Report Number: NGC 5006053

Test Method: This test method generally follows * the American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements - Designation: E 90 - 04 / E 413 - 04.

Specimen Description: Quarry Tile over ACOUSTIBLOK® & ACOUSTIWOOL on Hambro® MD2000 Composite Floor Joist System floor-ceiling assembly.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 152mm x 152mm x 12.7mm (6 in. x 6 in. x ½ in.) unglazed clay quarry tile 27.3 kg/m$^2$ (5.6 PSF) installed using Laticrete® 317 Thin Set Mortar with Laticrete® 333 Thin Set Additive and polymer modified grout mixtures 4.9 kg/m$^2$ (1.0 PSF).
- 1 layer of 2.64mm (0.104 in.) Acoustiblok® ,black sound isolation material 4.88 kg/m$^2$ (1.0 PSF).
- 1 layer 3.05mm (0.12) Acoustiwool fiber padding underlayment 0.88 kg/m$^2$ (0.18 PSF).
- 1 layer of nominal 101.6mm (4 in.) reinforced concrete 244 kg/m$^2$ (50 PSF).
- 1 layer of P3606 22 gauge steel deck with 38.1mm (1-1/2 in.) rib 8.2 kg/m$^2$ (1.68 PSF).
- 203.2mm (8 in.) steel joists 1219mm (48 in.) o.c. 10.4 kg/m (7.0 PLF) 10.6 kg/m$^2$ (2.18 PSF)
- 25 gauge steel hat channel 406.4mm (16 in.) o.c. positioned perpendicular to joists, and wire tied to bottom chord of beams.0.92 kg/m$^2$ (0.19 PSF)
- 1 layer 12.7mm (½ in.) Type C wallboard 10.2 kg/m$^2$ (2.1 PSF), attached 304.8mm (12 in.) o.c. to furring with 25.4mm (1 in.) type S screws The wallboard joints were taped and outer perimeter was sealed with acoustical caulk.

The overall weight of the test assembly is 312.1 kg/m$^2$ (63.93 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Specimen size: 3658mm x 4877mm (12 ft. x 16 ft.)

Steel and concrete assembly was constructed on premises under supervision of Hambro® personnel.

Conditioning: Concrete cured for a minimum of 28 days. Mortar and grout cured for a minimum of 6 days.

Test Results: The results of the tests are given on pages 3 and 4.

* Tests conducted in Floor-Ceiling chambers do not meet all requirements of the most recent ASTM E 90 Standard.

NGC Testing Services

# Acoustical Testing Laboratory

## Sound Transmission Loss Test Data



**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006053
Test Date: 9/7/2006
Size: 17.8 m²
Temperature [°C]: 21.4

**Sound Transmission Class STC = 52 dB**
Sum of unfavorable deviations: 29.0 dB
Max. unfavorable deviation: 6.0 dB at 125 Hz

| Frequency [Hz] | STL [dB] | L1 [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | ΔSTL |
|---|---|---|---|---|---|---|---|
| 100 | 34.0 | 99.4 | 70.9 | 1.34 | 5.2 | -.- | 0.985 |
| 125 | 30.0 | 95.1 | 71.3 | 1.66 | 6.2 | 6.0 | 1.077 |
| 160 | 34.0 | 99.1 | 73.1 | 2.52 | 8.0 | 5.0 | 0.632 |
| 200 | 40.0 | 95.4 | 62.4 | 2.25 | 7.5 | 2.0 | 0.539 |
| 250 | 40.0 | 93.5 | 60.7 | 2.10 | 7.2 | 5.0 | 0.700 |
| 315 | 42.0 | 94.8 | 60.4 | 2.35 | 7.7 | 6.0 | 0.693 |
| 400 | 48.0 | 97.8 | 57.2 | 2.40 | 7.8 | 3.0 | 0.436 |
| 500 | 51.0 | 96.5 | 52.9 | 2.26 | 7.5 | 1.0 | 0.490 |
| 630 | 54.0 | 95.6 | 48.6 | 2.03 | 7.1 | -.- | 0.412 |
| 800 | 54.0 | 95.9 | 48.8 | 2.19 | 7.4 | -.- | 0.387 |
| 1000 | 56.0 | 94.1 | 45.2 | 2.20 | 7.4 | -.- | 0.400 |
| 1250 | 62.0 | 94.1 | 39.2 | 1.93 | 6.8 | -.- | 0.436 |
| 1600 | 61.0 | 92.4 | 37.8 | 1.73 | 6.4 | -.- | 0.332 |
| 2000 | 58.0 | 93.3 | 41.2 | 1.56 | 5.9 | -.- | 0.245 |
| 2500 | 55.0 | 95.3 | 45.9 | 1.33 | 5.2 | 1.0 | 0.361 |
| 3150 | 56.0 | 95.4 | 43.9 | 1.22 | 4.9 | -.- | 0.245 |
| 4000 | 60.0 | 95.5 | 40.1 | 1.15 | 4.6 | -.- | 0.300 |
| 5000 | 62.0 | 93.4 | 35.8 | 1.05 | 4.2 | -.- | 0.458 |

STL = Sound Transmission Loss, dB
L1 = Source Room Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
Δ STL = Uncertainty for 95% Confidence Level



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## Sound Transmission Loss Test Data

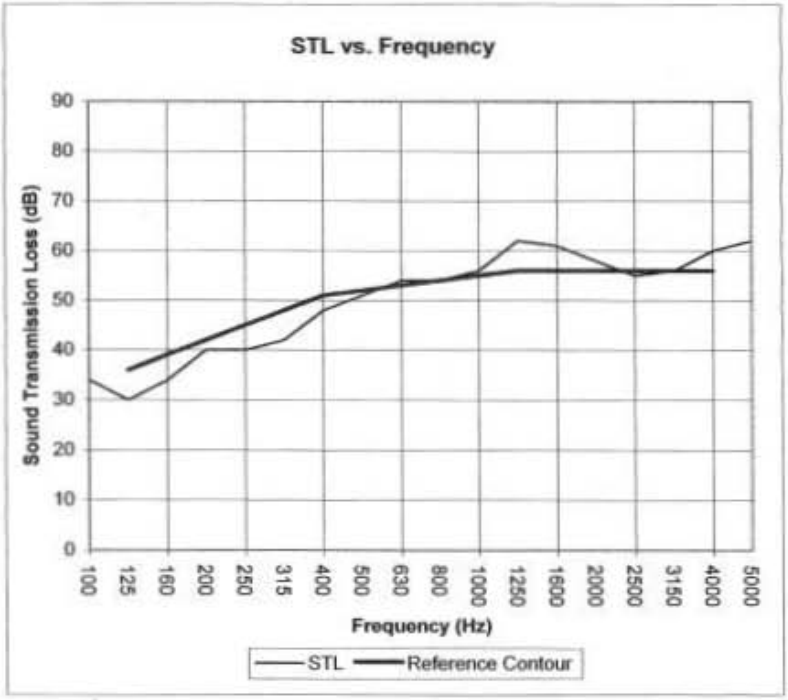


**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006053
Test Date: 9/7/2006
Size: 17.8 m²
Temperature [°C]: 21.4

**Sound Transmission Class STC = 52 dB**

| Frequency [Hz] | STL [dB] | ΔSTL |
|---|---|---|
| 100 | 34 | 0.985 |
| 125 | 30 | 1.077 |
| 160 | 34 | 0.632 |
| 200 | 40 | 0.539 |
| 250 | 40 | 0.700 |
| 315 | 42 | 0.693 |
| 400 | 48 | 0.436 |
| 500 | 51 | 0.490 |
| 630 | 54 | 0.412 |
| 800 | 54 | 0.387 |
| 1000 | 56 | 0.400 |
| 1250 | 62 | 0.436 |
| 1600 | 61 | 0.332 |
| 2000 | 58 | 0.245 |
| 2500 | 55 | 0.361 |
| 3150 | 56 | 0.245 |
| 4000 | 60 | 0.300 |
| 5000 | 62 | 0.458 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

STL = Sound Transmission Loss, dB
Δ STL = Uncertainty for 95% Confidence Level



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# Acoustiblok® 32 oz. and Tile Floor On Concrete Slab – *No Ceiling Assembly*: IIC40 and STC 53 Rated Acoustical Test Overview

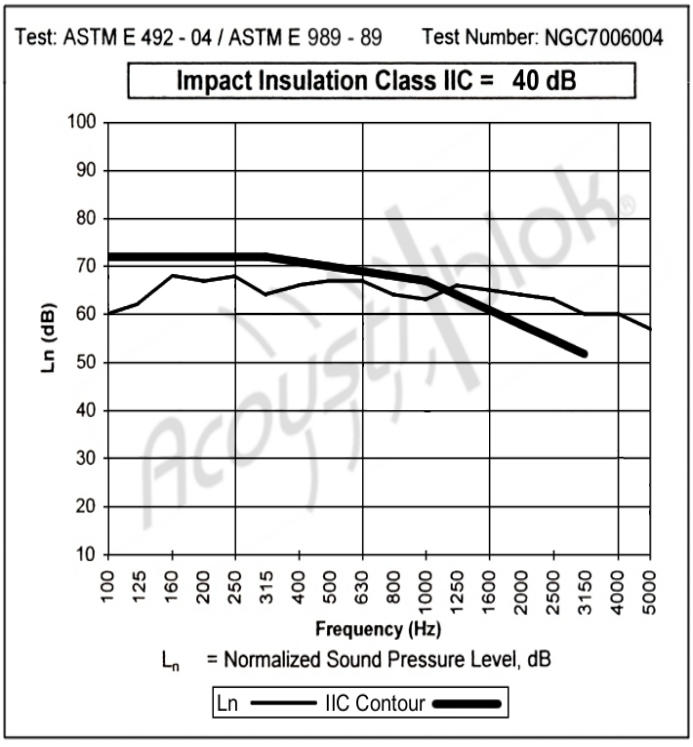

NGC Testing Services rates this floor configuration with an IIC (impact insulation class) of 40 dB, and an STC (sound transmission class) of 53. See report graphs below, showing the performance of this configuration relative to noise source frequencies.

The tested assembly: Unglazed quarry tile installed with modified polymer grout & mortar, 32 oz Acoustiblok, on a 6" reinforced concrete slab floor/ceiling. To increase impact insulation class and sound transmission class, add Acoustiwool-TF0.11 underlayment (see separate test data).

No ceiling assembly was installed for this test. Ceiling assemblies usually add 9-14 points to the IIC rating.

**Impact Insulation Class** (IIC) is a single number rating used to compare the performance of floor/ceiling partitions in blocking impact noise, such as footsteps and dropped objects. The higher the IIC rating number, the better the performance. An IIC of 50 is usually considered the minimum for preventing noise complaints in residential building. IIC ratings are calculated by a method similar to STC ratings (see description of STC below).

The IIC of a particular floor assembly is derived using a standard tapping machine, as stipulated in ASTM method E492.3 This machine incorporates five steel-faced hammers that strike the test floor and generate noise in a room below. The noise levels are measured and used to calculate the impact insulation class (IIC), following ASTM method E989.



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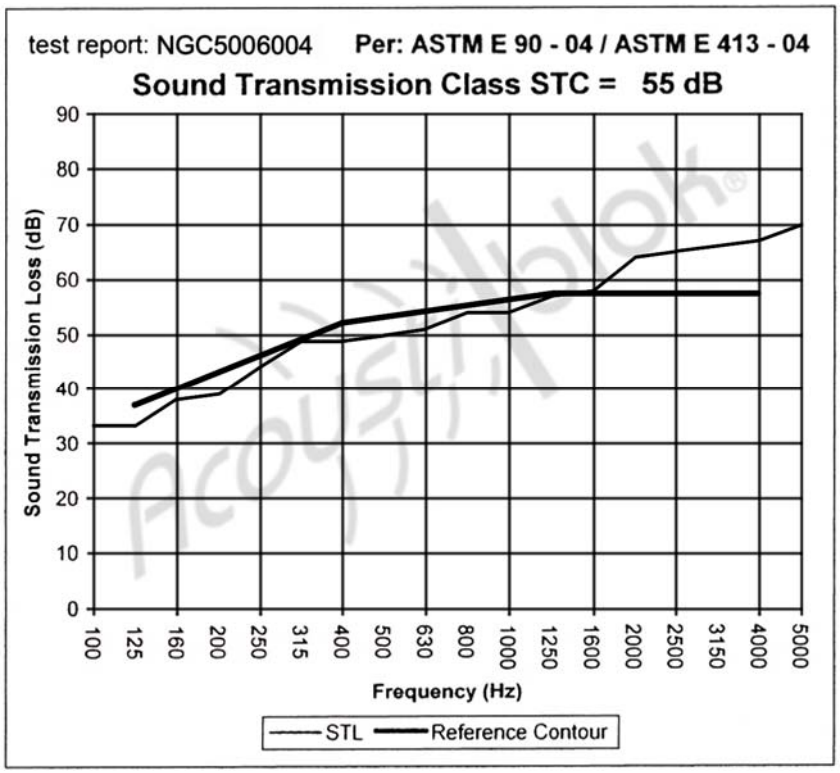
# Acoustiblok® 32 oz. and Tile Floor On Concrete Slab – *No Ceiling Assembly*: IIC40 and STC 53 Rated Acoustical Test Overview




Sound Transmission Loss data for concrete & steel floor/ceiling assembly with 32 oz. Acoustiblok, STC 53 rated.

**SOUND TRANSMISSION CLASS** is a single number that represents the sound blocking capacity of a partition such as a wall or ceiling.

STC numbers are often called out in architectural specifications, to assure that partitions will reduce noise levels. For performance similar to laboratory test numbers, it is necessary to adhere closely to the construction materials and techniques used in the tested partition.

STC calculations emphasize sound frequencies that match the human voice. A high STC partition will block the sound of human speech, and block noise that interferes with human speech. A high STC number may not indicate a partition that is effective in blocking very low or very high pitched sound. STC measures sound blocking for airborne noise source only; it does not indicate how well a partition can block impact noise (objects striking the far side of the partition), or directly transmitted noise such as machinery mounted on the far side of the wall.

STC is calculated by comparing the actual sound loss measured when 18 test frequencies pass through a partition, with fixed values for each STC level. The highest STC curve that the measured sound loss numbers fit under, determines the STC rating of the tested partition.

