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CALIFORNIA EXPANDED METAL COMPANY (CEMCO)
ACOUSTICAL PERFORMANCE TEST REPORT

SCOPE OF WORK
ASTM E90 SOUND TRANSMISSION LOSS TESTING ON A 3-5/8" SINGLE STEEL STUD WALL, WALL SYSTEM

REPORT NUMBER
K6244.01-303-11-R1

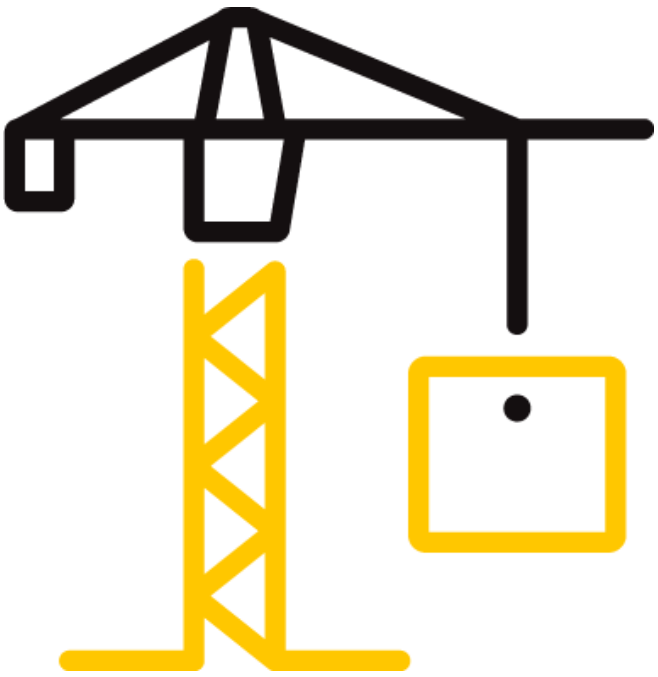
TEST DATE
01/27/20

ISSUE DATE **REVISION DATE**
02/11/20 02/14/20

RETENTION DATE
02/11/24

PAGES
12

DOCUMENT CONTROL NUMBER
RT-R-AMER-Test-2758 (01/24/19)



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Lake Forest, California 92630

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TEST REPORT FOR CALIFORNIA EXPANDED METAL COMPANY (CEMCO)

Report No.: K6244.01-303-11-R1
Date: 02/11/20

REPORT ISSUED TO

CALIFORNIA EXPANDED METAL COMPANY (CEMCO)
13191 Crossroads Parkway
North Suite 325
City of Industry, California

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by California Expanded Metal Company (CEMCO) to conduct a sound transmission loss test. Results obtained are tested values and were secured by using the designated test methods. 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 Lake Forest, California.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

For INTERTEK B&C:

COMPLETED BY:	Josue H. Vides	**REVIEWED BY:**	Leeland S. Hoover
TITLE:	Technician I Acoustical Testing	**TITLE:**	Laboratory Manager Acoustical Testing
SIGNATURE:	Digitally Signed by: Josue Vides	**SIGNATURE:**	Digitally Signed by: Leeland Hoover
DATE:	02/14/20	**DATE:**	02/14/20

JHV: LSH

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SECTION 2
SUMMARY OF TEST RESULTS

SERIES/MODEL	3-5/8” Single Steel Stud Wall 24” O.C
TYPE	Wall System
DATA FILE NO.	K6244.01A
STC	53
OITC	35

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*

SECTION 4
SPECIMEN INSTALLATION

The specimen was constructed in a 168" wide by 120" high by 12" deep steel frame test opening. Dense neoprene foam (3/8" thick by 3" wide) was adhered to the steel frame perimeter. Top and bottom plates and end studs were placed over the foam and fastened to the steel frame by TEK screws (3" long) with isolation washers.

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SECTION 5
EQUIPMENT

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

EQUIPMENT

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Card*	National Instruments	PXIe-4464	Data Acquisition Card	INT00392	09/19
Data Acquisition Card*	National Instruments	PXIe-4464	Data Acquisition Card	INT00395	10/19
Data Acquisition Card*	National Instruments	PXIe-4464	Data Acquisition Card	INT00625	11/18
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00234	03/19
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00235	03/19
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00236	03/19
Source Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00237	03/19
Source Room Microphone	PCB piezotronics	378C20	Microphone and Preamplifier	INT00238	03/19
Receive Room Microphone	PBC Piezotronics	378C20	Microphone and Preamplifier	INT00229	04/19
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00230	04/19
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT01542	04/19
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00232	04/19
Receive Room Microphone	PCB Piezotronics	378C20	Microphone and Preamplifier	INT00233	04/19
Receive Room Environmental Indicator	Comet	T7510	Receive Room	INT00299	05/19
Source Room Environmental Indicator	Comet	T7510	Source Room	INT00300	05/19
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	INT00289	09/19

**- Note: The calibration frequency for this equipment is every two years per the manufacturer's recommendation.*

TEST CHAMBER

	VOLUME	DESCRIPTION
RECEIVE ROOM	231 m³	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor
SOURCE ROOM	196 m³	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

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SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Josue H. Vides	Intertek B&C
Marco T. Santa Rosa	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.

