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DENEY SERTİFİKASI / Test Certificate



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

AB-0531-T

020.530.1 / 2016

03 / 2016



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

Kırklareli OSB. 2.Cadde No:2 Kızılıckdere / Kırklareli / TÜRKİYE

Referans No / Reference No: 2016.565

Numunenin Adı ve Tanımı / Sample's Name & Description: Asistal TH 78 Door and Window System
(Tilt & Turn)

Numunenin Kabul Tarihi / Receipt Date of Test Item: 02 / 03 / 2016

Uygulanan Normlar / Norms Applied: TS EN 14351-1+A1, TS EN 1026, TS EN 1027, TS 4644 EN 12211

Sonuçlar / Results: TS EN 12207 - Air Permeability : Class 4 (600Pa)
TS EN 12208 - Watertightness : Class 9A (600Pa)
TS EN 12210 - Resistance to Wind Load : Class C3 (1200Pa)
TS EN 12210 - Resistance to Safety Load : OK (1800Pa)

Test Tarihi / Date of Test

04 / 03 / 2016

Sayfa Sayısı / Number of Pages

1 / 17

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.



Tarih / Date

12 / 03 / 2016

Test Faaliyetleri Yöneticisi

Testing Manager

M. Serhat COLAK

F.15.22 REV NO: D TEMMUZ 2015

Laboratuvar Müdürü

Laboratory Manager

Öner ARSIZAN



TEST REPORT

Report Number : 020.530.1 / 2016

Report Date : 12 / 03 / 2016

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

Product : Asistal TH 78 Door and Window System (Tilt & Turn)

Client : Asist Alüminyum Profil 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 Asistal TH 78 Door and Window System which has been produced and designed by Asist Alüminyum Profil San. ve Tic. A.Ş. Tests were carried out on 04 / 03 / 2016 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 02 / 03 / 2016.

2. CLIENT

Asist Alüminyum Profil San. ve Tic. A.Ş.
Kırklareli OSB. 2.Cadde No:2
Kızılcıkdere / Kırklareli / TÜRKİYE

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 020.530.1/2016.

Test report has been prepared by Mr. Sinan BAYRAKTAR

EN 14351-1+ A1	* Windows and Doors – Product Standard
EN 1026	* Windows and Doors – Air Permeability – Test Method
EN 12207	* Windows and Doors – Air Permeability – Classification
EN 1027	* Windows and Doors – Watertightness – Laboratory Tests under Static Pressure
EN 12208	* Windows and Doors – Watertightness – 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

Tests were performed on 04 / 03 / 2016 with the following participants:

Mr. Öner ARSLAN	FTI	Laboratory Manager
Mr. Serhat ÇOLAK	FTI	Testing Manager
Mrs. Ayfer DİNCEL	FTI	Testing Engineer
Mr. Murat GÖL	FTI	Testing Engineer

and the witnesses;

Mr. Gökhan ÇAYLI Asist Alüminyum Profil San. ve Tic. A.Ş.

5. DESCRIPTION OF TEST SAMPLE

Type of sample	Door and Window System (Tilt & Turn)
System Name	Asistal TH 78 Door and Window System
Dimension of Sample (L x H)	1230 mm x 1480 mm
Surface area of Sample	1,82 m ²
Operable Joint Length	5,42 m
Glass Type	6 mm Tempered Glass + 16 mm air space + 6 mm Tempered Glass

6. CONDITIONS

	04.03.2016
Local Temperature	15 °C
Humidity	69%
Atmospheric Pressure	1013 Mbar

7. TEST PERFORMANCE

7.1 Pressure Sequence

Related to EN 14351-1 + A1 standard, process are shown in Table 1 below.

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

Table 1. Pressure sequence

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 660 Pa is applied to the sample. During the tests, the pressure at the following values is applied for 10 seconds. The measurements of air permeability based on overall area and operable joint length are shown as below.

Air permeability measurements based on overall area;

POSITIVE PRESSURE			
ϕ_1	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
ϕ_1	50	1,13	0,62
ϕ_1	100	2,60	1,43
ϕ_1	150	3,91	2,15
ϕ_1	200	4,91	2,70
ϕ_1	250	5,79	3,18
ϕ_1	300	6,61	3,63
ϕ_1	450	9,26	5,09
ϕ_1	600	11,74	6,45

Test No : 2016.565.01 / 04.03.2016

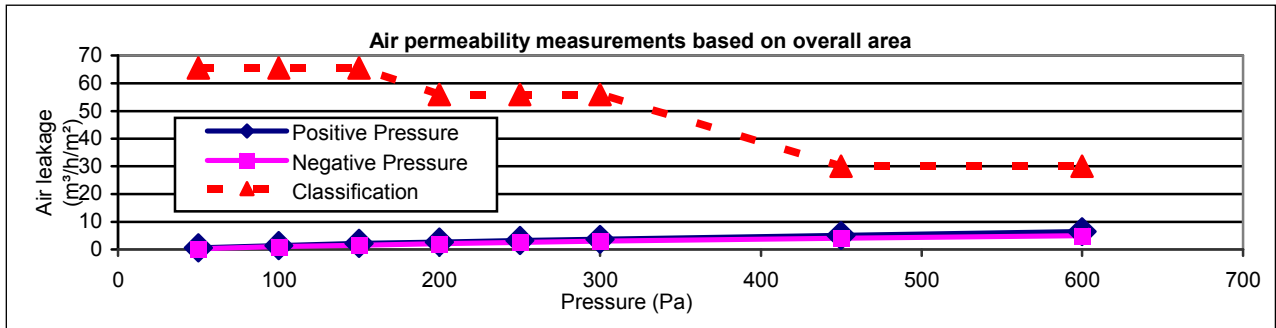
NEGATIVE PRESSURE			
ϕ_2	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
ϕ_2	50	0,34	0,18
ϕ_2	100	1,79	0,98
ϕ_2	150	2,77	1,52
ϕ_2	200	3,78	2,08
ϕ_2	250	4,69	2,58
ϕ_2	300	5,53	3,04
ϕ_2	450	7,40	4,06
ϕ_2	600	9,04	4,97

