TÜRKAK - TÜRK AKREDİTASYON KURUMU tarafından akredite
Accredited by TÜRKAK

TSE DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI

Yapı Malzemeleri Yangın ve Akustik Laboratuvarı Müdürlüğü

Adres: Aydınlı Mahallesi Ulus Sokak No:7/1 34953 Tuzla/ İSTANBUL
Tel: +90 (216) 560 05 27 Fax: +90 (216) 560 05 65 E-posta: yalitim@tse.org.tr Web: www.tse.org.tr

HEADSHIP OF TSE TEST and CALIBRATION CENTER
CONSTRUCTION MATERIALS FIRE AND ACOUSTICS LABORATORY DIRECTORATE
Address: Aydınlı Mahallesi Ulus Sokak No:7/1 34953 Tuzla/ ISTANBUL
Tel: +90 (216) 560 05 27 Fax: +90 (216) 560 05 65 E-mail: yalitim@tse.org.tr Web: www.tse.org.tr

AB-0001-T
509285
01-20

MUAYENE VE DENEY RAPORU
TEST REPORT

Deneyi Talep Eden/Firma (Adı,Adresi,Şehir vb.) *Requesting/Customer (Name,Adress,City etc.)*	:	KARE YAPI SİSTEMLERİ İNŞ. LTD. ŞTİ (KARE YAPI SİSTEMLERİ İNŞ. LTD. ŞTİ: ESENTEPE MAH. CEVİZLİ D100 GÜNEY YANYOL LAPİSHAN NO:25/117 SOĞANLIK Kartal-İSTANBUL)
Deney Talep Tarihi/No *Order Date / No*	:	13.12.2019 / 378405
Numunenin Tanımı (No,Cins, Marka, Tip, Tür, Model vb.) *Sample Description (No,Type,Mark,Model etc.)*	:	566334,ÇİFT CAMLI CAM-CAMA BÖLME DUVAR SİSTEMİ, KASA WALL , PLUS , - , - , 12,40 metrekare *566334,KASA Wall PLUS series, Double Glazed, Glass To Glass Partition Wall System,KASA WALL,PLUS,,,12,40 square meter*
Numune Kabul Tarihi *Test Item Receipt Date*	:	13.12.2019
Deneylerin Yapıldığı Tarih *Date of Test*	:	23.12.2019 - 08.01.2020
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*	:	11
Açıklamalar *Remarks*	:	

Türk Akreditasyon Kurumu(TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği(EA) ve Uluslararası Laboratuvar Akreditasyon Birliği(ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır.
The Turkish Accreditation Acency(TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation(ILAC) for the Mutual recognation of test reports.
Deney ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metodları bu raporun tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.
Numune müşteri tarafından alınmıştır, bu rapordaki sonuçlar numunenin teslim alındığı hali için geçerlidir. Bu rapor özel deney talebine istinaden düzenlenmiş olup, Standartlara Uygunluk Belgesi niteliğinde değildir. Partiyi temsil etmez, Piyasa Gözetim ve Denetim Faaliyetlerine esas oluşturmaz, ilan, reklam ve ihalelerde 6102 sayılı Türk Ticaret Kanunu'nun 54. Ve 55. Maddelerinde yer alan haksız rekabet hükümlerine aykırılık teşkil edecek şekilde kullanılamaz. Söz konusu hususlara aykırı hareket edilmesi halinde hukuki ve cezai açıdan TSE sorumlu tutulamaz.
The sample was taken by the customer and the results in this report are valid for the status of the sample being received. This report has been prepared in accordance with the request for special tests and is not qualified as a Certificate of Conformity to Standards. It does not represent the party, does not constitute a basis for Market Surveillance and Audit Activities, and cannot be used in announcement, advertisements and tenders in contradiction with the provisions of unfair competition in Articles 54 and 55 of the Turkish Commercial Law No. 6102. TSE cannot be held responsible in case of violation of these issues in legal and criminal terms.

Mühür *Seal*	Tarih *Date*	Deney Sorumlusu *Person in charge of tests*	Kontrol Eden *Reviewer*	Onaylayan *Approved by*
	08.01.2020	Mehmet Hüdai BAŞTÜRK Deney Personeli Testing Expert	Sencer GÜVEN Teknik Şef Technical Chief	Sencer GÜVEN Laboratuvar Müdürü V. Laboratory Manager Dep.

