FOR: **LATICRETE International, Inc.**
Bethany, CT.

Floor Covering Impact Reduction
RAL™-IFC15-011

CONDUCTED: 2015-09-11

ON: 5/16 inch Porcelain Tile - Fracture Ban™ 40 Peel and Stick Membrane

TEST METHOD

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 (NVLAP Lab Code: 100227-0). The test reported in this document conformed explicitly with ASTM E2179-03 (2009): "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 E989-06 (2012): "Standard Classification for Determination of Impact Insulation Class (IIC)." The measurements were recorded using a real time analyzer and a rotating microphone boom incorporating a spatial average. The rotation speed of the boom was set at 32 seconds per revolution and the linear integration time of the analyzer was set at 32 seconds. The impact sound pressure levels (ISPL) were measured for each of the twenty-one standard one-third octave bands from 50 Hz through 5000 Hz for both the standard concrete slab and the provided specimen. 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 6.10 m (20.0 ft.) test opening. A complete 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 5/16 inch Porcelain Tile - Fracture Ban™ 40 Peel and Stick Membrane. The building contractor and RAL staff compiled a detailed construction specification as follows:

Flooring

Layer 1:	Crossville unglazed porcelain tile and Laticrete Permacolor® Grout
Weight:	497.14 kg (1096.0 lbs.)
Mass per Unit Area:	19.11 kg/m^2 (3.91 lbs./ft^2)

The dimensions of each tile were measured as 298.45 mm (11.75 in.) wide by 298.45 mm (11.75 in.) long and 8.38 mm (0.33 in.) thick. The tile series was Cross Colors. The color was A825 Mercury. The individual weights of the tile and grout were 478.54 kg (1055.0 lbs.) and 18.60 kg (41.0 lbs.), respectfully.

Layer 2:	Laticrete 253 Gold Mortar
Weight:	85.96 kg (189.50 lbs.)
Mass per Unit Area:	3.30 kg/m^2 (0.68 lbs./ft^2)

Layer 3:	Laticrete Fracture Ban™ 40 Peel and Stick Membrane
Thickness:	1.02 mm (0.04 in.)

Flooring (Continued)

Weight:	10.66 kg (23.50 lbs.)
Mass per Unit Area:	0.41 kg/m^2 (0.08 lbs./ft^2)

Note: Note: The membrane was laid over the 152.40 mm (6.0 in.) concrete labs. The mortar was then applied over the membrane using a trowel. Tile was set in the mortar bed with a 6.35 mm (0.25 in.) grout joint. The mortar was allowed to cure for at least 24 hours before grouting. The flooring was then allowed to cure for at least 21 day prior to testing.

Concrete Slab

Overall Size:	Ten at 609.60 mm (24.0 in.) wide by 4.23 m (166.50 in.) long
Overall Thickness:	152.40 mm (6.0 in.)
Material:	Wire-reinforced concrete
Weight:	8640.93 kg (19,050.0 lbs.)
Mass per Unit Area:	332.22 kg/m^2 (68.04 lbs./ft^2)
Joints:	Sealed with acoustical caulk (underside) Filled with general purpose sand, sealed with ready mix compound.

Physical Measures

Size:	4.27 m (168.00 in.) wide by 6.10 m (240.00 in.) long
Thickness:	163.29 mm (6.43 in.)
Weight:	9234.69 kg (20359.0 lbs.)
Mass per Unit Area:	355.04 kg/m^2 (72.71 lbs./ft^2)
Transmission Area:	26.01 m^2 (280.00 ft^2)

Test Aperture

Size:	4.27 m (14.0 ft.) by 6.10 m (20.0 ft.)
Filler Wall:	None
Sealed:	Entire periphery (both sides) with dense mastic

Test Environment

Source Room

Volume:	139.6 m^3 (4,929.5 ft^3)
Temperature:	24±0ºC (75±1ºF)
Humidity:	61±1%

Receive Room

Volume:	87.0 m^3 (3,072.7 ft^3)
Temperature:	24±0ºC (75±0ºF)
Humidity:	63±1%

* = *Information provided by manufacturer and not verified by RAL.*

Figure 1 – Specimen mounted in the test opening.

Figure 2 - Detail of the test specimen.

