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TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI

Yapı Malzemeleri Yangın ve Akustik Laboratuvarı Müdürlüğü

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CONSTRUCTION MATERIALS FIRE AND ACOUSTICS LABORATORY DIRECTORATE

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TS EN ISO/IEC 17025
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AB-0001-T
444313
12-18

MUAYENE VE DENEY RAPORU
TEST REPORT

Deneyi Talep Eden/Firma (Adı,Adresi,Şehir vb.) *Requesting/Customer (Name,Adress,City etc.)*	:	NEVPANEL YAPI MADEN ÜR.İTH.İHR.SAN.VE TİC.LTD.ŞTİ. (NEVPANEL YAPI MADEN ÜR.İTH.İHR.SAN.VE TİC.LTD.ŞTİ.: BAĞDAT CAD.ÇOL AKOĞLU İŞ MERKEZİ No:458/30 Maltepe-İSTANBUL)
Deney Talep Tarihi/No *Order Date / No*	:	16.11.2018 / 231449
Numunenin Tanımı (No,Cins, Marka, Tip, Tür, Model vb.) *Sample Description (No,Type,Mark,Model etc.)*	:	440047,PLAKA, NEVPANEL , MGO PLAKA (ALÇI PANELLİ) , - , - , 12.00 metrekare *440047,PLATE,,MGO PLATE (WITH GYPSUM BOARD),,,12,00 square meter*
Numune Kabul Tarihi *Test Item Receipt Date*	:	16.11.2018
Deneylerin Yapıldığı Tarih *Date of Test*	:	19.11.2018 - 06.12.2018
Uygulanan Standard / Metod *Applied Standard/Method*	:	TS EN ISO 10140-2:2013-06 , TS EN ISO 717-1:2013-06 *TS EN ISO 10140-2:2013-06 , TS EN ISO 717-1:2013-06*
Raporun Sayfa Sayısı *Number of pages of the report*	:	10
Açıklamalar *Remarks*	:	

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Mühür *Seal*	**Tarih** *Date*	**Deney Sorumlusu** *Person in charge of tests*	**Kontrol Eden** *Reviewer*	**Onaylayan** *Approved by*
TÜRK STANDARDLARI ENSTİTÜSÜ TSE KALİBRASYON MERKEZİ	07.12.2018	Berat USTA Deney Personeli Testing Expert	Mehmet Hüdai BAŞTÜRK Teknik Şef V. Technical Chief Dep.	Halil Alper YILDIRIM Laboratuvar Müdürü V. Laboratory Manager Dep.

Bu rapor, hazırlayan laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mührsüz raporlar geçersizdir.
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AB-0001-T
444313
12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

Test Laboratory	TSE Construction Materials Fire and Acoustic Laboratory Aydınlı Mah. Gülennur Sokak No:7/1 Tuzla/İSTANBUL
Requested by	NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ. Bağdat Cad. Çolakoğlu İş Merkezi No:458/30 Maltepe / İSTANBUL
Test Sample	NEVPANEL Brand MGO Plate (with gypsum board)

1. Introduction

At the request of **NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ.** airborne sound insulation measurements were carried out for ***NEVPANEL Brand MGO Plate (with gypsum board)***, at the acoustic department of TSE Construction Materials Fire and Acoustic Laboratory according to TS EN ISO 10140-2: 2013 on 19/11/2018.

2. Test Facility

Test facility complies with all requirements of TS EN ISO 10140-2 and TS EN ISO 10140-5 standards. Dimensions, shape and mounting conditions were presented at the end of the report.

Volume of source room	**114,9m^3**
Volume of receiving room	**174,4m^3**
Test opening	**12,4m^2**

ROOM	Temperature °C	Pressure kPa	Humidity %
Source	21,7±0,8	100,4±1	53,9±5
Receiving	21,9±0,8	100,4±1	51,6±5

3. Test specimen

The specimen was chosen and delivered by the client.
Specimen arrival date: 11/2018

3.1 Description of the test specimen

Description of the product: Partition wall system that is constituted with single layer NEVPANEL plate with thickness of 12mm at the source side, 50mm thick Knauf Insulation Mineral Plus IPB 037 wall panel at 75mm thick gap and single layer Knauf gypsum board with thickness of 12mm at receiving side respectively.Panels were mounted on the carcase system that is comprised of box shape profile with 75mm width.

TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI YAPI MALZ. YANGIN VE AKUSTİK LAB.
HEADSHIP OF TSE TEST and CALIBRATION CENTER CONST. MAT. FIRE AND ACOUSTICS LABORATORY

AB-0001-T
444313
12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*
TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

Profile: 75mm box shape profile

Acoustic insulation tape: Sound insulation tape with 3mm thick front of the whole box profiles

Filler material: Knauf Insulation, Mineral Plus IPB 037 partition wall panel(50 mm)

Surface area: 12,4m^2

Mass per unit area: ≈19,73kg/m^2

3.2 Installation of test specimen

- Test frame was chosen according to TS EN ISO 10140-5. Test frame has dimensions of 4060mm width and 3060mm height.
- Test specimen was installed in to the frame by client in a similar manner to the actual construction practice.
- In order to mounting wall system to the frame, firstly box shape profiles were fixed at the frame via screws.
- After the mounting, insulation tape was used both front sides of the profiles.
- NEVPANEL was used at receiving side and Knauf brand gypsum board was used at source side in such a way that joints would not overlap each other on both sides.
- Knauf Insulation brand mineral wool with 50 mm thick was placed in the gap between two sides of the wall.
- Gypsum joint filler was applied on the joint tape which was used at joints of the gypsum boards.
- Green Glue noiseproofing sealant was used between sample and frame junction points at both sides.
- The ratio of the niche depths on either side of the test element is approximately 2:1.
- Installation of the frame between the test rooms was carried out by the laboratory.

4. Method

Test laboratory complies with all requirements of **TS EN ISO 10140-5** and **TS EN ISO 10140-2** standards.

- Two horizontally adjacent rooms, one of which is the source and the other is receiving, were used for tests.
- Test specimen was installed into the test opening as defined in clause 3.2 of this report.
- Loud speakers and microphones were placed at locations, which were determined previously.
- Microphone verifications were made before and after measurements.
- Sound pressure level measurements were carried out with mechanized microphone, during 60s. During the measurements, the time of rotating boom whole movement period is equal to 60 s.

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- At the receiving room, 12 measurements were conducted for each 1/3 octave band frequencies to obtain reverberation time according to TS EN ISO 3382.
- Background noise measurements were conducted at receiving room for making correction on the sound pressure levels if necessary.

Results were calculated from the formula below which is indicated in TS EN ISO 10140-2 and TS EN ISO 10140-1 standards;

$R=L_1-L_2+10\text{Log}\,(S/A)$
$A=0{,}16V/T$
Where;
L_1: is the energy average sound pressure level in the source room, in decibels;
L_2: is the energy average sound pressure level in the receiving room, in decibels;
S: is the area of the free test opening in which the test element is installed, in square meters;
A: is the equivalent sound absorption area in the receiving room, in square meters;
V: receiving room volume, cubic meters;
T: reverberation time in receiving room, s.

- Single number rating was obtained according to TS EN ISO 717-1.

5. Results

Results were given in 1/3 octave bands in tabular and graphic forms below.

Single number rating according to TS EN ISO 717-1 was found;

Rw (C;Ctr) = 44,1 (-5; -12) dB

TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI YAPI MALZ. YANGIN VE AKUSTİK LAB.
HEADSHIP OF TSE TEST and CALIBRATION CENTER CONST. MAT. FIRE AND ACOUSTICS LABORATORY

AB-0001-T
444313
12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

Sound reduction index according to ISO 10140-2

Laboratory measurement of sound insulation of building elements

Client: NEVPANEL YAPI MADEN ÜRETİM İTH. İHR. SAN. VE TİC. LTD. ŞTİ. Date of test: 19.11.2018

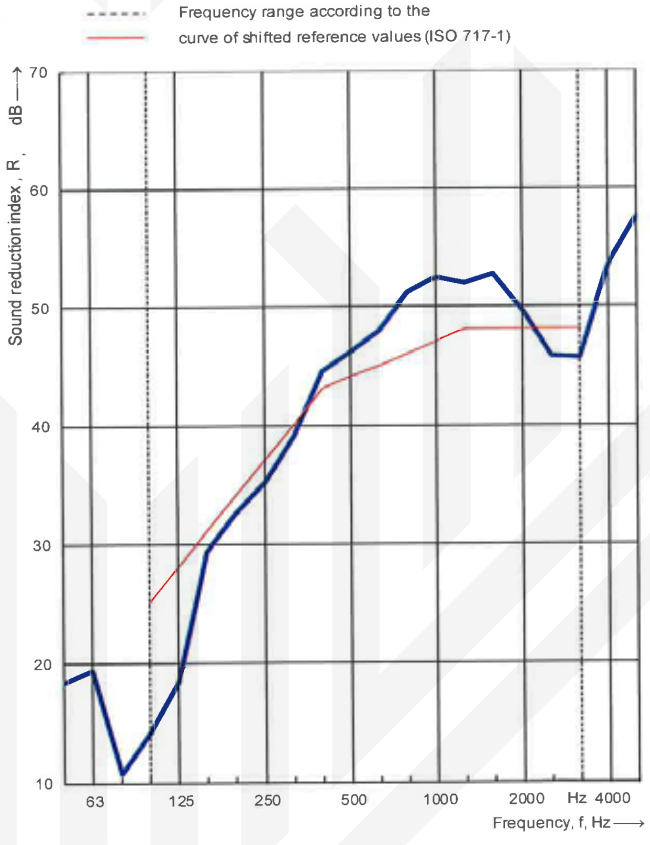
Test room identification: Two horizontally adjacent rooms, one of them is source room has 114,9 m3 volume and the other one is receiving room has 174,4 m3 volume, were used for tests.Diffusers were placed in rooms in order to provide diffuse sound field. Rooms are comply with all requirements of TS EN ISO 10140-2 and TS EN ISO 10140-5 standards. Figures regarding the rooms were presented in the report.

