

## Test Report

FOR: **Protecto Wrap Co.**  
Denver, Colorado

**Impact Sound Transmission**  
**RAL-IN16-035**

CONDUCTED: 2016-11-01

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ON: Porcelain Tile flooring - Thinset Mortar - Whisper Mat underlayment - 8 inch Concrete Slabs -  
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 Porcelain Tile flooring - Thinset Mortar - Whisper Mat underlayment - 8 inch Concrete Slabs - No Ceiling.

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

#### Flooring

|                         |  |
|-------------------------|--|
| Underlayment:           | Protecto Wrap Whisper Mat CS   |
| Underlayment Thickness: | 2.5 mm (0.098 in.)   |
| Underlayment Weight:    | 53.18 kg (117.25 lbs.)   |
| Mortar:                 | TEC Fast Setting Latex-Modified Mortar                                   |
| Thin Set:               | ¼" ⅜" ¼"   |
| Mortar Weight:          | 94.5 kg (208.25 lbs.)  |
| Tile:                   | Gres Fine Porcellanato Ingelivo<br>(Porcelain Stoneware Frost Resistant) |
| Tile Material:          | Porcelain  |
| Tile Dimensions:        | 301.62 mm (11.875 in.) x 301.62 mm (11.875 in.)                          |
| Tile Thickness:         | 5.5 mm (0.217 in.)   |
| Tile Spacing:           | 6.35 mm (0.25 in.)   |
| Tile Weight:            | 321.8 kg (709.5 lbs.)  |
| Grout:                  | Tec 550 Power Grout (NB Fuller)  |
| Grout Weight:           | 16.9 kg (37.25 lbs.)   |



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### Concrete Slab

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Dimensions: Ten 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: 12,462 kg (27,474 lbs.)  
Joints: Sealed with acoustical caulk (underside)  
Filled with general purpose sand, sealed with ready mix compound.

*Note: The slab surface was protected with a single layer of loose laid rosin paper.*

### Physical Measures

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Size: 4.27 m (168.00 in.) wide by 6.10 m (240.00 in.) long  
Thickness: 223.27 mm (8.79 in.)  
Weight: 12997.23 kg (28653.50 lbs.)  
Transmission Area: 26.01 m<sup>2</sup> (280.00 ft<sup>2</sup>)  
Mass per Unit Area: 499.62 kg/m<sup>2</sup> (102.33 lbs./ft<sup>2</sup>)

### Test Aperture

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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

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#### Source Room

Volume: 137.6 m<sup>3</sup> (4,859.2 ft<sup>3</sup>)  
Temperature: 23±0°C (73±0°F)  
Humidity: 65±2%

#### Receive Room

Volume: 87.1 m<sup>3</sup> (3,075.7 ft<sup>3</sup>)  
Temperature: 23±0°C (74±1°F)  
Humidity: 67±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 on the concrete slab. (Note: spacers were still present at the time the photo was taken, but were removed before installation of grout)



Figure 2 – Underlayment installed on the concrete slab.



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GENEVA, IL 60134  
630-232-0104

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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          | 52        | 1.03        |            | 800          | 59        | 0.72        | 2          |
| 125          | 62        | 2.57        | 1          | 1000         | 58        | 0.74        | 2          |
| 160          | 60        | 1.85        |            | 1250         | 53        | 0.37        |            |
| 200          | 57        | 1.01        |            | 1600         | 50        | 1.04        |            |
| 250          | 65        | 2.27        | 4          | 2000         | 47        | 0.44        |            |
| 315          | 64        | 1.39        | 3          | 2500         | 42        | 0.60        |            |
| 400          | 65        | 1.13        | 5          | 3150         | 38        | 0.66        |            |
| 500          | 61        | 1.18        | 2          |              |           |             |            |
| 630          | 62        | 0.74        | 4          |              |           |             |            |

