TÜV NORD

C E R T I F I C A T E

Management system as per
EN ISO 9001 : 2008

In accordance with TÜV NORD CERT procedures, it is hereby certified that

Spectrum Profiles Kft

H-2310 Szigetszentmiklos, Poeta utca 7, HUNGARY

applies a management system in line with the above standard for the following scope

Development, Production and Sales of U-PVC Profiles for Windows

Certificate Registration No. 44 100 125975
Audit Report No.2684/2020

Valid from 2022-04-03
Valid unti 2024-04-02
Initial certification 2009-07-03

Certification Body
At TÜV NORD CERT GmbH

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

TÜV NORD CERT GmbH Langemarckstrasse 20 45141 Essen www.tuev-nord-cert.com

DAkkS
Deutsche
Akkreditierungsstelle
D-ZM-12087-01-01

Laboratorium Techniki Budowlanej
Sp. z o.o.
Dąbrowa Górnicza 41-306, ul. Laski 83
NIP 6292465943; KRS 0000447876
Jednostka notyfikowana/Notified body 1827
WWW.LTB.org.pl

tel/fax: (+48) 32 26 4 079 kom: 608 50 66 32; 608 50 66 35; 604 97 62 07
Bank Śląski S.A. o/Dąbrowa Górnicza nr 17 1050 1360 1000 0023 6773 9022

AB 661

Świadectwo Badań Wstępnych Typu do normy PN-EN 14351-1+A1

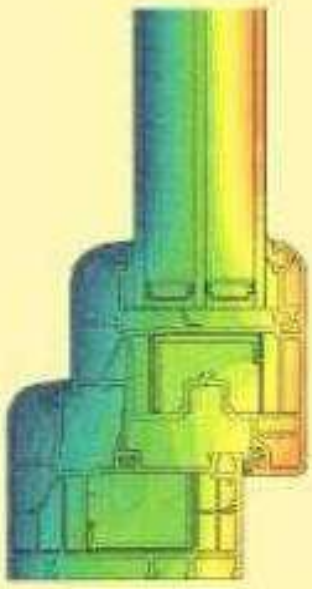
Nr 152/B – 2013 – 1

Laboratorium Techniki Budowlanej przeprowadziło wg norm PN-EN ISO 10077-1:2007 i PN-EN ISO 10077-2:2012 obliczenia cieplne okien systemu **SPECTRUM 86mm** opisanych w sprawozdaniu 152/B-2013, na zlecenie firmy:

Spectrum Profiles Kft.
Jaszberenyi ut 57
1106 Budapest

Wyniki badań	
Złożenie elementów	Rama/ skrzydło
U_f [W/m^{2}K]	1,0
Ψ [W/mK]	0,042
Szyba zespolona U_g [W/m^{2}K]	0,5
U_w [W/m^{2}K] dla okna 1,23 x 1,48 m	**0,78**

Wyniki badań odnoszą się jedynie do badanej próbki i warunków badania. Deklarowanie parametrów dla innych obiektów należy prowadzić zgodnie z zasadami podanymi w normie PN-EN 14351-1+A1.



Kierownik Jakości
mgr inż. Andrzej Żyła

Kierownik Techniczny
mgr inż. Bogdan Wójtowicz

Dąbrowa Górnicza, dnia 13 sierpnia 2013 r.

Laboratorium Techniki Budowlanej
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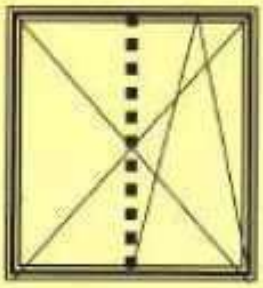
AB 661

Prüfbericht 187/B-2013-9
Erstprüfung (ITT) gemäß mit EN 14351-1:2006+A1

Laboratorium für Bautechnik hat die Prüfung der von:

Spectrum Profiles Kft.
Jaszberenyi u. 57
Hungary

hergestellten Fenster aus Profilensystem **SPECTRUM 86mm MD** durchgeführt, geschriebene in Prüfbericht 187/B-2013:

Probekörper	Prüfnorm	Eigenschaft	Klassifizierungnorm/Wert
 B=2000 H=2300	EN 12211	Widerstands-fähigkeit gegen Windlast Prüfdruck P1 **800 Pa** Rahmendurchbiegung: **Prüfdruck "+" 1/352** **Prüfdruck "-" 1/360**	EN 12210 **Klasse C2**
	EN 1027	Schlagregendichtheit **Dicht bis 450 Pa**	EN 12208 Ungeschützt (A) **Klasse 8A**
Materialien: Blendrahmen: 68610; Flügel: 68620; Stulp: 68631; Verstärkungen: s=2,0; Dichtungen: 57071, 57074; Beschlag: MACO; IGU: 4/16/4	EN 1026	Luftdurchlässigkeit bei 100 Pa: **0,71 $m^3/h\ m^2$** oder **0,31 $m^3/h\ m$**	EN 12207 **Klasse 4** (Maximaler prüfdruck600 Pa) Referenz- Luftdurchlässigkeit bei 100 Pa: 3$m^3/h\ m^2$ oder 0,75 $m^3/h\ m$
Bei die Erklärung von Kennenwerten für andere Gegenstände sind die Richtlinien laut der Norm EN 14351-1 +A1 zu berücksichtigen.		Prüfergebnisse beziehen sich lediglich auf die Prüfprobe und Prüfbedingungen	

Qualitätsleiter

mgr inż. Andrzej Żyła

LABORATORIUM TECHNIKI BUDOWLANEJ AB 661 LTB Dąbrowa Górnicza

Technischer Leiter

mgr inż. Bogdan Wójtowicz

Dąbrowa Górnicza, am 19 September 2013

Laboratorium Techniki Budowlanej
Sp. z o.o.
Dąbrowa Górnicza 41-306, ul. Laski 83
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Jednostka notyfikowana/Notified body 1827
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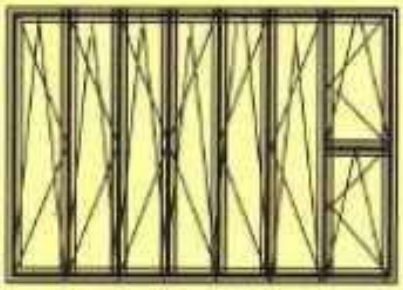
AB 661

Prüfbericht 187/B-2013-8
Erstprüfung (ITT) gemäß mit EN 14351-1:2006+A1

Laboratorium für Bautechnik hat die Prüfung der von:

Spectrum Profiles Kft.
Jaszberenyi u. 57
Hungary

hergestellten Fenster aus Profilensystem **SPECTRUM 86mm MD** durchgeführt, geschriebene in Prüfbericht 187/B-2013:

Probekörper	Prüfnorm	Eigenschaft	Klassifizierungnorm/Wert
 B=3563 H=2295	EN 12211	Widerstands-fähigkeit gegen Windlast Prüfdruck P1 **1200 Pa** Rahmendurchbiegung: **Prüfdruck "+" 1/329** **Prüfdruck "-" 1/337**	EN 12210 **Klasse C3**
	EN 1027	Schlagregendichtheit **Dicht bis 250 Pa**	EN 12208 Ungeschützt (A) **Klasse 6A**
Materialien: Blendrahmen: 68610 Flügel: 68620 Pfosten/Kämpfer: 68630 Verstärkungen: s=2,0 Dichtungen: 57071, 57074 Beschlag: MACO IGU: 4/16/4	EN 1026	Luftdurchlässigkeit bei 100 Pa: **1,10 $m^3/h\ m^2$** oder **0,23 $m^3/h\ m$**	EN 12207 **Klasse 4** (Maximaler prüfdruck600 Pa) Referenz- Luftdurchlässigkeit bei 100 Pa: 3$m^3/h\ m^2$ oder 0,75 $m^3/h\ m$
Bei die Erklärung von Kennenwerten für andere Gegenstände sind die Richtlinien laut der Norm EN 14351-1 +A1 zu berücksichtigen.		Prüfergebnisse beziehen sich lediglich auf die Prüfprobe und Prüfbedingungen	

Qualitätsleiter

mgr inż. Andrzej Żyła

Technischer Leiter

mgr inż. Bogdan Wójtowicz

LABORATORIUM TECHNIKI BUDOWLANEJ AB 661 LTB Dąbrowa Górnicza

Dąbrowa Górnicza, am 10 September 2013

Laboratorium Techniki Budowlanej
Sp. z o.o.
Dąbrowa Górnicza 41-306, ul. Laski 83
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AB 661

Prüfbericht 187/B-2013-7
Erstprüfung (ITT) gemäß mit EN 14351-1:2006+A1

Laboratorium für Bautechnik hat die Prüfung der von:

Spectrum Profiles Kft.
Jaszberenyi u. 57
Hungary

hergestellten Fenster aus Profilensystem **SPECTRUM 86mm MD** durchgeführt, geschriebene in Prüfbericht 187/B-2013:

Probekörper	Prüfnorm	Eigenschaft	Klassifizierungnorm/Wert
 B=1000 H=1800	EN 1027	Schlagregendichtheit **Dicht bis 450 Pa**	EN 12208 Ungeschützt (A) **Klasse 8A**
	EN 14609	Tragfähigkeit von Sicherheits-vorrichtungen	EN 14351-1+A1 Schwellenwert erfüllt **350 N**
Materialien: Blendrahmen: 68610; Flügel: 68620; Blendrahmenverstärkung: s=1,50; Flügelverstärkung: s=1,50; Dichtungen: 57071, 57074; Beschlag: MACO; Isolierglass: 4/16/4	EN 1026	Luftdurchlässigkeit bei 100 Pa: **0,51 $m^3/h\ m^2$** oder **0,17 $m^3/h\ m$**	EN 12207 **Klasse 4** (Maximaler prüfdruck600 Pa) Referenz- Luftdurchlässigkeit bei 100 Pa: 3 $m^3/h\ m^2$ oder 0,75 $m^3/h\ m$
Bei die Erklärung von Kennenwerten für andere Gegenstände sind die Richtlinien laut der Norm EN 14351-1 +A1 zu berücksichtigen.		Prüfergebnisse beziehen sich lediglich auf die Prüfprobe und Prüfbedingungen	