Test specimen mounted by: Test specimen was mounted by the client

Description of the specimen: Partition wall system that is constituted with single layer NEVPANEL plate with thickness of 12mm at the source side, 50mm thick Knauf Insulation Mineral Plus IPB 037 wall panel at 75mm thick gap and single layer Knauf gypsum board with thickness of 12mm at receiving side respectively.Panels were mounted on the carcase system that is comprised of box shape profile with 75mm width.

Static pressure:	100,4 kPa
Air temperature:	21,9 °C
Relative air humidity:	51,6 %
Mass per unit area:	≈19,73 kg/m²
Area, S, of test element:	12,42 m²
Source room volume:	114,9 m³
Receiving room volume:	174,4 m³

Frequency f [Hz]	R 1/3 octave [dB]
50	18,3
63	19,4
80	10,7
100	14,2
125	18,3
160	29,4
200	32,5
250	35,2
315	39,1
400	44,5
500	46,2
630	48,0
800	51,2
1000	52,4
1250	52,0
1600	52,7
2000	49,6
2500	45,8
3150	45,7
4000	53,5
5000	57,5



Rating according to ISO 717-1

R_w $(C;C_{tr})$ = 44,1 (-5 ; -12) dB

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method.

$C_{50\text{-}3150}$ = -6 dB $C_{50\text{-}5000}$ = -5 dB $C_{100\text{-}5000}$ = -4 dB

$C_{tr,50\text{-}3150}$ = -15 dB $C_{tr,50\text{-}5000}$ = -15 dB $C_{tr,100\text{-}5000}$ = -12 dB

5/10

LAB-D-FR-36 / 16.10.2018 - 4

TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI YAPI MALZ. YANGIN VE AKUSTİK LAB.
HEADSHIP OF TSE TEST and CALIBRATION CENTER CONST. MAT. FIRE AND ACOUSTICS LABORATORY

AB-0001-T
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12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

Sound reduction index according to ISO 10140-2

Laboratory measurement of sound insulation of building elements

Rating according to ISO 717-1

R_w $(C;C_{tr})$ = 44,1 (-5 ; -12) dB

Evaluation based on laboratory measurements results obtained in one-third-octave bands by an engineering method.

$C_{50-3150}$ = -6 dB $C_{50-5000}$ = -5 dB $C_{100-5000}$ = -4 dB

$C_{tr,50-3150}$ = -15 dB $C_{tr,50-5000}$ = -15 dB $C_{tr,100-5000}$ = -12 dB

Sum of unfavourable deviations : 31,6 dB

Max. unfavourable deviation : 10,9 dB at 100 Hz

Frequency [Hz]	R [dB]	L1 [dB]	L2 [dB]	T [s]	Corr. [dB]	u. Dev. [dB]	Bgn status	Ftm status
50	18,3			2,05				
63	19,4			2,78				
80	10,7			3,21				
100	14,2			2,40		10,9		
125	18,3			2,52		9,8		
160	29,4			2,70		1,7		
200	32,5			2,66		1,6		
250	35,2			2,89		1,9		
315	39,1			2,68		1,0		
400	44,5			3,08				
500	46,2			3,13				
630	48,0			3,03				
800	51,2			2,82				
1000	52,4			2,60				
1250	52,0			2,42				
1600	52,7			2,33				
2000	49,6			2,53				
2500	45,8			2,60		2,3		
3150	45,7			2,40		2,4		
4000	53,5			2,07				
5000	57,5			1,87				

Receiving room volume: 174,4 m³
Source room volume: 114,9 m³
Area, S, of test element: 12,42 m²