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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.

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.

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SECTION 9
SPECIMEN DESCRIPTION

GYPSUM BOARD	One-Layer 5/8" Type X
STUDS	3-5/8" 18 Mil/20EQ Steel, 24" O.C.
INSULATION	Unfaced R-13 Insulation
GYPSUM BOARD	Two-Layers 5/8" Type X

MATERIAL	ACTUAL DIMENSIONS (inches)	ACTUAL THICKNESS (inches)	MANUFACTURER AND SERIES	QUANTITY	AVERAGE WEIGHT
GYPSUM BOARD	48" by 120"	5/8"	Gypsum Type X	3.5 sheets	2.1 lbs/ft^2
	Note: Screws spaced on 12" centers on the field and 8" centers on the perimeter. Perimeter and joints sealed with acoustical sealant and foil tape. Screw heads sealed with foil tape.				
STUD	1-1/2" by 120"	3-5/8"	CEMCO ViperStud 362VXS144-18 Mil/20EQ, (0.0190")	11 pieces	0.42 lbs/linear ft
	Note: Spaced on 24" centers. Screwed to top and bottom plates.				
INSULATION	24" by 120"	3-1/2"	R-13 Unfaced Fiberglass Insulation	7 batts	0.20 lbs/ft^2
	Note: N/A				
GYPSUM BOARD	48" by 120"	5/8"	Gypsum Type X	3.5 sheets	2.1 lbs/ft^2
	Note: Screws spaced on 12" centers on the field and 8" centers on the perimeter. Perimeter and joints sealed with acoustical sealant and foil tape. Screw heads sealed with foil tape.				
GYPSUM BOARD	48" by 120"	5/8"	Gypsum Type X	3.5 sheets	2.1 lbs/ft^2
	Note: Screws spaced on 12" centers on the field and 8" centers on the perimeter. Perimeter and joints sealed with acoustical sealant and foil tape. Screw heads sealed with foil tape.				

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TOP PLATES	1-1/4” by 168	3-5/8”	CEMCO ViperTrack 362VXT144-18 Mil/20EQ (0.0185")	1.5 pieces	0.40 lbs/linear ft
	Note: N/A				
BOTTOM PLATES	1-1/4" by 168	3-5/8”	CEMCO ViperTrack 362VXT144-18 Mil/20EQ (0.0185")	1.5 pieces	0.40 lbs/linear ft
	Note: N/A				

Photographs are included in Section 11.

The client did not supply a report drawing of the test specimen.

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SECTION 10
TEST RESULTS

ASTM E90
AIRBORNE SOUND TRANSMISSION LOSS

IAS ACCREDITED Testing Laboratory

TEST DATE	01/27/20				
DATA FILE NO.	K6244.01A				
CLIENT	California Expanded Metal Company (CEMCO)				
DESCRIPTION	Series/Model: Single Steel Stud Wall 24" O.C. with 1 Layer 5/8" Gypsum Type X Receive, 2 Layers 5/8" Gypsum Type X Source				
SPECIMEN AREA	13.01 m^2	RECEIVE TEMP.	17.7 °C	SOURCE TEMP	17.8 °C
TECHNICIAN	Marco T Sant	RECEIVE HUMIDITY	56%	SOURCE HUMIDIT	56%

