

INOVUES, LLC

ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK

ASTM E90 SOUND TRANSMISSION LOSS TESTING ON A
CW+GS100LF CURTAIN WALL WITH GLAZING SHIELD

REPORT NUMBER

I6490.01-113-11-R0

TEST DATE

07/16/18

ISSUE DATE

07/25/18

RECORD RETENTION END DATE

07/16/22

PAGES

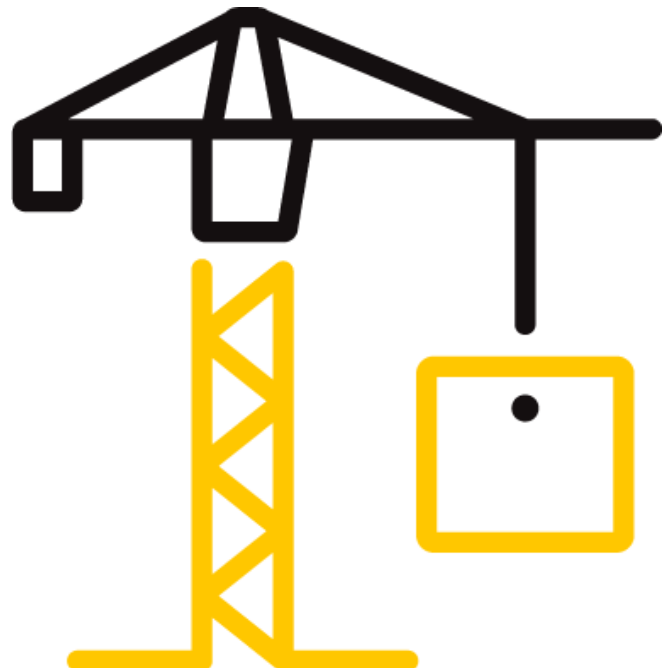
14

DOCUMENT CONTROL NUMBER

ATI 00596 (07/24/17)

RT-R-AMER-Test-2761

© 2017 INTERTEK



TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

REPORT ISSUED TO

INOVUES, LLC

2323 McCue Road
Houston, Texas 77056

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by Inovues, LLC to conduct a sound transmission loss test. Results obtained are tested values and were secured by using the designated test method(s). The complete test data is included herein. The client provided the test specimen. All measurements were conducted in the HT test chambers at Intertek B&C located in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C:

COMPLETED BY:	Daniel J. Poet	REVIEWED BY:	Kurt A. Golden
TITLE:	Technician II Acoustical Testing	TITLE:	Project Lead Acoustical Testing
SIGNATURE:		SIGNATURE:	
DATE:	07/25/18	DATE:	07/25/18

DJP:jmcs

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

SECTION 2

SUMMARY OF TEST RESULTS

OPTION A

SERIES/MODEL	CW+GS100LF
TYPE	Curtain wall with glazing shield
EXTERIOR GLAZING SHIELD (Nominal Dimensions)	5/16" Laminated, Glass temperature 75°F
GAP (Nominal Dimensions)	5/8" Air space
PRIMARY GLAZING (Nominal Dimensions)	1/4" Annealed
DATA FILE NO.	I6490.01A
STC	38
OITC	31

OPTION B

SERIES/MODEL	CW
TYPE	Curtain wall
GLAZING (Nominal Dimensions)	1/4" Annealed
DATA FILE NO.	I6490.01B
STC	31
OITC	28

SECTION 3

TEST METHODS

The specimens were evaluated in accordance with the following:

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 REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

SECTION 4

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 REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

**SECTION 5
EQUIPMENT**

The equipment listed below meets the requirements of the test methods stated in Section 3 of this report.

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65125	05/18
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65126	05/18
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	63763-3	04/18
Source Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64902	04/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64903	05/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	65106	03/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	64905	03/18
Source Room Microphone	PCB piezotronics	378C20	Microphone and Preamplifier	64906	03/18
Receive Room Microphone	PBC Piezotronics	378B20	Microphone and Preamplifier	64907	12/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64908	12/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64909	12/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64910	12/17
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64911	01/18
Receive Room Environmental Indicator	Comet	T7510	Receive Room	64915	03/18
Source Room Environmental Indicator	Comet	T7510	Source Room	64914	03/18
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	Y002919	04/18

TEST CHAMBER

	VOLUME	DESCRIPTION
RECEIVE ROOM	234 m ³	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
SOURCE ROOM	207 m ³	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

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

SECTION 6

LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Daniel Poet	Intertek B&C
Kurt Golden	Intertek B&C

SECTION 7

TEST PROCEDURE

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 receive and source rooms at each of five microphone positions.