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# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Impact Sound Transmission Test

**ASTM E 492 – 04 / ASTM E 989 – 89**
**On**

**6 Inch (152mm) Concrete Slab Floor-Ceiling Assembly with; Quarry Tile Flooring on 32 oz. Acoustiblok®**



Report Number: NGC 7006004

Assignment Number: G-287

Test Date: 01/13/2006

Report Date: 01/19/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director

Report Number: NGC 7006004

Test Method: This test method is in accordance with American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine - Designation: E 492 – 04.

The uncertainty limits of each tapping machine location met the precision requirements of section 11.3 of ASTM E 492-04.

Specimen Description: Quarry Tile Flooring over 32 oz. Acoustiblok® on 6 in. concrete floor-ceiling assembly.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 152mm x 152mm x 12.7mm (6 in. x 6 in. x ½ in.) unglazed clay quarry tile 27.3 kg/m$^2$ (5.6 PSF) installed using polymer modified mortar and polymer modified grout mixtures 4.9 kg/m$^2$ (1.0 PSF).
- 1 layer of 4.83mm (0.190 in.) Acoustiblok® ,black sound isolation material 9.18 kg/m$^2$ (1.88 PSF).
- 152mm (6 in.) thick reinforced concrete slab 366 kg/m$^2$ (75.0 PSF).

The overall weight of the test assembly is 407.5 kg/m$^2$ (83.48 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Test Floor Size: 3658mm x 4877mm (12 ft. x 16 ft.).

Conditioning: Mortar and grout cured for a minimum of 5 days. Concrete cured for a minimum of 28 days.

Test samples were submitted by client and tested as received.

Test Results: The results of the tests are given on pages 3 and 4.

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## Normalized impact sound pressure level

Test: ASTM E 492 - 04 / ASTM E 989 - 89



Test Number: NGC7006004 Date: 1/13/2006

Size: 17.84 m²

**Source room**

Temperature [°C]: 19.4

Humidity [%]: 36

**Receiving room**

Volume V = 45.24 m³

Temperature [°C]: 18.8

Humidity [%]: 62

### Impact Insulation Class IIC = 40 dB

Sum of unfavorable deviations: 26.0 dB

Max. unfavorable deviation: 8.0 dB at 3150 Hz

| Frequency [Hz] | $L_n$ [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | $\Delta L_n$ |
|---|---|---|---|---|---|---|
| 100 | 60.0 | 66.4 | 2.92 | -6.4 | -.- | 0.199 |
| 125 | 62.0 | 67.7 | 2.62 | -5.7 | -.- | 0.174 |
| 160 | 68.0 | 73.9 | 2.88 | -5.9 | -.- | 0.343 |
| 200 | 67.0 | 72.9 | 2.96 | -5.9 | -.- | 0.151 |
| 250 | 68.0 | 74.2 | 2.75 | -6.2 | -.- | 0.159 |
| 315 | 64.0 | 70.1 | 3.00 | -6.1 | -.- | 0.129 |
| 400 | 66.0 | 72.2 | 2.88 | -6.2 | -.- | 0.139 |
| 500 | 67.0 | 72.8 | 2.57 | -5.8 | -.- | 0.101 |
| 630 | 67.0 | 72.6 | 2.41 | -5.6 | -.- | 0.090 |
| 800 | 64.0 | 70.0 | 2.62 | -6.0 | -.- | 0.070 |
| 1000 | 63.0 | 68.8 | 2.58 | -5.8 | -.- | 0.054 |
| 1250 | 66.0 | 70.2 | 2.14 | -4.2 | 2.0 | 0.041 |
| 1600 | 65.0 | 69.6 | 1.98 | -4.6 | 4.0 | 0.050 |
| 2000 | 63.0 | 67.0 | 1.79 | -4.0 | 5.0 | 0.035 |
| 2500 | 62.0 | 65.7 | 1.58 | -3.7 | 7.0 | 0.038 |
| 3150 | 60.0 | 63.4 | 1.44 | -3.4 | 8.0 | 0.044 |
| 4000 | 60.0 | 62.5 | 1.26 | -2.5 | -.- | 0.036 |
| 5000 | 57.0 | 58.6 | 1.12 | -1.6 | -.- | 0.050 |

$L_n$ = Normalized Sound Pressure Level, dB

L2 = Receiving Room Level, dB

T = Reverberation Time, seconds

$\Delta L_n$ = Uncertainty for 95% Confidence Level



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Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200291

## Normalized impact sound pressure level

Test: ASTM E 492 - 04 / ASTM E 989 - 89

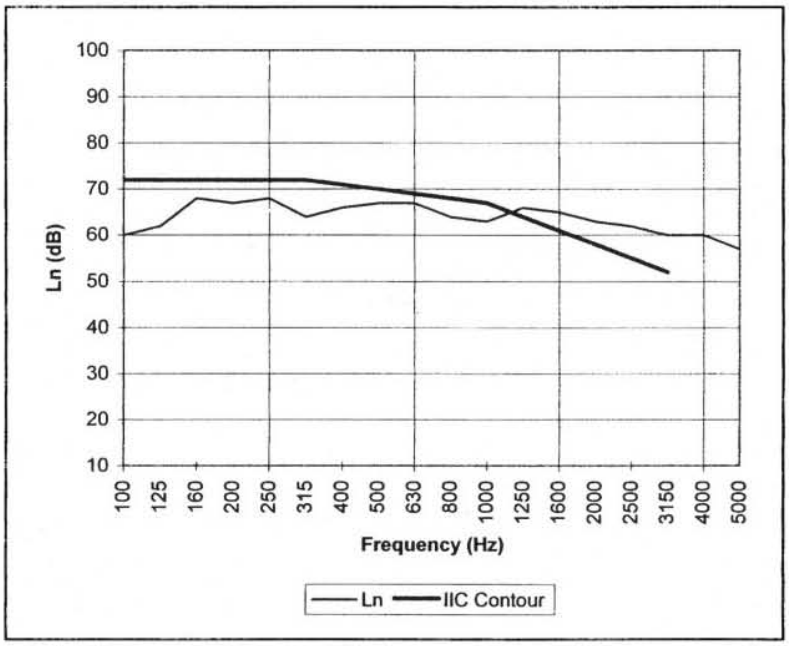


Test Number: NGC7006004

Date: 1/13/2006

**Impact Insulation Class IIC = 40 dB**

| Frequency [Hz] | $L_n$ [dB] |
|---|---|
| 100 | 60 |
| 125 | 62 |
| 160 | 68 |
| 200 | 67 |
| 250 | 68 |
| 315 | 64 |
| 400 | 66 |
| 500 | 67 |
| 630 | 67 |
| 800 | 64 |
| 1000 | 63 |
| 1250 | 66 |
| 1600 | 65 |
| 2000 | 63 |
| 2500 | 62 |
| 3150 | 60 |
| 4000 | 60 |
| 5000 | 57 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

$L_n$ = Normalized Sound Pressure Level, dB



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# Acoustical Testing Laboratory

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Sound Transmission Loss Test

**ASTM E 90 – 04 / E 413 - 04**
**On**

**6 Inch (152mm) Concrete Slab Floor-Ceiling Assembly with;**
**Quarry Tile Flooring on 32 oz. Acoustiblok®**



Report Number: NGC 5006004

Assignment Number: G-287

Test Date: 01/13/2006

Report Date: 01/19/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director

Report Number: NGC 5006004

Test Method: This test method generally follows * the American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements - Designation: E 90 - 04 / E 413 - 04.

Specimen Description: Quarry Tile Flooring over 32 oz. Acoustiblok® on 6 in. concrete floor-ceiling assembly.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 152mm x 152mm x 12.7mm (6 in. x 6 in. x ½ in.) unglazed clay quarry tile 27.3 kg/m$^2$ (5.6 PSF) installed using polymer modified mortar and polymer modified grout mixtures 4.9 kg/m$^2$ (1.0 PSF).
- 1 layer of 4.83mm (0.190 in.) Acoustiblok® ,black sound isolation material 9.18 kg/m$^2$ (1.88 PSF).
- 152mm (6 in.) thick reinforced concrete slab 366 kg/m$^2$ (75.0 PSF).

The overall weight of the test assembly is 407.5 kg/m$^2$ (83.48 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Test Floor Size: 3658mm x 4877mm (12 ft. x 16 ft.).

Conditioning: Mortar and grout cured for a minimum of 5 days. Concrete cured for a minimum of 28 days.

Test samples were submitted by client and tested as received.

Test Results: The results of the tests are given on pages 3 and 4.

* Tests conducted in Floor-Ceiling chambers do not meet all requirements of the most recent ASTM E 90 Standard.

NGC Testing Services

# Acoustical Testing Laboratory

## Sound Transmission Loss Test Data



**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006004
Test Date: 1/13/2006
Size: 17.8 m²
Temperature [°C]: 18.9

**Sound Transmission Class STC = 53 dB**
Sum of unfavorable deviations: 24.0 dB
Max. unfavorable deviation: 4.0 dB at 125 Hz

| Frequency [Hz] | STL [dB] | L1 [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | ΔSTL |
|---|---|---|---|---|---|---|---|
| 100 | 33 | 106.0 | 81.8 | 2.92 | 8.5 | -.- | 2.145 |
| 125 | 33 | 100.9 | 75.9 | 2.62 | 8.1 | 4.0 | 1.591 |
| 160 | 38 | 100.0 | 70.6 | 2.88 | 8.5 | 2.0 | 1.072 |
| 200 | 39 | 100.0 | 69.1 | 2.96 | 8.6 | 4.0 | 0.510 |
| 250 | 44 | 101.1 | 65.1 | 2.75 | 8.3 | 2.0 | 0.656 |
| 315 | 49 | 100.9 | 60.6 | 3.00 | 8.6 | -.- | 0.529 |
| 400 | 49 | 102.0 | 61.0 | 2.88 | 8.5 | 3.0 | 0.412 |
| 500 | 50 | 99.7 | 57.5 | 2.57 | 8.0 | 3.0 | 0.548 |
| 630 | 51 | 98.1 | 55.0 | 2.41 | 7.7 | 3.0 | 0.592 |
| 800 | 54 | 99.0 | 53.5 | 2.62 | 8.0 | 1.0 | 0.529 |
| 1000 | 54 | 97.9 | 52.1 | 2.58 | 8.0 | 2.0 | 0.755 |
| 1250 | 57 | 97.9 | 47.7 | 2.14 | 7.2 | -.- | 0.224 |
| 1600 | 58 | 98.6 | 47.0 | 1.98 | 6.8 | -.- | 0.510 |
| 2000 | 64 | 98.6 | 41.1 | 1.79 | 6.4 | -.- | 0.346 |
| 2500 | 65 | 100.4 | 41.6 | 1.58 | 5.9 | -.- | 0.200 |
| 3150 | 66 | 100.6 | 40.5 | 1.44 | 5.4 | -.- | 0.361 |
| 4000 | 67 | 100.1 | 37.6 | 1.26 | 4.9 | -.- | 0.361 |
| 5000 | 70 | 99.2 | 33.5 | 1.12 | 4.4 | -.- | 0.678 |

STL = Sound Transmission Loss, dB
L1 = Source Room Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
Δ STL = Uncertainty for 95% Confidence Level.



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# Acoustical Testing Laboratory

## Sound Transmission Loss Test Data

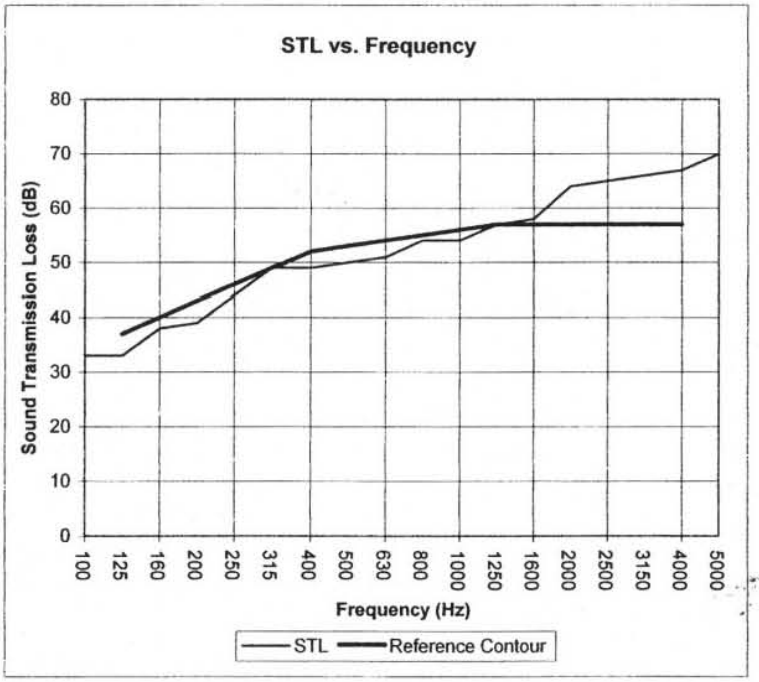


**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006004
Test Date: 1/13/2006
Size: 17.8 m²
Temperature [°C]: 18.9

**Sound Transmission Class STC = 53 dB**

| Frequency [Hz] | STL [dB] | ΔSTL |
|---|---|---|
| 100 | 33 | 2.145 |
| 125 | 33 | 1.591 |
| 160 | 38 | 1.072 |
| 200 | 39 | 0.510 |
| 250 | 44 | 0.656 |
| 315 | 49 | 0.529 |
| 400 | 49 | 0.412 |
| 500 | 50 | 0.548 |
| 630 | 51 | 0.592 |
| 800 | 54 | 0.529 |
| 1000 | 54 | 0.755 |
| 1250 | 57 | 0.224 |
| 1600 | 58 | 0.510 |
| 2000 | 64 | 0.346 |
| 2500 | 65 | 0.200 |
| 3150 | 66 | 0.361 |
| 4000 | 67 | 0.361 |
| 5000 | 70 | 0.678 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

STL = Sound Transmission Loss, dB
Δ STL = Uncertainty for 95% Confidence Level



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# Acoustiblok® 16 oz. and Tile Floor On Concrete Slab – *No Ceiling Assembly*: IIC38 and STC 54 Rated Acoustical Test Overview

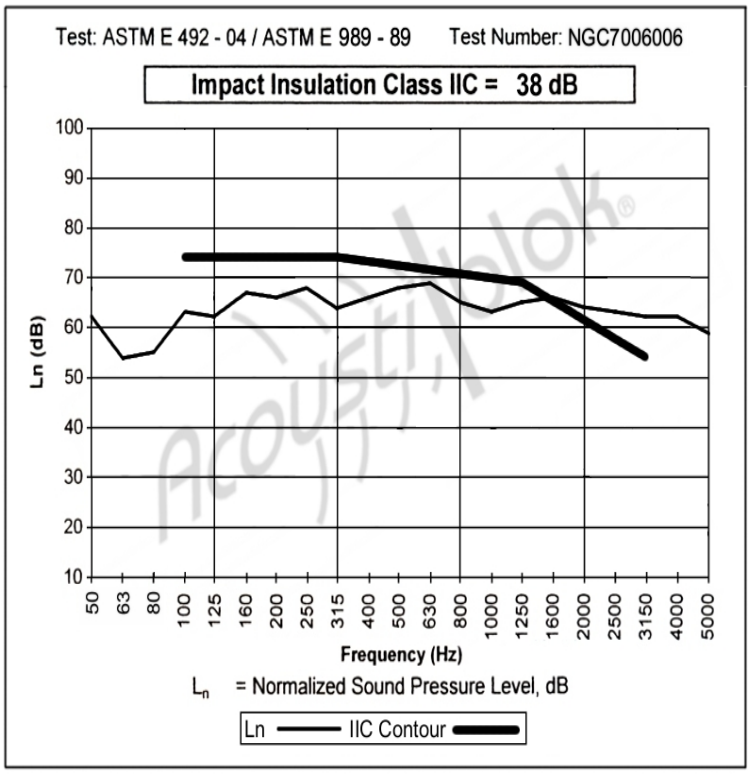

NGC Testing Services rates this floor configuration with an IIC (impact insulation class) of 38 dB, and an STC (sound transmission class) of 54. See report graphs below, showing the performance of this configuration relative to noise source frequencies.