Air temperature: 21,9 °C
Relative air humidity: 51,6 %
Static pressure: 100,4
Mass per unit area: ≈19,73 kg/m²

4

6/10

LAB-D-FR-36 / 16.10.2018 - 4

TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI YAPI MALZ. YANGIN VE AKUSTİK LAB.
HEADSHIP OF TSE TEST and CALIBRATION CENTER CONST. MAT. FIRE AND ACOUSTICS LABORATORY

AB-0001-T
444313
12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

R'_{max} comparison table

Frequency [Hz]	R [dB]	R'_{max} [dB]	R'max - R [dB]
50	18,3	44,6	26,3
63	19,4	46,3	26,9
80	10,7	50,8	40,1
100	14,2	54,9	40,7
125	18,3	53,0	34,7
160	29,4	56,3	26,9
200	32,5	59,0	26,5
250	35,2	59,0	23,8
315	39,1	64,1	25,0
400	44,5	70,4	25,9
500	46,2	73,3	27,1
630	48,0	77,3	29,3
800	51,2	80,8	29,6
1000	52,4	85,7	33,3
1250	52,0	89,6	37,6
1600	52,7	93,4	40,7
2000	49,6	95,1	45,5
2500	45,8	96,0	50,2
3150	45,7	94,5	48,8
4000	53,5	94,3	40,8
5000	57,5	93,1	35,6

Legend:
R: Sound reduction index of the test specimen.
R'max: The maximum sound reduction index of a building element.

7/10

LAB-D-FR-36 / 16.10.2018 - 4

TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI YAPI MALZ. YANGIN VE AKUSTİK LAB.
HEADSHIP OF TSE TEST and CALIBRATION CENTER CONST. MAT. FIRE AND ACOUSTICS LABORATORY

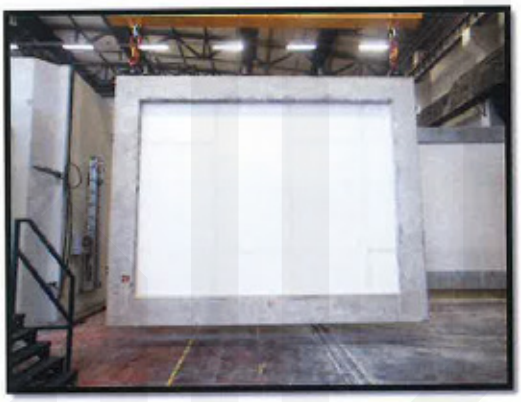
AB-0001-T
444313
12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

PHOTOS FOR TEST SPECIMEN IN SEVERAL STAGES



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8/10

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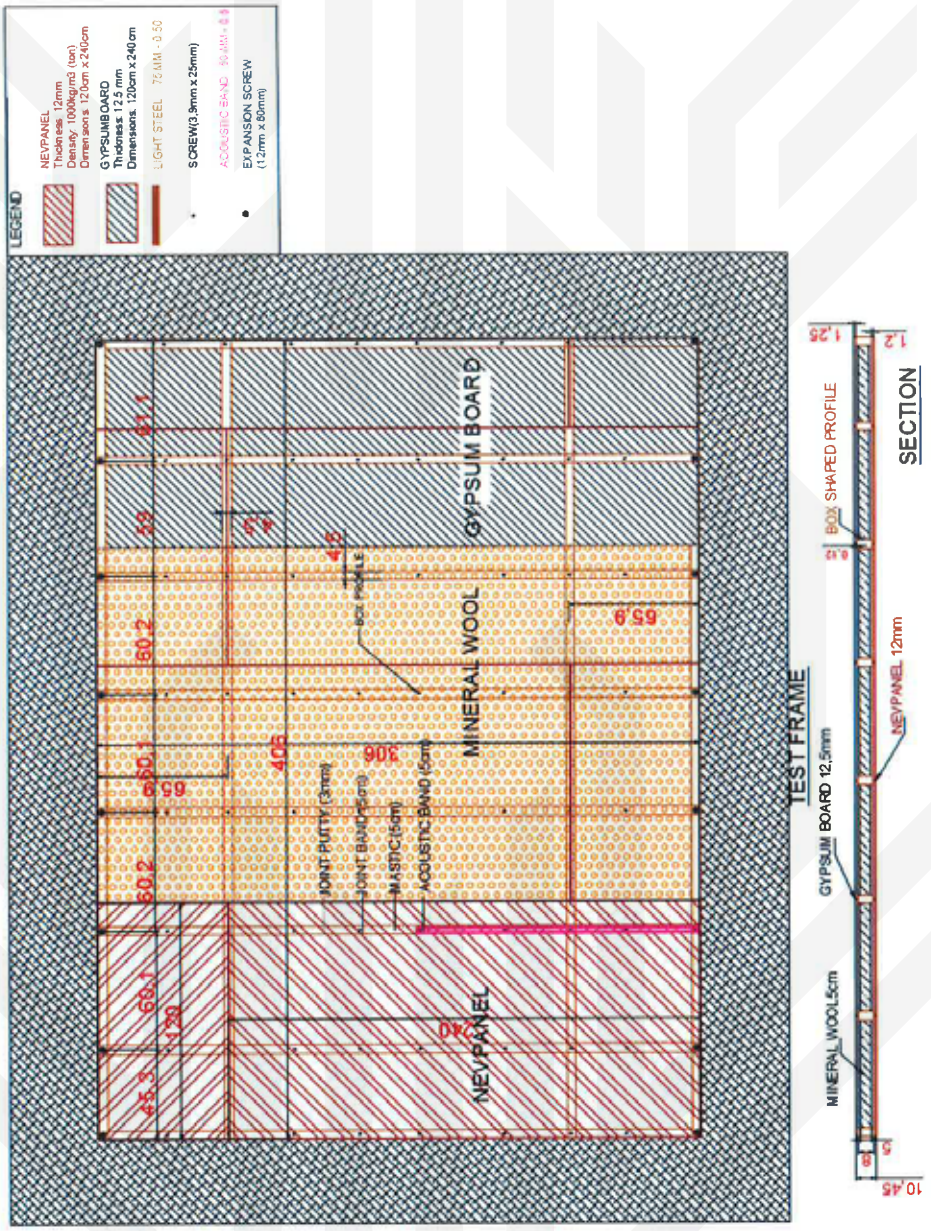
AB-0001-T
~~444313~~
12-18

