

BLX ACOUSTIC RESEARCH LABORATORY

TL-993

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TEST REPORT

TEST RAPORU

Customer Name Müşterinin Adı	: Acarkon Entegre Ağaç San. ve Tic. A.Ş.
Customer Address Müşterinin Adresi	: Horozluhan Mahallesi Gümüşlü Sk. No :48, Selçuklu/Konya Türkiye
Order No Talep Numarası	: 220809
Name and Identity of Test Numunenin Adı ve Tanımı	: Silva Premium 12 mm Akustik Panel
Date of Report Rapor Tarihi	: 18.10.2022
Date of Test Test tarihi	: 17.10.2022
Date of Receiving of Test Item Numunelerin Kabul Tarihi	: 17.10.2022
Number of Pages of the Report Raporun Sayfa Sayısı	: 34

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The test and/or measurement results, the uncertainties (if customer demand) with confidence probability and test methods are given on the following pages which are part of report.

Deney ve / veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (müşteri talep ettiğinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

- BLX ACOUSTIC RESEARCH LABORATORY IS SUB-ORGANIZATION OF KARAKUTU ELECTROACOUSTIC COMPANY.
- BLX AKUSTİK ARAŞTIRMA LABORATUVARI KARAKUTU ELEKTROAKUSTİK FİRMASININ BİR ALT KURULUŞUDUR.



Seal
Mühür
Date
Tarih
18.10.2022

Person in charge of test
Deneyi Yapan
Salih Okan Ercan

Person is charge of reporting
Raporlayan
Gizem İğci

Approval
Onaylayan
Altay Özbenkan

This report is only valid for the **Laboratory Measurement of Sound Absorption and Sound Absorption Coefficient in the Reverberation Chamber within the scope of ASTM C423 Standard** on the date of **17.10.2022** under the conditions of **Egemenlik Mahallesi 6106/18 Sokak No:13 Bornova / İzmir** made for **Acarkon Entegre Ağaç San. ve Tic. A.Ş.** This report can not be whole or partially copied and reproduced without the permission of the BLX Acoustic Research Laboratory. Unsigned and unsealed reports are invalid. The results of the measurement relate only conditions during measurement.

Test method Deney Metodu	: ASTM C423 Standard Test Method for Measuring Sound Absorption and Sound Absorption Coefficient in a Reverberation Room
Sampling Methods Numune Alma Prosedürü	: The report complies with Sample Taken Procedure that coded with number of BLX-PR-28.
Test Results Deney Sonuçları	: SAA = 0,53 NRC = 0,6
Environmental conditions Çevre Şartları	: Temperature has been measured as 24.1 °C, Relative Humidity has been measured as 66.0 % rH, Pressure has been measured as 1013.0 hPa.
Measurement uncertainty Ölçüm Belirsizliği	: ± 0,17
Opinions and interpretations Görüş ve Yorumlar	: The whole preparation process for the measurement has been made by BLX-ARL Technical details of the sample has been obtained by the customer.

* Conformity with requirements or specifications/Ölçüm sonuçlarının şartnamelere veya standartlara uygunluk beyanı:

* Disclaimer/Feragat beyanı:

* Definition of Decision Rule/Karar kuralının açık tanımı:

Rule 1- If the measurement results before and after the consideration the uncertainties are both positive, the test result is positive.

Rule 2- If measurement results are positive but there is a shift to the negative zone when measurement uncertainties are taken into consideration, customer agreement is taken for conformity assessment.

Rule 3- If measurement results are negative but there is a shift to the positive zone when measurement uncertainties are taken into consideration, the result of the tests are negative.

Rule 4- If measurement results are inconvenient and also there is a shift to the negative zone when measurement uncertainties are taken into consideration, the result of tests are negative.

* Statement that the results are valid for the sample received/Sonuçların teslim alınan numune için geçerli olduğuna dair beyan:

* Additions to, deviations, or exclusions from the test method/Deney yönteminden eklemeler, çıkarmalar ve sapmalar:

"Experiments marked with the """" specified in the report are not covered by Accreditation.

(*Applicable/when necessary))

The uncertainty given in the measurement results is extended uncertainty. Uncertainty is the result of multiplication with the k=2 scope factor, which provide s a 95% reliability level for normal distribution.

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1. INTRODUCTION

On **17.10.2022**, Measurement results of Sound Absorption and Sound Absorption Coefficient in accordance with ASTM C423 Standard are presented with this report. Measurements were taken between **17.00** and **18.00**.

Measurements were made according to the relevant section of ASTM C423 standard. Measurements are made with calibrated with traceability chain in accordance with TS EN ISO/IEC 17025 standard with devices and equipment in accordance with the acceptance criteria of the relevant standard.

Measurement results are presented in Section 6 of the report.

Calibration certificates for all equipment used during measurement are presented in Appendix A.

In Appendix B, the plan drawing of room 1 where the Sound Absorption Test was carried out in the BLX Acoustic Research Laboratory is presented.

