



**H0736.01-113-11-R0**  
**ACOUSTICAL PERFORMANCE TEST REPORT**  
**ASTM E90**

**Rendered to:**

**CUSTOM VINYL PRODUCTS, LLC**

**SERIES/MODEL: SHA4**

**TYPE: Single Hung Window**

<b>Summary of Test Results</b>			
<b>Data File No.</b>	<b>Glazing (Nominal Dimensions)</b>	<b>STC</b>	<b>OITC</b>
H0736.01A	1" IG (3/16" annealed exterior, 9/16" air space, 1/4" annealed interior)	34	28
H0736.01B	1" IG (3/16" annealed exterior, 9/16" air space, 1/4" laminated interior), Glass temperature 75°F	36	29

Reference should be made to Intertek-ATI Report No. H0736.01-113-11 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	H0736.01-113-11
Test Date	05/16/17
Report Date	05/26/17

### Project Scope

Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted 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(2016), *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

ASTM E413-16, *Classification for Rating Sound Insulation*

ASTM E1332-16, *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 level measurements 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 was used to adjust 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 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
<b>Size</b>	31-1/2" by 71-1/2"	29-1/4" by 35-1/2"
<b>Thickness</b>	3-1/4"	1-3/4"
Corners	Mitered	Mitered
Fasteners	Welds	Welds
Seal Method	N/A	N/A
<b>Material</b>	Vinyl	Vinyl
Reinforcement	N/A	Steel located in lock rail
Thermal Break Material	N/A	N/A
<b>Daylight Opening Size</b>	26-3/8" by 31-1/2"	25-1/4" by 31-5/8"

### Glazing Option A

<b>Measured Overall Insulation Glass Unit Thickness</b>	1.093"
<b>Spacer Type</b>	Aluminum

	Exterior Sheet	Gap	Interior Sheet
<b>Measured Thickness</b>	0.181"	0.692"	0.220"
<b>Muntin Pattern</b>	N/A	N/A	N/A
<b>Material</b>	Annealed	Air*	Annealed
<b>Laminate Material</b>	N/A	N/A	N/A

<b>Glazing Method (bottom sash)</b>	Exterior
<b>Glazing Method (fixed)</b>	Interior
<b>Glazing Material</b>	Silicone
<b>Glazing Bead Material</b>	Vinyl

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

**Specimen Descriptions (Continued)**

**Glazing Option B**

<b>Measured Overall Insulation Glass Unit Thickness</b>	1.113"
<b>Spacer Type</b>	Aluminum

	<b>Exterior Sheet</b>	<b>Gap</b>	<b>Interior Sheet</b>
<b>Measured Thickness</b>	0.181"	0.696"	0.103", 0.030", 0.103"
<b>Muntin Pattern</b>	N/A	N/A	N/A
<b>Material</b>	Annealed	Air*	Laminated
<b>Laminate Material</b>	N/A	N/A	PVB

<b>Glazing Method (bottom sash)</b>	Exterior
<b>Glazing Method (fixed)</b>	Interior
<b>Glazing Material</b>	Silicone
<b>Glazing Bead Material</b>	Vinyl

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

**Specimen Descriptions (Continued)**

**Components**

Type	Quantity	Location
<b>Weatherstrip</b>		
0.187" by 0.270" Polypile with center fin	1 Row	Sill and lock rail
0.187" by 0.270" Polypile with center fin	3 Rows	Stiles
0.187" by 0.270" Polypile with center fin	2 Rows	Bottom rail
1-1/2" by 1/2" Polypile pad	2	Lock rail at stiles
1/4" Diameter foam-filled bulb gasket	1 Row	Bottom rail
<b>Hardware</b>		
Sweep lock	2	Lock rail
Keeper	2	Keeper rail
Tilt latch	2	Lock rail
Tilt Bar	2	Stiles
<b>Drainage</b>		
1" by 1/4" Weep slot with cover	2	Sill
3/4" by 1/8" Weep notch	2	Sill
1-1/4" by 1/8" Weep notch	2	Sill
3/4" by 3/4" Weep notch	2	Sill

Option	Total Weight (lbs)	Average Weight (lbs/ft <sup>2</sup> )
A	84	6.56
B	84	6.56

**Comments**

The client did not supply a report drawing. Intertek-ATI will store test samples of 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.