AB-0001-T
509285
01-20

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. Ulus Sokak No:7/1 Tuzla/İSTANBUL
Requested by	**Kare Yapı Sistemleri İnşaat Ltd. Şti.** Esentepe Mah. Cevizli D100 Güney Yan Yol Lapishan No:25/117 Soğanlık Kartal/İSTANBUL
Test Sample	KASA Wall/PLUS series, Double Glazed, Glass To Glass Partition Wall System (double glazed partition wall system with glass to glass full length 5mm+1,52PVB (0,76+0,76)+5mm laminated transparent glass and 75 mm thick PLUS system profiles)

1. Introduction

At the request of **Kare Yapı Sistemleri İnşaat Ltd. Şti.**, airborne sound insulation measurements were carried out for **"KASA Wall/PLUS series, Double Glazed, Glass To Glass Partition Wall System "** at the acoustic department of TSE Construction Materials Fire and Acoustic Laboratory according to TS EN ISO 10140-2: 2013 on 24/12/2019.

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	22,9±0,8	99,2±1	47,6±5
Receiving	22,7±0,8	99,2±1	47,7±5

3. Test specimen

The specimen was chosen and delivered by the client.
Date of production: -
Specimen arrival date: 23/12/2019

3.1 Description of the test specimen

Description of the product: Double glazed glass partition wall system with approximately 75 mm total system thick that is constituted with various types of aluminium profiles, gaskets, 5mm+1,52mm(0,76+0,76) PVB+5mm mm thick laminated glass and 50mm gap between glasses.

Glass: 5mm+1,52mm(0,76+0,76) PVB laminated glass -*Manufacturer: Çıraylar Cam İnş. Malz. San. ve Tic. A.Ş.)*
Joint: 2mm VHB band
Profile: Various type and dimensions (given in technical drawings)
Gasket: Various type and dimensions(given in technical drawings)

Surface area: 12,4m^2
Mass per unit area: ≈52,4 kg/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.
- System was constructed in the laboratory then it was mounted in to the frame.
- 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.
- 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;

$R=L_1-L_2+10Log\ (S/A)$
$A=0,16V/T$
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 and 1/1 octave bands in tabular and graphic forms below.

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

Rw (C;Ctr) = 42,2 (-3 ; -7) dB

AB-0001-T
509285
01-20

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: Kare Yapı Sistemleri İnşaat Ltd. Şti. Date of test: 24.12.2019

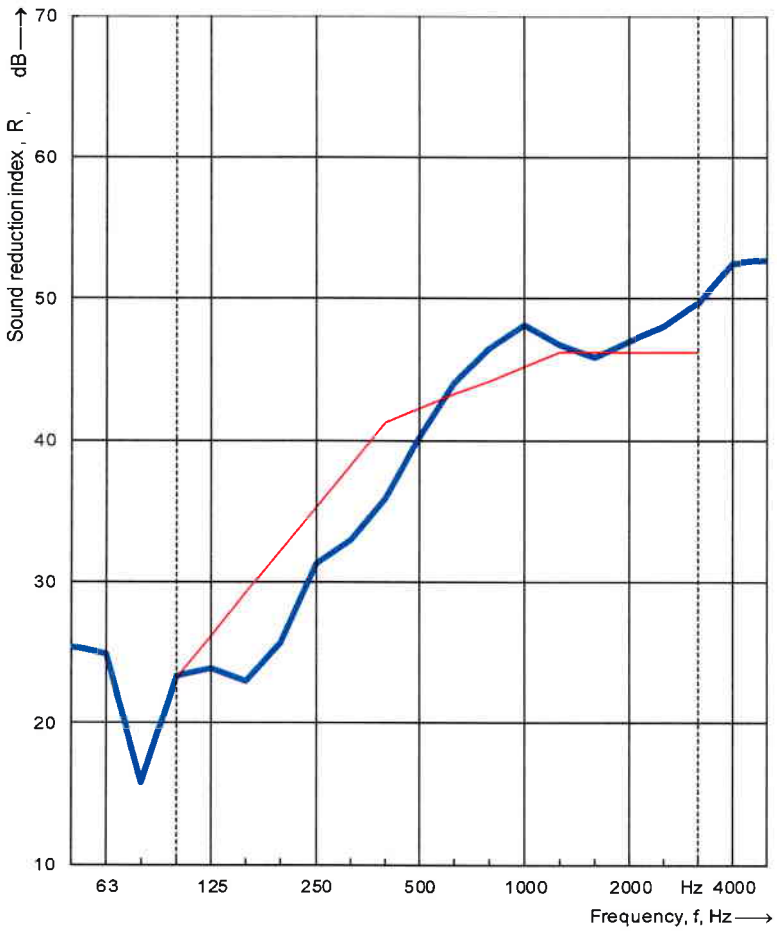
Test room identification: Two horizontally adjacent rooms, one of them is source room has 114,9 m3 volume and the other one is receiving room has 174,4 m3 volume, were used for tests.Diffusers were placed in rooms in order to provide diffuse sound field. Rooms are comply with all requirements of TS EN 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: KASA Wall/PLUS series, Double Glazed, Glass To Glass Partition Wall System (double glazed partition wall system with glass to glass full length 5mm+1,52PVB (0,76+0,76)+5mm laminated transparent glass and 75 mm thick PLUS system profiles)