Qualitätsleiter

mgr inż. Andrzej Żyła

LABORATORIUM TECHNIKI BUDOWLANEJ AB 661 LTB Dąbrowa Górnicza

Technischer Leiter

mgr inż. Bogdan Wójtowicz

Dąbrowa Górnicza, dnia 19 September 2013

LIGNOTESTING, a.s.
Technická 5
821 04 Bratislava

Testing laboratory of materials and products

Test report
No. 810/20/0090/15

Notified body 1478

Number of copies: 3
Copy No.:

Manufacturer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza , Slovakia

Manufacturing plant: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Customer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Product: Plastic window

System: Spectrum Prestige 86 mm

Product: Plastic French window with turn and tilt leaf

Overall dimensions: (width x height): (1000x2350) mm

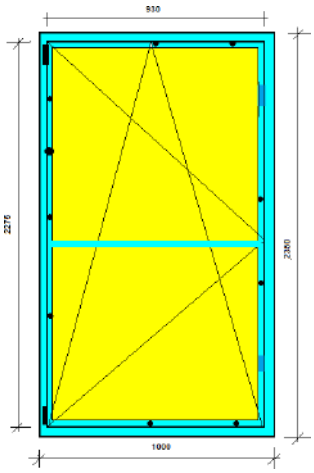
Test method

EN 1027: 2000
Windows and doors. Watertightness. Test method

EN 12211: 2000
Windows and doors. Resistance to wind load. Test method

EN 1026: 2000
Windows and doors. Air permeability. Test method

Figuration



Purpose of tests

On the basis of order no. TR 006/15 dated 29.05.2015

Contents

Number of pages: 11
Number of pages of annexes: 08
Annexes:

01 to 03	Sub - protocol
04	For classification
05	Sketch

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar, Product specialist

Authorized by: Mgr. Tibor Skákala, Head of the Testing Laboratory

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821 04 Bratislava

1. Test sample

1.1 Marking

Name	Plastic French window with turn and tilt leaf, system Spectrum Prestige 86 mm
Number	1 piece
Identification number	26/2015
Serial number	02

1.2 Dimensions

Overall dimension (width x height)	(1000x2350) mm
Opening vent dimension (width x height)	(930x2275) mm
Area [m^2]	2,35
Length of air space [m]	6,41

1.3 Technical description

Frame	68610, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Casement:	68620, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Mullion:	68630, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Reinforcement:	Thickness 1,5 - 2 mm: Frame+casement: 150U3527, mullion: 200O3419
Weather stripping:	Inner, central and outer gasket, Dekompression frame - two openings of sealing
Glazing:	(4-12-4-12-4) mm, spacer: AL
Glazing bead	68642
Hardware:	Hardware ROTO NT with safety device (catches with length of 260 mm) Location of latch hardware: in zero position..

2. Sampling

2.1 Test sampling

Sampling report	Sampling was not realized

2.2 Delivery of test sample to the test laboratory

Date of receipt of the test sample	04.12.2015

3. Tests results

3.1 Time for tests

Start of testing	08.12.2015
End of testing	08.12.2015

3.2 Summary of test results

The test results are listed in the individual protocols, which are annexed to this test report.

Characteristic	Test method	Test result	Serial number of sub-protocol
Resistance to wind load	EN 12211	the greatest value of the relative frontal deflection of the casement in pressure Δ p = 1 600 Pa is 0,0013	01
Watertightness	EN 1027	without water penetration at a pressure Δ p = 600 Pa	02
Air permeability	EN 1026	Reference air permeability at a pressure Δp = 100 Pa V_A = 0,53 $m^3/(hm^2)$ V_L= 0,19 $m^3/(hm)$	03

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Sub-protocol
No. 810/20/0090/15 - 01

1. Test

1.1 Name
Air permeability

1.2 Test method
EN 1026: 2001 Windows and doors. Air permeability. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

2.3 Preparation of specimen
Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel
Michal Beleš,

3. Test results
Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 01	V_L [$m^3h^{-1}m^{-1}$]	0,09	0,19	0,26	0,33	0,37	0,38	0,56	1,51
	V_A [$m^3h^{-1}m^{-2}$]	0,24	0,53	0,71	0,89	1,02	1,04	1,53	4,12

Enlarged uncertainty of measurement at k =2: U = 1,3 %

Key
hinge
closure - stop

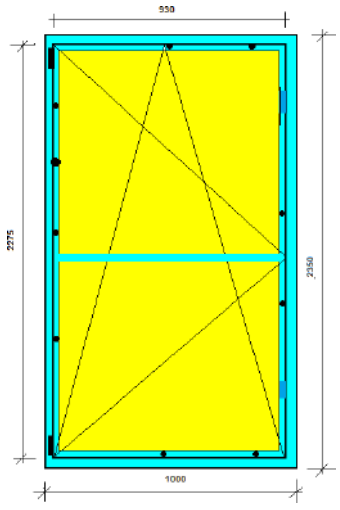

Figure No.1 Position of closure elements during the test

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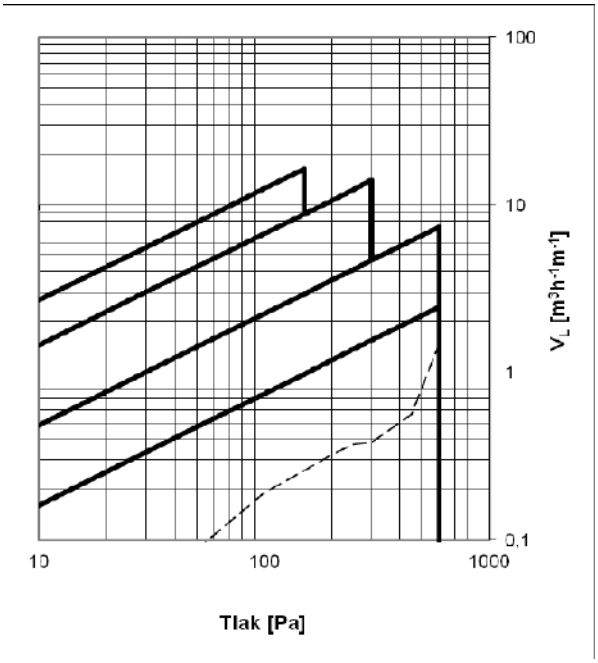

Figure No.2 Reference air permeability V_L

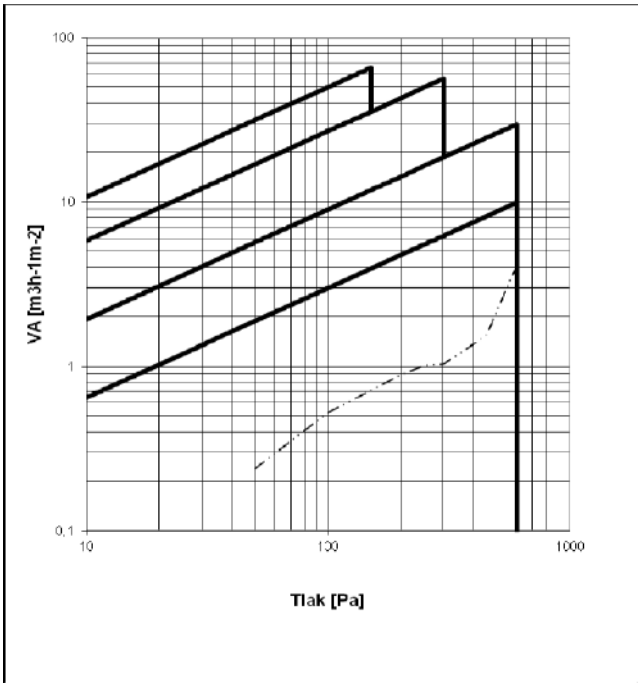

Figure No.3 Reference air permeability V_A

Bratislava 21.12.2015

Prepared: Ing. Ján Remiar

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Sub-protocol
No. 810/20/0090/15 - 02

1. Test

1.1 Name

Resistance to wind load

1.2 Test method

EN 12211: 2001 Windows and doors. Resistance to wind load. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11
	T - 1267/2014, T - 1268A/2014, T - 1268B/2014

2.2 Test conditions

Air temperature	20°C
Relative air humidity	50%

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel

Michal Beleš,

3. Test results

Test pressure (Pa)	P1 =	± 1 600	P2 =	± 800	P3 =	± 2 400

Marking of samples	*Measuring point*	*Frontal change of position (mm)*	*Frontal deflection (mm)*		*Relative frontal deflection (mm)*		*Marking of samples*	
			+ P1	- P1	+ P1	- P1	+ P1	- P1
Sample 02	B	1 600	4,63	4,08	1,00	1,26	0,0010	0,0013

Enlarged uncertainty of measurement at k = 2: U = 1,26 %

Marking of samples	*Test at repeated pressure P2*	*Safety test at pressure P3*
Sample 02	without visible deformation of the distance of 1 m in natural light and without deterioration in function	the test sample remained closed without destruction of any part of the test sample

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Key

hinge

closure - stop

A, B, C AC = 930 mm

- measuring points

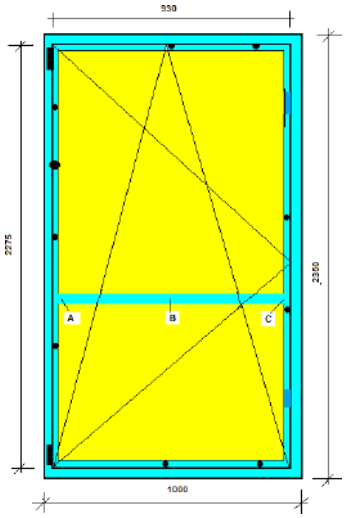

Figure No.1 Position of closure elements and measuring points during the test

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 02	V_L [$m^3h^{-1}m^{-1}$]	0,21	0,41	0,52	0,61	0,69	0,78	1,12	1,84
	V_A [$m^3h^{-1}m^{-2}$]	0,34	0,65	0,82	0,96	1,09	1,23	1,77	2,91