FREQ (Hz)	BACKGROUND SPL (dB)	ABSORPTION (m^2)	SOURCE SPL (dB)	RECEIVE SPL (dB)	SPECIMEN TL (dB)	95% CONFIDENCE LIMIT	NUMBER OF DEFICIENCIES
80	38.6	8.3	102	87	17	1.50	-
100	34.3	6.6	102	82	23	1.08	-
125	42.2	6.0	103	71	35	0.96	2
160	42.6	5.7	104	70	37	0.93	3
200	37.2	6.7	107	69	41	0.65	2
250	27.0	7.2	107	65	45	0.45	1
315	27.7	7.3	107	62	47	0.48	2
400	32.5	6.1	106	59	50	0.34	2
500	19.8	5.2	107	59	52	0.25	1
630	18.1	5.6	107	56	54	0.23	0
800	22.8	5.7	105	53	56	0.35	0
1000	12.8	5.8	107	52	59	0.38	0
1250	12.5	5.9	105	50	58	0.14	0
1600	9.5	6.5	103	48	58	0.13	0
2000	7.9	7.8	102	51	53	0.30	4
2500	7.0	8.8	101	53	50	0.20	7
3150	7.5	9.9	101	48	54	0.25	3
4000	7.5	12.1	97	39	59	0.27	0
5000	7.2	15.4	93	30	62	0.50	-
STC RATING	53	*(Sound Transmission Class)*					
DEFICIENCIES	27	*(Sum of Deficiencies)*					
OITC RATING	35	*(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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ASTM E90
AIRBORNE SOUND TRANSMISSION LOSS

IAS ACCREDITED Testing Laboratory

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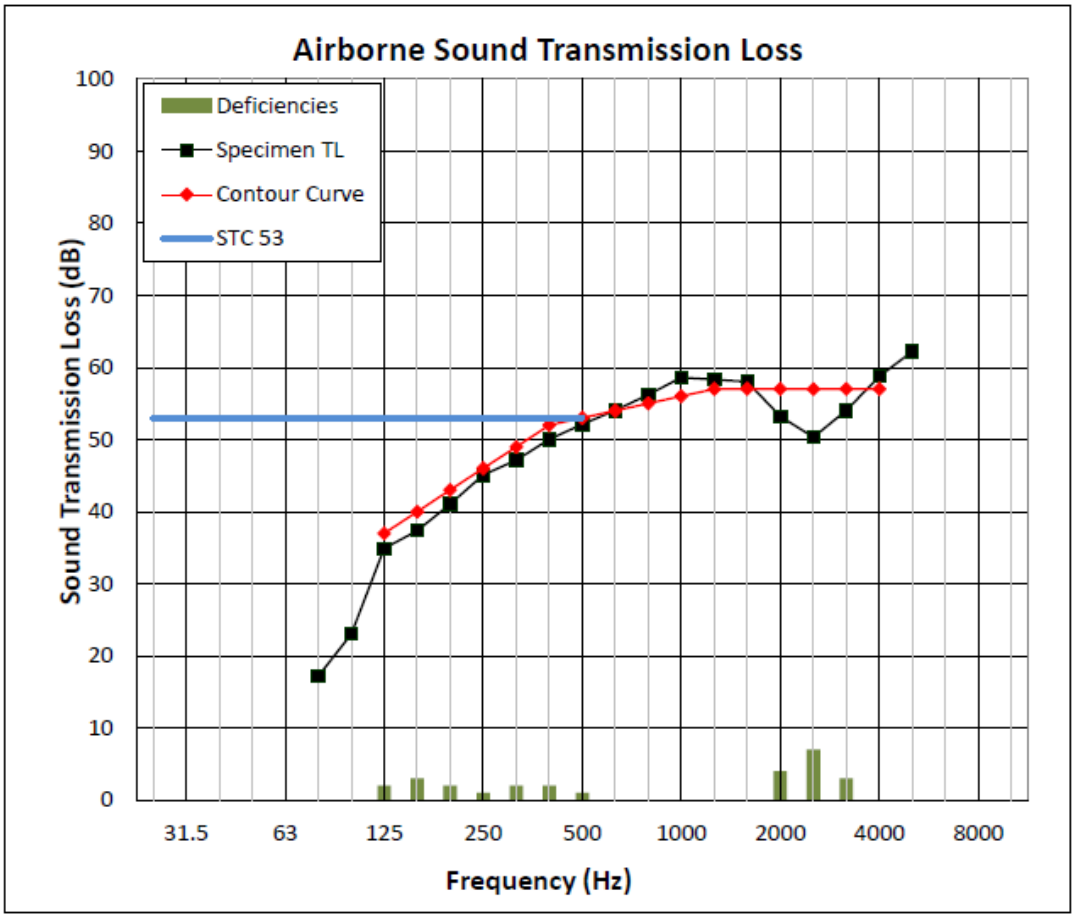

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SECTION 11
PHOTOGRAPHS

Photo No. 1
Source Room View of Test Specimen

Photo No. 2
Receive Room View of Test Specimen

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SECTION 12
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	02/11/20	N/A	Original Report Issue
1	02/13/20	7,8	Section 9; Updated Stud Size from 18 Ga. To 18 Mil/20EQ. Updated Top Plates & Bottom Plates to 18 Mil/20EQ.