Static pressure:	99,2 kPa
Air temperature:	22,7 °C
Relative air humidity:	47,7 %
Mass per unit area:	≈52,4 kg/m²
Area, S, of test element:	12,42 m²
Source room volume:	114,9 m³
Receiving room volume:	174,4 m³
Area, S, of test element:	12,42 m²

Frequency f [Hz]	R 1/3 octave [dB]
50	25,4
63	24,9
80	15,8
100	23,3
125	23,9
160	23,0
200	25,7
250	31,3
315	32,9
400	35,9
500	40,2
630	44,0
800	46,4
1000	48,1
1250	46,7
1600	45,8
2000	47,0
2500	48,0
3150	49,7
4000	52,5
5000	52,7



Rating according to ISO 717-1

R_w $(C;C_{tr})$ = 42,2 (-3 ; -7) dB

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

$C_{50\text{-}3150}$ = -3 dB $C_{50\text{-}5000}$ = -2 dB $C_{100\text{-}5000}$ = -2 dB

$C_{tr,50\text{-}3150}$ = -9 dB $C_{tr,50\text{-}5000}$ = -9 dB $C_{tr,100\text{-}5000}$ = -7 dB

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 $(C;C_{tr})$ = 42,2 (-3 ; -7) dB

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

$C_{50\text{-}3150}$ = -3 dB $C_{50\text{-}5000}$ = -2 dB $C_{100\text{-}5000}$ = -2 dB

$C_{tr,50\text{-}3150}$ = -9 dB $C_{tr,50\text{-}5000}$ = -9 dB $C_{tr,100\text{-}5000}$ = -7 dB

Sum of unfavourable deviations : 31,9 dB

Max. unfavourable deviation : 6,5 dB at 200 Hz

Frequency [Hz]	R [dB]	L1 [dB]	L2 [dB]	T [s]	Corr. [dB]	u. Dev. [dB]	Bgn status	Ftm status
50	25,4			2,30				
63	24,9			2,56				
80	15,8			3,00				
100	23,3			2,72				
125	23,9			2,53		2,3		
160	23,0			2,71		6,2		
200	25,7			2,92		6,5		
250	31,3			2,95		3,9		
315	32,9			2,80		5,3		
400	35,9			3,04		5,3		
500	40,2			3,20		2,0		
630	44,0			2,96				
800	46,4			2,79				
1000	48,1			2,64				
1250	46,7			2,44				
1600	45,8			2,32		0,4		
2000	47,0			2,46				
2500	48,0			2,53				
3150	49,7			2,38				
4000	52,5			2,03				
5000	52,7			1,85				

Receiving room volume:	174,4 m³	Air temperature:	22,7 °C
Source room volume:	114,9 m³	Relative air humidity:	47,7 %
Area, S, of test element:	12,42 m²	Static pressure:	99,2 kPa
		Mass per unit area:	≈52,4 kg/m²

DENEY ve KALİBRASYON MERKEZİ BAŞKANLIĞI YANGIN ve AKUSTİK LABORATUVARI

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	25,4	44,6	19,2
63	24,9	46,3	21,4
80	15,8	50,8	35,0
100	23,3	54,9	31,6
125	23,9	53,0	29,1
160	23,0	56,3	33,3
200	25,7	59,0	33,3
250	31,3	59,0	27,7
315	32,9	64,1	31,2
400	35,9	70,4	34,5
500	40,2	73,3	33,1
630	44,0	77,3	33,3
800	46,4	80,8	34,4
1000	48,1	85,7	37,6
1250	46,7	89,6	42,9
1600	45,8	93,4	47,6
2000	47,0	95,1	48,1
2500	48,0	96,0	48,0
3150	49,7	94,5	44,8
4000	52,5	94,3	41,8
5000	52,7	93,1	40,4

Legend:

R: Sound reduction index of the test specimen.

R'max: The maximum sound reduction index of a building element.

