

LABORATORY ACOUSTIC TEST REPORT

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

**System: DIRECT ACOUSTIC CEILING SYSTEM –
URSA + SOPREMA + SENOR**

Minimum-thickness acoustic ceiling system comprising:
47 mm and/or 60 mm KNAUF profiles + SE-BEC acoustic
strip (SENOR) + SE-MONT-BICAPA 40 decoupling strip
(SENOR) + SE-FTD NIVEL 47 and/or SE-FTD NIVEL 60
acoustic isolators (SENOR) + URSA TERRA PLUS 32 T0003
mineral wool + TECSOUND SY 50 synthetic polymer
membrane (SOPREMA) + double layer of 12,5 mm
standard gypsum board (KNAUF).

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

Ref: CAM25070023-2/MEJ_IMP

Date of Issue:

September 28, 2026



Report test

TEST LOCATION:	AUDIOTEC STANDARDIZED TEST CHAMBERS – C/ JUANELO TURRIANO, 4. BOECILLO TECHNOLOGY PARK. BOECILLO (VALLADOLID), SPAIN
TEST:	Laboratory measurement of the reduction of impact noise transmitted through floor and ceiling coverings over heavy standardized slab.
SAMPLE:	System: DIRECT ACOUSTIC CEILING SYSTEM – URSA + SOPREMA + SENOR Minimum-thickness acoustic ceiling system comprising: 47 mm and/or 60 mm KNAUF profiles + SE-BEC acoustic strip (SENR) + SE-MONT-BICAPA 40 decoupling strip (SENR) + SE-FTD NIVEL 47 and/or SE-FTD NIVEL 60 acoustic isolators (SENR) + URSA TERRA PLUS 32 T0003 mineral wool + TECSOUND SY 50 synthetic polymer membrane (SOPREMA) + double layer of 12,5 mm standard gypsum board (KNAUF). Load-bearing element: 140 mm reinforced concrete reference slab.
METHOD TEST:	UNE EN ISO 10140-1:2022. Annex H UNE EN ISO 10140-3:2022
CUSTOMERS:	SUSENSIONES ELÁSTICAS DEL NORTE S.L SENR. SOPREMA IBERIA S.L.U URSA IBERICA AISLANTES, S.A
TEST DATE:	5 November 2025

Performed by:



Firmado digitalmente por
ROJO MARTIN ARTURO JOSE -
12420493X
Nombre de reconocimiento
(DN): c=ES,
serialNumber=IDCES-12420493
X, givenName=ARTURO JOSE,
sn=ROJO MARTIN, cn=ROJO
MARTIN ARTURO JOSE -
12420493X

Signed.: Arturo Rojo Martín
Laboratory Technician

Reviewed by:



Firmado digitalmente por
ARENZ GOMBAU ANGEL
MARIA - 11954820H
Nombre de reconocimiento
(DN): c=ES,
serialNumber=IDCES-1195482
0H, givenName=ANGEL
MARIA, sn=ARENZ GOMBAU,
cn=ARENZ 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.- Test Results

1.- REPORT PURPOSE

Evaluation of the reduction of impact sound pressure level transmitted through floor finishes over a standardized heavy floor base of 140 mm, ΔL_w , from the following sample:

Identification of the construction system: Horizontal system comprising:

DIRECT ACOUSTIC CEILING SYSTEM – URSA + SOPREMA + SENOR

Minimum-thickness acoustic ceiling system comprising: 47 mm and/or 60 mm KNAUF profiles + SE-BEC acoustic strip (SENR) + SE-MONT-BICAPA 40 decoupling strip (SENR) + SE-FTD NIVEL 47 and/or SE-FTD NIVEL 60 acoustic isolators (SENR) + URSA TERRA PLUS 32 T0003 mineral wool + TECSOUND SY 50 synthetic polymer membrane (SOPREMA) + double layer of 12,5 mm standard gypsum board (KNAUF).

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

Approximate surface mass: 375,7 kg/m² (351 kg/m² reference slab + 24.7 kg/m² ceiling).

Approximate thickness: 220,5 mm (140 mm reference slab + 80,5 mm ceiling).

The ceiling 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 standardized test chambers of AUDIOTEC, located at the Boecillo Technology Park (Valladolid).

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 and material descriptions were provided by the client. The thickness and weight of the gypsum board, 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.
- The laboratory measurement test of noise reduction from impacts transmitted through a ceiling under a standardized heavy slab, requested by the client, is outside the scope of the Laboratory's ENAC accreditation. The report produced does not guarantee compliance with ENAC accreditation requirements according to the UNE EN ISO 17025 standard and therefore will not be covered by accreditation or international recognition agreements.