The tested assembly: Unglazed quarry tile installed with modified polymer grout & mortar, 16 oz Acoustiblok, on a 6" reinforced concrete slab floor/ceiling. To increase impact insulation and sound transmission, add Acoustiwool-TF0.11 underlayment (see separate test data).

No ceiling assembly was installed for this test. Ceiling assemblies usually add 9-14 points to the IIC rating.

**Impact Insulation Class** (IIC) is a single number rating used to compare the performance of floor/ceiling partitions in blocking impact noise, such as footsteps and dropped objects. The higher the IIC rating number, the better the performance. An IIC of 50 is usually considered the minimum for preventing noise complaints in residential building. IIC ratings are calculated by a method similar to STC ratings (see description of STC below).

The IIC of a particular floor assembly is derived using a standard tapping machine, as stipulated in ASTM method E492.3 This machine incorporates five steel-faced hammers that strike the test floor and generate noise in a room below. The noise levels are measured and used to calculate the impact insulation class (IIC), following ASTM method E989.



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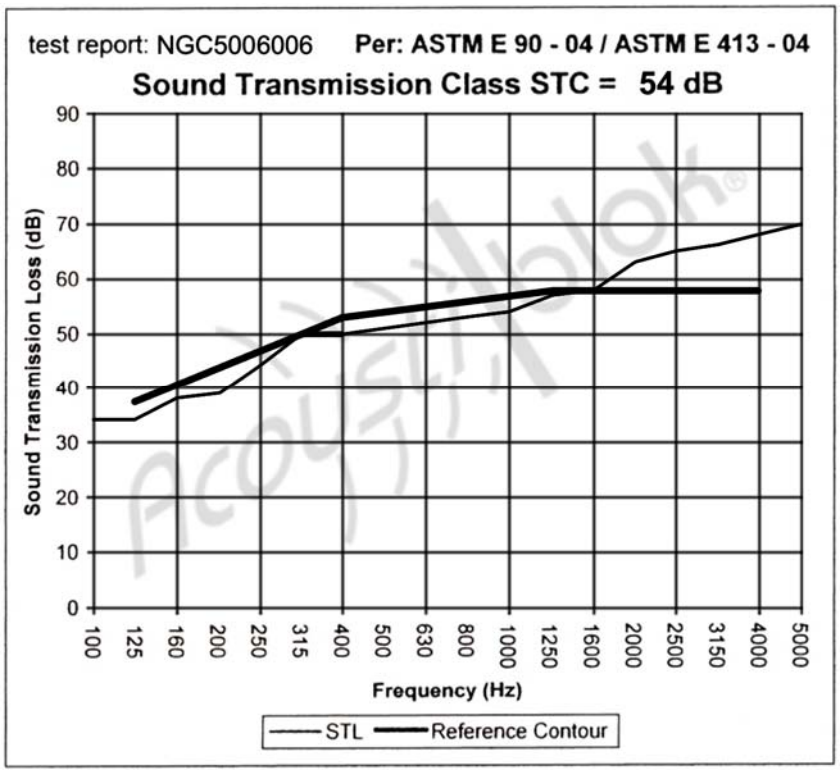
# Acoustiblok® 16 oz. and Tile Floor On Concrete Slab – *No Ceiling Assembly*: IIC38 and STC 54 Rated Acoustical Test Overview




Sound Transmission Loss data for concrete & steel floor/ceiling assembly with 16 Oz. Acoustiblok, STC 52 rated.

**SOUND TRANSMISSION CLASS** is a single number that represents the sound blocking capacity of a partition such as a wall or ceiling.

STC numbers are often called out in architectural specifications, to assure that partitions will reduce noise levels. For performance similar to laboratory test numbers, it is necessary to adhere closely to the construction materials and techniques used in the tested partition.

STC calculations emphasize sound frequencies that match the human voice. A high STC partition will block the sound of human speech, and block noise that interferes with human speech. A high STC number may not indicate a partition that is effective in blocking very low or very high pitched sound. STC measures sound blocking for airborne noise source only; it does not indicate how well a partition can block impact noise (objects striking the far side of the partition), or directly transmitted noise such as machinery mounted on the far side of the wall.

STC is calculated by comparing the actual sound loss measured when 18 test frequencies pass through a partition, with fixed values for each STC level. The highest STC curve that the measured sound loss numbers fit under, determines the STC rating of the tested partition.

NGC Testing Services

# Acoustical Testing Laboratory

NVLAP

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200291

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Impact Sound Transmission Test

**ASTM E 492 – 04 / ASTM E 989 – 89**
**On**

**6 Inch (152mm) Concrete Slab Floor-Ceiling Assembly with; Quarry Tile Flooring on 16 oz. Acoustiblok®**



Report Number: NGC 7006006

Assignment Number: G-287

Test Date: 01/23/2006

Report Date: 01/25/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director

Report Number: NGC 7006006

Test Method: This test method is in accordance with American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine - Designation: E 492 – 04.

The uncertainty limits of each tapping machine location met the precision requirements of section 11.3 of ASTM E 492-04.

Specimen Description: Quarry Tile Flooring over 16 oz. Acoustiblok® on 6 in. concrete floor-ceiling assembly.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 152mm x 152mm x 12.7mm (6 in. x 6 in. x ½ in.) unglazed clay quarry tile 27.3 kg/m$^2$ (5.6 PSF) installed using polymer modified mortar and polymer modified grout mixtures 4.9 kg/m$^2$ (1.0 PSF).
- 1 layer of 2.46mm (0.097 in.) Acoustiblok® ,black sound isolation material 4.88 kg/m$^2$ (1.0 PSF).
- 152mm (6 in.) thick reinforced concrete slab 366 kg/m$^2$ (75.0 PSF).

The overall weight of the test assembly is 403.2 kg/m$^2$ (82.6 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Test Floor Size: 3658mm x 4877mm (12 ft. x 16 ft.).

Conditioning: Mortar and grout cured for a minimum of 5 days. Concrete cured for a minimum of 28 days.

Test samples were submitted by client and tested as received.

Test Results: The results of the tests are given on pages 3 and 4.

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## Normalized impact sound pressure level

Test: ASTM E 492 - 04 / ASTM E 989 - 89



Test Number: NGC7006006 Date: 1/23/2006
Size: 17.84 m²

**Source room**

Temperature [°C]: 19.1
Humidity [%]: 35

**Receiving room**

Volume V = 45.24 m³
Temperature [°C]: 18.2
Humidity [%]: 65

**Impact Insulation Class IIC = 38 dB**

Sum of unfavorable deviations: 21.0 dB
Max. unfavorable deviation: 8.0 dB at 3150 Hz

| Frequency [Hz] | $L_n$ [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | $\Delta L_n$ |
|---|---|---|---|---|---|---|
| 50 | 62.0 | 69.4 | 4.36 | -7.4 | -.- | 0.389 |
| 63 | 54.0 | 59.8 | 2.52 | -5.8 | -.- | 0.144 |
| 80 | 55.0 | 60.3 | 2.44 | -5.3 | -.- | 0.363 |
| 100 | 63.0 | 69.5 | 2.98 | -6.5 | -.- | 0.189 |
| 125 | 62.0 | 67.2 | 2.59 | -5.2 | -.- | 0.150 |
| 160 | 67.0 | 73.3 | 2.94 | -6.3 | -.- | 0.279 |
| 200 | 66.0 | 71.9 | 3.05 | -5.9 | -.- | 0.165 |
| 250 | 68.0 | 73.9 | 2.79 | -5.9 | -.- | 0.118 |
| 315 | 64.0 | 70.6 | 3.05 | -6.6 | -.- | 0.119 |
| 400 | 66.0 | 72.5 | 2.94 | -6.5 | -.- | 0.107 |
| 500 | 68.0 | 73.3 | 2.56 | -5.3 | -.- | 0.101 |
| 630 | 69.0 | 73.7 | 2.41 | -4.7 | -.- | 0.104 |
| 800 | 65.0 | 70.8 | 2.61 | -5.8 | -.- | 0.076 |
| 1000 | 63.0 | 68.5 | 2.58 | -5.5 | -.- | 0.053 |
| 1250 | 65.0 | 69.7 | 2.17 | -4.7 | -.- | 0.039 |
| 1600 | 66.0 | 70.1 | 1.98 | -4.1 | 3.0 | 0.046 |
| 2000 | 64.0 | 68.1 | 1.81 | -4.1 | 4.0 | 0.034 |
| 2500 | 63.0 | 66.8 | 1.60 | -3.8 | 6.0 | 0.041 |
| 3150 | 62.0 | 64.8 | 1.47 | -2.8 | 8.0 | 0.044 |
| 4000 | 62.0 | 64.4 | 1.28 | -2.4 | -.- | 0.037 |
| 5000 | 59.0 | 61.2 | 1.14 | -2.2 | -.- | 0.039 |

$L_n$ = Normalized Sound Pressure Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
$\Delta L_n$ = Uncertainty for 95% Confidence Level



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NVLAP®

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## Normalized impact sound pressure level

Test: ASTM E 492 - 04 / ASTM E 989 - 89

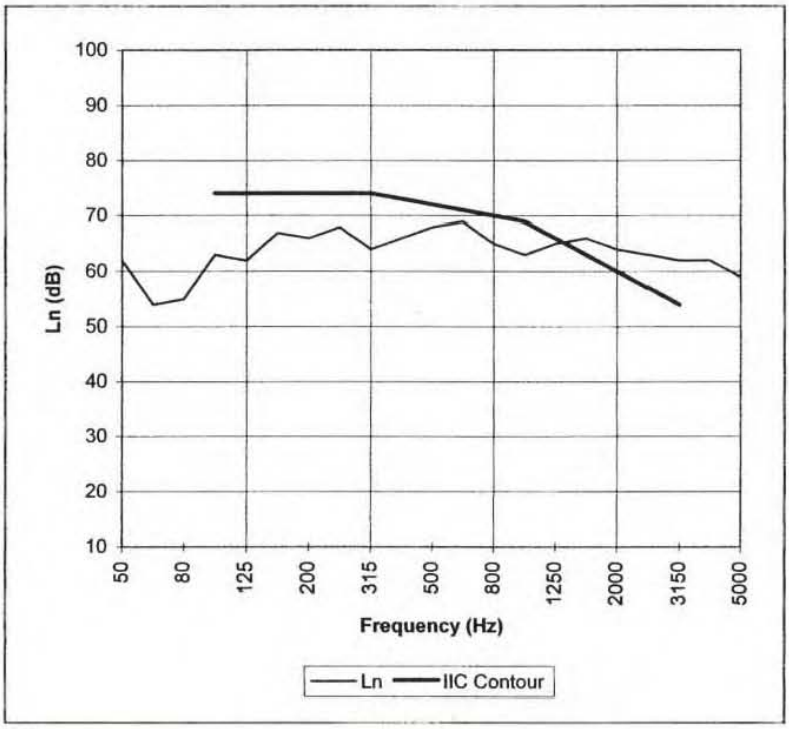


Test Number: NGC7006006

Date: 1/23/2006

**Impact Insulation Class IIC = 38 dB**

| Frequency [Hz] | $L_n$ [dB] |
|---|---|
| 50 | 62 |
| 63 | 54 |
| 80 | 55 |
| 100 | 63 |
| 125 | 62 |
| 160 | 67 |
| 200 | 66 |
| 250 | 68 |
| 315 | 64 |
| 400 | 66 |
| 500 | 68 |
| 630 | 69 |
| 800 | 65 |
| 1000 | 63 |
| 1250 | 65 |
| 1600 | 66 |
| 2000 | 64 |
| 2500 | 63 |
| 3150 | 62 |
| 4000 | 62 |
| 5000 | 59 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

$L_n$ = Normalized Sound Pressure Level, dB



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NGC Testing Services

# Acoustical Testing Laboratory

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Sound Transmission Loss Test

**ASTM E 90 – 04 / E 413 - 04**
**On**

**6 Inch (152mm) Concrete Slab Floor-Ceiling Assembly with;**
**Quarry Tile Flooring on 16 oz. Acoustiblok®**



Report Number: NGC 5006006

Assignment Number: G-287

Test Date: 01/23/2006

Report Date: 01/25/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Merichetti
Director

Report Number: NGC 5006006

Test Method: This test method generally follows * the American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements - Designation: E 90 - 04 / E 413 - 04.

