

# FTI FASAD TEKNOLOJİ MERKEZİ / FTI Façade Testing Institute

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Laboratuvar / Laboratory

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Test  
TS EN ISO/IEC 17025  
AB-0531-T

AB-0531
020.977.1 / 2017
04.12.2017



## DENEY SERTİFİKASI / Test Certificate

**Müşterinin Adı ve Adresi / Customer's Name & Address:** Burak Alüminyum San. ve Tic. A.Ş.

Yeni Mh. Muratlı Asfaltı No:10 Büyükkarıştıran, Lülebürgaz / Kırklareli / TÜRKİYE

**Numunenin Adı ve Tanımı / Sample's Name & Description:** BM 72 Gizli Kanat Pencere (Hidden Vent Window)

**Numune Kabul Tarihi:** 23.10.2017

Acceptance Date of Item

**Referans No:** 2017.897

Reference No

**Uygulanan Normlar / Norms Applied:** TS EN 14351-1 +A1, TS EN 1026, TS EN 1027, TS EN 12211

**Sonuçlar / Results:** Air Permeability - TS EN 12207 - Classification : Class 4 ( $\pm 600$  Pa)

Water Penetration - TS EN 12208 - Classification : E 1650 (1650 Pa)

Resistance to Wind Load - TS EN 12210 - Classification : C5 ( $\pm 2000$  Pa)

Resistance to Safety Load - TS EN 12210 : OK ( $\pm 3000$  Pa)

**Test Tarihi / Date of Test**

26.10.2017

**Sayfa Sayısı / Number of Pages**

1/16

Deneysel laboratuvarı olarak faaliyet gösteren FTI Fasad Teknoloji Merkezi, TÜRKAK 'tan AB-0531-T numarası ile TS EN ISO/IEC 17025 standardına göre akredite edilmiştir.

FTI Façade Testing Institute accredited by TURKAK under registration number AB-0531-T for TS EN ISO/IEC 17025 as test laboratory.

Türk Akreditasyon Kurumu (TÜRKAK) deney laboratuvarlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EU) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.

Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

Deneysel ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metodları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. Bu sertifika yalnızca test edilen numuneye ait sonuçları içerir ve ekte sunulan ilgili test raporu ile birlikte geçerlidir.

The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages. This certificate includes the test results of the specimen which is identified above and its valid with the related test report.



**Tarih / Date**

04.12.2017

**Test Faaliyetleri Yöneticisi**  
Testing Manager

Nilay BULUT

F.15.22 REV NO: 1 MART 2017

**Laboratuvar Müdürü**  
Laboratory Manager

Öner ARSLAN



## TEST REPORT

**Testing Reference** : TS EN 14351-1 +A1 Windows and doors - Product standard

**Product / Project** : BM 72 Gizli Kanat Pencere (Hidden Vent Window)

**Prepared by** : Nilay BULUT



## 1. PREFACE

This report comprises of tests and results, which were performed by FTI Façade Testing Institute at the address; Çakıl Mah. Şehit Teğmen Tamer Aydın Sok. No: 76 34540 Çatalca – İstanbul / TÜRKİYE.

Test sample is a window system which name is BM 72 Gizli Kanat Pencere (Hidden Vent Window) has been designed and constructed by Burak Alüminyum San. ve Tic. A.Ş..

Tests were carried out on 26.10.2017 for the determination of air infiltration, water penetration (under static pressure), wind resistance, extreme wind load resistance.

Test sample has been sent to FTI Façade Testing Institute's testing laboratories on 23.10.2017.

## 2. CLIENT

Burak Alüminyum San. ve Tic. A.Ş.

Yeni Mh. Muratlı Asfaltı No:10 Büyükkarıştıran

Lülebürgaz / Kırklareli / TÜRKİYE

## 3. TEST METHODS

The above mentioned test has been carried out in project specifications and classified on the standard indicated below.

<u>Document No</u>	<u>Date of Press</u>	<u>Subject of Document</u>
TS EN 14351-1 +A1	01.2012	Windows and doors - Product standard, performance characteristic - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics
TS EN 1026	07.2016	Windows and doors - Air permeability - Test method
TS EN 12207	03.2017	Windows and doors - Air permeability - Classification
TS EN 1027	07.2016	Windows and doors - Watertightness - Test method
TS EN 12208	03.2004	Windows and doors - Watertightness - Classification
TS EN 12211	07.2016	Windows and doors - Resistance to wind load - Test method
TS EN 12210	07.2016	Windows and doors - Resistance to wind load – Classification

## 4. TEST DATE AND PARTICIPANTS

Tests were performed on 26 / 10 / 2017 by the followings:

Oner ARSLAN FTI Laboratory Manager

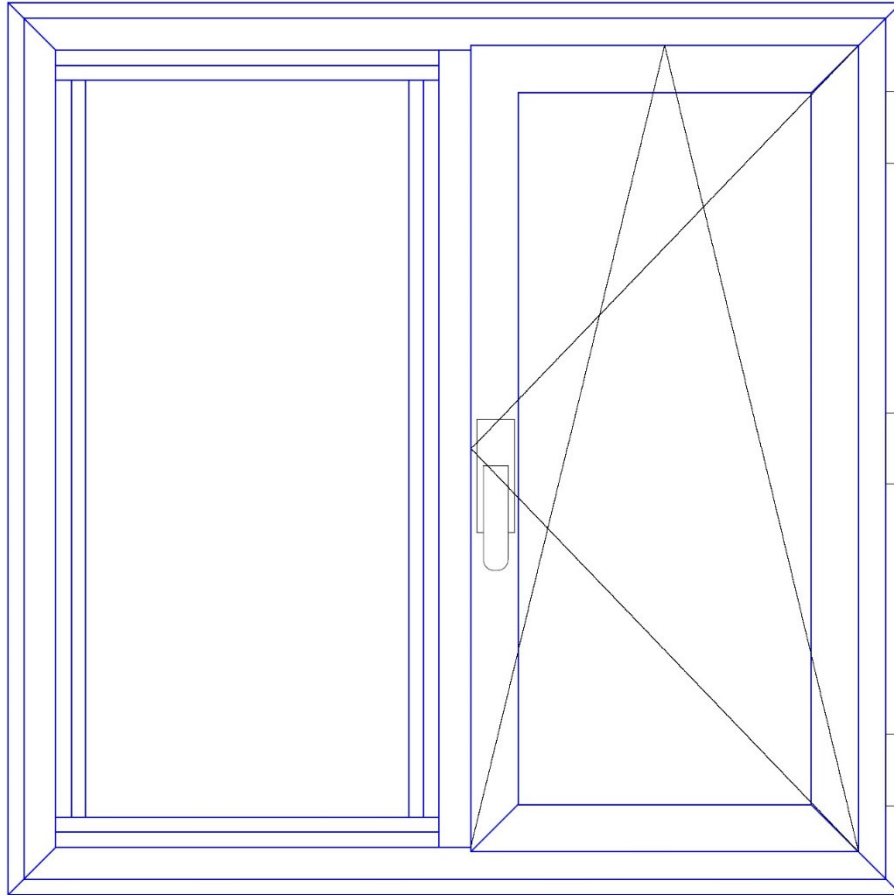
Berk ÖZTÜRK FTI Testing Engineer

And partially,

Hüseyin GURSOY Burak Alüminyum San. ve Tic. A.Ş.