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For INTERTEK-ATI:

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Sean G. Close  
Technician - Acoustical Testing

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Kurt A. Golden  
Project Lead – Acoustical Testing

SGC:jmcs

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: Photographs (1)



### Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
R0	05/26/17	N/A	Original Report Issue



## Appendix A

### Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-4462	Input Card	65126	05/16 *
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	1643A62	04/16
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65126	05/16
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	065125	05/16
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64902	07/16
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64903	02/17
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65103	02/17
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64905	02/17
Source Room Microphone	PCB piezotronics	378C20	Microphone and Preamplifier	64906	02/17
Receive Room Microphone	PBC Piezotronics	378B20	Microphone and Preamplifier	64907	01/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64908	01/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64909	01/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64910	01/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64911	01/17
Receive Room Environmental Indicator	Comet	T7510	Receive Room	64915	03/17
Source Room Environmental Indicator	Comet	T7510	Source Room	64914	03/17
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 <sup>3</sup>	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
Source Room	207 m <sup>3</sup>	Stationary diffusers only Temperature and humidity controlled

	Maximum Size	Description
TL Test Opening	4.27 m wide by 3.05 m high	Vibration break between source and receive rooms

N/A-Not Applicable



H0736.01-113-11-R0

## **Appendix B**

### **Complete Test Results**



**AIRBORNE SOUND TRANSMISSION LOSS**  
ASTM E90

<b>Test Date</b>	05/16/17						
<b>Data File No.</b>	H0736.01A						
<b>Client</b>	Custom Vinyl Products, LLC						
<b>Description</b>	Series/Model: SHA4, single hung window with 1" IG (3/16" annealed exterior, 9/16" air space, 1/4" annealed interior)						
<b>Specimen Area</b>	1.19 m <sup>2</sup>	Receive Temp.	21.4 °C		Source Temp.	21.3 °C	
<b>Technician</b>	Sean G. Close	Receive Humidity	54%		Source Humidity	54%	

Freq (Hz)	Background SPL (dB)	Absorption (m <sup>2</sup> )	Source SPL (dB)	Receive SPL (dB)	Specimen TL (dB)	95% Confidence Limit	Number of Deficiencies
80	43.2	5.2	105	80	20	1.64	-
100	36.2	5.0	105	75	25	1.45	-
125	39.1	5.0	105	78	20	1.62	0
160	40.7	4.6	105	71	29	0.93	0
200	38.5	4.7	106	80	20	1.27	4
250	31.6	5.3	106	74	25	0.96	2
315	26.1	5.5	99	67	25	0.73	5
400	22.4	5.8	96	60	29	0.71	4
500	18.7	6.0	96	57	32	0.92	2
630	18.0	5.8	100	60	34	0.58	1
800	15.8	6.1	100	58	35	0.69	1
1000	10.9	6.3	96	54	36	0.75	1
1250	9.2	6.7	97	53	37	0.62	1
1600	6.8	7.0	101	56	37	0.69	1
2000	4.9	7.5	94	50	36	0.59	2
2500	4.6	8.4	93	49	35	0.57	3
3150	4.8	10.0	96	49	37	0.63	1
4000	5.3	12.2	94	44	40	0.63	0
5000	6.1	15.6	94	41	42	0.64	-