Specimen Description: Quarry Tile Flooring over 16 oz. Acoustiblok® on 6 in. concrete floor-ceiling assembly.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 152mm x 152mm x 12.7mm (6 in. x 6 in. x ½ in.) unglazed clay quarry tile 27.3 kg/m$^2$ (5.6 PSF) installed using polymer modified mortar and polymer modified grout mixtures 4.9 kg/m$^2$ (1.0 PSF).
- 1 layer of 2.46mm (0.097 in.) Acoustiblok® ,black sound isolation material 4.88 kg/m$^2$ (1.0 PSF).
- 152mm (6 in.) thick reinforced concrete slab 366 kg/m$^2$ (75.0 PSF).

The overall weight of the test assembly is 403.2 kg/m$^2$ (82.6 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Test Floor Size: 3658mm x 4877mm (12 ft. x 16 ft.).

Conditioning: Mortar and grout cured for a minimum of 5 days. Concrete cured for a minimum of 28 days.

Test samples were submitted by client and tested as received.

Test Results: The results of the tests are given on pages 3 and 4.

* Tests conducted in Floor-Ceiling chambers do not meet all requirements of the most recent ASTM E 90 Standard.

NGC Testing Services

# Acoustical Testing Laboratory

## Sound Transmission Loss Test Data



**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006006
Test Date: 1/23/2006
Size: 17.8 m²
Temperature [°C]: 18.3

**Sound Transmission Class STC = 54 dB**
Sum of unfavorable deviations: 31.0 dB
Max. unfavorable deviation: 5.0 dB at 200 Hz

| Frequency [Hz] | STL [dB] | L1 [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | ΔSTL |
|---|---|---|---|---|---|---|---|
| 100 | 34 | 107.4 | 81.8 | 2.98 | 8.6 | -.- | 2.383 |
| 125 | 34 | 101.6 | 76.0 | 2.59 | 8.0 | 4.0 | 0.964 |
| 160 | 38 | 99.5 | 70.0 | 2.94 | 8.5 | 3.0 | 0.529 |
| 200 | 39 | 100.3 | 69.7 | 3.05 | 8.7 | 5.0 | 0.361 |
| 250 | 44 | 100.5 | 64.5 | 2.79 | 8.3 | 3.0 | 0.412 |
| 315 | 50 | 100.9 | 59.7 | 3.05 | 8.7 | -.- | 0.332 |
| 400 | 50 | 102.1 | 60.5 | 2.94 | 8.6 | 3.0 | 0.173 |
| 500 | 51 | 99.8 | 56.4 | 2.56 | 7.9 | 3.0 | 0.447 |
| 630 | 52 | 98.4 | 53.8 | 2.41 | 7.7 | 3.0 | 0.671 |
| 800 | 53 | 98.6 | 53.4 | 2.61 | 8.0 | 3.0 | 0.283 |
| 1000 | 54 | 98.4 | 51.9 | 2.58 | 8.0 | 3.0 | 0.768 |
| 1250 | 57 | 97.5 | 47.3 | 2.17 | 7.2 | 1.0 | 0.173 |
| 1600 | 58 | 98.6 | 47.3 | 1.98 | 6.8 | -.- | 0.447 |
| 2000 | 63 | 98.9 | 41.9 | 1.81 | 6.5 | -.- | 0.141 |
| 2500 | 65 | 100.7 | 41.9 | 1.60 | 5.9 | -.- | -.- |
| 3150 | 66 | 101.2 | 41.1 | 1.47 | 5.5 | -.- | 0.387 |
| 4000 | 66 | 100.1 | 38.8 | 1.28 | 5.0 | -.- | 0.283 |
| 5000 | 70 | 99.3 | 33.3 | 1.14 | 4.4 | -.- | 0.529 |

STL = Sound Transmission Loss, dB
L1 = Source Room Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
Δ STL = Uncertainty for 95% Confidence Level



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## Sound Transmission Loss Test Data

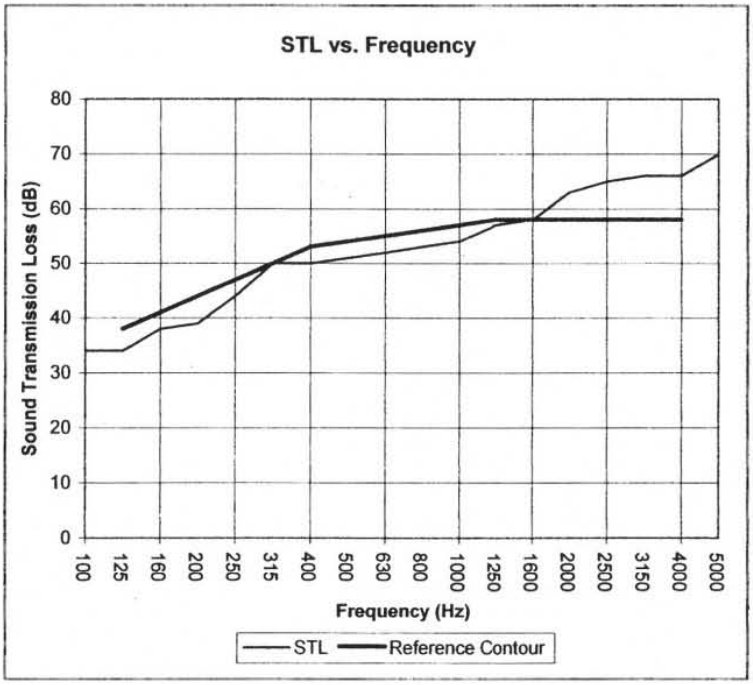


**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006006
Test Date: 1/23/2006
Size: 17.8 m²
Temperature [°C]: 18.3

**Sound Transmission Class STC = 54 dB**

| Frequency [Hz] | STL [dB] | ΔSTL |
|---|---|---|
| 100 | 34 | 2.383 |
| 125 | 34 | 0.964 |
| 160 | 38 | 0.529 |
| 200 | 39 | 0.361 |
| 250 | 44 | 0.412 |
| 315 | 50 | 0.332 |
| 400 | 50 | 0.173 |
| 500 | 51 | 0.447 |
| 630 | 52 | 0.671 |
| 800 | 53 | 0.283 |
| 1000 | 54 | 0.768 |
| 1250 | 57 | 0.173 |
| 1600 | 58 | 0.447 |
| 2000 | 63 | 0.141 |
| 2500 | 65 | -.- |
| 3150 | 66 | 0.387 |
| 4000 | 66 | 0.283 |
| 5000 | 70 | 0.529 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

STL = Sound Transmission Loss, dB
Δ STL = Uncertainty for 95% Confidence Level



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# Acoustiblok® 16 oz. and Acoustiwool™-WF0.125 With Wood Floor On A Wood Joist Subfloor: IIC56 and STC54 Rated Acoustical Test Overview

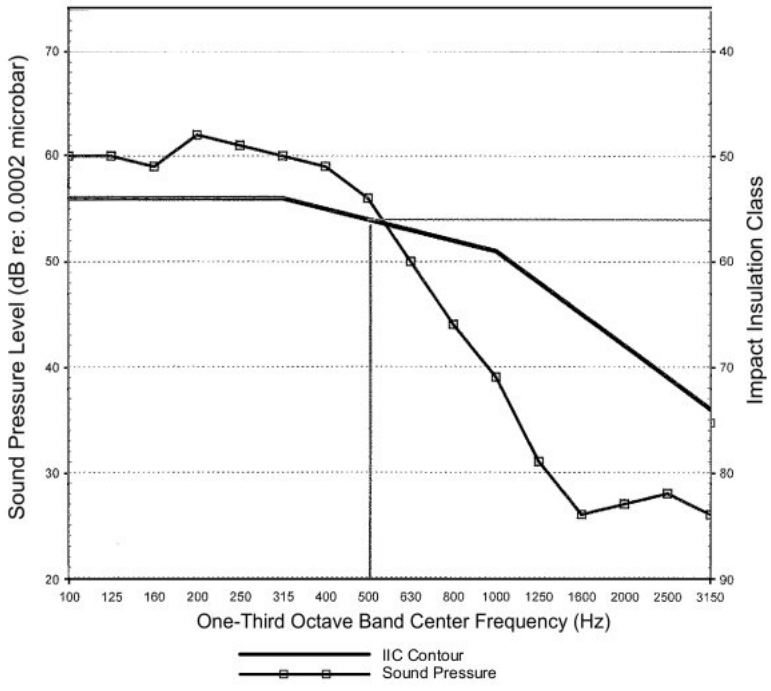

Intertek ETL SEMCO rates this floor configuration with an IIC (impact insulation class) of 56 dB, and an STC (sound transmission class) of 54. See report graphs below, which show the performance of this configuration relative to noise source frequencies.

The tested assembly: A wooden floor/ceiling with 16" truss members spaced 24" o/c, 5/8" plywood subfloor with 1-1/2" gypcrete applied, and layers of Acoustiwool and 16 oz Acoustiblok under hardwood flooring. The space between truss members has 5-1/2" cellulose insulation, and the 5/8" gypsum board ceiling is mounted to resilient channel. All material seams are sealed.

**Impact Insulation Class** (IIC) is a single number rating used to compare the performance of floor/ceiling partitions in blocking impact noise, such as footsteps and dropped objects. The higher the IIC rating number, the better the performance. An IIC of 50 is usually considered the minimum for preventing noise complaints in residential building. IIC ratings are calculated by a method similar to STC ratings (see description of STC below).

The IIC of a particular floor assembly is derived using a standard tapping machine, as stipulated in ASTM method E492.3 This machine incorporates five steel-faced hammers that strike the test floor and generate noise in a room below. The noise levels are measured and used to calculate the impact insulation class (IIC), following ASTM method E989.

**Impact Insulation Class IIC 56**
**Per Intertek ETL SEMKO test 3107558CRT-003**



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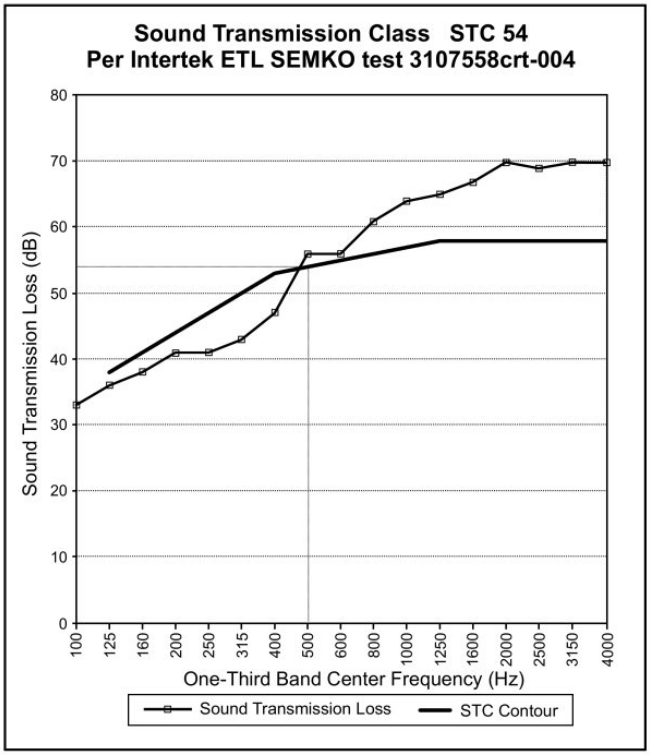
# Acoustiblok® 16 oz. and Acoustiwool™-WF0.125 With Wood Floor On A Wood Joist Subfloor: IIC56 and STC54 Rated Acoustical Test Overview




Sound Transmission Loss data for wooden floor/ceiling assembly with Gypcrete, Acoustiwool, Acoustiblok, and resilient channel, STC 54 rated.

**SOUND TRANSMISSION CLASS** is a single number that represents the sound blocking capacity of a partition such as a wall or ceiling.

STC numbers are often called out in architectural specifications, to assure that partitions will reduce noise levels. For performance similar to laboratory test numbers, it is necessary to adhere closely to the construction materials and techniques used in the tested partition.

STC calculations emphasize sound frequencies that match the human voice. A high STC partition will block the sound of human speech, and block noise that interferes with human speech. A high STC number may not indicate a partition that is effective in blocking very low or very high pitched sound. STC measures sound blocking for airborne noise source only; it does not indicate how well a partition can block impact noise (objects striking the far side of the partition), or directly transmitted noise such as machinery mounted on the far side of the wall.

STC is calculated by comparing the actual sound loss measured when 18 test frequencies pass through a partition, with fixed values for each STC level. The highest STC curve that the measured sound loss numbers fit under, determines the STC rating of the tested partition.

SINCE 1896

# REPORT

Intertek ETL SEMKO

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Accredited by the National Voluntary Laboratory Accreditation Program for the Specific Accreditation under Lab Code 100402-0.

Order No.3107558 Date: November 14, 2006

## REPORT NO. 3107558CRT-003

## IMPACT SOUND TRANSMISSION TEST AND CLASSIFICATION OF ENGINEERED HARDWOOD FLOORING OVER A MAT/UNDERLAYMENT COMBINATION ON A WOOD JOIST FLOOR/CEILING ASSEMBLY

**RENDERED TO**

**ACOUSTIBLOK INTERNATIONAL**
**4216 E. BUSCH**
**TAMPA, FL 33617**

## INTRODUCTION

This report gives the results of an Impact Sound Transmission test on Engineered Hardwood Flooring over a mat/underlayment combination over a wood joist floor/ceiling assembly. The floor/ceiling assembly was supplied and installed by Intertek. The mat and underlayment were selected and supplied by the client and received at the laboratories on October 25, 2006. The mat and underlayment appeared to be in new, unused condition upon arrival.

## AUTHORIZATION

Signed Intertek Quotation No. 314980.

## TEST METHOD

The specimen was tested in accordance with the American Society for Testing and Materials designation ASTM E492-04, "Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine". It was classified in accordance with ASTM E989-89 (Re-approved 1999), entitled, "Standard Classification for Determination of Impact Insulation Class (IIC)".