## 5. DESCRIPTION OF TEST SAMPLE

Type of sample	Window
System name	BM 72 Gizli Kanat Pencere (Hidden Vent Window)
Dimensions of sample	1244 mm x 1244 mm
Surface area of sample	1,55 m <sup>2</sup>
Dimensions of sash	546 mm x 1124 mm
Area of sash	0,61 m <sup>2</sup>
Sashes Joint Length	3,34 m
Glass Type	6 mm transparent float glass + 16 mm air space + 6 mm transparent float glass



**Figure 1.** The view of the sample

## 6. CONDITIONS

Date	:	26 / 10 / 2017
Local Temperature (°C)	:	20
Atmospheric Pressure (Mbar)	:	1025
Ambient Humidity (%)	:	65

## 7. TEST PERFORMANCE

### 7.1. Pressure Sequence

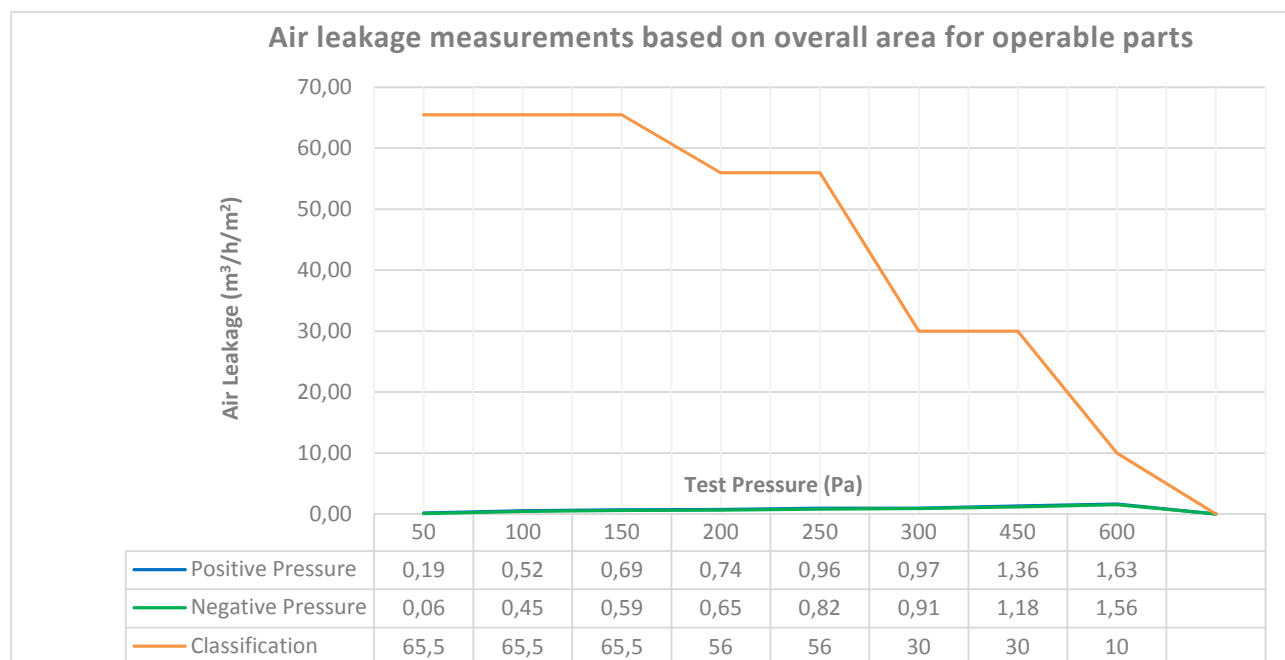
STEPS		POSITIVE PRESSURE (Pa)	NEGATIVE PRESSURE (Pa)
1	PA	600	600
2	PW	1650	-
3	PD	2000	2000
5	PE	3000	3000

PA: Pressure for Airtightness ; PW: Pressure for Watertightness ;

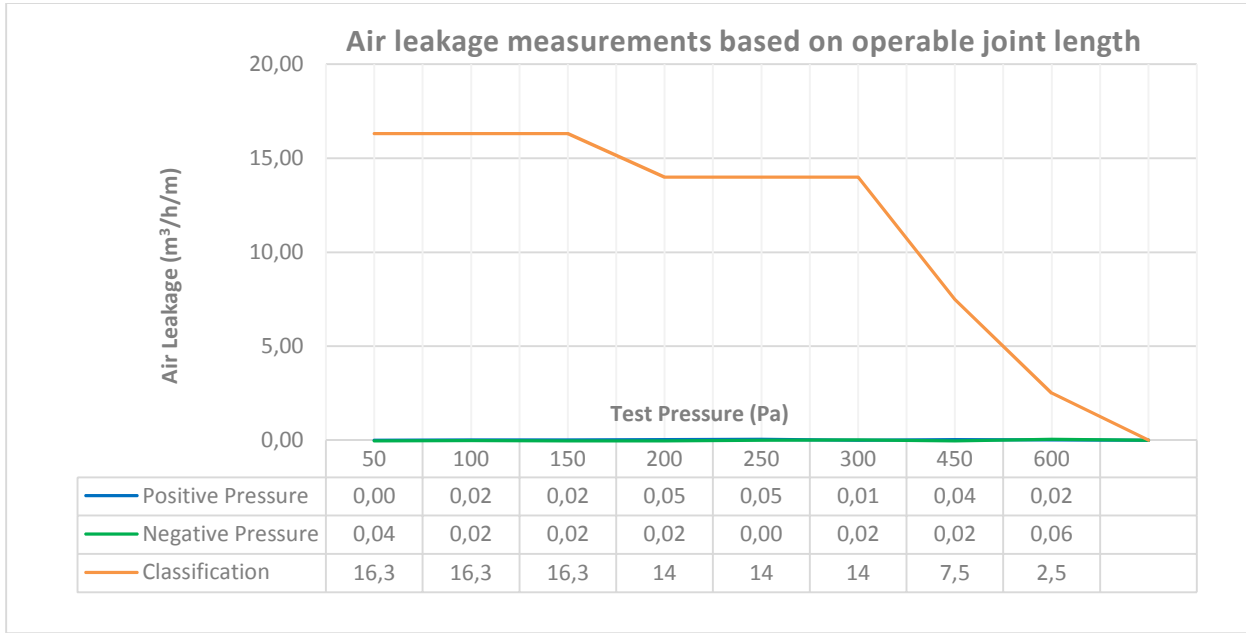
PD: Design Pressure ; PE: Extreme Pressure

### 7.2. Air Permeability

Before starting the test, 3 pulses at 660 Pa is applied to the sample. During the tests, the pressure at the following values is applied for 10 seconds. The following data includes the values of the system after tare.



**Test No: 2017.897.06-07 / 26.10.2017**



**Test No: 2017.897.08-09 / 26.10.2017**

### 7.3. Watertightness Under Static Pressure

Before starting the test, 3 pulses at 1815 Pa were applied to the sample. Waiting duration between each impacts were 3 seconds. An adjustable device for spraying water 2,0 l/m<sup>2</sup>.min so that a constant and continuous film was applied to the outside surface of the specimen.

The amount of water applied to the façade = 2,0 l/min x 1,55 m<sup>2</sup> = 3,1 (l.m<sup>2</sup> /min).

**Observations**

Pressure Value (Pa)	Time Period (min)	Observations
0	15	No water leakage was observed.
50	5	No water leakage was observed.
100	5	No water leakage was observed.
150	5	No water leakage was observed.
200	5	No water leakage was observed.
300	5	No water leakage was observed.
450	5	No water leakage was observed.
600	5	No water leakage was observed.
750	5	No water leakage was observed.
900	5	No water leakage was observed.
1050	5	No water leakage was observed.
1200	5	No water leakage was observed.
1350	5	No water leakage was observed.
1500	5	No water leakage was observed.
1650	5	No water leakage was observed.

