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

SPONSOR: **LATICRETE International, Inc**
Bethany, CT

Floor Covering Impact Reduction
RAL-IFC19-001

CONDUCTED: 2019-01-09

ON: Porcelain tile, 125 Tri Max mortar (0.5 in. trowel), Spectralock Pro grout

TEST METHODOLOGY

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) 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 E2179-03 (2016): "Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors" The single number rating was calculated according to ASTM E989-18: "Standard Classification for Determination of Impact Insulation Class (IIC)". A complete description of the measurement procedure and room specifications are available upon request. The results presented in this report apply to the sample material as received from the test sponsor.

STANDARD CONCRETE FLOOR

The laboratory's standard concrete floor is a fully cured 152.40 mm (6.0 in.) thick concrete floor installed directly in the laboratory's 4.27 m (14.0 ft.) by 2.44 m (8 ft.) test opening. No additional ceiling materials were installed over the bottom face of the concrete.

Concrete Slab

Material:	Wire-reinforced concrete
Dimensions:	4 @ 609.6 mm (24 in.) x 4267.2 mm (168 in.)
Thickness:	152.4 mm (6 in.)
Overall Weight:	3474.74 kg (7660.5 lbs)
Mass per Unit Area:	333.94 kg/m^2 (68.40 lbs/ft^2)
Joints:	Underside sealed with acoustical caulk and tape
	Top filled with general purpose sand, sealed with ready mix compound

Note: A 0.1 mm (0.004 in.) thick polyethylene sheet was adhered with spray adhesive to the top face of the concrete slab in order to protect the slab surface.

SPECIMEN MEASUREMENTS & TEST CONDITIONS

The test specimen was designated by the sponsor as Porcelain tile, 125 Tri Max mortar (0.5 in. trowel), Spectralock Pro grout.
The building contractor and RAL staff compiled a detailed construction specification for the test specimen as follows, in order of installation:

Mortar

Trade Name:	Laticrete 125 Tri Max
Installed Thickness:	Approximately 9.52 mm (0.375 in.)
Installation Method:	12.7 mm (0.5 in.) x 12.7 mm (0.5 in.) x 12.7 mm (0.5 in.) trowel Trowel lines oriented parallel to length of concrete slab
Mix Ratio	4.12 L water per 11.34 kg (25 lbs) dry mortar
Wet Weight:	61.58 kg (135.75 lbs)

Tiles

Material:	Porcelain
Tile Dimensions:	304.8 mm (12 in.) x 304.8 mm (12 in.)
Tile Thickness:	7.87 mm (0.31 in.)
Overall Weight:	166.24 kg (366.5 lbs)
Installation:	Layer of mortar applied to bottom face with straight edge of trowel Approximately 3.18 mm (0.125 in.) thick mortar layer on tile Treated tiles laid on troweled mortar layer Tiles spaced 6.35 mm (0.25 in.) apart
Installation Date:	2018-12-10

Grout

Trade Name:	Laticrete Spectralock Pro Premium Grout
Installation:	Inserted into gaps between tiles
Overall Weight:	6.92 kg (15.25 lbs)
Installation Date:	2018-12-12

Physical Measures

Size:	2.44 m (96.0 in) wide by 4.27 m (168.0 in) long
Overall Thickness:	15.24 mm (0.6 in.)
Overall Weight:	234.73 kg (517.5 lbs)
Transmission Area:	10.405 m² (112 ft²)
Mass per Unit Area:	22.56 kg/m² (4.62 lbs/ft²)

Test Aperture

Size:	4.27 m (14.0 ft.) by 2.44 m (8 ft.)
Filler Wall:	None
Sealed:	Entire periphery (both sides) with dense mastic

Test Environment

Source Room

Volume:	131.3 m³
Temperature:	22.8 °C ± 0.0 °C
Relative Humidity:	49.5 % ± 1.0 %

Receive Room

Volume:	82.64 m³
Temperature:	22.8 °C ± 0.0 °C
Relative Humidity:	48.0 % ± 2.0 %

Figure 1 – Completed specimen mounted in test opening, as viewed from source room

Figure 2 – Typical application of mortar to rear face of tile prior to installation

Figure 3 – Mortar and tiles partially installed over concrete slab

Figure 4 – Underside of concrete slab, as viewed from receive room

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TEST RESULTS

1/3 Octave Center Frequency (Hz)	Normalized Impact SPL, L_0, Bare Standard Concrete Floor (dB)	Normalized Impact SPL, L_c, Floor Covering Installed (dB)	Reduction in Impact SPL, L_d, ($L_o - L_c$), (dB)	Impact SPL of Floor Covering on a Reference Concrete Slab, $L_{ref,c}$, (dB)
100	57	58	-1	68
125	58	57	1	67
160	61	60	1	67
200	62	62	0	69
250	68	66	2	67
315	70	70	0	70
400	71	68	3	67
500	70	70	0	71
630	70	69	1	70
800	71	69	2	70
1000	70	66	4	68
1250	71	64	7	65
1600	75	61	14	58
2000	73	56	17	55
2500	72	52	20	52
3150	73	48	25	47