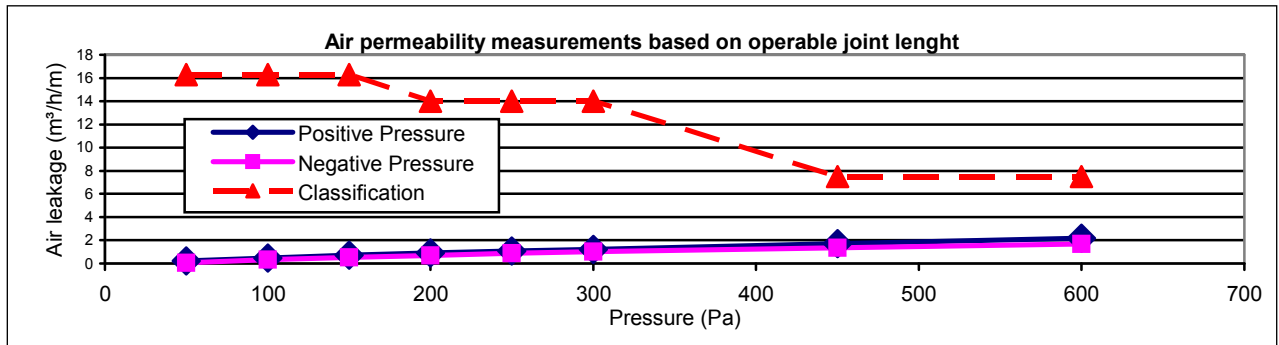
Test No : 2016.565.02 / 04.03.2016
Air permeability measurements based on operable joint length;

POSITIVE PRESSURE			
ϕ_3	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
ϕ_3	50	1,13	0,21
ϕ_3	100	2,60	0,48
ϕ_3	150	3,91	0,72
ϕ_3	200	4,91	0,91
ϕ_3	250	5,79	1,07
ϕ_3	300	6,61	1,22
ϕ_3	450	9,26	1,71
ϕ_3	600	11,74	2,17

Test No : 2016.565.01 / 04.03.2016

NEGATIVE PRESSURE			
ϕ_4	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
ϕ_4	50	0,34	0,06
ϕ_4	100	1,79	0,33
ϕ_4	150	2,77	0,51
ϕ_4	200	3,78	0,70
ϕ_4	250	4,69	0,87
ϕ_4	300	5,53	1,02
ϕ_4	450	7,40	1,36
ϕ_4	600	9,04	1,67

Test No : 2016.565.02 / 04.03.2016




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 1,82 m² = 3,64 l/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.
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 : 2016.565.03 / 04.03.2016

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** **1480 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 limit values are as below:

L=1480 *L/ 300 = 4,93 mm *L/200 = 7,40 mm *L/150 = 9,86 mm

Specimen dimensions and sensor replacement coordinates;

	X coordinates (mm)	Y coordinates (mm)
External Dimensions	1230	1480
Sensor 1 Replacement	80	80
Sensor 2 Replacement	80	740
Sensor 3 Replacement	80	1415

Frontal deflection measurement results on the profile;

Positive Pressure (Pa)	Point 1 (mm)	Point 2 (mm)	Point 3 (mm)	Frontal Deflection λ_1 (mm)	Negative Pressure (Pa)	Point 1 (mm)	Point 2 (mm)	Point 3 (mm)	Frontal Deflection λ_2 (mm)
0	0,0	0,0	0,0	0,0	0	0,0	0,0	0,0	0,0
1200	0,12	0,36	0,17	0,21	1200	0,13	0,51	0,27	0,14
0	0,01	0,01	0,00	0,01	0	0,00	0,01	0,02	0,01

Test No : 2016.565.04 / 04.03.2016

Test No : 2016.565.05 / 04.03.2016

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.

