SAPA SBS

Espace vernède 4-5
Route des Vernèdes
83480 PUGET SUR ARGENT

Test no. **EN-2128**
Date: **3 July 2012**

SAMPLING FOR TESTS A*.E*. V*.

Project reference: DUBAI

JOINERY CHARACTERISTICS

TYPE OF JOINERY	sliding 2 Vtx FC		For the calculation of the length of seal in linear metres, indicate the number of floors and sides	
TYPE OF OPENING	Sliding \N° of Openings: **2**			
OVERALL DIMENSIONS	H= 2.300 m x L = 1.780 m / S=4.09 m^2		Number of floors	**3**
WINDOW DIMENSIONS	H= 2.203 m x L = 1.700 m / S=3.75 m^2		Number of sides	**2**
SEAL LENGTH	**L = 10.01 m**	N° Vtx: **2 vtx**	A*E*V* Joinery	

CHANNEL REFERENCES

FRAME	P22056	**BASE PLATE**	None
CASEMENT	P21290+P21296+P21288	**STOP**	None
MULLION	None	**BEADS**	P21300
SEAL	J22036	**WATER JET**	None
REINFORCEMENT	1 flat section, 40x4 aluminium/alternated	**CASING**	None
WIDTH OF THE STOP	None	**N° OF LOCKS**	6
HARDWARE	Croise DS (Seduction)	**N° OF HINGES**	None

PANES

Check the wind classification based on the thickness of the pane

TYPE	Insulating Composition	6/16/6
DIMENSIONS	H 2.071 m x L 0.770 m S = 1.59 m^2	
Base board	H 0.000 m x L 0.000 m S 0 m^2	

PERFORMANCES

HANDLING FORCE REQUIRED	**Opening:**	30.8 N	**Closing:**	44.6 N
SECOND CASEMENT FORCE REQUIRED	**Opening:**	31.0 N	**Closing:**	36.6 N

CLASSIFICATION CLAIMED	**A*4**	**E*8A**	**V*A3**
CLASSIFICATION OBTAINED	**A*4**	**E*9A**	**V*C3**

CLASSIFICATION ADOPTED	**A*4**	**E*9A**	**V*C3**
Additional pressure 2000 Pa	**No comment**		

Test manager Laurent LIGER - Pierre TURQUI

Observations: Mr BRODE Jean-Baptiste of Bureau VERITAS
This report includes 9 pages including 2 with diagram 8-9

1.3 MEAN AIR PERMEABILITY

Class for the total surface area: A*4
Class based on the length of the seal in linear metres: A*3
Final class of the joinery: **A*4**

(After 3 pressure increases to 660 Pa for the fitting of the window seals and any leaks around the caisson)

Total surface area: ***4.09 m²*** ***Length of the casement seal:*** ***10.01 m***

Positive pressure => **Temp: 23.5°C** **P Atm: 101.5 kPa**
Negative pressure => **Temp: 23.6°C** **P Atm: 101.5 kPa**

	Positive pressure (A*4)			Negative pressure (A*4)			Mean			
Pressure (Pa)	m3/h under normal conditions	m3/h/m2 under normal conditions	m3/h/m under normal conditions	m3/h under normal conditions	m3/h/m2 under normal conditions	m3/h/m under normal conditions	m3/h/m2 under normal conditions Mean	Class for the surface area	m3/h/m under normal conditions	Class for the length in linear metres
50	4.62	1.13	0.46	5.98	1.46	0.60	**1.29**	**4**	**0.53**	**3**
100	6.72	1.64	0.67	9.66	2.36	0.97	**2.00**	**4**	**0.82**	**3**
150	8.61	2.10	0.86	12.52	3.06	1.25	**2.58**	**4**	**1.06**	**3**
200	10.64	2.60	1.06	14.84	3.63	1.48	**3.11**	**4**	**1.27**	**3**
250	12.36	3.02	1.23	17.29	4.22	1.73	**3.62**	**4**	**1.48**	**3**
300	14.22	3.47	1.42	19.44	4.75	1.94	**4.11**	**4**	**1.68**	**3**
450	19.66	4.80	1.96	26.07	6.37	2.60	**5.59**	**4**	**2.28**	**3**
600	24.64	6.02	2.46	33.67	8.22	3.36	**7.12**	**4**	**2.91**	**3**