Increase in Impact Insulation Class $\Delta IIC = 16$

Impact Insulation Class, IIC_c for $L_{ref,c}$ $IIC_c = 44$

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TEST RESULTS (Continued)

The measured impact sound pressure levels (ISPL) are tabulated in each of the twenty-one standard one third octave bands from 100 Hz through 3150 Hz for both the standard concrete slab and the installed test specimen. The reduction in ISPL calculated for the floor covering has been applied to a reference concrete floor with an IIC = 28 as described in the standard. The increase in impact insulation class, ΔIIC as well as the IIC_c for the floor covering on a reference concrete slab has also been calculated. An * indicates that the value has been adjusted for background noise levels and reflects a lower limit. A graphic presentation of the data appears on the following page.

Tested by _____
Marc Sciaky
Senior Experimentalist

Report by _____
Malcolm Kelly
Acoustician

Approved by _____
Eric P. Wolfram
Laboratory Manager

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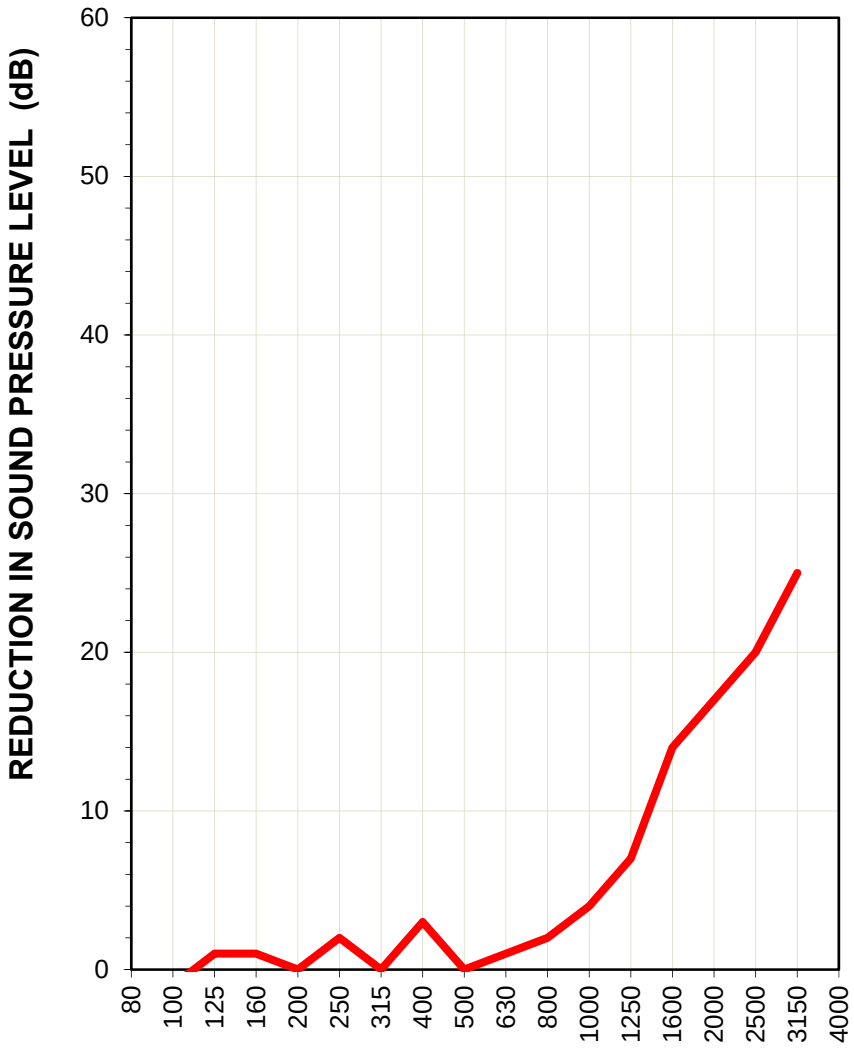
Date: 2019.02.21 13:49:43 -06'00'

Floor Covering Impact Reduction

Porcelain tile, 125 Tri Max mortar (0.5 in. trowel), Spectralock Pro grout



ΔIIC=16

IMPACT REDUCTION OF FLOOR COVERING ON A CONCRETE FLOOR

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APPENDIX A: Instruments of Traceability

Specimen: Porcelain tile, 125 Tri Max mortar (0.5 in. trowel), Spectralock Pro grout (See Full Report)

Description	Model	Serial Number	Date of Certification	Calibration Due
System 2	Type 3160-A-042	3160-106974	2018-08-09	2019-08-09
Bruel & Kjaer Mic And Preamp D	Type 4943-B-001	2311440	2018-09-28	2019-09-28
Wood Case Tapping Machine	Type 3204	226940	2018-08-23	2019-08-23
Bruel & Kjaer Pistonphone	Type 4228	2781248	2018-08-06	2019-08-06
EXTECH Hygro 330	SD700	A083330	2018-09-07	2019-09-07
EXTECH Hygro 322	SD700	A083322	2018-09-07	2019-09-07

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