



NORTH ORBIT

ACOUSTIC LABORATORIES

REPORT NUMBER	NOAL 25-06069
TEST METHOD	ASTM E90-23: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements
TEST SPONSOR	Indow Windows, 6427 NE 59th Place, Portland, OR 97218
ISSUED TO	Indow Windows, 6427 NE 59th Place, Portland, OR 97218
TEST SPECIMEN	Fixed Window with Insert
RESULT SUMMARY	STC 51, OITC 36
TEST DATE	June 25, 2025
REPORT DATE	July 9, 2025
TEST SITE	North Orbit Acoustic Laboratory Facility, 917 Rice Street, Saint Paul, MN 55117
TECHNICIAN	D. Berg

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SIGNATURE

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HEIDE GROSS – LABORATORY QUALITY MANAGER



TEST SPONSOR Indow Windows
6427 NE 59th Place
Portland, OR 97218

ASTM E90 TEST REPORT

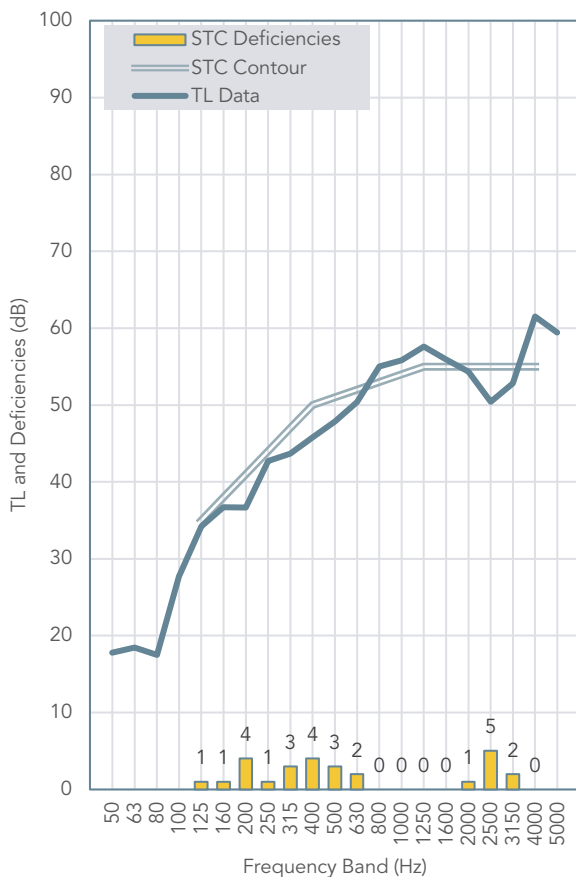
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SECTION A – DATA SUMMARY

STC 51, OITC 36



FREQUENCY (Hz)	TL (dB)	DEFICIENCIES (dB)
50	18	-
63	18	-
80	18	-
100	28	-
125	34	1
160	37	1
200	37	4
250	43	1
315	44	3
400	46	4
500	48	3
630	50	2
800	55	0
1,000	56	0
1,250	58	0
1,600	56	0
2,000	54	1
2,500	50	5
3,150	53	2
4,000	62	0
5,000	59	-
TOTAL DEFICIENCIES		27

ELEMENTS	
Primary window	Fixed aluminum storefront window
Dimensions	39.5" x 51.5" [1.00 m x 1.31 m]
Glass Makeup	1/4" clear tempered
Air Space	4"
Secondary window	IndowPRO frame with 5/16" Acoustic Laminate
Dimensions	39.5" x 51.5" [1.00 m x 1.31 m]

See Section C on page 4 and 5 for a full specimen description.



SECTION B – APPROACH

INSTALLATION

The specimen is a window that was installed on June 25, 2025, at the Saint Paul, MN acoustic laboratory facility. The assembly and building element descriptions can be found in Section C on pages 4 & 5 of this report.

Qualified representatives from North Orbit Acoustic Laboratories observed or performed the installation and inspected all major building elements when completed and prior to testing.

