



NORTH ORBIT

ACOUSTIC LABORATORIES

REPORT NUMBER	NOAL 24-05010
TEST METHOD	ASTM E90-23: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission of Building Partitions and Elements
TEST SPONSORS	CEMCO, 13191 Crossroads Pkwy N., Ste 325, City of Industry, CA 91746 Trim-Tex, 3700 W. Pratt Ave, Lincolnwood, IL 60712
ISSUED TO	CEMCO, 13191 Crossroads Pkwy N., Ste 325, City of Industry, CA 91746 Trim-Tex, 3700 W. Pratt Ave, Lincolnwood, IL 60712
TEST SPECIMEN	Wall Assembly
RESULT SUMMARY	STC 50
TEST DATE	May 8, 2024
REPORT DATE	June 3, 2024
TEST SITE	North Orbit Acoustic Laboratory Facility, 917 Rice Street, Saint Paul, MN 55117
TECHNICIAN	D. Berg

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DAVID M. BERG –LABORATORY MANAGER

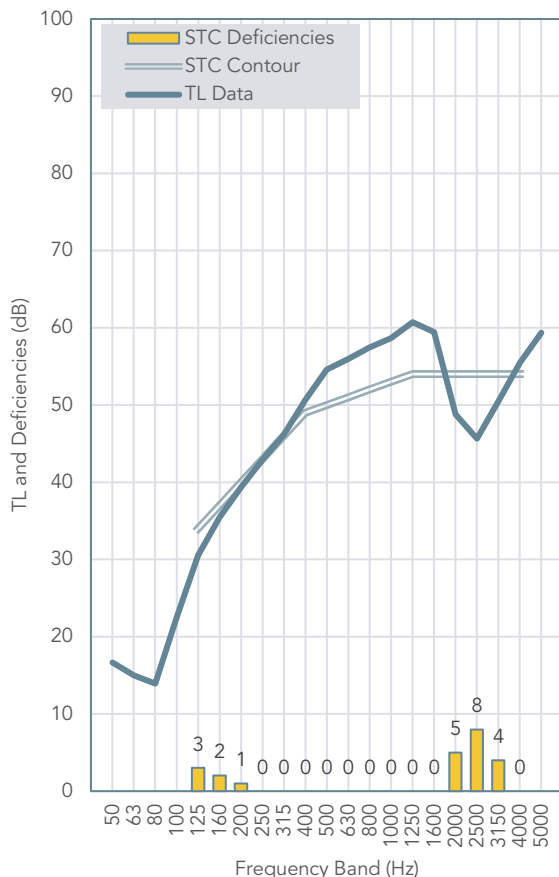
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HEIDE GROSS – LABORATORY QUALITY MANAGER



SECTION A – DATA SUMMARY

STC 50



FREQUENCY (Hz)	TL (dB)	DEFICIENCIES (dB)
50	17	-
63	15	-
80	14	-
100	22	-
125	31	3
160	35	2
200	39	1
250	43	0
315	46	0
400	51	0
500	55	0
630	56	0
800	57	0
1,000	59	0
1,250	61	0
1,600	59	0
2,000	49	5
2,500	46	8
3,150	50	4
4,000	55	0
5,000	59	-
TOTAL DEFICIENCIES		23

ELEMENTS	FROM SOURCE ROOM SIDE TO RECEIVING ROOM SIDE
Hardware	3/8" Super Seal-X (8 LF one side)
Hardware	1" x 1" HOTROD® Type X w/flat deflection bead (12 LF top and 8 LF one side)
Sheathing	5/8" Type X gypsum panels (vs); #6 x 1-5/8" type S screws spaced 24" OC
Sheathing	5/8" Type X gypsum panels (v); #6 x 1" type S screws spaced 12" OC
Framing	1" x 8" 30 mil steel angle
Framing	3-5/8" CEMCO 30 mil (20 GA) steel slotted top track
Framing	3-5/8" CEMCO 18 mil (20 ga. EQ) steel studs spaced 24" OC
Framing	3-5/8" CEMCO 18 mil (20 ga. EQ) steel bottom tracks
Framing	1/2" x 8" 30 mil steel angle
Insulation	3-1/2" glass fiber batt insulation (R13)
Hardware	6-1/2" x 3" x 96" curtain wall aluminum mullion
Sheathing	5/8" Type X gypsum panels (vs); #6 x 1" type S screws spaced 12" OC
Hardware	1/2" x 1" HOTROD® Type X w/flat deflection bead (12 LF top and 8 LF one side)
Hardware	3/8" Super Seal-X (8 LF one side)



