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DENEY SERTİFİKASI / Test Certificate



Test
TS EN ISO IEC 17025
AB-0531-T

AB-0531-T

020.440.1 / 2015

09 / 2015

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

Çakmaklı Mevkii, Akçaburgaz Mah., 58 Sok. No:4 Esenyurt / İstanbul

Referans No / Reference No: 2015.451

Numunenin Adı ve Tarifi / Sample's Name & Description: Alutech W75 Seri W8-2 T

Tild and Turn, Single Sashed, Window System

Numunenin Kabul Tarihi / Receipt Date of Test Item: 01 / 09 / 2015

Uygulanan Normlar / Norms Applied: EN 1026, EN 1027, EN 12211

Sonuçlar / Results: Air Permeability - EN 12207 : Class 4 (600 Pa)

Watertightness - EN 12208 : Class 9A (600 Pa)

Resistance to Wind Load - EN 12210 : Class C3 (1200 Pa)

Test Tarihi / Date of Test

01 / 09 / 2015

Sayfa Sayısı / Number of Pages

1 / 20

Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma anlaşması imzalamıştır.

The Turkish Accreditation Agency (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 recognition of test reports.

Uygulanan metodlar, test sonuçları ve genişletilmiş ölçüm belirsizlikleri (talep edilirse), bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. Bu sertifika yalnız test edilen numuneye ait sonuçları içerir ve ekte sunulan ilgili test raporu ile birlikte geçerlidir.

The applied methods, test results and the uncertainties (if requested) with confidence probability are given on the following pages which are part of this report. This certificate includes the test specimen which is identified above and its valid with the related test report which is presented as annex.



Mühür / Seal

Tarih / Date

14 / 09 / 2015

Test Faaliyetleri Yöneticisi

Testing Manager

S. Çolak

Serhat ÇOLAK

F.15.22 REV NO: D TEMMUZ 2015

Laboratuvar Müdürü

Laboratory Manager

Öner ARSLAN

Öner ARSLAN



TEST REPORT

Report Number : 020.440.1 / 2015

Report Date : 14 / 09 / 2015

Testing Reference : TS EN 14351-1 + A1 Windows and Doors - Product Standard

Product : Alutech W75 Seri W8-2 T Window System

Client : Sistem Alüminyum San. Ve Tic. A.Ş.



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:60/A 34540 Çatalca - İstanbul / TÜRKİYE. Test sample is a window system which name is Alutech W75 seri W8-2 T which has been produced by Sistem Alüminyum San. ve Tic. A.Ş.

Tests were carried out on 01 / 09 / 2015 for the determination of air infiltration, water penetration (under static pressure) and wind resistance performances.

Test sample has been sent to FTI Façade Testing Institute's testing laboratories on 01 / 09 / 2015.

2. CLIENT

Sistem Alüminyum San. Ve Tic. A.Ş.

Çakmaklı Mevkii, Akçaburgaz Mah., 58 Sok. No:4 Esenyurt / İstanbul

3. TEST METHODS

The above mentioned tests have been carried out as per the test methods provided in project specifications and classified on the standards indicated below. Tests have been reported as the number of 020.440.1/2015.

Test report has been prepared by Mr. Sinan BAYRAKTAR

EN 14351-1 * Windows and Doors – Product Standard

EN 1026 * Windows and Doors – Air Tightness – Test Method

EN 12207 * Windows and Doors – Air Tightness – Classification

EN 1027 * Windows and Doors – Water Tightness – Laboratory Tests under Static Pressure

EN 12208 * Windows and Doors – Water Tightness – Classification

EN 12211 * Windows and Doors – Resistance to Wind Load – Test Method

EN 12210 * Windows and Doors – Resistance to Wind load – Classification

4. TEST DATE AND PARTICIPANTS

Test was performed on 01 / 09 / 2015 with the following participants:

Mr. Öner ARSLAN	FTI	Laboratory Manager
Mr. Serhat ÇOLAK	FTI	Testing Manager
Mr. Sinan BAYRAKTAR	FTI	Testing Engineer
Mr. Onurcan ERDOĞU	FTI	Testing Engineer
Miss Nilay BULUT	FTI	Testing Engineer

And partially by;

Zeki AYDIN	SİSTEM ALÜMİNYUM
Fatih BANDAĞÇIOĞLU	SİSTEM ALÜMİNYUM
Ali AYDIN	SİSTEM ALÜMİNYUM
Ertaç KARATAŞ	SİSTEM ALÜMİNYUM

5. DESCRIPTION OF TEST SAMPLE

Type of sample	Tild and turn, Single Sashed, Window System
System Name	Alutech W75 Seri W8-2 T
Dimension of Sample (L x H)	1250 mm x 1500 mm
Surface area of Sample	1,87 m ²
Dimension of Sash (L x H)	540 mm x 1370 mm
Surface area of Sash	0,74 m ²
Operable joint length	3,82 m
Number of operable part(s)	1
Sash Glass Type	6DC / 12 / 6DC mm Insulated Glass
Fixed Glass Type	6DC / 12 / 6DC mm Insulated Glass

6. CONDITIONS

Date	:	01.09.2015
Local Temperature	:	28 °C
Humidity	:	59%
Atmospheric Pressure	:	1013 Mbar

7. TEST PERFORMANCE

7.1. Pressure Sequence

STEPS		POSITIVE PRESSURE (Pa)	NEGATIVE PRESSURE (Pa)
1	PA	600	600
2	PW	600	-
3	PD	1200	1200
4	PE	1800	1800

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

PD: Design Pressure ; PE: Extreme Pressurre

7.2. Air Permeability

Before starting the test, 3 pulses at 660Pa is applied to the sample. During the tests, the pressure at the following values is applied for 10 seconds. The following data includes the remaining values of the system after tare. Chamber leakage was measured 1,0 m³/h as positive and negative pressure at 600 Pa.

Air permeability measurements based on overall area;

POSITIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
$\phi 1$	50	0,31	0,17
$\phi 1$	100	0,78	0,41
$\phi 1$	150	1,40	0,75
$\phi 1$	200	1,66	0,89
$\phi 1$	250	2,48	1,33
$\phi 1$	300	2,89	1,54
$\phi 1$	450	5,61	2,99
$\phi 1$	600	6,58	3,51

Test No : 2015.451.13 / 01.09.2015

NEGATIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
$\phi 1$	50	1,02	0,54
$\phi 1$	100	2,18	1,16
$\phi 1$	150	2,98	1,59
$\phi 1$	200	3,86	2,06
$\phi 1$	250	4,74	2,53
$\phi 1$	300	5,06	2,70
$\phi 1$	450	7,00	3,73
$\phi 1$	600	8,75	4,67

