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# BENETTI HOME
# ACOUSTICAL PERFORMANCE TEST REPORT

**SCOPE OF WORK**
ASTM C423 SOUND ABSORPTION TESTING ON BENETTIMOSS WALL PANELS

**REPORT NUMBER**
H6047.01-303-11 R0

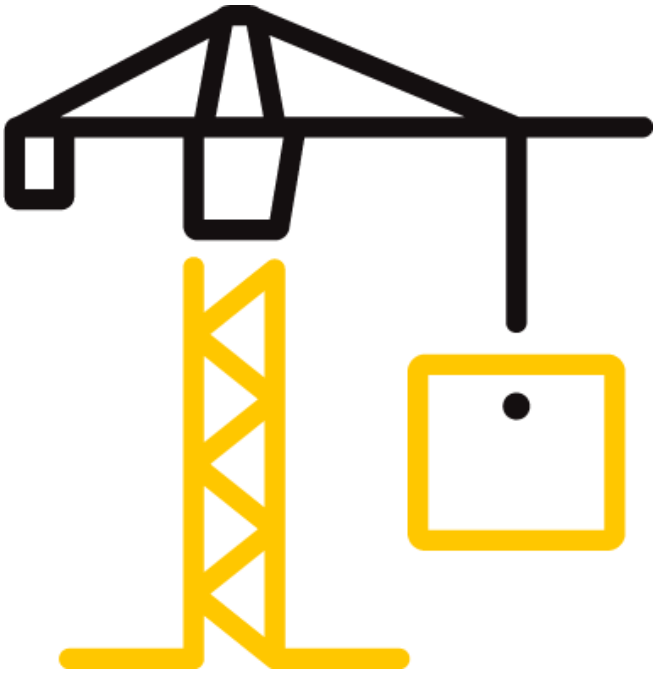
**TEST DATE**
10/20/17

**ISSUE DATE**
11/13/17

**RECORD RETENTION END DATE**
10/20/21

**PAGES**
9

**DOCUMENT CONTROL NUMBER**
ATI 00270 (07/24/17)
RT-R-AMER-Test-2755

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# TEST REPORT FOR BENETTI HOME

Report No.: H6047.01-303-11 R0
Date: 11/13/17

## REPORT ISSUED TO

**BENETTI HOME S.R.L**
Via Matteotti 34
28060 Granozzo (NO) - Italy

## SECTION 1

## SCOPE

Intertek Building & Construction (B&C) was contracted by Benetti Home to perform a sound absorption test. Results obtained are tested values and were secured by using the designated test method(s). The complete test data is included herein. The client provided the test specimen. All measurements were conducted in the HT test chambers at Intertek B&C located in Lake Forest, California.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

## SECTION 2

## SUMMARY OF TEST RESULTS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SERIES/MODEL** | BenettiMoss | | | | | | | |
| **SAMPLE TYPE** | Wall Panels | | | | | | | |
| **MOUNTING TYPE** | Type A | | | | | | | |
| **DATA FILE NO.** | **1/3 OCTAVE SOUND ABSORPTION COEFFICIENTS AT THE OCTAVE BAND FREQUENCIES** | | | | | | **NRC** | **SAA** |
| | **125** | **250** | **500** | **1000** | **2000** | **4000** | | |
| H6047.01 | 0.08 | 0.14 | 0.28 | 0.42 | 0.39 | 0.34 | 0.30 | 0.31 |

For INTERTEK B&C:

| | | | |
|---|---|---|---|
| **COMPLETED BY:** | Leeland S. Hoover | **REVIEWED BY:** | Bradlay D. Hunt |
| **TITLE:** | Technician I | **TITLE:** | Laboratory Manager |
| **SIGNATURE:** | Digitally Signed by: Leeland Hoover | **SIGNATURE:** | Digitally Signed by: Bradlay Hunt |
| **DATE:** | 11/13/17 | **DATE:** | 11/13/17 |

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## SECTION 3
## TEST METHOD(S)

The specimens were evaluated in accordance with the following:

**ASTM C423-17**, *Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method*

**ASTM E795-16**, *Standard Practices for Mounting Test Specimens During Sound Absorption Tests*

## SECTION 4
## SPECIMEN MOUNTING

For the Type A mounting, the test specimen was placed directly against the floor of the reverberation room with the absorptive side facing the sound field.

