

LABORATORY ACOUSTIC TEST REPORT

**SUSPENSIONES ELÁSTICAS DEL NORTE S.L. SENOR,
SOPREMA IBERIA S.L.U,
URSA IBÉRICA AISLANTES, S.A.**

**System: CONCRETE ACOUSTIC FLOOR SYSTEM –
URSA + SOPREMA + SENOR**

High-performance acoustic floor system comprising:
URSA TERRA PLUS 32 T0003 mineral wool + SE-TP-60
acoustic isolators (SENOR) + 82 mm omega profiles
(KNAUF) + SE-BEC acoustic strip (SENOR) + SE-
MONT-BICAPA 40 decoupling strip (SENOR) + 16 mm
moisture-resistant MDF board + TECSOUND 2FT 80
sound-insulating composite membrane (SOPREMA) +
700-gauge black polyethylene sheet + SE-SP-30 R
mesh spacers (SENOR) + B500S welded wire mesh
(20×20×0.4 cm) + 60 mm concrete slab.

Load-bearing element: 140 mm reinforced
concrete reference slab.

Ref: CAM25070023-1/MEJ_AER

Issue Date:

September 28, 2026



Report test

TEST LOCATION

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

TEST

Laboratory measurement of airborne noise insulation of a horizontal enclosure.

SAMPLE

**System: CONCRETE ACOUSTIC FLOOR SYSTEM –
URSA + SOPREMA + SENOR**

High-performance acoustic floor system comprising:
URSA TERRA PLUS 32 T0003 mineral wool + SE-TP-60 acoustic isolators (SENOR) + 82 mm omega profiles (KNAUF) + SE-BEC acoustic strip (SENOR) + SE-MONT-BICAPA 40 decoupling strip (SENOR) + 16 mm moisture-resistant MDF board + TECSOUND 2FT 80 sound-insulating composite membrane (SOPREMA) + 700-gauge black polyethylene sheet + SE-SP-30 R mesh spacers (SENOR) + B500S welded wire mesh (20×20×0.4 cm) + 60 mm concrete slab.

Load-bearing element: 140 mm reinforced concrete reference slab.

METHOD TEST

**UNE EN ISO 10140-2:2022 and Annex G of standard
UNE-EN ISO 10140-1:2022**

CUSTOMERS

**SUSENSIONES ELÁSTICAS DEL NORTE S.L
SENOR.
SOPREMA IBERIA S.L.U
URSA IBÉRICA AISLANTES, S.A**

TEST DATE:

11 December 2025

Performed by



Firmado digitalmente por
ALVARADO HUERFANO JOHN
FREDY - Z0132565K
Nombre de reconocimiento (DN):
c=ES, serialNumber=IDCES-
Z0132565K, givenName=JOHN
FREDY, sn=ALVARADO
HUERFANO, cn=ALVARADO
HUERFANO JOHN FREDY -
Z0132565K
Fecha: 2026.09.30 12:27:08 +02'00'

Signed.: John Alvarado Huerfano
Laboratory Technician

Reviewed by:



Firmado digitalmente por
ARENAZ GOMBAU ANGEL MARIA
- 11954820H
Nombre de reconocimiento
(DN): c=ES,
serialNumber=IDCES-11954820H
, givenName=ANGEL MARIA,
sn=ARENAZ GOMBAU,
cn=ARENAZ GOMBAU ANGEL
MARIA - 11954820H

Signed.: Ángel Arenaz Gombau
Technical Director of the Laboratory

CONTENTS

1.- Report Purpose

2.- Test Procedure

2.1.- Procedures and Standards Applied

2.2.- Methodology and Test Parameters

2.3.- Instrumentation Used

2.4.- Product Identification

2.5.- Sample Installation Process

2.6.- Test Characteristics and Conditions

2.7.- Photographic Documentation of the Assembly

3.- Airborne Sound Insulation Test Results

1.- REPORT PURPOSE

Evaluation, in standardized test chambers, of the airborne sound reduction improvement index, ΔR , of a complementary lining system.