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TEST RESULTS

1/3 Octave Center Frequency (Hz)	Impact SPL, L_o, Bare Standard Concrete Floor (dB)	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	69.0	69.0	0.0	67.0
125	64.0	64.0	0.0	67.5
160	66.0	64.0	2.0	66.0
200	68.0	67.0	1.0	67.5
250	69.0	69.0	0.0	69.0
315	71.0	71.0	0.0	69.5
400	70.0	68.0	2.0	68.0
500	70.0	69.0	1.0	69.5
630	67.0	67.0	0.0	71.0
800	70.0	69.0	1.0	70.5
1000	72.0	68.0	4.0	68.0
1250	71.0	63.0	8.0	64.0
1600	73.0	65.0	8.0	64.0
2000	73.0	62.0	11.0	61.0
2500	74.0	57.0	17.0	55.0
3150	75.0	53.0	22.0	50.0

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

Impact Insulation Class, IIC_c for $L_{ref,c}$ $IIC_c = 42$

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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 three sample materials. 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
Experimentalist

Report by _____
Chris Nottoli
Acoustician

Approved by _____
Eric P. Wolfram
Laboratory Manager

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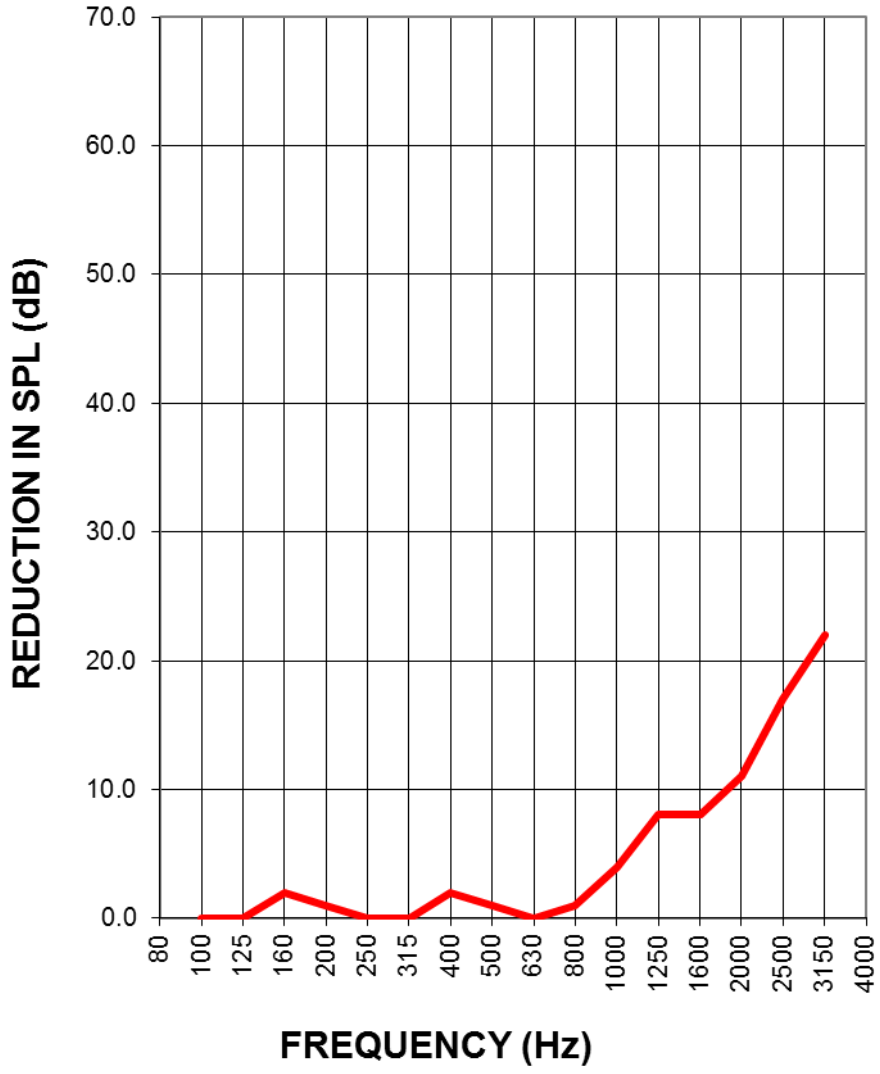
DN: cn=Eric Wolfram, o=Alion Science and Technology, ou=Riverbank Acoustical Laboratories, email=ewolfram@alionscience.com, c=US
Date: 2015.09.16 14:55:10 -05'00'

Floor Covering Impact Reduction

5/16 inch Porcelain Tile - Fracture Ban™ 40 Peel and Stick Membrane



ΔIIC=14

IMPACT REDUCTION OF FLOOR COVERION ON A CONCRETE FLOOR

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APPENDIX A: Instruments of Traceability

Specimen: 5/16 inch Porcelain Tile - Fracture Ban™ 40 Peel and Stick Membrane (See Full Report)

Description	Model	Serial Number	Date of Certification	Calibration Due
Bruel & Kjaer Pulse Analyzer	Type 3560-C	2647140	2015-04-08	2016-04-08
Bruel & Kjaer Mic And Preamp	Type 4943-B-001	2311439	2015-03-18	2016-03-18
Bruel & Kjaer Tapping Machine	Type 3207	2724862	2014-12-02	2015-12-02
G.R.A.S Pistonphone	Type42AF-1	80001	2015-08-14	2016-08-14
Omega Digital Thermo-Hygrometer	Model # RH411	H0101841	2014-11-28	2015-11-28
Omega Digital Thermo-Hygrometer	Model # RH411	H0103273	2015-06-30	2016-06-29

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