**Test No: 2017.897.10/** 24.07.2017

**7.4. Resistance to Wind Load**

Before starting the test, 3 pulses at 2200 Pa for positive and negative design load test. Waiting duration between each impacts were 3 seconds. During the tests, the test pressure values are applied for 10 seconds.

Length of vertical profile L = 1244 mm

The measured frontal deflection (d) on the vertical profile should not exceed identified limit which is determined according to the following criteria :

- if  $d \leq L/150$ , Class A
- if  $d \leq L/200$ , Class B
- if  $d \leq L/300$ , Class C

$L / 300 = 1244 \text{ mm} / 300 = 4,14 \text{ mm}$  for L/300 criteria.

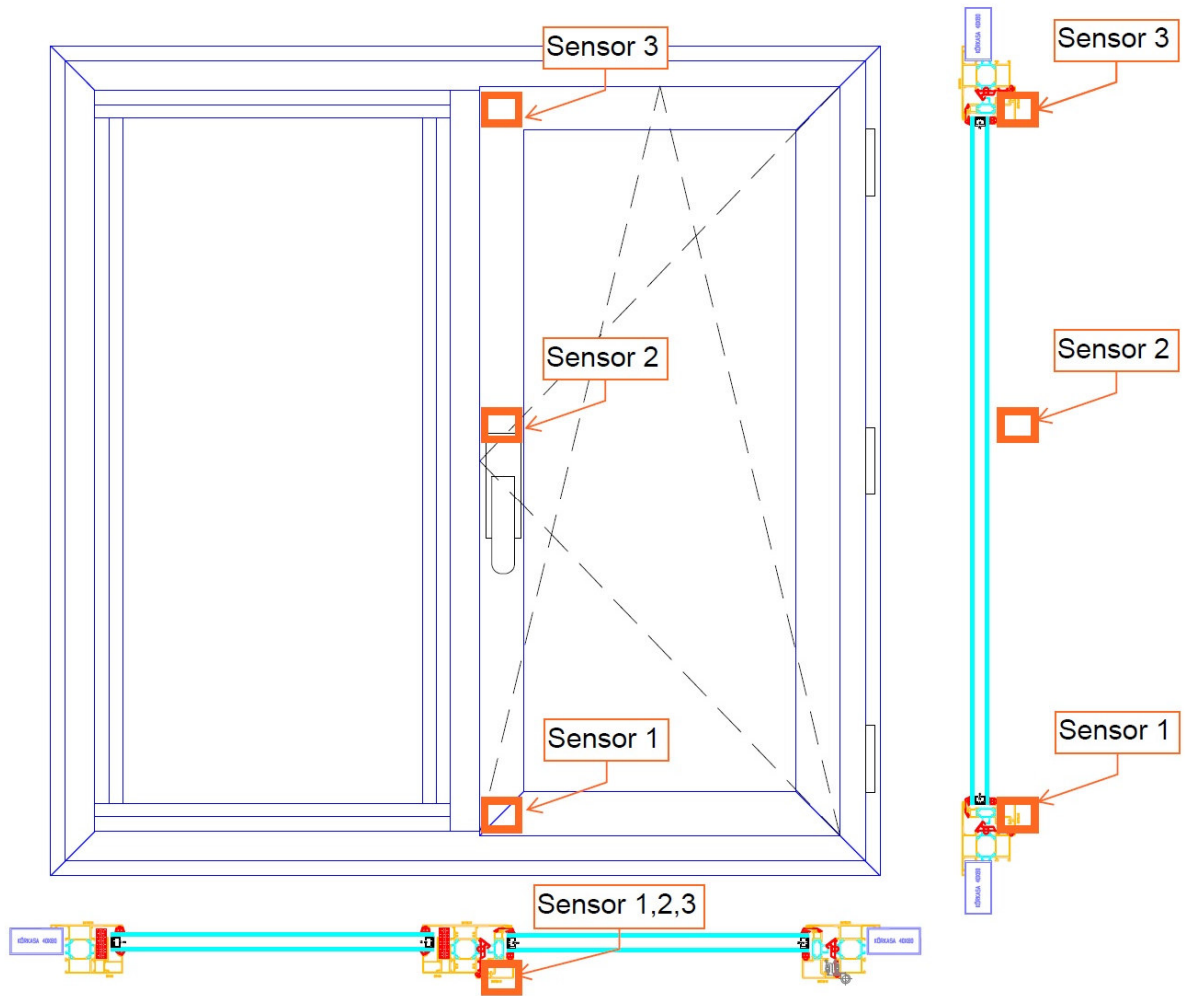
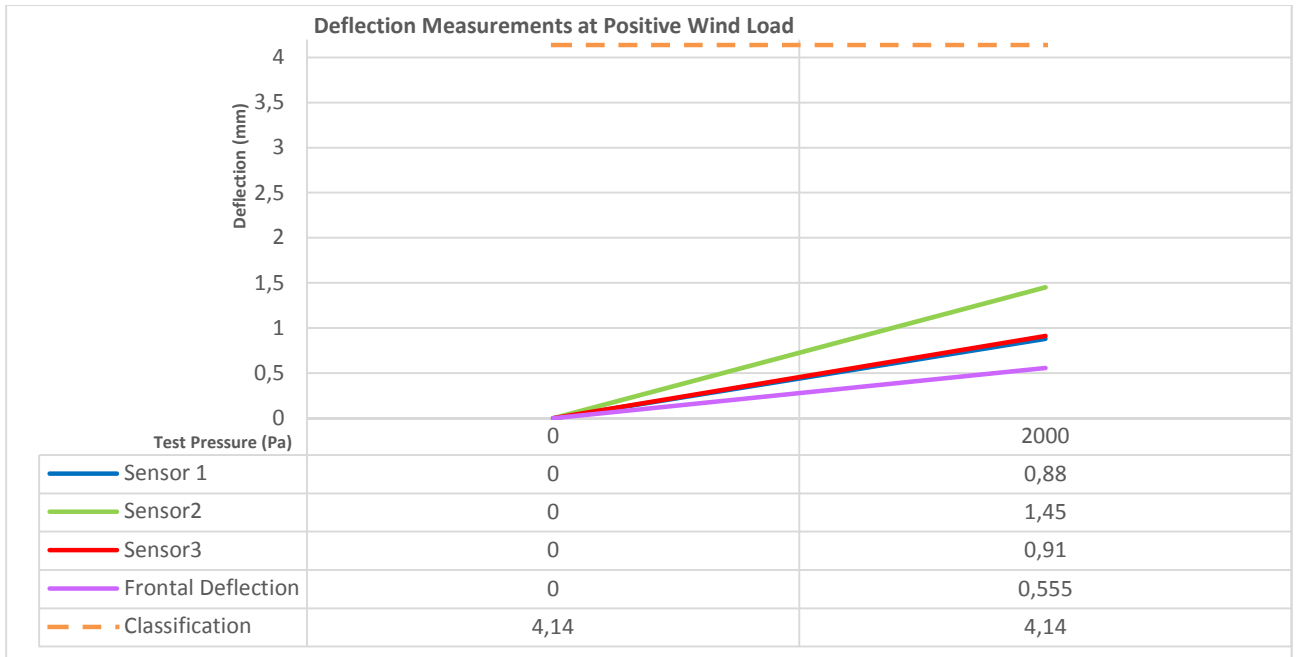
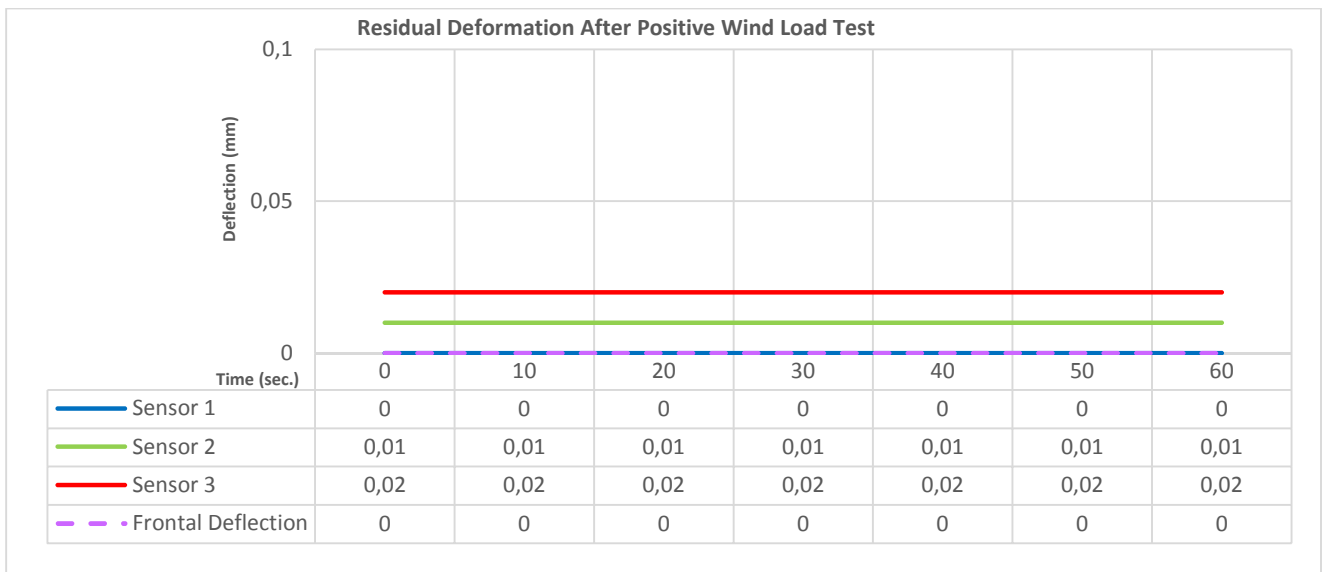


