

LABORATORY ACOUSTIC TEST REPORT



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

Horizontal enclosure: 14 cm concrete reference slab + AMC BASIC floor composed of Aquapanel 70 profiles on AMC AFS 50+ SYLOMER AMC MECANOCAUCHO SR-28/12 + OSB III board 18 mm + Tabiabsorber 5 + OSB III board 18 mm + Acoustic Floor Getzner Mat 29 + Sports finish 10 mm (1x1 m rubber tiles)

Ref: CAM23050027-3/MEJ_AER

Date of issue:
October 5, 2023



TEST REPORT

TEST LOCATION

Place of test

STANDARDIZED TEST CHAMBERS OF

**AUDIOTEC. C/JUANELO TURRIANO, 4. PARK
BOECILLO TECHNOLOGY. BOECILLO.
(VALLADOLID) SPAIN**

TEST

Laboratory measurement of the improvement index
of a horizontal enclosure

SAMPLE

Supporting enclosure: 14 cm concrete reference slab

Covering: AMC BASIC floor composed of Aquapanel 70 profiles
on AMC AFS 50+ SYLOMER AMC MECANOCAUCHO SR-28/12
+ OSB III board 18 mm + Tabiabsorber 5 + OSB III board 18 mm
+ Acoustic Floor Getzner Mat 29 + Sports finish 10 mm (1x1 m
rubber tiles)

*Note: 48 mm thick mineral wool between profiles and additionally
installed on the perimeter of the system.*

TEST METHOD

UNE EN ISO 10140-1:2022. Annex G

UNE EN ISO 10140-2:2022

CUSTOMER

AMC Mekanocaucho

Industrialdea Zone A. Hall 35.

Asteasu E-20159, Gipuzkoa

TEST DATE:

July 19, 2023

Technician

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- 71161871D**

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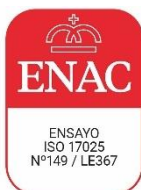
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Laboratory Technical Director



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1.- TEST OBJECT.

Evaluation in standardized test chambers of the acoustic reduction improvement index, ΔR , of a complementary coating.

Identification of the construction system: Horizontal system composed of

- **Bearing enclosure:** 14 cm concrete reference slab + AMC BASIC floor composed of Aquapanel 70 profiles on AMC AFS 50+ SYLOMER AMC MECANOCAUCHO SR-28/12 + OSB III board 18 mm + Tabiabsorber 5 + OSB III board 18 mm + Acoustic Floor Getzner Mat 29 + Sports finish 10 mm (1x1 m rubber tiles).

Note: 48 mm thick mineral wool between profiles, and mineral wool installed on the perimeter of the system.

The test was carried out in AUDIOTEC's standardized chambers in the 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 10140-2:2022. Acoustics. Laboratory measurement of sound insulation of building elements.*
- *Annex G of the UNE-EN ISO 10140-1:2022 standard (Acoustic Coatings. Improvement of airborne noise insulation).*
- *Annex B of the UNE-EN ISO 10140-5:2022 standard (Standardized Basic Elements to measure the improvement of acoustic insulation of airborne noise through coatings).*
- *Measurement procedures and calculations set out in the specific test procedures PE-36 and PE-38 of the AUDIOTEC Acoustics Laboratory.*

2.2- Methodology and test parameters.

The chambers where the test was carried out comply with the regulations and requirements established in the UNE EN ISO 10140-5:2022 Standard. They are vertically adjacent chambers. One of them, the lower or receiving one, is fixed and sits under the floor level. The other one, the upper one or source room (chamber where the impact machine is located), is mobile and is placed on the slab at test. 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 m³. 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 carried out, the first with the complete system, that is, with the carrier system plus the coating and then only the carrier system was tested. The methodology is the same for each of them and is described below.

For each of the two tests, pink noise was generated with 2 source positions in the Emitting camera (mobile camera), located at least 0.7 m from the existing enclosures, and on a tripod at different heights. For each source position, three measurements were made with a rotating microphone in the diffuse field area of the

Emitting chamber. The microphone kept at all times a minimum distance of 0.7 m from the side walls, 1 m from the sound source and 1 m from the sample under test. The scanning radius of the microphone was one meter and with a minimum inclination of 10°.

