised and stacked at top		
Specimen Area	6.23 Sq Ft		
Filler Area	133.77 Sq Ft		
Operator	Brandon C. Ward		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	75.1	77.0	76.8	75.6	71.8	76.1
RH %	39.8	38.9	68.9	40.4	62.9	47.0

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 Deficiencies	Trans Coef Diff
80	40.4	49.8	85.6	61.3	36.1	16	4.27	0	7.5
100	42.5	58.6	87.4	61.8	39.3	16	3.94	0	10.1
125	39.9	59.8	92.7	64.3	45.7	19	2.86	0	13.8
160	45.9	54.9	94.5	68.2	45.8	17	2.23	5	15.6
200	46.1	57.7	99.4	66.2	48.9	24	0.75	1	12.0
250	38.5	60.0	100.5	67.3	51.4	23	1.67	5	14.7
315	36.5	62.2	98.3	63.9	54.0	24	0.93	7	16.3
400	35.1	63.8	98.3	59.3	57.4	29	0.83	5	15.2
500	33.7	62.4	99.9	58.4	60.4	31	0.88	4	15.6
630	28.4	58.9	101.8	58.4	65.4	34	0.49	2	18.5
800	27.9	60.3	102.1	53.1	66.4	39	0.75	0	13.9
1000	25.9	64.8	101.5	50.1	72.1	41	0.41	0	17.5
1250	25.7	69.7	105.2	50.5	77.8	44	0.19	0	20.3
1600	20.5	71.7	111.4	56.0	82.9	45	0.23	0	24.7
2000	14.2	77.6	107.4	51.2	82.2	45	0.25	0	23.6
2500	7.4	91.8	106.0	47.7	77.7	47	0.60	0	17.8
3150	7.6	109.1	107.0	46.7	80.1	48	0.52	0	19.0
4000	6.9	134.4	106.0	51.4	82.2	41	0.38	0	27.6
5000	7.3	176.9	104.3	46.4	80.8	43	0.29	0	24.1

STC Rating = 35 *(Sound Transmission Class)*
Deficiencies = 29 *(Number of deficiencies versus contour curve)*
OITC Rating = 26 *(Outdoor/Indoor Transmission Class)*

