



# TEST REPORT

## TEST LOCATION

**CÁMARAS DE ENSAYO NORMALIZADAS DE AUDIOTEC. C/JUANELO TURRIANO, 4. PARQUE TECNOLÓGICO DE BOECILLO. BOECILLO. (VALLADOLID) ESPAÑA**

## TEST

Laboratory measurement of the improvement of airborne sound insulation of a horizontal enclosure

## SAMPLE

**Supporting enclosure:** Concrete reference slab, 14 cm thick.

**Covering:** "Akustik + Sylomer® 25 Floor Mount", made by AMC, with 50 x 50 mm wooden battens with 45 mm mineral wool between them + 22 mm OSB board

## TEST METHOD

**UNE EN ISO 10140-1:2016. Annex H  
UNE EN ISO 10140-3:2011**

## CUSTOMER

**AMC Mekanocaucho**  
Industrialdea Zona A. Pab 35.  
Asteasu E-20159, Gipuzkoa

## TEST DATE:

**October 9<sup>th</sup> and 19<sup>th</sup>, 2020**

Technician

Signed: Ángel Arenaz Gombau  
Laboratory Technical Director

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## 1.- TEST OBJECT

Evaluation in standardized test rooms of the impact sound reduction,  $\Delta L_w$ , transmitted through a floor covering over a heavy standardized slab of 140 mm.

**Construction system identification:** Sistema horizontal compuesto por:

- **Supporting enclosure:** Concrete reference slab, 14 cm thick.
- **Covering:** “Akustik + Sylomer® 25 Floor Mount”, made by AMC, with 50 x 50 mm wooden battens with 45 mm mineral wool between them + 22 mm OSB board

The covering of the floor, due to its characteristics, belongs to Category II, according to paragraph H.2.2.2 of Annex H of the standard UNE EN ISO 10140-1:2016.

The test has been carried out in AUDIOTEC’s standardized test rooms in Boecillo Technology Park (Valladolid).

## 2.- TEST PROCEDURE

### 2.1- Procedures and standards used

The test has been carried out taking into account the following laboratory standards and procedures:

- *UNE-EN ISO 10140-3:2011. Acoustics. Laboratory measurement of impact sound insulation.*
- *Annex H of UNE-EN ISO 10140-1:2016 (Floor coverings. Improvement of impact sound insulation).*
- *Annexo C of UNE-EN ISO 10140-5:2016 (Standard floors for measuring the improvement of impact sound insulation of floor coverings.)u*
- *Measurement procedure and calculations presented in specific procedures PE-37 and PE-39 of AUDIOTEC's Acoustics Laboratory.*

### 2.2.- Methodology and test parameters

The rooms where the test was carried out comply with the regulations and requirements established in the UNE EN ISO 10140-5:2011 Standard. They are vertically adjacent rooms. One of them, the lower one or receiving, is fixed and sits under the floor level. The other one, the upper one or source room, is mobile and is placed over the slab to be tested. Both have the shape of irregular 6-faced prisms without parallel corners. The walls of the receiving room are 30 cm concrete walls and inner acoustic claddings covered with 15 mm plasterboard. It's volume is 52,8 m<sup>3</sup>. Upper chamber's walls are made of a 15 cm sandwich metal structure on the outside, reinforced with acoustic insulating and absorbing materials and an inside acoustic cladding.

Two tests were performed; the first one with the complete system, being the supporting element and the covering, and, afterwards, the supporting element alone was tested. The methodology is the same for each of the tests and is described below:

For each of the tests, a standardized tapping machine was placed successively in five positions distributed on the tested surface.

For each position of the machine, three measurements were made with a rotating microphone in the diffuse field area of the receiving room. The microphone stayed at a minimum distance of 0.7 m from the side walls and 1 m from the sample under test. The scanning radius of the microphone was of 1 m with a minimum inclination of  $10^\circ$ .

The time of each measurement was 48 seconds (3 full sweeps), enough time for the signal to stabilize.

