

RIVERBANK ACOUSTICAL LABORATORIES

1512 BATAVIA AVENUE
GENEVA, ILLINOIS 60134

OF
IIT RESEARCH INSTITUTE

708/232-0104
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

FOR: Dietrich Industries, Inc.

Sound Transmission Loss
Test RAL™-TL92-46

ON: Stairwall 3

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CONDUCTED: 3 February 1992

TEST METHOD

Unless otherwise designated, the measurements reported below were made with all facilities and procedures in explicit conformity with the ASTM Designations E90-90 and E413-87, as well as other pertinent standards. Riverbank Acoustical Laboratories has been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure. A description of the measuring technique is available separately. The microphone used was a Bruel & Kjaer serial number 792729.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated as Stairwall 3. The overall dimensions of the specimen as measured were 4.27 m (168 in.) wide by 2.74 m (108 in.) high and 101.6 mm (4 in.) thick. The specimen was constructed by Klamer Construction Company directly into the laboratory's 2.74 m (9 ft) by 4.27 m (14 ft) wood-lined steel frame. The description of the specimen was as follows: The specimen was a stairwall assembly constructed of 63.5 mm (2.5 in.) steel C-T studs with one layer of 25.4 mm (1 in.) thick gypsum wallboard liner panels and one layer of 12.7 mm (0.5 in.) thick Firecode C drywall on the source side and single-leg resilient channel between the studs and one layer of 12.7 mm (0.5 in.) thick Firecode C drywall on the receiving side. Mineral wool insulation filled the stud cavities. A visual inspection verified the description of the specimen. The specimen was cured for a minimum of twelve hours before testing. The source and receiving room temperatures at the time of the test were 18°C (65±2°F) and 60±2% relative humidity.

Floor and Ceiling Runners

The runners were 25 ga. steel "J" shaped, 63.5 mm (2.5 in.) wide with unequal legs of 25.4 mm (1 in.) and 57.2 mm (2.25 in.). The "J" runners were manufactured by Dietrich Industries, Inc. The runners were positioned with the short leg toward the receiving room. The runners were attached to the floor and ceiling (top and bottom of the test frame) with 41.3 mm (1.625 in.) type S drywall screws, 0.61 m (24 in.) on center. The end screws were located 50.8 mm (2 in.) from each end. A 3.05 m (120 in.) piece plus a 1.22 m (48 in.) piece was used at both the ceiling and the floor. Runners, cut 2.74 m (108 in.) long, were also used at each end of the wall. The total used was 14.0 m (46 ft). The weight of the "J" runners used was 9.1 kg (20 lbs).

THE RESULTS REPORTED ABOVE APPLY ONLY TO THE SPECIFIC SAMPLE SUBMITTED FOR MEASUREMENT. NO RESPONSIBILITY IS ASSUMED FOR PERFORMANCE OF ANY OTHER SPECIMEN.

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DESCRIPTION OF THE SPECIMEN (con't)

Steel Studs

The steel studs were 63.5 mm (2.5 in.), 25 ga. steel C-T studs 38.1 mm (1.5 in.) wide by 63.5 mm (2.5 in.) deep. The C-T studs were manufactured by Dietrich Industries, Inc. The studs were cut to lengths 19.1 mm (0.75 in.) less than the floor-to-ceiling height and spaced 0.61 m (24 in.) on center. The studs were cut to 2.71 m (106.75 in.) long. Studs were friction fit into the floor and ceiling "J" runners. Six studs were used, and the weight was 11.3 kg (25 lbs).

Gypsum Liner Panels

The gypsum liner panels were 25.4 mm (1 in.) thick gypsum wallboard liner panels (USG type SLX) supplied in nominal 0.61 m (24 in.) widths. The liner panels were cut 25.4 mm (1 in.) less than the floor-to-ceiling height. The vertical edges were inserted into the "T" section of the C-T studs (friction fit). The gypsum liner panels were cut nominally 2.71 m (106.5 in.) long. The weight of the gypsum liner panels used was 231.3 kg (510 lbs).