For each source position, three measurements were made with a rotating microphone in the diffuse field area of the receiving chamber. The microphone kept at all times 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 one meter and with a minimum inclination of 10°.

Next, the background noise was measured in the receiving chamber with the sound source stopped.

The time of each of the measurements was 48 seconds (3 full scans), enough time for the signal to stabilize, and the measurements were carried out in each of the third-octave bands between 100 and 5000 Hz.

To measure the reverberation time, 2 source positions in the receiving chamber separated by more than 3 meters were used.

For each source position, 3 microphone positions in the receiving chamber were used to measure reverberation. All of them were more than 1 m away from the side walls, 1.8 m between them and 2 m from the sound source. 2 measurements were taken in each position and the respective averages were obtained. TR20 was measured.

2.3.- Instrumentation used.

The instrumentation used in the test was the following:

- Brüel & Kjaer noise source type 4292, with serial number 004007.
- PULSE analyzer model B&K 3560-B-030 with serial number 2538701.
- PHONIC MAX 860 amplifier with serial number ABA2GBA171.
- BEHRINGER third octave equalizer model DEQ2496.
- B&K 4189 microphone with serial number 2534182 and B&K 2669 preamplifier with serial number 2532870.
- B&K 4189 microphone with serial number 2345614 and B&K 2669 preamplifier with serial number 2532823.
- B&K type 4231 calibrator-verifier, class 1, with serial number 2136530.
- BARIGO thermoanemometer, model no. 525.

2.4.- Identification of the products and description of the sample.

PRODUCT	DIMENSIONS	BRAND/MODEL	PROPERTIES ESSENTIALS	
Reinforced concrete reference slab (Supporting enclosure)	400x440cm	--	surface mass	351kg/ m ²
			Surface	17.6 m ²
floor stands	--	AMC AFS 50	Maximum load	50kg
Sylomer	--	SR28	Thickness	12mm
Profiles	73x48mm	Aquapanel 70	--	--
Mineral wool	--	--	Thickness	48mm
OSB III board	--	--	Thickness	18mm

PRODUCT	DIMENSIONS	BRAND/MODEL	PROPERTIES	
			ESSENTIALS	
Tabiabsorber 5	--	--	Thickness	5mm
Acoustic Floor Mat 29	1500 x 750mm	Getzner	Thickness	11mm
rubber tile	1000 x 1000mm	--	Thickness	10mm
Screws	--	--	--	--
Silicone	--	--	--	--
Immediate tack adhesive	--	--	--	--

Sample sketch (provided by client):



2.5.- Sample installation process.

In the gap between the transmitting and receiving chambers, the standard 14 cm thick reinforced concrete reference slab was placed.

Firstly, the AMC AFS 50 were placed inside the Aquapanel 70 profiles, 500 mm apart between centers and the profiles were placed on the concrete slab, 500 mm apart between centers. Next, the 12 mm thick Sylomer SR28 strips were placed on the profiles, using immediate tack adhesive, and the 48 mm thick mineral wool was placed in the spaces between the profiles.

Once the support structure was in place, mineral wool was placed around the perimeter of the sample and an 18 mm thick OSB III board was installed on the structure, using immediate grip adhesive. Next, a layer of Tabiabsorber 5 (5 mm thick) was placed and a second 18 mm thick OSB III board was installed, using screws to fix it to the support structure.

Finally, the Acoustic Floor Mat 29 sheets were installed on the second board and on top of them the sports finish made up of 10 mm thick rubber tiles.

2.6.- Characteristics and test conditions

The approximate nominal thickness of the system: 319 mm: 140 mm of the carrier + 179 mm of the system (Springs + profile 105 mm, SR28 12 mm, OSB III 18 mm, Tabiabsorber 5 mm, OSB III 18 mm, Mat 29 11 mm, Tiles rubber 10 mm)

The approximate surface mass of the system is 394 kg/m^2 (351 kg/m^2 of the reference slab + 43 kg/m^2 of the floor system).

The dimensions of the measurement opening are 3.3 m wide by 3.675 m long. The common surface between the two chambers is 12.12 m^2 .

The approximate total area of the sample is 14.58 m^2 .

The tested sample was installed by operators subcontracted by AUDIOTEC.

The volume of the upper chamber is 58.35 m³ and that of the receiving or lower chamber is 52.83 m³.