Test No : 2015.451.14 / 01.09.2015

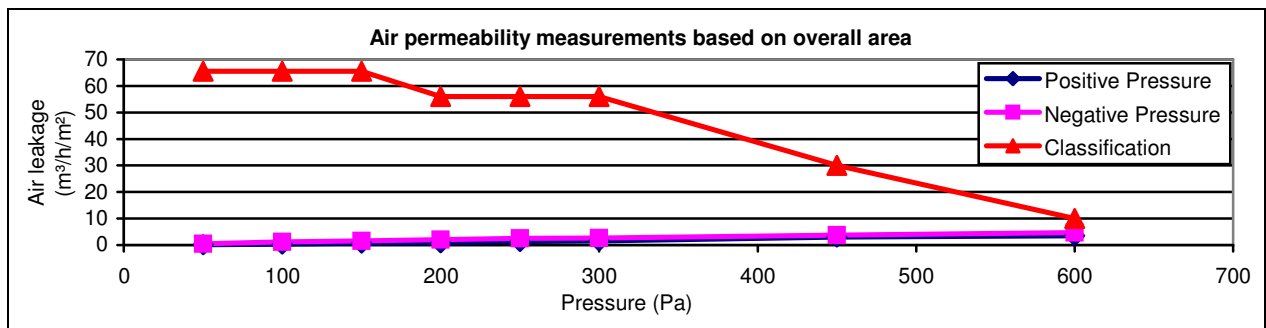
Air permeability measurements based on operable joint length;

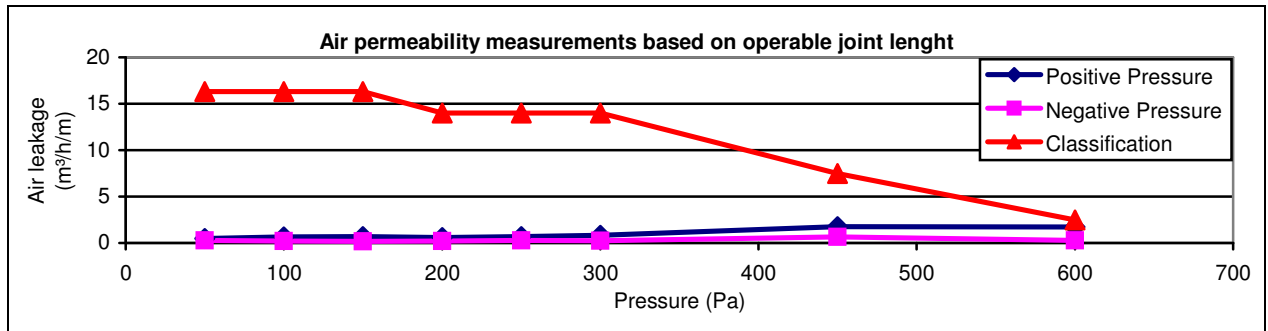
POSITIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
$\phi 1$	50	0,49	0,13
$\phi 1$	100	0,67	0,18
$\phi 1$	150	0,68	0,18
$\phi 1$	200	0,60	0,16
$\phi 1$	250	0,68	0,18
$\phi 1$	300	0,82	0,21
$\phi 1$	450	1,75	0,46
$\phi 1$	600	1,72	0,45

Test No : 2015.451.15 / 01.09.2015

NEGATIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
$\phi 1$	50	1,00	0,26
$\phi 1$	100	0,79	0,21
$\phi 1$	150	0,68	0,18
$\phi 1$	200	0,84	0,22
$\phi 1$	250	1,06	0,28
$\phi 1$	300	0,86	0,23
$\phi 1$	450	2,57	0,67
$\phi 1$	600	1,12	0,29

Test No : 2015.451.16 / 01.09.2015





7.3. Watertightness Under Static Pressure

Before starting the test, 3 pulses at 660 Pa were applied to the sample. Waiting duration between each impacts were 3 seconds. An adjustable device for spraying water 2,0 l/m².min so that a constant and continuous film was applied to the outside surface of the specimen.

The amount of water applied to the facade = 2,0 l/min x 1,88 m² = 3,76 l/min. = 225,6 l/h

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.
250	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.

Test No : 2015.451.17 / 01.09.2015

7.4. Resistance to Wind Load

Before starting the test, 3 pulses at 1320 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 30 seconds.

Acceptable proportion at resistance to wind load:

Position: Vertical distance for mullion at middle axis

Scale: **Vertical 1500 mm**

The measured frontal deflection between points of the structural support should not exceed the minimum of 1/300 or 1/200 or 1/150 of the framing member's span. The minimum values are as below:

L=1500 *L/ 300 = 5,0 mm *L/200 = 7,5 mm *L/150 = 10,0 mm

Specimen dimensions and sensor replacement coordinates;

	X coordinates (mm)	Y coordinates (mm)
External Dimensions	1250	1500
Sensor 1 Replacement	705	120
Sensor 2 Replacement	705	750
Sensor 3 Replacement	705	1380

Frontal deflection measurement results on the profile;

Positive Pressure (Pa)	Point 1 (mm)	Point 2 (mm)	Point 3 (mm)	Frontal Deflection (mm)	Negative Pressure (Pa)	Point 1 (mm)	Point 2 (mm)	Point 3 (mm)	Frontal Deflection (mm)
0	0,00	0,00	0,00	0,00	0	0,00	0,00	0,00	0,00
1200	0,58	1,27	0,69	0,63	1200	1,12	1,63	0,77	0,69
0	0,01	0,01	0,01	0,00	0	0,01	0,02	0,02	0,00

Test No : 2015.451.19 / 01.09.2015
Test No : 2015.451.18 / 01.09.2015

Relevant to limit values, the specimen's frontal deflection values are suitable according to requirements of EN 12210 standard as seen above table. As a consequence, no damage was observed at \pm 1200 Pa on the sample at the end of the wind resistance test.

