G6935.01-113-11-R0
ACOUSTICAL PERFORMANCE TEST REPORT
ASTM E90

Rendered to:

CUSTOM VINYL PRODUCTS, LLC

SERIES/MODEL: Veka DHA4

TYPE: Double Hung Window

Summary of Test Results			
Data File No.	**Glazing (Nominal Dimensions)**	**STC**	**OITC**
G6935.01	7/8" IG (1/8" annealed exterior, 1/2" air space, 1/4" annealed interior)	33	28

Reference should be made to Intertek-ATI Report No. G6935.01-113-11 for complete test specimen description. This page alone is not a complete report. Flanking limit tests and reference specimen tests are available upon request.

Acoustical Performance Test Report

CUSTOM VINYL PRODUCTS, LLC
260 Enterprise Drive
Newport News, Virginia 23603

Report No	G6935.01-113-11
Test Date	01/17/17
Report Date	01/26/17

Project Scope
Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by Client to conduct a sound transmission loss test. The complete test data is included as Appendix B of this report. The client provided the test specimen.

Test Methods
Testing for this project was conducted in accordance with the following standards. The equipment listed in the attachments meets the requirements of the following standards.

ASTM E90-09, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*
ASTM E413-10, *Classification for Rating Sound Insulation*
ASTM E1332-10a, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation*
ASTM E2235-04 (2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*

Test Procedure
All measurements were conducted in the HT test chambers at Intertek-ATI located in York, Pennsylvania. The sensitivity of the microphones was checked before measurements were conducted.

The transmission loss values were obtained for a single direction of measurement. Two background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions.

Two sound pressure levels were made simultaneously in the receive and source rooms at each of five microphone positions.

The air temperature and relative humidity conditions were monitored and recorded during all measurements.

Specimen Installation
A sound transmission loss test was initially performed on a filler wall.

The specimen plug was removed from the filler wall assembly. A filler wall-reducing element, consisting of two separate 2x6 wood frames filled with concrete, was used to adjust the test opening size to accommodate the test specimen. A dense neoprene gasket was placed between the two wood and concrete frames. The specimen was placed on an isolation pad in the custom test opening. Duct seal was used to seal the perimeter of the specimen to the test opening on both sides. The interior side of the specimen, when installed, was approximately 1/4" from being flush with the receive room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. Operable portions of the test specimen, if any, were cycled at least five times prior to testing.

Test Calculations
Transmission loss (TL) at each 1/3 octave frequency is the average source room sound pressure level minus the average receive room sound pressure level, plus, 10 times the log of the specimen area divided by the sound absorption of the receive room with the sample in place.

STC Rating
To obtain the Sound Transmission Class (STC), read the TL of the contour curve at 500 Hz. The sum of the deficiencies below the contour curve must not exceed 32. The maximum deficiency at any one frequency must not exceed 8.

OITC Rating
The Outdoor-Indoor Transmission Class (OITC) is calculated by subtracting the logarithmic summation of the TL values from the logarithmic summation of the A-weighted transportation noise spectrum stated in ASTM E1332.

Specimen Descriptions

		Frame	Bottom Sash	Top Sash
Size		47-1/4" by 59"	45" by 29"	44" by 29-1/4"
Thickness		4"	1-5/8"	1-5/8"
	Corners	Mitered	Mitered	Mitered
	Fasteners	Welds	Welds	Welds
	Seal Method	N/A	N/A	N/A
Material		Vinyl	Vinyl	Vinyl
	Reinforcement	N/A	N/A	N/A
	Thermal Break Material	N/A	N/A	N/A
Daylight Opening Size		N/A	42-1/8" by 26-1/8"	41-1/8" by 26-1/8"

Glazing

Measured Overall Insulation Glass Unit Thickness	0.874"
Spacer Type	Aluminum

	Exterior Sheet	Gap	Interior Sheet
Measured Thickness	0.118"	0.532"	0.224"
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	Foam tape
Glazing Bead Material	Vinyl

** - Stated per Client/Manufacturer, N/A-Not Applicable*

Specimen Descriptions (Continued)