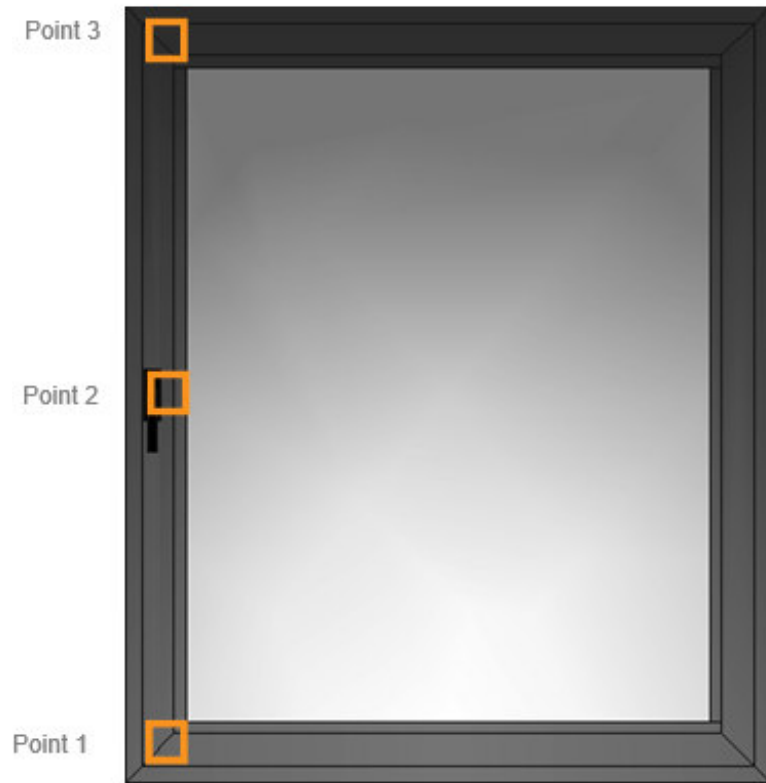
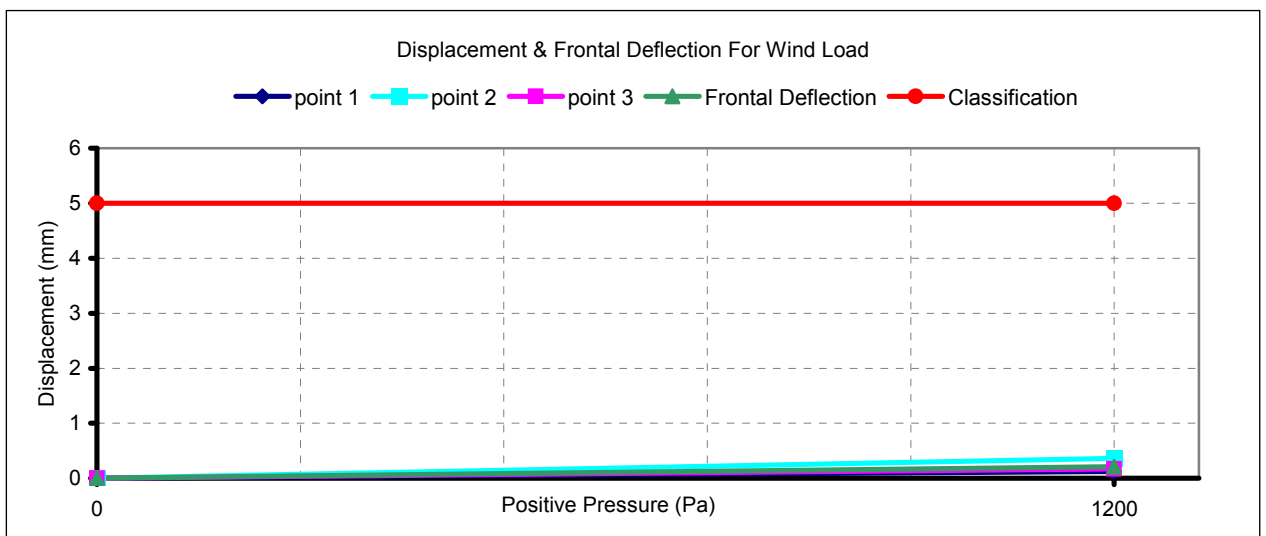
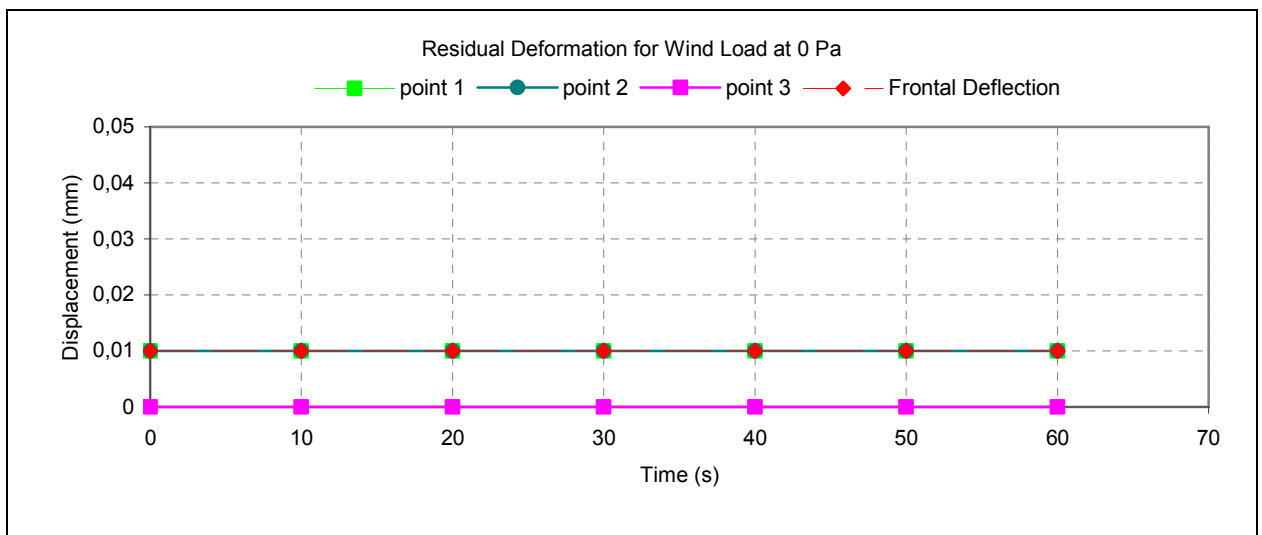
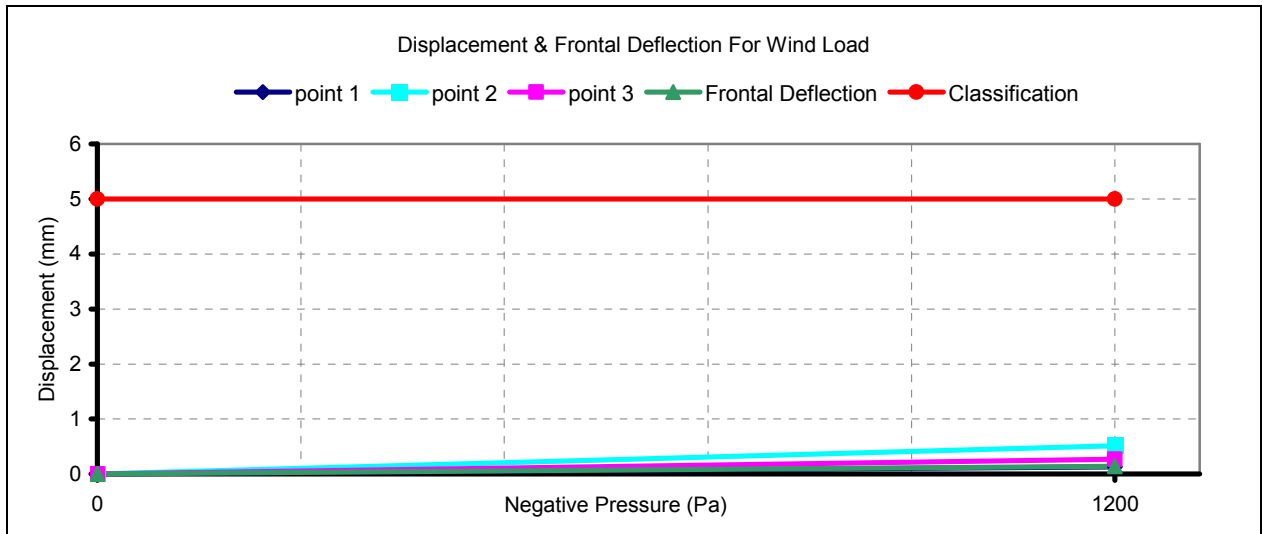
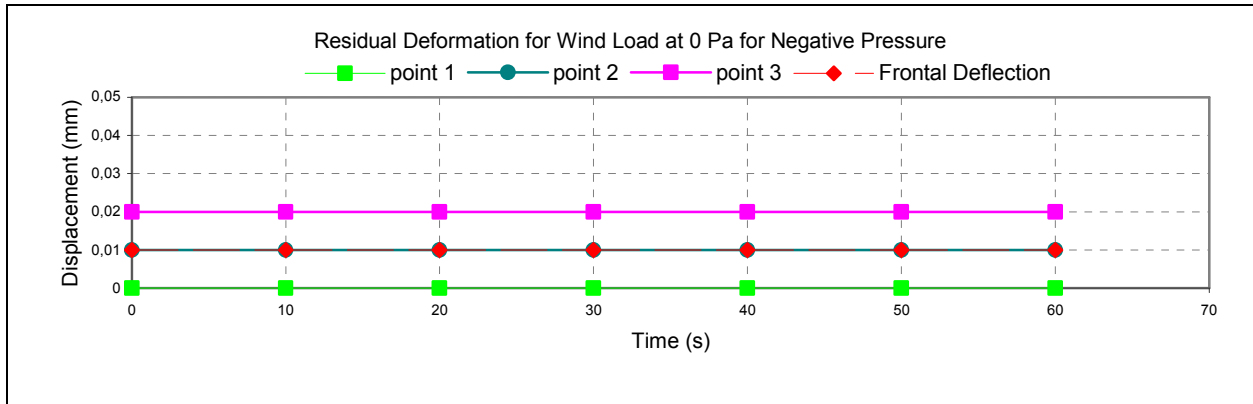