Identification of the construction system: Horizontal system constitution

CONCRETE ACOUSTIC FLOOR SYSTEM – URSA + SOPREMA + SENOR

High-performance acoustic floor system comprising: URSA TERRA PLUS 32 T0003 mineral wool + SE-TP-60 acoustic isolators (SENR) + 82 mm omega profiles (KNAUF) + SE-BEC acoustic strip (SENR) + SE-MONT-BICAPA 40 decoupling strip (SENR) + 16 mm moisture-resistant MDF board + TECSOUND 2FT 80 sound-insulating composite membrane (SOPREMA) + 700-gauge black polyethylene sheet + SE-SP-30 R mesh spacers (SENR) + B500S welded wire mesh (20×20×0.4 cm) + 60 mm concrete slab.

Load-bearing element: 140 mm reinforced concrete reference slab.

Floor finish: Acoustic Concrete Floor — URSA + SOPREMA + SENOR.

Approximate surface mass: 522,79 kg/m² (351 kg/m² reference slab + 171.79 kg/m² floor).

Approximate thickness: 323.5 mm (140 mm load-bearing element + 183.5 mm floor).

The floor finish is classified as Category II in accordance with clause H.2.2.2 of Annex H of standard UNE EN ISO 10140-1:2022.

The test was carried out in the accredited chambers at AUDIOTEC's laboratory, located at the Boecillo Technology Park (Valladolid, Spain).

Notes:

- The sample was installed by the client's own operatives and by operatives contracted by AUDIOTEC, under the supervision of AUDIOTEC Laboratory technicians.
- Thickness descriptions and material data were supplied by the client. The weight, thickness, mineral wool and MDF board were independently verified by AUDIOTEC
- Audiotec Ingeniería Acústica S.A. declines all responsibility for any variation in the declared values.
- AUDIOTEC is not responsible for the information contained in this report that has been provided or indicated by the client. Client-supplied information is not covered by the accreditation.

2.- TEST PROCEDURE

2.1.- Procedures and Standards Applied

The test was carried out in accordance with the following standards and laboratory procedures:

- *UNE-EN ISO 10140-2:2022 Acoustics. Laboratory measurement of airborne sound insulation of building elements.*
- *Annex G of standard UNE-EN ISO 10140-1:2022 (Acoustic finishes. Improvement of airborne sound insulation).*
- *Annex B of standard UNE-EN ISO 10140-5:2022 (Standardized basic elements for measuring the improvement of airborne sound insulation by means of finishes).*
- *Measurement procedures and calculations are set out in AUDIOTEC Acoustic Laboratory Specific Test Procedure PE-36.*

2.2.- Methodology and Test Parameters

The test chambers comply with the requirements set out in standard UNE-EN ISO 10140-5:2022. The chambers are vertically adjacent: the lower (receiving) chamber is fixed and located below floor level, while the upper (source) chamber is mobile and is positioned on top of the assembly under test. Both chambers have an irregular prismatic shape with no parallel edges. The receiving (lower) chamber is located below floor level, with 30 cm thick concrete walls and internal acoustic lining consisting of 15 mm gypsum board cladding; its volume is 52.8 m³. The walls of the upper chamber comprise a 15 cm thick external metal sandwich structure reinforced with acoustic insulating and absorbing materials, with an internal acoustic lining.

Two test measurements were performed: the first with the complete system, that is, with the load-bearing system (heavy reference slab), and then with the load-bearing system plus the cladding (floor) and the ceiling. The methodology is the same for each and is described below.

For each of the two tests, pink noise was generated using 2 source positions in the source chamber (mobile chamber), placed at a minimum distance of 0.7 m from the surrounding enclosures and at varying heights on a tripod. For each source position,

three measurements were carried out using a rotating microphone in the diffuse field zone of the source chamber. The microphone was maintained at a minimum distance of 0.7 m from the side walls, 1 m from the sound source, and 1 m from the test sample always. The microphone's sweep radius was one meter with a minimum inclination of 10°.