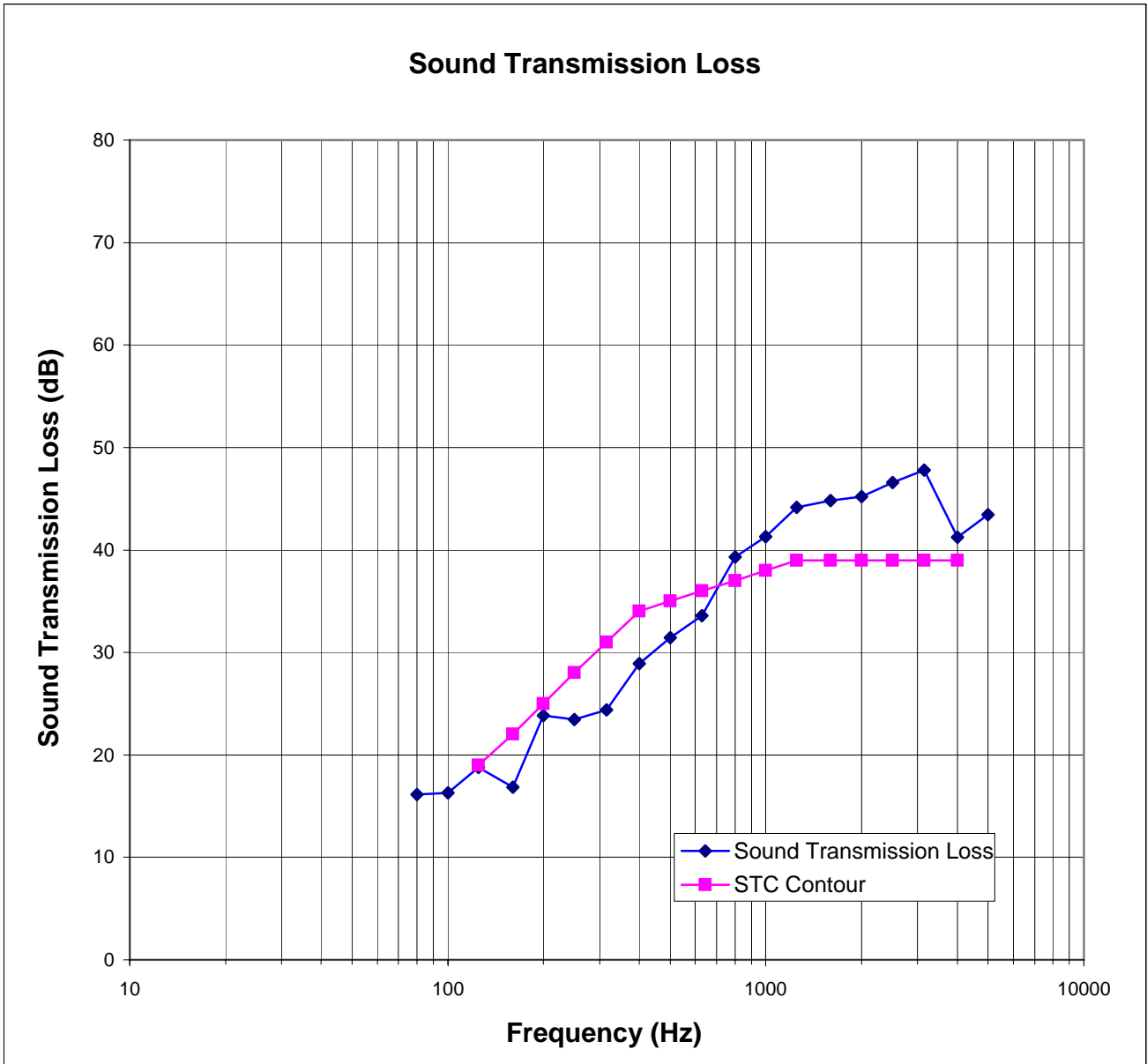
Note: *The acoustical chambers are qualified for measurements down to 80 hertz.
Data reported below 80 hertz is for reference only.*

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Architectural Testing

ATI No. 75652.01A Date 08/17/07
Client ODL, Inc
Specimen Series/Model Harmony blind glass unit with internal muntins. Triple glazed with 1/8" tempered, blinds raised and stacked at top
Specimen Area 6.23 Sq Ft
Filler Area 133.77 Sq Ft
Operator Brandon C. Ward



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SOUND TRANSMISSION LOSS

ASTM E90

Architectural Testing

ATI No.	75652.01B	Date	08/17/07
Client	ODL, Inc		
Specimen	Series/Model Harmony blind glass unit with internal muntins. Triple glazed with 1/8" annealed blinds lowered and closed		
Specimen Area	6.23 Sq Ft		
Filler Area	133.77 Sq Ft		
Operator	Brandon C. Ward		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	77.2	77.7	77.9	77.4	71.8	77.6
RH %	38.8	38.6	62.6	38.7	62.9	44.7