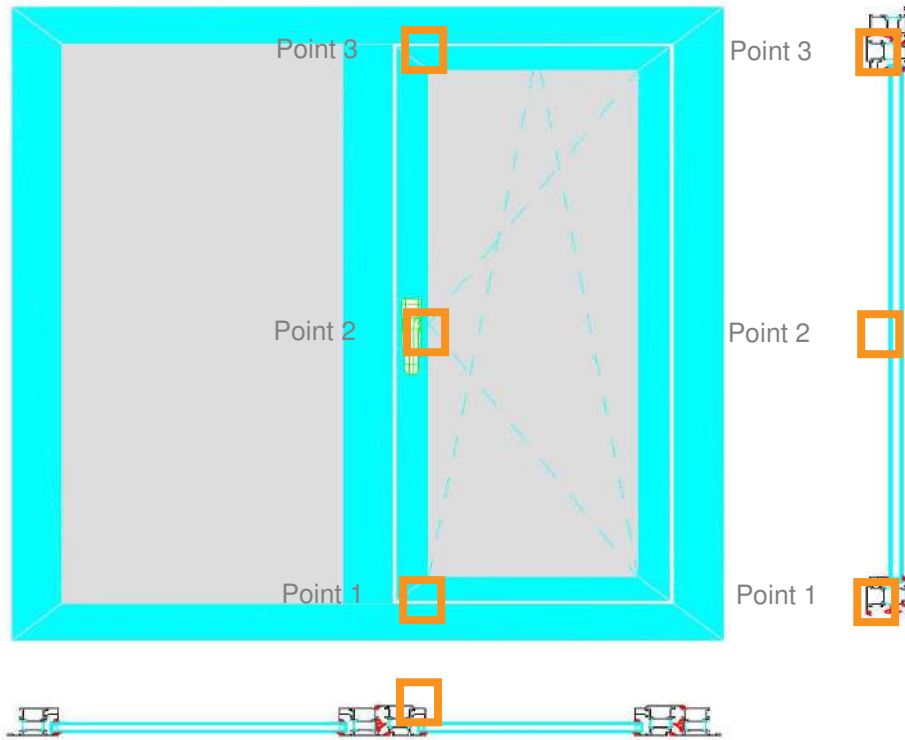
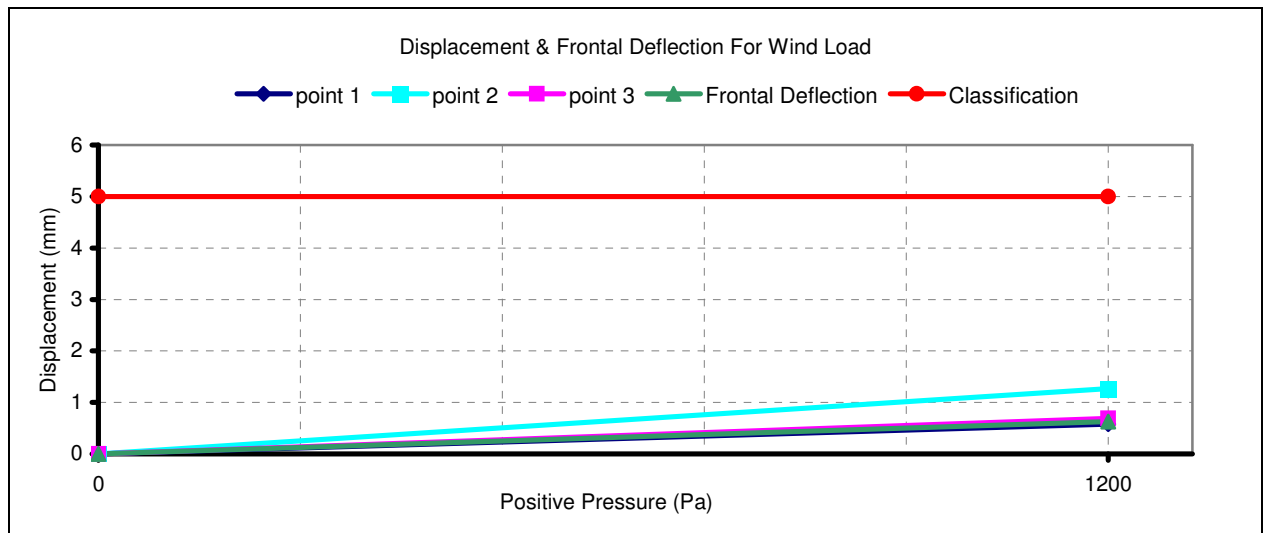
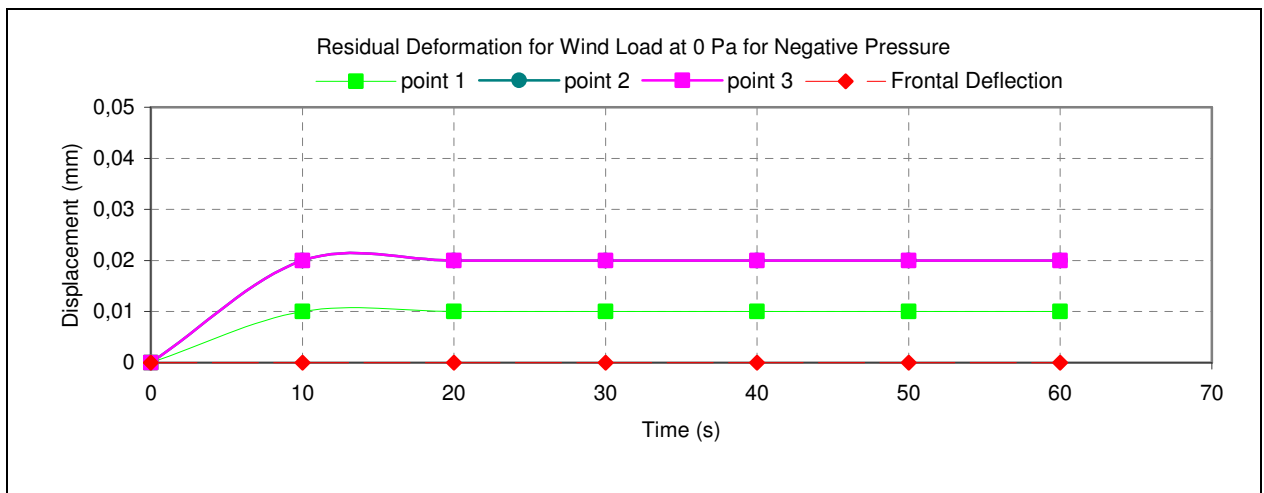
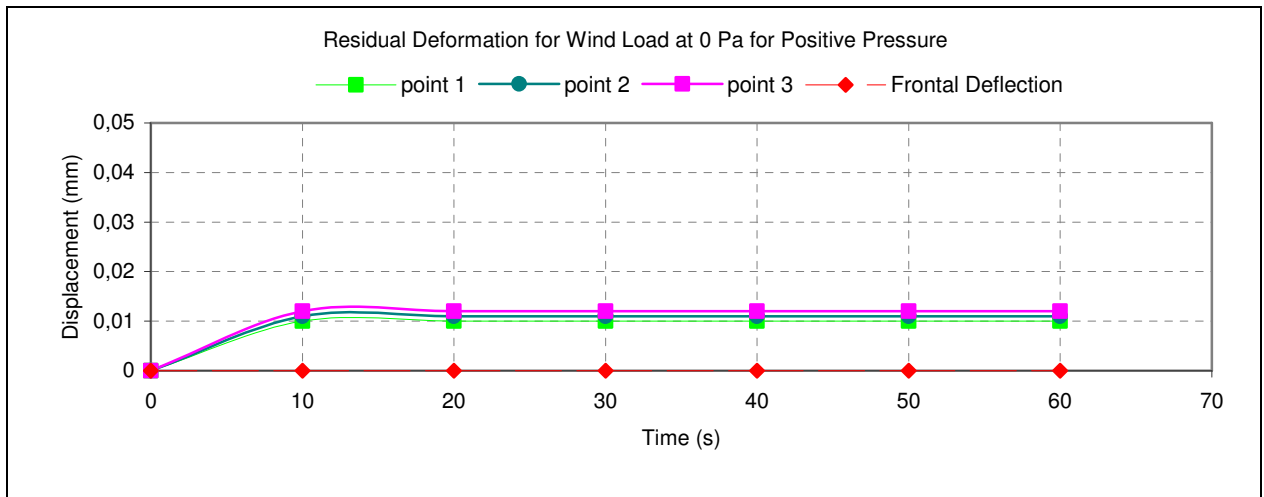
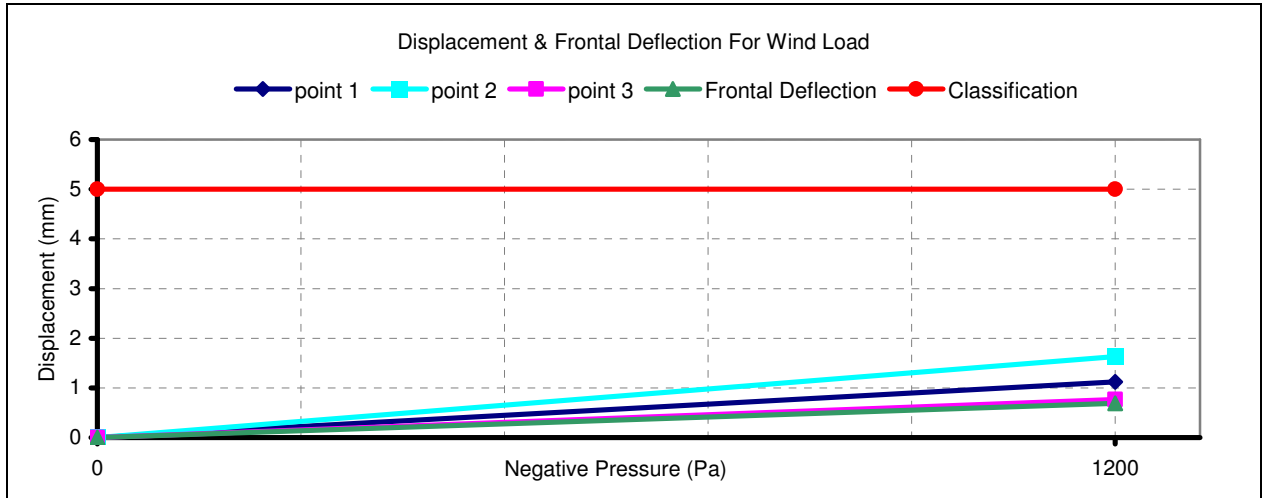