## SECTION 5
## EQUIPMENT

The equipment listed below meets the requirements of the test methods stated in Section 3 of this report.

| INSTRUMENT | MANUFACTURER | MODEL | DESCRIPTION | ASSET # | CAL DATE |
|---|---|---|---|---|---|
| Data Acquisition Card | National Instruments | PXIe-4464 | Data Acquisition Card | INT00627 | 10/16 * |
| Data Acquisition Card | National Instruments | PXIe-4464 | Data Acquisition Card | INT00395 | 10/16 * |
| Data Acquisition Card | National Instruments | PXIe-4464 | Data Acquisition Card | INT00396 | 10/16 * |
| Receive Room Microphone | PBC Piezotronics | 378C20 | Microphone and Preamplifier | INT00244 | 04/17 |
| Receive Room Microphone | PCB Piezotronics | 378C20 | Microphone and Preamplifier | INT00245 | 04/17 |
| Receive Room Microphone | PCB Piezotronics | 378C20 | Microphone and Preamplifier | INT00246 | 04/17 |
| Receive Room Microphone | PCB Piezotronics | 378C20 | Microphone and Preamplifier | INT00247 | 04/17 |
| Receive Room Microphone | PCB Piezotronics | 378C20 | Microphone and Preamplifier | INT00228 | 04/17 |
| Receive Room Environmental Indicator | Comet | T7510 | Receive Room | INT00299 | 10/17 |
| Microphone Calibrator | Norsonic | 1251 | Pistonphone Calibrator | INT00288 | 06/17 |

**- Note: The calibration frequency for this equipment is every two years per the manufacturer's recommendation.*

**TEST CHAMBER**

| | VOLUME | DESCRIPTION |
|---|---|---|
| RECEIVE ROOM | 231 $m^3$ | Rotating vane and stationary diffusers<br>Temperature and humidity controlled<br>Isolation pads under the floor |

*N/A-Not Applicable*

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## SECTION 6
**LIST OF OFFICIAL OBSERVERS**

| NAME | COMPANY |
|---|---|
| Leeland S. Hoover | Intertek B&C |
| Ryan R. Lau | Intertek B&C |

## SECTION 7
**TEST PROCEDURE**

The sensitivity of the microphones was checked before measurements were conducted. Empty room sound absorption measurements were conducted before the specimen was installed. Full room sound absorption measurements were conducted after the specimen was installed.

For the empty and full room measurements, ten decay measurements were conducted at each of the five microphone positions. Data was obtained at 1/3 octave band frequencies ranging from 80 to 5000 hertz. The air temperature and relative humidity conditions were monitored and recorded during the measurements.

The specimen was returned per the client's request.

## SECTION 8
**TEST CALCULATIONS**

The Sound Absorption Coefficient is the full room absorption minus the empty room absorption divided by the area of the sample in $m^2$. The Sound Absorption Coefficient is dimensionless.

The Noise Reduction Coefficient (NRC) rating is the arithmetic average of the sound absorption coefficients at 250, 500, 1000 and 2000 hertz. The average is rounded to the nearest multiple of 0.05.

The Sound Absorption Average (SAA) rating is the arithmetic average of the sound absorption coefficients at the frequencies ranging from 200 to 2500 hertz. The average is rounded to the nearest multiple of 0.01.

