



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

Rendered to:

GAMCO CORPORATION

SERIES/MODEL: W250HC

TYPE: Casement Window

Summary of Test Results			
Data File No.	Glazing (Nominal Dimensions)	STC	OITC
B9646.01	1" IG (1/4" laminated, 1/2" air space, 1/4" laminated), Glass temperature 75°F	40	31

Reference should be made to Architectural Testing, Inc. Report No. B9646.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.



ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

GAMCO CORPORATION
131-10 Maple Avenue
Flushing, New York 11355

Report No: B9646.01-113-11

Test Sample Identification:

Series/Model: W250HC

Type: Casement Window

Performance Class: Heavy Commercial

Overall Size: 34" by 68"

Glazing (Nominal Dimensions): 1" IG (1/4" Laminated, 1/2" Air Space, 1/4" Laminated),
Glass Temperature 75°F

Project Scope: Architectural Testing, Inc. was contracted by Gamco Corporation to conduct a sound transmission loss test on a Series/Model W250HC, casement 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 sample was 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, *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 68.

A filler wall reducing element (STC 64) was used to reduce the test opening size to accommodate the test specimen. The reducing element consisted of a double 2x4 wood stud wall construction with three layers of 5/8" drywall on both sides. The stud cavities in the wall were insulated with two layers of R-13 fiberglass insulation. The window was placed on a foam 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. 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	34" by 68"
Thickness	2-1/2"
Corners	Mitered
Fasteners	Welds, keyed, staked
Seal Method	Sealant
Material	Aluminum
Reinforcement	N/A
Thermal Break Material	Urethane

N/A-Non Applicable

Sample Descriptions: (Continued)

Vent Construction:

		Vent
Size		32-1/4" by 66-1/4"
Thickness		2-1/2"
Corners		Mitered
	Fasteners	Welds, keyed, staked
	Seal Method	Sealant
Material		Aluminum
	Reinforcement	N/A
	Thermal Break Material	Urethane
Daylight Opening Size		27-1/4" by 61-1/4"

Vent Glazing:

Measured Overall Insulation Glass Unit Thickness	0.991"
Spacer Type	Aluminum

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.086", 0.028", 0.112"	0.500"	0.119", 0.029", 0.117"
Muntin Pattern	N/A	N/A	N/A
Material	Laminated	Air*	Laminated
Laminate Material	PVB	N/A	PVB

Glazing Method	Interior
Glazing Material	Silicone
Glazing Bead Material	Aluminum with flexible wedge gasket

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

Sample Descriptions: (Continued)

Components:

	TYPE	QUANTITY	LOCATION
Weatherstrip			
	3/16" Hollow bulb gasket	1 Row	Frame perimeter
	1/4" Hollow bulb gasket	1 Row	Vent perimeter
Hardware			
	Cam style lock	2	Lock stile
	Keeper	2	Keeper jamb
	Butt hinge	3	Hinge jamb
	Bar hinge	1	Head
Drainage			
	2-1/4" by 1/4" Weep slot	2	Sill

Comments: The total weight of the sample was 134 lbs. The design drawing (included in Appendix C) supplied by the client, accurately describes the Series/Model W250HC, casement window. The dimensions on the drawing that are circled and/or checked were verified against the test specimen. 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 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 W250HC, casement window is listed below.

Summary of Test Results			
Data File No.	Glazing (Nominal Dimensions)	STC	OITC
B9646.01	1" IG (1/4" laminated, 1/2" air space, 1/4" laminated), Glass temperature 75°F	40	31

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.

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.

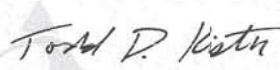
This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:



Digitally Signed by: Eric Thompson

Eric A Thompson
Technician - Acoustical Testing




Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

ET: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: Design drawing (1)
- Appendix-D: Photographs (1)

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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	05/29/12	N/A	Original Report Issue

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	02/09/12
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	Y002652	09/26/11
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.	B9646.01	Date	05/16/12
Client	Gamco Corporation		
Specimen	Series/Model: W250HC, Casement window with 1" IG (1/4" laminated, 1/2" air space, 1/4" laminated), Glass temperature 75°F		
Specimen Area	1.49 Square Meters		
Filler Area	11.50 Square Meters		
Operator	Eric A. Thompson		


	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp C	23.6	24.4	22.9	24.0	23.5	23.7
RH %	48.1	45.6	47.2	46.8	44.2	46.9

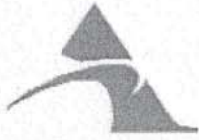
Freq (Hz)	Bkgrd SPL (dB)	Absorp (Square Meters)	Source SPL (dB)	Receive SPL (dB)	Filler TL (dB)	Specimen TL (dB)	95% Conf Limit	No. of Defici- encies	Trans Coef Diff
80	45.9	6.3	90.2	63.3	34.4	22	3.03	0	4.9
100	40.1	5.2	94.3	67.2	41.2	22	2.76	0	10.5
125	42.5	4.9	101.9	69.2	47.9	28	2.18	0	11.5
160	40.7	4.5	101.9	76.0	49.2	21	2.55	6	19.2
200	39.0	5.0	106.0	75.5	52.1	25	1.05	5	18.0
250	37.4	5.2	105.7	69.4	55.1	31	1.27	2	15.3
315	33.9	5.3	103.4	70.0	58.7	28	0.50	8	21.9
400	27.3	5.4	104.1	64.0	63.7	35	0.47	4	20.1
500	23.3	5.9	105.8	63.8	68.8	36	0.35	4	23.9
630	21.3	5.5	107.4	61.3	73.6	40	0.27	1	24.2
800	20.1	5.6	107.5	58.4	74.4	43	0.29	0	22.2
1000	15.2	5.8	107.9	55.4	76.9	47	0.29	0	21.4
1250	13.3	6.8	107.8	53.2	78.8	48	0.23	0	21.8
1600	10.8	6.6	113.5	59.3	86.1	48	0.47	0	29.5
2000	7.8	6.8	105.7	54.3	85.5	45	0.43	0	31.9
2500	7.1	7.7	103.0	52.6	84.9	43	0.39	1	32.7
3150	7.3	9.3	103.9	47.3	87.5	49	0.24	0	30.1
4000	7.8	11.0	102.2	40.4	87.9	53	0.21	0	25.8
5000	7.6	14.0	99.4	31.6	86.9	58	0.64	0	19.8

