1512 S BATAVIA AVENUE
GENEVA, IL 60134
630-232-0104

An ALION Technical Center

Test Report

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FOUNDED 1918 BY
WALLACE CLEMENT SABINE

FOR: **Shredded Tire Inc.**
Fort Lauderdale, FL

Sound Transmission Loss
RAL-TL16-510

CONDUCTED: 2016-11-10

ON: Recycled Tire and Concrete Panels

TEST METHOD

Riverbank Acoustical Laboratories™ is accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) as an ISO 17025:2005 Laboratory (NVLAP Lab Code: 100227-0) and for this test procedure. The test reported in this document conformed explicitly with ASTM E90-09: "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements." The single number rating of the specimen was calculated according to ASTM E413-16: "Classification for Rating Sound Insulation." A description of the measuring procedure and room qualifications is available upon request.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as Recycled Tire and Concrete Panels. A full internal inspection performed on the test specimen by Riverbank personnel verified the manufacturer's description. The client provided 3 units of the specimen which were stacked in a single column of 3 units. Each unit was comprised of a single panel composed of a shredded tire mixture (faced away from the source) adhered to a high strength grout backing (which was faced toward the source). The seams between each of the units were sealed with mastic on both sides of the test specimen.

Source Side

Material:	High strength grout
Thickness:	28.7 mm (1.13 in.) – 33.78 mm (1.33 in.)+

Receive Side

Material:	Shredded Tire mixture (see note below)
Dimensions:	612 mm (24.095 in.) x 1019 mm (40.118 in.)
Thickness:	74.17 mm (2.92 in.) – 79.25 mm (3.12 in.)+

*Note: The rubber portion of the panel was made from mostly recycled shredded tire pieces which were mixed with silica fume, slag cement, and regular Portland cement**

* = *Information provided by manufacturer and not verified by RAL.*
\+ = *Approximate measurement; measurement varied.*

Physical Measures

Overall Dimensions:	1.02 m (40.00 in.) wide by 1.85 m (72.75 in.) high
Overall Thickness:	101.60 mm (4.00 in.)
Overall Weight:	204.46 kg (450.75 lbs.)
Transmission Area:	1.86 m^2 (20.00 ft^2)
Mass per Unit Area:	108.93 kg/m^2 (22.31 $lbs./ft^2$)

Test Aperture

Size:	1.22 m (4.0 ft.) by 2.44 m (8.0 ft.)
Filler Wall:	Yes
Sealed:	Entire periphery (both sides) with dense mastic

Test Environment

Source Room

Volume:	178.3 m^3 (6297.6 ft^3)
Temperature:	23±0ºC (74±1ºF)
Humidity:	50±1%

Receive Room

Volume:	138.1 m^3 (4876.8 ft^3)
Temperature:	24±0ºC (75±0ºF)
Humidity:	50±1%

Requirements

Temperature:	22º C +/- 2° C, not more than 3° C change over all tests.
Humidity:	≥ 30% RH, not more than +/- 3% change over all tests.

Figure 1 – Specimen mounted in the test opening (taken from source side)

Figure 2 – Specimen mounted in the test opening (taken from receive side).

Figure 3 – Detail of test specimen.

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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 transmission loss test data is within the limits set by the ASTM Standard E90-09.

FREQ.	T.L.	C.L.	DEF.	FREQ.	T.L.	C.L.	DEF.
100	35	0.95		800	39	0.15	2
125	34	0.55		1000	41	0.11	1
160	34	0.69		1250	41	0.16	2
200	33	0.54		1600	40	0.13	3
250	35	0.34		2000	40	0.09	3
315	33	0.29	2	2500	42	0.09	1
400	34	0.37	4	3150	43	0.07	
500	34	0.22	5	4000	43	0.05	
630	36	0.21	4	5000	45	0.04	

STC=39

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 (SUM OF DEF = 27)
STC = SOUND TRANSMISSION CLASS