The measurements were made in each of the 1/3 octave bands between 100 and 5000 Hz.

Afterwards, the background noise in the receiving room was measured with no tapping machine.

In order to measure the reverberation time, 2 loudspeaker positions were used in the receiving room with a separation of more than 3 m between them.

For each loudspeaker position, 3 microphone positions were used in the receiving room to measure the reverberation. All of them were at a distance of more than 1 m from the side walls, 1.8 m between them and 2 m from the loudspeaker. Two measurements were taken in each position and the respective averages were obtained. The TR20 was measured.

### 2.3.- Instrumentation used

The instrumentation used in this test was the following:

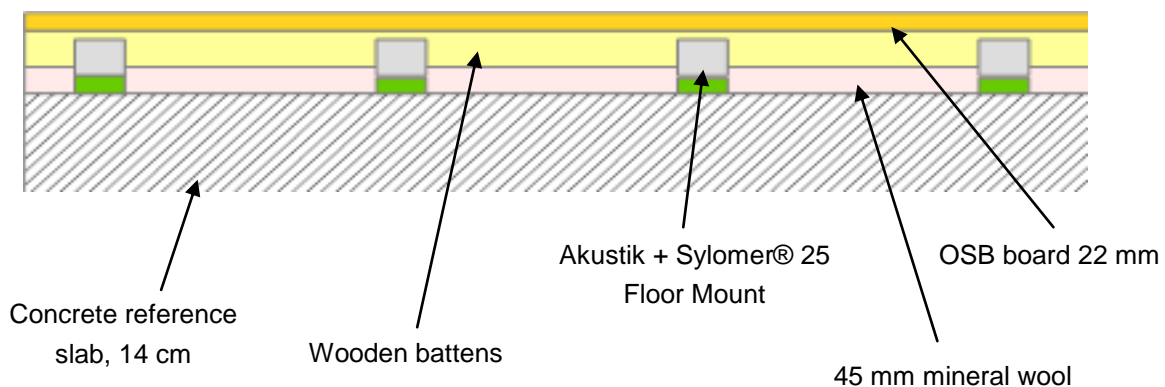
- Standardized tapping machine Brüel & Kjaer, type 3207, serial number 2705758.
- Brüel & Kjaer Sound source type 4292, serial number 004007.
- PULSE Analyzer, model B&K 3560-B-030, serial number 2538701.
- PHONIC MAX 860 Amplifier, serial number ABA2GBA171.
- Third octave band equalizer BEHRINGER model DEQ2496.

- B&K Microphone 4189, serial number 2534182, and B&K preamp 2669, serial number 2532870.
- B&K Microphone 4189, serial number 2345614, and B&K preamp 2669, serial number 2532823.
- B&K Sound calibrator type 4231, class 1, serial number 2136530.
- BARIGO Thermoanemometer, model num. 525.

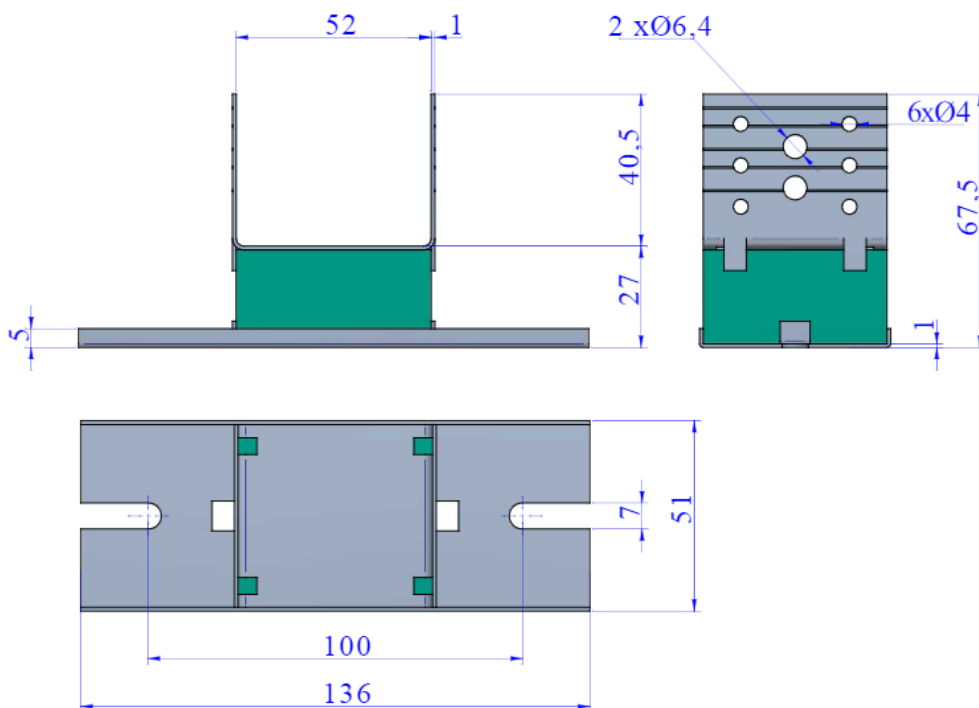
## 2.4.- Product identification and sample description