Reminder

Flowrate = (SQR(dP) x K) + C
Normal flowrate = m3/h x (293 / (273 + temperature)) x (Atmospheric pressure / 101.3)
Normal surface flowrate = Normal flowrate / total surface area
Normal linear flowrate = Normal flowrate / total seal length

Contraction coefficient K for the measurement system used for:

Positive pressure				Negative pressure			
N°4	K=	0.72	Constant = -0.43	N°4	K=	0.72	Constant = -0.37
N°	K=		Constant =	N°3	K=	2.26	Constant = 1.33
N°	K=		Constant =		N°	K=	Constant =
N°	K=		Constant =		N°	K=	Constant =

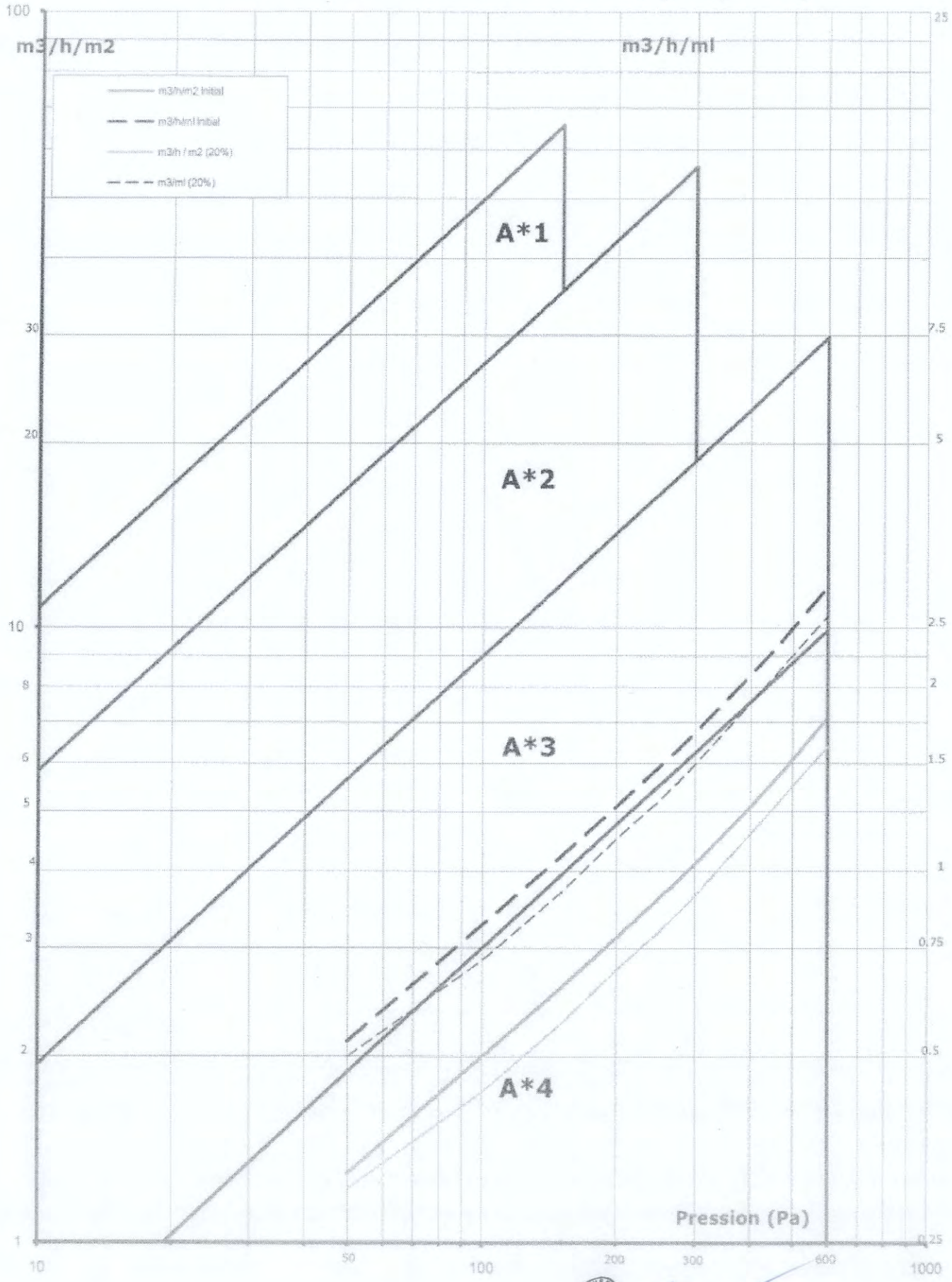
Calibrated on: ***23/09/2010*** *Checked on:* ***23/09/2010***