Enlarged uncertainty of measurement at k = 2: U=1,3%

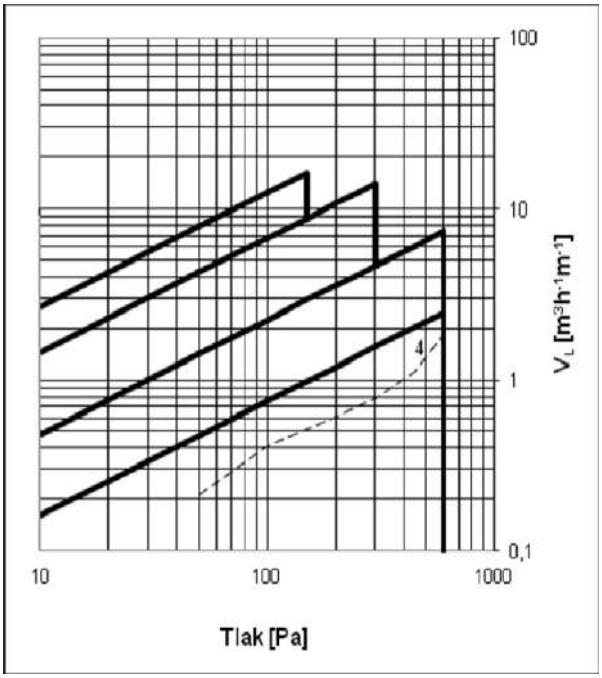

Figure No. 2 Reference air permeability V_L

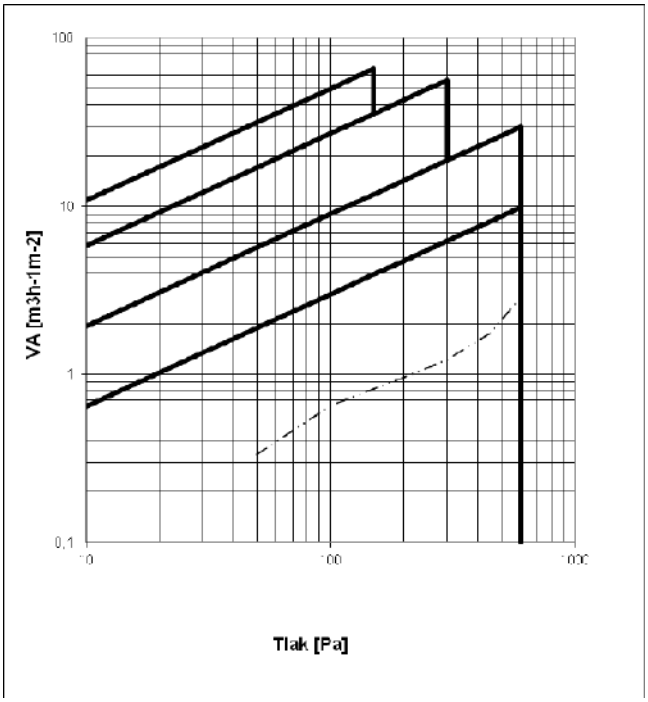

Figure No. 3 Reference air permeability V_A

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 02	V_L [$m^3h^{-1}m^{-1}$]	0,24	0,40	0,51	0,62	0,71	0,84	1,45	2,54
	V_A [$m^3h^{-1}m^{-2}$]	0,38	0,63	0,81	0,97	1,12	1,32	2,28	4,01

Enlarged uncertainty of measurement at k = 2: U=1,3%

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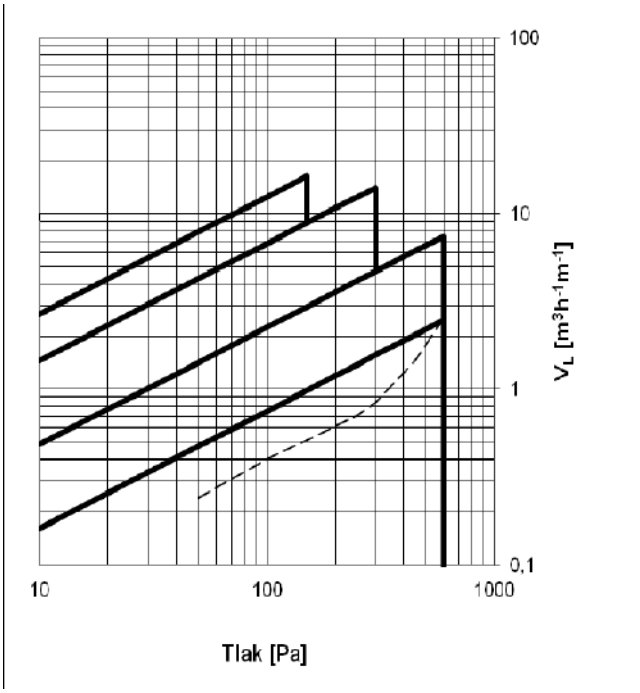

Figure No. 2 Reference air permeability V_L

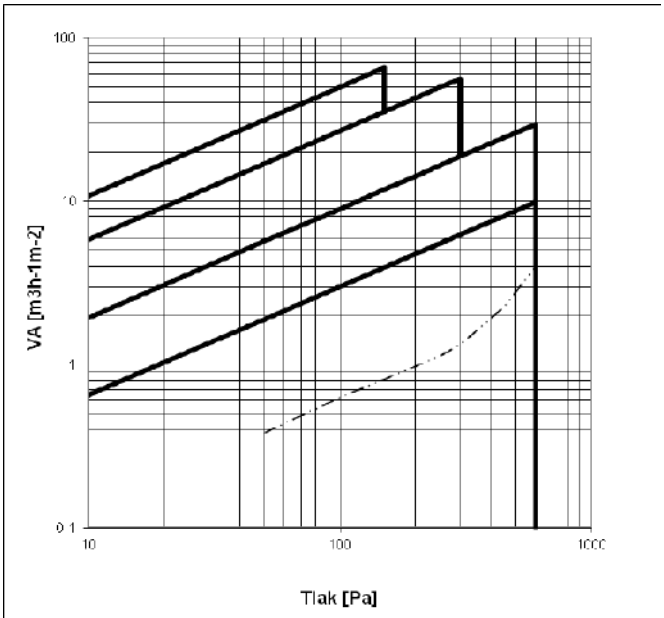

Figure No. 3 Reference air permeability V_A

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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821 04 Bratislava

Sub-protocol

No. 810/20/0090/15 - 03

1. Test

1.1 Name

Watertightness

1.2 Test method

EN 1027: 2001 Windows and doors. Watertightness. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	ČF - 02/24
Calibration certificates	0163/312.04/14

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer.

2.4 Involved personnel

Michal Beleš

3. Test results

Water penetration time

Marking of samples	*Pressure p [Pa] / Water penetration time t [min]*										
	0	50	100	150	200	250	300	450	600		
Sample 02	-	-	-	-	-	-	-	-	-		

Key

- hinge
- ● closure - stop
- △ water penetration - dropping
- ▲ water penetration - flowing

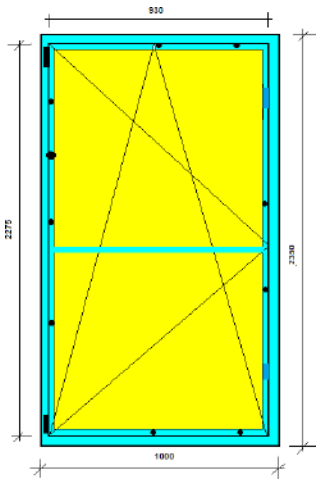

Figure No.1 Position of closure elements and water penetration during the test

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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Technická 5
821 04 Bratislava

Proposal for the classification

1. Product

1.1 Name

Product: Plastic French window with turn and tilt leaf, system Spectrum Prestige 86 mm

1.2 Dimensions

Overall dimension (width x height): (1000x2350) mm

2. Classification standards

EN 12208: 1999	Windows and doors. Watertightness. Classification
EN 12210: 1999	Windows and doors. Resistance to wind load. Classification
EN 12207: 1999	Windows and doors. Air permeability. Classification

3. Values and classes of the product

Characteristic	Value and class
Watertightness	**class 4**
Resistance to wind load	**class C4**
Air permeability	**class 9A**

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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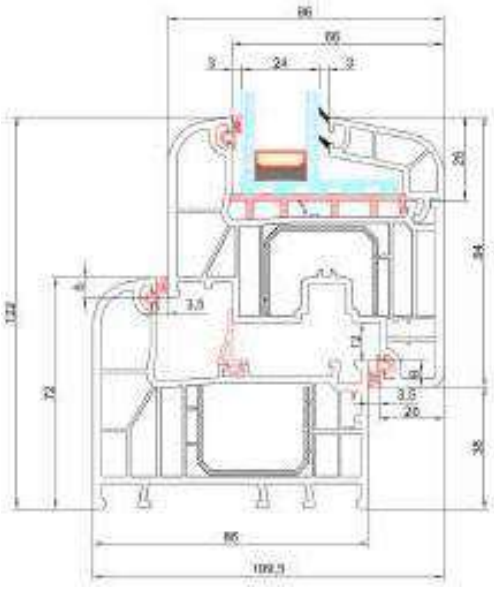
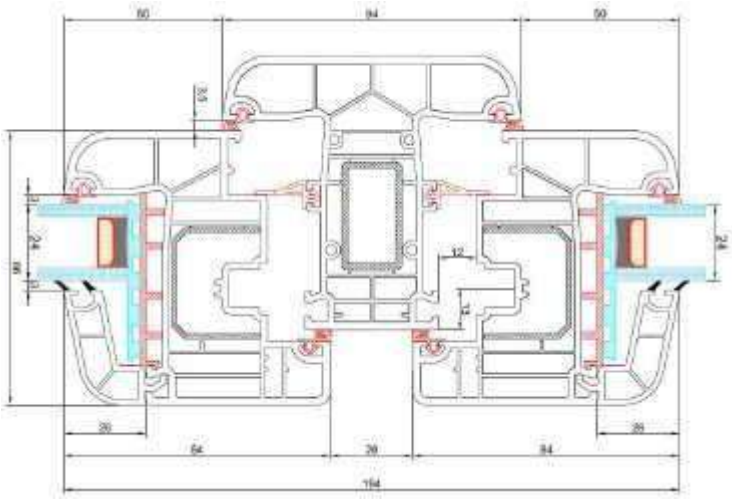
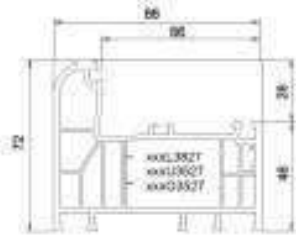
Technická 5
821 04 Bratislava