Figure 1. The view of specimen's frontal deflection's measurements location





7.5 Cycle

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

- Test pressure equal 600 Pa ;
- First step was negative, next was positive as was the last sequence of 50 impulses;
- Value \pm 600 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 600 Pa were applied for 50 cycle. (**Test no: 2015.451.20** / 01.09.2015)

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 remaining values of the system after tare. Chamber leakage was measured 1,0 m³/h as positive and negative pressure at 600 Pa.

Air permeability measurements based on overall area ;

POSITIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
$\phi 1$	50	1,05	0,56
$\phi 1$	100	1,88	1,00
$\phi 1$	150	3,01	1,60
$\phi 1$	200	3,52	1,88
$\phi 1$	250	3,84	2,05
$\phi 1$	300	4,62	2,46
$\phi 1$	450	5,85	3,12
$\phi 1$	600	6,67	3,56

Test No : 2015.451.21 / 01.09.2015

NEGATIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
$\phi 1$	50	0,97	0,52
$\phi 1$	100	2,26	1,21
$\phi 1$	150	3,08	1,64
$\phi 1$	200	3,96	2,11
$\phi 1$	250	5,07	2,70
$\phi 1$	300	5,80	3,10
$\phi 1$	450	7,22	3,85
$\phi 1$	600	8,87	4,73

Test No : 2015.451.22 / 01.09.2015

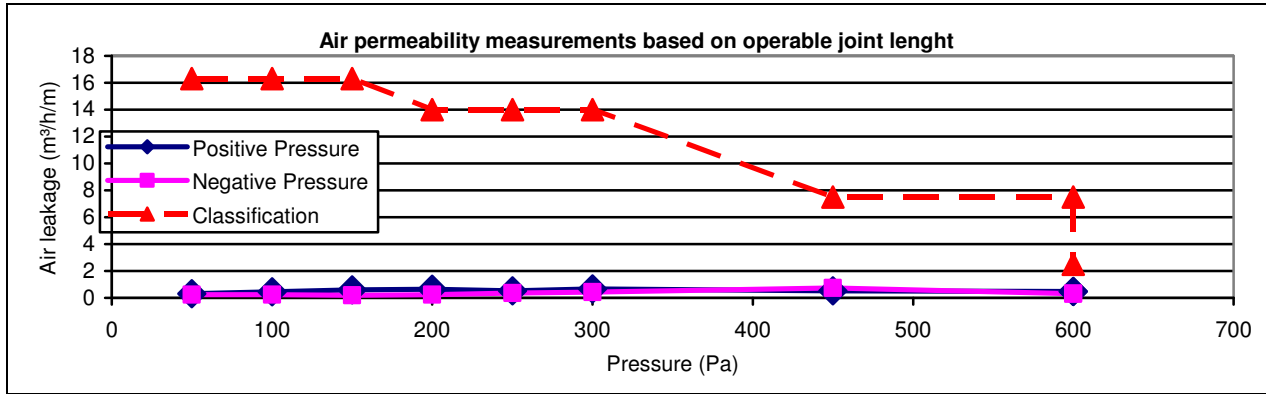
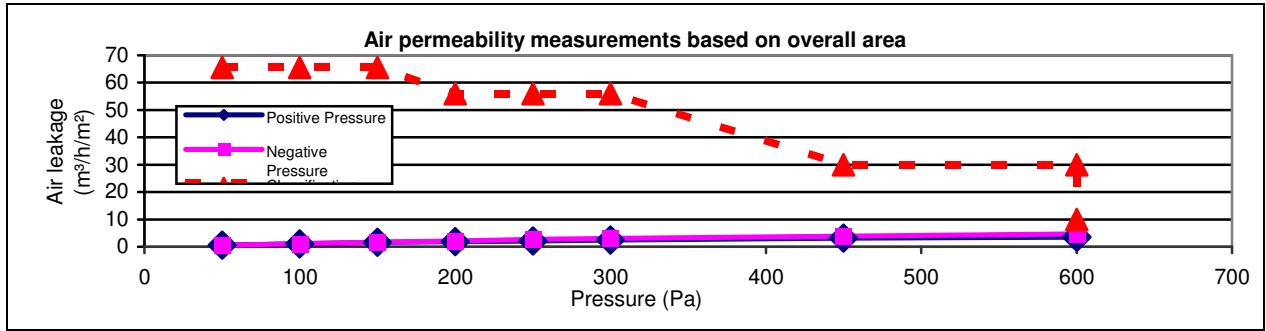
Air permeability measurements based on operable joint length ;

POSITIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
$\phi 1$	50	1,22	0,32
$\phi 1$	100	1,78	0,46
$\phi 1$	150	2,29	0,60
$\phi 1$	200	2,47	0,65
$\phi 1$	250	2,04	0,53
$\phi 1$	300	2,54	0,67
$\phi 1$	450	1,99	0,52
$\phi 1$	600	1,81	0,47