IIC=51

### 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 = 23 )

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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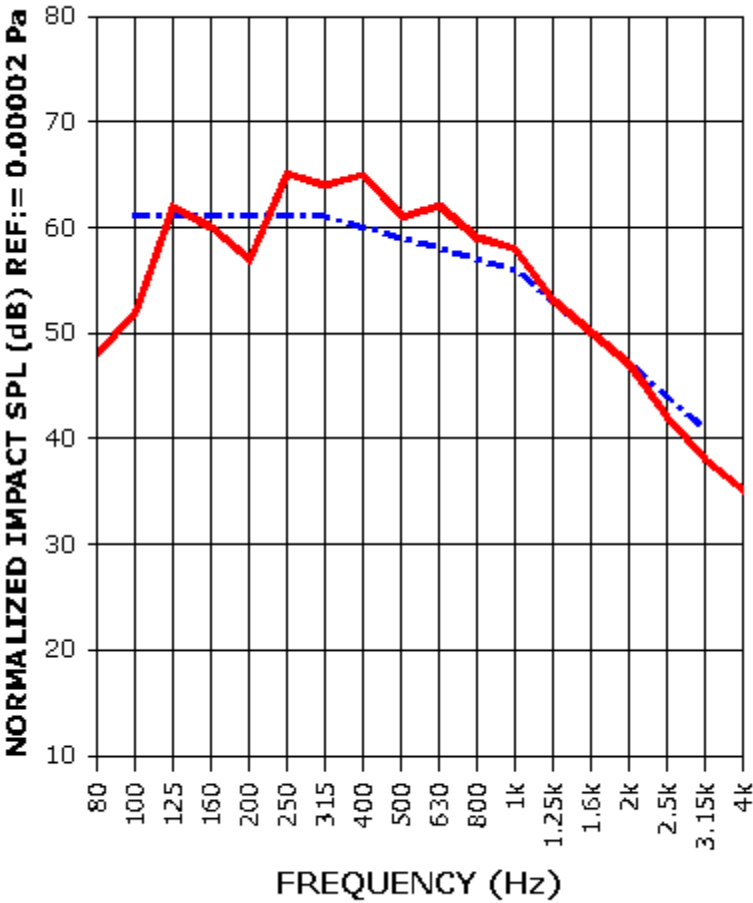
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IMPACT SOUND TRANSMISSION REPORT

Porcelain Tile flooring - Thinset Mortar - Whisper Mat underlayment - 8 inch  
Concrete Slabs - No Ceiling



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IMPACT SOUND PRESSURE LEVEL  
IMPACT INSULATION CLASS CONTOUR



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### **APPENDIX A: Extended Frequency Range Data**

Specimen: Porcelain Tile flooring - Thinset Mortar - Whisper Mat underlayment - 8 inch Concrete Slabs - 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<br>Center Frequency<br>(Hz) | Normalized Impact<br>Sound Pressure Level<br>(dB) | Repeatability<br>(95% $\pm$ ) |
|---|---|-------------------------------|
| 31.5  | 75  | 3.13                          |
| 40  | 49  | 1.43                          |
| 50  | 50  | 2.74                          |
| 63  | 53  | 4.95                          |
| 80  | 48  | 3.51                          |
| 100   | 52  | 1.03                          |
| 125   | 62  | 2.57                          |
| 160   | 60  | 1.85                          |
| 200   | 57  | 1.01                          |
| 250   | 65  | 2.27                          |
| 315   | 64  | 1.39                          |
| 400   | 65  | 1.13                          |
| 500   | 61  | 1.18                          |
| 630   | 62  | 0.74                          |
| 800   | 59  | 0.72                          |
| 1000  | 58  | 0.74                          |
| 1250  | 53  | 0.37                          |
| 1600  | 50  | 1.04                          |
| 2000  | 47  | 0.44                          |
| 2500  | 42  | 0.60                          |
| 3150  | 38  | 0.66                          |
| 4000  | 35  | 0.75                          |
| 5000  | 28  | 1.19                          |
| 6300  | 23  | 0.94                          |
| 8000  | 19  | 1.77                          |
| 10000                                       | 18  | 1.63                          |
| 12500                                       | 13  | 1.80                          |



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Page 7 of 7**APPENDIX B: Instruments of Traceability**Specimen: Porcelain Tile flooring - Thinset Mortar - Whisper Mat underlayment - 8 inch Concrete Slabs -  
No Ceiling (See Full Report)

| <b><u>Description</u></b>                 | <b><u>Model</u></b> | <b><u>Serial<br/>Number</u></b> | <b><u>Date of<br/>Certification</u></b> | <b><u>Calibration<br/>Due</u></b> |
|---|---------------------|---------------------------------|---|-----------------------------------|
| Bruel & Kjaer Pulse Analyzer -<br>System4 | Type 3560-C         | 2639093                         | 2016-07-26                              | 2017-07-26                        |
| Bruel & Kjaer Mic And Preamp<br>E         | Type 4943-B-001     | 2311441                         | 2016-03-17                              | 2017-03-17                        |
| Bruel & Kjaer Tapping Machine             | Type 3207           | 2724862                         | 2015-11-24                              | 2016-11-24                        |
| Bruel & Kjaer Pistonphone                 | Type 4228           | 2781248                         | 2016-07-25                              | 2017-07-25                        |
| Omega Digital Thermo-<br>Hygrometer B     | Model # RH411       | H0101841                        | 2015-12-28                              | 2016-12-28                        |
| Omega Digital Thermo-<br>Hygrometer D     | Model # RH411       | H0102210                        | 2016-07-13                              | 2017-07-13                        |

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