Picture No. 1 Frame - casement



Picture No. 2 Casement - mullion

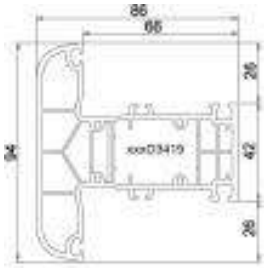


68610

Frame

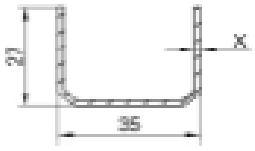
68620

Casement

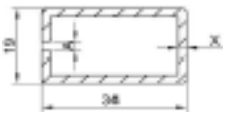


68630

Mullion



Reinforcement frame, casement



Reinforcement mullion

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Testing laboratory of materials and products

Test report
No. 810/20/0089/15

Notified body 1478

Number of copies: 3
Copy No.:

Manufacturer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza , Slovakia

Manufacturing plant: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Customer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Product: Plastic window

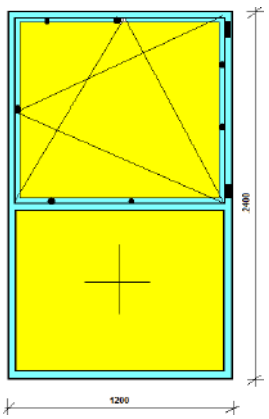
System: Spectrum Prestige 86 mm

Product: Plastic window with turn and tilt leaf and fixed fanlight

Overall dimensions: (width x height): (1200x2400) mm

Test method
EN 1027: 2000
Windows and doors. Watertightness. Test method
EN 12211: 2000
Windows and doors. Resistance to wind load. Test method
EN 1026: 2000
Windows and doors. Air permeability. Test method

Figuration



Purpose of tests
On the basis of order no. TR 006/15 dated 29.05.2015

Contents

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar, Product specialist

Authorized by: Mgr. Tibor Skákala, Head of the Testing Laboratory

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1. Test sample

1.1 Marking

Name	Plastic window with turn and tilt leaf and fixed fanlight, system Spectrum Prestige 86 mm
Number	1 piece
Identification number	26/2015
Serial number	01

1.2 Dimensions

Overall dimension (width x height)	(1200x2400) mm
Opening vent dimension (width x height)	(1120x1150) mm
Area [m^2]	2,88
Length of air space [m]	4,54

1.3 Technical description

Frame	68610, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Casement:	68620, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Mullion:	68630, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Reinforcement:	Thickness 1,5 - 2 mm: Frame+casement: 150U3527, mullion: 200O3419
Weather stripping:	Inner, central and outer gasket, Dekompression frame - two openings of sealing
Glazing:	(4-12-4-12-4) mm, spacer: AL
Glazing bead	68642
Hardware:	Hardware WINKHAUS CONCEPT with safety device (catches with length of 260 mm) Location of latch hardware: in zero position..

2. Sampling

2.1 Test sampling

Sampling report	Sampling was not realized

2.2 Delivery of test sample to the test laboratory

Date of receipt of the test sample	09.08.2015

3. Tests results

3.1 Time for tests

Start of testing	10.08.2015
End of testing	10.08.2015

3.2 Summary of test results

The test results are listed in the individual protocols, which are annexed to this test report.

Characteristic	Test method	Test result	Serial number of sub-protocol
Resistance to wind load	EN 12211	the greatest value of the relative frontal deflection of the casement in pressure Δ p = 1 600 Pa is 0,0017	01
Watertightness	EN 1027	without water penetration at a pressure Δ p = 600 Pa	02
Air permeability	EN 1026	Reference air permeability at a pressure Δp = 100 Pa V_A = 0,65 $m^3/(hm^2)$ V_L= 0,41 $m^3/(hm)$	03

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Sub-protocol
No. 810/20/0089/15 - 01

1. Test

1.1 Name
Air permeability

1.2 Test method
EN 1026: 2001 Windows and doors. Air permeability. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

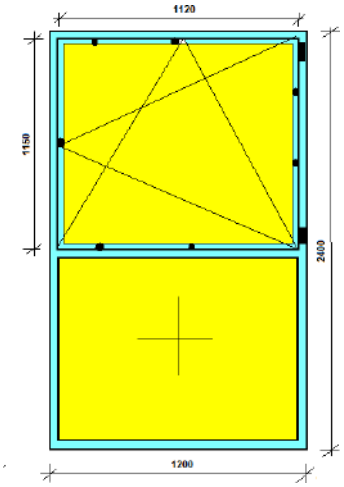
2.3 Preparation of specimen
Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel
Michal Beleš,

3. Test results
Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 01	V_L [$m^3h^{-1}m^{-1}$]	0,21	0,41	0,52	0,61	0,69	0,78	1,12	1,84
	V_A [$m^3h^{-1}m^{-2}$]	0,34	0,65	0,82	0,96	1,09	1,23	1,77	2,91

Enlarged uncertainty of measurement at k =2: U = 1,3 %



Key
hinge
closure - stop

Figure No.1 Position of closure elements during the test

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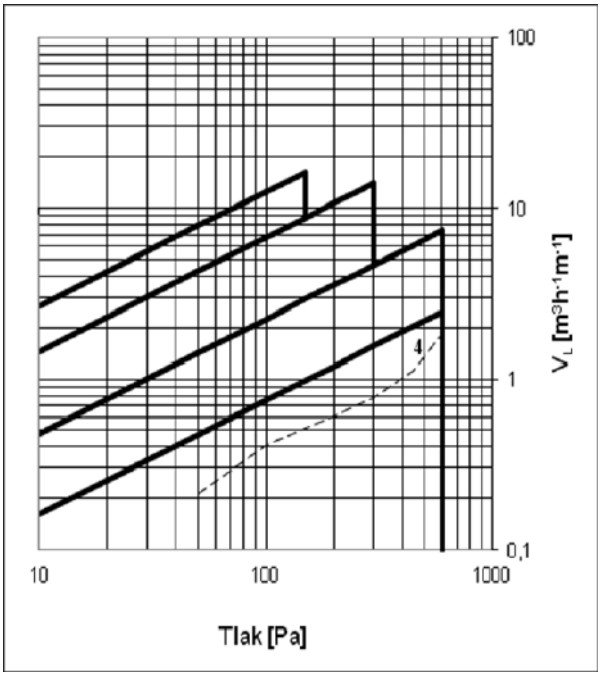

Figure No.2 Reference air permeability V_L

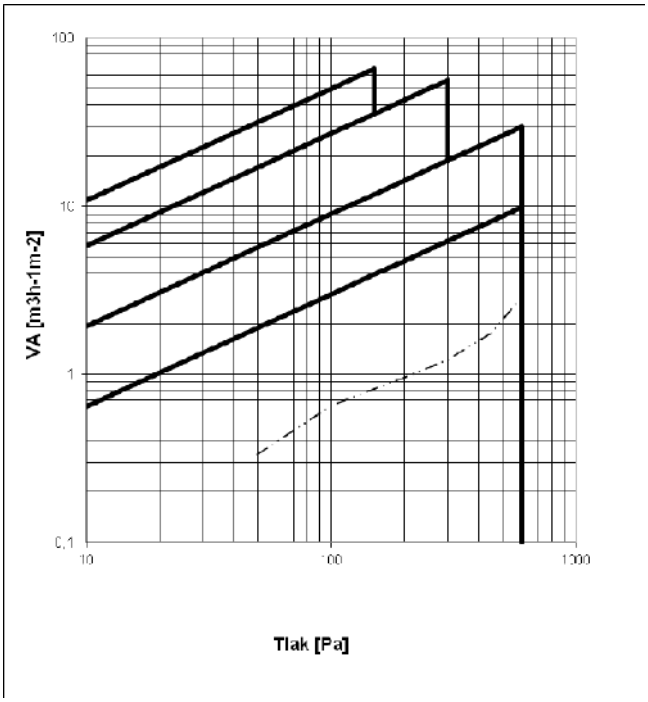

Figure No.3 Reference air permeability V_A

Bratislava 21.12.2015

Prepared: Ing. Ján Remiar

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Sub-protocol
No. 810/20/0090/15 - 02

1. Test

1.1 Name

Resistance to wind load

1.2 Test method

EN 12211: 2001 Windows and doors. Resistance to wind load. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11
	T - 1267/2014, T - 1268A/2014, T - 1268B/2014

2.2 Test conditions

Air temperature	20°C
Relative air humidity	50%

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel

Michal Beleš,

3. Test results

Test pressure (Pa)	P1 =	± 1 600	P2 =	± 800	P3 =	± 2 400

Marking of samples	*Measuring point*	*Frontal change of position (mm)*	*Frontal deflection (mm)*		*Relative frontal deflection (mm)*		*Marking of samples*	
			+ P1	- P1	+ P1	- P1	+ P1	- P1
Sample 02	B	1 600	4,63	4,08	1,00	1,26	0,0010	0,0013

Enlarged uncertainty of measurement at k = 2: U = 1,26 %

Marking of samples	*Test at repeated pressure P2*	*Safety test at pressure P3*
Sample 02	without visible deformation of the distance of 1 m in natural light and without deterioration in function	the test sample remained closed without destruction of any part of the test sample