Components

Type	Quantity	Location
Weatherstrip		
0.187" x 0.290" Polypile with center fin	3 Rows	Stiles and top rail
0.187" x 0.290" Polypile with center fin	2 Rows	Keeper rail
0.187" x 0.290" Polypile with center fin	1 Row	Lock rail, head, and sill
0.187" x 0.470" Polypile with center fin	1 Row	Keeper rail
1-1/2" by 3/4" Polypile pad	2	Lock rail corners
Co-extruded 3/8" diameter foam-filled gasket with 1/8" leaf	1 Row	Bottom rail
Hardware		
Cam lock	2	Lock rail
Keeper	2	Meeting rail
Tilt latch	4	Lock and top rail corners
Tilt Bar	4	Stiles
Constant force balance	4	Jambs
Drainage		
Sloped sill	1	Sill
1/2" Weep notch	2	Sill
3/4" Weep notch	2	Sill
1-1/4" by 5/8" Weep slot with cover	2	Sill

Total Weight (lbs)	**Average Weight** (lbs/ft^2)
96	4.96

Comments

The client did not supply a report drawing of the test specimen. Intertek-ATI will store samples of test specimens for four years.

Intertek-ATI 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 Intertek-ATI for the entire test record retention period. The test record retention period ends four years after the test date.

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 is intended to help in the client's quality assurance program, but it does not represent a continuous or exhaustive evaluation of the specimen tested or of other products or materials that were not evaluated. The statements and data provided herein do not constitute approval, disapproval, certification, or acceptance of performance or materials.

For INTERTEK-ATI:

Digitally Signed by: Matthew Tressler

Matthew D. Tressler
Technician – Acoustical Testing

Digitally Signed by: Kurt A. Golden

Kurt A. Golden
Project Lead – Acoustical Testing

MDT:jmcs

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)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
R0	01/26/17	N/A	Original Report Issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-1033	Data Acquisition card	65126	05/16 *
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64902	07/16
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00249	04/16
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00250	04/16
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00251	04/16
Source Room Microphone	PCB piezotronics	378C20	Microphone and Preamplifier	INT00252	04/16
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifer	65319	11/16
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64340	08/16
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	65320	08/16
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	63746	09/16
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65586	02/16
Receive Room Environmental Indicator	Comet	T7510	Receive Room	64915	03/16
Source Room Environmental Indicator	Comet	T7510	Source Room	64914	03/16
Microphone Calibrator	Norsonic	1251	Pistonphone Calibrator	65105	05/16

**- 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-Not Applicable

Appendix B

Complete Test Results

Intertek | Architectural Testing

ACCREDITED Testing Laboratory

AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

Test Date	01/17/17					
Data File No.	G6935.01					
Client	Custom Vinyl Products, LLC					
Description	Series/Model: Veka DHA4, double hung window with 7/8" IG (1/8" annealed exterior, 1/2" air space, 1/4" annealed interior)					
Specimen Area	1.80 m²	Receive Temp.	21.0 °C		Source Temp.	21.1 °C
Technician	Matthew D. Tre	Receive Humidity	54%		Source Humidity	53%

Freq (Hz)	**Background SPL** (dB)	**Absorption** (m²)	**Source SPL** (dB)	**Receive SPL** (dB)	**Specimen TL** (dB)	**95% Confidence Limit**	**Number of Deficiencies**
80	39.5	5.0	105	82	19.4	1.51	-
100	37.0	5.5	105	75	26.0	1.46	-
125	38.6	5.0	104	77	23.1	1.36	0
160	41.5	4.6	105	76	25.3	0.54	0
200	40.3	4.7	106	82	20.1	0.45	3
250	35.1	5.4	106	81	20.6	0.82	5
315	29.2	5.4	99	69	25.1	0.34	4
400	24.8	5.8	96	62	29.4	0.35	3
500	21.2	5.8	97	60	31.4	0.25	2
630	19.1	5.5	101	62	34.1	0.26	0
800	17.5	5.9	100	60	35.7	0.17	0
1000	13.1	6.1	97	55	36.0	0.37	0
1250	11.6	6.6	97	56	35.0	0.29	2
1600	9.1	7.0	101	61	34.2	0.17	3
2000	7.5	7.4	95	54	34.5	0.22	2
2500	7.4	8.4	93	51	35.5	0.15	2
3150	8.2	10.1	96	52	36.7	0.24	0
4000	10.0	12.3	95	50	37.0	0.24	0
5000	11.6	15.8	94	46	38.3	0.29	-