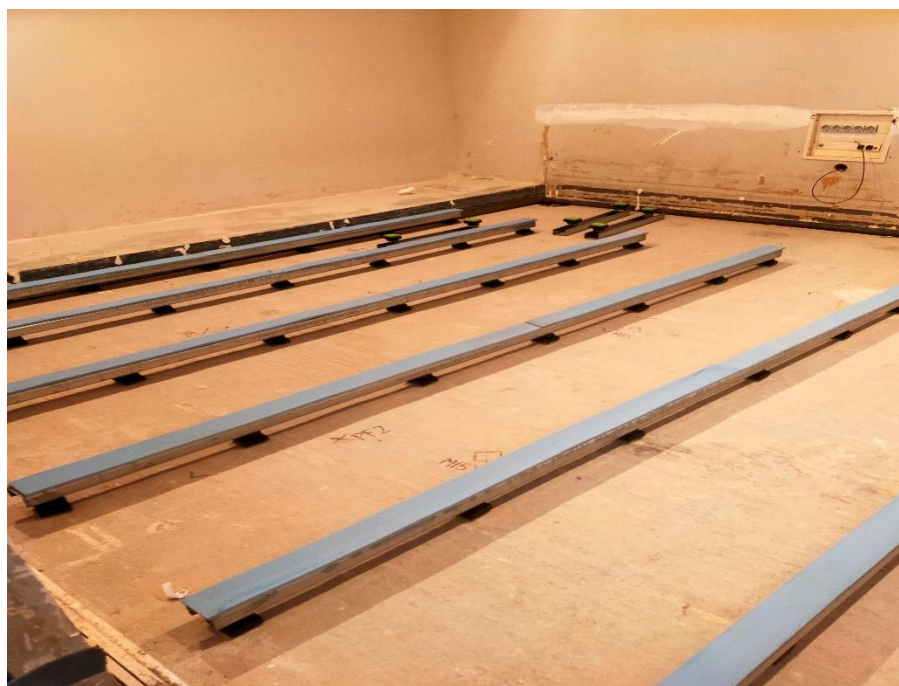
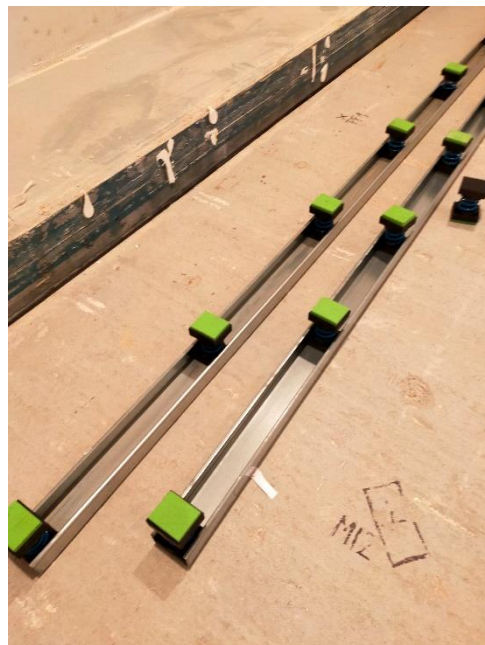
Environmental conditions (reference forged test):

	Temperature (°C)		RH (%)		Atmospheric pressure (mba)	
Camera	Initial	Final	Initial	Final	Initial	Final
Station	17.2	17.2	40	40	1018	1018
Receiver	16.8	16.8	44	44		

Environmental conditions (full system test):

	Temperature (°C)		RH (%)		Atmospheric pressure (mba)	
Camera	Initial	Final	Initial	Final	Initial	Final
Station	22.5	23	43	43	1024	1024
Receiver	21	21	44	44		

2.7.- Photographs of the assembly.









3.- TEST RESULTS.

For the system tested, a page is presented with a brief description of the sample tested and a table with the values of the acoustic reduction index for each frequency band in dB, as well as its corresponding graph. It also shows the values of R_{with} , $R_{without}$, and ΔR as specified in chapter G.6. of the ISO 10140-5:2022 standard and the values of $R_w(C, C_{tr})_{without}$ and $R_w(C, C_{tr})_{with}$.