Figure 1. The view of specimen's frontal deflection's measurements location







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 ± 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. ± 600 Pa were applied for 50 cycle.

(Test no: 2015.565.06/ 04.03.2016)

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.

Air permeability measurements based on overall area ;

POSITIVE PRESSURE			
ϕ_5	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
ϕ_5	50	0,67	0,37
ϕ_5	100	1,86	1,02
ϕ_5	150	2,49	1,37
ϕ_5	200	3,74	2,06
ϕ_5	250	4,64	2,55
ϕ_5	300	5,41	2,97
ϕ_5	450	7,33	4,02
ϕ_5	600	9,51	5,23

Test No : 2016.565.07 / 04.03.2016

NEGATIVE PRESSURE			
ϕ_6	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m ²)
ϕ_6	50	1,96	1,08
ϕ_6	100	3,17	1,74
ϕ_6	150	4,20	2,31
ϕ_6	200	5,04	2,77
ϕ_6	250	5,84	3,21
ϕ_6	300	6,55	3,60
ϕ_6	450	8,08	4,44
ϕ_6	600	9,78	5,37

Test No : 2016.565.08 / 04.03.2016

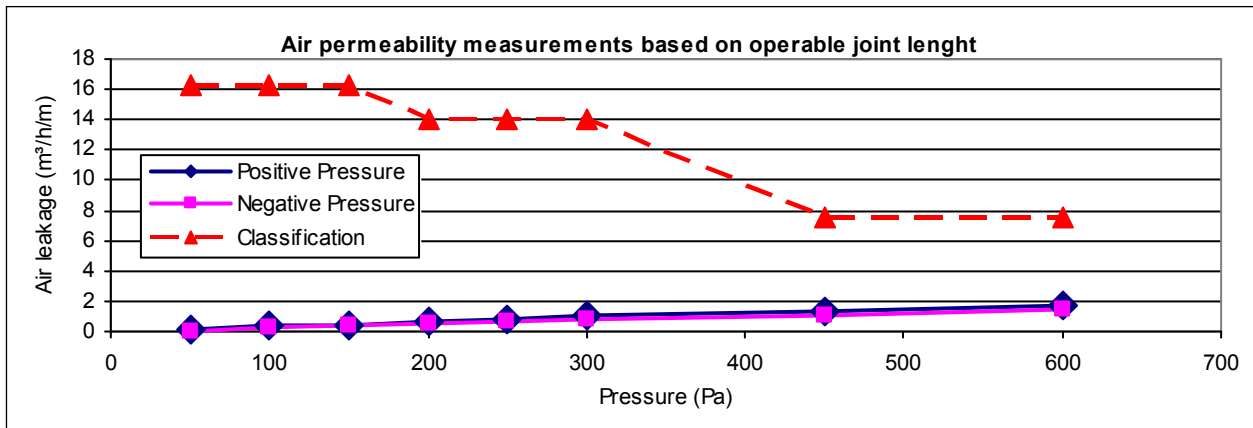
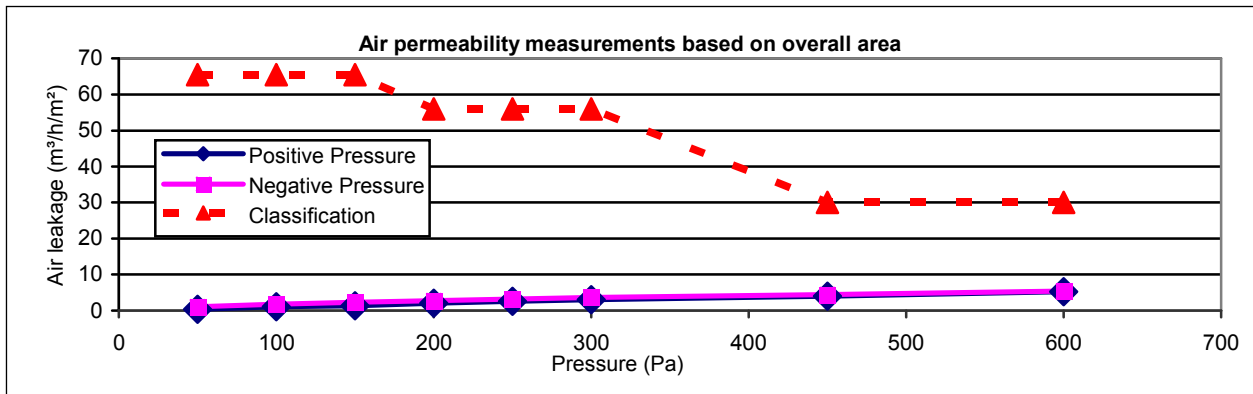
Air permeability measurements based on operable joint length;

