BELGIAN BUILDING RESEARCH INSTITUTE
INSTITUTION RECOGNISED BY APPLICATION OF THE DECREE-LAW OF 30 JANUARY 1947

All tests in this report are executed according to the ISO 9001
certified Quality management system of the BBRI

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TEST REPORT

Laboratory	ROOF AND FAÇADES ELEMENTS – CAR	**O/References**	DE651XO255 CAR 17146 EN Page 1/6

Requested by	ALUK Zwaarveld 44 B-9220 Hamme Tel : +32.52.48.48.48	INVOICE : ALUK Zwaarveld 44 B-9220 Hamme	
Date of the order	2017.06.08	**Samples registration**	In situ
		Date of reception of samples	In situ
Date of issue of the report	2017.06.26 Translation		
Test carried out	Air permeability, water tightness, resistance to wind load and service strength on a window with horizontal sliding sash		
References	NBN EN 14351-1 «Windows and external pedestrian doors – Product standard» and other European classification and test standards		

This test report contains 6 pages and 1 appendix. This test report may only be reproduced in its entirety. Each page of the original report has been stamped (in red) by the laboratory and initialled by the head of laboratory. The results and findings are only valid for the tested samples.

- ❑ *No sample*
- ❑ *Sample(s) subjected to destructive test*
- ❑ *Sample(s) to be removed from our laboratories 30 calendar days after sending of the report, save in the case of a further written request*

C.S.T.C. CAR W.T.C.B.

Ing. E. Kinnaert
Senior Project leader

Ir. V. Detremmerie
Head of Laboratory

1. Introduction

At request of the firm Aluk, represented by Mr Devriendt, the BBRI carried out the supervision of some tests in order to measure the air permeability, water tightness, resistance to wind load and service strength on a window with horizontal sliding sash. The results of these tests are given in the report with reference "CAR 17146 EN".

2. Description of the sample

The sample, an aluminium window, was installed on the test frame of the firm Aluk in Hamme on June 23rd 2017. It is an aluminium window made by the applicant. The composition and dimensions are given below.

2.1. Composition of the sample

The sample composition can be found in figure 1.

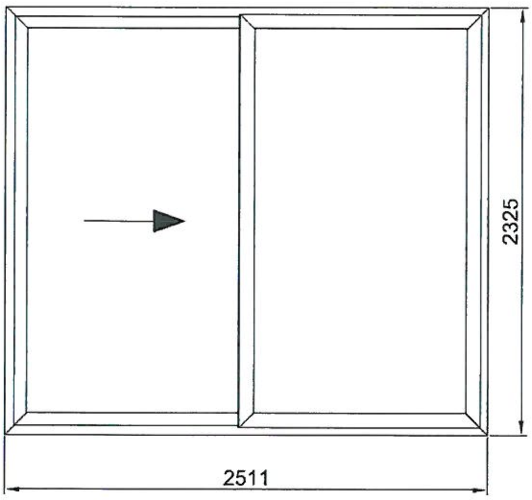

Figure 1: Schematic dimensions of the sample

2.2. Dimensions of the sample

Total window:	- Height :	2.325m
	- Width :	2.511m
	- Surface:	5.838m²
Active leaf:	- Length of the sealing joints: 11.520m	
	- Surface: 2.695m²	

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2.3. Description of the sample

The characteristics of the elements constituting the sample are given by the applicant and are mentioned below. The numbers used are the same as in figure 1 (* observations added by the laboratory):

- **Type of window :** Window with horizontal sliding sash
- **System of window :** See appendix
- **Material :** Aluminium with thermal break
- **Thermal break :** See appendix
- **Assembling method:** See appendix
- **Glue :** /
- **Rubber joint between the active leaf and the frame:** See appendix
- **Glass:** See appendix
- **Preformed gasket :** See appendix
- **Sticking joint dimensions:** See appendix
- **Glass unit drainage:** See appendix
- **Ventilation of the glass unit drainage:** See appendix
- **The glazing bars are clipped**
- **Hardware:** Sobinco BT Lock - See appendix
- **Plans:** Appendix

3. Description of the tests

Table 1: List of the standard and implemented tests

		Classification	Description of the tests	Implemented tests
1	Service strength	NBN EN 13115	NBN EN 12046-1	√
2	Air permeability	NBN EN 12207	NBN EN 1026	√
3	Resistance to wind (P1 and P2)	NBN EN 12210	NBN EN 12211	√
4	Air permeability (verification)	NBN EN 12207	NBN EN 1026	√
5	Water Tightness	NBN EN 12208	NBN EN 1027	√
9	Resistance to wind (P3: security)	NBN EN 12210	NBN EN 12211	√
7	Wrong use (Resistance to racking)	NBN EN 13115	NBN EN 14608	
8	Wrong use (Static torsion)	NBN EN 13115	NBN EN 14609	
9	Impact test	NBN EN 13049	NBN EN 13049	

4. Results of the tests

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Temperature at the laboratory : 25.0°C
Atmospheric pressure in the laboratory : 1012.0mb
Humidity : 35.0%

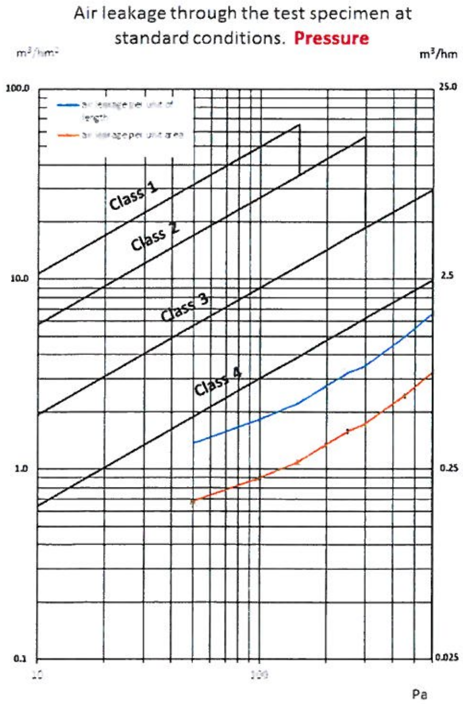
4.1. Summary of the performances

The summary of the window performances is given in table 2. The test procedure was done according to the succession described in § 3. The details of the results are given in appendix.