TEST METHODS

North Orbit Acoustic Laboratory (NOAL) is accredited through A2LA certificate number 4240.01 for this test method.

Test methods follow the published standards listed below.

ASTM E90-23: *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

ASTM E413-22: *Classification for Rating Sound Insulation*

ASTM E1332-22: *Classification for Outdoor-Indoor Sound Attenuation*

All results reported herein were derived from tests performed in full accordance with test method ASTM E90. The laboratory and measurement systems fully meet all requirements of the test standard and the requirements of ASTM E90 Annex A2: Qualification of room sound fields and microphone systems used for sampling. All values stated are derived from single-direction transmission loss measurements.

The standard deviation of reproducibility is stated in ASTM E90 as <2 dB for frequencies from 125 Hz to 4 kHz. Detailed test procedures for this test method, the flanking limit report, repeatability measurements and reference specimen tests are available upon request.

The Sound Transmission Class (STC) value was obtained by applying the Transmission Loss (TL) values to the STC reference contour of ASTM E413 which was used to calculate a single number rating. The Outdoor-Indoor Transmission Class (OITC) value was obtained by applying the TL values to the calculation procedure in ASTM E1332.

FILLER WALL

A high-transmission-loss filler wall was constructed in the entire 12' x 8' test opening, consisting of two individual decoupled frames separated by an airspace, with studs installed 24" on centers (OC). Glass fiber batt insulation was friction fit in each stud cavity of each frame. On the source side, a single layer of 5/8" Type gypsum drywall was attached directly to the frame. On the receiving room side, a layer of 5/8" thick, Type X gypsum panels was installed over a layer of 1/2" constrained layer, damped gypsum panels. Both layers were applied and attached directly to the frame. The overall thickness of the assembled filler wall was 12.75". The filler wall assembly was tested, and the results were retained for composite wall corrections. The filler wall was then modified to provide a decoupled opening to accommodate the specimen under test according to the requirements of ASTM E90 Annex A3: *Procedures for Dealing with Specimens Smaller than the Test Opening*.

TEST REPORTS

This report does not constitute certification of the assembly or test item nor an opinion or endorsement by this laboratory. The report applies only to the specimen tested and may not be reproduced, except in full, without the permission of the client or test sponsor. It is the exclusive property of the test sponsor so named herein.

CONFIDENTIALITY

The test sponsor has full control over this information. Any release of information will be only to the test sponsor. The specific testing results are deemed to be confidential exclusively for the test sponsor's use. Reproduction of this report, except in full, is prohibited.



Certificate #4240.01

This page alone is not a complete report.

SECTION C – SPECIMEN DESCRIPTION

The test specimen consists of a fixed aluminum storefront window, with an IndowPRO Secondary Window installed on the receiving room side. The secondary window is mounted to the filler wall, creating a 4" air gap between the primary and secondary window glazing.

The test laboratory provided materials to build the filler wall assembly. The Test Sponsor supplied all other test specimen materials.

TEST SPECIMEN

Specimen Dimensions	39.5" [1.00 m] x 51.5" [1.31 m]
Specimen Face Area	14.1 SF [1.31 m ²]
Total Daylight Area	12.0 SF [1.15 m ²] or 86%
Overall Mass	122 lb [55.3 kg]
Overall Surface Density	8.64 PSF [42.2 kg/m ²]

WINDOW DETAILS

Window Type	Fixed window with insert
Primary Window Frame	1.75" x 4.50" deep extruded aluminum assembly
Secondary Window Frame	1.625" x 1.06" deep extruded aluminum assembly

GLASS PANES

Identification	Fixed aluminum storefront window	
Dimensions	39.5" [1.00 m] x 51.5" [1.31 m]	
Daylight Opening	36.0" [0.91 m] x 48.0" [1.22 m]	
Daylight Area	12.0 SF [1.15 m ²]	
Glass Makeup	0.25" [6.35 mm] annealed	
Air Space	4" [10.2 cm]	
	IndowPRO frame mounted to filler wall	
Identification	IndowPro secondary glazing frame	
Dimensions	39.5" [1.00 m] x 51.5" [1.31 m]	
Daylight Opening	36.0" [0.91 m] x 48.0" [1.22 m]	
Daylight Area	12.0 SF [1.15 m ²]	
Glass Makeup	5/16" [7.94 mm] acoustic laminated	0.1250" [3.18 mm] annealed 0.0300" [0.76 mm] PVB interlayer 0.1875" [4.76 mm] annealed