POSITIVE PRESSURE			
ϕ_7	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
ϕ_7	50	0,67	0,12
ϕ_7	100	1,86	0,34
ϕ_7	150	2,49	0,46
ϕ_7	200	3,74	0,69
ϕ_7	250	4,64	0,86
ϕ_7	300	5,41	1,00
ϕ_7	450	7,33	1,35
ϕ_7	600	9,51	1,76

Test No : 2016.565.07 / 04.03.2016

NEGATIVE PRESSURE			
ϕ_8	Test Pressure (Pa)	Air Leakage (m ³ /h)	Air Leakage (m ³ /h/m)
ϕ_8	50	0,07	0,01
ϕ_8	100	1,14	0,21
ϕ_8	150	2,17	0,40
ϕ_8	200	3,00	0,55
ϕ_8	250	3,80	0,70
ϕ_8	300	4,52	0,83
ϕ_8	450	6,04	1,11
ϕ_8	600	7,74	1,43

Test No : 2016.565.08 / 04.03.2016





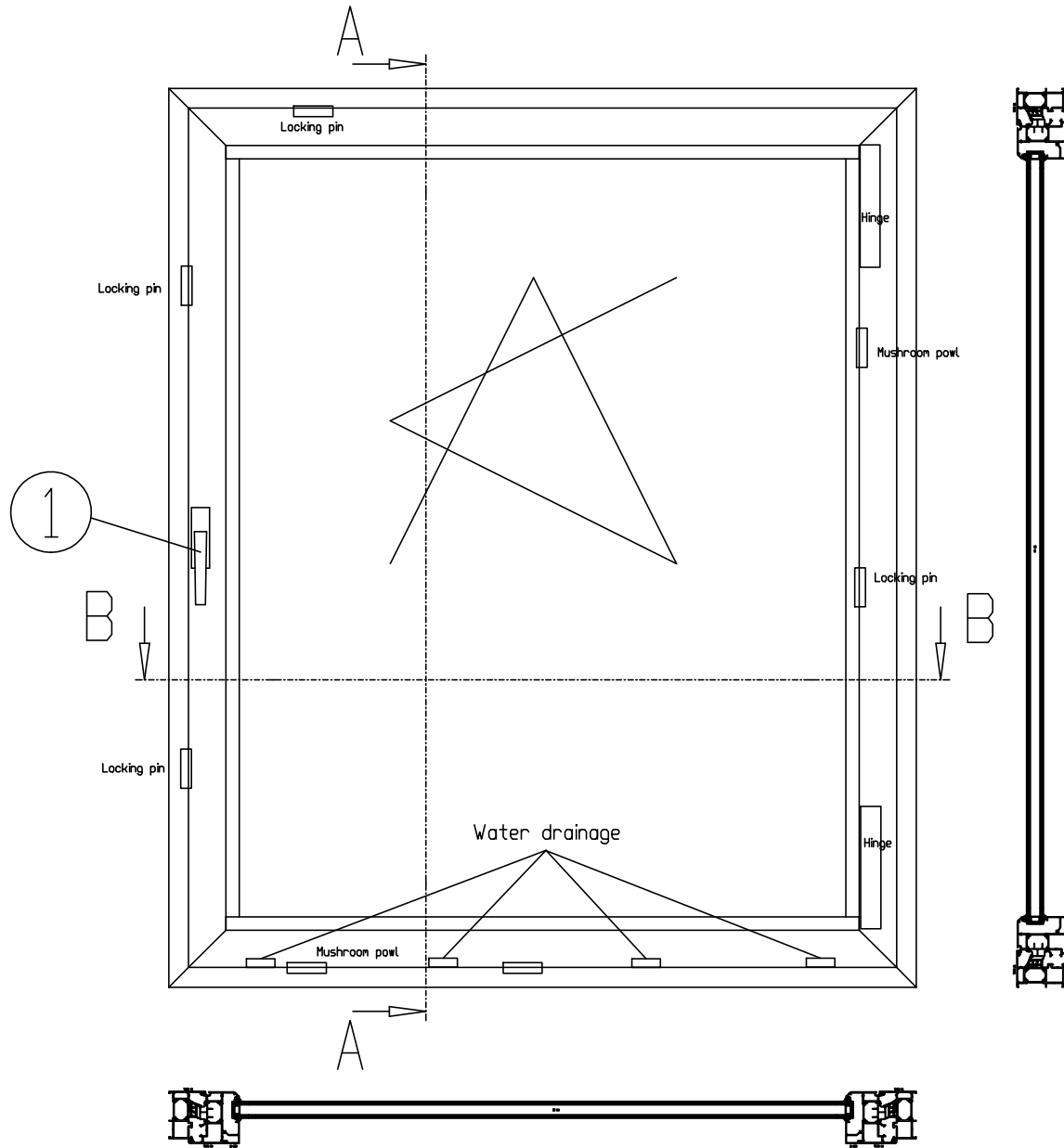
7.7 Increased Load Test (Safety Test - Secure Load)