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

FIGURE REGARDING TEST SAMPLE MOUNTING



LAB-D-FR-36 / 16.10.2018 - 4

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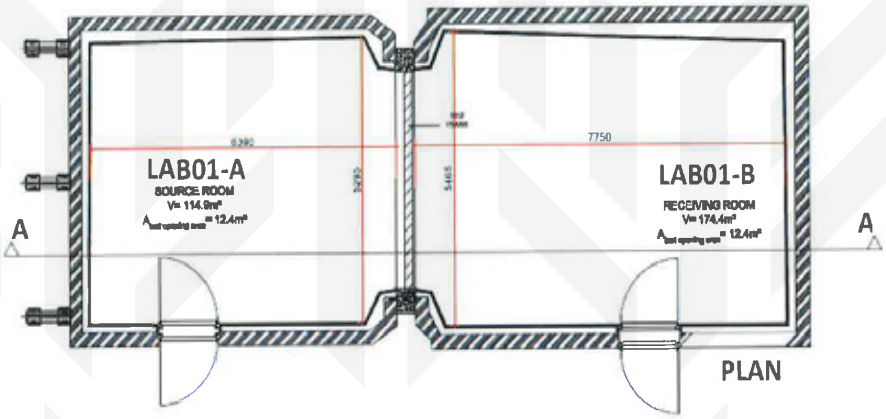
HEADSHIP OF TSE TEST and CALIBRATION CENTER CONST. MAT. FIRE AND ACOUSTICS LABORATORY

AB-0001-T
~~444~~313
12-18

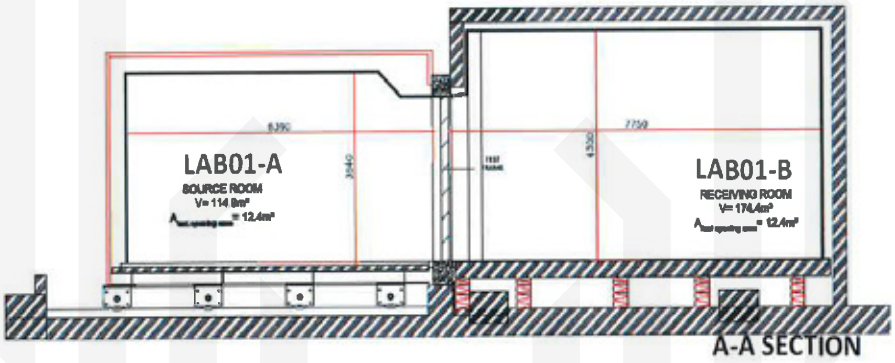
MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

FIGURES REGARDING THE TEST FACILITY



PLAN



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10/10

LAB-D-FR-36 / 16.10.2018 - 4