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 10140-3:2022. Acoustics. Laboratory measurement of sound insulation of building elements. Part 3: Measurement of impact sound insulation.*
- *Annex H of standard UNE-EN ISO 10140-1:2022 (Floor coverings. Improvement of impact sound insulation).*
- *Annex C of standard UNE-EN ISO 10140-5:2022 (Standardized floors for measuring the improvement of impact sound insulation by floor coverings).*
- *Measurement procedures and calculations are set out in AUDIOTEC Acoustic Laboratory Specific Test Procedures PE-37 and PE-39.*

2.2.- Methodology and Test Parameters

The test chambers comply with the provisions and requirements of standard UNE EN ISO 10140-5:2022. The chambers are vertically adjacent: the lower (receiving) chamber is fixed and located below ground level, while the upper (source) chamber — which houses the tapping machine — is mobile and placed on top of the floor element under test. Both chambers have the shape of an irregular prism with no parallel edges. The receiving (lower) chamber is below street level, with 300 mm reinforced concrete walls and an internal acoustic lining consisting of 15 mm gypsum board cladding; its volume is 52.8 m³. The walls of the upper chamber consist of a 150 mm external metal sandwich structure reinforced with insulating and sound-absorbing materials, together 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 test, a standardized tapping machine was placed successively in five positions distributed across the surface under test.

For the complete system test, three measurements were taken for each tapping machine position using a rotating microphone in the diffuse-field zone of the receiving chamber. The microphone was always kept at a minimum distance of 0.7 m from the lateral walls and at least 1.0 m from the sample under test. The microphone's sweep radius was one meter with a minimum inclination of 10°.

For the load-bearing element test, three measurements were taken for each tapping machine position using a rotating microphone in the diffuse-field zone of the receiving chamber. The microphone was always kept at a minimum distance of 0.7 m from the lateral walls and at least 1.0 m from the sample under test. The microphone's sweep radius was one meter with a minimum inclination of 10°.

Each measurement had a duration of 48 seconds, taken after the signal had stabilized, with a rotation period of 16 seconds — covering three complete revolutions.

Measurements were taken in each one-third-octave band between 100 Hz and 5,000 Hz.

Subsequently, with the tapping machine stopped, the background noise level in the receiving room was measured. For the complete system test, this was done with the rotating microphone under the same conditions as during the active test. The same procedure was followed for the load-bearing element test.

Finally, the reverberation time in the receiving room was measured using 2 source positions separated by more than 3 m. For each source position, 3 microphone positions in the receiving chamber were used, all at least 1 m from the lateral walls, at least 1.8 m apart from one another and at least 2 m from the sound source. Two measurements were taken at each position, and the respective averages were computed. The 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
Tapping Machine	Brüel & Kjaer, Type 3207	3302870
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
Tripods and auxiliary equipment		

2.4.- Product Identification

CEILING 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-FTD NIVEL 47 SE-FTD NIVEL 60	Load range	3 Kg a 25 Kg
Metal Stud (Track)	-	KNAUF / F47/17/06	Thickness	47 mm
Metal Stud (Track)	--	KNAUF / 60/27/06	Thickness	60 mm
Acoustic strip	--	SEÑOR / SE-BEC 8x80	Thickness	8 mm
Mineral wool	--	URSA TERRA PLUS 32 T0003	Thickness	50 mm

PRODUCT	DIMENSIONS	BRAND / MODEL	ESSENTIAL PROPERTY	
Decoupling strip		SEÑOR / SE-MONT-BICAPA-40	Thickness	5,5 mm
Gypsum board (GWB)	--	KNAUF/ Standard	Thickness	12,5 mm
TECSOUND membrane	--	SOPREMA / Tecsound SY 50	Thickness	2,5 mm
Joint compound	--	--	--	--

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:

Ceiling Assembly

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

Perimeter Decoupling and Air-tightness:

The SE-BEC acoustic strip (SEÑOR) was installed at all perimeter junctions between the ceiling and the partition walls, ensuring the elimination of acoustic bridges and allowing the new ceiling to function as a fully floating system.

Installation of Low-Profile Acoustic Isolators:

The SE-FTD NIVEL 47 and/or SE-FTD NIVEL 60 acoustic isolators (SEÑOR) were anchored to the structural slab. These devices are critical to the system: their design allows the profile to be housed within the isolator body, substantially reducing the overall system depth without compromising vibration damping capacity.