By: ***CSTB*** *By:* ***Mr Laurent DELRIEU***

Location of leaks:

Supposed cause of any failure:

AIR PERMEABILITY CURVE (mean)



2. WATER LEAKTIGHTNESS

Selecting the method: ***A***

N° of Nozzles: **5**

Nozzle orientation: ***24°***

Theoretical flowrate: **600 l/h** *or* ***10 l/min***

Target flowrate: **562 l/h** *or* ***-5.4 l/min***

Classification obtained ***E * 9A***

Pressure in Pa	***Time in minutes***	Method **A**	Method **B**	***Observations***
0	*15*	1A	1B	No comment
50	*5*	2A	2B	No comment
100	*5*	3A	3B	No comment
150	*5*	4A	4B	No comment
200	*5*	5A	5B	No comment
250	*5*	6A	6B	No comment
300	*5*	7A	7B	No comment
450	*5*	8A		No comment
600	*5*	9A		No comment
750	*5*	E750		
900	*5*	E900		
1050	*5*	E1050		
1200	*5*	E1200		
1350	*5*	E1350		
1500	*5*	E1500		
1650	*5*	E1650		
1800	*5*	E1800		
1950	*5*	E1950		
2100	*5*	E2100		
XX	*5*	EXXXX		

Location of leaks:

Supposed cause of any failure:

3. WIND RESISTANCE

Classification according to deflection A (1/150) B (1/200) C (1/300) **Option A**
Possible pressure classification **Option 3**

3.1 Measuring deflection with positive pressure P1 P1 = 1200 Pa

Increase pressure 3 times to + 1320 Pa (P1 +10%)

Pressure in Pa	Central service post			F. P.
	H	M	B	
400	0.72	2.90	0.94	2.07
800	1.21	5.50	1.80	4.00
1200	1.69	8.25	2.62	6.10
1600				
2000				
after 60s	0.03	0.05	0.06	0.01
Distance between sensors H and B (mm)				2123
Allowable relative deflection 1/150				14.15
Opposite deflection				6.09

0			F.P.
H	M	B	
Distance between sensors H and B (mm)			
Allowable relative deflection 1/150			
Opposite deflection			

Relative stop deflection: 1/349 **Relative mullion deflection:**

3.2 Measuring deflection with negative pressure P1

Decrease pressure 3 times to -1320 Pa (P1 +10%)

Pressure in Pa	Central service post			F.P.
	H	M	B	
400	-1.35	-3.00	-1.10	-1.78
800	-1.90	-5.65	-1.82	-3.79
1200	-2.43	-8.40	-2.55	-5.91
1600				
2000				
after 60s	-0.05	-0.07	-0.05	-0.02
Distance between sensors H and B (mm)				2123
Allowable relative deflection 1/150				-14.15
Opposite deflection				-5.89

0			F.P.
H	M	B	
Distance between sensors H and B (mm)			
Allowable relative deflection 1/150			
Opposite deflection			

Relative stop deflection: 1/-360 **Relative mullion deflection:**

3.4 Repeated pressure of 50 cycles from -P2 to +P2 — P2 = 600 Pa (P2 = 0.5 P1)

Observations after 50 cycles from -P2 to +P2 **No comment**

3.5 Mean for air permeability tests after P2 for positive and negative pressure

(After opening and closing the assembly, set pressure to 660 Pa 3 times to fit the seals)