Figure 2. A view of the wind load sensor location





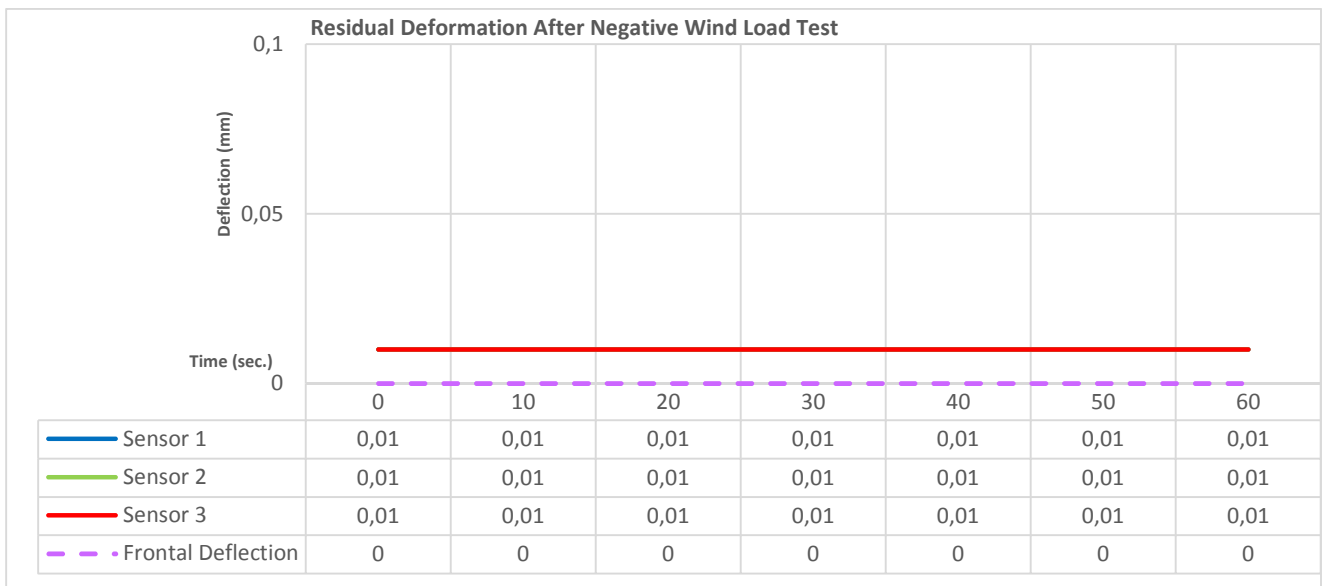
*Test No: 2017.897.11 / 26.10.2017*



*Test No: 2017.897.11 / 26.10.2017*



**Test No: 2017.897.12 / 26.10.2017**



**Test No: 2017.897.12 / 26.10.2017**

### 7.5. Cycle

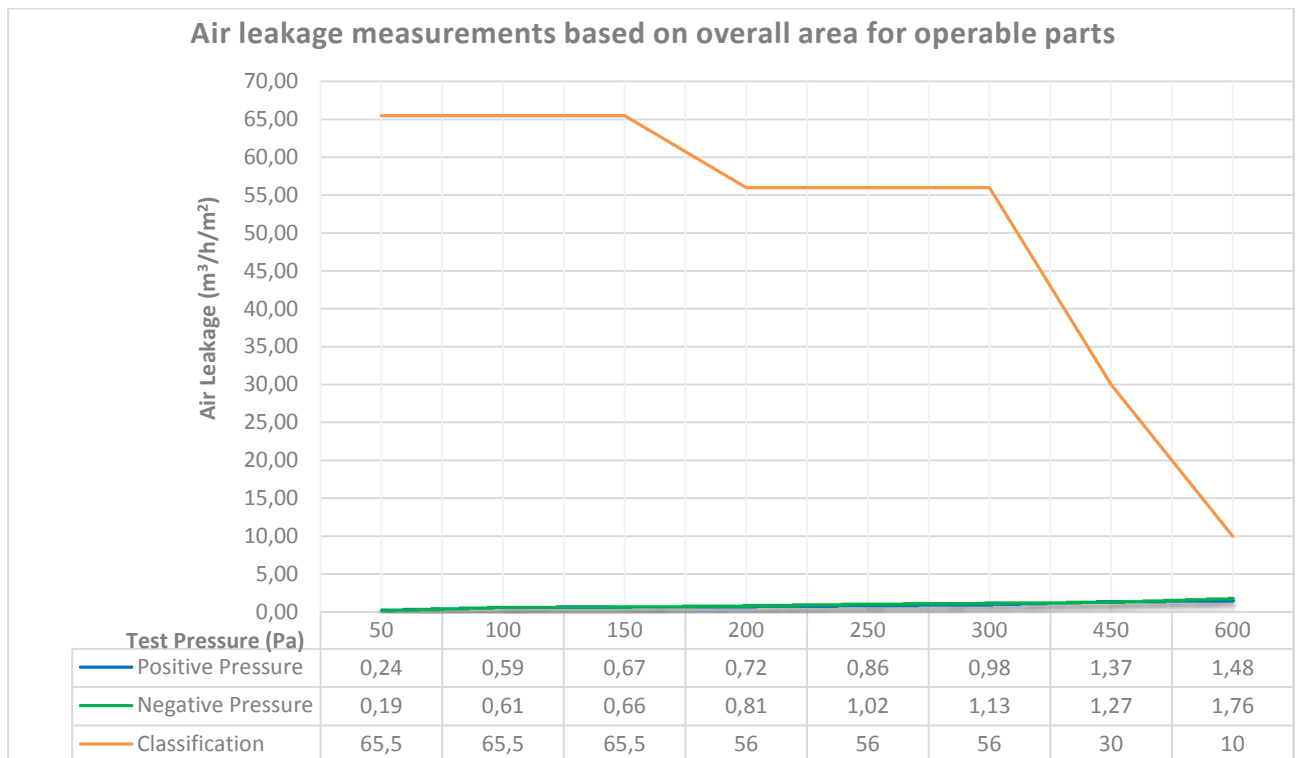
The test specimen was subjected to 50 cycles including negative and positive pressures, with the following features:

- Test pressure equal 1000 Pa ;
- First step was negative, next was positive as was the last sequence of 50 impulses;
- Value  $\pm$  1000 Pa was maintained at for 5 s.