Tested by _____
Dean Victor
Experimentalist

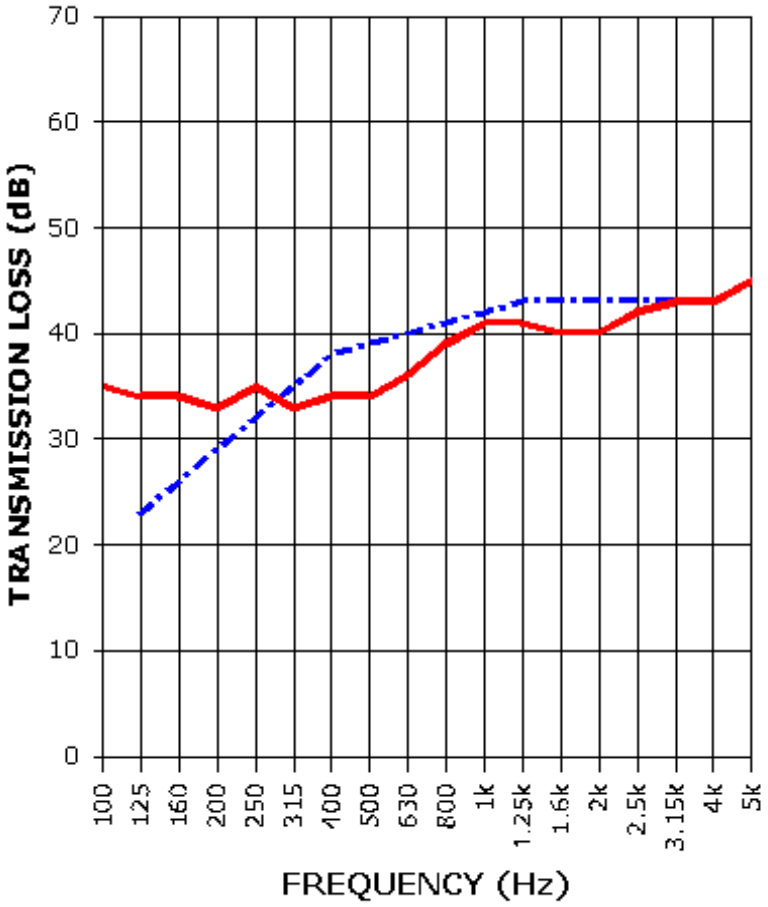
Report by _____
Miles Possing
Acoustician

Approved by _____
Eric P. Wolfram
Laboratory Manager

Digitally signed by Eric Wolfram
DN: cn=Eric Wolfram, o=Alion Science and Technology, ou=Riverbank Acoustical Laboratories, email=ewolfram@alionscience.com, c=US
Date: 2016.11.22 16:25:08 -06'00'

SOUND TRANSMISSION REPORT

Recycled Tire and Concrete Panels



STC=39

OITC=36

TRANSMISSION LOSS
SOUND TRANSMISSION LOSS CONTOUR

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APPENDIX A: Extended Frequency Range Data

Specimen: Recycled Tire and Concrete Panels (See Full Report)

The following non-accredited data were obtained in accordance with ASTM E90-09, but extend beyond the defined frequency range of 100Hz to 5,000Hz. These unofficial results are representative of the RAL test environment only and intended for research & comparison purposes.

1/3 Octave Band Center Frequency (Hz)	**Sound Transmission Loss** (dB)	**Uncertainty** (95% ±)
31.5	22	0.65
40	24	0.68
50	31	1.13
63	29	0.88
80	28	2.18
100	35	0.95
125	34	0.55
160	34	0.69
200	33	0.54
250	35	0.34
315	33	0.29
400	34	0.37
500	34	0.22
630	36	0.21
800	39	0.15
1000	41	0.11
1250	41	0.16
1600	40	0.13
2000	40	0.09
2500	42	0.09
3150	43	0.07
4000	43	0.05
5000	45	0.04
6300	47	0.05
8000	48	0.07
10000	51	0.04
12500	52	0.05

APPENDIX B: OITC Determination (Outdoor Indoor Transmission Class)

Specimen: Recycled Tire and Concrete Panels (See Full Report)

The determination of the Outdoor Indoor Transmission Class (OITC) as reported below was made with explicit conformity to the procedures described in the ASTM E1332-10a test standard. Test Method ASTM E90-09 was used to obtain the sound transmission loss data. This rating is based on an average transportation noise source spectrum and an A-weighted sound level reduction, either of which may be inappropriate for some applications.

One-third Octave Band Center Frequency, Hz	Reference Sound Spectrum, dB	Test Specimen Transmission Loss, dB
80	103	28
100	102	35
125	101	34
160	98	34
200	97	33
250	95	35
315	94	33
400	93	34
500	93	34
630	91	36
800	90	39
1000	89	41
1250	89	41
1600	88	40
2000	88	40
2500	87	42
3150	85	43
4000	84	43

*OITC=**36***

APPENDIX C: Instruments of Traceability

Specimen: Recycled Tire and Concrete Panels (See Full Report)

Description	Model	Serial Number	Date of Certification	Calibration Due
Bruel & Kjaer Pulse Analyzer - System4	Type 3560-C	2639093	2016-07-26	2017-07-26
Bruel & Kjaer Mic And Preamp E	Type 4943-B-001	2311441	2016-03-17	2017-03-17
Bruel & Kjaer Pistonphone	Type 4228	2781248	2016-07-25	2017-07-25
Omega Digital Thermo-Hygrometer B	Model # RH411	H0101841	2015-12-28	2016-12-28
Omega Digital Thermo-Hygrometer D	Model # RH411	H0102210	2016-07-13	2017-07-13

END