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

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

PHOTOS FOR TEST SPECIMEN IN SEVERAL STAGES

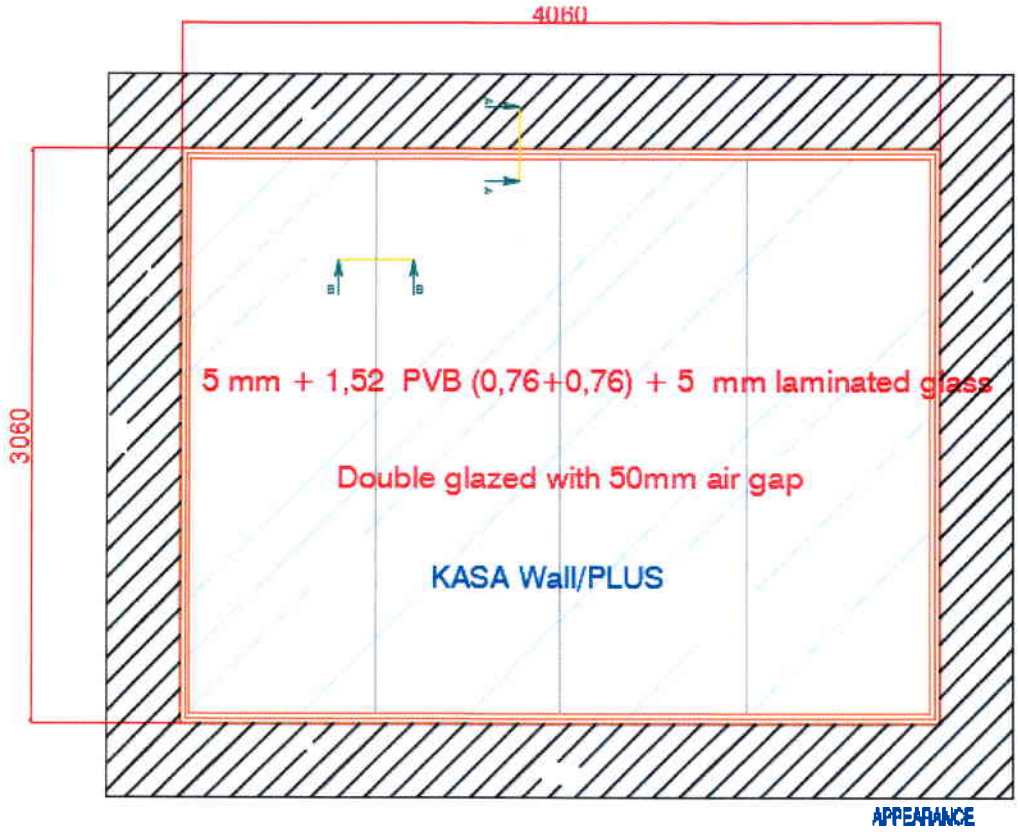
MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

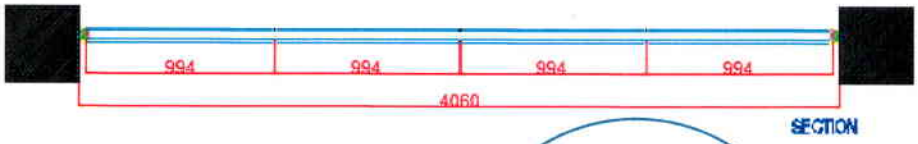
TS EN ISO 10140-2: 2013; TS EN ISO 717-1: 2013

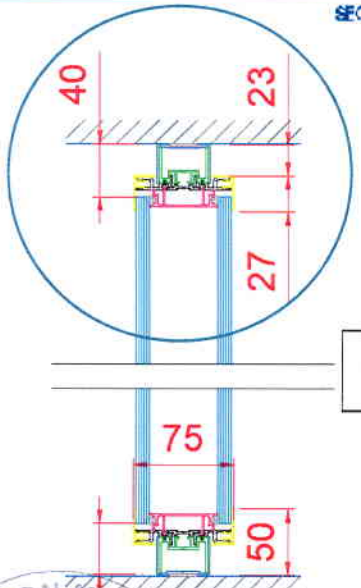
MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

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

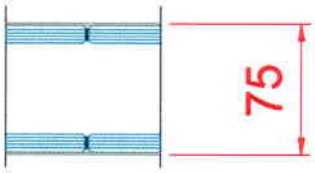
FIGURE REGARDING TEST SAMPLE MOUNTING







A-A section detail



Glass to glass joint with
2mm thick VHB band

B-B section detail

MUAYENE - DENEY SONUÇLARI *TEST RESULTS*

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

AB-0001-T
509285
01-20

FIGURES REGARDING THE TEST FACILITY