Test No : 2015.451.15 / 01.09.2015

NEGATIVE PRESSURE			
$\phi 1 / \phi 2$ Pipe	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
$\phi 1$	50	0,95	0,25
$\phi 1$	100	0,86	0,23
$\phi 1$	150	0,78	0,20
$\phi 1$	200	0,94	0,25
$\phi 1$	250	1,39	0,36
$\phi 1$	300	1,61	0,42
$\phi 1$	450	2,80	0,73
$\phi 1$	600	1,23	0,32

Test No : 2015.451.16 / 01.09.2015



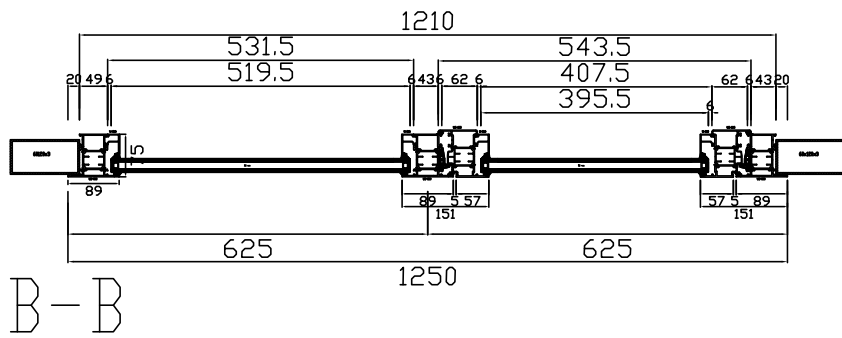
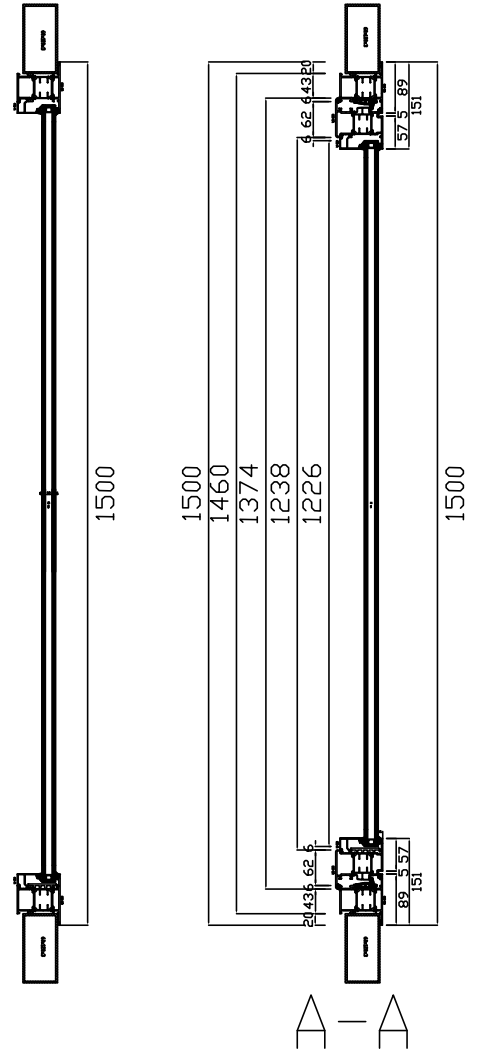
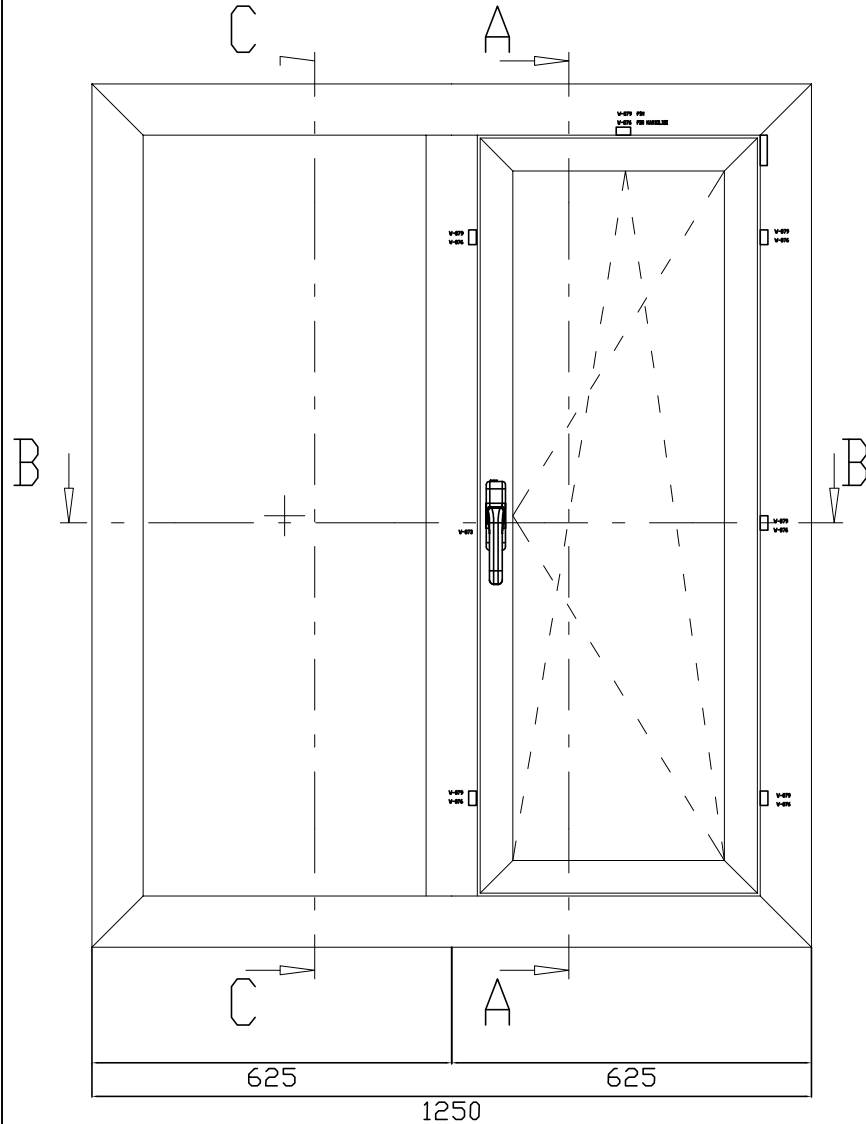
7.7 Increased Load Test (Safety Test - Secure Load)

Test Pressure	Applied		Observations
	Positive	Negative	
PE = + 1800 Pa	+ 1800 Pa	-	No damage was observed on the sample
PE = - 1800 Pa	-	- 1800 Pa	No damage was observed on the sample