Metal Sub-frame, Air-tightness and Acoustic Optimization:

The 47 mm and/or 60 mm KNAUF profiles were clipped into the isolators. Prior to installing the gypsum boards, the SE-MONT-BICAPA-40 decoupling strip (SENOR) was applied to the outer face of each profile to optimize acoustic performance and dampen the contact between the metal profile and the gypsum board.

Acoustic Absorption Infill:

URSA TERRA PLUS 32 T0003 mineral wool was installed within the plenum cavity formed between the structural slab and the ceiling sub-frame, acting as an acoustic absorber within the cavity.

Gypsum Board Layer and Membrane Installation:

The first 12.5 mm standard KNAUF gypsum board was mechanically fastened to the sub-frame. The TECSOUND SY 50 synthetic polymer membrane (SOPREMA) was then self-adhesively bonded to its face. This high-density self-adhesive membrane provides additional mass to the system and dampens the resonance frequencies of the boards.

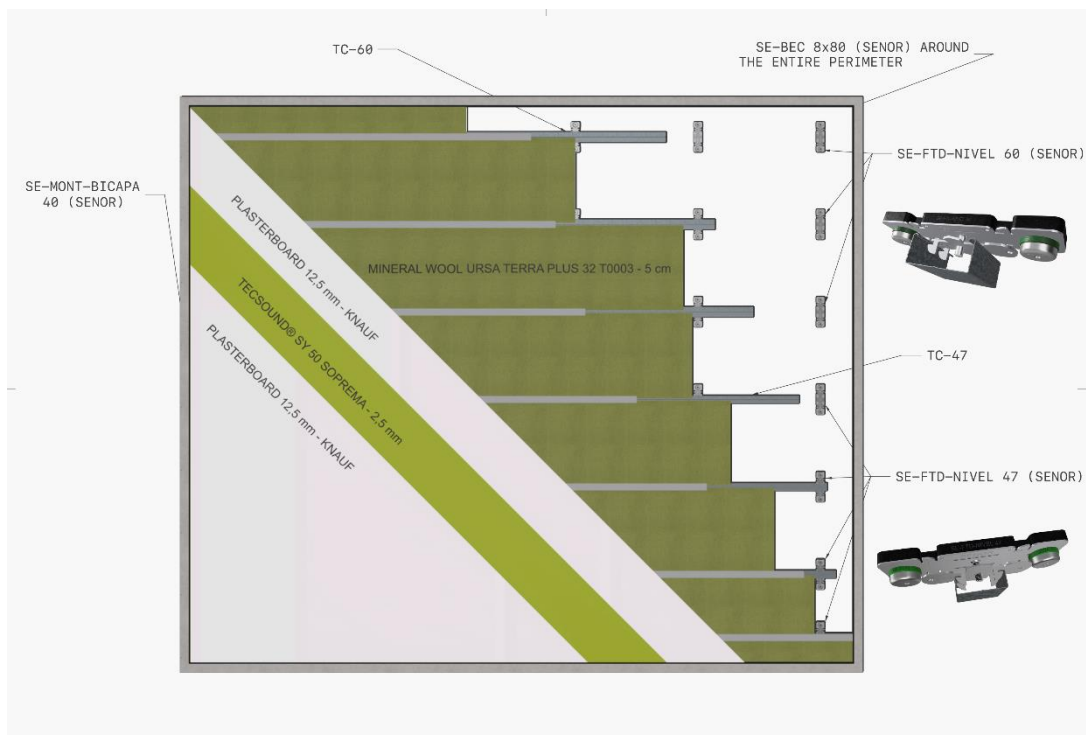
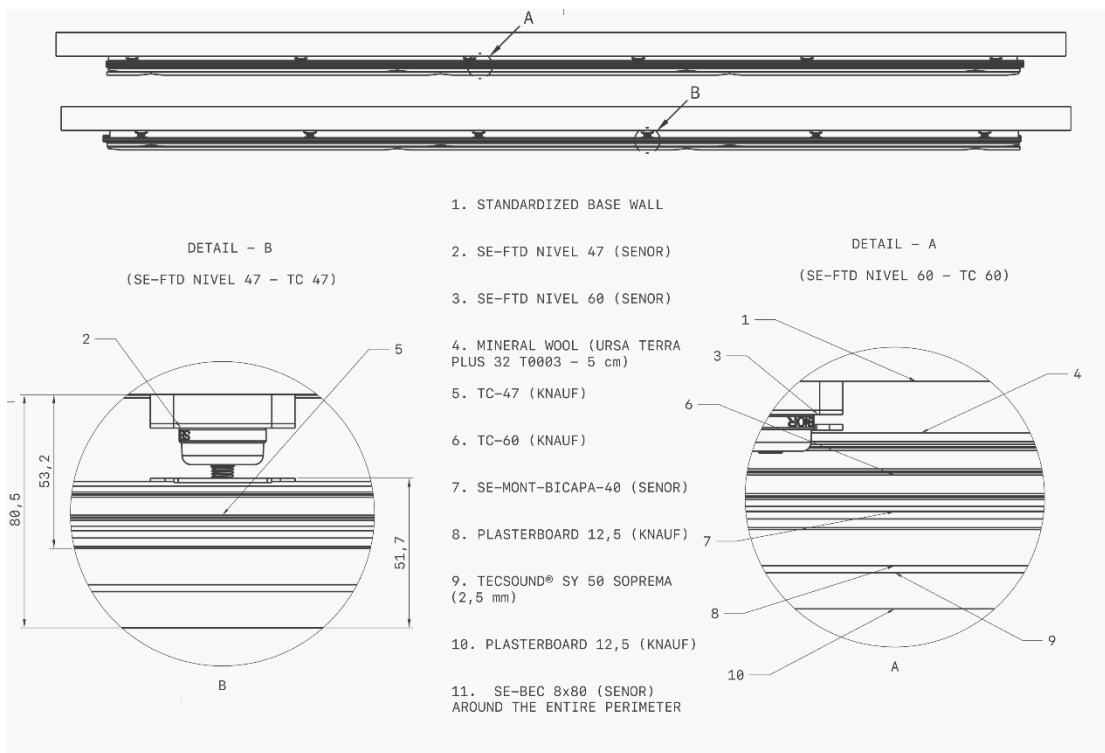
Finishing Layer:

The second 12.5 mm standard KNAUF gypsum board was installed in a staggered joint pattern (offsetting the joints of the first layer) to ensure full air-tightness and to maximize airborne sound insulation performance.

Joint Treatment and System Sealing:

Both the first and second layers of gypsum board received joint treatment at all board junctions. The perimeter joints between the gypsum boards and the side walls were also sealed, in order to guarantee the air-tightness of the system and to prevent sound transmission through potential acoustic leakage paths.

Assembly Diagrams



Assembly diagrams provided by the client

2.6.- Test Characteristics and Conditions

The approximate nominal thickness of the system was 220,5 mm (140 mm load-bearing element + 80,5 mm ceiling). The surface mass of the system was 375,7 kg/m² (351 kg/m² reference slab + 24,7 kg/m² ceiling).

The dimensions of the test opening were 3,30 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 supervised by AUDIOTEC's laboratory technicians.

The volume of the upper (source) chamber was 58.35 m³ and that of the receiving (lower) chamber was 51.85 m³.

Environmental conditions — Reference slab 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	18,2	18,4	43	43	1020	1020
Receiving	18	18,3	40	40		

2.7.- Photographic Documentation of the Assembly

Ceiling assembly





3.- TEST RESULTS

For the tested system, the following data are presented:

- A brief description of the sample tested.
- A table and graph showing the values of the reduction of the impact sound pressure level due to the ceiling finish under test as a function of frequency, ΔL .
- A table showing the normalized impact sound pressure level of the heavy floor base used in the test as a function of frequency, L_{n0} .
- An overall value of the weighted reduction of the impact sound pressure level, ΔL_w , as well as the overall values of L_{nwr} y L_{nw0} , calculated in accordance with standard UNE EN ISO 717-2 (latest version).