The accreditation certificate and attachment of BLX Acoustic Research Laboratory are presented in Appendix C.

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2. ABOUT MEASUREMENT OF SOUND INSULATION PARAMETERS

2.1. Terms related to Sound Insulation

Decibel (dB): Decibel (dB) is a relative unit of measurement widely used in acoustics. The dB is a logarithmic ratio between the measured level and a reference (threshold) level of 0 dB.

Background noise level ($L_{p,B}$): Measured sound pressure level in the receiving room from all sources except the loudspeaker in the source room.

Room Sound Absorption Area (A_{1-2}): It is the assumed area of a completely absorptive surface that has the same reverberation time as a given room, free from diffraction effects, as if the room had only the absorber.

Sample Sound Absorption Area (A_T): It is the difference between the equivalent sound absorption areas of the reverberation room when the test sample is in the room and when it is not in the room.

Sound Absorption Average (SAA): An odd-numbered rating of a material's sound absorption coefficients, rounded to the nearest 0.01, for 12 1/3 octave bands from 200 to 2500 Hz, measured according to ASTM C423.

Noise Reduction Coefficient (NRC): It is the odd-numbered rating of a material's sound absorption coefficients, rounded to the nearest 0.05, for 4 1/3 octave bands, 250 Hz, 500 Hz, 1000 Hz and 2000 Hz, measured according to ASTM C423.

Reverberation Time (T): Reverberation time is a measure of the time required for reflecting sound to "fade away" in an enclosed area after the source of the sound has stopped. The time it takes a reverberant sound field to decay 60 dB after the source is interrupted.

White Noise: White noise is a random signal having equal intensity at different frequencies, giving it a constant power spectral density.

Pink Noise: Pink noise is a signal or process with a frequency spectrum such that the power spectral density (power per frequency interval) is inversely proportional to the frequency of the signal. In pink noise, each octave interval (halving or doubling in frequency) carries an equal amount of noise energy.

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2.2. Measurement Standard

It was carried out by BLX Acoustic Research Laboratory on **17.10.2022** in accordance with ASTM C423 standard. Below are the standards referenced during the preparation of the report numbered **BLX-R-BA-92_EN**.

- ASTM C423 Standard Test Method for Measuring Sound Absorption and Sound Absorption Coefficient in a Reverberation Room

2.3. Calculation Method

The calculation process was carried out using the formulas specified in C423 standard. The equivalent sound absorption (α) area of a test sample is calculated as follows.

$$\alpha = (A_2 - A_1)/S$$

In this formula

α = It is the ratio of the equivalent sound absorption area of a test sample to the area of the test sample.

A_1 : The area measured when there is no sample in the reverberation chamber.

A_2 : The area measured with the sample in the reverberation chamber.

S : The area of the floor or wall covered with the test sample.

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3. SAMPLE INFORMATION

3.1. General

All technical specifications of the sample measured were obtained by the customer, In order to prepare the sample for measurement, the shipment and assembly operations were carried out by **Acarkon Entegre Ağaç San. ve Tic. A.Ş.** The area of sample which had been placed directly on the floor of the reverberation chamber(Type A Mounting) is **11.76 m²**.

The back surface of the measurement sample contains a 12 mm felt panel and the front surface contains a decorative profile at regular intervals.

Technical details of the sample are given in Figure 3.1 to 3.3.