Table 2: Summary of the performances

Closing condition: Locked by key	
Test	**European standard (NBN EN 14351-1)**
Air permeability	**4**
Water tightness	**8A**
Wind resistance	**C3**
Service strength	**1**

4.2. Air permeability



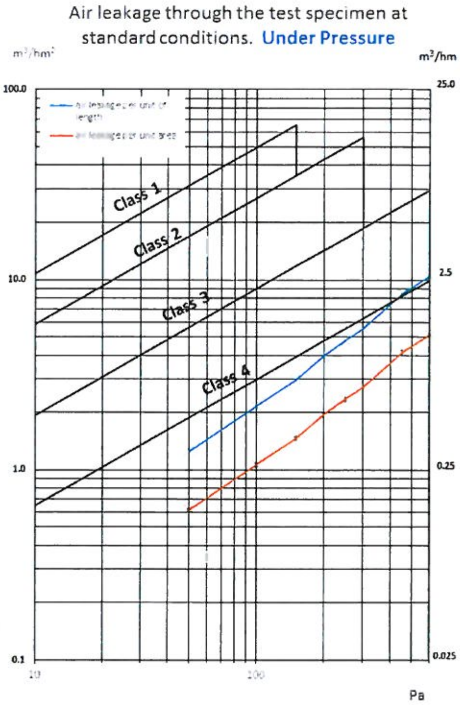


Figure 2 Air permeability

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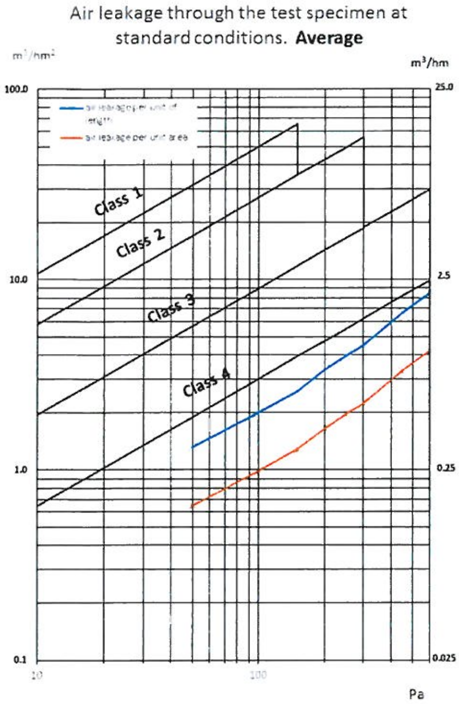
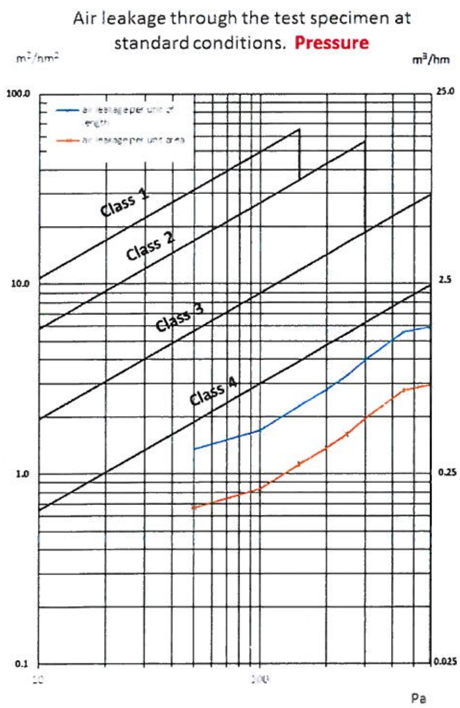


Figure 3 Air permeability - average

4.3. VERIFICATION AIR PERMEABILITY



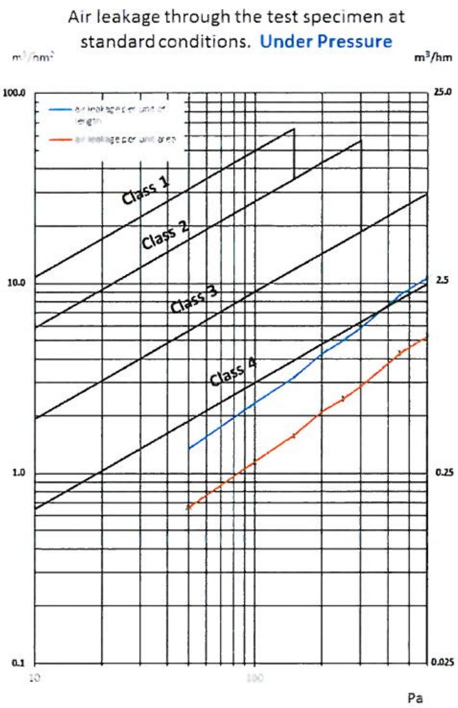


Figure 4 Verification air permeability

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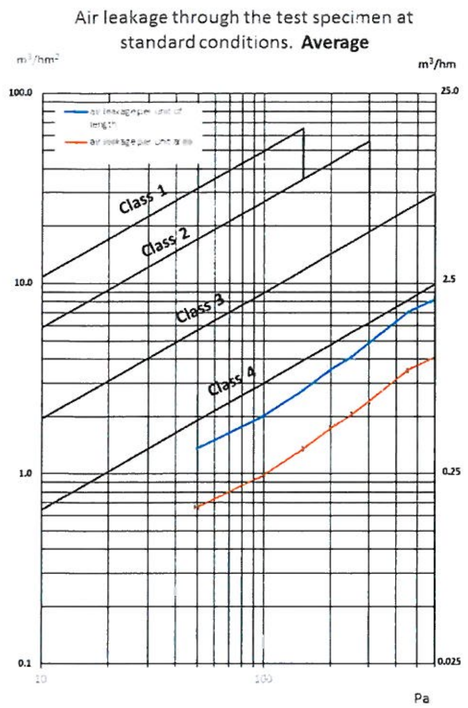

Figure 5 Verification air permeability - average

4.4. Service Strength

Table 3: Service Strength

	Measurement 1	Measurement 2	Measurement 3	Average
Opening leaf (N)	95.0	91.0	101.0	**95.67N**
Closing leaf (N)	20.0	22.0	25.0	**22.33N**

Classification for the Service Strength

- **According to NBN EN 13115: Class 1**

4.5. Verification of the results

The calibration report is checked and approved.

