Laboratory Acoustical Test Report

FC22-0557

Impact Insulation Class and Sound Transmission Class

ASTM E492, E90

November 8, 2022

Test Assembly:
Urban Surfaces SoundTec SPC Flooring
Urban Surfaces FloorSilencer Boost
USG Levelrock 2500
Oriented Strand Board Sheathing
Johns Manville Unfaced R-13
York PB Truss L/360
ClarkDietrich RC Deluxe™
USG SHEETROCK® Brand FIRECODE® C Core

IIC-55
HIIC-73
LIIC-46
STC-60
Impact Insulation Class Test FC22-0557: IIC 55

Finish Flooring
Underlayment
Gypsum Concrete
Oriented Strand Board Sheathing
Fiberglass Insulation
Open Web Truss
Resilient Channel
Gypsum Panel

6 mm Urban Surfaces SoundTec SPC Flooring
6 mm Urban Surfaces FloorSilencer Boost
19.1 mm USG Levelrock 2500
18.8 mm OSB
88.9 mm Johns Manville Unfaced R-13
457.2 mm York PB Truss L/360
12.7 mm ClarkDietrich RC Deluxe™
15.9 mm USG SHEETROCK® Brand FIRECODE® C Core

Test Date: September 20, 2022
Construction Date: September 20, 2022
Test Specimen Area: 11 sq.m.
Receiving Room Volume: 156 cu.m.
Receiving Room Temperature: 21.6-21.7 degrees C
Receiving Room Relative Humidity: 53-55 percent

95% Confidence
Freq Limit Ln
50 1.8 68
63 2.9 66
80 1.9 67
100 1.6 61
125 0.9 65
160 1.1 64
200 0.7 61
250 0.6 57
315 0.6 51
400 0.4 47
500 0.4 44
630 0.3 39
800 0.3 34
1000 0.4 28
1250 0.3 22
1600 0.3 19
2000 0.3 21
2500 0.3 21
3150 0.8 15
4000 0.5 10
5000 0.8 10
6300 0.5 10
8000 0.5 11
10000 0.5 11

Background Affected
High-frequency Impact Insulation Class Test FC22-0557: HIIC 73

Finish Flooring: 6 mm Urban Surfaces SoundTec SPC Flooring
Underlayment: 6 mm Urban Surfaces FloorSilencer Boost
Gypsum Concrete: 19.1 mm USG Levelrock 2500
Oriented Strand Board Sheathing: 18.8 mm OSB
Fiberglass Insulation: 88.9 mm Johns Manville Unfaced R-13
Open Web Truss: 457.2 mm York PB Truss L/360
Resilient Channel: 12.7 mm ClarkDietrich RC Deluxe™
Gypsum Panel: 15.9 mm USG SHEETROCK® Brand FIRECODE® C Core

Test Date: September 20, 2022
Construction Date: September 20, 2022
Test Specimen Area: 11 sq.m.
Receiving Room Volume: 156 cu.m.
Receiving Room Temperature: 21.6-21.7 degrees C
Receiving Room Relative Humidity: 53-55 percent

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Background Affected

Report must be distributed in its entirety except with written authorization from Veneklasen Associates. This page alone is not a complete report.
Sound Transmission Class Test FC22-0557: STC 60

Test Date: September 20, 2022
Construction Date: September 20, 2022
Test Specimen Area: 11 sq.m.
Source/Receiving Room Volume: 190/156 cu.m.
Source/Receiving Room Temperature: 21.6/20.7 degrees C
Source/Receiving Room Relative Humidity: 54/54 percent

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Background Affected
Flanking Affected
Background and Flanking Affected

Transmission Loss, STC Contour, and STC Rating in dB
FREQUENCY IN HERTZ

Finish Flooring
Underlayment
Gypsum Concrete
Oriented Strand Board Sheathing
Fiberglass Insulation
Open Web Truss
Resilient Channel
Gypsum Panel

6 mm Urban Surfaces SoundTec SPC Flooring
6 mm Urban Surfaces FloorSilencer Boost
19.1 mm USG Levelrock 2500
18.8 mm OSB
88.9 mm Johns Manville Unfaced R-13
457.2 mm York PB Truss L/360
12.7 mm ClarkDietrich RC Deluxe™
15.9 mm USG SHEETROCK® Brand FIRECODE® C Core

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1.0 TEST PROCEDURES

1.1 Impact Insulation Tests

All tests were conducted in accordance with ASTM E492, "Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine.” The IIC is a single-number rating derived from the Impact Sound Pressure Level in accordance with ASTM E989, “Standard Classification for Determination of Impact Insulation Class (IIC).” Results are presented above.

95% confidence intervals represent uncertainty for microphone averaging, not tapping positions.

1.2 High-frequency Impact Insulation Class Tests

The HIIC is the High-frequency Impact Insulation Class and is meant to assess the high-frequency impact noise on a floor-ceiling assembly. The higher the value, the better the floor, meaning less noise from high-frequency impacts in the space below.

All tests were conducted in accordance with the requirements of ASTM E492, "Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine,” using ASTM E3222 “Standard Classification for Determination of High-frequency Impact Sound Ratings” to calculate the High-frequency Impact Insulation Class (HIIC). Results are presented above.

1.3 Low-frequency Impact Insulation Class Tests

The LIIC is the Low-frequency Impact Insulation Class and is meant to assess the low-frequency impact noise on a floor-ceiling assembly. The higher the value, the better the floor, meaning less noise from low-frequency impacts in the space below.