Total surface area: **4.09** ***m²*** ***Length of the casement seal:*** **10.01 m**

Positive pressure => **Temp: 25.4°C** **P Atm: 101.5 kPa**

Negative pressure => **Temp: 25.5°C** **P Atm: 101.5 kPa**

Pressure (Pa)	m3/h/m2 in pressure	m3/h/lm in pressure	m3/h/m2 in negative pressure	m3/h/lm in negative pressure	$m^3/h/m^2$ mean	Difference from initial flowrate+ 20% of the class obtained	Difference from initial flowrate + 20% of the class claimed
50	1.0	0.4	1.5	0.6	**1.22**	1.67	1.67
100	1.3	0.6	2.2	0.9	**1.75**	2.60	2.60
150	1.7	0.7	2.8	1.1	**2.25**	3.37	3.37
200	2.2	0.9	3.4	1.4	**2.76**	4.07	4.07
250	2.6	1.1	3.8	1.6	**3.19**	4.73	4.73
300	3.0	1.2	4.3	1.8	**3.65**	5.36	5.36
450	4.1	1.7	6.0	2.4	**5.06**	7.22	7.22
600	5.2	2.1	7.6	3.1	**6.39**	9.10	9.10

$M^3/h/lm$ mean	Difference from initial flowrate+ 20% of the class obtained	Difference from initial flowrate + 20% of the class claimed
0.50	0.62	0.62
0.72	0.97	0.97
0.92	1.25	1.25
1.13	1.51	1.51
1.30	1.76	1.76
1.49	1.99	1.99
2.07	2.69	2.69
2.61	3.41	3.41

3.6 Safety test at -P3 and +P3 — P3 = 1800 Pa (P3 = 1.5 P1)

Class	Pressure (Pa)	Observations
V*3	**1800**	No comment
Additional pressure 2000 Pa		**No comment**

Summary

Positive and negative pressure deflection	C	3		CLASSIFICATION OBTAINED	CLASSIFICATION ADOPTED
P2 cycles	C	3		V* C 3	V* C 3
> 20% of the class obtained?	C	no	X		
> 20% of the class claimed?	C	X	no		
Safety	C	3			

SAPA SBS **Test N° : EN-2128** **DATE: 3/7/2012**

SAMPLING FOR TESTS A *.E*. V*. *Project ref:* DUBAI

JOINERY CHARACTERISTICS

TYPE OF JOINERY	sliding 2 Vtx FC			REINFORCEMENT	1 flat section, 40x4 aluminium/alternated	
TYPE OF OPENING	Sliding	N° of Openings: **2**		WIDTH OF THE STOP	None	
OVERALL DIMENSIONS	**H= 2.300 m x L = 1.780 m / S=4.09 m²**			HARDWARE	Croise DS (Seduction)	
CASEMENT DIMENSIONS	**H= 2.203 L = 1.700 m / S=3.75 m²**			N° OF LOCKS	6	WATER JET
SEAL LENGTH	***L = 10.01 m***	3xH + 2xL	N° Vtx: **2 Vtx**	N° OF HINGES	None	None

HANDLING FORCE REQUIRED	
Opening: 31 N	
Closing: 44.6 N	

1. AIR PERMEABILITY

P+		P-		
A*4		A*4	=	A*4

2. WATER LEAKTIGHTNESS **E*9A**

Surface area = 4.09 m² ***Seal length = 10.01 m***

***Positive pressure* => Temp: 23.5°C P Atm: 101.5 kPa**

***Negative pressure* => Temp: 23.6°C P Atm: 101.5 kPa**

P (Pa)	Positive pressure m³/h/m²	Positive pressure m³/h/m	Negative pressure m³/h/m²	Negative pressure m³/h/m	Mean m³/h/m²	Mean class	Mean m³/h/m	Mean class
50	1.13	0.46	1.46	0.60	**1.29**	**4**	**0.53**	**3**
100	1.64	0.67	2.36	0.97	**2.00**	**4**	**0.82**	**3**
150	2.10	0.86	3.06	1.25	**2.58**	**4**	**1.06**	**3**
200	2.60	1.06	3.63	1.48	**3.11**	**4**	**1.27**	**3**
250	3.02	1.23	4.22	1.73	**3.62**	**4**	**1.48**	**3**
300	3.47	1.42	4.75	1.94	**4.11**	**4**	**1.68**	**3**
450	4.80	1.96	6.37	2.60	**5.59**	**4**	**2.28**	**3**
600	6.02	2.46	8.22	3.36	**7.12**	**4**	**2.91**	**3**