| PRODUCT                                         | DIMENSIONS   | BRAND/MODEL                             | ESSENTIAL PROPERTIES |                       |
|-------------------------------------------------|--------------|-----------------------------------------|----------------------|-----------------------|
| Concrete reference slab<br>(supporting closing) | 400 x 440 cm | --                                      | Mass per unit area   | 351 kg/m <sup>2</sup> |
|                                                 |              |                                         | Surface              | 17.6 m <sup>2</sup>   |
| Floor mount                                     | --           | Akustik +<br>Sylomer® 25<br>Floor Mount | Maximum load         | 25 kg                 |
|                                                 |              |                                         |                      | 55 lbs                |
| Sylomer                                         | --           | SR11                                    | Thickness            | 12 mm                 |
| Wooden battens                                  | 50 x 50 mm   | --                                      | --                   | --                    |
| Mineral wool                                    | --           | --                                      | Thickness            | 45 mm                 |
| OSB board                                       | --           | --                                      | Thickness            | 22 mm                 |
| Screws                                          | --           | --                                      | --                   | --                    |
| Silicone                                        | --           | --                                      | --                   | --                    |
| Fast fix adhesive                               | --           | --                                      | --                   | --                    |

**Sample sketch:**

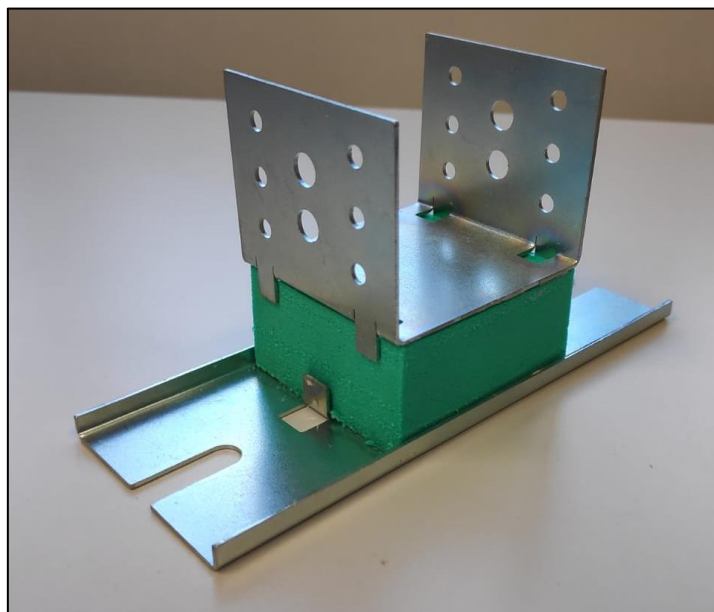


**Mount sketch (dimensions in millimeters):**





**Mount picture:**



## **2.5.- Sample installation process**

The standardized reference slab was installed between the receiving and the source room.