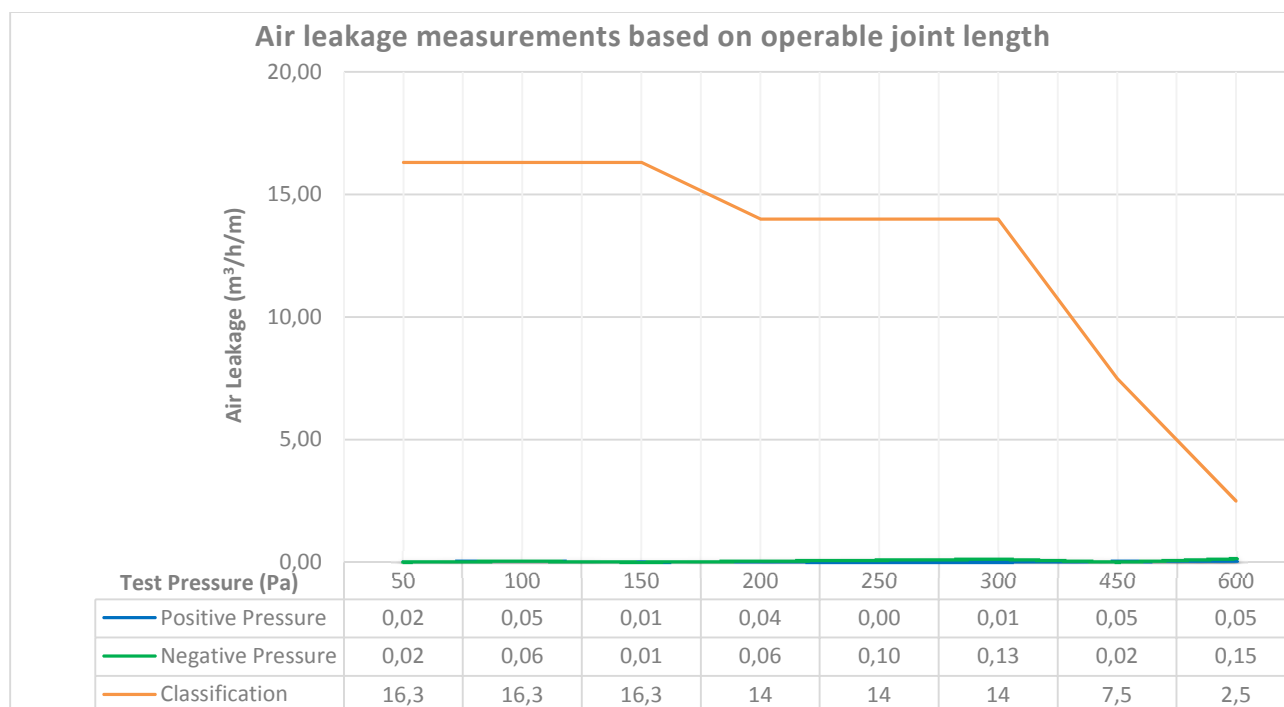
After completion of the 50 cycles, there was no damage observed on the sample at the end of the test.  $\pm$  1000 Pa were applied for 50 cycle. (**Test No : 2017.897.13 / 26.10.2017**)

### 7.6. Air Permeability (Repeat)

Before starting the test, 3 pulses at 660 Pa is applied to the sample. During the tests, the pressure at the following values is applied for 10 seconds. The following data includes the values of the system after tare. In this test, overall area air permeability values were similar of first values of the first air permeability test. Thus, sash taped values were not needed to take. So, first sash taped values were used for fixed joint length in this test.



**Test No: 2017.897.14-15 / 26.10.2017**



*Test No: 2017.897.14-15 / 26.10.2017*

### 7.7. Extreme Load

In this test, 1,5 times design load was applied to the sample.

Test Pressure	Applied		Observations
	Positive	Negative	
PE	+ 1980 Pa	-	No damage was observed on the sample.
	-	- 1980 Pa	No damage was observed on the sample.