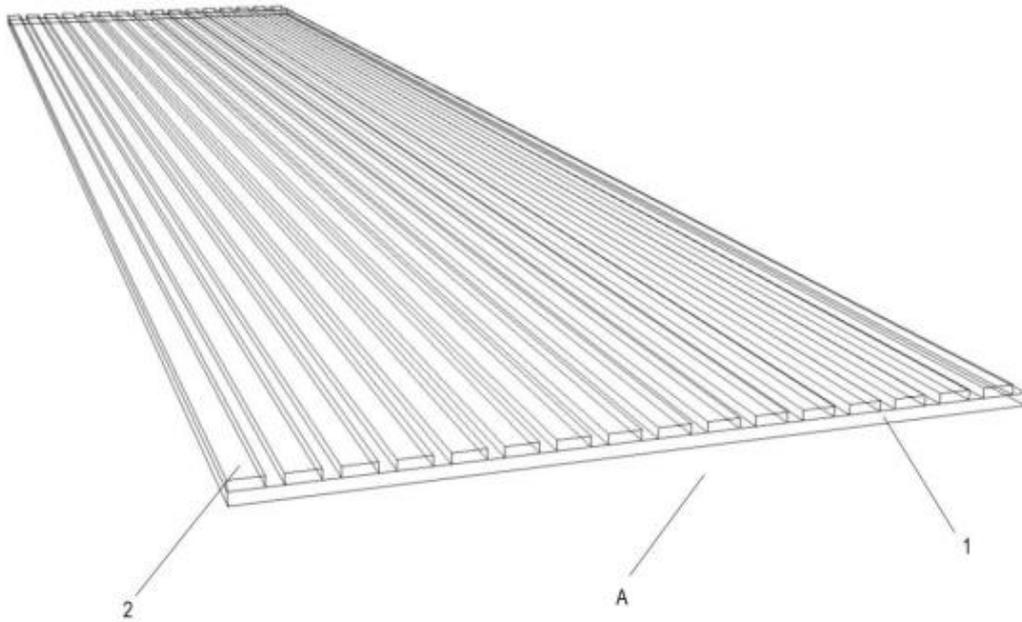


Figure 3.1 Technical details

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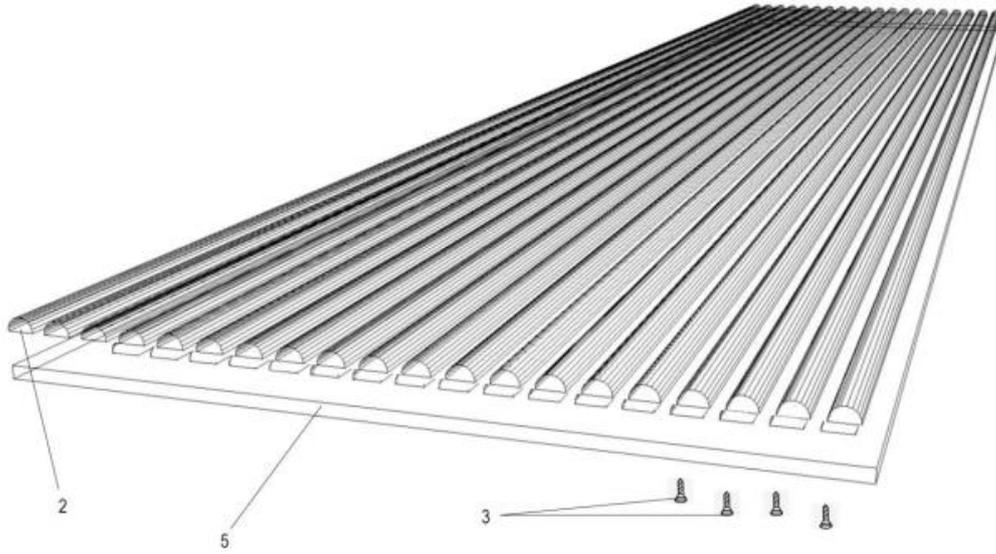


Figure 3.2 Technical details 2

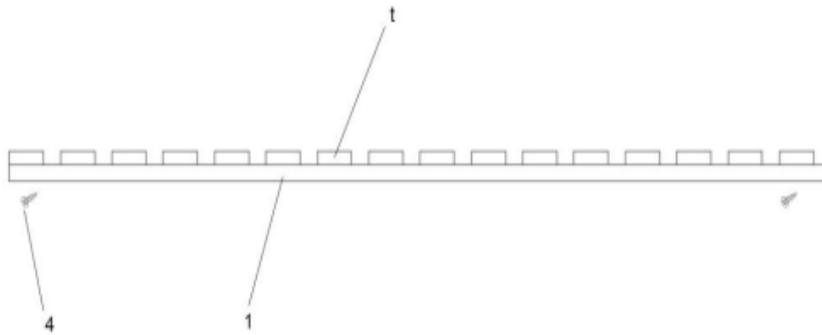


Figure 3.3 Technical details 3

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Application detail photographs of the sample in preparation for measurement are given in Figure 3.4 to Figure 3.7.