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Key

hinge

closure - stop

A, B, C AC = 930 mm

- measuring points

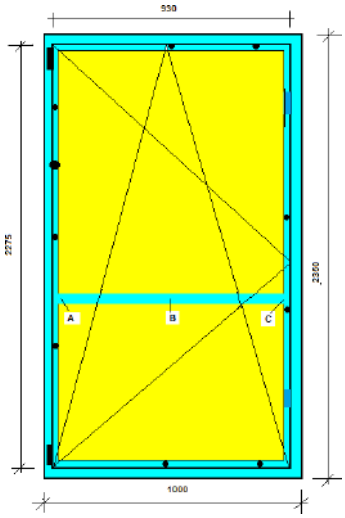

Figure No.1 Position of closure elements and measuring points during the test

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 02	V_L [$m^3h^{-1}m^{-1}$]	0,21	0,41	0,52	0,61	0,69	0,78	1,12	1,84
	V_A [$m^3h^{-1}m^{-2}$]	0,34	0,65	0,82	0,96	1,09	1,23	1,77	2,91

Enlarged uncertainty of measurement at k = 2: U=1,3%

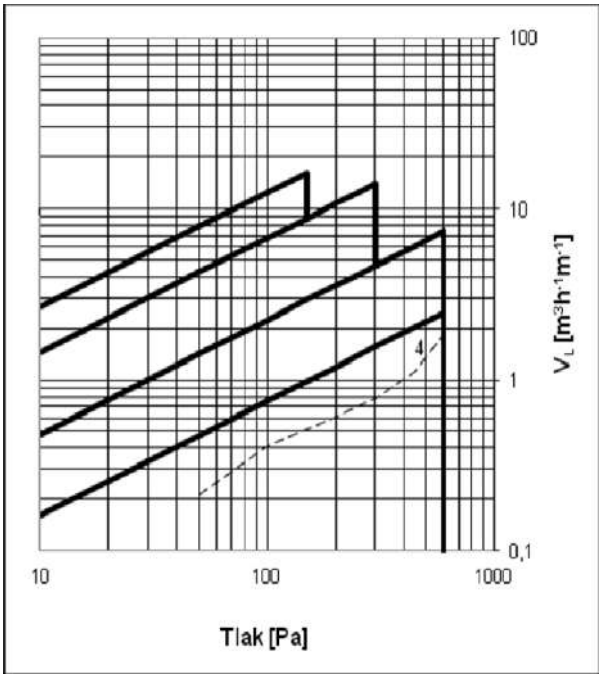

Figure No. 2 Reference air permeability V_L

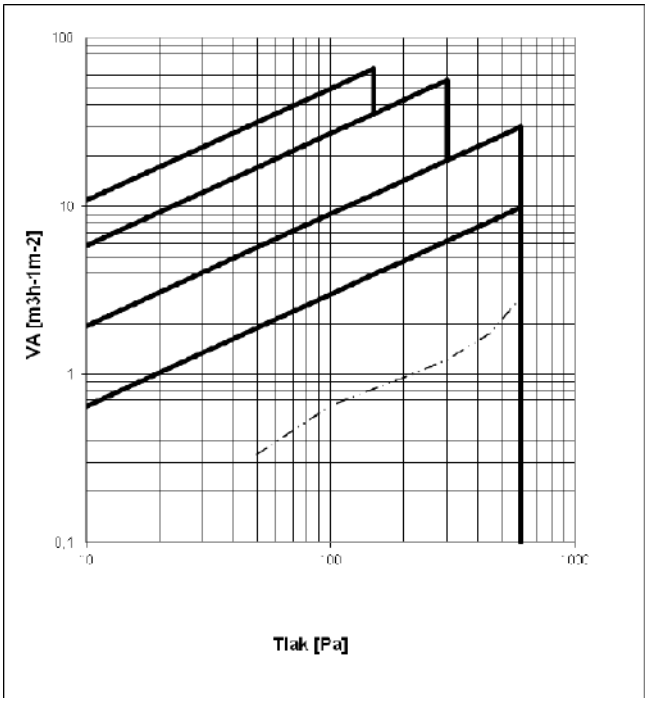

Figure No. 3 Reference air permeability V_A

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 02	V_L [$m^3h^{-1}m^{-1}$]	0,24	0,40	0,51	0,62	0,71	0,84	1,45	2,54
	V_A [$m^3h^{-1}m^{-2}$]	0,38	0,63	0,81	0,97	1,12	1,32	2,28	4,01

Enlarged uncertainty of measurement at k = 2: U=1,3%

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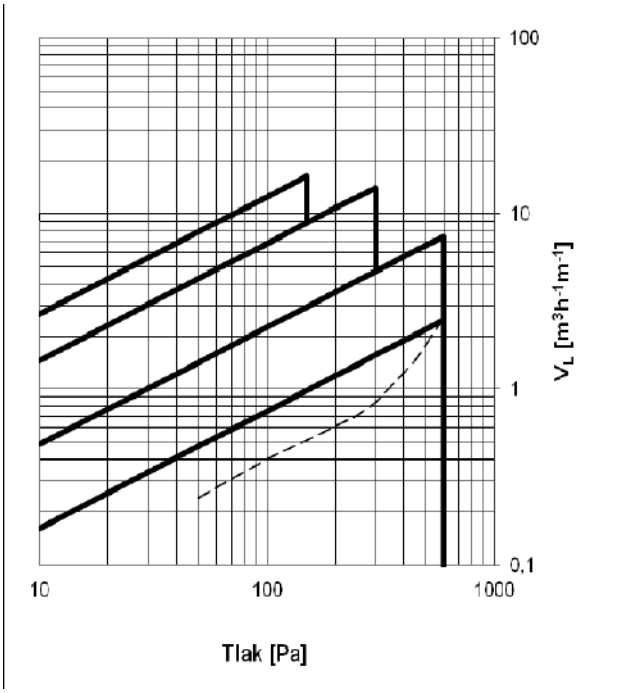

Figure No. 2 Reference air permeability V_L

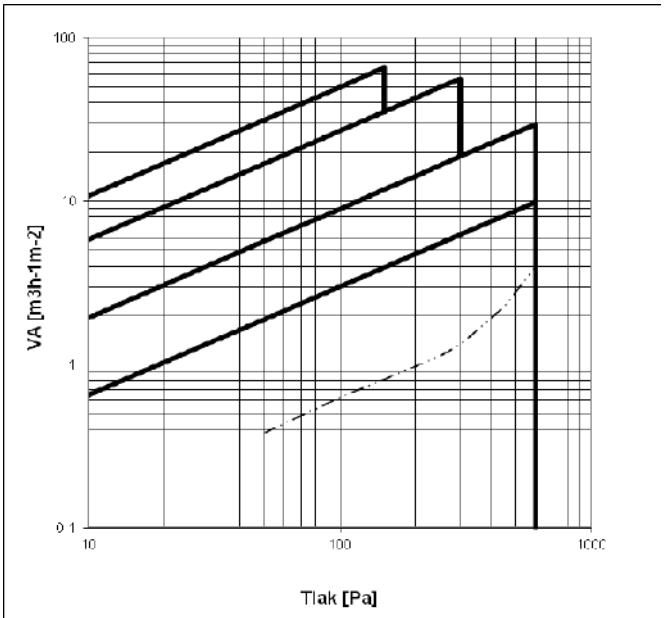

Figure No. 3 Reference air permeability V_A

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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Sub-protocol

No. 810/20/0089/15 - 03

1. Test

1.1 Name

Watertightness

1.2 Test method

EN 1027: 2001 Windows and doors. Watertightness. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	ČF - 02/24
Calibration certificates	0163/312.04/14

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer.

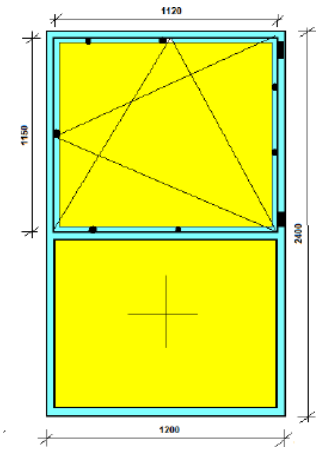
2.4 Involved personnel

Michal Beleš

3. Test results

Water penetration time

Marking of samples	*Pressure p [Pa] / Water penetration time t [min]*										
	0	50	100	150	200	250	300	450	600		
Sample 01	-	-	-	-	-	-	-	-	-		



Key

- hinge
- ● closure - stop
- △ water penetration - dropping
- ▲ water penetration - flowing

Figure No.1 Position of closure elements and water penetration during the test

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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821 04 Bratislava

Proposal for the classification

1. Product

1.1 Name

Product: Plastic window with turn and tilt leaf and fixed fanlight, system Spectrum Prestige 86 mm

1.2 Dimensions

Overall dimension (width x height): (1200x2400) mm

2. Classification standards

EN 12208: 1999	Windows and doors. Watertightness. Classification
EN 12210: 1999	Windows and doors. Resistance to wind load. Classification
EN 12207: 1999	Windows and doors. Air permeability. Classification

3. Values and classes of the product

Characteristic	Value and class
Watertightness	**class 4**
Resistance to wind load	**class C4**
Air permeability	**class 9A**