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 Deficiencies	Trans Coef Diff
80	44.4	59.9	85.9	61.7	36.1	15	3.73	0	8.4
100	40.6	53.3	87.5	62.2	39.3	16	4.36	0	10.1
125	39.1	52.8	92.7	64.1	45.7	20	2.93	0	13.1
160	45.0	55.6	94.6	68.1	45.8	17	1.83	5	15.4
200	45.8	58.3	99.5	66.0	48.9	24	1.08	1	11.8
250	40.0	58.8	100.6	67.3	51.4	24	1.92	4	14.6
315	39.1	61.4	98.3	63.6	54.0	25	0.82	6	15.8
400	36.8	60.1	98.4	59.7	57.4	29	1.05	5	15.2
500	34.6	60.9	99.6	58.0	60.4	32	0.73	3	15.4
630	28.6	58.4	101.7	58.1	65.4	34	0.47	2	18.3
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1250	26.9	68.0	105.2	50.5	77.8	44	0.19	0	20.2
1600	22.4	73.0	111.4	56.0	82.9	45	0.34	0	24.9
2000	14.7	78.3	107.4	51.0	82.2	45	0.15	0	23.4
2500	7.3	91.1	106.0	47.7	77.7	47	0.50	0	17.7
3150	8.3	109.2	107.1	46.6	80.1	48	0.49	0	18.8
4000	7.3	135.6	105.9	51.5	82.2	41	0.28	0	27.8
5000	7.4	175.9	104.5	46.3	80.8	44	0.36	0	23.9

STC Rating = 35 *(Sound Transmission Class)*
Deficiencies = 26 *(Number of deficiencies versus contour curve)*
OITC Rating = 26 *(Outdoor/Indoor Transmission Class)*

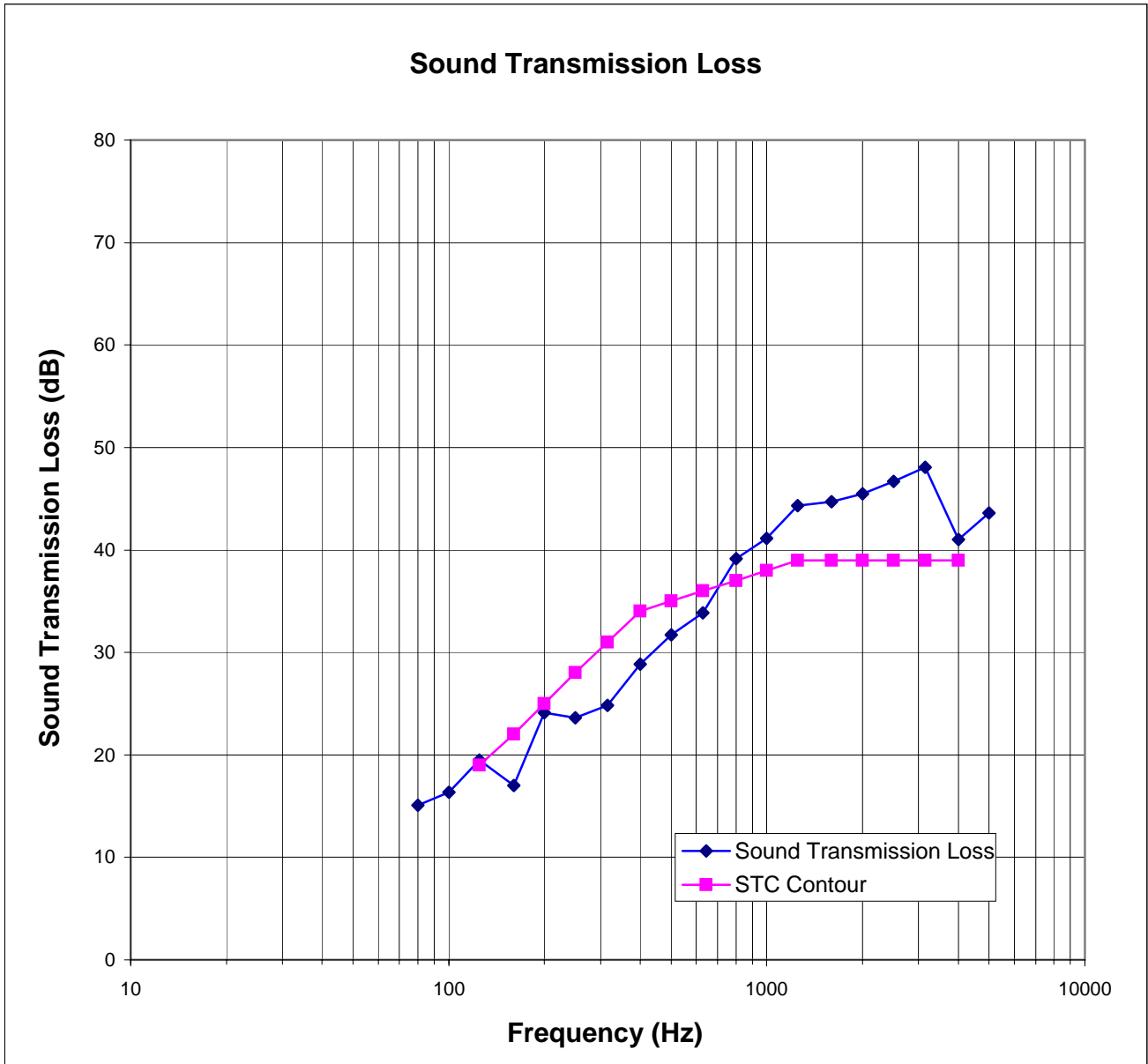
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Architectural Testing