Selected method: ***A***
Nozzle orientation: ***24 °***

P (Pa)	Time (min)	Meth. A	Observations
0	15	1A	No comment
50	5	2A	No comment
100	5	3A	No comment
150	5	4A	No comment
200	5	5A	No comment
250	5	6A	No comment
300	5	7A	No comment
450	5	8A	No comment
600	5	9A	No comment
Exxx	5	Exxx	0

3. WIND RESISTANCE ***Option: A***
Option: 3 ***P1 = 1200 Pa***

P (Pa)	Positive pressure Deflection Stop	Positive pressure Deflection Mullion	Positive pressure Deflection Crossbeam	Negative pressure Deflection Stop	Negative pressure Deflection Mullion	Negative pressure Deflection Crossbeam
400	2.1			-1.8		
800	4.0			-3.8		
1200	6.1			-5.9		
1600						
2000						
0 after 60s	0.0			0.0		
Opposite deflection	**6.1**			**-5.9**		
Distance between sensors H and B	2123			2123		
Allowable relative deflection 1/150	14.2			-14.2		
Relative deflection	1/349			**1/-360**		

3.4 Repeated pressure of 50 cycles from -P2 to +P2
P2= 600 Pa Pa *P2= 0.5 P1*
Observations after 50 cycles from -P2 to +P2: **NO COMMENT**

3.5 Mean for air permeability tests* at *P2 at positive and negative pressure
Positive pressure => Temp: 25.4°C P Atm: 101.5 kPa
Negative pressure => Temp: 25.5°C P Atm: 101.5 kPa

P	m3/h/m2	20% O	20% R	m3/h/m	20% O	20% R
50	1.22	1.67	1.67	0.50	0.62	0.62
100	1.75	2.60	2.60	0.72	0.97	0.97
150	2.25	3.37	3.37	0.92	1.25	1.25
200	2.76	4.07	4.07	1.13	1.51	1.51
250	3.19	4.73	4.73	1.30	1.76	1.76
300	3.65	5.36	5.36	1.49	1.99	1.99
450	5.06	7.22	7.22	2.07	2.69	2.69
600	6.39	9.10	9.10	2.61	3.41	3.41

3.6 Safety test at -P3 and +P3

	Observations:
Resistance to negative pressure of -1800 Pa	**No comment**
Resistance to positive pressure of 1800 Pa	**No comment**

Classification claimed
A*4 E*8A V*A3

			CLASSIFICATION OBTAINED	CLASSIFICATION ADOPTED
Positive and negative pressure deflection	**C**	**3**		
P2 cycles	**No comment**		A*4 E*9A	**A*4 E*9A**
> 20% of the class obtained?	**C**	**no** X		
> 20% of the class claimed?	**C**	X **no**	V*C3	**V*C3**
Safety	**C**	**3**		

Observation: Mr BRODE Jean-Baptiste of bureau VERITAS

This report includes 9 pages including 2 with plans 8-9

Additional pressure 2000 Pa	No comment

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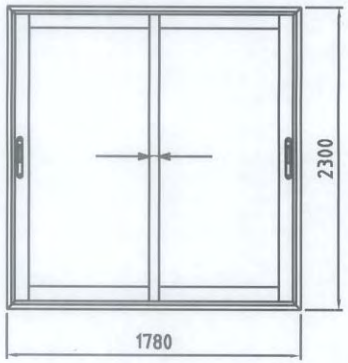