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## SECTION 9
## TEST SPECIMEN DESCRIPTION

Fifteen, (12) 0.813 m by 0.601 m (32" by 24") panels and (3) 0.813 m by 0.305 m (32" by 12") panels, were arranged to produce the 2.44 m by 2.74 m (96" by 108") test specimen. The total weight of the specimen was 50.94 kg (112.32 lbs). Photographs are included in Section 12. The client did not supply a report drawing of the test specimen.

| DESCRIPTION | THICKNESS | WEIGHT |
|---|---|---|
| BenettiMoss | 48.26 mm<br>1.90 inches | 1.56 lbs/ft$^2$<br>7.61 kg/m$^2$ |

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**TEST REPORT FOR BENETTI HOME**
Report No.: H6047.01-303-11 R0
Date: 11/13/17

## SECTION 10
## TEST RESULTS

### ASTM C423
### SOUND ABSORPTION TEST

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Testing Laboratory

| | | |
|---|---|---|
| **TEST DATE** | 10/20/17 | |
| **DATA FILE NO.** | H6047.01 | |
| **CLIENT** | Benetti Home | |
| **DESCRIPTION** | Series/Model: BenettiMoss | |
| **TECHNICIAN** | Leeland S. Hoover | |
| **SPECIMEN AREA** | 6.69 m² | |
| **MOUNTING TYPE** | Type A | |
| | **EMPTY** | **FULL** |
| **TEMP °C** | 19.8 | 21.3 |
| **RH %** | 47 | 50 |
| **B.P. (mb)** | 1014 | 1014 |

| **FREQ** (Hz) | **EMPTY ROOM ABSORPTION** ($m^2$) | **UNCERTAINTY** | **FULL ROOM ABSORPTION** ($m^2$) | **UNCERTAINTY** | **ABSORPTION COEFFICIENT** | **RELATIVE UNCERTAINTY** |
|---|---|---|---|---|---|---|
| 80 | 4.54 | 0.335 | 4.88 | 0.324 | 0.05 | 0.070 |
| 100 | 4.42 | 0.378 | 4.79 | 0.215 | 0.06 | 0.065 |
| 125 | 4.78 | 0.214 | 5.31 | 0.231 | 0.08 | 0.047 |
| 160 | 4.69 | 0.153 | 5.28 | 0.154 | 0.09 | 0.032 |
| 200 | 5.77 | 0.133 | 6.51 | 0.138 | 0.11 | 0.029 |
| 250 | 6.33 | 0.055 | 7.30 | 0.113 | 0.14 | 0.019 |
| 315 | 6.27 | 0.066 | 7.43 | 0.055 | 0.17 | 0.013 |
| 400 | 5.30 | 0.056 | 6.71 | 0.030 | 0.21 | 0.009 |
| 500 | 4.56 | 0.037 | 6.41 | 0.093 | 0.28 | 0.015 |
| 630 | 4.70 | 0.029 | 6.91 | 0.023 | 0.33 | 0.006 |
| 800 | 4.72 | 0.026 | 7.30 | 0.028 | 0.39 | 0.006 |
| 1000 | 4.69 | 0.013 | 7.50 | 0.022 | 0.42 | 0.004 |
| 1250 | 4.65 | 0.019 | 7.57 | 0.015 | 0.44 | 0.004 |
| 1600 | 4.77 | 0.011 | 7.71 | 0.016 | 0.44 | 0.003 |
| 2000 | 5.40 | 0.014 | 7.99 | 0.185 | 0.39 | 0.028 |
| 2500 | 5.52 | 0.008 | 8.39 | 0.141 | 0.43 | 0.021 |
| 3150 | 5.54 | 0.010 | 7.98 | 0.004 | 0.36 | 0.002 |
| 4000 | 5.62 | 0.012 | 7.91 | 0.004 | 0.34 | 0.002 |
| 5000 | 5.82 | 0.007 | 7.85 | 0.006 | 0.30 | 0.001 |

| | | |
|---|---|---|
| **NRC RATING** | 0.30 | *(Noise Reduction Coefficient)* |
| **SAA RATING** | 0.31 | *(Sound Absorption Average)* |

*Notes:*

*1) The NRC rating is the arithmetic average of the sound absorption coefficients at 250, 500, 1000, and 2000 hertz. The average is rounded to the nearest multiple of 0.05.*

*2) The SAA rating is the arithmetic average of the sound absorption coefficients at the frequencies ranging from 200 to 2500 hertz. The average is rounded to the nearest multiple of 0.01.*

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## SECTION 11
## RESULTS GRAPH