Test No : 2015.451.23 / 01.09.2015

8. RESULTS

	CONDITIONS	RESULTS	CLASSIFICATION	FINAL	CONDITIONS
AIR PERMEABILITY EN 12207	at 600 Pa $\phi_1 < 10 \text{ m}^3/(\text{h.m}^2)$ at 600 Pa $\phi_2 < 2,5 \text{ m}^3/(\text{h.m})$	Positive Pressure	$\phi_1=3,51$ $\phi_2=0,45$	Class 4	Class 4
	at 600 Pa $\phi_3 < 10 \text{ m}^3/(\text{h.m}^2)$ at 600 Pa $\phi_4 < 2,5 \text{ m}^3/(\text{h.m})$	Negative Pressure	$\phi_3=4,67$ $\phi_4=0,29$	Class 4	
WATER-TIGHTNESS (Static Pressure) EN 12208	There should be no water leakage at 600 Pa	There was no water leakage		Class 9A	Class 9A
RESISTANCE TO WIND LOAD (design load) EN 12210	1200 Pa, $C = L/300 = 5,00 \text{ mm}$ $\lambda_1 < C$	Positive Pressure	$\lambda_1 = 0,63 \text{ mm}$	Class C3	Class C3
	1200 Pa, $C = L/300 = 5,00 \text{ mm}$ $\lambda_2 < C$	Negative Pressure	$\lambda_2 = 0,69 \text{ mm}$	Class C3	Class C3
CYCLE TEST	There should be no damage during the test + 600 Pa and - 600 Pa for 50 cycle	No damage was observed on the sample.		OK	OK
AIR PERMEABILITY EN 12207 (repeat)	at 600 Pa $\phi_5 < 10 \text{ m}^3/(\text{h.m}^2)$ at 600 Pa $\phi_6 < 2,5 \text{ m}^3/(\text{h.m})$	Positive Pressure	$\phi_5=3,56$ $\phi_6=0,47$	Class 4	Class 4
	at 600 Pa $\phi_7 < 10 \text{ m}^3/(\text{h.m}^2)$ at 600 Pa $\phi_8 < 2,5 \text{ m}^3/(\text{h.m})$	Negative Pressure	$\phi_7=4,73$ $\phi_8=0,32$	Class 4	
RESISTANCE TO SAFETY LOAD EN 12210	There should be no damage at +1800 Pa and -1800 Pa.	There was no damage on the sample.		OK	OK



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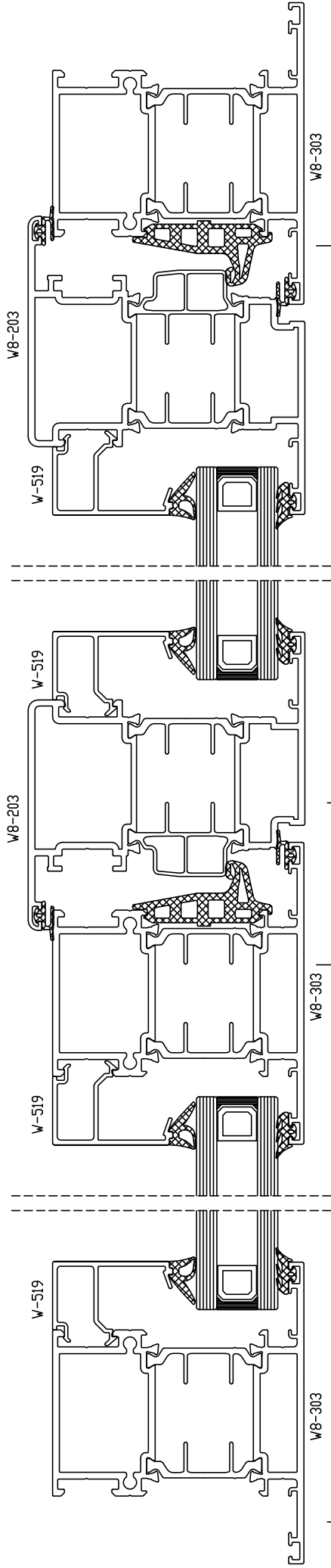
NOTIFIED BODY NO:	NB-2547	DETAIL: GENERAL VIEW OF THE SAMPLE			
ACCREDITATION NO:	AB-0531-T	ALUTECH W75 SERI W8-2T			
REPORT NO:	020.440.1/2015	PROJECT CODE:	2015.451	DATE:	14.09.2015
PREPARED BY:	N.BULUT	CLIENT:	SISTEM ALUMINYUM SAN. VE TIC. A.S.	REV.NO:	A
CONTROL BY:	S.COLAK	EXPLANATION:	AIR PERMEABILITY, WATERTIGHTNESS AND WIND LOAD		



LEFT LOCATION

MIDDLE LOCATION

RIGHT LOCATION

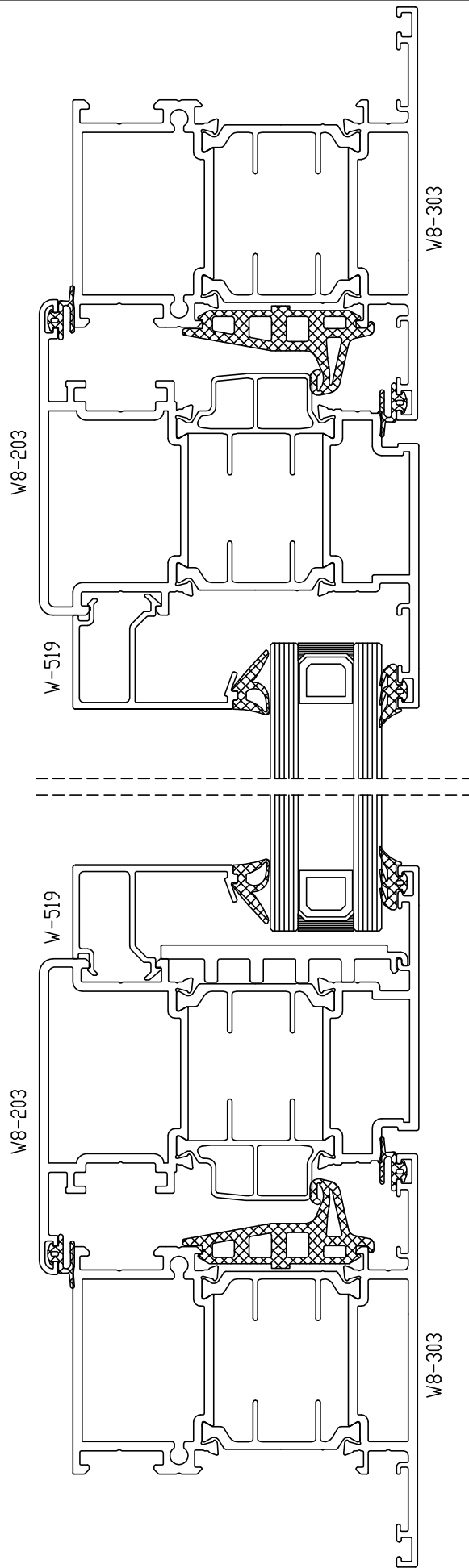


FIXED UNIT

SASH UNIT

NOTIFIED BODY NO	NB-2547	DETAIL:	B-B PLAN (LEFT - MIDDLE - RIGHT) DETAIL		
ACCREDITATION NO	AB-0531-T	SAMPLE NO	2015.451	DATE	14.09.2015
REPORT NO	020.440.1/2015	CLIENT	SISTEM ALUMINIUM SAN. VE TIC. A.S.		
PREPARED BY	N.BULUT	EXPLANATION	AIR PERMEABILITY, WATERTIGHTNESS AND WIND LOAD		
CONTROL BY	S.COLAK		REV. NO	A	