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: 05/11/2025

METHOD TEST: UNE-EN ISO 10140-1, Annex H. Cat. II and UNE EN ISO 10140-3:2022

SAMPLE: DIRECT ACOUSTIC CEILING SYSTEM – URSA + SOPREMA + SENOR

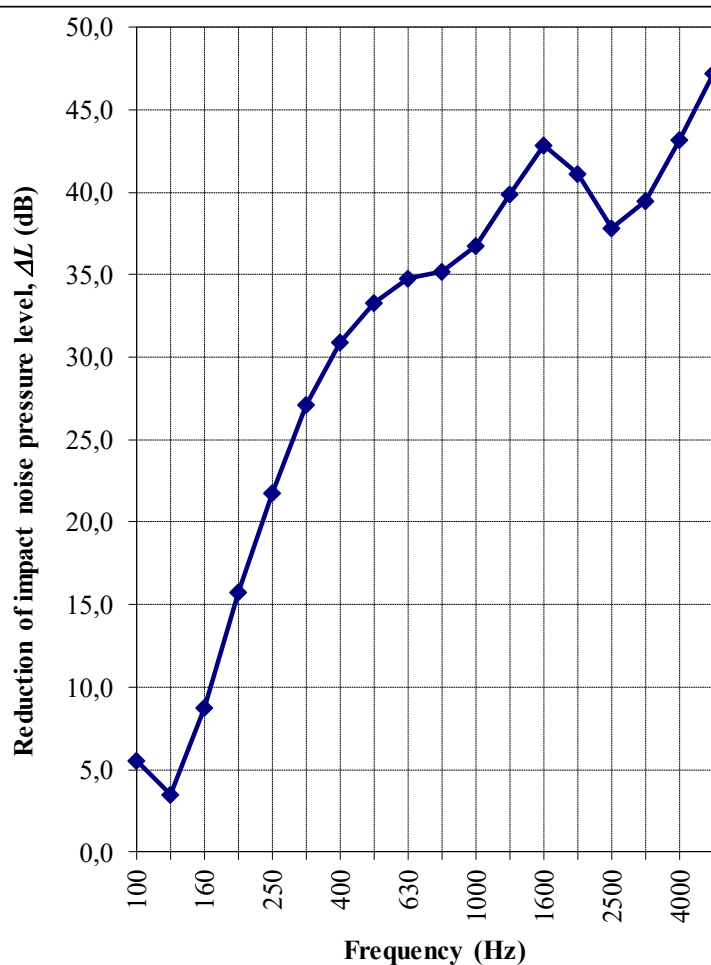
Minimum-thickness acoustic ceiling system comprising: 47 mm and/or 60 mm KNAUF profiles + SE-BEC acoustic strip (SENOR) + SE-MONT-BICAPA 40 decoupling strip (SENOR) + SE-FTD NIVEL 47 and/or SE-FTD NIVEL 60 acoustic isolators (SENOR) + URSA TERRA PLUS 32 T0003 mineral wool + TECSOUND SY 50 synthetic polymer membrane (SOPREMA) + double layer of 12.5 mm standard gypsum board (KNAUF).

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

Approximate surface mass: 375,7 kg/m² (351 kg/m² reference slab + 24,7 kg/m² ceiling).

Approximate thickness: 220,5 mm (140 mm reference slab + 80,5 mm ceiling).

Frec. <i>f</i> Hz	<i>L</i> _{n,0} dB	ΔL dB
100	59,2	5,6
125	58,9	3,5
160	61,3	8,7
200	62,6	15,8
250	67,6	21,8
315	72,4	27,1
400	72,3	30,9
500	73,6	33,3
630	73,9	34,8
800	73,0	35,2
1000	71,7	36,8
1250	70,4	39,8
1600	71,0	42,8
2000	70,3	41,1
2500	70,2	37,8
3150	70,4	39,5
4000	69,0	43,2
5000	67,2	47,2



Weighted reduction of the sound pressure level of impacts according to Standard UNE EN ISO 717-2

$\Delta L_w = 28$ dB

$CI\Delta = -13$ dB

$L_n w, r = 50$ dB

$CI, r = 2$ dB

$L_n w, 0 = 77$ dB

$CI, 0 = -10$ dB



TEST DATE:

05/11/2025

Prepared by:

Firmado digitalmente por ROJO MARTIN ARTURO JOSE
13420493X
Número de reconocimiento (DNI):
c=ES,
serialNumber=DCE:13420493X
givenName=ARTURO JOSE,
sn=ROJO MARTIN, o=ROJO MARTIN ARTURO JOSE
13420493X

Signed: Arturo Rojo

Reviewed by:

Firmado digitalmente por ARENALZ GOMBAU ANGEL MARIA - 11954620H
Número de reconocimiento (DNI):
c=ES,
serialNumber=DCE:11954620H
givenName=ANGEL MARIA,
sn=ARENALZ GOMBAU, o=ARENALZ GOMBAU ANGEL MARIA - 11954620H

Signed: Ángel Arenaz



902 37 37 99

www.audiotec.es

info@audiotec.es

mediciones@audiotec.es