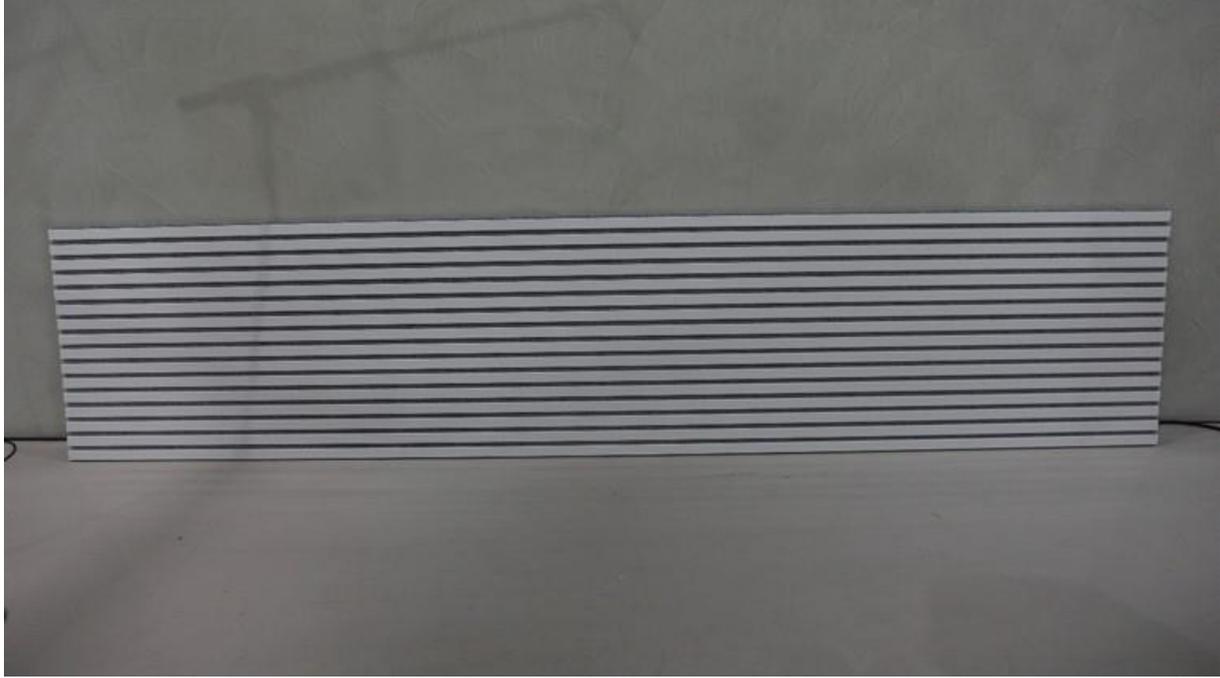


Figure 3.4 Front face of the specimen



Figure 3.5 Rear face of the specimen

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Figure 3.6 Detail of the specimen

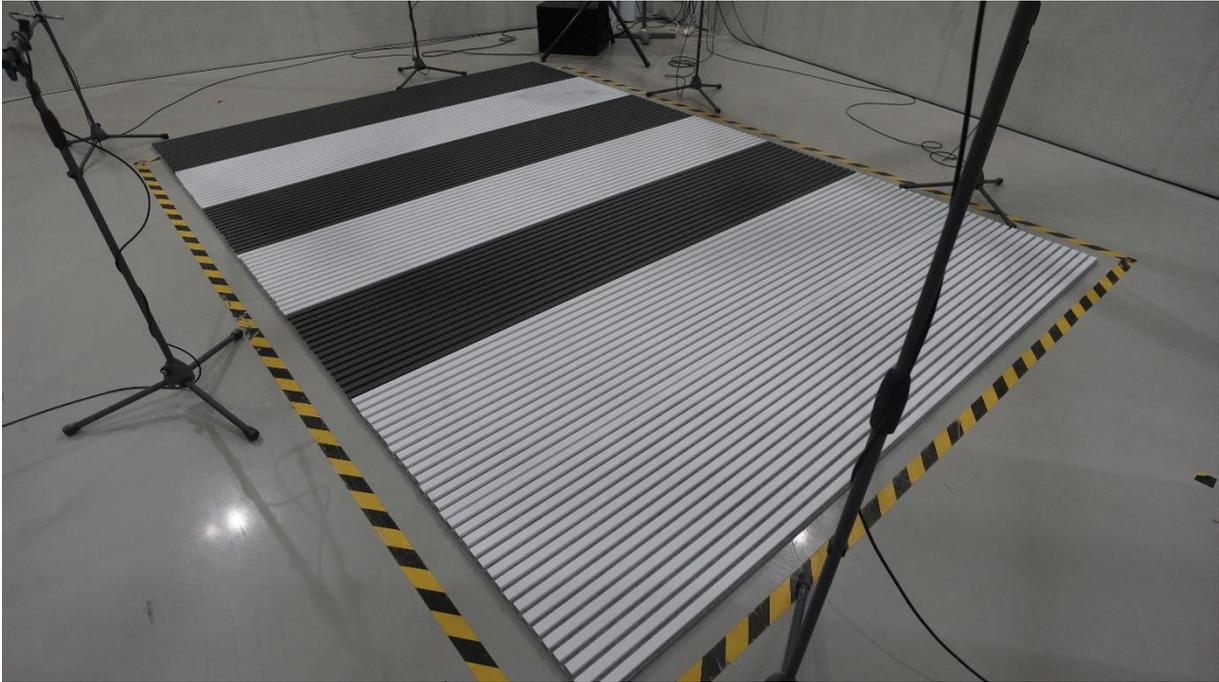


Figure 3.7 Sample photograph inside the reverberation room

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4. DEVICE INFORMATION USED IN MEASURING VOLUME AND MEASUREMENT

The volume of the reverberation chamber where the measurement is made has a volume of **223 m³**. At the time of measurement, the temperature is **24.1 °C**, the pressure is **1013.0 hPa**, and the relative humidity is **66.0% rH**. The measurement was carried out depending on the numbers specified by the relevant standard.

The properties of the reverberation room :

- The floor area of the reverberation room is 44.5 square meters and its height is 5 meters.
- There are 18 diffuser panels of 5.5 kg/m², each of which is 5.5 m² in the reverberation room where the measurement is taken.
- The average sound absorption performance between 500-5000 Hz is 1,20%.
- According to ISO 9613 standard, environmental conditions are controlled at the beginning and end of the measurement and adaptation to ambient conditions is ensured.