Resilient Channel

The resilient channel was 25 ga. single-leg resilient channel attached to the face of the "C" shaped section of the C-T studs with 9.5 mm (0.375 in.) S-12 pan head screws. One screw was used at each intersection of the stud and channel. The channels were applied to the studs horizontally across the studs and spaced 0.61 m (24 in.) on center. The first channel was 76.2 mm (3 in.) from the floor with the attachment leg up. The remainder of the channels were 0.61 m (24 in.) on center from the floor with the attachment leg down. The top channel was 76.2 mm (3 in.) from the top of the test frame. Where spliced, the channels were overlapped 31.8 mm (1.25 in.) and attached to the stud with a single screw. A total of 25.6 m (84 ft.) of resilient channel was used, and the weight was 10.0 kg (22 lbs).

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DESCRIPTION OF THE SPECIMEN (con't)

Perimeter Caulking

The perimeter caulking was USG Acoustical Sealant. It was used to caulk the perimeter "J" runners to the test frame. The weight of the acoustical caulk was 5.4 kg (12 lbs).

Insulation

Mineral wool insulation (Thermafiber SAB) manufactured by USG completely filled the stud cavities. The insulation was supplied in batts 38.1 mm (1.5 in.) thick, 0.61 m (24 in.) wide, and 1.22 m (48 in.) long. The weight of the mineral wool insulation used was 21.1 kg (46.5 lbs).

Wallboard Gypsum

The wallboard gypsum was 12.7 mm (0.5 in.) thick USG type X Firecode C drywall. Pieces that were 1.22 m (48 in.) wide were applied vertically in a single layer directly to the studs on the source side and vertically to resilient channels on the receiving side. The drywall was attached to the studs and channels with 25.4 mm (1 in.) long type S bugle head drywall screws spaced 0.30 m (12 in.) on center along the edges and in the field of the boards with the first screw 76.2 mm (3 in.) from the end. The weight of the drywall used was 227 kg (499.5 lbs).

Gypsum Perimeter Caulking

All the 12.7 mm (0.5 in.) gypsum board was installed with an approximately 6.4 mm (0.25 in.) space between the gypsum board and the test frame perimeter. The space between the 12.7 mm (0.5 in.) gypsum board and the test frame was caulked with USG Acoustical Sealant. The weight of the acoustical sealant was 5.4 kg (12 lbs).

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DESCRIPTION OF THE SPECIMEN (con't)

Joint Compound and Paper Tape

The outer layer of 12.7 mm (0.5 in.) gypsum board joints were covered with joint tape and USG All Purpose Joint Compound. The exposed screw heads were covered with joint compound. The weight of the joint compound when wet was 12.2 kg (27 lbs).

Perimeter of Test Assembly

The perimeter of the completed test assembly (both sides) was sealed with Mortite dense mastic.

Weight/Area

The weight of the specimen as determined was 533 kg (1174 lbs) an average of 45.5 kg/m² (9.3 lbs/ft²). The transmission area used in the calculations was 11.7 m² (126 ft²).

TEST RESULTS

Sound transmission loss values are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages. The precision of the TL test data are within the limits set by the ASTM Standard E90-90.

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TEST RESULTS (con't)

<u>FREQ.</u>	<u>T.L.</u>	<u>C.L.</u>	<u>DEF.</u>	<u>FREQ.</u>	<u>T.L.</u>	<u>C.L.</u>	<u>DEF.</u>
100	20	0.28	0	800	58	0.38	0
125	27	0.34	8	1000	61	0.35	0
160	32	0.34	6	1250	64	0.26	0
200	41	0.36	0	1600	67	0.29	0
250	45	0.48	0	2000	67	0.20	0
315	48	0.49	0	2500	62	0.19	0
400	51	0.42	0	3150	59	0.13	0
500	52	0.37	0	4000	63	0.13	0
630	55	0.38	0	5000	67	0.13	0

STC = 51

ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)
T.L. = TRANSMISSION LOSS, dB
C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT
DEF. = DEFICIENCIES, dB<STC CONTOUR
STC = SOUND TRANSMISSION CLASS