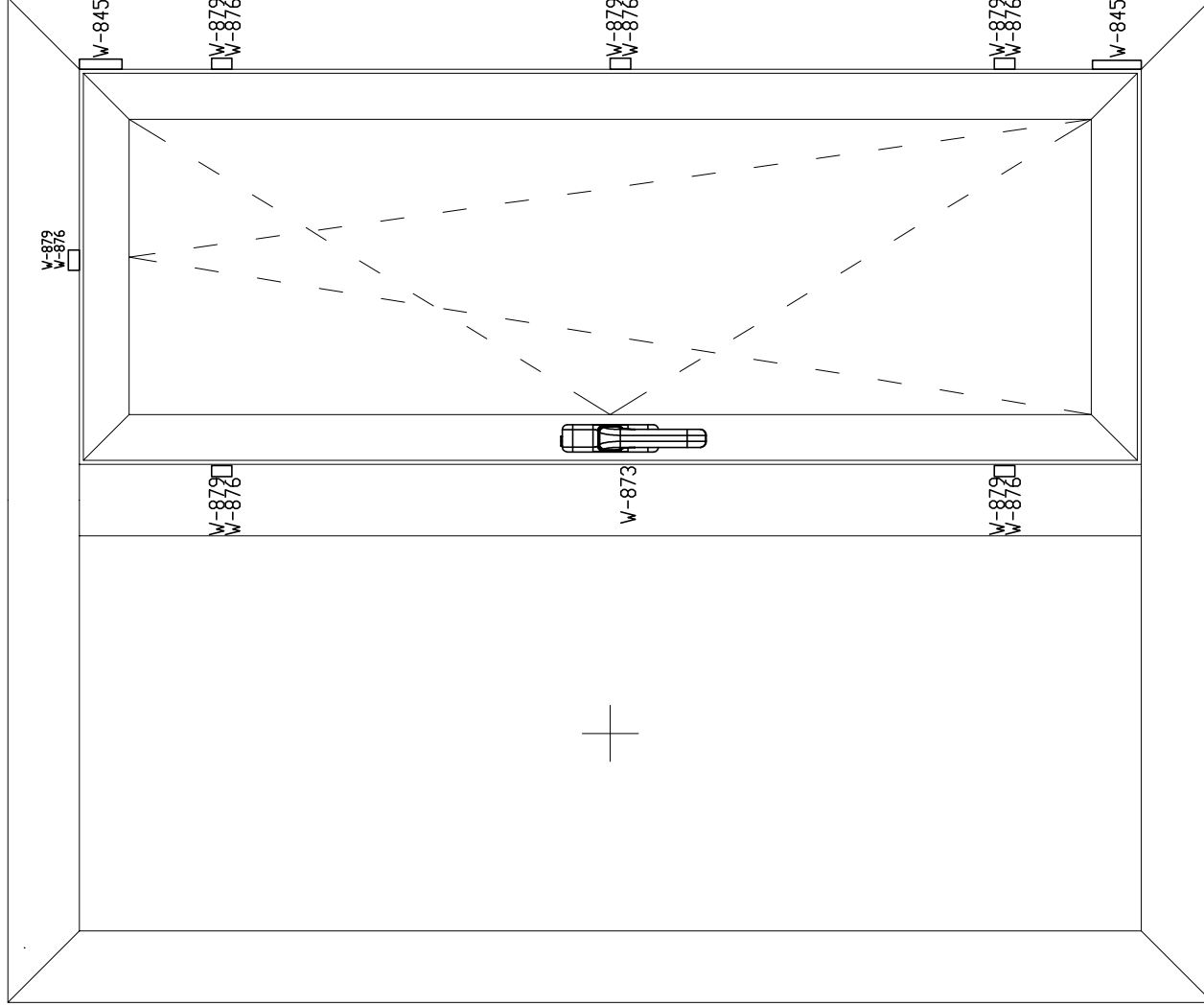
REPORT NO:	020.440.1/2015
PAGE NO:	15 / 20

NOTIFIED BODY NO:	NB-2547	DETAIL: A-A SECTION (SASH) DETAIL			
ACCREDITATION NO:	AB-0531-T	ALUTECH W75 SERI W8-2T			
REPORT NO:	020.440.1/2015	PROJECT CODE:	2015.451	DATE:	14.09.2015
PREPARED BY:	N.BULUT	CLIENT:	SISTEM ALUMINYUM SAN. VE TIC. A.S.	REV.NO:	A
CONTROL BY:	S.COLAK	EXPLANATION:	AIR PERMEABILITY,WATERTIGHTNESS AND WIND LOAD		



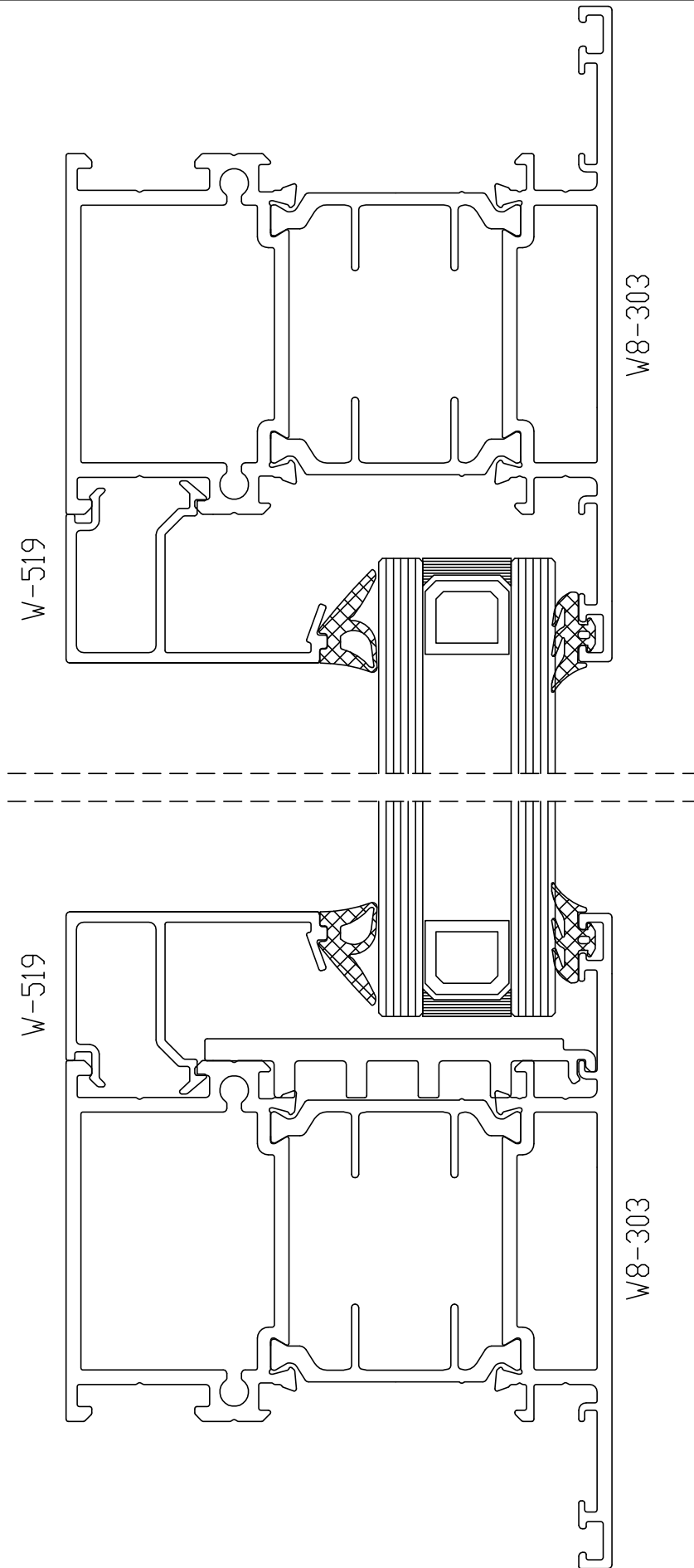
All sash mechanism parts are marked as GIESSE