ATI No. 75652.01B Date 08/17/07
Client ODL, Inc
Specimen Series/Model Harmony blind glass unit with internal muntins. Triple glazed with 1/8" annealed blinds lowered and closed
Specimen Area 6.23 Sq Ft
Filler Area 133.77 Sq Ft
Operator Brandon C. Ward



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Appendix C
Design Drawings

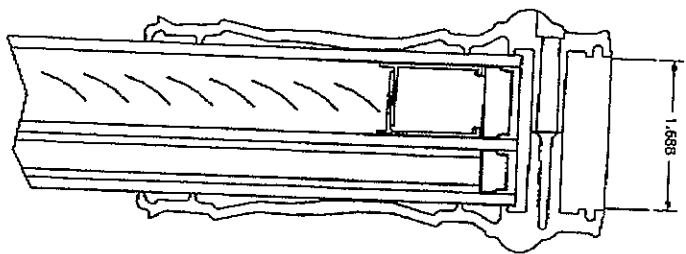


Architectural Testing

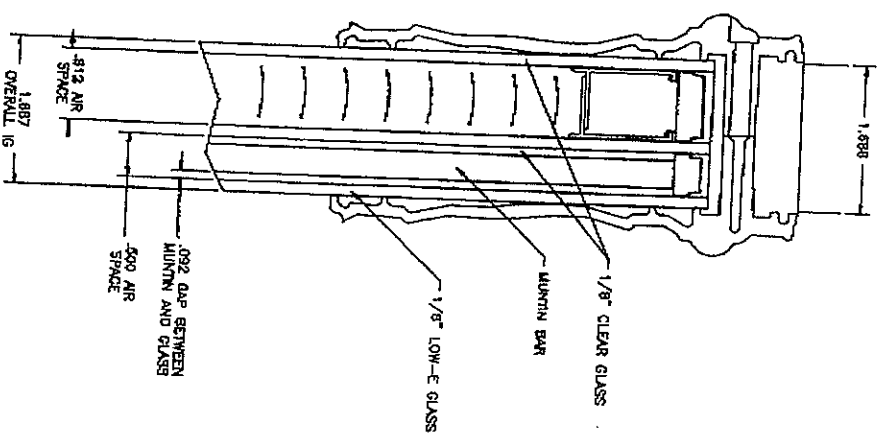
Test sample complies with these details.
Deviations are noted.

Report# 75652.01

Date 8-18-07 Tech BCV



SLAT WIDTH: .590"
SLAT THICKNESS: .008"
SLAT MATERIAL: ALUMINUM



Appendix D

Photographs



Interior of Sample Installed in Test Opening (Blinds Raised and Stacked)



Interior of Sample Installed in Test Opening (Blinds Lowered and Closed)