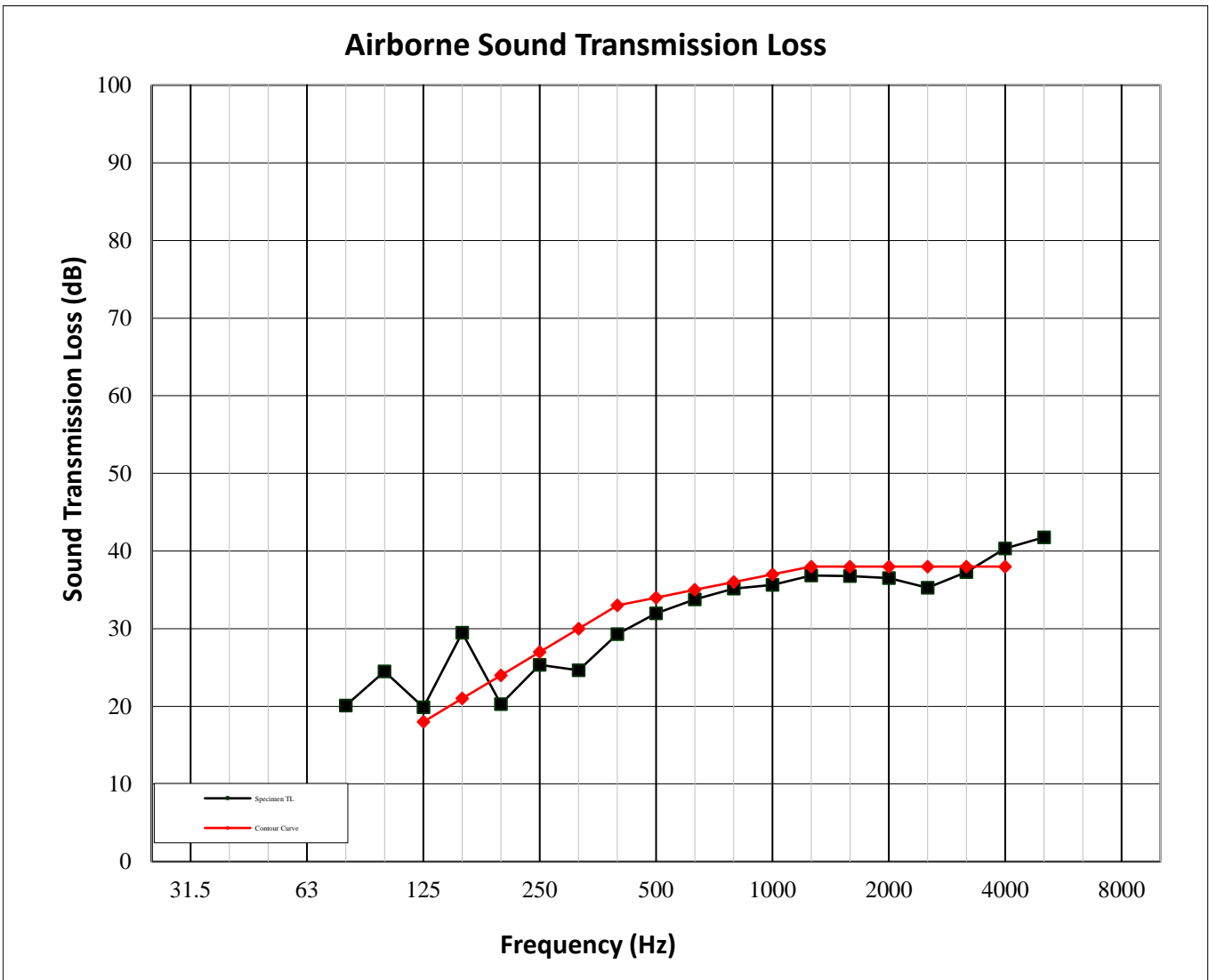
**STC Rating**            **34**            *(Sound Transmission Class)*  
**Deficiencies**        **28**            *(Sum of Deficiencies)*  
**OITC Rating**        **28**            *(Outdoor-Indoor Transmission Class)*

**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



**AIRBORNE SOUND TRANSMISSION LOSS**  
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<b>Test Date</b>	05/16/17					
<b>Data File No.</b>	H0736.01A					
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<b>Specimen Area</b>	1.19 m <sup>2</sup>	Receive Temp.	21.4 °C		Source Temp.	21.3 °C
<b>Technician</b>	Sean G. Close	Receive Humidity	54%		Source Humidity	54%





**AIRBORNE SOUND TRANSMISSION LOSS**  
ASTM E90

<b>Test Date</b>	05/16/17						
<b>Data File No.</b>	H0736.01B						
<b>Client</b>	Custom Vinyl Products, LLC						
<b>Description</b>	Series/Model: SHA4, single hung window with 1" IG (3/16" annealed exterior, 9/16" air space, 1/4" laminated interior), Glass temperature 75°F						
<b>Specimen Area</b>	1.19 m <sup>2</sup>	Receive Temp.	22.1 °C		Source Temp.	21.8 °C	
<b>Technician</b>	Sean G. Close	Receive Humidity	50%		Source Humidity	52%	

Freq (Hz)	Background SPL (dB)	Absorption (m <sup>2</sup> )	Source SPL (dB)	Receive SPL (dB)	Specimen TL (dB)	95% Confidence Limit	Number of Deficiencies
80	40.1	5.1	105	80	20	1.59	-
100	36.0	5.9	105	75	24	1.53	-
125	38.3	5.4	105	79	19	1.57	1
160	40.2	4.5	105	70	30	0.68	0
200	38.2	4.8	106	77	23	0.78	3
250	31.6	5.5	106	72	27	0.69	2
315	25.4	5.7	99	67	26	0.52	6
400	21.8	5.8	97	58	31	0.48	4
500	18.2	6.0	96	56	34	0.51	2
630	17.7	5.7	100	58	36	0.26	1
800	15.9	6.1	100	56	37	0.29	1
1000	10.7	6.2	97	52	37	0.34	2
1250	9.2	6.7	97	52	38	0.23	2
1600	7.0	7.2	101	55	38	0.30	2
2000	5.1	7.5	94	48	38	0.30	2
2500	5.0	8.4	93	46	38	0.23	2
3150	4.9	10.2	96	48	38	0.21	2
4000	5.5	12.5	94	43	41	0.19	0
5000	6.2	15.9	94	40	42	0.30	-