Code	Description
W-803	Tild and Turn sash mechanism locking part
W-845	Hinge
W-873	Euro 900 Tild and Turn Handle
W-884	Friction System
W-879	Pim
W-876	Strike



NOTIFIED BODY NO	NB-2547	DETAIL:	SASH MECHANISM DETAIL
ACCREDITATION NO	AB-0531-T	SAMPLE NO	2015.451
REPORT NO	020.440.1/2015	CLIENT	SISTEM ALUMINYUM SAN. VE TIC. A.S.
PREPARED BY	N.BULUT	EXPLANATION	AIR PERMEABILITY, WATERTIGHTNESS AND WIND LOAD
CONTROL BY	S.COLAK	DATE	14.09.2015
		REV. NO	A

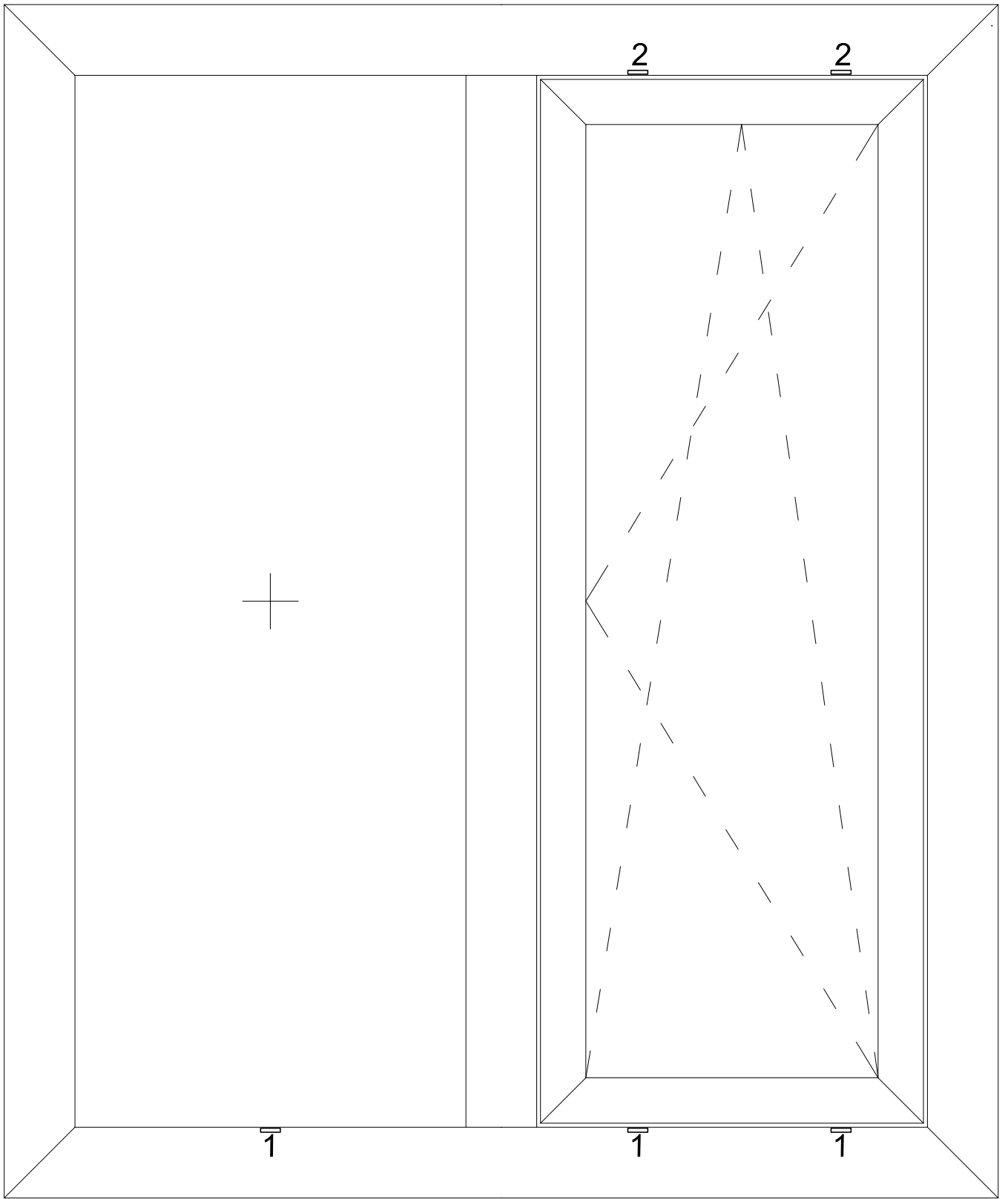




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NOTIFIED BODY NO:	NB-2547	DETAIL: C-C SECTION (FIXED) DETAIL			
ACCREDITATION NO:	AB-0531-T	ALUTECH W75 SERI W8-2T			
REPORT NO:	020.440.1/2015	PROJECT CODE:	2015.451	DATE:	14.09.2015
PREPARED BY:	N.BULUT	CLIENT:	SISTEM ALUMINYUM SAN. VE TIC. A.S.	REV.NO:	A
CONTROL BY:	S.COLAK	EXPLANATION:	AIR PERMEABILITY,WATERTIGHTNESS AND WIND LOAD		





- 1 → Water Drainage hole (5 x 25 mm)
 2 → Ventilation hole (5 x 25 mm)

REPORT NO: 020.440.1/2015
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NOTIFIED BODY NO:	NB-2547	DETAIL: DRAINAGE AND VENTILATION LOCATION			
ACCREDITATION NO:	AB-0531-T	ALUTECH W75 SERI W8-2T			
REPORT NO:	020.440.1/2015	PROJECT CODE:	2015.451	DATE:	14.09.2015
PREPARED BY:	N.BULUT	CLIENT:	SISTEM ALUMINYUM SAN. VE TIC. A.S.	REV.NO:	A
CONTROL BY:	S.COLAK	EXPLANATION:	AIR PERMEABILITY, WATERTIGHTNESS AND WIND LOAD		