4.1. DEVICE INFORMATIONS

- SINUS Apollo Lite 8D
- NTI Audio DS3 Dodecahedron Omnidirectional Loudspeakers
- I-Tech HD Power Amplifier
- GRAS 46AQ 1/2" CCP Microphone Set
- Microphone Rotation Boom
- Grass 42AG Microphone Calibrator
- Grass 42AG Acoustic Calibrator-Temperature / Humudity Meter
- Stanley Tape Measure

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5. MEASUREMENT PROCESS

TYPE A MOUNTING

The test sample is mounted or placed directly opposite the surface of a room, for example, on the floor of the reverberation room.

If necessary, adhesives or mechanical stabilizers can be used to hold the test sample during the experiment without leaving the slightest air gap.

The mounting type of the sample is shown in Figure 5.1.



FIG. 1 Type A Mounting

Figure 5.1 Specimen Mounting Type Indication

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The photograph of the measured room and the process of measurement are shown in Figure 5.2 to Figure 5.4.

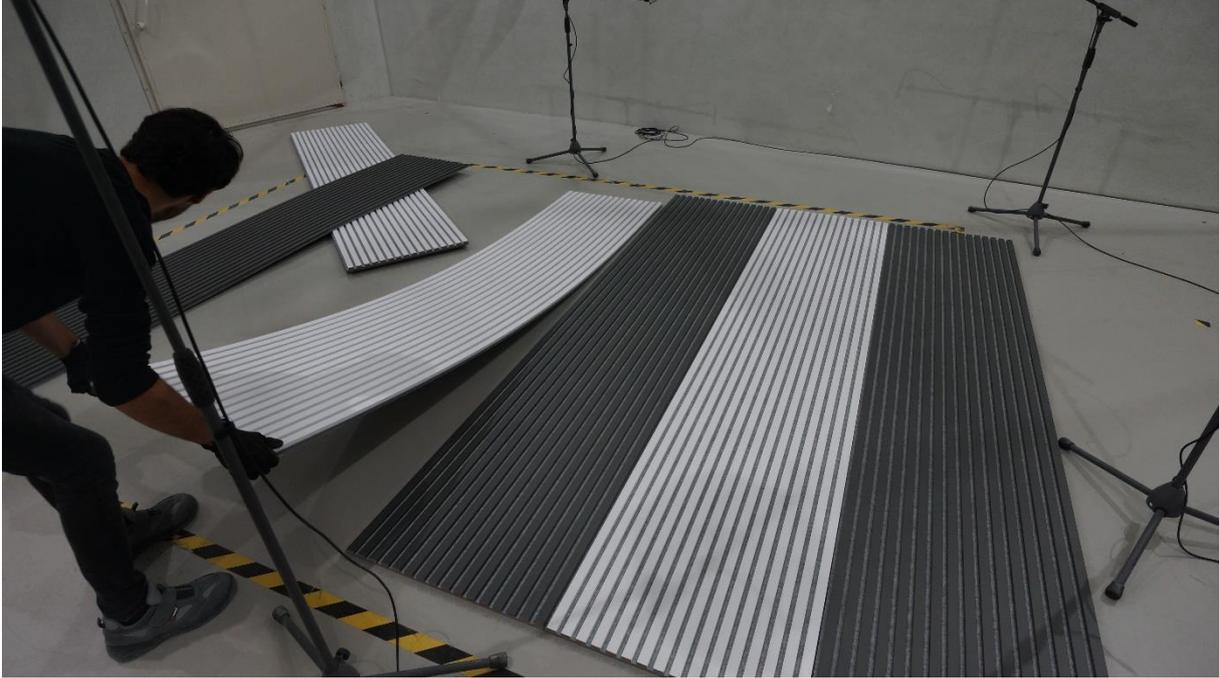


Figure 5.2 Preparation process of measurement

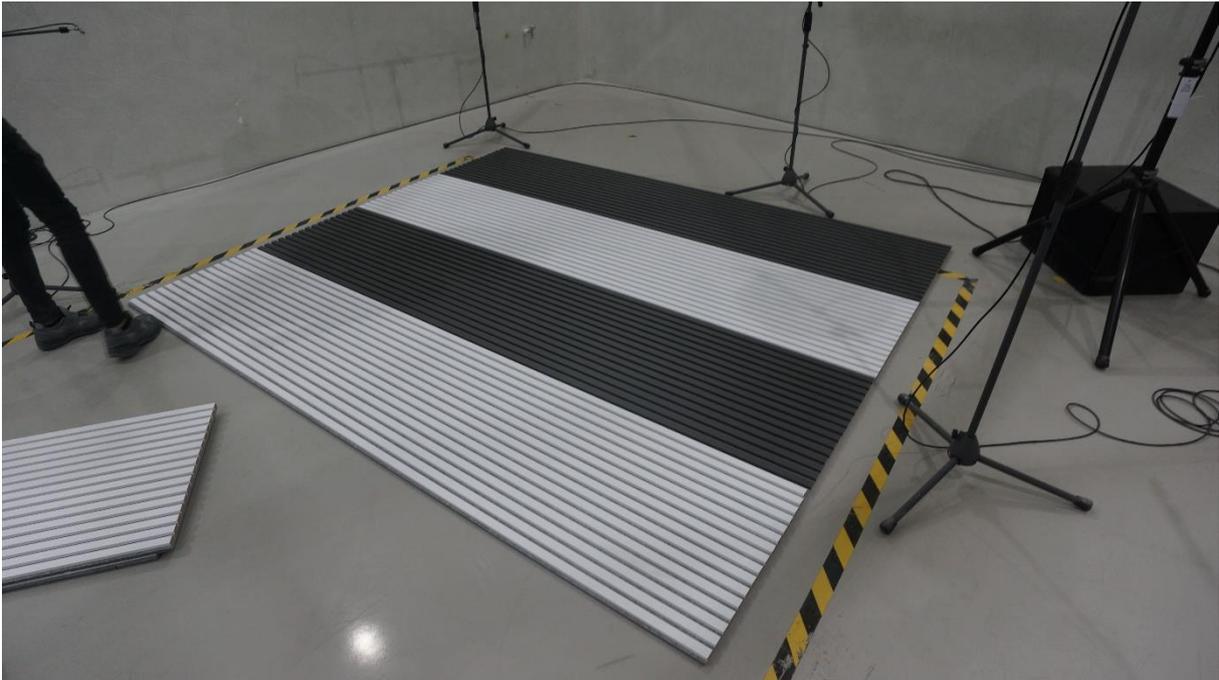


Figure 5.3 Preparation process of measurement

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Figure 5.4 Measurement of sound absorption

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6. RESULTS OF MEASUREMENT

Reverberation times at each frequency, sound absorption coefficient, equivalent sound absorption area; Measurement results including SAA and NRC values are presented in this section.

