

## Test Report

FOR: **Regupol Acoustics**  
Lebanon, PA

**Impact Sound Transmission**  
**RAL-IN17-028**

CONDUCTED: 2017-07-12

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ON: Quarry Floor Tiles and Regupol SonusPlus (underlayment) over 8 inch Concrete Slab (no Ceiling)

### 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 E492-09: "Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine." The single number rating of the specimen was calculated according to ASTM E989-06 (2012): "Standard Classification for Determination of Impact Insulation Class (IIC)." 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 Quarry Floor Tiles and Regupol SonusPlus (underlayment) over 8 inch Concrete Slab (no Ceiling).

The building contractor and RAL staff compiled a detailed construction specification as follows:

#### Concrete Slab

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Dimensions: Four at 609.60 mm (24.0 in.) wide by 4.23 m (166.50 in.) long  
Thickness: 203.2 mm (8 in.)  
Material: Wire-reinforced concrete  
Weight: 5,023.08 kg (11,074 lbs.)  
Mass per Unit Area: 482.75 kg/m<sup>2</sup> (98.875 lbs./ft<sup>2</sup>)  
Joints: Sealed with acoustical caulk (underside)  
Filled with general purpose sand, sealed with ready mix compound.

#### Flooring

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Layer 1  
Material: Rubber-like Underlayment  
Dimensions: 2 @ 1219.2 mm (48 in.) x 4267.2 mm (168 in.)  
Overall Thickness: 12.7 mm (0.5 in.)  
Weight: 73.94 kg (163 lbs)  
Area Mass Density: 7.13 kg/m<sup>2</sup> (1.46 lbs/ft<sup>2</sup>)



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### Flooring (Continued)

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Layer 2  
Material: Ultraflex 3 thinset mortar  
Trowel: 1/4"-3/8"-1/4"  
Weight: 36.97 kg (81.5 lbs)  
Area Mass Density: 3.55 kg/m<sup>2</sup> (0.73 lbs/ft<sup>2</sup>)  
Layer 3  
Material: Quarry tile  
Dimensions: 304.8 mm (12 in.) x 304.8 mm (12 in.)  
Thickness: 11.94 mm (0.47 in.)  
Overall Weight: 283.04 kg (624 lbs)  
Area Mass Density: 27.19 kg/m<sup>2</sup> (5.57 lbs/ft<sup>2</sup>)

### Physical Measures

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Size: 2.44 m (96.00 in.) wide by 4.27 m (168.00 in.) long  
Thickness: 228.60 mm (9.00 in.)  
Weight: 5427.66 kg (11965.75 lbs.)  
Transmission Area: 10.40 m<sup>2</sup> (112.00 ft<sup>2</sup>)  
Mass per Unit Area: 521.64 kg/m<sup>2</sup> (106.84 lbs./ft<sup>2</sup>)

### Test Aperture

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Size: 4.27 m (14.0 ft) x 6.10 m (20.0 ft)  
Filler Wall: Yes – STC 77 filler – isolated concrete slabs with suspended gypsum board ceiling  
Sealed: Entire periphery (both sides) with dense mastic

### Test Environment

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Source Room  
Volume: 130.4 m<sup>3</sup> (4,604.6 ft<sup>3</sup>)  
Temperature: 24±0°C (75±0°F)  
Humidity: 63±1%

Receive Room  
Volume: 83.2 m<sup>3</sup> (2,938.7 ft<sup>3</sup>)  
Temperature: 23±0°C (73±1°F)  
Humidity: 63±0%

### Requirements

Temperature: 22° C +/- 5° C, not more than 3° C change over all tests.  
Humidity: ≥ 30% RH; not more than +/- 3% change over all tests.



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Figure 1 – Specimen mounted in the test opening.



Figure 2 – Concrete slabs mounted in the test opening.



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Figure 3 – Detail of underlayment installed on concrete slabs.

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### TEST RESULTS

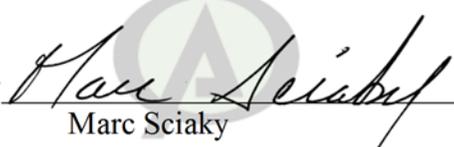
The impact sound pressure levels, normalized to 10 m<sup>2</sup>, are tabulated at the sixteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages. The precision of the test data is within the limits set by the ASTM Standard E989-06 (2012).

<u>FREQ.</u>	<u>Ln</u>	<u>C.L.</u>	<u>DEV</u>	<u>FREQ.</u>	<u>Ln</u>	<u>C.L.</u>	<u>DEV</u>
100	59	0.49	1	800	44	0.34	
125	54	1.73		1000	42	0.26	
160	62	0.52	4	1250	35	0.22	
200	66	0.56	8	1600	31	0.21	
250	62	0.77	4	2000	31	0.19	
315	57	0.69		2500	28	0.16	
400	53	0.55		3150	23	0.16	
500	48	0.42					
630	47	0.53					

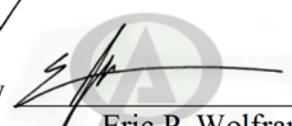
IIC=54

### ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)  
 Ln = NORMALIZED IMPACT SOUND PRESSURE LEVEL, dB  
 C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT  
 DEV. = DEVIATION, dB > IIC CONTOUR (SUM OF DEV = 17)  
 IIC = IMPACT INSULATION CLASS  
 \* = INDICATES A CORRECTION HAS BEEN APPLIED TO DATA  
 DUE TO BACKGROUND NOISE LEVELS