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

Data for flanking limit tests, repeatability measurements, and reference specimen tests are available upon request.

Intertek B&C will store samples of test specimens for four years.

SECTION 8

ACOUSTICAL 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.

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

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.

SECTION 9

SPECIMEN DESCRIPTION

	FRAME
SIZE	53" by 77"
THICKNESS	6-1/4"
CORNERS	Butted
FASTENERS	Screws
SEAL METHOD	Sealant
MATERIAL	Aluminum
REINFORCEMENT	N/A
THERMAL BREAK MATERIAL	EDPM
DAYLIGHT OPENING SIZE	48" by 72"

	TYPE	QUANTITY	LOCATION
WEATHERSTRIP	No weatherstrip		
HARDWARE	No hardware		
DRAINAGE	5/16" Weep hole	2	Sill

N/A-Not Applicable

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

OPTION A (Curtain Wall with Glazing Shield)

MEASURED OVERALL INSULATION GLASS THICKNESS	1.137"
SPACER TYPE	Hybrid (aluminum profiles/extrusions between adhesives/sealants)

	EXTERIOR SHEET	GAP	INTERIOR SHEET
MEASURED THICKNESS	0.121", 0.057", 0.123"	0.615"	0.221"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Laminated	Air*	Annealed
LAMINATE MATERIAL	PVB	N/A	N/A

GLAZING SHEILD GLAZING METHOD	Exterior structural adhesive tape
PRIMARY GLAZING METHOD	Exterior pressure glazed
GLAZING MATERIAL	EDPM
GLAZING BEAD MATERIAL	Aluminum

OPTION B (Curtain Wall)

	SHEET
MEASURED THICKNESS	0.222"
MUNTIN PATTERN	N/A
MATERIAL	Annealed
LAMINATE MATERIAL	N/A

GLAZING METHOD	Pressure glazed
GLAZING MATERIAL	EDPM
GLAZING BEAD MATERIAL	Aluminum

OPTION	TOTAL WEIGHT (lbs)	AVERAGE WEIGHT (lbs/ft²)
A	244	8.61
B	150	5.29

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

Per client's instruction, the construction details of the test specimen are proprietary.

The following drawing numbers and dates were provided by the client: INO-002-04004-R1 (04/24/18), INO-002-04002 (07/19/18), INO-002-04003 (07/19/18)

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

SECTION 10

TEST RESULTS

I6490.01A DATA

SPECIMEN AREA	2.63 m ²	RECEIVE TEMP.	23.2 °C	SOURCE TEMP	22.3 °C
TECHNICIAN	Daniel Poet	RECEIVE HUMIDITY	51%	SOURCE HUMIDITY	50%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION (m ²)	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	35.2	4.0	100	79	20	2.46	-
100	34.6	4.9	101	73	25	2.26	-
125	35.7	5.0	100	73	25	1.43	0
160	39.2	4.6	100	76	22	1.06	3
200	38.8	5.0	104	76	25	1.11	3
250	34.3	5.5	102	74	25	0.68	6
315	29.1	5.8	96	62	30	0.72	4
400	26.0	6.0	93	59	31	0.47	6
500	19.1	6.0	93	54	35	0.47	3
630	18.3	5.7	97	57	37	0.51	2
800	13.4	6.1	96	53	40	0.61	0
1000	8.3	6.3	93	49	40	0.59	1
1250	7.5	6.7	94	47	43	0.60	0
1600	5.7	7.2	97	51	43	0.56	0
2000	4.7	7.5	91	45	42	0.43	0
2500	6.0	8.4	90	43	42	0.51	0
3150	5.3	10.0	93	40	47	0.39	0
4000	6.2	12.0	91	34	51	0.47	0
5000	7.6	15.3	91	29	54	0.48	-
STC RATING	38 (Sound Transmission Class)						
DEFICIENCIES	28 (Sum of Deficiencies)						
OITC RATING	31 (Outdoor-Indoor Transmission Class)						