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Internal report of the enterprise

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PROEFVERSLAG

Firma	AluK	Technicus :	Joost/Gino
	Zwaarveld 44	Datum:	23 ~~26~~ juni 2017
	9220 Hamme	Bestand:	S141.par

KENMERKEN ELEMENT

TYPE:	Schuifraa		REF: AluK			
BUITENAFMETINGEN:	L:	2,500 m	H:	2,300 m	S:	5,75 m²
AFMETINGEN OPENGAANDE DELEN:	L:	2,430 m	H:	2,220 m	S:	5,39 m²
TYPE OPENING:	Rechts open					
SLAGLENGTE:	11,520					
TYPE DICHTING:	Borstel					

ELEMENTEN

KADER / VERSTEVIGING:	P-35-100
VLEUGEL / VERSTEVIGING:	P-35-200
STIJL / VERSTEVIGING:	--------------
DICHTING:	A-00-120
VERSTEVIGING:	-------------
BESLAG:	BT-Lock (Sobinco)
DORPEL:	P-6S-041
AANSLAG/STOLP:	A-00-120
GLASLIJST:	P-6S-025
WATERNEUS	---------------
BREEDTE AANSLAG/STOLP	P-15-503 + P-35-300
AANTAL SLUITPUNTEN:	2
AANTAL DRAAIPUNTEN:	0

VITRAGE

TYPE GLAS	Dubbel
DIKTE (GLAS/SPACER/GLAS)	4/15/6

KLASSERING

GEVRAAGDE KLASSE	LUCHTDOORLATENDHEID:	A: C4	KLASSERING	C	4
	WEERSTAND YEGEN WIND	V: C3	(p) XX (d) XX		C3
	WATERDICHTHEID:	E: A9			8A

OMGEVING

TEMPERATUUR:	25,0 °C
ATMOSFEERDRUK:	1012 Hpa
RELATIEVE VOCHTIGHEID :	35 %

KLASSERING VAN DE MECHANISCHE EIGENSCHAPPEN

BEDIENINGSKRACHT:	OPENEN:	Nm	SLUITEN:	Nm
PASSIEVE VLEUGEL:	OPENEN:	Nm	SLUITEN:	Nm

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KINNAERT F

ALGEMENE OPMERKINGEN

Bedieningskrachten NBN EN 13115: klasse 1
Luchtdichtheid NBN EN 12207: Klasse 4

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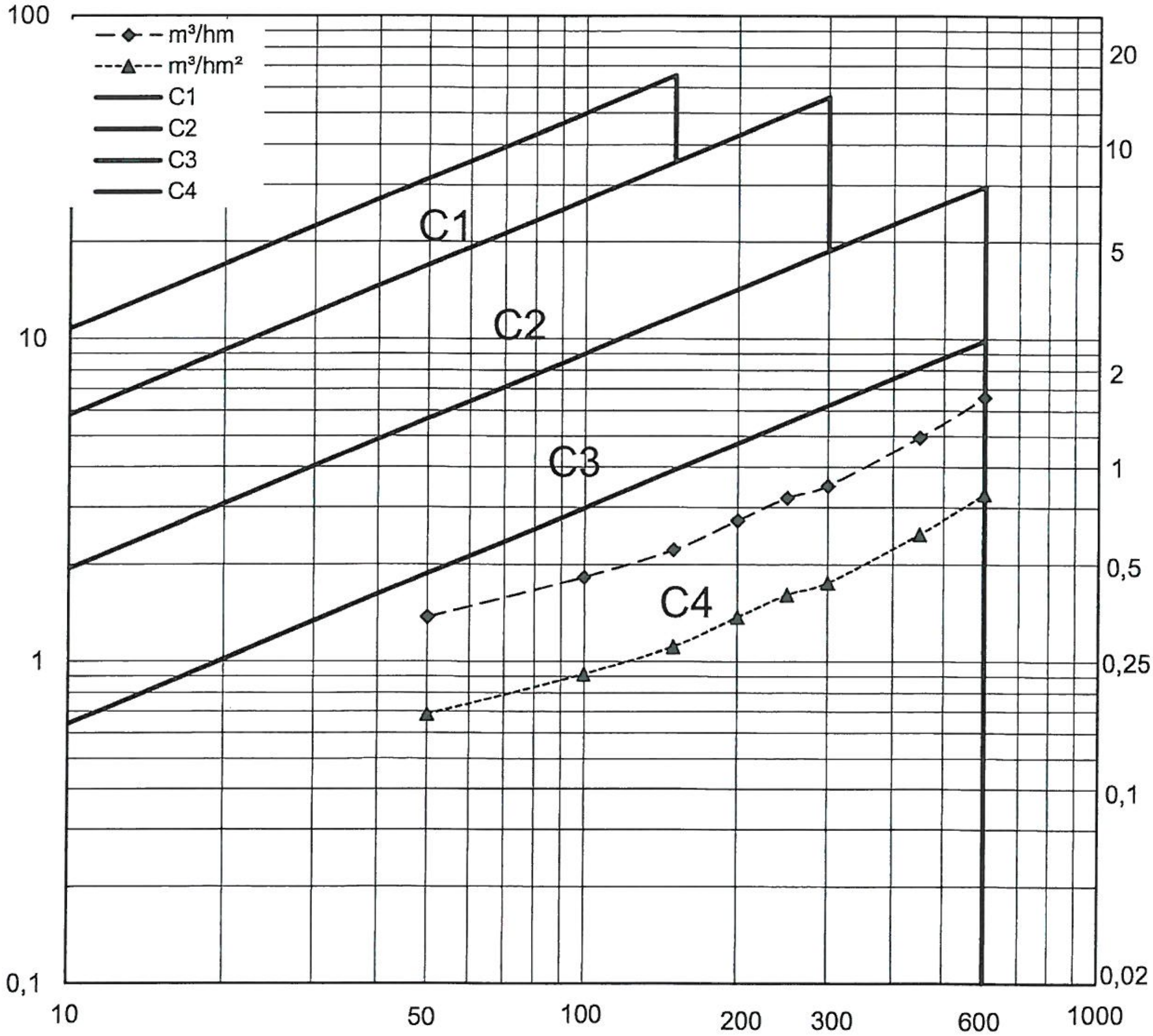
LUCHTDOORLATENDHEID OVERDRUK