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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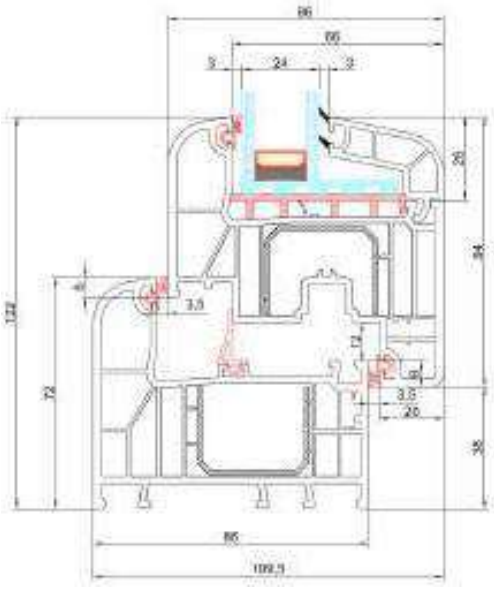
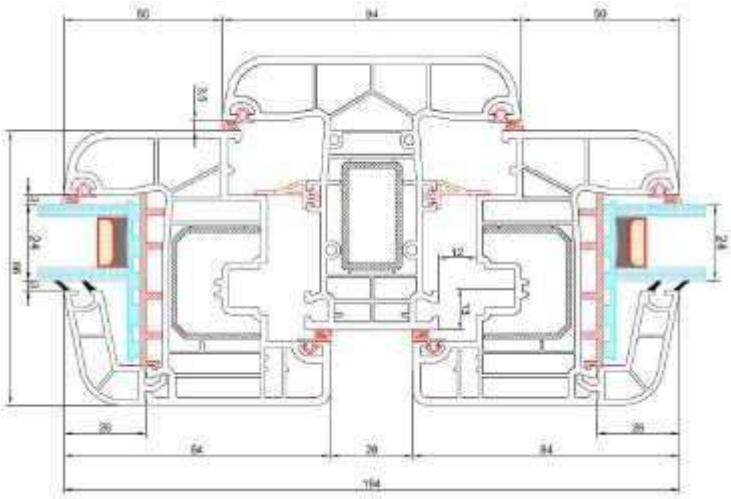
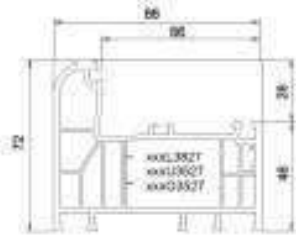


Picture No. 1 Frame - casement

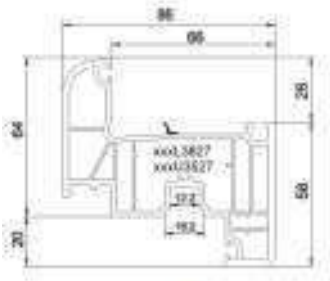


Picture No. 2 Casement - mullion



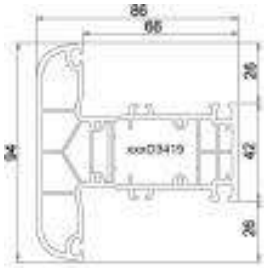
68610

Frame



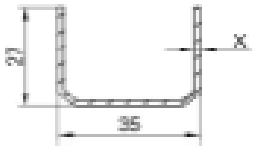
68620

Casement

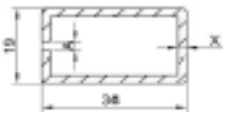


68630

Mullion



Reinforcement frame, casement



Reinforcement mullion

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Testing laboratory of materials and products

Test report
No. 810/20/0092/15

Notified body 1478

Number of copies: 3
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Manufacturer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza , Slovakia

Manufacturing plant: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Customer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Product: Plastic window

System: Spectrum Prestige 86 mm

Product: Plastic French window double leaf with one turn and tilt leaf and one side-hung leaf

Overall dimensions: (width x height): (1500x2200) mm

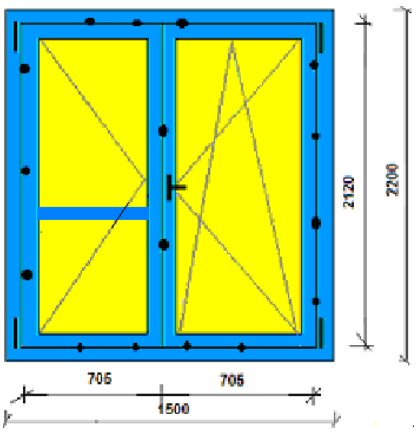
Test method

EN 1027: 2000
Windows and doors. Watertightness. Test method

EN 12211: 2000
Windows and doors. Resistance to wind load. Test method

EN 1026: 2000
Windows and doors. Air permeability. Test method

Figuration



Purpose of tests

On the basis of order no. TR 006/15 dated 29.05.2015

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Number of pages: 11
Number of pages of annexes: 08
Annexes:

01 to 03	Sub - protocol
04	For classification
05	Sketch

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar, Product specialist

Authorized by: Mgr. Tibor Skákala, Head of the Testing Laboratory

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821 04 Bratislava

1. Test sample

1.1 Marking

Name	Plastic French window double leaf with one turn and tilt leaf and one side-hung leaf, system Spectrum Prestige 86 mm
Number	1 piece
Identification number	26/2015
Serial number	04

1.2 Dimensions

Overall dimension (width x height)	(1500x2200) mm
Opening vent dimension (width x height)	2x(705x2120) mm
Area [m^2]	3,30
Length of air space [m]	9,18

1.3 Technical description

Frame	68610, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Casement:	68620, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Mullion:	68630, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Reinforcement:	Thickness 1,5 - 2 mm: Frame+casement: 150U3527, mullion: 200O3225
Weather stripping:	Inner, central and outer gasket, Dekompression frame - two openings of sealing
Glazing:	(4-12-4-12-4) mm, spacer: AL
Glazing bead	68642
Hardware:	Hardware ROTO NT with safety device (catches with length of 260 mm) Location of latch hardware: in zero position..

2. Sampling

2.1 Test sampling

Sampling report	Sampling was not realized

2.2 Delivery of test sample to the test laboratory

Date of receipt of the test sample	04.12.2015

3. Tests results

3.1 Time for tests

Start of testing	12.12.2015
End of testing	12.12.2015

3.2 Summary of test results

The test results are listed in the individual protocols, which are annexed to this test report.

Characteristic	Test method	Test result	Serial number of sub-protocol
Resistance to wind load	EN 12211	the greatest value of the relative frontal deflection of the casement in pressure Δ p = 1 200 Pa is 0,0030	01
Watertightness	EN 1027	without water penetration at a pressure Δ p = 600 Pa	02
Air permeability	EN 1026	Reference air permeability at a pressure Δp = 100 Pa V_A = 0,90 $m^3/(hm^2)$ V_L= 0,33 $m^3/(hm)$	03

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Sub-protocol
No. 810/20/0092/15 - 01

1. Test

1.1 Name
Air permeability

1.2 Test method
EN 1026: 2001 Windows and doors. Air permeability. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

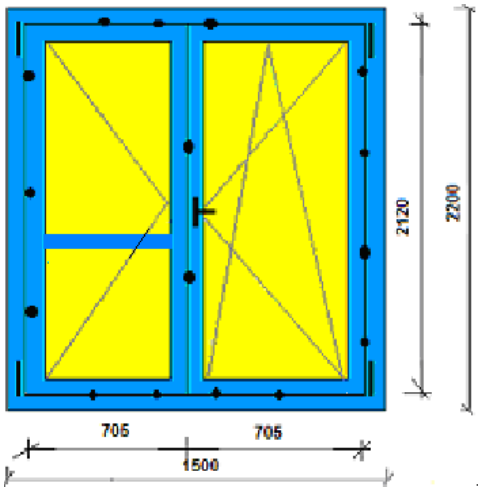
2.3 Preparation of specimen
Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel
Michal Beleš,

3. Test results
Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 01	V_L [$m^3h^{-1}m^{-1}$]	0,22	0,33	0,41	0,44	0,53	0,63	0,96	1,34
	V_A [$m^3h^{-1}m^{-2}$]	0,60	0,90	1,13	1,23	1,48	1,75	2,68	3,72

Enlarged uncertainty of measurement at k =2: U = 1,3 %



Key
hinge
closure - stop

Figure No.1 Position of closure elements during the test

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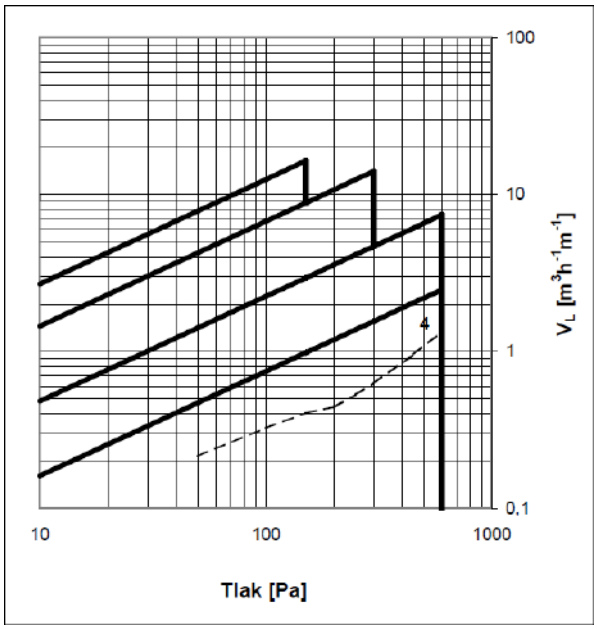

Figure No.2 Reference air permeability V_L

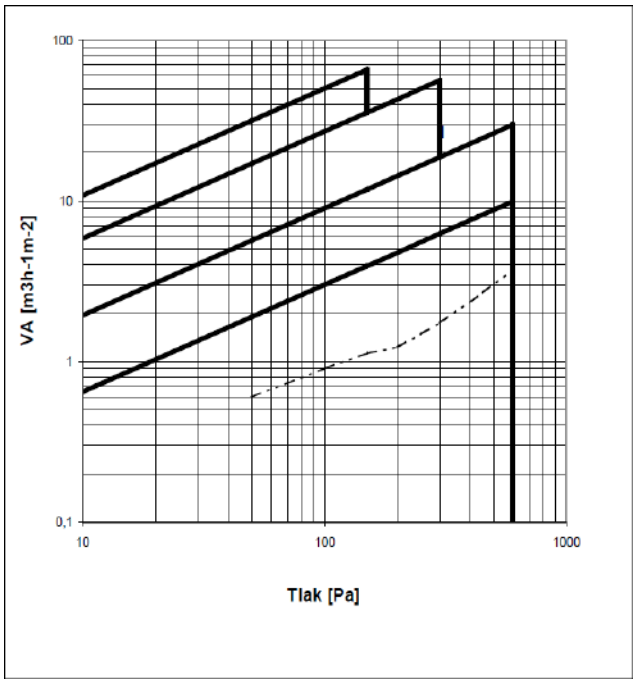

Figure No.3 Reference air permeability V_A

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Sub-protocol
No. 810/20/0092/15 - 02