Over the slab, the mounts “Akustik + Sylomer® 25 Floor Mount” were fixed using fast fix adhesive. 8 mount rows were installed, with a separation of 50 cm between them, and a separation of 50 cm between the mounts of each row. Next, the wooden battens were placed and screwed over each mount row.

After that, Sylomer SR11 was installed in the whole perimeter in order to avoid direct contact between the floating floor and the chamber. In the gaps between the battens, strips of 45 mm thick mineral wool were installed. Last, the OSB boards were placed and screwed over the battens, and joints between boards, as well as perimeter joints, were sealed using silicone.

## 2.6.- Test characteristics and conditions

Approximate nominal thickness of the system: 22.65 cm (slab, 14 cm + mounts, 1.45 cm + battens, 5 cm + board, 2.2 cm). Mass per unit area of the system: 371,4 kg/m<sup>2</sup> (slab, 351 kg/m<sup>2</sup> + mounts, 0.6 kg/m<sup>2</sup> + battens, 5.5 kg/m<sup>2</sup> + board, 14.3 kg/m<sup>2</sup>).

Dimensions of the measurement aperture are 3.3 m wide per 3.675 m long. Common surface between the chambers is 12.12 m<sup>2</sup>.

Approximate sample surface is 14,58 m<sup>2</sup>.

The tested sample was installed by operators outsourced by AUDIOTEC.

Upper room volume is 58,35 m<sup>3</sup> and lower room volume is 52,83 m<sup>3</sup>.

For the test of the supporting slab:

In the source room temperature was 22.15 °C ± 0,1; relative humidity was 48.5 % ± 1,4; and static pressure was 960 hPa ± 0.

In the receiving room temperature was 21.55 °C ± 0,1; relative humidity was 47.5 % ± 0; and static pressure was 960 hPa ± 0.

For the test of the complete system:

In the source room temperature was 21,0 °C ± 0,1; relative humidity was 46,1 % ± 0; and static pressure was 1022 hPa ± 0.

In the receiving room temperature was 21,6 °C ± 0,1; relative humidity was 45,8 % ± 0; and static pressure was 1022 hPa ± 0.

## 2.7.- Pictures of assembly











### 3.- TEST RESULTS.

For the tested system, a page is shown containing:

- A brief description of the tested sample.
- A chart and a graphic with the values of the impact sound reduction provided by the floor covering,  $\Delta L$ .
- A chart with the standardized impact sound pressure level of the heavy slab used in the test,  $L_{n0}$ .
- A global value of the weighted impact sound reduction,  $\Delta L_w$ , as well as the global value of  $L_{nwr}$  and  $L_{nw0}$ , calculated according to the standard UNE EN ISO 717-2.

Notes:

- ♦ The results of this test only concern the tested elements and in the moment and conditions in which the measurements were made.
- ♦ Measurement uncertainty is available to the customer in AUDIOTEC Acoustics Laboratory.
- ♦ This report must not be reproduced by any means unless it is made entirely and with the AUDIOTEC S.A. Acoustics Laboratory authorization.
- ♦ The standard UNE EN ISO 10140-3:2011 replaces UNE EN ISO 140-6:1999.
- ♦ Annex H of UNE EN ISO 10140-1:2016 replaces Annex H of UNE EN ISO 10140-1:2011, which in turn replaces UNE EN ISO 140-8:1998.