Druk (Pa)	Diafhragma K	Delta P	m³/hm	m²/hm²
50	2	425	0,34	0,69
100	2	755	0,46	0,92
150	2	1115	0,56	1,11
200	2	1694	0,68	1,37
250	2	2331	0,80	1,61
300	3	101	0,88	1,75
450	3	202	1,24	2,48
600	3	358	1,65	3,30

Koefficienten van de debietmeter:

K1 = 0,054 K3 = 1,022 K5 = 20,548
K2 = 0,195 K4 = 4,278



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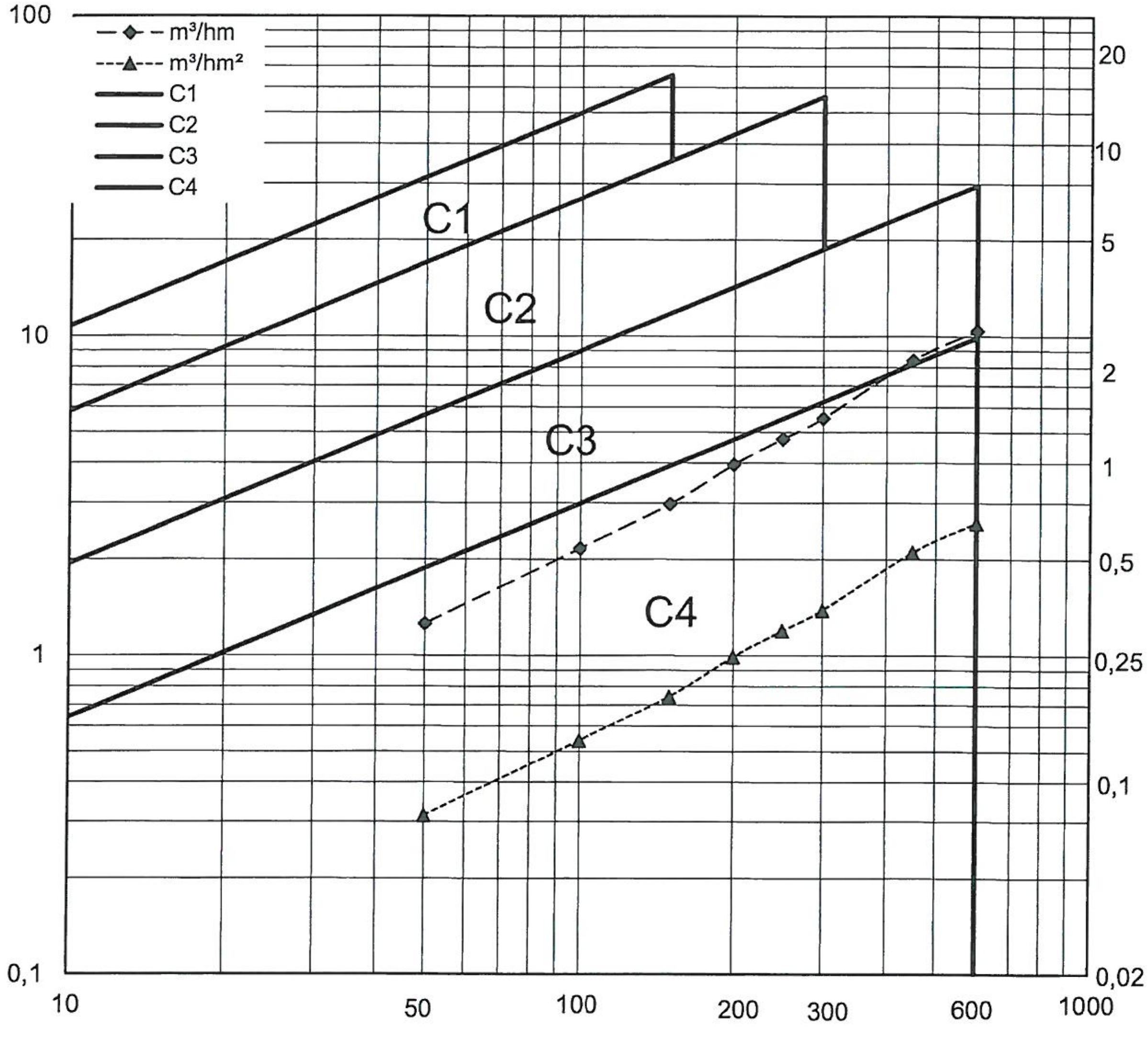
LUCHTDOORLATENDHEID ONDERDRUK

Druk (Pa)	Diafragma K	Delta P	m³/hm	m³/hm²
50	2	356	0,31	0,31
100	2	1058	0,54	0,54
150	2	1997	0,74	0,74
200	3	129	0,99	0,99
250	3	187	1,19	1,19
300	3	252	1,38	1,38
450	3	582	2,10	2,10
600	3	892	2,60	2,60