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

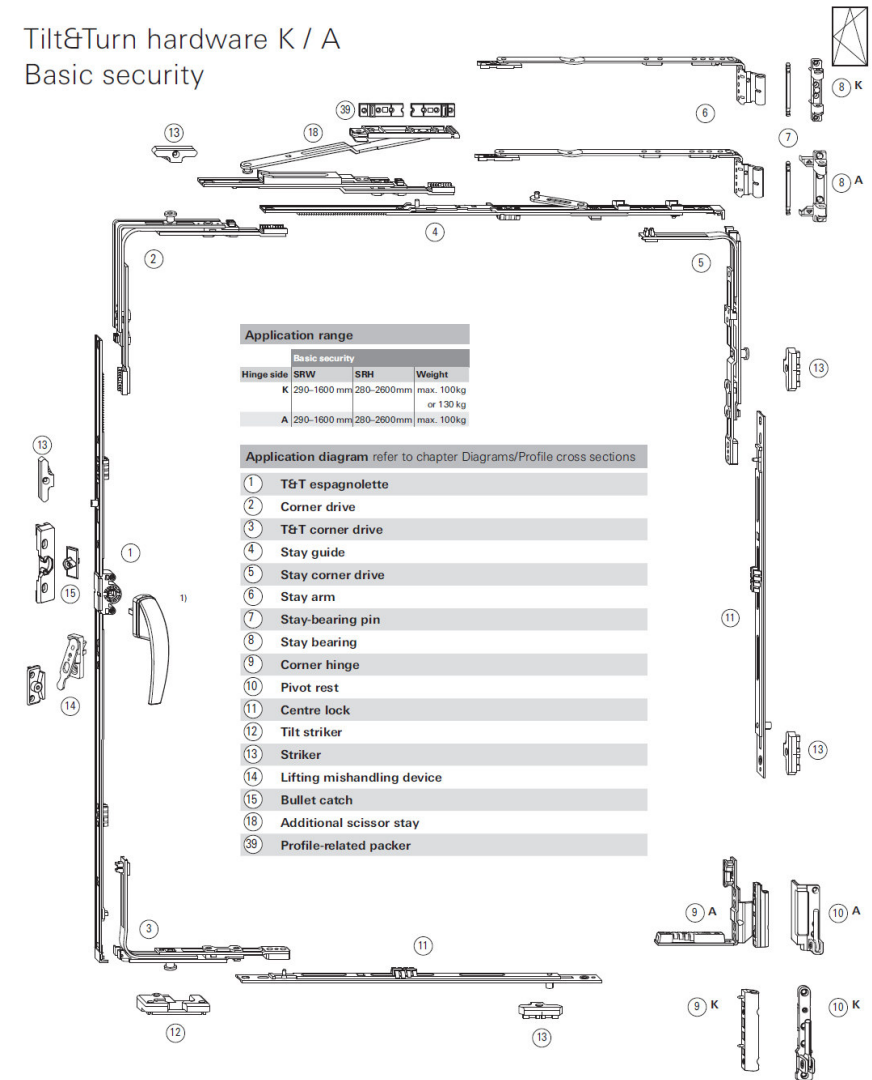
Test No : 2016.565.09 / 04.03.2016

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	$\phi_1=6,45$ $\phi_2=2,17$	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	$\phi_3=4,97$ $\phi_4=1,67$	Class 4	
WATERTIGHTNESS (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, $C = L/300 = 4,93 \text{ mm}$ $\lambda_1 < C$	Positive Pressure	$\lambda_1 = 0,21 \text{ mm}$	Class C3	Class C3
	1200 Pa, $C = L/300 = 5,00 \text{ mm}$ $\lambda_2 < C$	Negative Pressure	$\lambda_2 = 0,14 \text{ mm}$	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 $\phi_1 < 10 \text{ m}^3/(\text{h.m}^2)$ at 600 Pa $\phi_2 < 2,5 \text{ m}^3/(\text{h.m})$	Positive Pressure	$\phi_5=5,23$ $\phi_6=1,76$	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	$\phi_7=5,37$ $\phi_8=1,43$	Class 4	
AIR PERMEABILITY (Compare)	$\phi_5 < 7,74 \text{ m}^3/(\text{h.m}^2)$ $\phi_6 < 2,60 \text{ m}^3/(\text{h.m})$	Positive Pressure	$\phi_5=5,23$ $\phi_6=1,76$	OK	OK
	$\phi_7 < 5,96 \text{ m}^3/(\text{h.m}^2)$ $\phi_8 < 2,00 \text{ m}^3/(\text{h.m})$	Negative Pressure	$\phi_7=5,37$ $\phi_8=1,43$	OK	
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