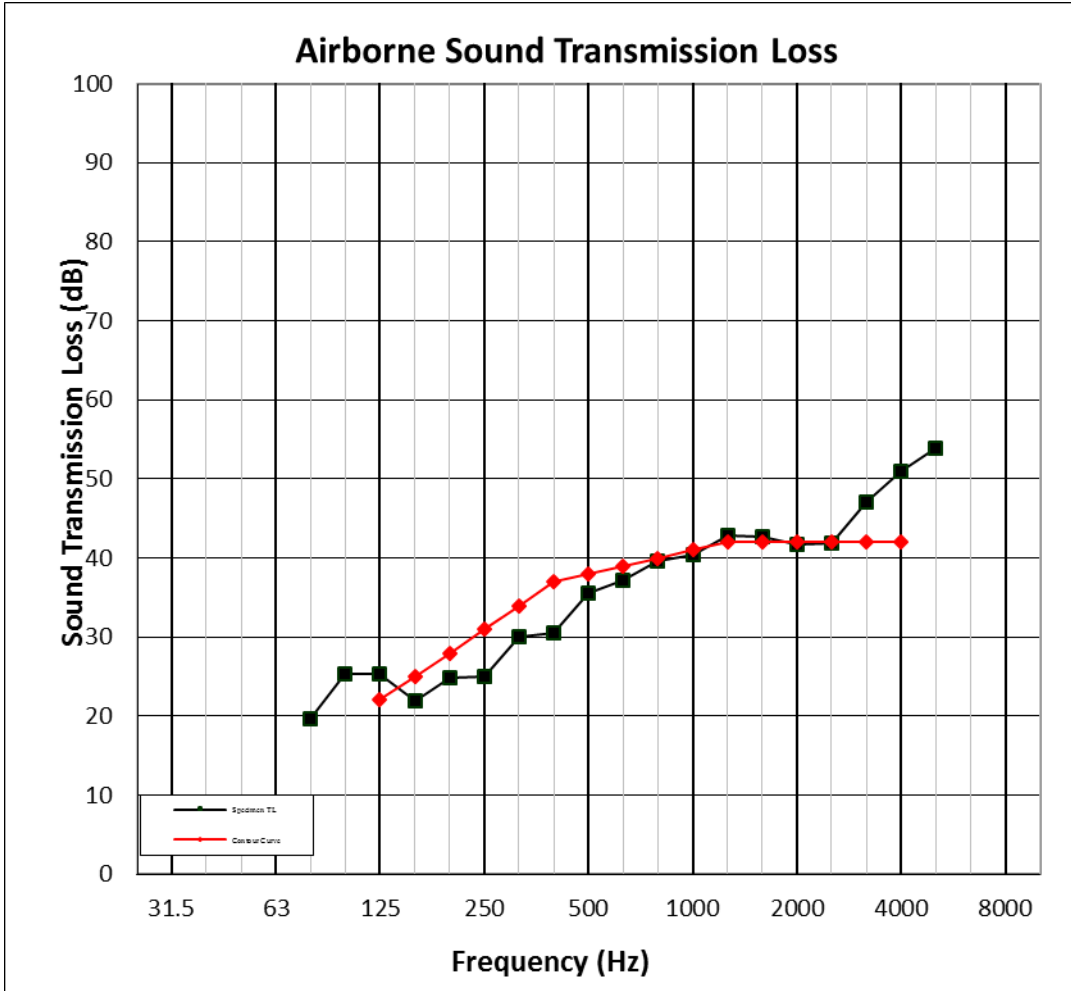
- Notes:**
- 1) Receive Room levels less than 5 dB above the Background levels are red.
 - 2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
 - 3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

I6490.01A GRAPH



TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

I6490.01B DATA

SPECIMEN AREA	2.63 m ²	RECEIVE TEMP.	22.4 °C	SOURCE TEMP	21.6 °C
TECHNICIAN	Daniel Poet	RECEIVE HUMIDITY	53%	SOURCE HUMIDITY	55%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION (m ²)	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	35.5	4.3	100	80	18	2.47	-
100	33.8	4.9	101	76	23	2.20	-
125	35.1	4.9	100	75	22	1.36	0
160	40.3	4.3	101	75	24	1.03	0
200	39.7	4.6	104	77	24	1.07	0
250	32.9	5.4	102	75	24	0.53	0
315	29.0	5.7	96	67	25	0.59	2
400	28.6	5.9	93	62	27	0.71	3
500	33.0	6.0	93	60	30	0.42	1
630	29.8	5.8	97	63	31	0.47	1
800	27.7	6.1	96	60	32	0.68	1
1000	23.8	6.3	93	56	33	0.48	1
1250	19.3	6.7	93	54	35	0.50	0
1600	17.4	7.1	97	59	34	0.54	1
2000	16.9	7.5	91	58	29	0.43	6
2500	14.0	8.4	90	58	27	0.41	8
3150	11.2	10.0	93	56	31	0.36	4
4000	9.1	12.1	91	51	34	0.41	1
5000	10.0	15.4	91	47	36	0.49	-
STC RATING	31 <i>(Sound Transmission Class)</i>						
DEFICIENCIES	29 <i>(Sum of Deficiencies)</i>						
OITC RATING	28 <i>(Outdoor-Indoor Transmission Class)</i>						