Koefficienten van de debietmeter:

K1 = 0,054 K3 = 1,022 K5 = 20,548

K2 = 0,195 K4 = 4,278



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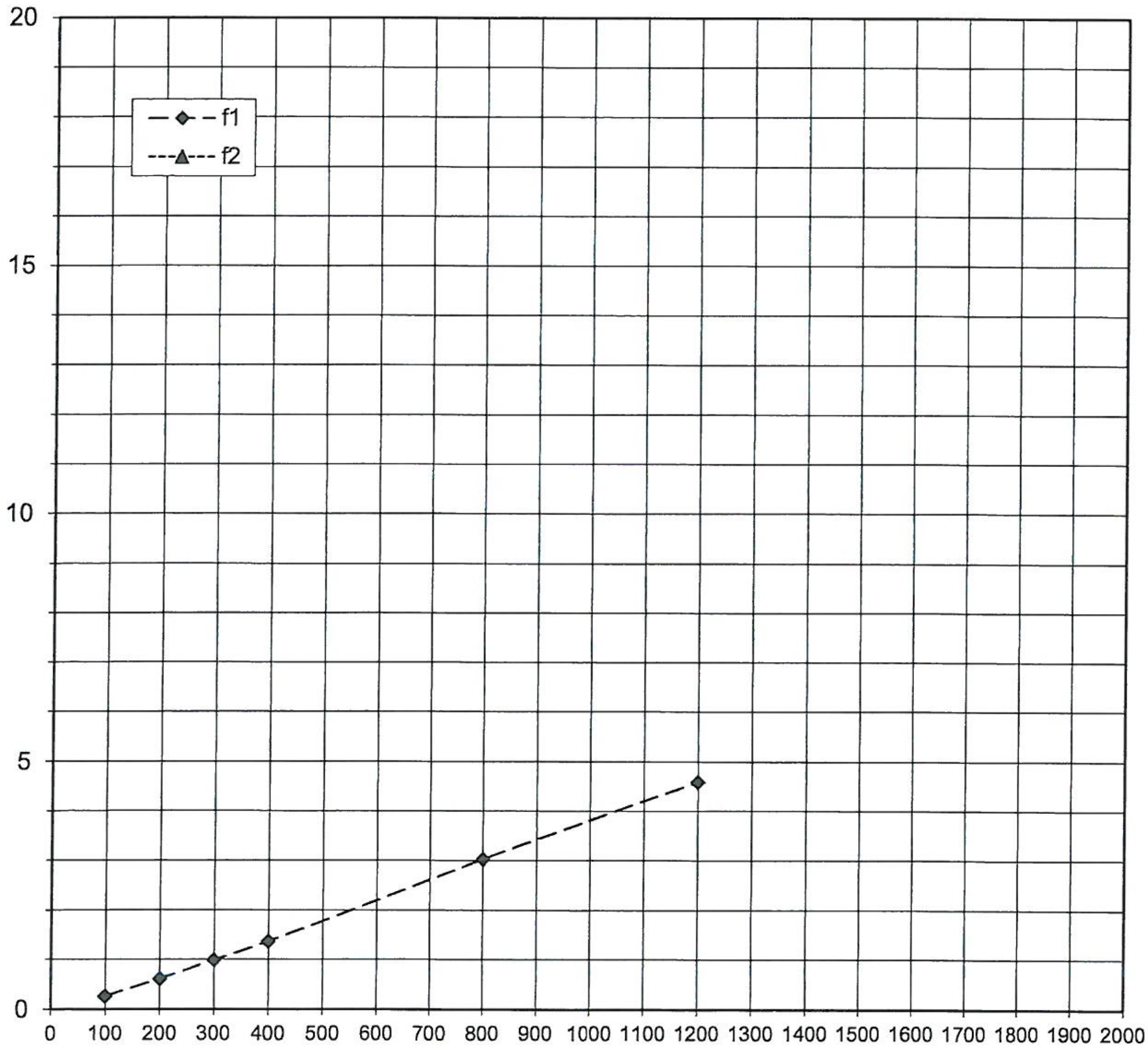
WEERSTAND TEGEN WIND OVERDRUK

Druk(Pa)	f1 (mm)		f2 (mm)		Klasse
0	0,1	1/19091			
100	0,3	1/8077			
200	0,6	1/3443			
300	1,0	1/2132			
400	1,4	1/1538			**1**
800	3,0	1/694			**2**
1200	4,6	1/458			**3**
1600					**4**
2000					**5**