Submitted by Diane C. Perrone
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Experimentalist

Tested and Reviewed by John W. Kopec
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Acoustical Laboratories

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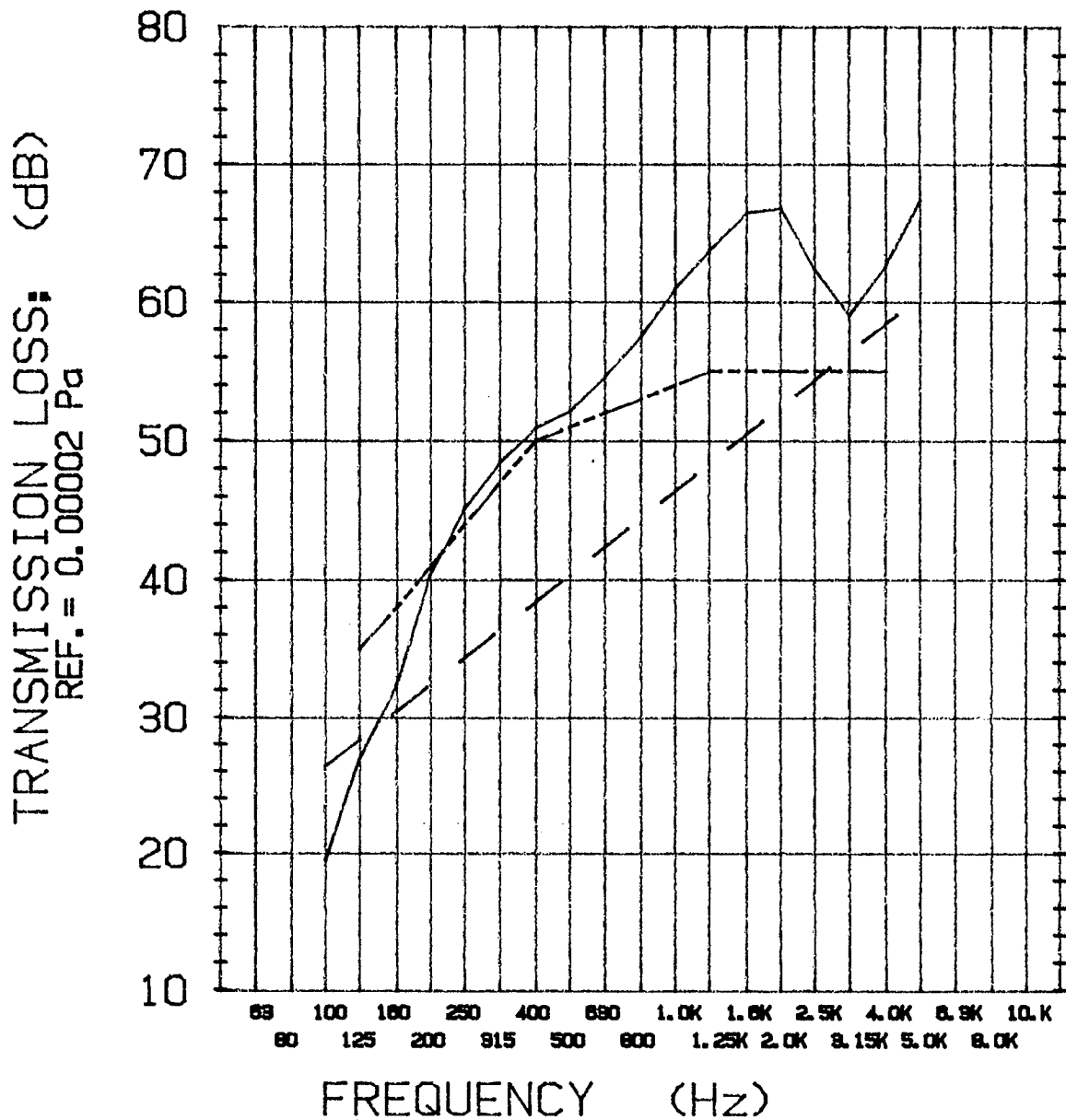
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