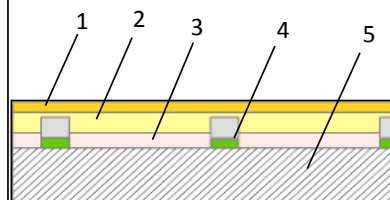
**Customer:** AMC Mecanocaucho

**Identification of the sample:**

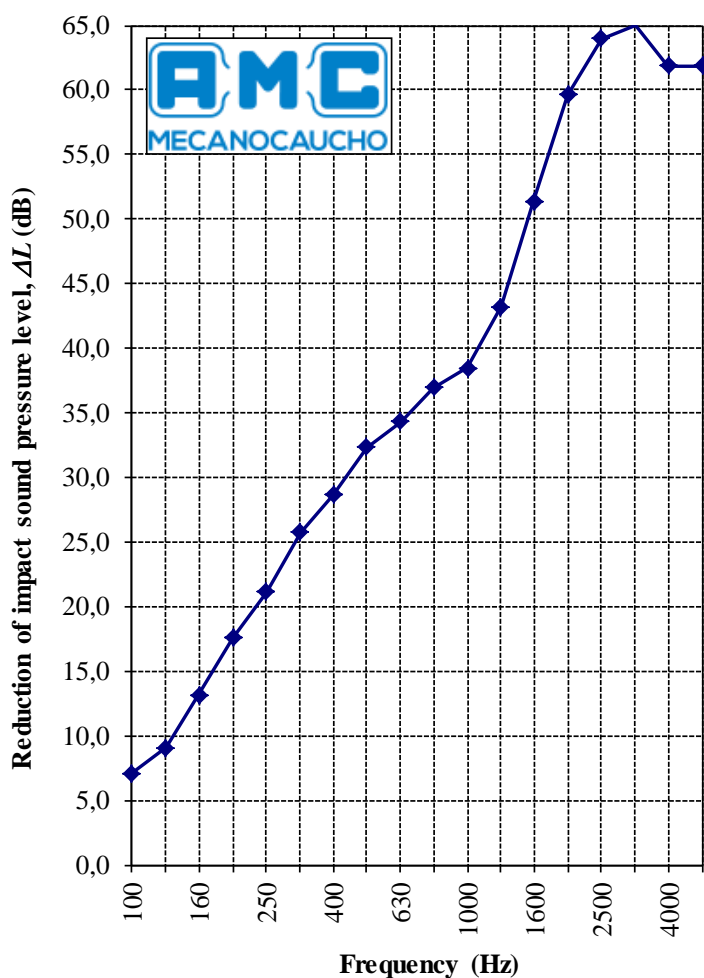
- (1) OSB board, 22 mm
- (2) Wooden battens, 5 cm
- (3) Mineral wool, 45 mm
- (4) Akustik + Sylomer® 25 Floor Mount
- (5) Concrete reference slab, 14 cm

**Test method:** UNE-EN ISO 10140-1, Annex H. Category II sample

**Thickness:** 23,9 cm; **Mass per unit area:** 371,4 kg/m<sup>2</sup>



| Freq<br><i>f</i><br>Hz | L <sub>n,0</sub><br>dB | ΔL<br>dB |
|------------------------|------------------------|----------|
| 100                    | 58,8                   | 7,1      |
| 125                    | 58,6                   | 9,0      |
| 160                    | 63,1                   | 13,1     |
| 200                    | 64,7                   | 17,5     |
| 250                    | 68,4                   | 21,2     |
| 315                    | 70,0                   | 25,7     |
| 400                    | 71,7                   | 28,7     |
| 500                    | 72,8                   | 32,3     |
| 630                    | 73,4                   | 34,3     |
| 800                    | 72,9                   | 37,0     |
| 1000                   | 71,1                   | 38,5     |
| 1250                   | 70,5                   | 43,2     |
| 1600                   | 70,5                   | 51,4     |
| 2000                   | 69,3                   | 59,6     |
| 2500                   | 68,9                   | 64,0     |
| 3150                   | 69,5                   | 65,0     |
| 4000                   | 68,4                   | 61,9     |
| 5000                   | 68,1                   | 61,8     |



Weighted reduction of impact sound pressure level according to the standard ISO 717-2:2013

ΔL<sub>w</sub> = 31 dB

CIA = -12 dB

Ln w,r = 47 dB

CI,r = 1 dB

Ln w,0 = 76 dB

CI,0 = -9 dB



**Test date:**  
October 9th and 19th,  
2020

**Technician:**

**Signed:** Ángel Arenaz



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