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



SECTION B – APPROACH

INSTALLATION

The specimen is a wall assembly that was originally constructed on May 7, 2024, 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. Some details of the specimen design are proprietary and have been withheld at the request of the test sponsor.

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*

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.

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.



SECTION C – SPECIMEN DESCRIPTION

The test sponsors supplied HOTROD® Type X, and the flat deflection bead. CertainTeed supplied gypsum board panels. All other materials were purchased through regional retail or wholesale channels.

FRAMING

Framing was constructed on May 6, 2024, and was retained for subsequent tests in the series.

A steel stud frame was constructed within the perimeter of the laboratory test specimen opening. The frame consisted of 30 mil designated thickness (20 ga.) 3-5/8" x 2-1/2" steel slotted top track, 18 mil designated thickness (20 EQ) 3-5/8" x 1-1/4" steel bottom track and seven 18 mil designated thickness (20 EQ.) 3-5/8" x 1-7/16" steel studs installed vertically 24" on centers (OC). The tracks and outer studs were fastened together with two #8 x 1/2" type S screws at each intersection. A L-angle was attached to the top and bottom track with the long leg cantilevered beyond the end stud. The perimeter of the frame was sealed at the specimen opening with non-hardening acoustic sealant.

Top Track: CEMCO 362 CST250-30 20 GA 33 KSI
Bottom Track: CEMCO 362 VXT125-18 NS 57 KSI
Studs: CEMCO 362 VXS144-18 NS 57 KSI

CURTAIN WALL MULLION

A 6-1/2" x 3" x 96" tall curtain wall aluminum mullion was constructed within the perimeter of the laboratory test specimen opening. The mullion was set against one outer vertical perimeter of the test opening. The area where glazing panels would normally be installed was filled with 2 layer strips of 1-1/2" wide x 96" tall 5/8" gypsum board. A thin veil of insulation batt was installed behind the L-angle.

INSULATION

Glass fiber insulation batts were friction fit into the stud cavities. The batts were 24" wide and 3-1/2" thick with an R-Value of R-13.

SHEATHING

Source Side: Two layers of gypsum panels were applied to the framing also cantilevered beyond the end stud and supported by the L-angle.

Base layer: 5/8" gypsum panels were applied parallel to the studs. The panels were attached to the frame with #6 x 1" type S drywall screws, spaced 12" OC.

Face layer: 5/8" gypsum panels were applied parallel to the studs. The panels were attached to the frame with #6 x 1-5/8" type S drywall screws, spaced 24" OC. Joints were staggered one stud cavity to offset each layer.

Receiving Side: One layer of 5/8" Type X gypsum panels was applied parallel to the studs also cantilevered beyond the end stud and supported by the L-angle. The panels were attached to the frame with #6 x 1" type S drywall screws at 12" OC. Joints were staggered one stud cavity on opposite sides.

All fasteners in the assembly installation were mechanically installed.

The panels were shimmed at installation so equal 1/4" gaps were maintained on the vertical perimeter and 1/2" gap at the perimeter top and bottom. Shims were removed after the panels were fastened and the specimen bottom and seams were sealed on the source and receiving room sides with non-hardening acoustical sealant. The entire perimeter of both sides of the specimen were sealed with drywall accessories as noted below.

DRYWALL ACCESSORIES

1" x 1" and 1/2" x 1" HOTROD® Type X was installed along the top and single side perimeter of the source side and receiver sides and was friction fit into the gap at the perimeter of the test specimen.

1-1/2" Trim-Tex flat deflection bead was installed at the top perimeter of the source and receiver sides and fastened with staples every 3"-6". The Trim-Tex was finished with joint compound.