Measurement results are given in Figure 6.1.

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Measurement of sound absorption in a reverberation room ASTM C423

Laboratory measurements of the sound absorption coefficient in a reverberation room

Manufacturer: Acarkon Entegre Ağaç San. ve Tic. A.Ş.
 Client: Acarkon Entegre Ağaç San. ve Tic. A.Ş.
 Test specimen mounted by: BLX-ARL
 Description of test specimen: Silva Premium 12mm Akustik Panel

Date of test: 17.10.2022



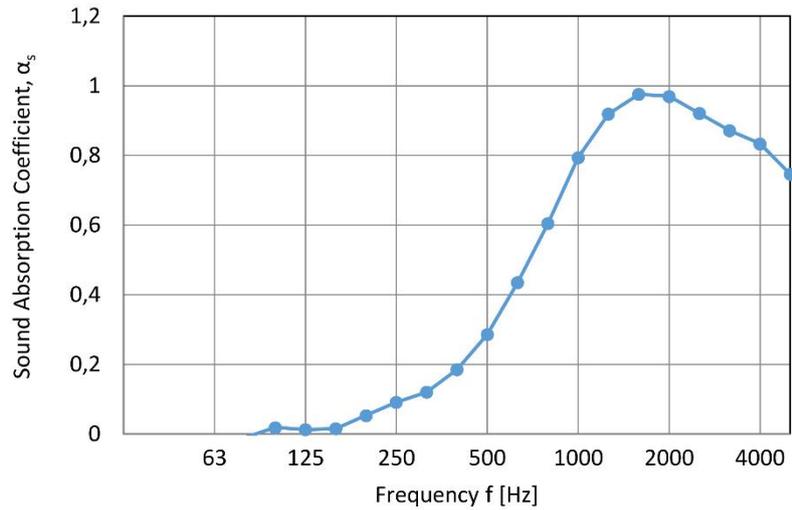
Without specimen: θ [°C] 26,3 rH[%] 63 P[hPa] 1003
 With specimen: 24,1 66 1013

Room: 01
 Volume: 223.2 m³
 Specimen Area: 11,76 m²



TL-993

Frequency f [Hz]	α_s 1/3 Octave	α_p Octave
50	0,0	
63	0,0	-0,01
80	0,0	
100	0,0	
125	0,0	0,02
160	0,0	
200	0,1	
250	0,1	0,09
315	0,1	
400	0,2	
500	0,3	0,30
630	0,4	
800	0,6	
1000	0,8	0,77
1250	0,9	
1600	1,0	
2000	1,0	0,96
2500	0,9	
3150	0,9	
4000	0,8	0,82
5000	0,7	



α_s Sound absorption coefficient according to ASTM C423

α_p Practical sound absorption coefficient according to ISO 11654

Rating according to ISO 11654:

Weighted sound absorption coefficient

$\alpha_{w=}$ **0,30**

Sound absorption class: **D**

Rating according to ASTM C423:

Noise Reduction Coefficient NRC = 0,6

Sound Absorption Average SAA = 0,53

No of Test Report: BLX-R-BA-92

Name of test institute: BLX ACOUSTIC RESEARCH LAB.