## GENERAL

The method is designed to measure the impact sound transmission performance of a floor/ceiling assembly in a controlled laboratory environment. A standard tapping machine (Bruel & Kjaer Type 3207) was placed at four positions on the test floor that forms the horizontal separation between two rooms, one directly above the other. The data obtained was normalized to a reference room absorption of 10 square meters in accordance with the test method.

The standard also prescribes a single-figure classification rating called "Impact Insulation Class, IIC" which can be used by architects, builders and code authorities for acoustical design purposes in building construction.

The IIC is obtained by matching a standard reference contour to the plotted normalized one-third octave band sound pressure levels at each test frequency. The greater the IIC rating, the lower the impact sound transmission through the floor-ceiling assembly

## DESCRIPTION OF THE FLOOR/CEILING ASSEMBLY

The test floor is a 100 sq. ft. opening that forms the horizontal separation of the two rooms, one directly above the other. The structural members are open webbed wood floor trusses, 16 inches deep installed 24 inches on center. The sub flooring is 5/8 inch thick plywood. The bridging is a continuous 2 x 4 nailed to the bottom chord and the sides of the diagonals with 2 inch long nails. Single leaf RC-1 resilient channels (2 ½ inch x ½ inch) were spaced 16 inches on center and attached to the bottom chord by screws. The insulation is 5 1/2 inches of cellulose with a density of 1.6 pcf. The ceiling is gypsum board, 5/8 inches thick, with the long edges located between the joists perpendicular to the resilient channels. Short edges are staggered by 4 ft. Sheets are fastened to the resilient channels by means of 1 1/2 inch screws located 1/2 inch away from the edge and 3 inches from the long edges; screws are spaced 6 inches on center. Joints are taped and finished with two layers of compound.

The topping over the plywood sub-floor is 1½ inch thick gypsum concrete.

## DESCRIPTION OF TEST SPECIMEN

Engineered Hardwood flooring (15/32 inch thick) installed over Acoustiblok® (3/32 inch thick vinyl mat) which was installed over Acoustiblok's Acoustiwool-WFO.125" in accordance with the manufacturer's instructions.

## RESULTS OF TEST

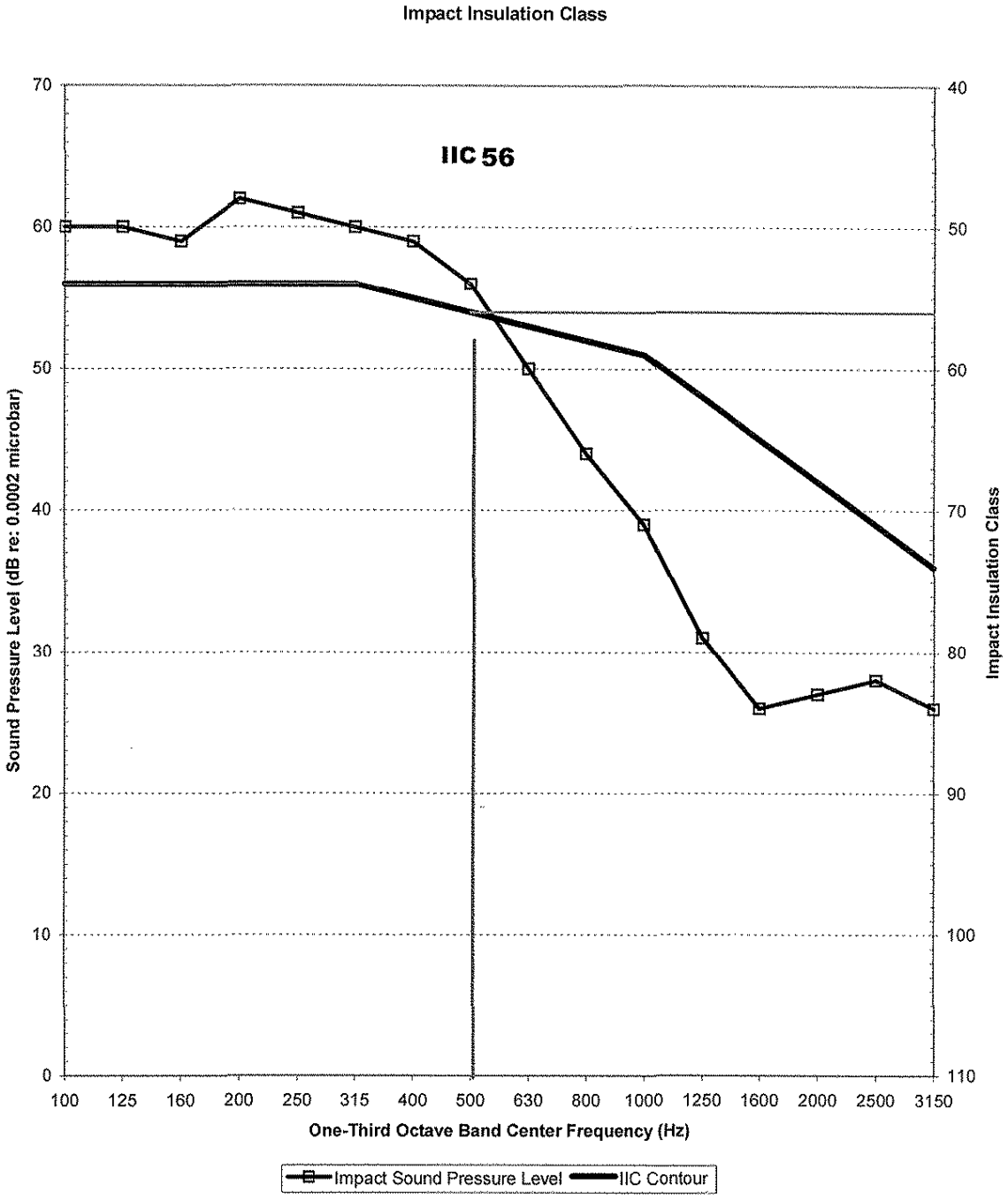
The data obtained in the room below the panel normalized to $A_o$ = 10 square meters, is as follows:

| 1/3 Octave Band Center Frequency Hz | 1/3 Octave Band Sound Pressure Level dB re 0.0002 Microbar |
|---|---|
| 100 | 60 |
| 125 | 60 |
| 160 | 59 |
| 200 | 62 |
| 250 | 61 |
| 315 | 60 |
| 400 | 59 |
| 500 | 56 |
| 630 | 50 |
| 800 | 44 |
| 1000 | 39 |
| 1250 | 31 |
| 1600 | 26 |
| 2000 | 27 |
| 2500 | 28 |
| 3150 | 26 |
| Impact Insulation Class (IIC) | 56 |

The 95% uncertainty level for each tapping machine location is less than 3 dB for the 1/3 octave bands centered in the range from 100 to 400 Hz and less than 2.5 dB for the bands centered in the range from 500 to 3150 Hz.

For the floor/ceiling construction, the 95% uncertainty limits ($\Delta L_n$) for the normalized sound pressure levels were determined to be less than 2 dB for the 1/3 octave bands centered in the range from 100 to 3500.

# ENGINEERED HARDWOOD OVER ACOUSTIBLOK/ACOUSTIWOOL-WFO.125" ON A WOOD JOIST FLOOR/CEILING WITH 1½ INCH GYPSUM CONCRETE




## ACOUSTIBLOK

Checked by: JK

## REMARKS

1. Aging Period: None
2. Ambient Temperature: 71°F
3. Relative Humidity: 42%

## CONCLUSION

The test method employed for this test has no pass-fail criteria, therefore, the evaluation of the test results is left to the discretion of the client.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test: November 14, 2006

Report Approved by:

James H. Nickelsen
Senior Project Engineer
Acoustical Testing

Report Reviewed By:

James R. Kline
Engineer/Quality Supervisor
Acoustical Testing

Attachments: None

# REPORT

Intertek ETL SEMKO

SINCE 1896

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 3107558 Date: November 14, 2006

**REPORT NO. 3107558CRT-004**

**SOUND TRANSMISSION LOSS TEST AND CLASSIFICATION OF ENGINEERED HARDWOOD FLOORING OVER A MAT/UNDERLAYMENT COMBINATION ON A WOOD JOIST FLOOR/CEILING ASSEMBLY WITH 1 ½ INCHES OF GYPSUM CONCRETE**

**RENDERED TO**

**ACOUSTIBLOK INTERNATIONAL**
**4216 E. BUSCH**
**TAMPA, FL 33617**

## INTRODUCTION

This report gives the results of a Sound Transmission Loss Test and Classification on Engineered Hardwood Flooring over a mat/underlayment combination over a wood joist floor/ceiling assembly with 1 ½ inches of gypsum concrete. The floor/ceiling assembly was supplied and installed by Intertek. The mat and underlayment were selected and supplied by the client and received at the laboratories on October 25, 2006. The mat and underlayment appeared to be in new, unused condition upon arrival.

## AUTHORIZATION

Signed Intertek Quotation No. 314980.

## TEST METHOD

The specimen was tested in general accordance with the American Society for Testing and Materials designation ASTM E90-04, "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements", and classified in accordance with the American Society for Testing and Materials designation ASTM E413-04, "Classification for Rating Sound Insulation". The size of the source room for the measurements is smaller than the minimum recommended of 125m$^3$. This leads to slightly elevated uncertainties in the measurement data at low frequencies and does not allow microphones to be placed in full accordance with section A.2.

## GENERAL

The sound-insulating property of a partition element is expressed in terms of the sound transmission loss. The procedure for determining this quantity is to mount (and perimeter seal) the test specimen as a partition between two reverberation rooms. Sound is introduced in one of the rooms (the source room) and measurements are made of the noise reduction between source room and receiving room. The rooms are so arranged and constructed that the only significant sound transmission between them is through the test specimen.

The purpose of the Sound Transmission Class (STC) is to provide a single figure rating that can be used for comparing the sound-insulating properties of partition elements used for general building design purposes. The higher the rating (STC) the greater the sound insulating properties of the partition.

## DESCRIPTION OF THE FLOOR/CEILING ASSEMBLY

The test floor is a 100 sq. ft. opening that forms the horizontal separation of the two rooms, one directly above the other. The structural members are open webbed wood floor trusses, 16 inches deep installed 24 inches on center. The sub flooring is 5/8 inch thick tongue and groove plywood. The bridging is a continuous 2 x 4 nailed to the bottom chord and the sides of the diagonals with 2 inch long nails. Single leaf RC-1 resilient channels (2½ inch x ½ inch) were spaced 16 inches on center and attached to the bottom chord by screws. The insulation is 5½ inches cellulose with a density of 1.6 pcf. The ceiling is gypsum board, 5/8 inches thick, with the long edges located between the joists perpendicular to the resilient channels. Short edges are staggered by 4 ft. Sheets are fastened to the resilient channels by means of 1½ inch screws located ½ inch away from the edge and 3 inches from the long edges; screws are spaced 6 inches on center. Joints are taped and finished with two layers of compound.

The topping over the tongue and groove plywood sub-floor is 1½ inches of gypsum concrete.

## DESCRIPTION OF TEST SPECIMEN

Engineered Hardwood flooring (15/32 inch thick) installed over Acoustiblok® (3/32 inch thick vinyl mat) which was installed over Acoustiblok's Acoustiwool-WFO.125" in accordance with the manufacturer's instructions.

**ENGINEERED HARDWOOD OVER ACOUSTIBLOK/ACOUSTIWOOL-WFO.125" ON A WOOD JOIST FLOOR/CEILING WITH 1½ INCH GYPSUM CONCRETE**

| 1/3 Octave Band Center Frequency Hertz | Sound Transmission Loss in dB |
|---|---|
| 80 | 31 |
| 100 | 33 |
| 125 | 36 |
| 160 | 38 |
| 200 | 41 |
| 250 | 41 |
| 315 | 43 |
| 400 | 47 |
| 500 | 56 |
| 630 | 56 |
| 800 | 61 |
| 1000 | 64 |
| 1250 | 65 |
| 1600 | 67 |
| 2000 | 70 |
| 2500 | 69 |
| 3150 | 70 |
| 4000 | 70 |
| 5000 | 65 |
| Sound Transmission Class | 54 |

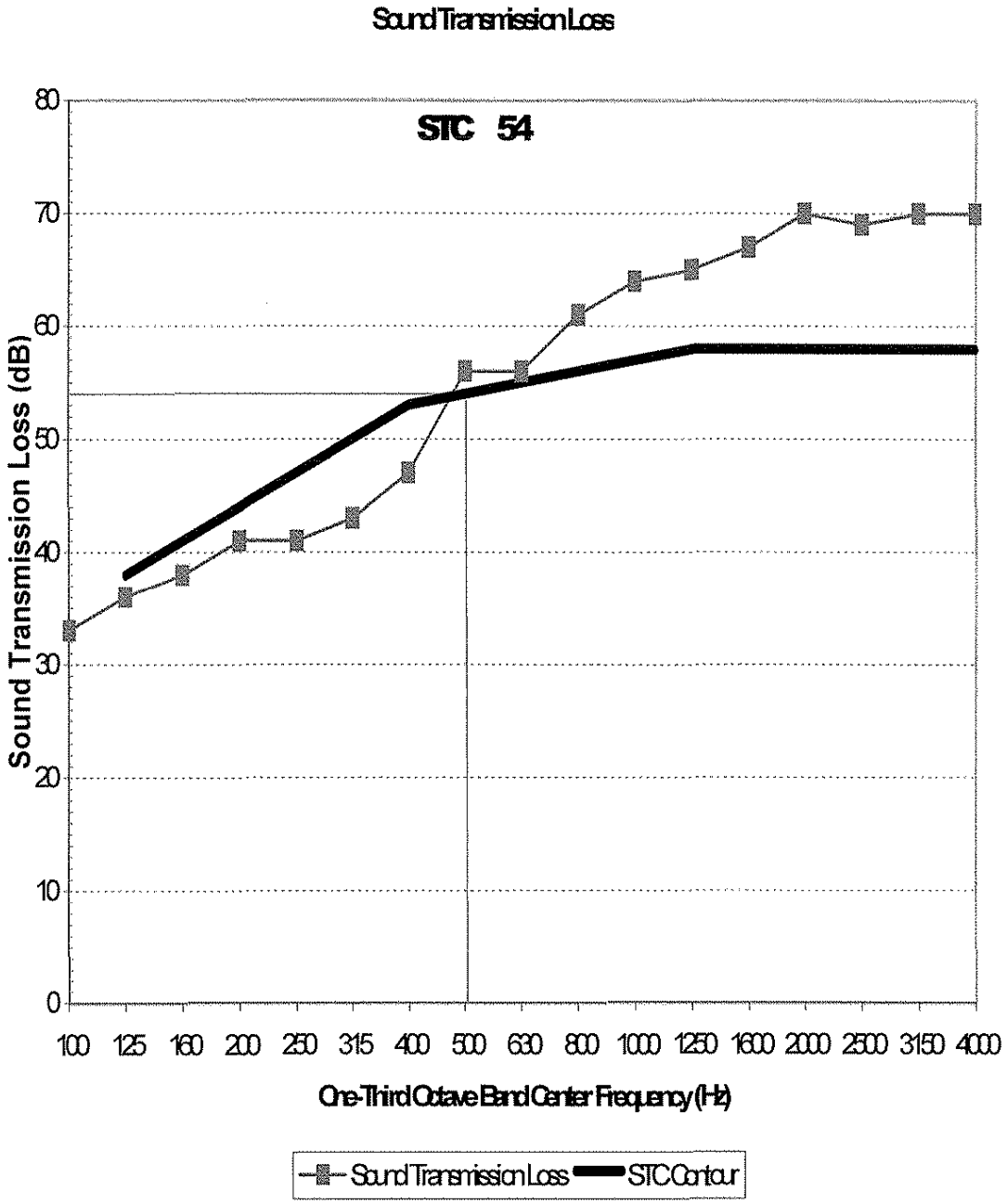
## PRECISION

For the Intertek flooring test facility, the 95% confidence interval ΔTL, is as follows:

| Range of One-Third Octave Bands | Transmission Loss 95% Confidence Uncertainty, dB |
|---|---|
| 125 and 200 | <4.0 |
| 250 and 315 | <2.0 |
| 400 - 4000 | <1.5 |