STC Rating	**33**	*(Sound Transmission Class)*
Deficiencies	26	*(Sum of Deficiencies)*
OITC Rating	**28**	*(Outdoor-Indoor Transmission Class)*

Notes: *1) Receive Room levels less than 5 dB above the Background levels are red.*
2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

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IAS ACCREDITED Testing Laboratory

AIRBORNE SOUND TRANSMISSION LOSS

ASTM E 90

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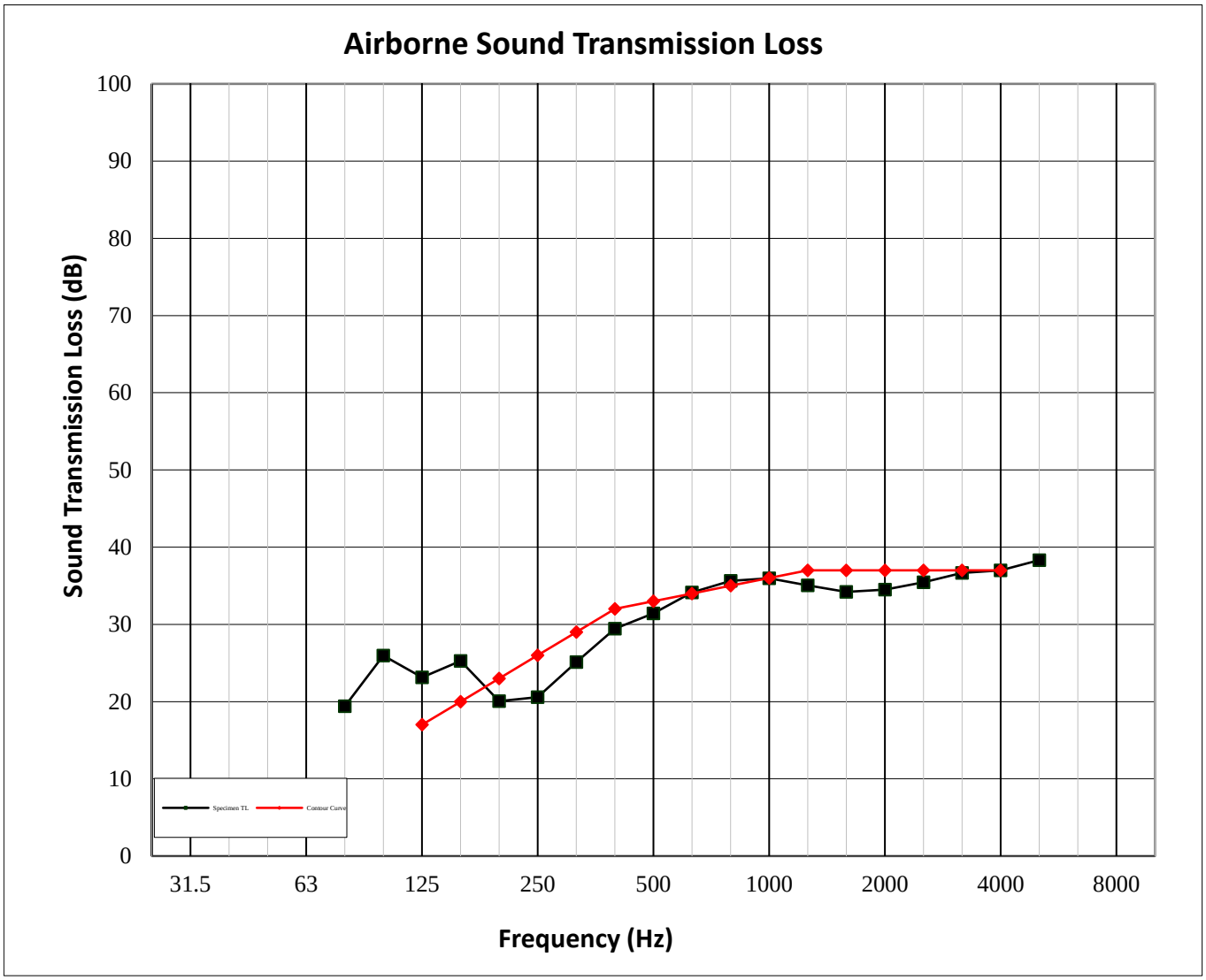

Appendix C

Photographs

Interior View of Specimen

Exterior View of Specimen