Grades:

- ♦ The results of this test only concern the objects presented for testing and the time and conditions in which the measurements were made.
- ♦ The measurement uncertainty is available to the client in the AUDIOTEC Acoustics Laboratory.
- ♦ This report must not be reproduced by any means unless it is done in its entirety and with the authorization of the AUDIOTEC SA Acoustics Laboratory.
- ♦ The UNE EN ISO 10140-2:2022 standard replaces the UNE EN ISO 140-3:1995 standard.
- ♦ Annex G of the UNE EN ISO 10140-1:2022 standard replaces Annex G of the UNE EN ISO 10140-1:2016 standard, which in turn replaces Annex G of the UNE EN ISO 10140-1 standard. :2011 and in turn to the UNE EN ISO 140-16:2007 standard.

Costumer: AMC Mecanocaucho

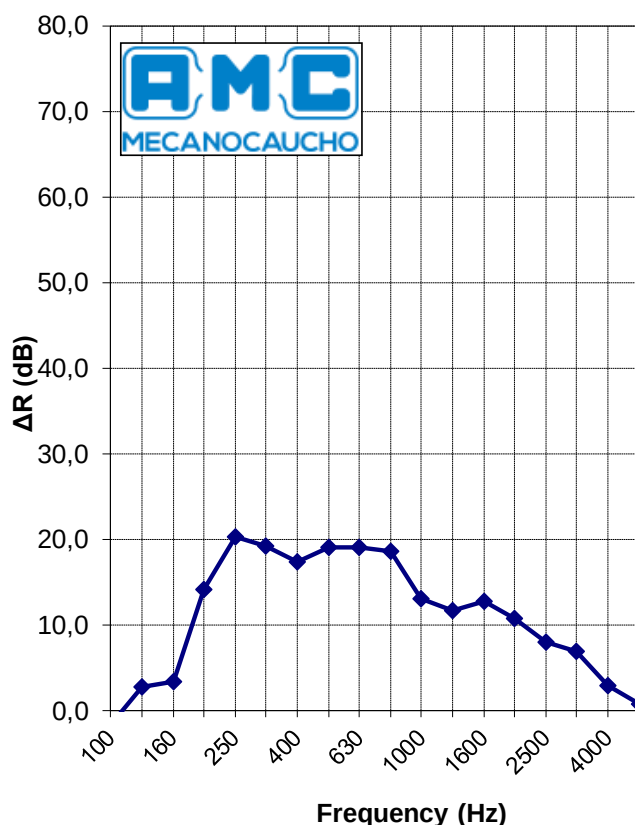
Sample identification:

14 cm concrete reference slab sample + AMC BASIC floor composed of Aquapanel 70 profiles on AMC AFS 50+ SYLOMER AMC MECANOCAUCHO SR-28/12+ OSB III board 18 mm + Tabiabsorber5 + OSB III board 18 mm + Acoustic Floor Getzner Mat 29 + Sports finish 10 mm (1x1 m rubber tiles)
Note: 48 mm thick mineral wool between profiles and additionally installed on the perimeter of the system

Test method: UNE EN ISO 10140-1:2022. Annex G

Thickness: 319 mm; **Surface mass:** 394 kg/m²; (351 kg/m² of the concrete slab + 43 kg/m² of the floor system).

Freq. <i>f</i> Hz	R _{with} dB	R _{without} dB	ΔR dB
100	44,8	46,5	-1,7
125	51,7	49,0	2,7
160	55,0	51,6	3,4
200	61,8	47,7	14,1
250	61,4	41,1	20,3
315	61,7	42,5	19,2
400	63,0	45,7	17,3
500	66,2	47,2	19,0
630	69,5	50,5	19,0
800	71,6	53,0	18,6
1000	72,2	59,1	13,1
1250	73,5	61,8	11,7
1600	77,0	64,3	12,7
2000	78,1	67,4	10,7
2500	77,6	69,6	8,0
3150	78,2	71,3	6,9
4000	76,2	73,3	2,9
5000	71,4	70,7	0,7



R_{wef} (C;Ctr) without = 52 (0;-5) dB

R_{wref} (C;Ctr) with = 65 (-3;-10) dB

Δ(R_w + C)_{Heavy} = 10 dB

Δ(R_w + C_{tr})_{heavy} = 8 dB

ΔR(A) (DB-HR) = 11 dBA

Test date: July 19, 2023

ΔR_w heavy = 13 dB

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