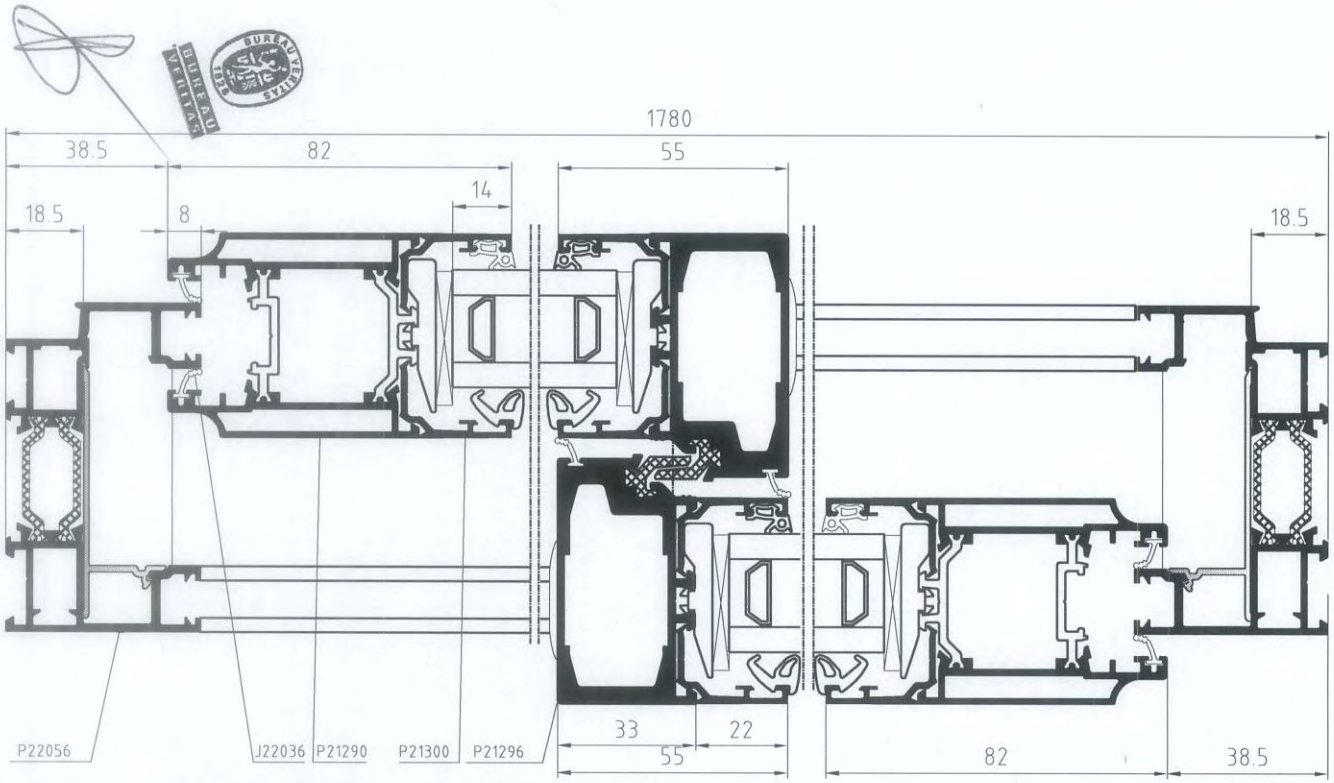
PROFILES

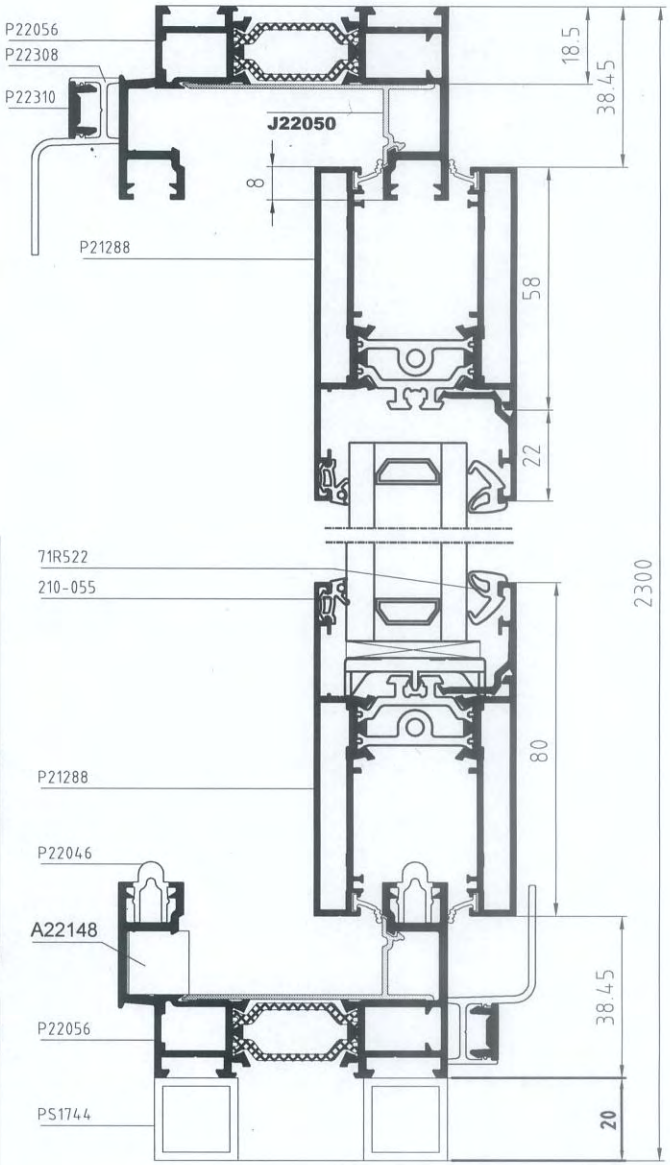
Ref.	Désignation	Coupe	Qte	Débit	Coupe	Qte.	Débit
Dormants							
P22056	Dormant 2 rails		1	L		2	H-20
P22046	Rail		2	L-74			
P22308	Rejet d'eau		2	L			
P22310	Clip pour Rejet d'eau		2	L			
PS1744	Tube carré 20x20x2		2	L			
Ouvrants							
P21290	Montant latéral forte charge					2	H-97
P21296	Montant central forte charge renforcé					2	H-97
P21288	Traverse plate forte charge		4	L/2-104			
P21300	Parclose forte charge		4	L/2-104		8	H-257

Débit de vitrage 28 MM: 6/16/6	L/2-120	H-209	Qte: 2

JOINTS

Réf.	Désignation	Qté	Débit	Qté	Débit