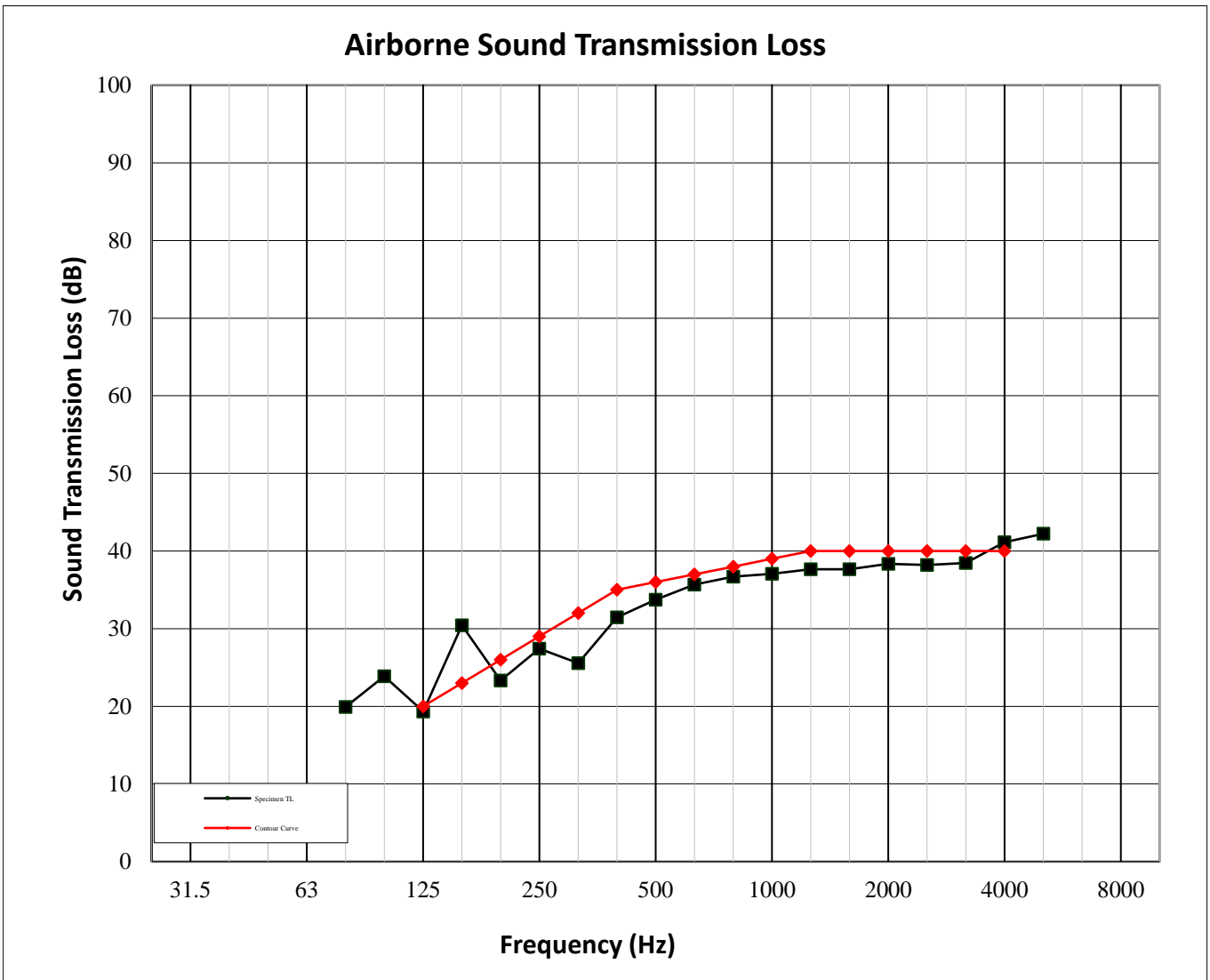
**STC Rating**            **36**            *(Sound Transmission Class)*  
**Deficiencies**        **32**            *(Sum of Deficiencies)*  
**OITC Rating**        **29**            *(Outdoor-Indoor Transmission Class)*

**Notes:**  
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ASTM E90

<b>Test Date</b>	05/16/17					
<b>Data File No.</b>	H0736.01B					
<b>Client</b>	Custom Vinyl Products, LLC					
<b>Description</b>	Series/Model: SHA4, single hung window with 1" IG (3/16" annealed exterior, 9/16" air space, 1/4" laminated interior), Glass temperature 75°F					
<b>Specimen Area</b>	1.19 m <sup>2</sup>	Receive Temp.	22.1 °C		Source Temp.	21.8 °C
<b>Technician</b>	Sean G. Close	Receive Humidity	50%		Source Humidity	52%



**Appendix C**

**Photographs**



**Receive Room View of Installed Specimen**



**Source Room View of Installed Specimen**