STC Rating = 40 (Sound Transmission Class)
Deficiencies = 31 (Number of deficiencies versus contour curve)
OITC Rating = 31 (Outdoor/Indoor Transmission Class)

Notes:

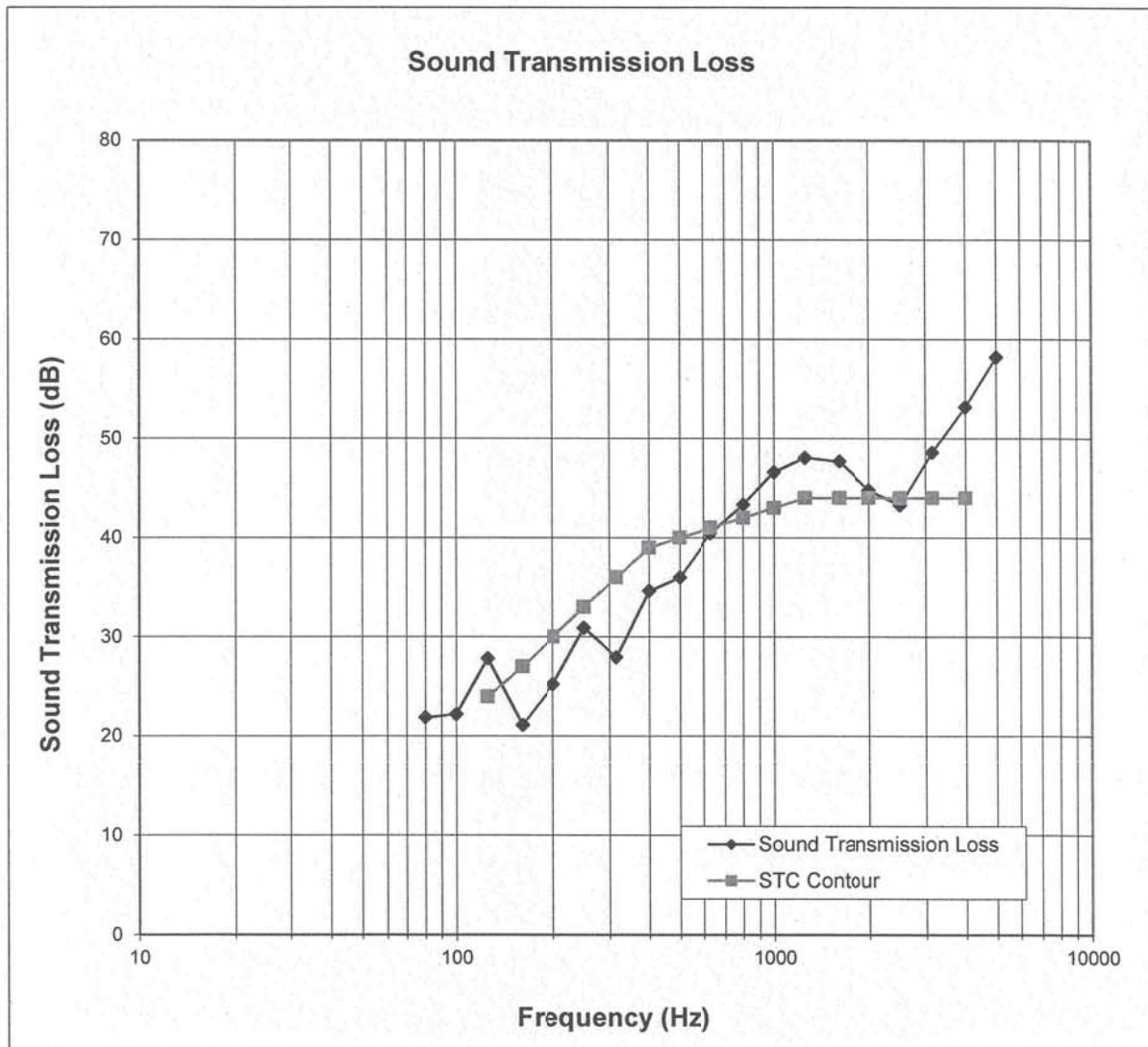
- 1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.
- 2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.
- 3) Transmission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

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Architectural Testing

ATI No. B9646.01 Date 05/16/12
Client Gamco Corporation
Specimen Series/Model: W250HC, Casement window with 1" IG (1/4" laminated, 1/2" air space, 1/4" laminated), Glass temperature 75°F
Specimen Area 1.49 Square Meters
Filler Area 11.50 Square Meters
Operator Eric A. Thompson



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ATI 00254 Revised 04/21/10