**ASTM C423**
**SOUND ABSORPTION TEST**

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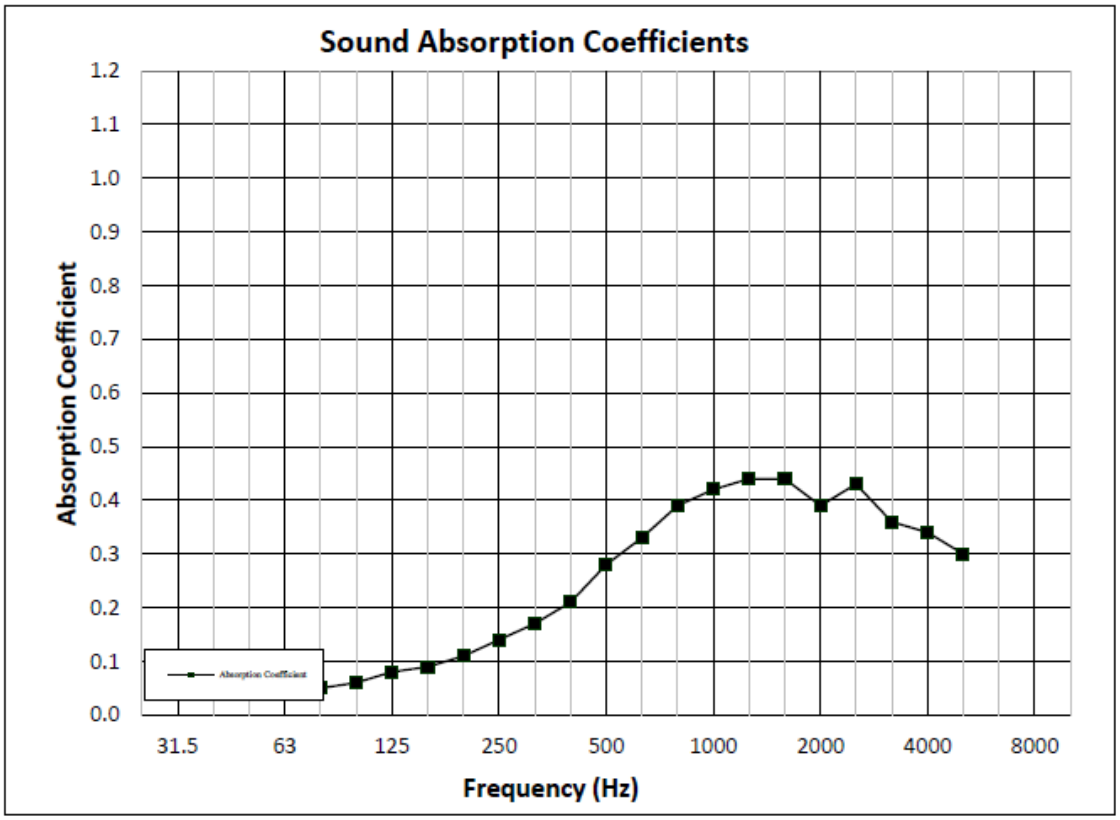
Testing Laboratory

| | | |
|---|---|---|
| **TEST DATE** | 10/20/17 | |
| **DATA FILE NO.** | H6047.01 | |
| **CLIENT** | Benetti Home | |
| **DESCRIPTION** | Series/Model: BenettiMoss | |
| **TECHNICIAN** | Leeland S. Hoover | |
| **SPECIMEN AREA** | 6.69 m² | |
| **MOUNTING TYPE** | Type A | |
| | **EMPTY** | **FULL** |
| **TEMP °C** | 19.8 | 21.3 |
| **RH %** | 47 | 50 |
| **B.P. (mb)** | 1014 | 1014 |



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## SECTION 12
## PHOTOGRAPHS

**Receive Room View of Test Specimen**

**Receive Room View of Test Specimen**

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## SECTION 13
## REVISION LOG

| REVISION # | DATE | PAGES | REVISION |
|---|---|---|---|
| 0 | 11/13/17 | N/A | Original Report Issue |