Tested by

Salih Okan ERCAN

Reported by

Gözem İDAI

Approved by

Altay ÖZANKAN



Figure 6.1 Measurement Results

7. EVALUATION of the MEASUREMENT RESULTS

- The relevant result is presented in Figure 6.1.
- No visible damage was detected on the test sample during the test.

8. APPENDIX

- Calibration certificates for the equipment used during measurement are presented in Appendix-A.
- In Appendix B, plan drawing of the BLX Acoustic Research Laboratory are presented.
- In Appendix C, accreditation certificate of the BLX Acoustic Research Laboratory are presented.

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Appendix-A

REPORT NAME
BLX-R-BA-92_EN



AVL AKUSTİK VİBRASYON KALİBRASYON LAB. LTD. ŞTİ.

A: İvedik O.S.B Dericiler Sit. 1385. Sok No: 10 Ostim / Ankara
T: +90 (312) 394 15 50 F: +90 (312) 394 15 53 E: bilgi@avl.com.tr W: www.avl.com.tr



AB-0089-K
220631
04-22

KALİBRASYON SERTİFİKASI

Calibration Certificate

Cihazın Sahibi Customer Name	:	KARAKUTU ELEKTROAKUSTİK PROJE VE UYGULAMA SANAYİ VE TİCARET LİMİTED ŞİRKETİ ADALET MAH. ANADOLU CAD. NO.40 K.4 OFİS.401 BAYRAKLI / İZMİR
İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	469414
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.
This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

Kalibrasyon laboratuvarı olarak faaliyet gösteren AVL Kalibrasyon Laboratuvarı, TÜRKAK'tan AB-0089-K dosya numarası ile TS EN ISO/IEC 17025-2017 standardına göre akredite edilmiştir.

AVL Kalibrasyon Laboratuvarı is accredited by TÜRKAK under registration number AB-0089-K for TS EN ISO/IEC 17025-2017 as test laboratory.

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Seal



Yayın Tarihi
Publication Date

14.04.2022

Kalibrasyonu Yapan
Calibrated By

Fatma SOLGUNTEKİN

Kalibrasyon Personeli

Calibration Responsible



Onaylayan / Tarih
Approval / Date

Younes NEVAYEŞİRİZİ / 14.04.2022

Laboratuvar Müdürü

Laboratory Manager



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KALİBRASYON SERTİFİKASI
Calibration Certificate

Cihazın Sahibi Customer Name	:	KARAKUTU ELEKTROAKUSTİK PROJE VE UYGULAMA SANAYİ VE TİCARET LİMİTED ŞİRKETİ ADALET MAH. ANADOLU CAD. NO.40 K.4 OFİS.401 BAYRAKLI / İZMİR
İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	427877
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Yayın Tarihi
Publication Date
14.04.2022

Kalibrasyonu Yapan
Calibrated By
Fatma SOLGUNTEKİN
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Onaylayan / Tarih
Approval / Date
Younes NEVAYESHİRAZİ / 14.04.2022
Laboratuvar Müdürü
Laboratory Manager



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04-22

KALİBRASYON SERTİFİKASI

Calibration Certificate

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İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	427874
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Publication Date

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Kalibrasyonu Yapan
Calibrated By

Fatma SOLGUNTEKİN
Kalibrasyon Personeli

Calibration Responsible



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Approval / Date

Younes NEVAYEŞİRAZI / 14.04.2022

Laboratuvar Müdürü

Laboratory Manager



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İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	427876
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Yayın Tarihi

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Calibration Responsible



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Laboratuvar Müdürü

Laboratory Manager



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İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	427879
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Laboratuvar Müdürü
Laboratory Manager



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İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	427875
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Laboratuvar Müdürü

Laboratory Manager



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İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	469418
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Kalibrasyon Personeli
Calibration Responsible



Onaylayan / Tarih
Approval / Date
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Laboratuvar Müdürü
Laboratory Manager



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Makine / Cihaz Instrument / Device	:	Mikrofon / Güçlendirici Microphone
İmalatçı Manufacturer	:	GRAS
Tip Type	:	46AQ
Seri Numarası Serial number	:	427878
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Mühür / Kaşe
Seal



Yayın Tarihi
Publication Date
14.04.2022

Kalibrasyonu Yapan
Calibrated By
Fatma SOLGUNTEKİN
Kalibrasyon Personeli
Calibration Responsible



Onaylayan / Tarih
Approval / Date
Younes NEVAYESHİRAZİ / 14.04.2022
Laboratuvar Müdürü
Laboratory Manager



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KALİBRASYON SERTİFİKASI
Calibration Certificate