The Primary window frame was shimmed at installation so equal gaps were maintained at the top and bottom. Gaps were less than 3/8" in all cases. The perimeter was sealed on the source and receiving room sides with non-hardening acoustical sealant. In addition, the perimeter of both sides of the specimen was sealed with 2" wide polypropylene tape and 7/8" dense putty tape.

The IndowPro secondary glazing frame was held in place with integral perimeter bulb and foam corner seals



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SECTION D – MEASUREMENT SET-UP

ENVIRONMENTAL CONDITIONS

Source Room Temperature	71.5 °F [21.9 °C]
Source Room Relative Humidity	54.8%
Receiving Room Temperature	73.3 °F [22.9 °C]
Receiving Room Relative Humidity	54.7%

CHAMBER VOLUME

Source Room	7,642 CF [216.4 m ³]
Receiving Room	12,320 CF [348.7 m ³]
Source Niche Depth	6.50" [16.5 cm]
Receiving Niche Depth	5.75" [14.6 cm]

INSTRUMENTATION

DESCRIPTION	BRAND	MODEL	SERIAL
Analyzer	Sinus	Apollo	7510
Software	Sinus	Samurai	ver. 2.8.3
Microphone	Brüel & Kjær	4166	1620281
Microphone	Brüel & Kjær	4166	1620312
Preamplifier	Brüel & Kjær	2669	2025373
Preamplifier	Brüel & Kjær	2669	2083679
Calibrator	Brüel & Kjær	4231	2314028
Thermohygrometer	Kestrel	5200	2807716
Thermohygrometer	Kestrel	5200	2947354



SECTION E – TEST RESULTS

FREQUENCY BAND (Hz)	TL (dB)	DATA FLAGS (see below)	95% C.I. (dB)	FLANKING LIMIT (dB)	DEFICIENCIES (dB)
50	17.8	†	±3.9	44.8	-
63	18.5	†	±4.0	46.8	-
80	17.5	‡	±3.0	52.8	-
100	27.7	†	±1.6	59.2	-
125	34.2	†	±1.7	65.2	1
160	36.7	†	±1.4	69.7	1
200	36.7	‡	±1.1	72.8	4
250	42.7	‡	±0.6	77.7	1
315	43.7	‡	±0.6	82.6	3
400	45.8	‡	±0.5	88.3	4
500	47.8	‡	±0.5	93.4	3
630	50.4	‡	±0.4	95.6	2
800	55.0	‡	±0.5	100.5	0
1,000	55.8		±0.4	105.0	0
1,250	57.6		±0.4	107.9	0
1,600	55.9		±0.3	105.9	0
2,000	54.4		±0.5	106.0	1
2,500	50.4		±0.3	105.7	5
3,150	52.8		±0.4	105.2	2
4,000	61.5		±0.4	103.4	0
5,000	59.4		±0.5	100.7	-
TOTAL DEFICIENCIES BELOW CONTOUR [dB]					27
STC RATING [ASTM E413]					51
OITC RATING [ASTM E1332]					36

Note: Composite 95% confidence intervals from room qualification testing. Extended frequency results below 80 Hz and above 5000 Hz are for reference only. Specimen TL rounded to 0.1 dB provided in this table for reference. Specimen TL rounded to whole decibels found on page 2.

Data Flags:

- ‡ Correction included in calculation due to a portion of the sound transmitted by way of the filler wall. Sound transmission through the filler wall is within correction limits established in ASTM E90.
- † Actual transmission loss of specimen may be higher than measured at this frequency band. Sound transmission through the filler wall exceeds correction limits established in ASTM E90; therefore the result is "an estimate of the lower limit".

