

Test Report

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

Floor Covering Impact Reduction
RAL™-IFC19-002

CONDUCTED: 2019-02-07

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ON: Porcelain tile, 125 Tri Max mortar (0.25 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/m² (68.40 lbs/ft²)
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.

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SPECIMEN MEASUREMENTS & TEST CONDITIONS

The test specimen was designated by the sponsor as Porcelain tile, 125 Tri Max mortar (0.25 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 6.35 mm (0.25 in.)
Installation Method: 6.35 mm (0.25 in.) x 9.52 mm (0.375 in.) x 6.35 mm (0.25 in.) trowel
Trowel lines oriented parallel to length of concrete slab
Mix Ratio 4.375 L water per 11.34 kg (25 lbs) dry mortar
Wet Weight: 44.57 kg (98.25 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: 166.47 kg (367 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: 2019-01-09

Grout

Trade Name: Laticrete Spectralock Pro Premium Grout
Installation: Inserted into gaps between tiles
Overall Weight: 7.94 kg (17.5 lbs)
Installation Date: 2019-01-11

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Physical Measures

Size: 2.44 m (96.0 in) wide by 4.27 m (168.0 in) long
Thickness: 12.7 mm (0.5 in.)
Weight: 218.97 kg (482.75 lbs)
Transmission Area: 10.405 m² (112 ft²)
Mass per Unit Area: 21.04 kg/m² (4.31 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: 23.3 °C ± 0.0 °C
Relative Humidity: 48.0 % ± 2.0 %

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



Figure 2 – Pretreatment of tiles with smooth mortar layer

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Figure 3 – Mortar and tile 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 , ($L_0 - L_c$), (dB)	Impact SPL of Floor Covering on a Reference Concrete Slab, $L_{ref,c}$, (dB)
100	59	60	-1.0	68.0
125	58	58	0.0	67.5
160	61	61	0.0	68.0
200	63	62	1.0	67.5
250	66	65	1.0	68.0
315	70	69	1.0	68.5
400	70	68	2.0	68.0
500	70	68	2.0	68.5
630	69	68	1.0	70.0
800	70	68	2.0	69.5
1000	70	65	5.0	67.0
1250	69	64	5.0	67.0
1600	74	64	10.0	62.0
2000	72	59	13.0	59.0
2500	71	55	16.0	56.0
3150	71	53	18.0	54.0

Increase in Impact Insulation Class $\Delta IIC = 14$

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

$IIC_c = 42$

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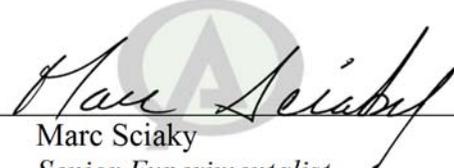
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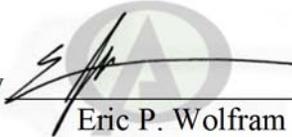
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TEST RESULTS (Continued)

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.

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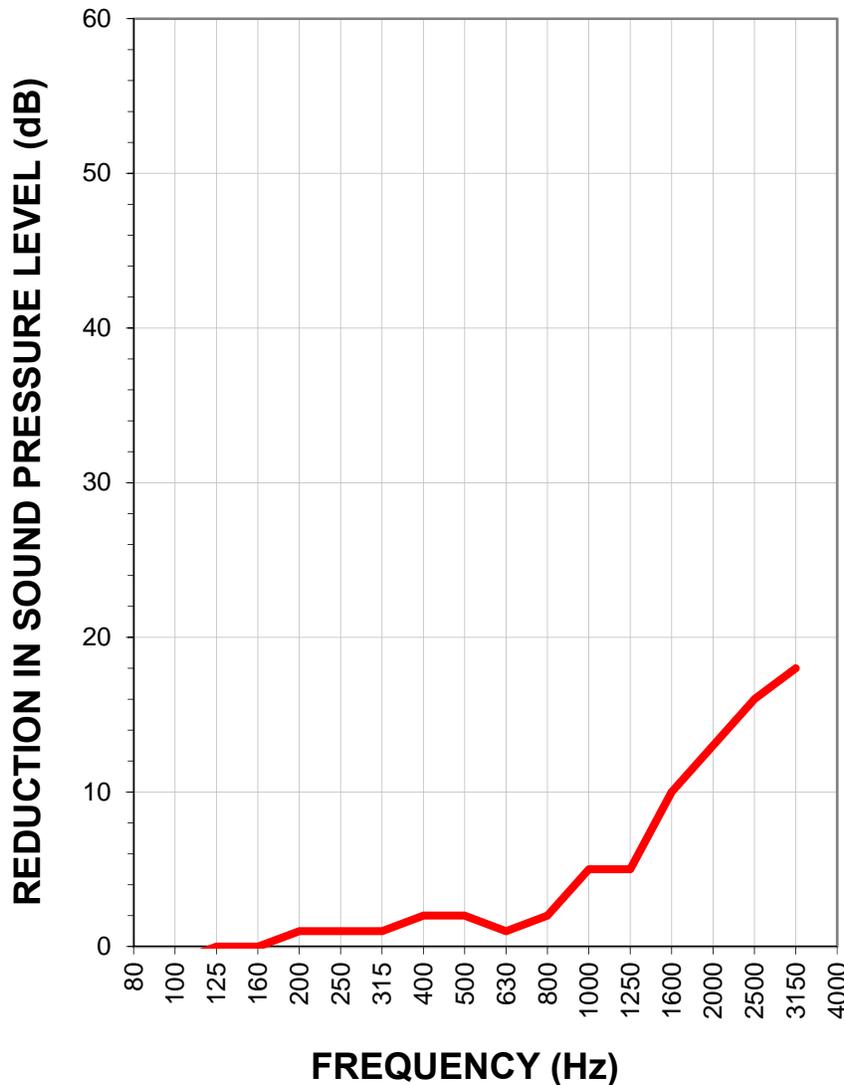
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Floor Covering Impact Reduction

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ΔIIC=14



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 (0.25 in. trowel), Spectralock Pro grout (See Full Report)

<u>Description</u>	<u>Model</u>	<u>Serial Number</u>	<u>Date of Certification</u>	<u>Calibration Due</u>
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

APPENDIX B: Revisions to Original Test Report

Specimen: Porcelain tile, 125 Tri Max mortar (0.25 in. trowel), Spectralock Pro grout (See Full Report)

<u>Date</u>	<u>Revision</u>
2019-01-02	Original report issued

END