Cihazın Sahibi Customer Name	:	KARAKUTU ELEKTROAKUSTİK PROJE VE UYGULAMA SANAYİ VE TİCARET LİMİTED ŞİRKETİ ADALET MAH. ANADOLU CAD. NO.40 K.4 OFİS.401 BAYRAKLI / İZMİR
İstek Numarası Order No.	:	T-0322-037
Makine / Cihaz Instrument / Device	:	Akustik Kalibratör Acoustic Calibrator
İmalatçı Manufacturer	:	GRAS
Tip Type	:	42AG
Seri Numarası Serial number	:	280620
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
Sertifika Sayfa Sayısı Number of pages	:	4

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Yayın Tarihi
Publication Date
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Kalibrasyonu Yapan
Calibrated By
Fatma SOLGUNTEKİN
Kalibrasyon Personeli
Calibration Responsible



Onaylayan / Tarih
Approval / Date
Younes NEVAYESHİRAZİ / 14.04.2022
Laboratuvar Müdürü
Laboratory Manager



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Kalibrasyon
TS EN ISO/IEC 17025
AB-0089-K

AB-0089-K

220650

04-22

KALİBRASYON SERTİFİKASI

Calibration Certificate

Cihazın Sahibi Customer Name	:	KARAKUTU ELEKTROAKUSTİK PROJE VE UYGULAMA SANAYİ VE TİCARET LİMİTED ŞİRKETİ ADALET MAH. ANADOLU CAD. NO.40 K.4 OFIS.401 BAYRAKLI / İZMİR
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Tip Type	:	42AG
Seri Numarası Serial number	:	280620
Kalibrasyon Tarihi Date of calibration	:	14.04.2022
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Publication Date

14.04.2022

Kalibrasyonu Yapan
Calibrated By

Fatma SOLGUNTEKİN
Kalibrasyon Personeli

Calibration Responsible



Onaylayan / Tarih
Approval / Date

Younes NEVAYESHİRAZİ / 14.04.2022

Laboratuvar Müdürü

Laboratory Manager



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KALİBRASYON SERTİFİKASI

Calibration Certificate



Kalibrasyon
TS EN ISO/IEC 17025
AB-0089-K

AB-0089-K
220651
04-22

Cihazın Sahibi / Adresi: KARAKUTU ELEKTROAKUSTİK PROJE VE UYGULAMA SANAYİ VE TİCARET LİMİTED ŞİRKETİ
Customer / Address: ADALET MAH. ANADOLU CAD. NO.40 K.4 BAYRAKLI / İZMİR

Talep Numarası: T-0322-037 / 1 - L22
Order No:

Makina / Cihaz: Akustik Kalibratör - Sıcaklık / Nem Ölçer
Instrument / Device: Acoustic Calibrator - Temperature / Humidity Meter

İmalatçı: GRAS
Manufacturer:

Tip: 42AG
Type:

Seri No / Cihaz Kodu: 280620
Serial No / Product Code:

Kalibrasyon Tarihi: 14.04.2022
Date of Calibration:

Sertifikanın Sayfa Sayısı: 4
Number of Pages:

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Seal



Yayın Tarihi
Publication Date

14.04.2022

Kalibrasyonu Yapan
Calibrated by

Mehmet GÜVENDİ
Kalibrasyon Personeli
Calibration Responsible



Onaylayan / Tarih
Approval / Date

Younes NEVAYESHİRAZİ / 14.04.2022
Laboratuvar Müdürü
Laboratory Manager



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CERTIFICATE OF ACCREDITATION

This is to attest that

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ADALET DISTRICT ANADOLU STREET NO:40 TEPEKULE İŞ MERKEZİ OFFICE NO:401
BAYRAKLI, İZMİR, 35530, REPUBLIC OF TURKEY

Testing Laboratory TL-993

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date July 16, 2021



Rej Nathan
President

Visit www.iasonline.org for current accreditation information.

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Contact Name Erdal KARA

Contact Phone +90 535 717 55 99

Accredited to ISO/IEC 17025:2017

Effective Date July 16, 2021

ASTM C423	Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
ASTM E90	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
ASTM E2179	Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors
IEC 60268-16:2020	Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index
ISO 354:2003	Acoustics - Measurement of sound absorption in a reverberation room
ISO 3382-1	Acoustics - Measurement of room acoustic parameters - Part 1: Performance spaces
ISO 3741:2010	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for reverberation test rooms
ISO 10140-2:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation
ISO 16251-1:2014	Acoustics - Laboratory measurement of the reduction of transmitted impact noise by floor coverings on a small floor mock-up - Part 1: Heavyweight compact floor
ISO 23351-1:2020	Acoustics — Measurement of speech level reduction of furniture ensembles and enclosures — Part 1: Laboratory method.

TL-993
Karakutu Elektroakustik Proje
ve Uygulama Sanayi ve Ticaret
Limited Sirketi



Page 2 of 2

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