For each source position, three measurements were also carried out using a rotating microphone in the diffuse field zone of the receiving chamber. The microphone was maintained at a minimum distance of 0.7 m from the side walls and 1 m from the test sample always. The microphone's sweep radius was one meter with a minimum inclination of 10°.

Background noise was subsequently measured in the receiving chamber with the sound source switched off.

Each measurement lasted 48 seconds (3 complete sweeps), which was sufficient to allow the signal to stabilize. Measurements were taken across each one-third octave band between 100 Hz and 5000 Hz.

Reverberation time was measured using 2 source positions in the receiving chamber, separated by more than three meters. Three microphone positions were used in the receiving chamber for each source position. All positions were at more than 1 m from the side walls, at least 1.8 m apart from each other, and 2 m from the sound source. Two measurements were taken at each position, and the respective averages were calculated. TR20 was measured.

2.3.- Instrumentation Used

The instrumentation used in the test was as follows:

Equipment Type	Brand / Model	Serial No.
Class 1 Calibrator-Verifier	Brüel&Kjaer Type 4231	2136530
PULSE Analyzer	Brüel&Kjaer 3560-B-030	2538701
Omnidirectional Sound Source	Brüel&Kjaer Type 4292	004007
Thermo-anemometer / Hygrometer	Barigo Model 525	156
Equalizer	BEHRINGER DEQ2496.	
Amplifier	PHONIC MAX 860	ABA2GBA171
Microphone	B&K 4189	2534182
Preamplifier	B&K 2669	2532870
Microphone	B&K 4189	2345614
Preamplifier	B&K 2669	2532823
Tripods and auxiliary equipment		

2.4.- Product Identification

FLOOR ASSEMBLY				
PRODUCT	DIMENSIONS	BRAND / MODEL	ESSENTIAL PROPERTY	
Reinforced concrete reference slab (load-bearing element)	(400 x 440) cm	--	Surface mass	351 kg/m ²
			Surface	17,6 m ²
Acoustic isolator	--	SEÑOR / SE-TP-60 /150	Thickness	60 mm
Acoustic strip	--	SEÑOR / SE-BEC-10x135	Thickness	10 mm
Mineral wool	--	URSA TERRA PLUS 32 T0003	Thickness	50 mm

PRODUCT	DIMENSIONS	BRAND / MODEL	ESSENTIAL PROPERTY	
Omega profiles	--	KNAUF/80 Z1	--	--
Decoupling strip	--	SEÑOR / SE-MONT-BICAPA-40	Thickness	5,5 mm
MDF board	(1220 x 2440 x 16) mm	Moisture-resistant MDF	Thickness	16 mm
Black polyethylene sheet	--	--	Gauge	700
TECSOUND membrane	--	SOPREMA / TECSOUND 2FT 80	Thickness	24 mm
Mesh spacers	--	SEÑOR/SE-SP-30R	Thickness	28 mm
Welded wire mesh	(20x20x0,4) cm	B500S	Thickness	4 mm
Concrete slab	--	--	Thickness	60 mm

2.5.- Sample Installation Process

The reference reinforced concrete slab (140 mm thickness) was placed in the opening between the source and receiving chambers.

The system was installed as a floating, structurally decoupled assembly following the construction sequence detailed below:

Cladding installation (Floor Assembly)

The tested system was installed in accordance with the following construction sequence:

Thermal and Acoustic Insulation:

URSA TERRA PLUS 32 T0003 mineral wool panels were laid across the entire floor surface of the slab.

Perimeter Decoupling and Air-tightness:

The SE-BEC acoustic strip (SEÑOR) was installed along the entire floor perimeter to prevent acoustic bridging and to ensure that the concrete slab has no direct contact with the vertical enclosures.

Damped Sub-frame Installation:

The SE-TP-60 acoustic isolators (SENOR) were positioned and distributed in a modular pattern. They were installed over the base slab through openings cut in the mineral wool layer. KNAUF 82 mm omega profiles were screwed to the isolators using metal-to-metal (MM) fasteners, creating a levelled, elastic sub-frame. To optimize the acoustic performance of the profile, the SE-MONT-BICAPA-40 decoupling strip (SENOR) was applied to the base of each profile.