Lengte f1: 2100 mm
Lengte f2: 0 mm

Blijvende vervorming: f1: 0 mm
f2: mm

Toegelaten vervorming (mm):
1/150 A
1/200 B
1/300 C



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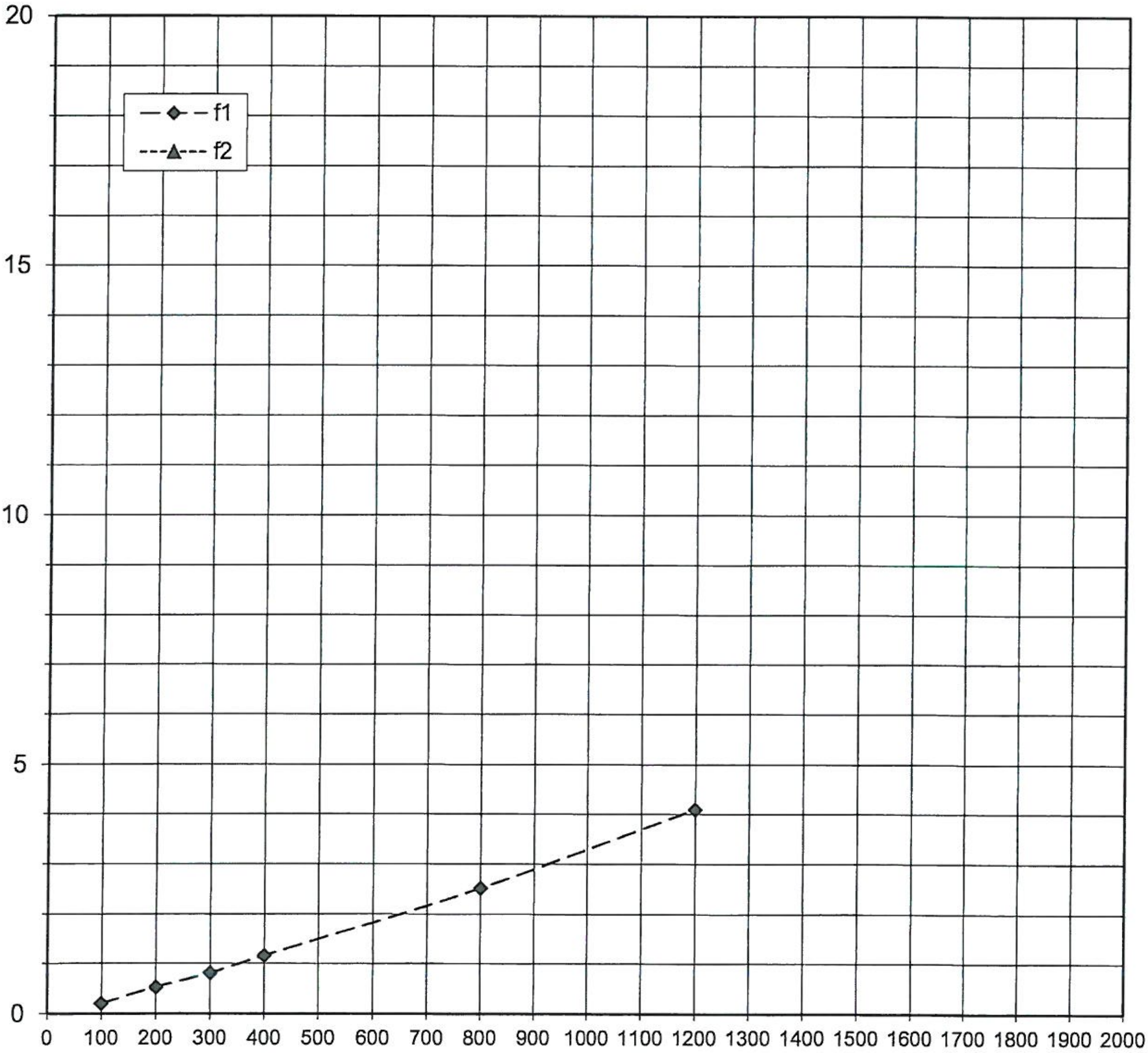
WEERSTAND TEGEN WIND ONDERDRUK

Druk (Pa)	f1 (mm)		f2 (mm)		Klasse
0	0,1	1/19091			
100	0,2	1/10244			
200	0,5	1/3962			
300	0,8	1/2593			
400	1,2	1/1810			**1**
800	2,5	1/833			**2**
1200	4,1	1/513			**3**
1600					**4**
2000					**5**

Lengte f1: 2100 mm
lengte f2: 0 mm

Blijvende vervorming: f1: 0 mm
f2: mm

Toegelaten vervorming (mm):
1/150 A
1/200 B
1/300 C



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KONTROLE LUCHTDOORLATENDHEID OVERDRUK NA DE 50 PULSATIES

Druk (Pa)	Diafragma K	Delta P	m³/hm	m³/hm²
50	2	414	0,34	0,68
100	2	647	0,42	0,85
150	2	1175	0,57	1,14
200	2	1748	0,70	1,39
250	2	2454	0,82	1,65
300	3	129	0,99	1,98
450	3	255	1,39	2,79
600	3	292	1,49	2,98

KONTROLE LUCHTDOORLATENDHEID ONDERDRUK NA DE 50 PULSATIES

Drukn (Pa)	Diafragma K	Delta P	m³/hm	m³/hm²
50	2	411	0,34	0,68
100	2	1220	0,58	1,16
150	2	2318	0,80	1,60
200	3	148	1,06	2,12
250	3	205	1,25	2,50
300	3	279	1,46	2,92
450	3	616	2,16	4,33
600	3	935	2,66	5,34

WATERDICHTHEID

Druk (Pa)	Tijd (min)	Infiltraties
0	15	GEEN
50	5	GEEN
100	5	GEEN
150	5	GEEN
200	5	GEEN
250	5	GEEN
300	5	GEEN
450	5	GEEN
600	5	waterspatten binnenrail
750	5	
900	5	
1050	5	
1200	5	
1350	5	
1500	5	
1650	5	
1800	5	
1950	5	
2100	5	