Tilt&Turn hardware K / A
Basic security

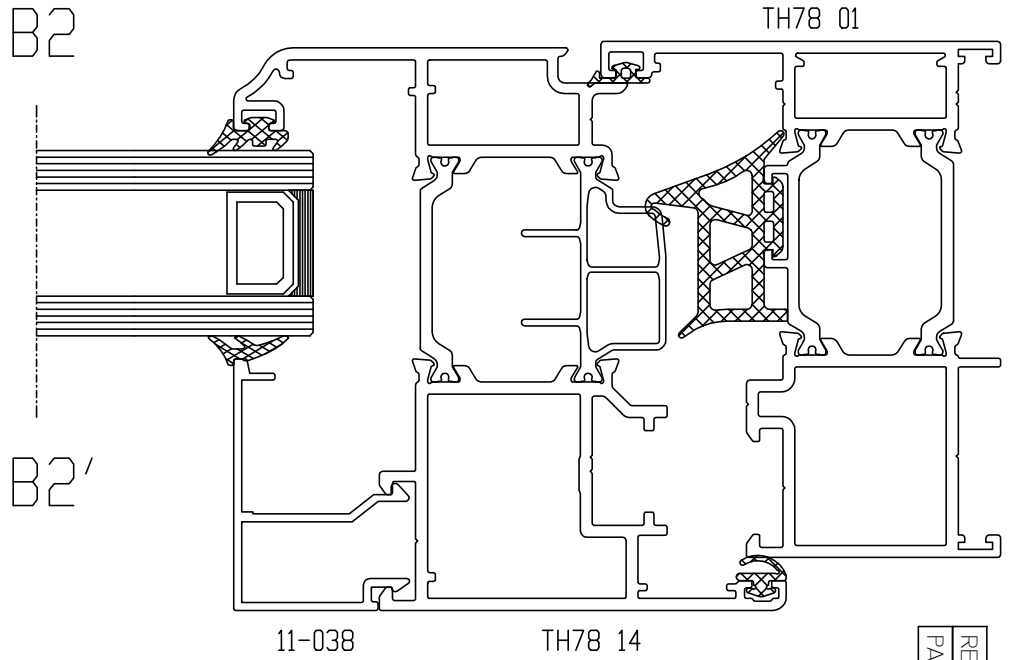
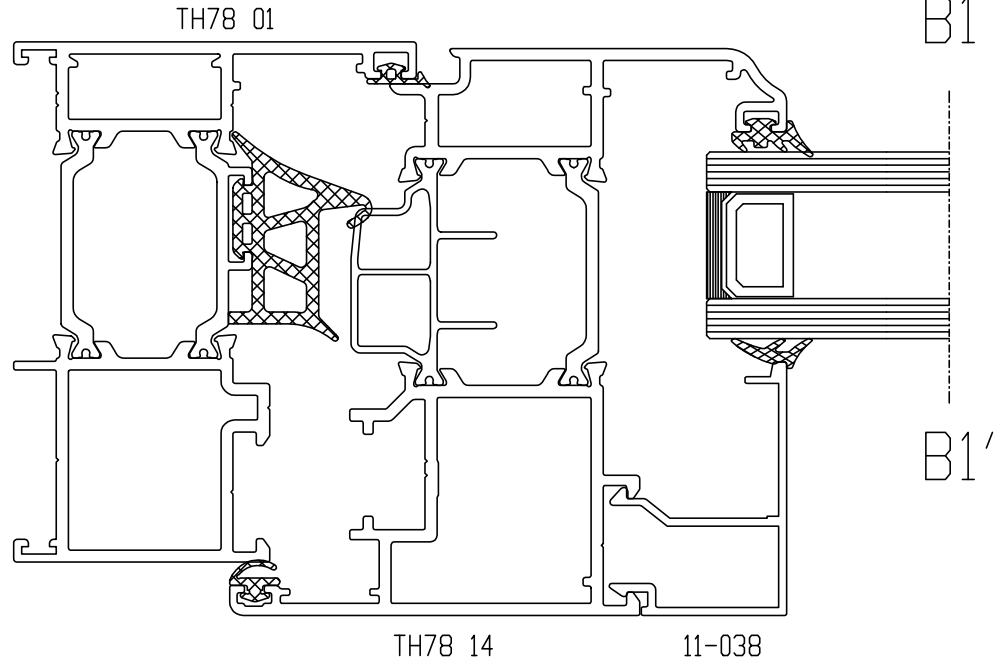
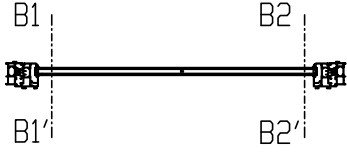
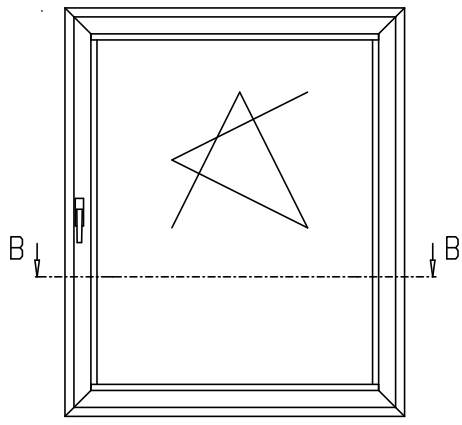


Application range		
Basic security		
Hinge side	SRW	SRH Weight
K	290-1800 mm	290-2800mm max. 100kg or 130 kg
A	290-1800 mm	290-2800mm max. 100kg

- Application diagram refer to chapter Diagrams/Profile cross sections
- 1 T&T espagnolette
 - 2 Corner drive
 - 3 T&T corner drive
 - 4 Stay guide
 - 5 Stay corner drive
 - 6 Stay arm
 - 7 Stay-bearing pin
 - 8 Stay bearing
 - 9 Corner hinge
 - 10 Pivot rest
 - 11 Centre lock
 - 12 Tilt striker
 - 13 Striker
 - 14 Lifting mishandling device
 - 15 Bullet catch
 - 18 Additional scissor stay
 - 39 Profile-related packer

NOTIFIED BODY NO	NB-2547	DETAIL: ASISTAL TH 78			
ACCREDITATION NO	AB-0531-T	DOOR AND WINDOW SYSTEM (TILT & TURN)			
REPORT NO	020.530.1/2016	SAMPLE NO	2016.565	DATE	12.03.2016
PREPARED BY	S.BAYRAKTAR	CLIENT	ASIST ALÜMİNYUM PROFİL SAN. VE TİC. A.Ş.	REV.NO	A
CONTROL BY	S.COLAK	EXPLANATION	AIR PERMEABILITY, WATERTIGHTNESS AND RESISTANCE TO WIND LOAD		