Tested by   
 Marc Sciaky  
 Experimentalist

Report by   
 Miles Possing  
 Acoustician

Approved by   
 Eric P. Wolfram  
 Laboratory Manager



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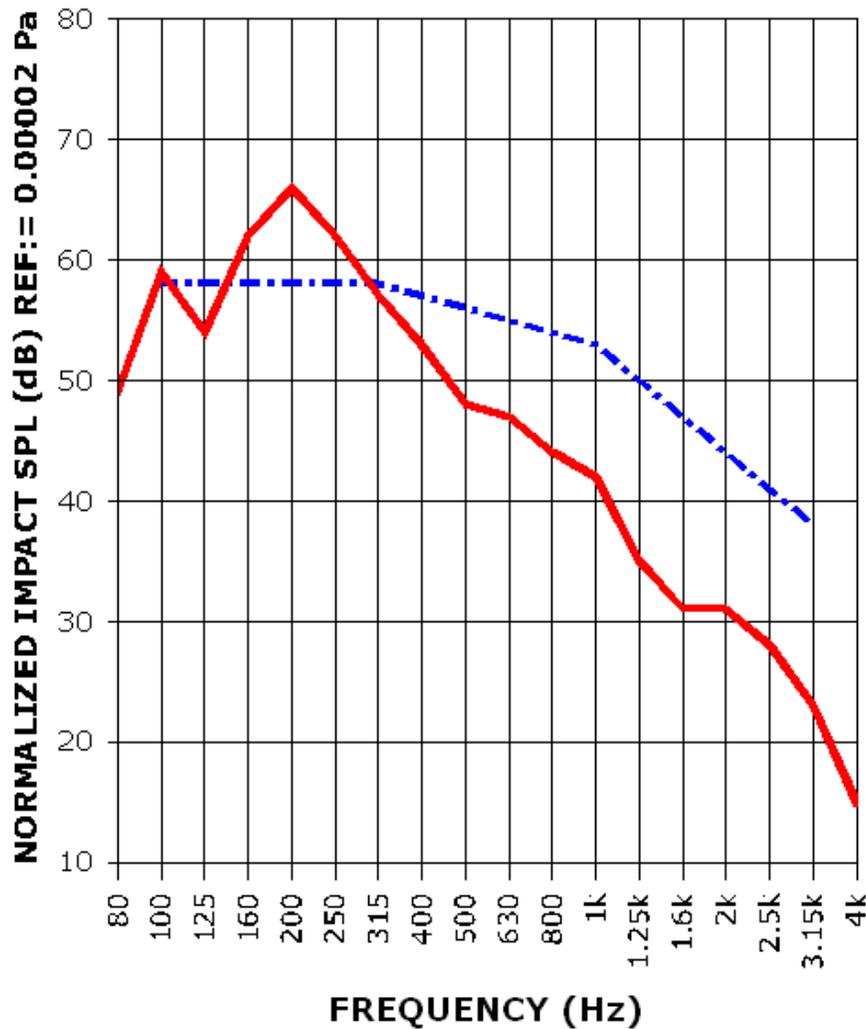
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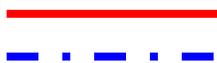
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**IMPACT SOUND TRANSMISSION REPORT**

Quarry Floor Tiles and Regupol SonusPlus (underlayment) over 8 inch Concrete Slab  
 (no Ceiling)



**IIC=54**



**IMPACT SOUND PRESSURE LEVEL**  
**IMPACT INSULATION CLASS CONTOUR**



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### APPENDIX A: Extended Frequency Range Data

Specimen: Quarry Floor Tiles and Regupol SonusPlus (underlayment) over 8 inch Concrete Slab (no Ceiling) (See Full Report)

*The following non-accredited data were obtained in accordance with ASTM E989-06 (2012), but extend beyond the defined frequency range of 100Hz to 3,150Hz. These unofficial results are representative of the RAL test environment only and intended for research & comparison purposes.*

1/3 Octave Band Center Frequency (Hz)	Normalized Impact Sound Pressure Level (dB)	Repeatability (95% ±)
31.5	58	1.26
40	50	1.70
50	49	0.86
63	57	0.44
80	49	0.81
100	59	0.49
125	54	1.73
160	62	0.52
200	66	0.56
250	62	0.77
315	57	0.69
400	53	0.55
500	48	0.42
630	47	0.53
800	44	0.34
1000	42	0.26
1250	35	0.22
1600	31	0.21
2000	31	0.19
2500	28	0.16
3150	23	0.16
4000	15	0.60
5000	8	1.68
6300	7	2.06
8000	8	1.85
10000	9	1.37
12500	9	1.51



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### **APPENDIX B: Instruments of Traceability**

Specimen: Quarry Floor Tiles and Regupol SonusPlus (underlayment) over 8 inch Concrete Slab (no Ceiling) (See Full Report)

<b><u>Description</u></b>	<b><u>Model</u></b>	<b><u>Serial Number</u></b>	<b><u>Date of Certification</u></b>	<b><u>Calibration Due</u></b>
Bruel & Kjaer Pulse Analyzer - System4	Type 3560-C	2639093	2016-07-26	2017-07-26
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2016-09-19	2017-09-19
Bruel & Kjaer Tapping Machine	Type 3207	2724862	2016-12-05	2017-12-05
Bruel & Kjaer Pistonphone	Type 4228	2781248	2016-07-25	2017-07-25
Omega Digital Thermo-Hygrometer A	Model # RH411	H0102487	2016-08-12	2017-08-12
Omega Digital Thermo-Hygrometer B	Model # RH411	H0101841	2017-01-17	2018-01-18

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