Debiet: 11,5 l/min

VEILIGHEIDSPROEF

klasse	Druk (Pa)	Opmerkingen
C1	600	
C2	1200	
C3	1800	ok
C4	2400	
C5	3000	

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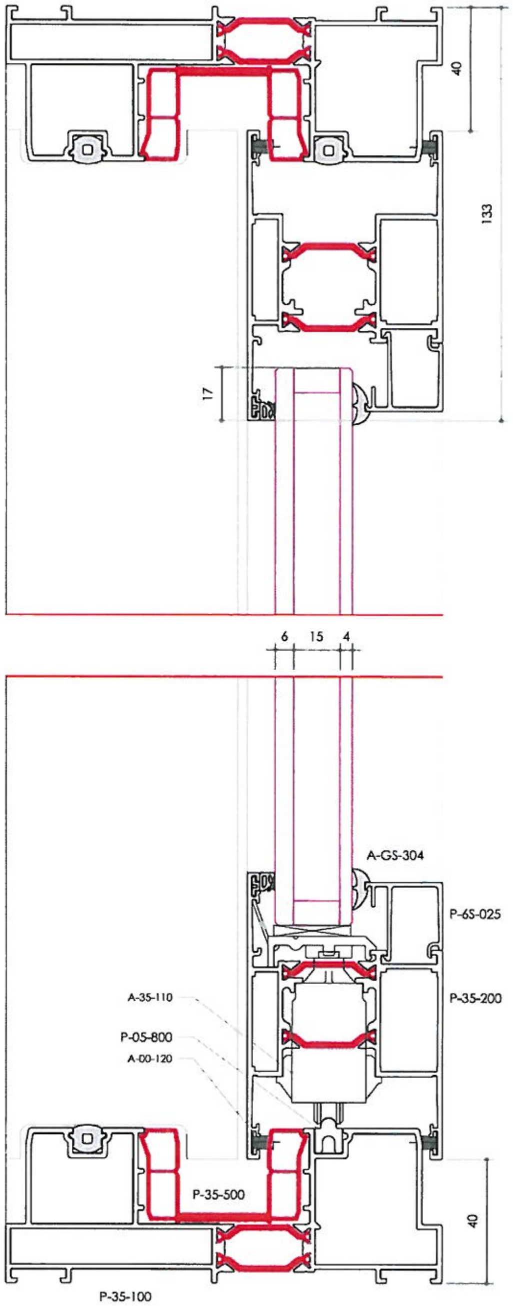
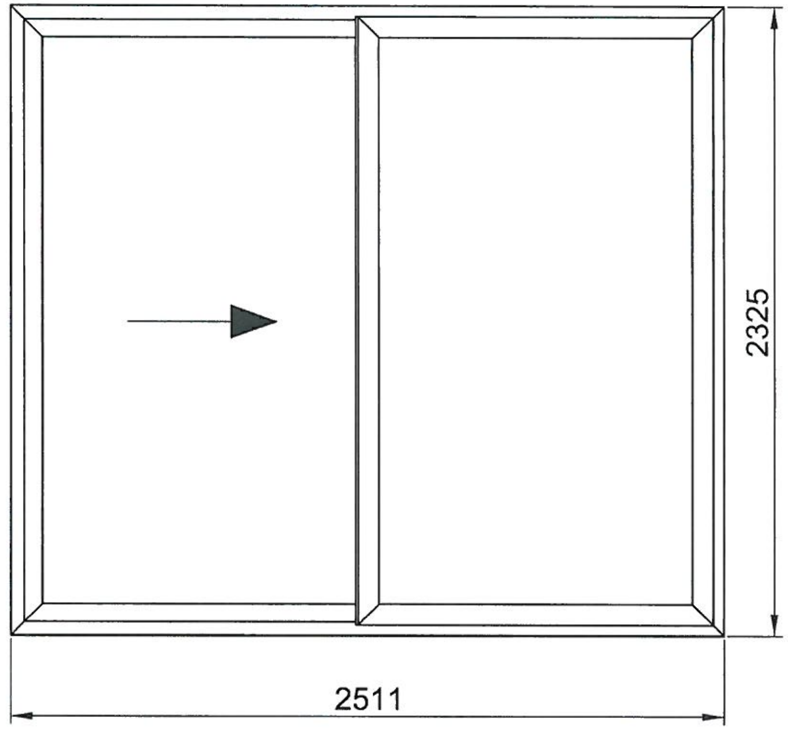
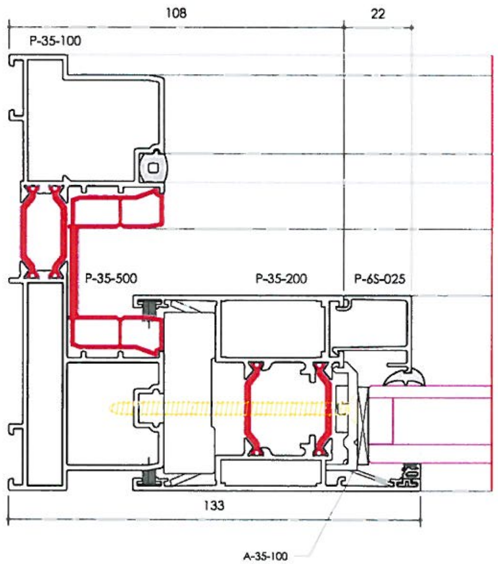
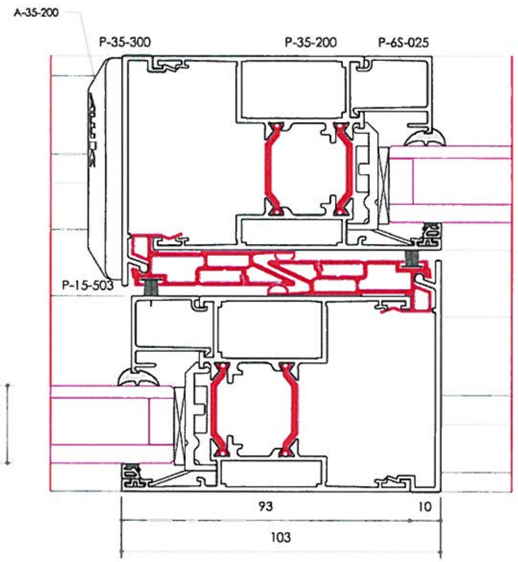
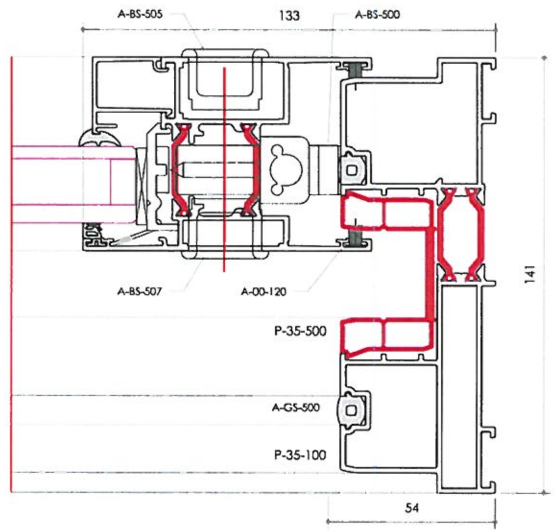