3/8" x 1" Super Seal-X was installed along the side perimeters of the curtain wall aluminum mullion, and installed on the source side and receiver sides and fastened with staples every 3"-6". The Super-Seal X was finished with joint compound.



Certificate #4240.01

This page alone is not a complete report.

SECTION C – SPECIMEN DESCRIPTION (CONT.)

SPECIMEN DETAIL

Specimen Face Dimensions	12.0' [3.66 m] x 8.00' [2.44 m]
Specimen Thickness	15.0" [38.1 cm]
Specimen Face Area	96.0 SF [8.92 m ²]
Overall Mass	733 lb [333 kg]
Overall Surface Density	7.64 PSF [37.3 kg/m ²]

Mass of fasteners, tape and sealant is not represented in the above totals.



SECTION C – SPECIMEN DESCRIPTION (CONT.)

HARDWARE			
Material	Super Seal-X		
Dimensions	0.38" x 1.00" [1.0 cm x 2.5 cm]	Net Length	8.00' [2.44 m]
Lengths	1 @ 96.00" [243.8 cm]		
HARDWARE			
Material	HOTROD® Type X w/flat deflection bead		
Dimensions	1.00" x 1.00" [2.5 cm x 2.5 cm]	Net Length	12.0' [3.66 m]
Lengths	1 @ 144.00" [365.8 cm]		
SHEATHING SOURCE SIDE FACE LAYER			
Material	Type X gypsum panels	Mass	211 lb [95.7 kg]
Thickness	0.63" [1.6 cm]	Net Area	96.0 SF [8.92 m²]
Face Dimensions	2 @ 48.00" x 96.00" [121.9 cm x 243.8 cm] 2 @ 24.00" x 96.00" [61.0 cm x 243.8 cm]	Surface Density	2.20 PSF [10.7 kg/m²]
SHEATHING SOURCE SIDE BASE LAYER			
Material	Type X gypsum panels	Mass	211 lb [95.7 kg]
Thickness	0.63" [1.6 cm]	Net Area	96.0 SF [8.92 m²]
Face Dimensions	3 @ 48.00" x 96.00" [121.9 cm x 243.8 cm]	Surface Density	2.20 PSF [10.7 kg/m²]
FRAMING			
Material	30 mil steel angle	Mass	7.00 lb [3.18 kg]
Steel Thickness	0.0300" [762 µm]	Net Length	8.00' [2.44 m]
Dimensions	8.00" x 1.00" [20.3 cm x 2.5 cm]	Linear Density	0.875 lb/ft [1.30 kg/m]
Lengths	1 @ 96.00" [243.8 cm]		
FRAMING			
Material	CEMCO 30 mil (20 GA) steel slotted top track	Mass	9.17 lb [4.16 kg]
Steel Thickness	0.0312" [792 µm]	Net Length	11.5' [3.49 m]
Dimensions	3.63" x 2.50" [9.2 cm x 6.4 cm]	Linear Density	0.800 lb/ft [1.19 kg/m]
Lengths	1 @ 137.50" [349.3 cm]		
FRAMING			
Material	CEMCO 18 mil (20 ga. EQ) steel studs	Mass	24.5 lb [11.1 kg]
Steel Thickness	0.0188" [478 µm]	Net Length	55.7' [17.0 m]
Dimensions	3.63" x 1.44" [9.2 cm x 3.7 cm]	Linear Density	0.440 lb/ft [0.654 kg/m]
Lengths	7 @ 95.50" [242.6 cm]		



SECTION C – SPECIMEN DESCRIPTION (CONT.)