1. Test

1.1 Name

Resistance to wind load

1.2 Test method

EN 12211: 2001 Windows and doors. Resistance to wind load. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11
	T - 1267/2014, T - 1268A/2014, T - 1268B/2014

2.2 Test conditions

Air temperature	20°C
Relative air humidity	50%

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel

Michal Beleš,

3. Test results

Test pressure (Pa)	P1 =	± 1 200	P2 =	± 600	P3 =	± 1 800

Marking of samples	*Measuring point*	*Frontal change of position (mm)*	*Frontal deflection (mm)*		*Relative frontal deflection (mm)*		*Marking of samples*	
			+ P1	- P1	+ P1	- P1	+ P1	- P1
Sample 04	B	1 200	9,15	8,64	6,07	6,3	0,0028	0,0030
	E	1 200	6,04	5,79	1,79	2,05	0,0025	0,0029

Enlarged uncertainty of measurement at k = 2: U = 1,26 %

Marking of samples	*Test at repeated pressure P2*	*Safety test at pressure P3*
Sample 04	without visible deformation of the distance of 1 m in natural light and without deterioration in function	the test sample remained closed without destruction of any part of the test sample

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Key

hinge

closure - stop

A, B, C AC = 930 mm

▪ measuring points

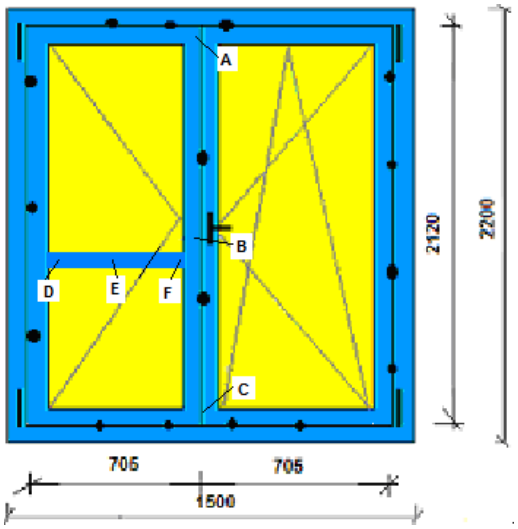

Figure No.1 Position of closure elements and measuring points during the test

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 04	V_L [$m^3h^{-1}m^{-1}$]	0,22	0,33	0,41	0,44	0,53	0,63	0,96	1,34
	V_A [$m^3h^{-1}m^{-2}$]	0,60	0,90	1,13	1,23	1,48	1,75	2,68	3,72

Enlarged uncertainty of measurement at k = 2: U=1,3%

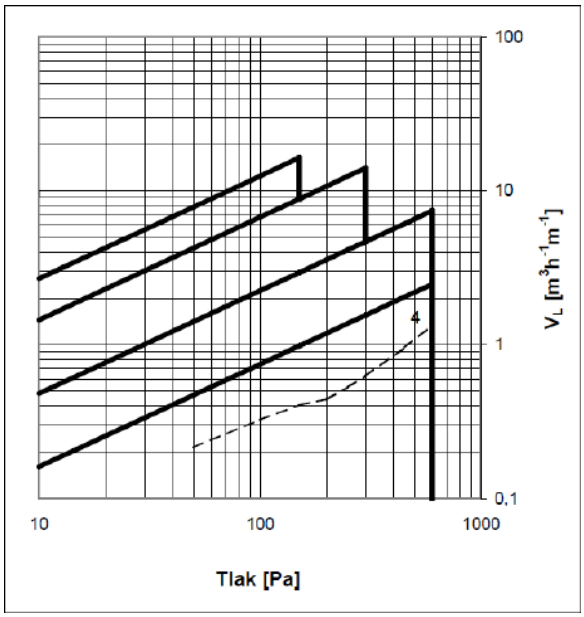

Figure No. 2 Reference air permeability V_L

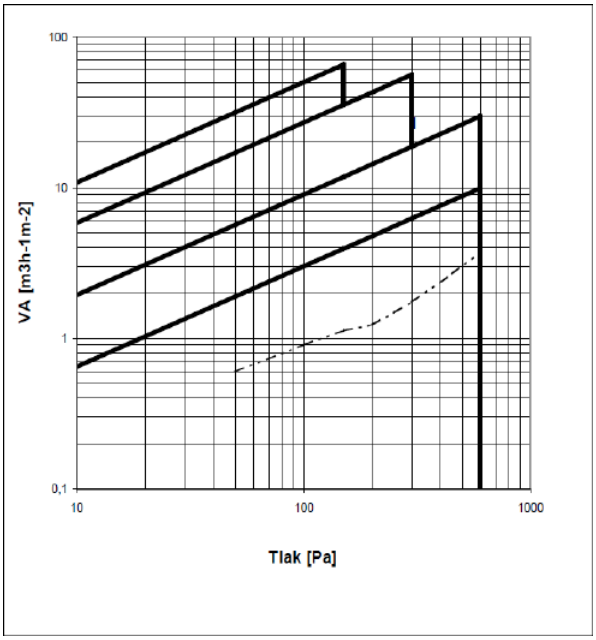

Figure No. 3 Reference air permeability V_A

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Vzorka 01	V_L [$m^3h^{-1}m^{-1}$]	0,18	0,28	0,35	0,38	0,45	0,56	0,91	1,32
	V_A [$m^3h^{-1}m^{-2}$]	0,49	0,77	0,98	1,05	1,24	1,55	2,53	3,67

Enlarged uncertainty of measurement at k = 2: U=1,3%

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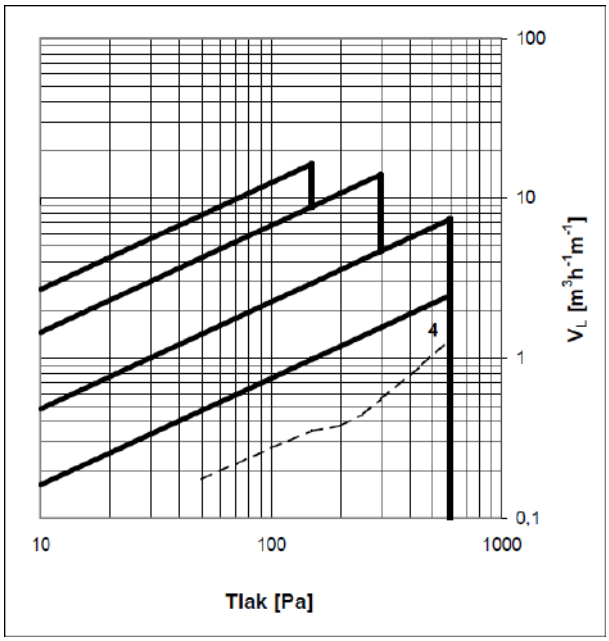

Figure No. 2 Reference air permeability V_L

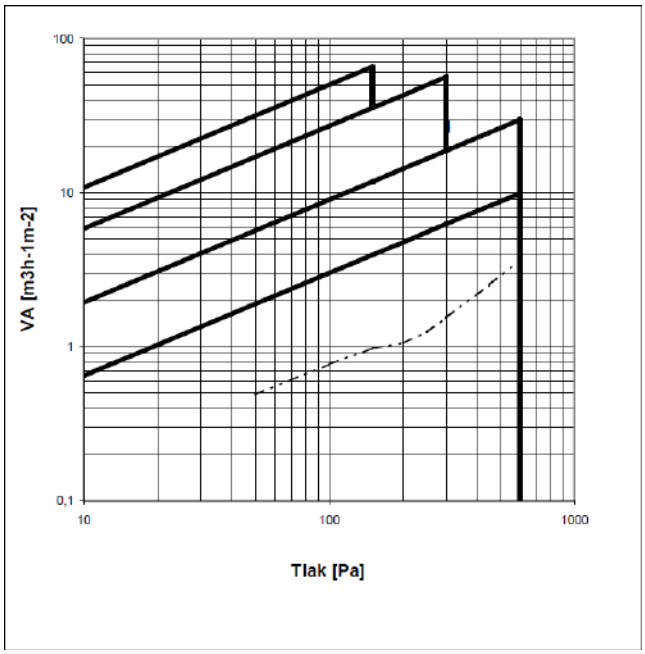

Figure No. 3 Reference air permeability V_A

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Sub-protocol

No. 810/20/0092/15 - 03

1. Test

1.1 Name

Watertightness

1.2 Test method

EN 1027: 2001 Windows and doors. Watertightness. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	ČF - 02/24
Calibration certificates	0163/312.04/14

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer.