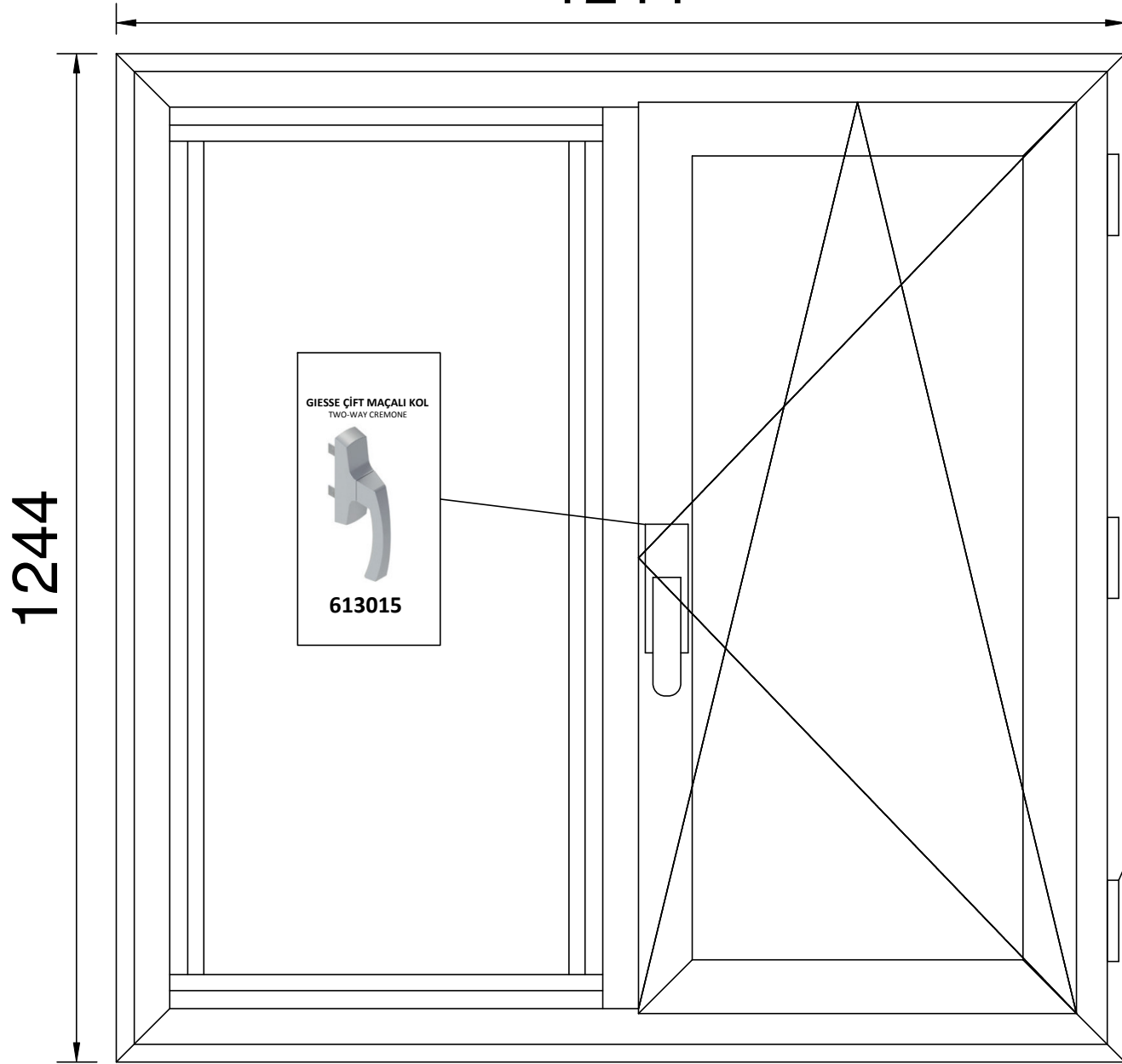
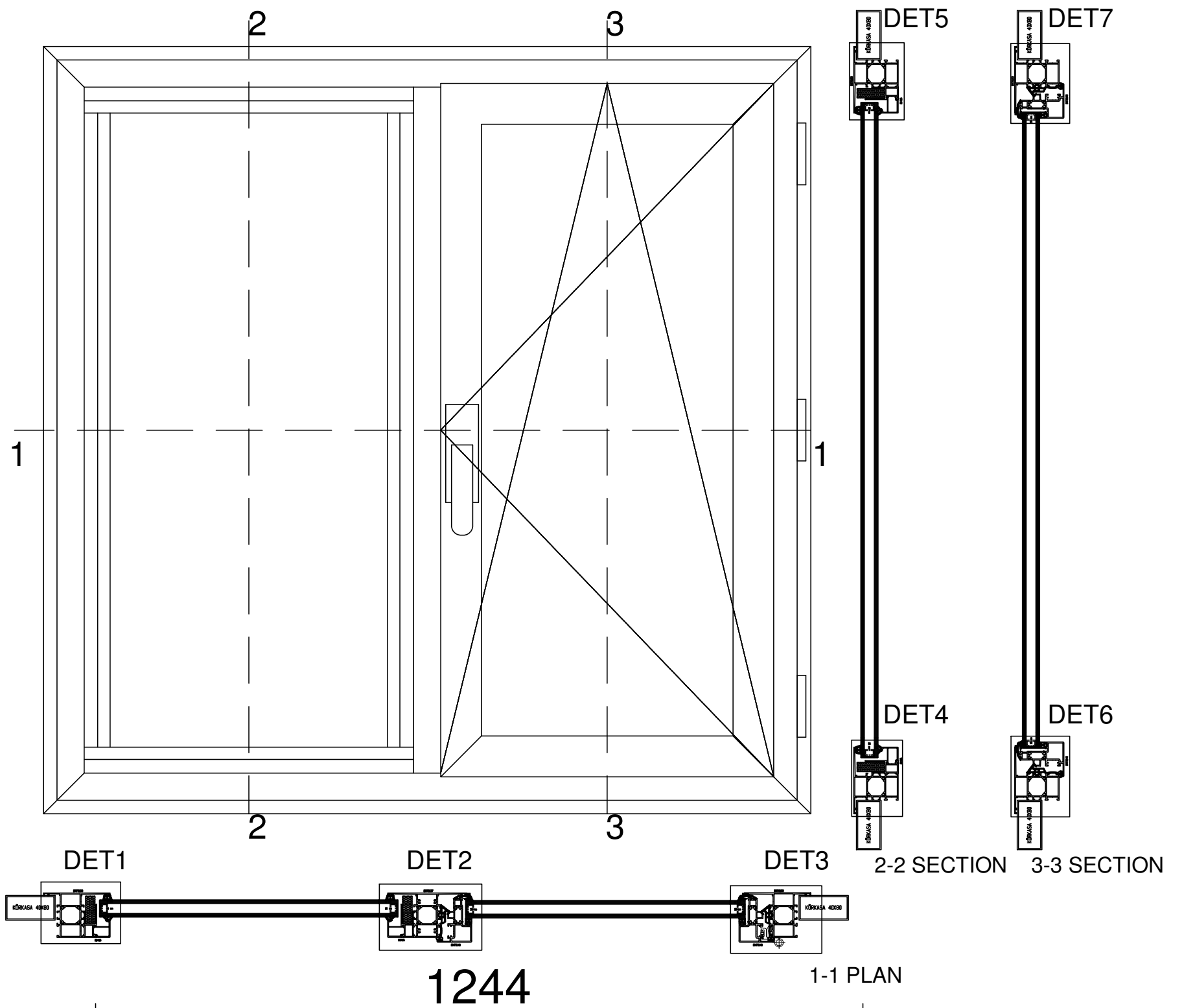
*Test No: 2017.897.16 / 26.10.2017*

## 8. RESULT

	CONDITIONS	RESULT		CLASS	FINAL
<b>AIR PERMEABILITY TS EN 12207</b>	at 600 Pa, air leakage < 10 m <sup>3</sup> /(h.m <sup>2</sup> ) overall area at 600 Pa, air leakage < 2,5 m <sup>3</sup> /(h.m) operable joint length	Positive Pressure <i>air leakage</i>	1,63 0,02	<b>Class 4</b>	<b>Class 4</b>
	at 600 Pa, air leakage < 10 m <sup>3</sup> /(h.m <sup>2</sup> ) overall area at 600 Pa, air leakage < 2,5 m <sup>3</sup> /(h.m) operable joint length	Negative Pressure <i>air leakage</i>	1,56 0,06	<b>Class 4</b>	
<b>WATER-TIGHTNESS (Static Pressure) TS EN 12208</b>	There should be no water leakage at 1650 Pa	There was no water leakage observed on the sample.		<b>E 1650</b>	
<b>RESISTANCE TO WIND LOAD (design load) TS EN 12210</b>	2000 Pa, L/300 = 4,14 mm frontal deflection < L/300	Positive Pressure <i>frontal deflection</i>	0,55 mm	<b>C5</b>	
	2000 Pa, C = L/300 = 4,14 mm frontal deflection < L/300	Negative Pressure <i>frontal deflection</i>	0,61 mm		
<b>CYCLE TEST</b>	There should be no damage during the test + 1000 Pa and – 1000 Pa for 50 cycle	No damage was observed on the sample.		<b>OK</b>	
<b>AIR PERMEABILITY TS EN 12207 (repeat)</b>	at 600 Pa, air leakage < 10 m <sup>3</sup> /(h.m <sup>2</sup> ) overall area at 600 Pa, air leakage < 2,5 m <sup>3</sup> /(h.m) operable joint length	Positive Pressure <i>air leakage</i>	1,48 0,05	<b>Class 4</b>	
	at 600 Pa, air leakage < 10 m <sup>3</sup> /(h.m <sup>2</sup> ) overall area at 600 Pa, air leakage < 2,5 m <sup>3</sup> /(h.m) operable joint length	Negative Pressure <i>air leakage</i>	1,76 0,15	<b>Class 4</b>	
<b>AIR PERMEABILITY TS EN 12207 (compare)</b>	at 600 Pa, air leakage < 1,63 + 2,00 m <sup>3</sup> /(h.m <sup>2</sup> ) at 600 Pa, air leakage < 0,02 + 0,5 m <sup>3</sup> /(h.m)	Positive Pressure <i>air leakage</i>	1,48 0,05	<b>Class 4</b>	
	at 600 Pa, air leakage < 1,56 + 2,00 m <sup>3</sup> /(h.m <sup>2</sup> ) at 600 Pa, air leakage < 0,06 + 0,5 m <sup>3</sup> /(h.m)	Negative Pressure <i>air leakage</i>	1,76 0,15		
<b>RESISTANCE TO SAFETY LOAD TS EN 12210</b>	There should be no damage at +2000 Pa and -2000 Pa.	There was no damage on the sample.		<b>OK</b>	