Checked by: JK

## ENGINEERED HARDWOOD OVER ACOUSTIBLOK/ACOUSTIWOOL-WFO.125" ON A WOOD JOIST FLOOR/CEILING WITH 1½ INCH GYPSUM CONCRETE




**ACOUSTIBLOK INTERNATIONAL**

Checked by: QK

## REMARKS

1. Aging Period: None (flooring and underlay)
2. Ambient Temperature: 69°F
3. Relative Humidity: 45%

## CONCLUSION

The test method employed for this test has no pass-fail criteria; therefore, the evaluation of the test results is left to the discretion of the client.

Date of Test: November 14, 2006

Report Approved by:

James H. Nickelsen
Senior Project Engineer
Acoustical Testing

Report Reviewed By:

James R. Kline
Engineer/Quality Supervisor
Acoustical Testing

Attachments: None

*North American Office*
**Acoustiblok, Inc.**
6900 Interbay Boulevard
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www.acoustiblok.com
sales@acoustiblok.com

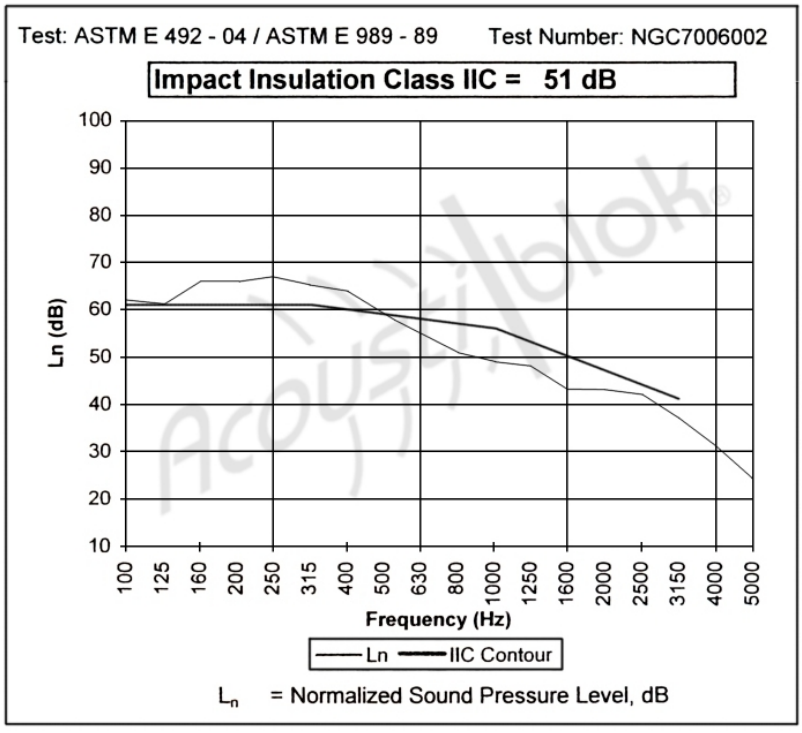
# Acoustiblok® 32 oz. with Wood Floor on Wood Joist Assembly: IIC51 and STC55 Rated Acoustical Test Overview


NGC Testing Services rates this floor configuration with an IIC (Impact Insulation Class) of 51, and STC (sound transmission class) of 55. See report graph below, which shows the high sound blocking performance of this configuration across both low and high frequency ranges.

The tested assembly: 3/4" Red Oak tongue & groove flooring, 3/4" plywood, 1 layer 32 Oz Acoustiblok®, 3/4" OSB sub-floor attached to joists, 2x10" wood floor joists spaced 16" with 1x4" cross bracing, 3-1/2" fiberglass insulation between joists, RC resilient channel screwed to joists, 1 layer 5/8" drywall (joints taped).

**Impact Insulation Class** (IIC) is a single number rating used to compare the performance of floor/ceiling partitions in blocking impact noise, such as footsteps and dropped objects. The higher the IIC rating number, the better the performance. An IIC of 50 is usually considered the minimum for preventing noise complaints in residential building. IIC ratings are calculated by a method similar to STC ratings (see description of STC below).

The IIC of a particular floor assembly is derived using a standard tapping machine, as stipulated in ASTM method E492.3 This machine incorporates five steel-faced hammers that strike the test floor and generate noise in a room below. The noise levels are measured and used to calculate the impact insulation class (IIC), following ASTM method E989.



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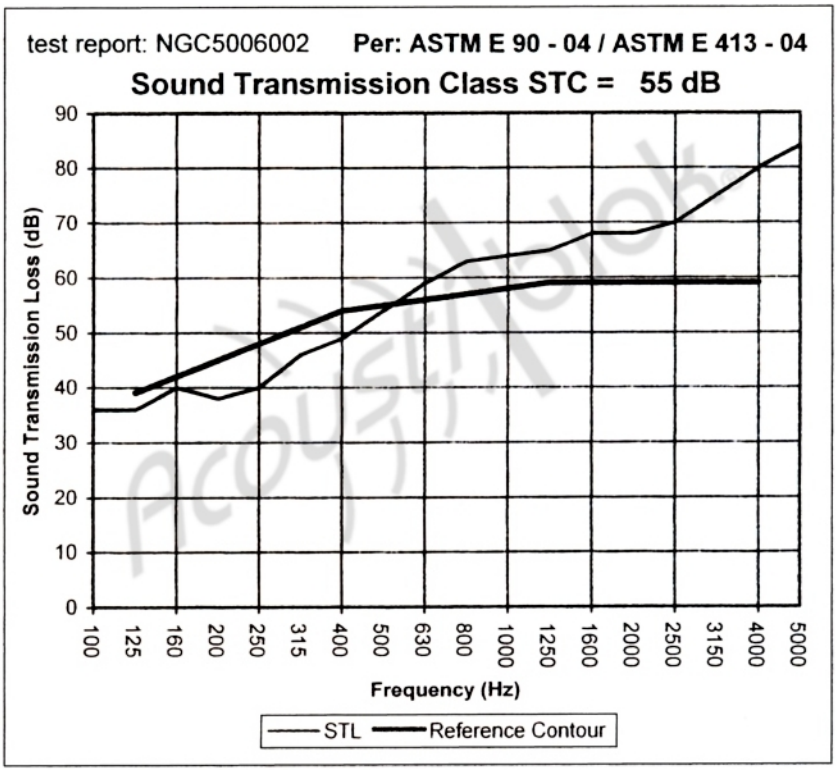
# Acoustiblok® 32 oz. with Wood Floor on Wood Joist Assembly: IIC51 and STC55 Rated Acoustical Test Overview




Sound Transmission Loss data for tile floor/ceiling assembly with 32 Oz. Acoustiblok, STC 55. See illustration and description on previous page for details of the assembly. Unlike other noise barriers, Acoustiblok's performance remains high at the lowest sound frequencies.

**SOUND TRANSMISSION CLASS** is a single number that represents the sound blocking capacity of a partition such as a wall or ceiling.

STC numbers are often called out in architectural specifications, to assure that partitions will reduce noise levels. For performance similar to laboratory test numbers, it is necessary to adhere closely to the construction materials and techniques used in the tested partition.

STC calculations emphasize sound frequencies that match the human voice. A high STC partition will block the sound of human speech, and block noise that interferes with human speech. A high STC number may not indicate a partition that is effective in blocking very low or very high pitched sound. STC measures sound blocking for airborne noise source only; it does not indicate how well a partition can block impact noise (objects striking the far side of the partition), or directly transmitted noise such as machinery mounted on the far side of the wall.

STC is calculated by comparing the actual sound loss measured when 18 test frequencies pass through a partition, with fixed values for each STC level. The highest STC curve that the measured sound loss numbers fit under, determines the STC rating of the tested partition.

Acoustical • Analytical • Fire • Structural
NGC Testing Services

# Acoustical Testing Laboratory

NVLAP®
Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200291

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Impact Sound Transmission Test

**ASTM E 492 – 04 / ASTM E 989 – 89**
**On**

**Wood Joist Floor-Ceiling Assembly with;**
**Oak Flooring on 32 oz. Acoustiblok®**



Report Number: NGC 7006002

Assignment Number: G-287

Test Date: 01/11/2006

Report Date: 01/19/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director

Report Number: NGC 7006002

Test Method: This test method is in accordance with American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine - Designation: E 492 – 04.

The uncertainty limits of each tapping machine location met the precision requirements of section 11.3 of ASTM E 492-04.

Specimen Description: Wood joist floor-ceiling assembly with, according to client, Wood Joist Floor-Ceiling Assembly with Oak Flooring over 32 oz. Acoustiblok®

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 19.0mm (¾ in.) red oak tongue & groove flooring boards nailed to 19.0mm (¾ in.) plywood. 23.29 kg/m$^2$ (4.77 PSF)
- 1 layer of 4.83mm (0.190 in.) Acoustiblok® ,black sound isolation material 9.18 kg/m$^2$ (1.88 PSF).
- 19.0mm (¾ in.) OSB sub-floor 12.2 kg/m$^2$ (2.5 PSF) attached to wood joists 12.2 kg/m$^2$ (2.5 PSF).
- 50.8mm x 254mm x 3658mm (2 in. x 10 in. x 12ft.) wood joists spaced 406.4mm (16 in.) o.c. 12.6 kg/m$^2$ (2.57 PSF) with 25.4mm x 101.6mm (1in.x 4 in.) wood cross bracing.
- Unimast RC Deluxe resilient furring channel 0.43mm (0.017 in.) metal, 609.6mm (24 in.) o.c. 2.49 kg/m$^2$ (0.51 PSF) screw attached to wood joists.
- Paper faced 88.9mm (3-½ in.) fiberglass insulation. 0.98 kg/m$^2$ (0.2 PSF)
- 1 layer 15.9mm (5/8 in.) Type X wallboard 11.0 kg/m$^2$ (2.25 PSF), attached 609.6mm (24 in.) o.c. to furring with 28.6mm (1-1/8 in.) type S screws. The wallboard joints were taped.

The overall weight of the test assembly is 83.9 kg/m$^2$ (17.18 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Specimen size: 3658mm x 4877mm (12 ft. x 16 ft.)

Test samples were submitted by client and tested as received.

Conditioning: Room Conditions

Test Results: The results of the tests are given on pages 3 and 4.