Beslag - Quincaillerie:
Sobinco BT Lock

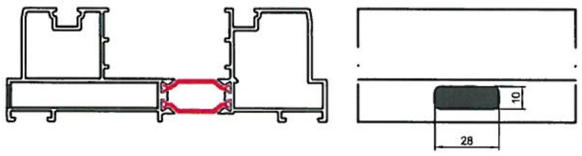








A : Afwatering buitenkader
Evacuation d'eau dormant



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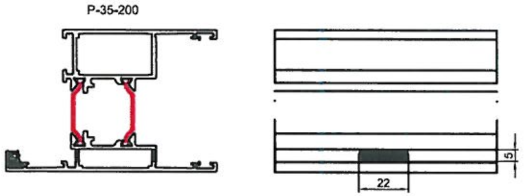
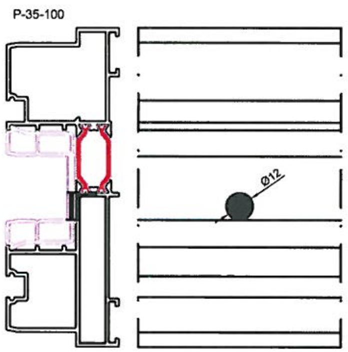
B : Afwatering vleugel
Evacuation d'eau vantail

C : Ontluchting
Ventilation



D : Afwatering buitenkader
Evacuation d'eau dormant



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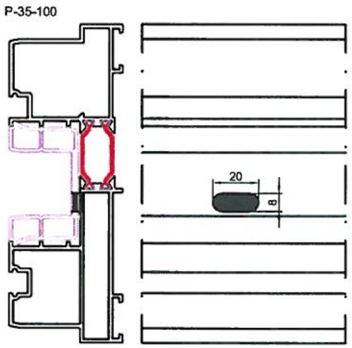
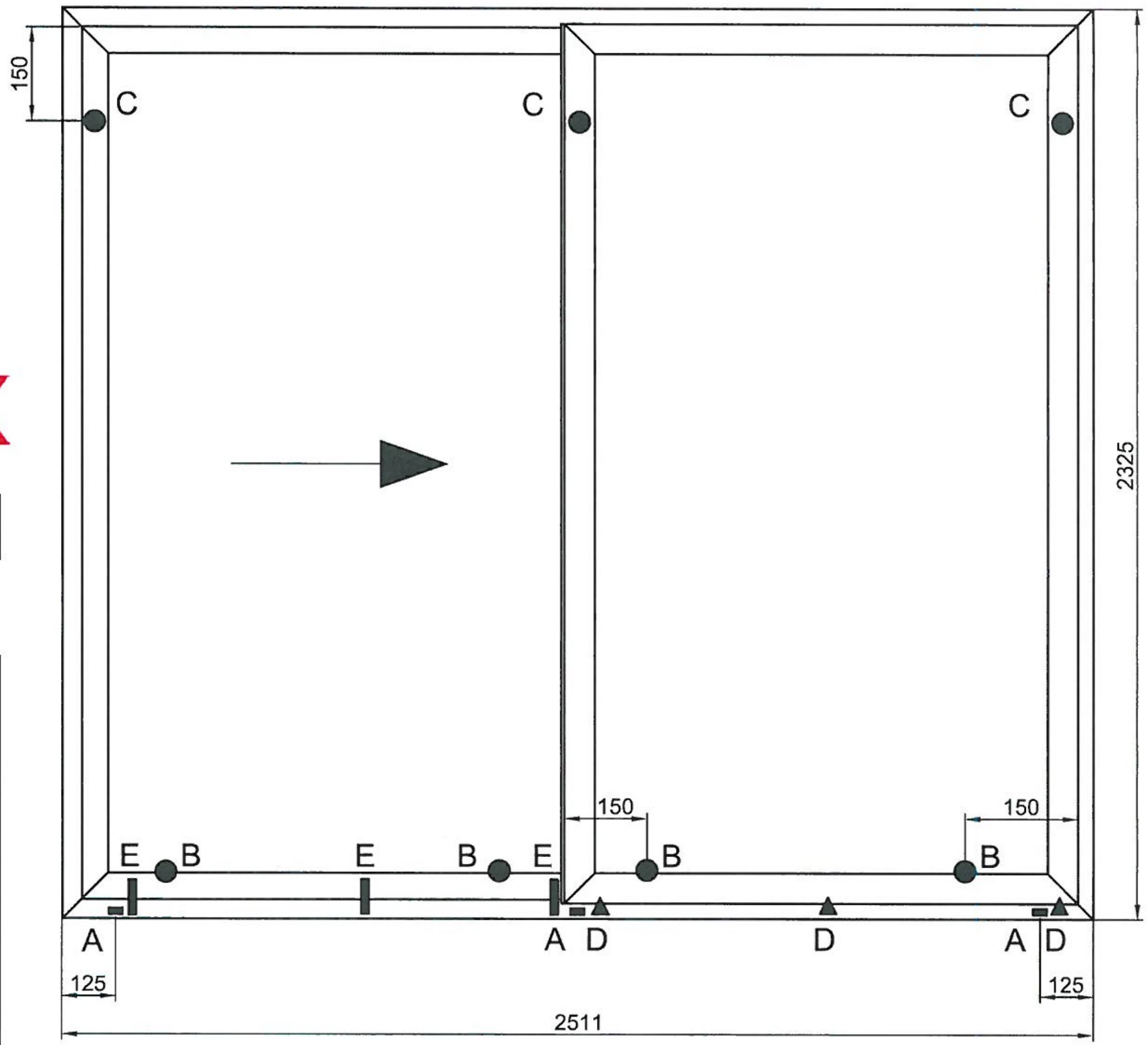
E : Afwatering buitenkader
Evacuation d'eau dormant



Buitenaanzicht
Vue extérieure

ALUK

Beslag - Quincaillerie:
Sobinco BT Lock



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