9. TEST PHOTOS





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NOTIFIED BODY NO:	NB-2547	PROJECT	BM 72 HIDDEN VENT WINDOW		
ACCREDITATION NO:	AB-0531-T	PROJECT CODE:	2017.897	DATE:	04.12.2017
REPORT NO:	020.977.1 /2017	CLIENT:	BURAK ALUMINYUM SAN. VE TIC. A.S.	REV.NO:	A
PREPARED BY:	N. BULUT	EXPLANATION:	AIR PERMEABILITY, WATERTIGHTNESS AND RESISTANCE TO WIND LOAD		
CONTROL BY:	Ö. ARSLAN				



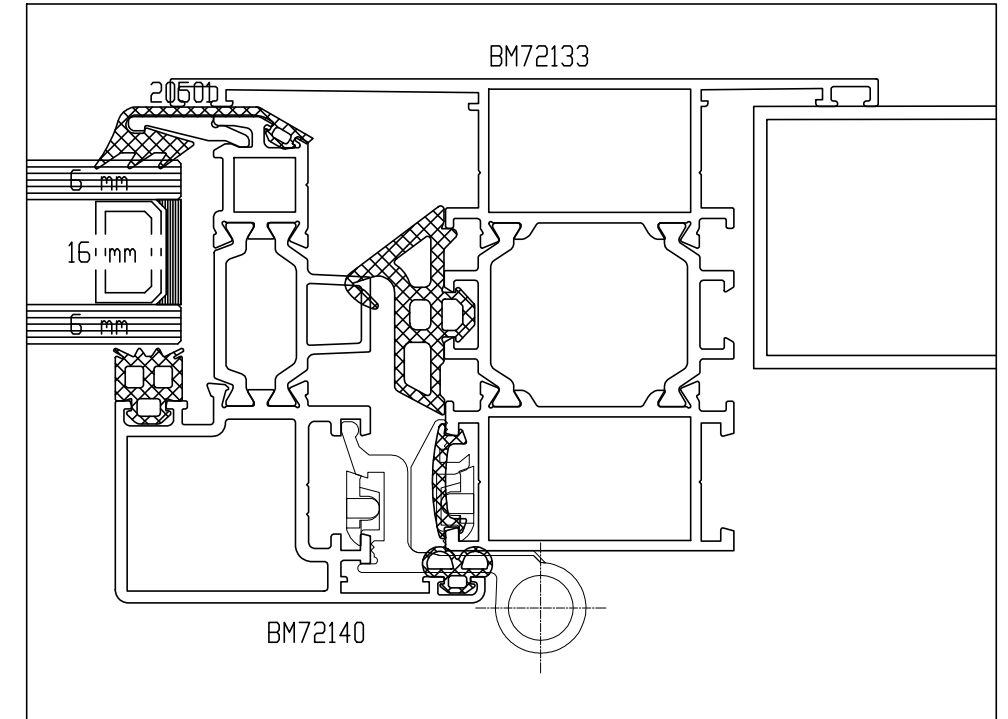
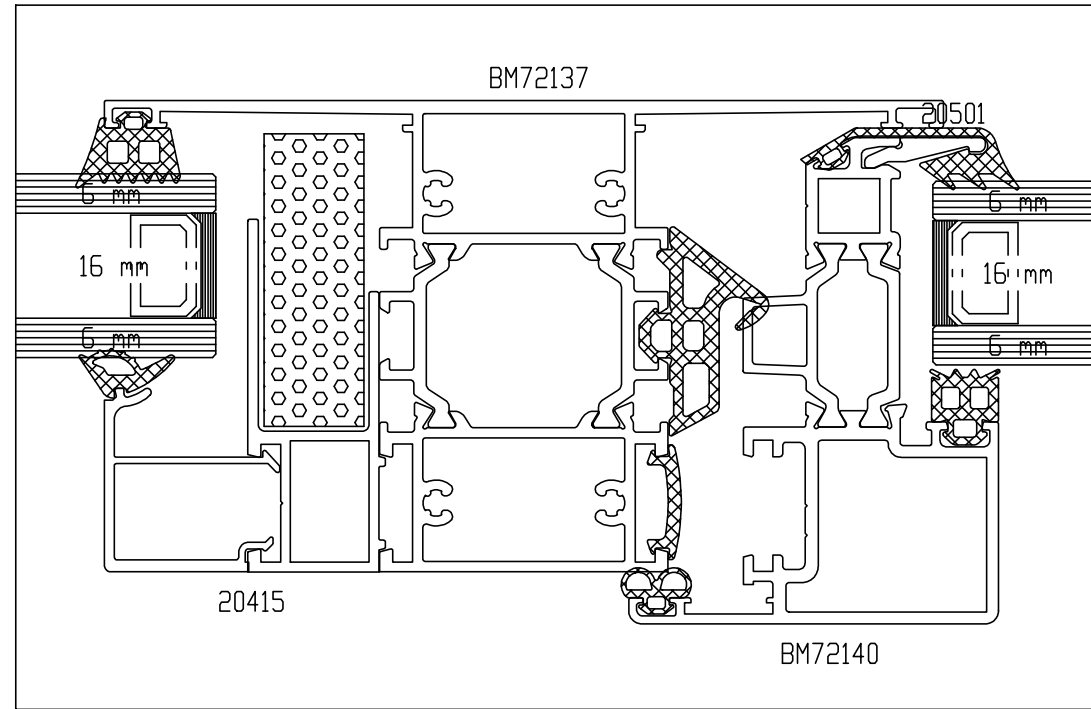
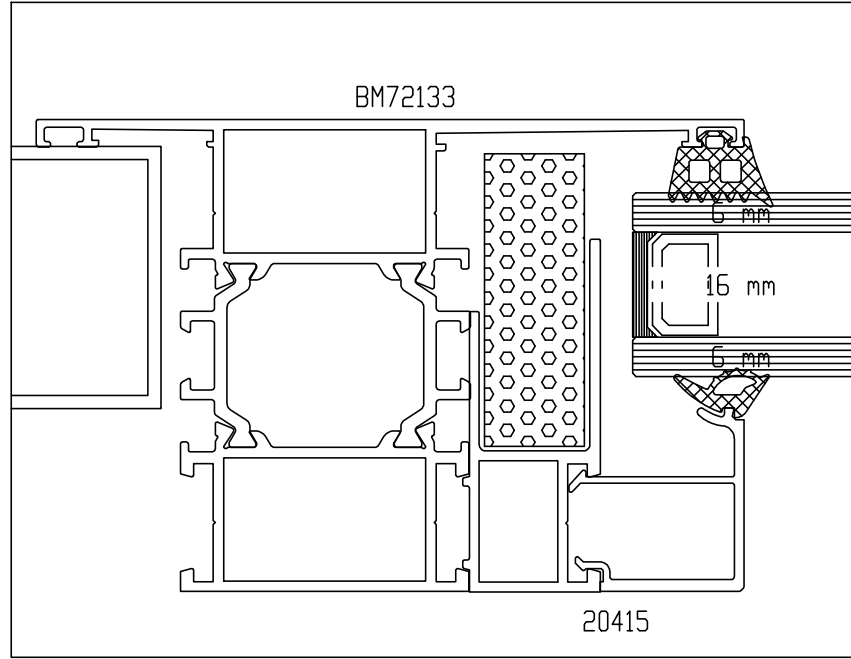
DET1