# Normalized impact sound pressure level

Test: ASTM E 492 - 04 / ASTM E 989 - 89



Test Number: NGC7006002 Date: 1/11/2006
Size: 17.84 m²

**Source room**

Temperature [°C]: 19.2
Humidity [%]: 36

**Receiving room**

Volume V = 42.73 m³
Temperature [°C]: 18.7
Humidity [%]: 63

## Impact Insulation Class IIC = 51 dB

Sum of unfavorable deviations: 25.0 dB
Max. unfavorable deviation: 6.0 dB at 250 Hz

| Frequency [Hz] | $L_n$ [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | $\Delta L_n$ |
|---|---|---|---|---|---|---|
| 100 | 62.0 | 66.7 | 1.88 | -4.7 | 1.0 | 0.208 |
| 125 | 61.0 | 66.3 | 2.16 | -5.3 | -.- | 0.234 |
| 160 | 66.0 | 69.9 | 1.73 | -3.9 | 5.0 | 0.267 |
| 200 | 66.0 | 70.7 | 2.04 | -4.7 | 5.0 | 0.217 |
| 250 | 67.0 | 71.3 | 1.96 | -4.3 | 6.0 | 0.213 |
| 315 | 65.0 | 69.4 | 2.09 | -4.4 | 4.0 | 0.124 |
| 400 | 64.0 | 68.8 | 2.21 | -4.8 | 4.0 | 0.130 |
| 500 | 59.0 | 63.9 | 2.16 | -4.9 | -.- | 0.141 |
| 630 | 55.0 | 60.2 | 2.16 | -5.2 | -.- | 0.114 |
| 800 | 51.0 | 56.6 | 2.34 | -5.6 | -.- | 0.084 |
| 1000 | 49.0 | 54.1 | 2.25 | -5.1 | -.- | 0.060 |
| 1250 | 48.0 | 53.0 | 1.97 | -5.0 | -.- | 0.052 |
| 1600 | 43.0 | 47.5 | 1.84 | -4.5 | -.- | 0.039 |
| 2000 | 43.0 | 46.6 | 1.62 | -3.6 | -.- | 0.044 |
| 2500 | 42.0 | 45.1 | 1.44 | -3.1 | -.- | 0.032 |
| 3150 | 37.0 | 39.8 | 1.37 | -2.8 | -.- | 0.040 |
| 4000 | 31.0 | 33.2 | 1.25 | -2.2 | -.- | 0.032 |
| 5000 | 24.0 | 26.2 | 1.13 | -2.2 | -.- | 0.032 |

$L_n$ = Normalized Sound Pressure Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
$\Delta L_n$ = Uncertainty for 95% Confidence Level

## Normalized impact sound pressure level

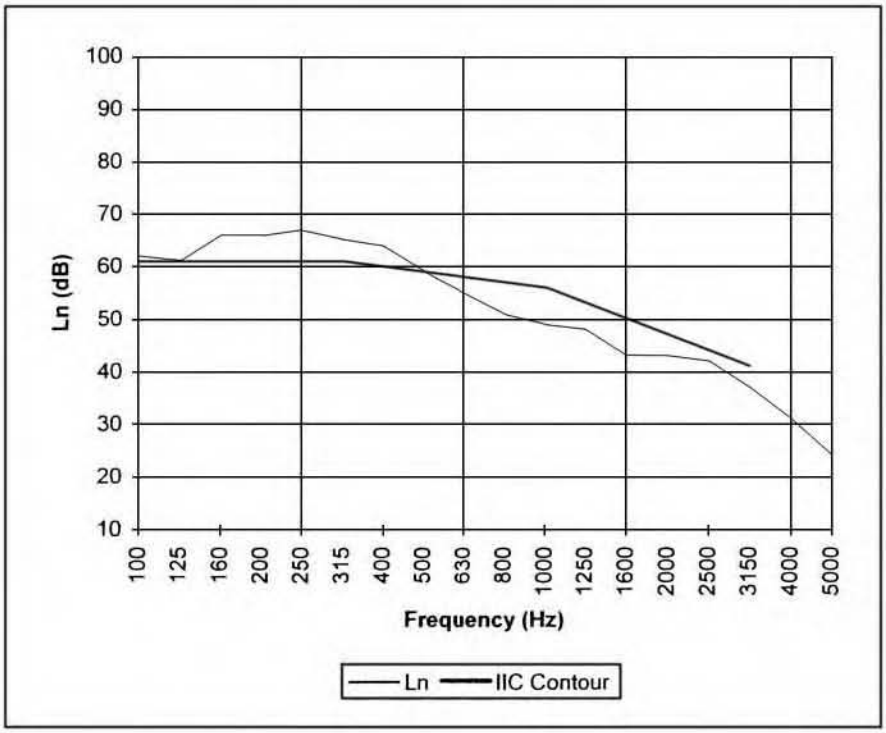
Test: ASTM E 492 - 04 / ASTM E 989 - 89



Test Number: NGC7006002 Date: 1/11/2006

**Impact Insulation Class IIC = 51 dB**

| Frequency [Hz] | $L_n$ [dB] |
|---|---|
| 100 | 62 |
| 125 | 61 |
| 160 | 66 |
| 200 | 66 |
| 250 | 67 |
| 315 | 65 |
| 400 | 64 |
| 500 | 59 |
| 630 | 55 |
| 800 | 51 |
| 1000 | 49 |
| 1250 | 48 |
| 1600 | 43 |
| 2000 | 43 |
| 2500 | 42 |
| 3150 | 37 |
| 4000 | 31 |
| 5000 | 24 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

$L_n$ = Normalized Sound Pressure Level, dB

NGC Testing Services

# Acoustical Testing Laboratory

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Sound Transmission Loss Test

**ASTM E 90 – 04 / E 413 - 04**
**On**

**Wood Joist Floor-Ceiling Assembly with;**
**Oak Flooring on 32 oz. Acoustiblok®**



Report Number: NGC 5006002

Assignment Number: G-287

Test Date: 01/11/2006

Report Date: 01/19/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director

Report Number: NGC 5006002

Test Method: This test method generally follows * the American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements - Designation: E 90 - 04 / E 413 - 04.

Specimen Description: Wood joist floor-ceiling assembly with, according to client, Wood Joist Floor-Ceiling Assembly with Oak Flooring over 32 oz. Acoustiblok®

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 19.0mm (¾ in.) red oak tongue & groove flooring boards nailed to 19.0mm (¾ in.) plywood. 23.29 kg/m$^2$ (4.77 PSF)
- 1 layer of 4.83mm (0.190 in.) Acoustiblok® ,black sound isolation material 9.18 kg/m$^2$ (1.88 PSF).
- 19.0mm (¾ in.) OSB sub-floor 12.2 kg/m$^2$ (2.5 PSF) attached to wood joists 12.2 kg/m$^2$ (2.5 PSF).
- 50.8mm x 254mm x 3658mm (2 in. x 10 in. x 12ft.) wood joists spaced 406.4mm (16 in.) o.c. 12.6 kg/m$^2$ (2.57 PSF) with 25.4mm x 101.6mm (1in.x 4 in.) wood cross bracing.
- Unimast RC Deluxe resilient furring channel 0.43mm (0.017 in.) metal, 609.6mm (24 in.) o.c. 2.49 kg/m$^2$ (0.51 PSF) screw attached to wood joists.
- Paper faced 88.9mm (3-½ in.) fiberglass insulation. 0.98 kg/m$^2$ (0.2 PSF)
- 1 layer 15.9mm (5/8 in.) Type X wallboard 11.0 kg/m$^2$ (2.25 PSF), attached 609.6mm (24 in.) o.c. to furring with 28.6mm (1-1/8 in.) type S screws. The wallboard joints were taped.

The overall weight of the test assembly is 83.9 kg/m$^2$ (17.18 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Specimen size: 3658mm x 4877mm (12 ft. x 16 ft.)

Test samples were submitted by client and tested as received.

Conditioning: Room Conditions

Test Results: The results of the tests are given on pages 3 and 4.

* Tests conducted in Floor-Ceiling chambers do not meet all requirements of the most recent ASTM E 90 Standard.

## Sound Transmission Loss Test Data



**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006002
Test Date: 1/11/2006
Size: 17.8 m²
Temperature [°C]: 18.4

**Sound Transmission Class STC = 55 dB**
Sum of unfavorable deviations: 31.0 dB
Max. unfavorable deviation: 8.0 dB at 250 Hz

| Frequency [Hz] | STL [dB] | L1 [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | ΔSTL |
|---|---|---|---|---|---|---|---|
| 100 | 36 | 103.5 | 74.1 | 1.88 | 6.9 | -.- | 1.741 |
| 125 | 36 | 102.0 | 73.6 | 2.16 | 7.5 | 3.0 | 0.728 |
| 160 | 40 | 101.3 | 67.9 | 1.73 | 6.5 | 2.0 | 0.775 |
| 200 | 38 | 96.5 | 65.7 | 2.04 | 7.2 | 7.0 | 1.100 |
| 250 | 40 | 97.4 | 64.1 | 1.96 | 7.0 | 8.0 | 0.938 |
| 315 | 46 | 98.8 | 60.3 | 2.09 | 7.3 | 5.0 | 0.648 |
| 400 | 49 | 98.9 | 57.8 | 2.21 | 7.6 | 5.0 | 0.200 |
| 500 | 54 | 97.5 | 50.5 | 2.16 | 7.5 | 1.0 | 0.245 |
| 630 | 59 | 97.3 | 45.5 | 2.16 | 7.5 | -.- | 0.648 |
| 800 | 63 | 97.4 | 42.4 | 2.34 | 7.8 | -.- | 0.480 |
| 1000 | 64 | 96.4 | 40.1 | 2.25 | 7.6 | -.- | 0.374 |
| 1250 | 65 | 95.8 | 37.9 | 1.97 | 7.1 | -.- | 0.400 |
| 1600 | 68 | 97.4 | 36.2 | 1.84 | 6.8 | -.- | 0.557 |
| 2000 | 68 | 97.8 | 36.0 | 1.62 | 6.2 | -.- | 0.424 |
| 2500 | 70 | 100.0 | 36.1 | 1.44 | 5.7 | -.- | 0.510 |
| 3150 | 75 | 100.5 | 31.3 | 1.37 | 5.5 | -.- | 0.500 |
| 4000 | 80 | 100.5 | 25.5 | 1.25 | 5.1 | -.- | 0.949 |
| 5000 | 84 | 99.6 | 20.5 | 1.13 | 4.6 | -.- | 1.229 |

STL = Sound Transmission Loss, dB
L1 = Source Room Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
Δ STL = Uncertainty for 95% Confidence Level

## Sound Transmission Loss Test Data

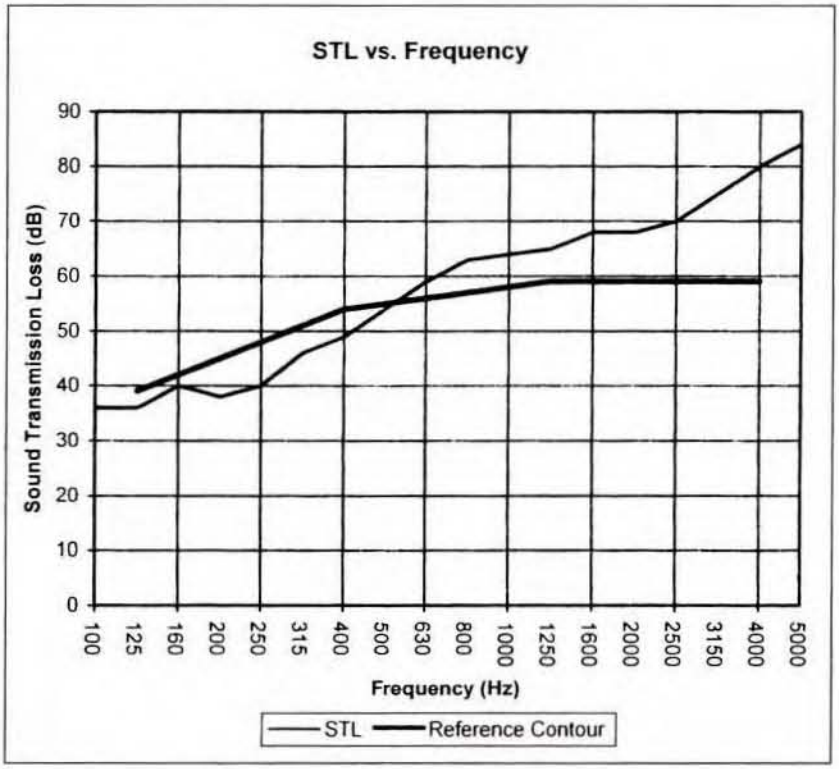


**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006002
Test Date: 1/11/2006
Size: 17.8 m²
Temperature [°C]: 18.4

**Sound Transmission Class STC = 55 dB**

| Frequency [Hz] | STL [dB] | ΔSTL |
|---|---|---|
| 100 | 36 | 1.741 |
| 125 | 36 | 0.728 |
| 160 | 40 | 0.775 |
| 200 | 38 | 1.100 |
| 250 | 40 | 0.938 |
| 315 | 46 | 0.648 |
| 400 | 49 | 0.200 |
| 500 | 54 | 0.245 |
| 630 | 59 | 0.648 |
| 800 | 63 | 0.480 |
| 1000 | 64 | 0.374 |
| 1250 | 65 | 0.400 |
| 1600 | 68 | 0.557 |
| 2000 | 68 | 0.424 |
| 2500 | 70 | 0.510 |
| 3150 | 75 | 0.500 |
| 4000 | 80 | 0.949 |
| 5000 | 84 | 1.229 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

STL = Sound Transmission Loss, dB
Δ STL = Uncertainty for 95% Confidence Level

NGC Testing Services

# Acoustical Testing Laboratory

NVLAP®

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab.Code 200291

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Impact Sound Transmission Test

**ASTM E 492 – 04 / ASTM E 989 – 89**
**On**

**Wood Joist Floor-Ceiling Assembly with;**
**Oak Flooring on 16 oz. Acoustiblok®**



Report Number: NGC 7006003

Assignment Number: G-287

Test Date: 01/12/2006

Report Date: 01/19/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director

Report Number: NGC 7006003

Test Method: This test method is in accordance with American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine - Designation: E 492 – 04.

The uncertainty limits of each tapping machine location met the precision requirements of section 11.3 of ASTM E 492-04.

Specimen Description: Wood joist floor-ceiling assembly with, according to client, Wood Joist Floor-Ceiling Assembly with Oak Flooring over 16 oz. Acoustiblok®.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 19.0mm (¾ in.) red oak tongue & groove flooring boards nailed to 19.0mm (¾ in.) plywood. 23.29 kg/m$^2$ (4.77 PSF)
- 1 layer of 2.46mm (0.097 in.) Acoustiblok® ,black sound isolation material 4.88 kg/m$^2$ (1.0 PSF).
- 19.0mm (¾ in.) OSB sub-floor 12.2 kg/m$^2$ (2.5 PSF) attached to wood joists 12.2 kg/m$^2$ (2.5 PSF).
- 50.8mm x 254mm x 3658mm (2 in. x 10 in. x 12ft.) wood joists spaced 406.4mm (16 in.) o.c. 12.6 kg/m$^2$ (2.57 PSF) with 25.4mm x 101.6mm (1in.x 4 in.) wood cross bracing.
- Unimast RC Deluxe resilient furring channel 0.43mm (0.017 in.) metal, 609.6mm (24 in.) o.c. 2.49 kg/m$^2$ (0.51 PSF) screw attached to wood joists.
- Paper faced 88.9mm (3-½ in.) fiberglass insulation. 0.98 kg/m$^2$ (0.2 PSF)
- 1 layer 15.9mm (5/8 in.) Type X wallboard 11.0 kg/m$^2$ (2.25 PSF), attached 609.6mm (24 in.) o.c. to furring with 28.6mm (1-1/8 in.) type S screws. The wallboard joints were taped.

The overall weight of the test assembly is 79.6 kg/m$^2$ (16.3 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Specimen size: 3658mm x 4877mm (12 ft. x 16 ft.)

Test samples were submitted by client and tested as received.

Conditioning: Room Conditions

Test Results: The results of the tests are given on pages 3 and 4.