Support Base and Acoustic Sandwich Construction:

A 16 mm moisture-resistant MDF board was fixed onto the omega profile sub-frame. The TECSOUND 2FT 80 sound-insulating composite membrane (SOPREMA) was then laid over this board.

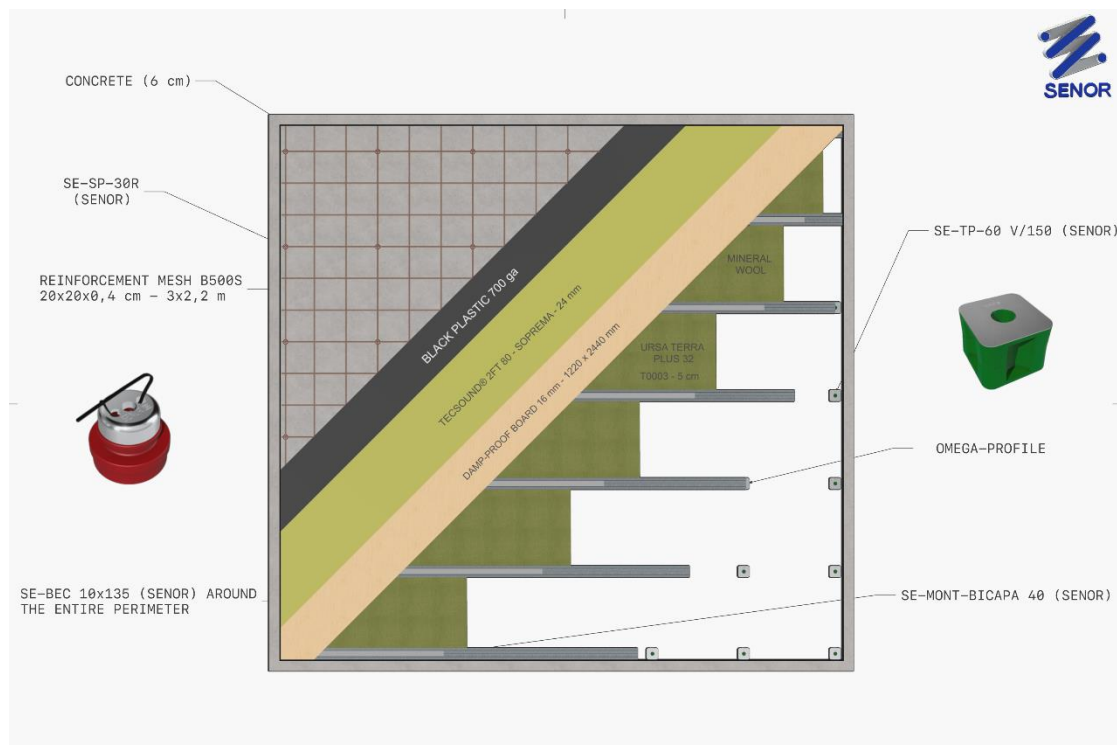
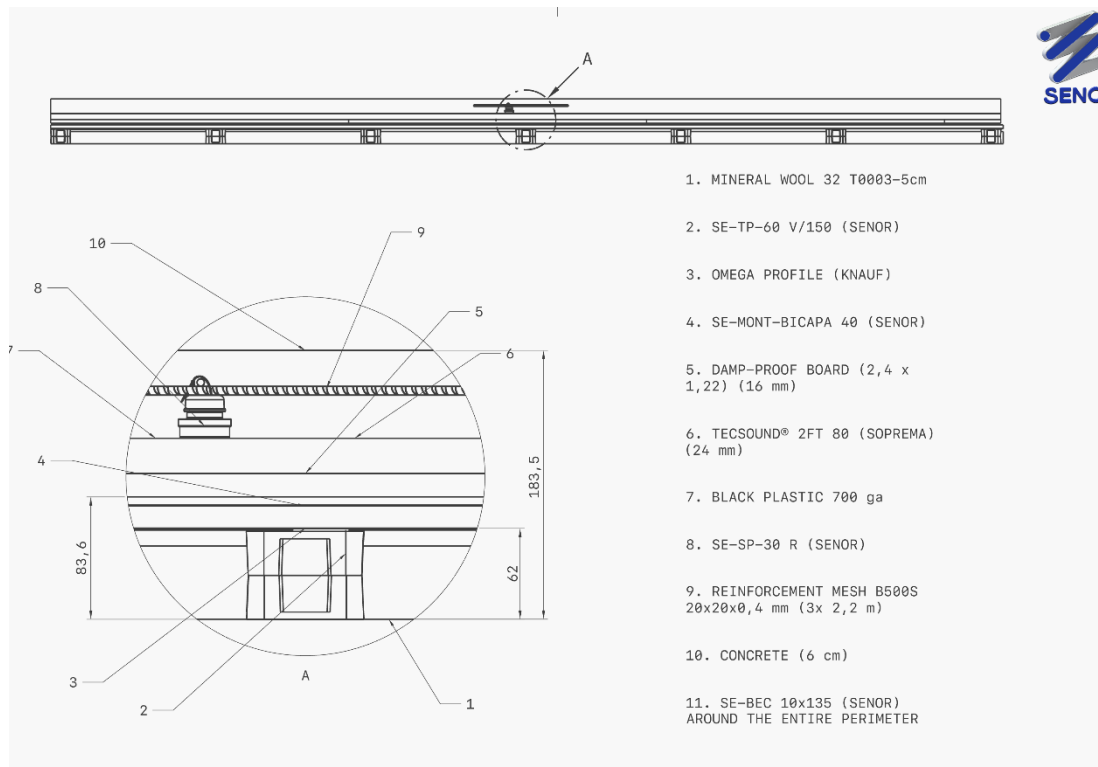
Protective and Reinforcing Layer:

A 700-gauge black polyethylene sheet was installed to protect the acoustic sandwich from moisture from the concrete. SE-SP-30 R mesh spacers (SENOR) were placed on top, supporting the B500S welded wire mesh (20×20×0.4 cm) and ensuring that the reinforcement is positioned at the central axis of the cross-section.

Finishing Layer:

A 60 mm concrete slab was poured and levelled to complete the floor assembly.

Assembly diagrams



Assembly diagrams provided by the client

2.6.- Test Characteristics and Conditions

The approximate nominal thickness of the system was 323.5 mm (140 mm load-bearing element + 183.5 mm floor). The surface mass of the system was 522.79 kg/m² (351 kg/m² reference slab + 171.79 kg/m² floor).

The dimensions of the test opening were 3.3 m wide by 3.67 m long.

The shared area between the two chambers was 12.12 m².

The total approximate area of the sample was 14,58 m².

The sample was installed by the client's own operatives and by operatives contracted by AUDIOTEC, under the supervision of AUDIOTEC Laboratory technicians.

The volume of the upper (source) chamber was 58.35 m³ and that of the receiving (lower) chamber was 52.83 m³.

Environmental conditions – Reference enclosure test:

Chamber	Temperature (°C)		Relative Humidity (%)		Atmospheric Pressure (mbar)	
	Initial	Final	Initial	Final	Initial	Final
Source	16.4	16.6	49	49	1021	1021
Receiving	16.1	16.2	50	50		

Environmental conditions — complete system test:

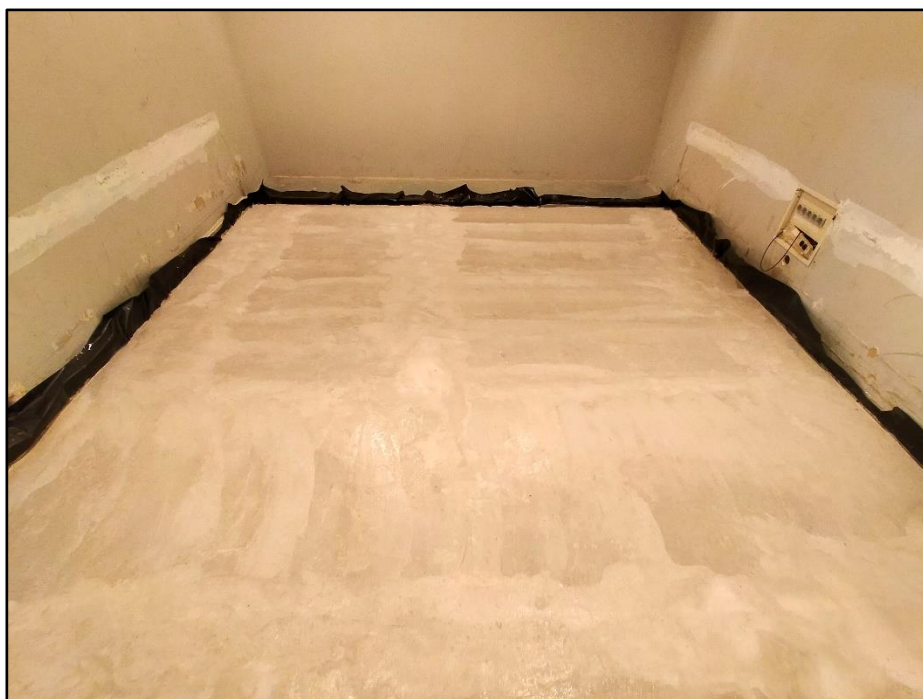
Chamber	Temperature (°C)		Relative Humidity (%)		Atmospheric Pressure (mbar)	
	Initial	Final	Initial	Final	Initial	Final
Source	15.2	15.2	49	49	1020	1020
Receiving	14.1	14.1	52	52		

2.7.- Photographic Documentation of the Assembly

Floor assembly







3.- AIRBORNE SOUND INSULATION TEST RESULTS

The following section presents the results obtained, including a brief description of the sample tested and a table showing the sound insulation values for each frequency band in dB, as well as a table with the values of the acoustic reduction index for each frequency band in dB and the corresponding graph.

The values of R_w for the reference element, R_w for the complete system, R_{with} , $R_{without}$, and ΔR as specified in clause G.1 of standard ISO 10140-1:2022, together with the values of $R_w(C, C_{tr})_{without}$ and $R_w(C, C_{tr})_{with}$.

For standardized basic elements in accordance with clauses B.2, B.3 and B.4 of standard ISO 10140-5:2022: ΔR_w , $\Delta(R_w+C)$ and $\Delta(R_w+C_{tr})$ as specified in standard ISO 717-1, with an index indicating the reference basic element used

Notes:

- ♦ The results of this test relate solely to the items submitted for testing and apply to the specific time and conditions under which the measurements were carried out.
- ♦ Measurement uncertainty is available to the client at the AUDIOTEC Acoustic Laboratory.
- ♦ This report may not be reproduced by any means unless it is reproduced in its entirety and with the written authorization of the AUDIOTEC S.A. Acoustic Laboratory.

CUSTOMERS: SUSENSIONES ELÁSTICAS DEL NORTE S.L. SENOR, SOPREMA IBERIA S.L.U, URSA Ibérica Aislantes S.A.
TEST DATE: 11/12/2025