J22050	Bouclier thermique	2	L-37	2	H-37
J22036	Joint TPE	4	L	6	H
210-055	Joint frappe	2	L	4	H
71R522	Joint frappe	2	L	4	H





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DIMENSION		FERMETURE	
LARGEUR	HAUTEUR	SEMI-FIXE	SERVICE
1780	2280	SEDUCTION 3 PTS	SEDUCTION 3PTS

sapa

Designation : Page 8
AEV OUVRANT FORTE CHARGE
Draingage tubulaire - JT TPE

Catégorie de dessin: statut du dessin

Numero reference : Indice
EN 2128

Modifié par :

Dessin : P.TURQUI | Vérifié par : | Date : 03/07/12 | Echelle : 1:2 | Serie : PERF70 | Dossier : ETU488

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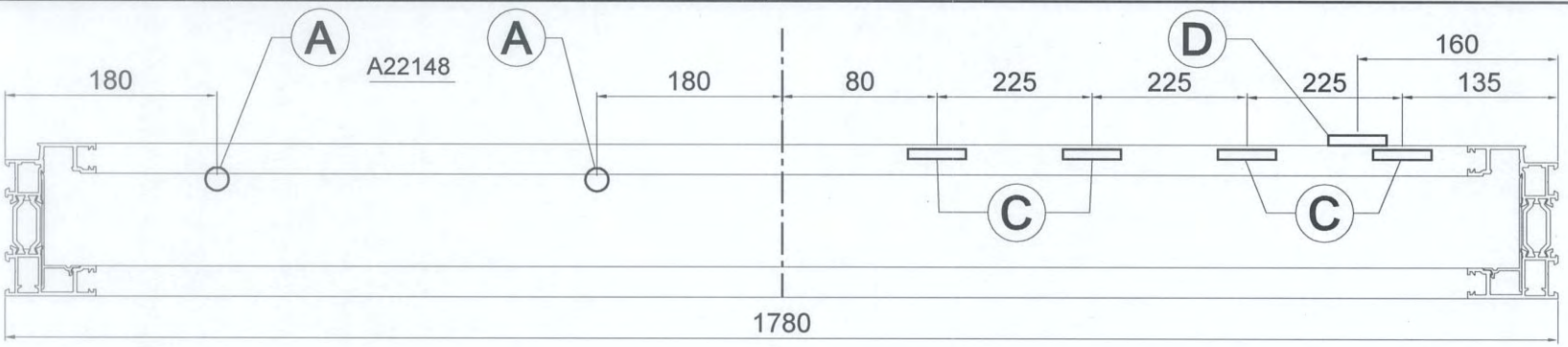