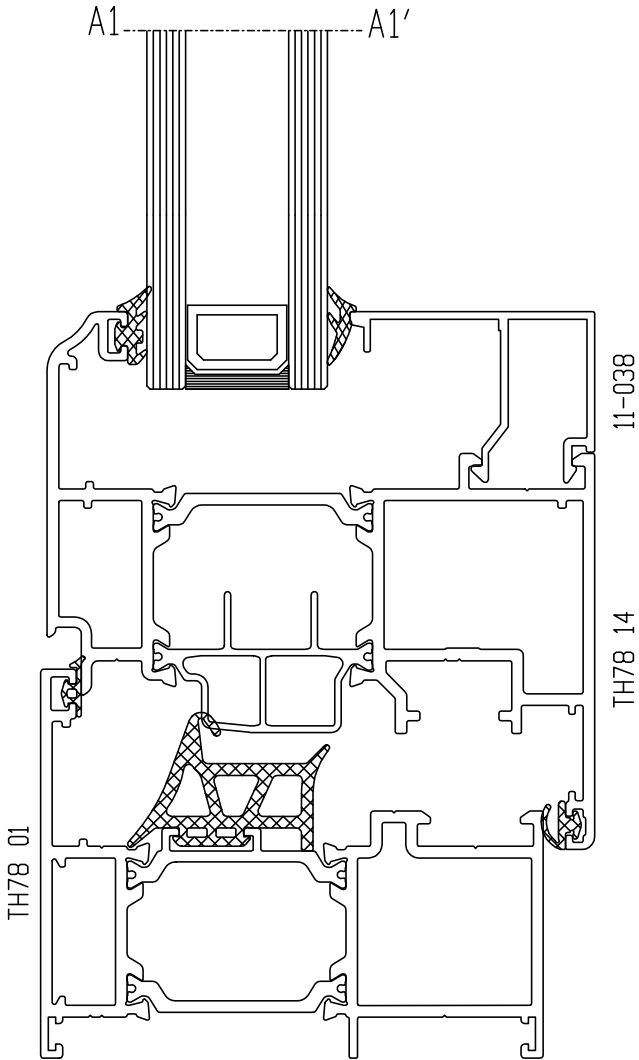
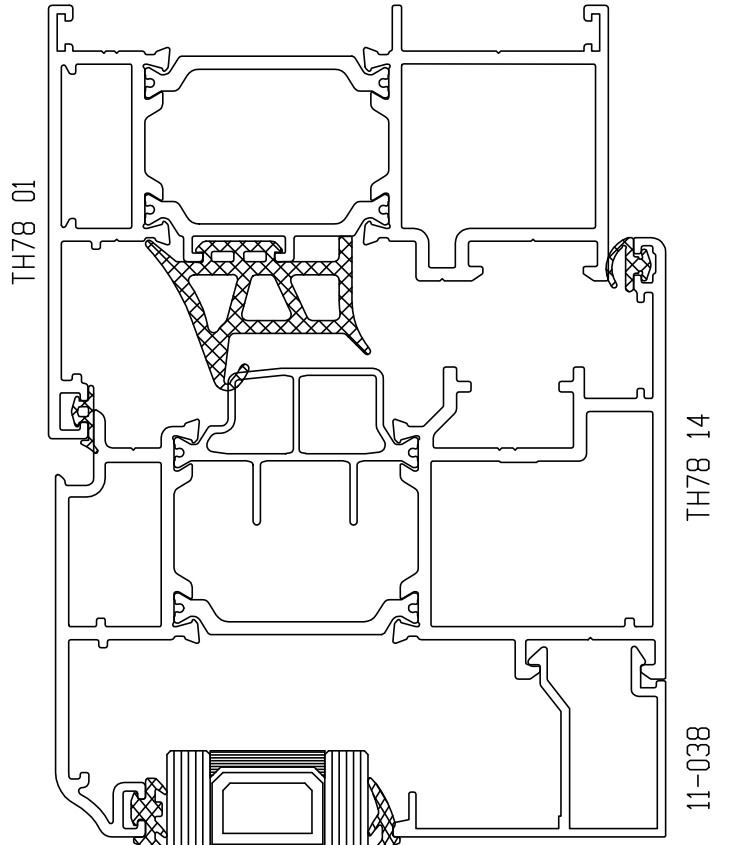
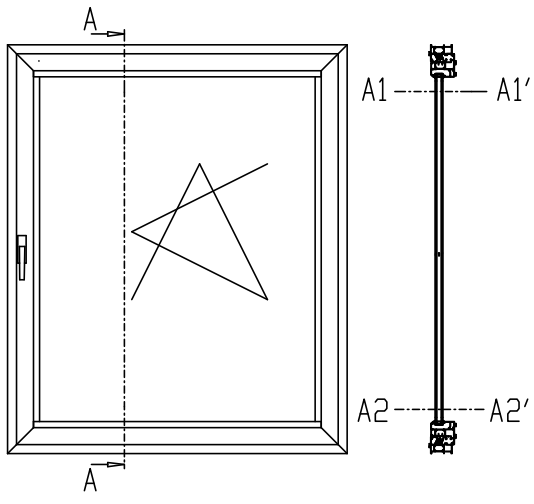




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NOTIFIED BODY NO:	NB-2547	PROJECT	ASISTAL TH 78		
ACCREDITATION NO:	AB-0531-T		DOOR AND WINDOW SYSTEM (TILT & TURN)		
REPORT NO:	020.530.1/2016	PROJECT CODE:	2016.565	DATE:	12.03.2016
PREPARED BY:	S.BAYRAKTAR	CLIENT:	ASIST ALÜMİNYUM PROFİL SAN. VE TİC. A.Ş.	REV.NO:	A
CONTROL BY:	S.COLAK	EXPLANATION:	AIR PERMEABILITY, WATERTIGHTNESS AND RESISTANCE TO WIND LOAD		





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NOTIFIED BODY NO:	NB-2547	PROJECT	ASISTAL TH 78		
ACCREDITATION NO:	AB-0531-T		DOOR AND WINDOW SYSTEM (TILT & TURN)		
REPORT NO:	020.530.1/2016	PROJECT CODE:	2016.565	DATE:	12.03.2016
PREPARED BY:	S.BAYRAKTAR	CLIENT:	ASIST ALÜMİNYUM PROFİL SAN. VE TİC. A.Ş.	REV.NO:	A
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