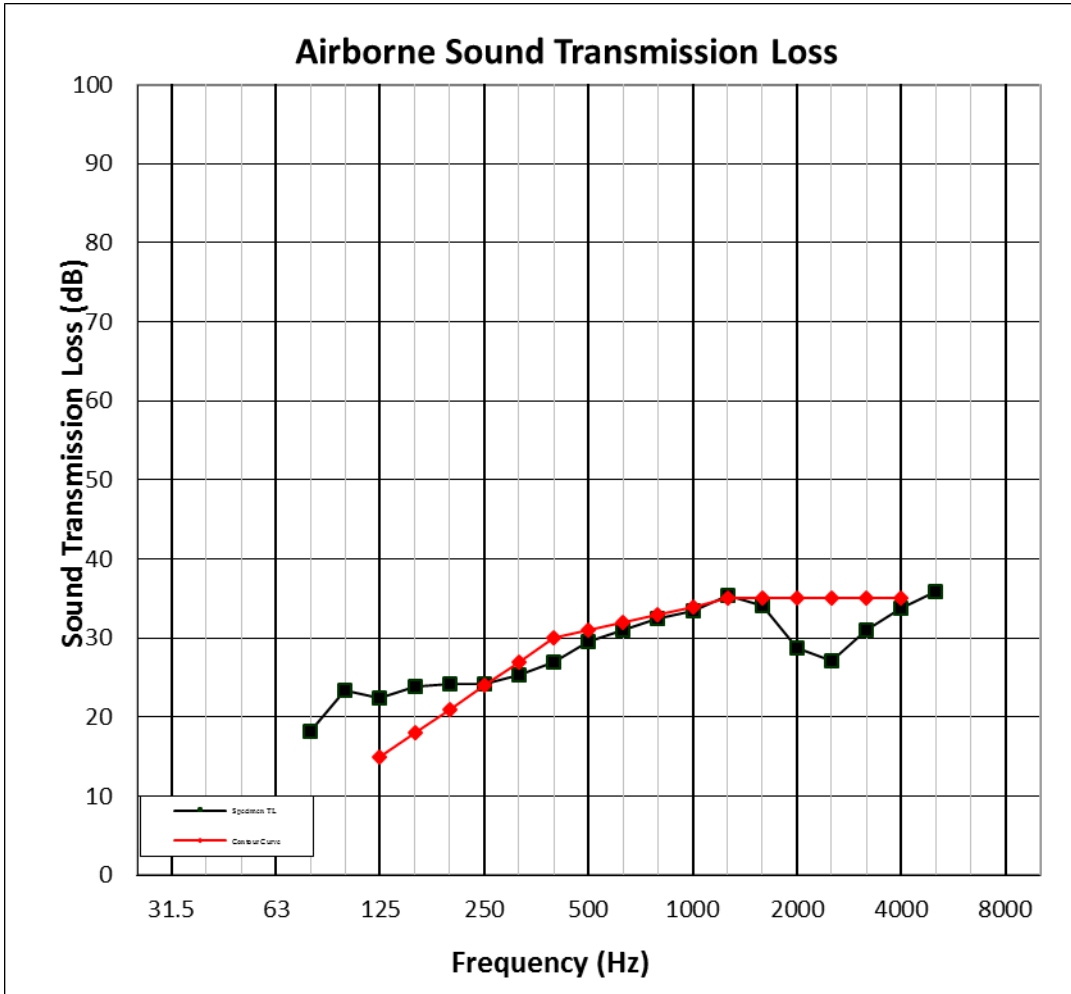
- Notes:**
- 1) Receive Room levels less than 5 dB above the Background levels are red.
 - 2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
 - 3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

I6490.01B GRAPH



TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

SECTION 11

PHOTOGRAPHS



Photo No. 1
Receive Room View of Installed Specimen



Photo No. 2
Source Room View of Installed Specimen



Total Quality. Assured.

130 Derry Court
York, Pennsylvania 17406

Telephone: 717-764-7700
Facsimile: 717-764-4129
www.intertek.com/building

TEST REPORT FOR INOVUES, LLC

Report No.: I6490.01-113-11-R0

Date: 07/25/18

SECTION 12

REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	07/25/18	N/A	Original Report Issue