NGC Testing Services

# Acoustical Testing Laboratory

NVLAP®

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200291

## Normalized impact sound pressure level

Test: ASTM E 492 - 04 / ASTM E 989 - 89



Test Number: NGC7006003 Date: 1/12/2006

Size: 17.84 m²

**Source room**

Temperature [°C]: 19.1

Humidity [%]: 36

**Receiving room**

Volume V = 42.73 m³

Temperature [°C]: 18.7

Humidity [%]: 59

### Impact Insulation Class IIC = 49 dB

Sum of unfavorable deviations: 26.0 dB

Max. unfavorable deviation: 7.0 dB at 250 Hz

| Frequency [Hz] | $L_n$ [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | $\Delta L_n$ |
|---|---|---|---|---|---|---|
| 100 | 64.0 | 68.8 | 1.88 | -4.8 | 1.0 | 0.208 |
| 125 | 63.0 | 68.4 | 2.16 | -5.4 | -.- | 0.234 |
| 160 | 68.0 | 71.5 | 1.73 | -3.5 | 5.0 | 0.267 |
| 200 | 68.0 | 73.1 | 2.04 | -5.1 | 5.0 | 0.217 |
| 250 | 70.0 | 74.4 | 1.96 | -4.4 | 7.0 | 0.213 |
| 315 | 67.0 | 72.2 | 2.09 | -5.2 | 4.0 | 0.124 |
| 400 | 66.0 | 71.4 | 2.21 | -5.4 | 4.0 | 0.130 |
| 500 | 61.0 | 65.7 | 2.16 | -4.7 | -.- | 0.141 |
| 630 | 55.0 | 60.4 | 2.16 | -5.4 | -.- | 0.114 |
| 800 | 51.0 | 55.8 | 2.34 | -4.8 | -.- | 0.084 |
| 1000 | 48.0 | 53.1 | 2.25 | -5.1 | -.- | 0.060 |
| 1250 | 47.0 | 51.4 | 1.97 | -4.4 | -.- | 0.052 |
| 1600 | 42.0 | 46.3 | 1.84 | -4.3 | -.- | 0.039 |
| 2000 | 43.0 | 47.2 | 1.62 | -4.2 | -.- | 0.044 |
| 2500 | 42.0 | 45.1 | 1.44 | -3.1 | -.- | 0.032 |
| 3150 | 37.0 | 40.2 | 1.37 | -3.2 | -.- | 0.040 |
| 4000 | 31.0 | 33.5 | 1.25 | -2.5 | -.- | 0.032 |
| 5000 | 24.0 | 26.2 | 1.13 | -2.2 | -.- | 0.032 |

$L_n$ = Normalized Sound Pressure Level, dB

L2 = Receiving Room Level, dB

T = Reverberation Time, seconds

$\Delta L_n$ = Uncertainty for 95% Confidence Level

## Normalized impact sound pressure level

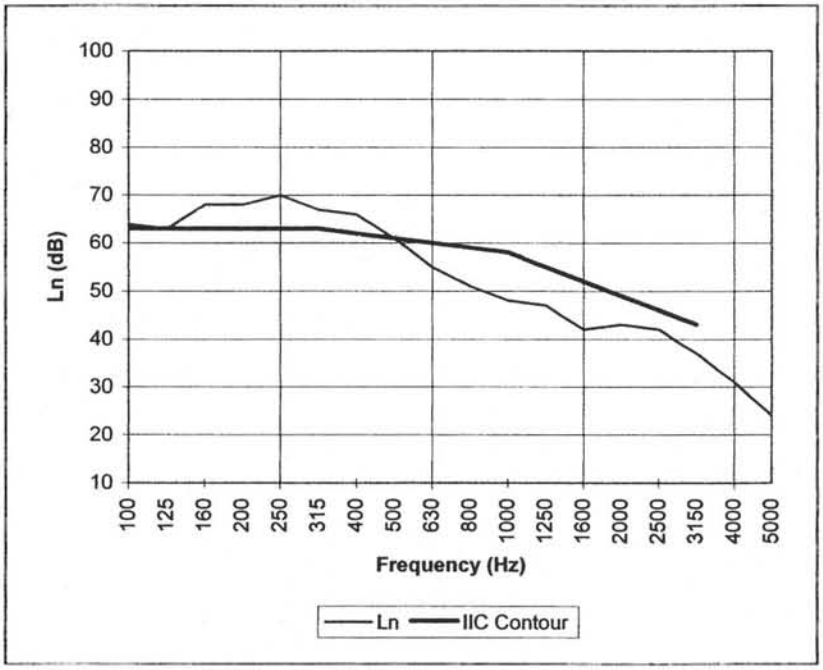
Test: ASTM E 492 - 04 / ASTM E 989 - 89



Test Number: NGC7006003 Date: 1/12/2006

**Impact Insulation Class IIC = 49 dB**

| Frequency [Hz] | $L_n$ [dB] |
|---|---|
| 100 | 64 |
| 125 | 63 |
| 160 | 68 |
| 200 | 68 |
| 250 | 70 |
| 315 | 67 |
| 400 | 66 |
| 500 | 61 |
| 630 | 55 |
| 800 | 51 |
| 1000 | 48 |
| 1250 | 47 |
| 1600 | 42 |
| 2000 | 43 |
| 2500 | 42 |
| 3150 | 37 |
| 4000 | 31 |
| 5000 | 24 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

$L_n$ = Normalized Sound Pressure Level, dB

NGC Testing Services

# Acoustical Testing Laboratory

# TEST REPORT

for

Acoustiblok, Inc.
6900 Interbay Blvd.
Tampa, FL 33616
Marilyn Myers / 813-980-1400

## Sound Transmission Loss Test

**ASTM E 90 – 04 / E 413 - 04**
**On**

**Wood Joist Floor-Ceiling Assembly with;**
**Oak Flooring on 16 oz. Acoustiblok®**



Report Number: NGC 5006003

Assignment Number: G-287

Test Date: 01/12/2006

Report Date: 01/19/2006

Submitted by: _____
Craig G. Cooper
Test Engineer

Reviewed by: _____
Robert J. Menchetti
Director



National Gypsum

1650 Military Road • Buffalo, NY 14217-1198
(716)873-9750 • Fax (716)873-9753 • www.ngctestingservices.com

Report Number: NGC 5006003

Test Method: This test method generally follows * the American Society for Testing and Materials Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements - Designation: E 90 - 04 / E 413 - 04.

Specimen Description: Wood joist floor-ceiling assembly with, according to client, Wood Joist Floor-Ceiling Assembly with Oak Flooring over 16 oz. Acoustiblok®.

The test specimen was a floor-ceiling assembly consisting of the following:

- 1 layer of 19.0mm (¾ in.) red oak tongue & groove flooring boards nailed to 19.0mm (¾ in.) plywood. 23.29 kg/m$^2$ (4.77 PSF)
- 1 layer of 2.46mm (0.097 in.) Acoustiblok® ,black sound isolation material 4.88 kg/m$^2$ (1.0 PSF).
- 19.0mm (¾ in.) OSB sub-floor 12.2 kg/m$^2$ (2.5 PSF) attached to wood joists 12.2 kg/m$^2$ (2.5 PSF).
- 50.8mm x 254mm x 3658mm (2 in. x 10 in. x 12ft.) wood joists spaced 406.4mm (16 in.) o.c. 12.6 kg/m$^2$ (2.57 PSF) with 25.4mm x 101.6mm (1in.x 4 in.) wood cross bracing.
- Unimast RC Deluxe resilient furring channel 0.43mm (0.017 in.) metal, 609.6mm (24 in.) o.c. 2.49 kg/m$^2$ (0.51 PSF) screw attached to wood joists.
- Paper faced 88.9mm (3-½ in.) fiberglass insulation. 0.98 kg/m$^2$ (0.2 PSF)
- 1 layer 15.9mm (5/8 in.) Type X wallboard 11.0 kg/m$^2$ (2.25 PSF), attached 609.6mm (24 in.) o.c. to furring with 28.6mm (1-1/8 in.) type S screws. The wallboard joints were taped.

The overall weight of the test assembly is 79.6 kg/m$^2$ (16.3 PSF) nominal.

The perimeter of the floor assembly was sealed with rubber gasketing and a sand filled trough. The test assembly is structurally isolated from the receiving room.

Specimen size: 3658mm x 4877mm (12 ft. x 16 ft.)

Test samples were submitted by client and tested as received.

Conditioning: Room Conditions

Test Results: The results of the tests are given on pages 3 and 4.

* Tests conducted in Floor-Ceiling chambers do not meet all requirements of the most recent ASTM E 90 Standard.

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## Sound Transmission Loss Test Data



**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006003
Test Date: 1/12/2006
Size: 17.8 m²
Temperature [°C]: 18.7

**Sound Transmission Class STC = 55 dB**
Sum of unfavorable deviations: 32.0 dB
Max. unfavorable deviation: 8.0 dB at 200 Hz

| Frequency [Hz] | STL [dB] | L1 [dB] | L2 [dB] | T [s] | Corr. [dB] | u.Dev. [dB] | ΔSTL |
|---|---|---|---|---|---|---|---|
| 100 | 37 | 101.6 | 71.3 | 1.88 | 6.9 | -.- | 1.879 |
| 125 | 37 | 98.7 | 68.7 | 2.16 | 7.5 | 2.0 | 1.463 |
| 160 | 40 | 98.3 | 65.1 | 1.73 | 6.5 | 2.0 | 0.400 |
| 200 | 37 | 97.3 | 67.2 | 2.04 | 7.2 | 8.0 | 0.424 |
| 250 | 40 | 97.8 | 64.5 | 1.96 | 7.0 | 8.0 | 0.648 |
| 315 | 46 | 98.2 | 59.4 | 2.09 | 7.3 | 5.0 | 0.346 |
| 400 | 48 | 98.3 | 57.5 | 2.21 | 7.6 | 6.0 | 0.332 |
| 500 | 54 | 97.1 | 50.4 | 2.16 | 7.5 | 1.0 | 0.332 |
| 630 | 57 | 95.0 | 45.7 | 2.16 | 7.5 | -.- | 0.557 |
| 800 | 61 | 96.1 | 42.6 | 2.34 | 7.8 | -.- | 0.265 |
| 1000 | 62 | 95.3 | 40.5 | 2.25 | 7.6 | -.- | 0.141 |
| 1250 | 63 | 94.7 | 38.3 | 1.97 | 7.1 | -.- | 0.469 |
| 1600 | 66 | 96.0 | 36.6 | 1.84 | 6.8 | -.- | 0.300 |
| 2000 | 66 | 96.1 | 36.6 | 1.62 | 6.2 | -.- | 0.387 |
| 2500 | 67 | 98.3 | 36.9 | 1.44 | 5.7 | -.- | 0.557 |
| 3150 | 72 | 98.6 | 31.7 | 1.37 | 5.5 | -.- | 0.721 |
| 4000 | 78 | 98.7 | 25.9 | 1.25 | 5.1 | -.- | 0.872 |
| 5000 | 82 | 98.4 | 20.8 | 1.13 | 4.6 | -.- | 1.432 |

STL = Sound Transmission Loss, dB
L1 = Source Room Level, dB
L2 = Receiving Room Level, dB
T = Reverberation Time, seconds
Δ STL = Uncertainty for 95% Confidence Level



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## Sound Transmission Loss Test Data

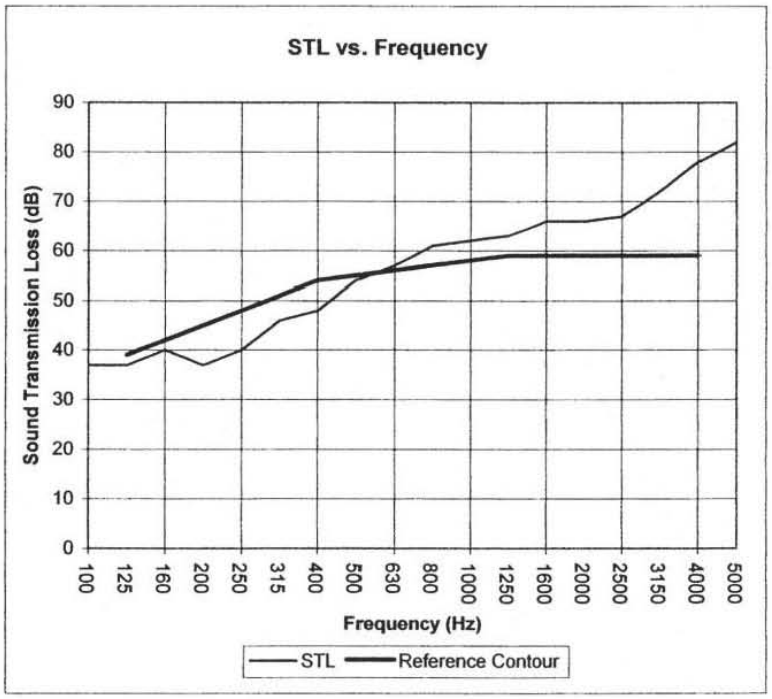


**Per: ASTM E 90 - 04 / ASTM E 413 - 04**

No. of test report: NGC5006003
Test Date: 1/12/2006
Size: 17.8 m²
Temperature [°C]: 18.7

**Sound Transmission Class STC = 55 dB**

| Frequency [Hz] | STL [dB] | ΔSTL |
|---|---|---|
| 100 | 37 | 1.879 |
| 125 | 37 | 1.463 |
| 160 | 40 | 0.400 |
| 200 | 37 | 0.424 |
| 250 | 40 | 0.648 |
| 315 | 46 | 0.346 |
| 400 | 48 | 0.332 |
| 500 | 54 | 0.332 |
| 630 | 57 | 0.557 |
| 800 | 61 | 0.265 |
| 1000 | 62 | 0.141 |
| 1250 | 63 | 0.469 |
| 1600 | 66 | 0.300 |
| 2000 | 66 | 0.387 |
| 2500 | 67 | 0.557 |
| 3150 | 72 | 0.721 |
| 4000 | 78 | 0.872 |
| 5000 | 82 | 1.432 |




* Due to high insulating value of specimen, background levels limit results at these frequencies.

STL = Sound Transmission Loss, dB
Δ STL = Uncertainty for 95% Confidence Level



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