FRAMING			
Material	CEMCO 18 mil (20 ga. EQ) steel bottom tracks	Mass	4.68 lb [2.12 kg]
Steel Thickness	0.0188" [478 µm]	Net Length	11.5' [3.49 m]
Dimensions	3.63" x 1.25" [9.2 cm x 3.2 cm]	Linear Density	0.408 lb/ft [0.608 kg/m]
Lengths	1 @ 137.50" [349.3 cm]		
FRAMING			
Material	30 mil steel angle	Mass	6.00 lb [2.72 kg]
Steel Thickness	0.0300" [762 µm]	Net Length	8.00' [2.44 m]
Dimensions	8.00" x 0.50" [20.3 cm x 1.3 cm]	Linear Density	0.750 lb/ft [1.12 kg/m]
Lengths	1 @ 96.00" [243.8 cm]		
INSULATION			
Material	glass fiber batt insulation	Mass	20.0 lb [9.07 kg]
Thickness	3.50" [8.9 cm]	Net Volume	23.3 CF [0.661 m³]
Face Dimensions	5 @ 24.00" x 96.00" [61.0 cm x 243.8 cm]	Density	0.857 PCF [13.7 kg/m³]
HARDWARE			
Material	curtain wall aluminum mullion	Mass	29.0 lb [13.2 kg]
Dimensions	3.00" x 6.50" x 96.00" [7.6 cm x 16.5 cm x 243.8 cm]	Quantity	1.0000
		Unit Mass	29.0 lb [13.2 kg]
SHEATHING		RECEIVING SIDE	
Material	Type X gypsum panels	Mass	211 lb [95.7 kg]
Thickness	0.63" [1.6 cm]	Net Area	96.0 SF [8.92 m²]
Face Dimensions	2 @ 48.00" x 96.00" [121.9 cm x 243.8 cm] 2 @ 24.00" x 96.00" [61.0 cm x 243.8 cm]	Surface Density	2.20 PSF [10.7 kg/m²]
HARDWARE			
Material	HOTROD® Type X w/flat deflection bead		
Dimensions	0.50" x 1.00" [1.3 cm x 2.5 cm]	Net Length	12.0' [3.66 m]
Lengths	1 @ 144.00" [365.8 cm]		
HARDWARE			
Material	Super Seal-X		
Dimensions	0.38" x 1.00" [1.0 cm x 2.5 cm]	Net Length	8.00' [2.44 m]
Lengths	1 @ 96.00" [243.8 cm]		

All materials were weighed prior to installation. The nominal dimensions and product information were provided by the test sponsor or obtained from manufacturer data sheets.



SECTION D – MEASUREMENT SET-UP

ENVIRONMENTAL CONDITIONS

Source Room Temperature	70.1 °F [21.2 °C]
Source Room Relative Humidity	49.3%
Receiving Room Temperature	70.1 °F [21.2 °C]
Receiving Room Relative Humidity	50.2%

CHAMBER VOLUME

Source Room	7,689 CF [217.7 m ³]
Receiving Room	12,310 CF [348.6 m ³]
Source Niche Depth	16.4" [41.6 cm]
Receiving Niche Depth	3.38" [8.57 cm]

INSTRUMENTATION

DESCRIPTION	BRAND	MODEL	SERIAL
Analyzer	Sinus	Apollo	75110
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	D2	2781724
Thermohygrometer	Kestrel	5200	2311344



SECTION E – TEST RESULTS

FREQUENCY BAND (Hz)	TL (dB)	DATA FLAGS (see below)	95% C.I. (dB)	FLANKING LIMIT (dB)	DEFICIENCIES (dB)
50	16.6		±4.2	44.8	-
63	15.0		±4.4	46.8	-
80	13.9		±2.8	52.8	-
100	22.5		±1.6	59.2	-
125	30.5		±1.4	65.2	3
160	35.5		±1.2	69.7	2
200	39.4		±1.3	72.8	1
250	42.9		±0.7	77.7	0
315	46.2		±0.6	82.6	0
400	50.6		±0.6	88.3	0
500	54.6		±0.4	93.4	0
630	56.0		±0.4	95.6	0
800	57.4		±0.4	100.5	0
1,000	58.6		±0.5	105.0	0
1,250	60.7		±0.7	107.9	0
1,600	59.4		±0.4	105.9	0
2,000	48.8		±0.4	106.0	5
2,500	45.6		±0.5	105.7	8
3,150	50.5		±0.4	105.2	4
4,000	55.5		±0.4	103.4	0
5,000	59.3		±0.5	100.7	-
TOTAL DEFICIENCIES BELOW CONTOUR [dB]					23
STC RATING [ASTM E413]					50

Note: Composite 95% confidence intervals from room qualification testing. Extended frequency results below 80Hz and above 5000Hz 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.