METHOD TEST: UNE EN ISO 10140-2:2022 and Annex G of UNE-EN ISO 10140-1:2022

System: CONCRETE ACOUSTIC FLOOR SYSTEM – URSA + SOPREMA + SENOR

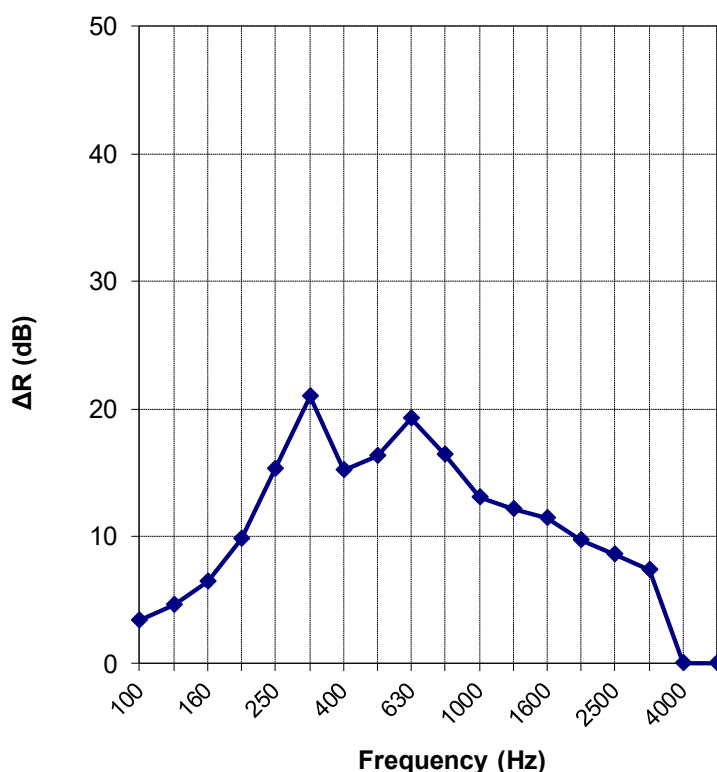
High-performance acoustic floor system comprising: URSA TERRA PLUS 32 T0003 mineral wool + SE-TP-60 acoustic isolators (SENR) + 82 mm omega profiles (KNAUF) + SE-BEC acoustic strip (SENR) + SE-MONT-BICAPA 40 decoupling strip (SENR) + 16 mm moisture-resistant MDF board + TECSOUND 2FT 80 sound-insulating composite membrane (SOPREMA) + 700-gauge black polyethylene sheet + SE-SP-30 R mesh spacers (SENR) + B500S welded wire mesh (20×20×0.4 cm) + 60 mm concrete slab.

Load-bearing element: 140 mm reinforced concrete reference slab.

Approximate surface mass: 522,79 kg/m² (351 kg/m² reference slab + 171.79 kg/m² floor).

Approximate thickness: 323.5 mm (140 mm load-bearing element + 183.5 mm floor).

f Hz	R _{with} dB	R _{without} dB	ΔR dB
100	48,9	45,5	3,4
125	53,2	48,6	4,6
160	57,5	51,1	6,4
200	59,0	49,2	9,8
250	59,1	43,8	15,3
315	62,5	41,5	21,0
400	61,7	46,5	15,2
500	63,6	47,3	16,3
630	69,1	49,9	19,2
800	70,0	53,6	16,4
1000	70,7	57,6	13,1
1250	72,6	60,5	12,1
1600	75,0	63,6	11,4
2000	76,0	66,3	9,7
2500	77,3	68,7	8,6
3150	77,6	70,2	7,4
4000	77,3	≥ 72,1	0,0
5000	73,7	≥ 71,6	0,0
R _w	69	53	



ΔR_w, heavy = 13 dB

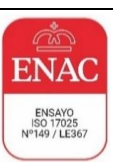
R_{w,ref} (C; C_{tr}) without = 52 (0;-5) dB

R_{w,ref} (C; C_{tr}) with = 65 (-2;-7) dB

Δ(R_w + C) heavy 11 dB

Δ(R_w + C_{tr}) heavy 11 dB

ΔR(A) (DB-HR) = 12 dBA

			Prepared by: Formado digitalmente por ALVARADO HURFANO JORN FRECIF: 201210406 Nombre de reconocimiento (DN): c=ES, o=Audiotec S.L., ou=11554204, cn=ALVARADO HURFANO JORN FRECIF - 201210406 Fecha: 2025.09.30 12:27:59 +0200 Signed: John Alvarado	Reviewed by: Formado digitalmente por ARENAS GOMBAU ANGEL MARIA - 11554204 Nombre de reconocimiento (DN): c=ES, ou=11554204, cn=ARENAS GOMBAU ANGEL MARIA - 11554204 Signed: Ángel Arenaz
---	---	---	--	--



902 37 37 99

www.audiotec.es

info@audiotec.es

mediciones@audiotec.es