DET2

DET3

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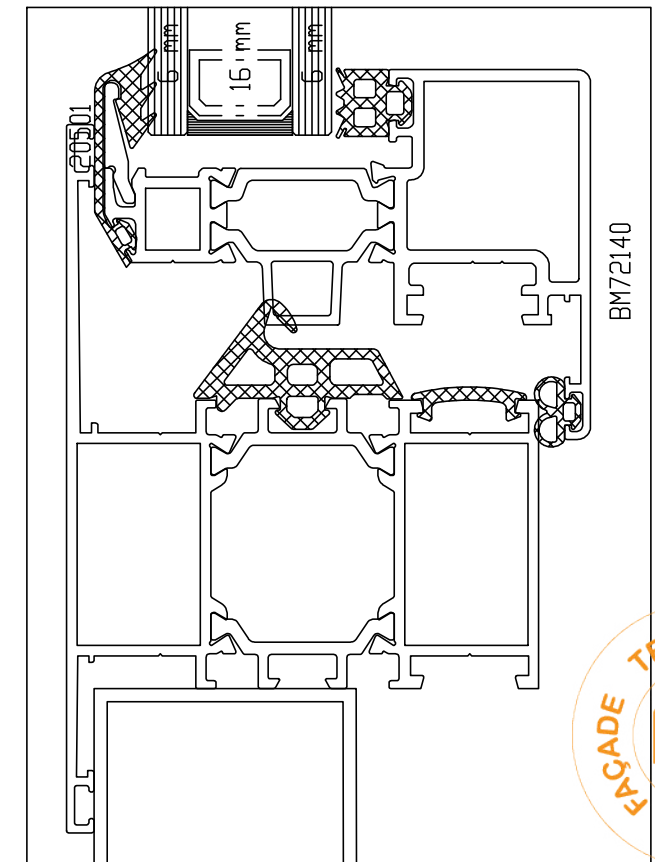
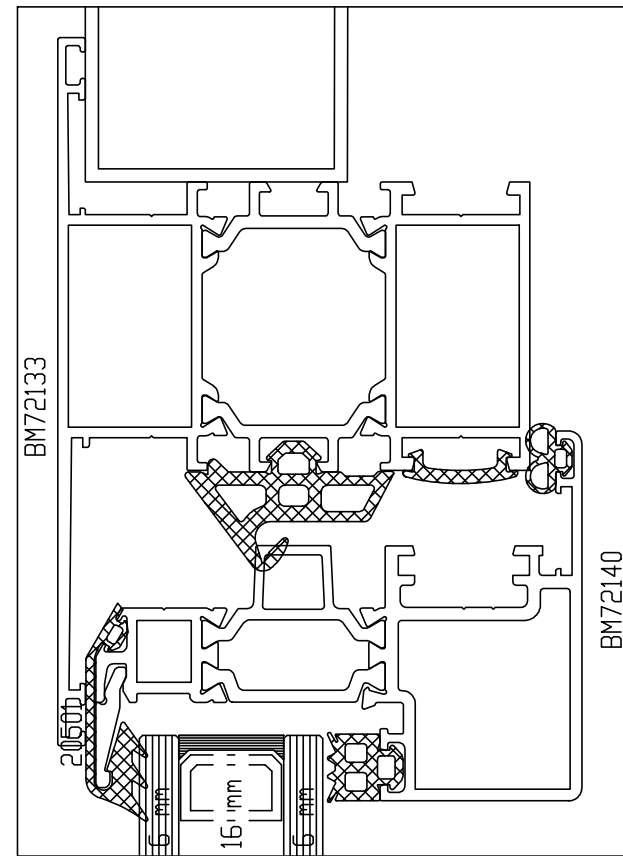
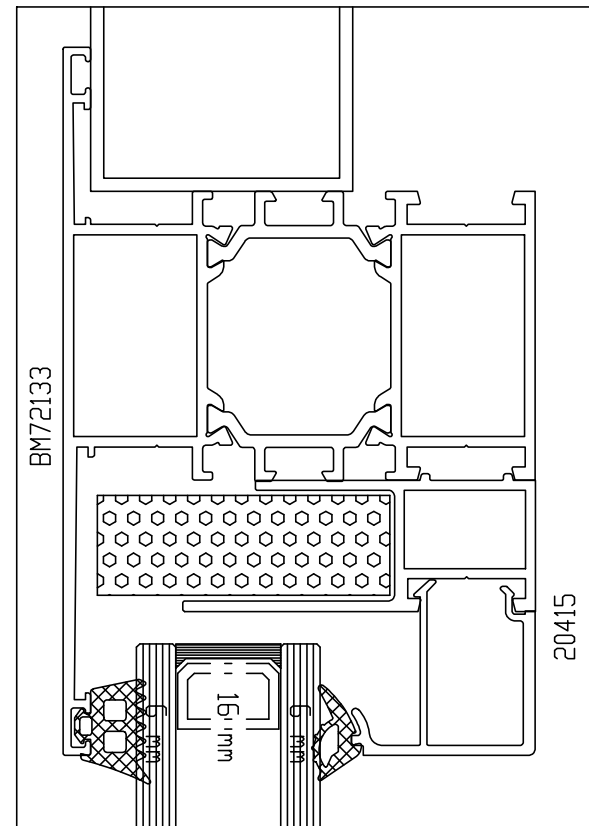
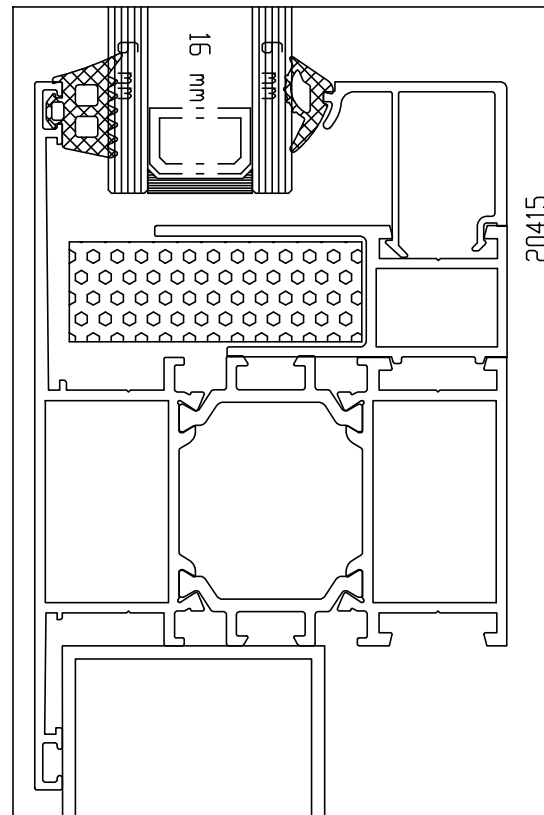


DET4

DET5

DET7

DET6



NOTIFIED BODY NO	NB-2547	DETAIL:		BM 72 HIDDEN VENT WINDOW	
ACCREDITATION NO	AB-0531-T			PLAN & SECTION DETAILS	
REPORT NO	020.977.1/2017	SAMPLE NO	2017.897	DATE	04.12.2017
PREPARED BY	N. BULUT	CLIENT	BURAK ALUMINYUM SAN. VE TIC. A.S.	REV.NO	A
CONTROL BY	Ö. ARSLAN	EXPLANATION	AIR PERMEABILITY, WATERTIGHTNESS AND RESISTANCE TO WIND LOAD		