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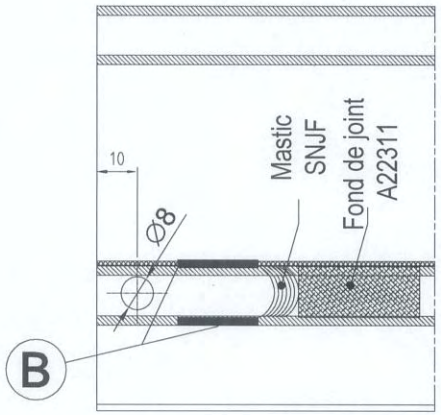

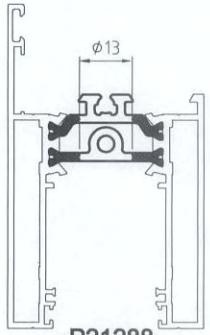

P21288
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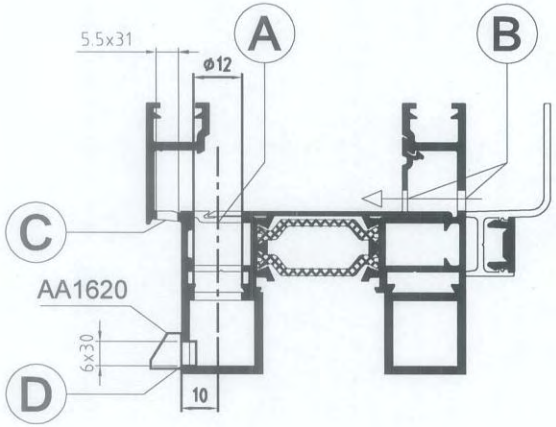

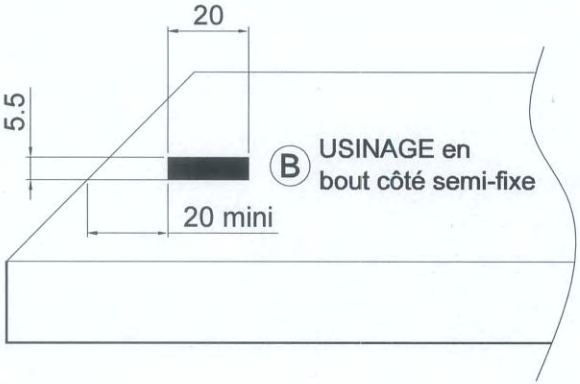

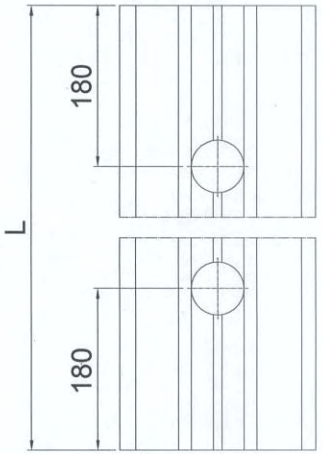

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sapa	Designation : Page 9 AEV OUVRANT FORTE CHARGE Plan des Drainages			Catégorie de dessin:	statut du dessin
	Modifié par :			Numero reference : EN 2128	Indice
Dessin : P.TURQUI	Vérifié par :	Date : 03/07/12	Echelle : 1:2	Serie : PERF70	Dossier : ETU488