All tests were conducted in accordance with the requirements of ASTM E492, "Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine,” using ASTM E3207 “Standard Classification for Determination of Low-frequency Impact Noise Ratings” to calculate the Low-frequency Impact Insulation Class (LIIC).

Measured result is LIIC-46.

1.4 Transmission Loss Tests

All tests were conducted in accordance with ASTM E90, “Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions,” using the single-direction method. STC is a single-number rating derived from measured values of Sound Transmission Loss through a test specimen in accordance with ASTM E413, “Classification for Rating Sound Insulation.” Results are presented above.
2.0 TEST ASSEMBLY

2.1 Assembly Description

The test assembly consists of:

- Urban Surfaces SoundTec SPC Floor, Finish Flooring;
- Urban Surfaces FloorSilencer Boost, Acoustical Fiberboard;
- USG Levelrock 2500, Gypsum Concrete;
- Oriented Strand Board Sheathing;
- Johns Manville Unfaced R-13, Fiberglass Insulation;
- York PB Truss L/360, Open Web Truss;
- ClarkDietrich RC Deluxe™, Resilient Channel;
- USG SHEETROCK® Brand FIRECODE® C Core, Gypsum Panel;

Total mass of the floor-ceiling assembly was 950 kg, having an area density of 73.46 kg/m²).

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<th>Product/Element</th>
<th>Thickness</th>
<th>Dimensions</th>
<th>Area</th>
<th>Area Density</th>
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<tr>
<td>Urban Surfaces SoundTec SPC Flooring</td>
<td>6 mm</td>
<td>1219 mm x 178 mm</td>
<td>10.98 m²</td>
<td>9.41 kg/m²</td>
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<tr>
<td>Urban Surfaces FloorSilencer Boost</td>
<td>6 mm</td>
<td>908 mm x 597 mm</td>
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<td>USG Levelrock 2500</td>
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<td>Oriented Strand Board Sheathing</td>
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<td>Johns Manville Unfaced R-13</td>
<td>88.9 mm</td>
<td>521 mm x 3023 mm</td>
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<td>1.32 kg/m²</td>
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<tr>
<td>York PB Truss L/360</td>
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<td>88.9 mm x 2934 mm</td>
<td>7 trusses</td>
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<td>ClarkDietrich RC Deluxe™</td>
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<td>67 mm x 3454 mm</td>
<td>31.05 lin m</td>
<td>0.33 kg/m</td>
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<td>USG SHEETROCK® Brand FIRECODE® C Core</td>
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<td>1219 mm x 3023 mm</td>
<td>10.98 m²</td>
<td>11.9 kg/m²</td>
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2.2 Installation

The materials were installed in the following manner:

- Urban Surfaces SoundTec SPC Flooring: Loose laid
- Acoustical Fiberboard: Loose laid
- Gypsum Concrete: Poured directly onto the subfloor underlayment, cured a minimum of 14 days. The gypsum panel had a closed cell foam perimeter isolation. No noticeable shrinkage or cracking was visible on the specimen.
- Oriented Strand Board Sheathing: Adhered to the floor trusses with Loctite PL 400 Subfloor adhesive. Fastened with 9D nails on 203 mm centers along perimeter and 305 mm centers along trusses.
- Fiberglass Insulation: Installed in the cavity between trusses, stapled flush with the subfloor.
- Open Web Truss: Installed on 610 mm centers using JUS414 hanger brackets.
- Resilient Channel: Installed on 305 mm centers perpendicular to the trusses. The measured thickness of the metal was 0.7 mm.
- Gypsum Panel: Fastened to the channels on 305 mm centers with 25.4 mm Type S bugle head screws. The seams of the gypsum panels were sealed with Pecora AC-20 FTR caulk and covered with pressure sensitive tape.

The assembly was constructed on September 20, 2022.
3.0 TESTING PROTOCOL

This report summarizes laboratory acoustical testing contracted by Veneklasen to be completed for Veneklasen Associates on 6.0 mm Urban Surfaces SoundTec SPC Flooring over 6 mm Urban Surfaces FloorSilencer Boost Acoustical Fiberboard. The scope of the acoustical testing is for Impact Insulation Class (IIC), High-frequency Impact Insulation Class (HIIC), Low-frequency Impact Insulation Class (LIIC), and Sound Transmission Class (STC), in accordance with ASTM standards E492, E90.

The tests were conducted on September 20, 2022. Details of the tests are contained in this report. Testing was completed in strict accordance with the following standards:

- ASTM E413, “Classification for Rating Sound Insulation”
- ASTM E989, “Standard Classification for Determination of Impact Insulation Class (IIC)”

3.1 Equipment

Equipment list and information associated with this test, including calibration information, is included in the Appendix.

3.2 Accreditation and Reporting

Report must be distributed in its entirety except with written authorization from Veneklasen Associates. Test was conducted at IAS-accredited test facility; the full report is available upon request. Detailed test procedures, data for flanking limit tests, repeatability measurements, and reference specimen tests are available on request.

Veneklasen Associates provides no warranties, expressed or implied, regarding the structural integrity or fitness of these assemblies for a specific installation. Any advertising which utilizes this test report or test data must not imply product certification or endorsement by Veneklasen Associates, NVLAP, NIST or the U.S. Government.

Sincerely,
Veneklasen Associates, Inc.

John LoVerde, FASA
Principal
APPENDIX

Test Equipment and Photos
<table>
<thead>
<tr>
<th>Instrument</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Description</th>
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Photo 1: View of Source Chamber, finish flooring installation observed

Photo 2: View of Receive Chamber, bottom of ceiling observed