2.4 Involved personnel

Michal Beleš

3. Test results

Water penetration time

Marking of samples	*Pressure p [Pa] / Water penetration time t [min]*										
	0	50	100	150	200	250	300	450	600		
Sample 04	-	-	-	-	-	-	-	-	-		

Key

- hinge
- ● closure - stop
- △ water penetration - dropping
- ▲ water penetration - flowing

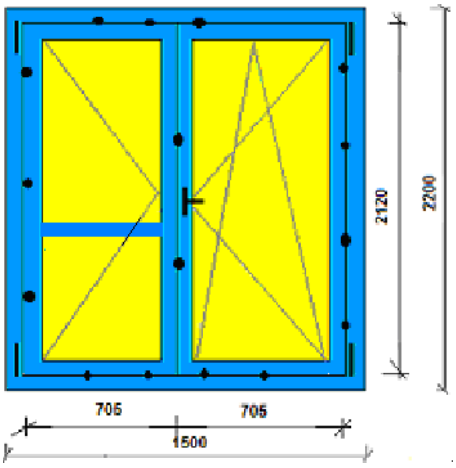

Figure No.1 Position of closure elements and water penetration during the test

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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Testing laboratory of materials and products

Test report
No. 810/20/0091/15

Notified body 1478

Number of copies: 3
Copy No.:

Manufacturer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza , Slovakia

Manufacturing plant: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Customer: WINK TRADE, s.r.o.
Priemyselná 8, 971 01 Prievidza, Slovakia

Product: Plastic window

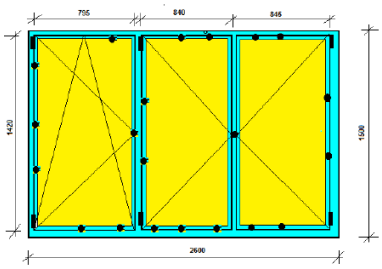
System: Spectrum Prestige 86 mm

Product: Plastic window with three turn and tilt leafs

Overall dimensions: (width x height): (2600x1500) mm

Test method
EN 1027: 2000
Windows and doors. Watertightness. Test method
EN 12211: 2000
Windows and doors. Resistance to wind load. Test method
EN 1026: 2000
Windows and doors. Air permeability. Test method

Figuration



Purpose of tests
On the basis of order no. TR 006/15 dated 29.05.2015

Contents

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar, Product specialist

Authorized by: Mgr. Tibor Skákala, Head of the Testing Laboratory

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1. Test sample

1.1 Marking

Name	Plastic window with three turn and tilt leafs, system Spectrum Prestige 86 mm
Number	1 piece
Identification number	26/2015
Serial number	03

1.2 Dimensions

Overall dimension (width x height)	(2600x1500) mm
Opening vent dimension (width x height)	(795x1420) mm, (840x1420) mm, (845x1420) mm
Area [m^2]	3,90
Length of air space [m]	12,060

1.3 Technical description

Frame	68610, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Casement:	68620, manufacturer Spectrum Profiles Kft., Budapest, Hungary
Mullion:	68630, 68631 manufacturer Spectrum Profiles Kft., Budapest, Hungary
Reinforcement:	Thickness 1,5 - 2 mm: Frame+casement: 150U3527, mullion: 200O3225, 200O3419
Weather stripping:	Inner, central and outer gasket, Dekompression frame - two openings of sealing
Glazing:	(4-12-4-12-4) mm, spacer: AL
Glazing bead	68642
Hardware:	Hardware ROTO NT with safety device (catches with length of 260 mm) Location of latch hardware: in zero position..

2. Sampling

2.1 Test sampling

Sampling report	Sampling was not realized

2.2 Delivery of test sample to the test laboratory

Date of receipt of the test sample	04.12.2015

3. Tests results

3.1 Time for tests

Start of testing	11.12.2015
End of testing	11.12.2015

3.2 Summary of test results

The test results are listed in the individual protocols, which are annexed to this test report.

Characteristic	Test method	Test result	Serial number of sub-protocol
Resistance to wind load	EN 12211	the greatest value of the relative frontal deflection of the casement in pressure Δ p = 1 600 Pa is 0,0023	01
Watertightness	EN 1027	without water penetration at a pressure Δ p = 600 Pa	02
Air permeability	EN 1026	Reference air permeability at a pressure Δp = 100 Pa V_A = 1,11 $m^3/(hm^2)$ V_L= 0,36 $m^3/(hm)$	03

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Sub-protocol
No. 810/20/0091/15 - 01

1. Test

1.1 Name
Air permeability

1.2 Test method
EN 1026: 2001 Windows and doors. Air permeability. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

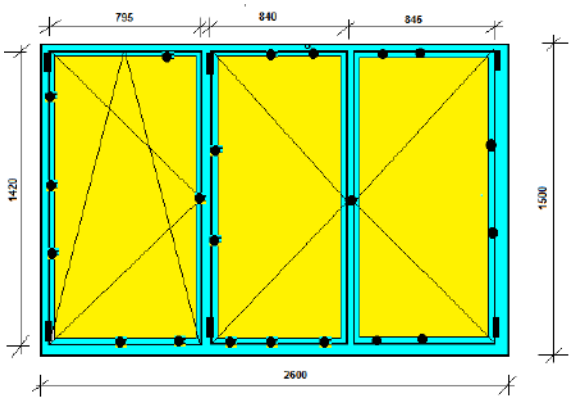
2.3 Preparation of specimen
Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel
Michal Beleš,

3. Test results
Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 01	V_L [$m^3h^{-1}m^{-1}$]	0,23	0,36	0,51	0,73	0,98	1,13	1,98	2,29
	V_A [$m^3h^{-1}m^{-2}$]	0,71	1,11	1,59	2,24	3,02	3,48	6,14	7,07

Enlarged uncertainty of measurement at k =2: U = 1,3 %



Key
hinge
closure - stop

Figure No.1 Position of closure elements during the test

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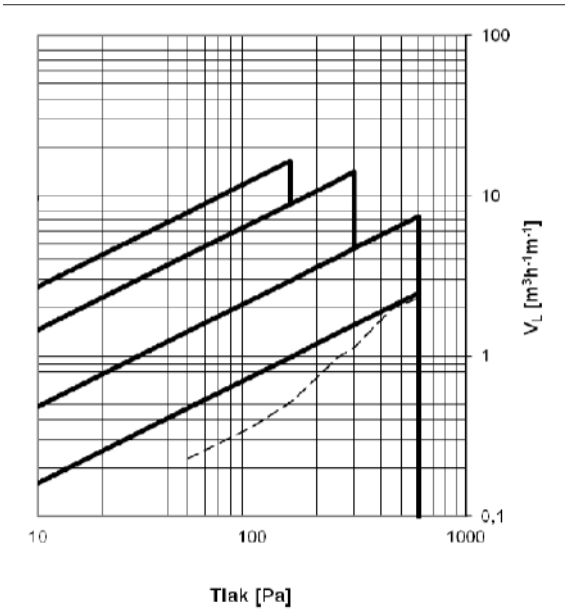

Figure No.2 Reference air permeability V_L

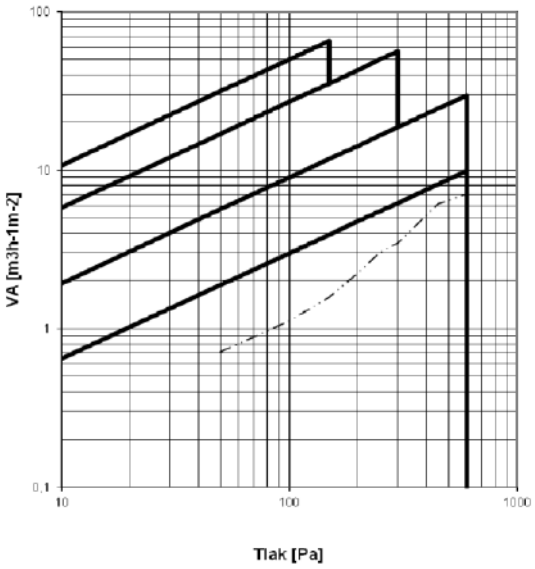

Figure No.3 Reference air permeability V_A

Bratislava 21.12.2015

Prepared: Ing. Ján Remiar

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Sub-protocol
No. 810/20/0091/15 - 02

1. Test

1.1 Name

Resistance to wind load

1.2 Test method

EN 12211: 2001 Windows and doors. Resistance to wind load. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten, KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	DL-19/24, DL-20/24 a DL-21/24
Calibration certificates	K 021.1/0684/11, K 021.1/0683/11, K 021.1/0682/11
	T - 1267/2014, T - 1268A/2014, T - 1268B/2014

2.2 Test conditions

Air temperature	20°C
Relative air humidity	50%

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer

2.4 Involved personnel

Michal Beleš,

3. Test results

Test pressure (Pa)	P1 =	± 1 600	P2 =	± 800	P3 =	± 2 400

Marking of samples	*Measuring point*	*Frontal change of position (mm)*	*Frontal deflection (mm)*		*Relative frontal deflection (mm)*		*Marking of samples*	
			+ P1	- P1	+ P1	- P1	+ P1	- P1
Sample 03	B	1 600	4,22	3,30	3,30	2,67	0,0023	0,0018
	E	1600	5,24	4,12	2,57	2,40	0,0018	0,0017

Enlarged uncertainty of measurement at k = 2: U = 1,26 %

Marking of samples	*Test at repeated pressure P2*	*Safety test at pressure P3*
Sample 03	without visible deformation of the distance of 1 m in natural light and without deterioration in function	the test sample remained closed without destruction of any part of the test sample

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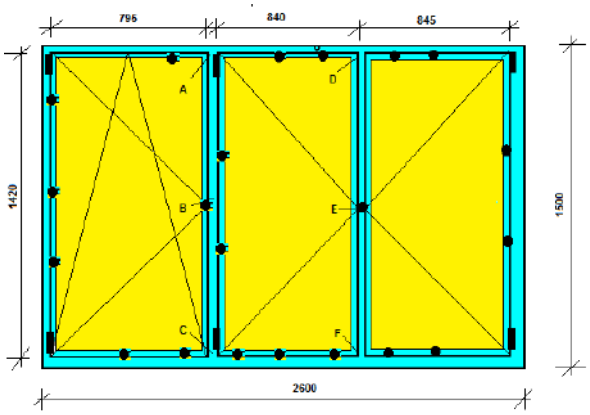

Key

hinge

closure - stop

A, B, C AC = 1420 mm

D, E, F DF = 1420 mm

- measuring points

Figure No.1 Position of closure elements and measuring points during the test

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 03	V_L [$m^3h^{-1}m^{-1}$]	0,23	0,36	0,51	0,73	0,98	1,13	1,98	2,29
	V_A [$m^3h^{-1}m^{-2}$]	0,71	1,11	1,59	2,24	3,02	3,48	6,14	7,07

Enlarged uncertainty of measurement at k = 2: U=1,3%

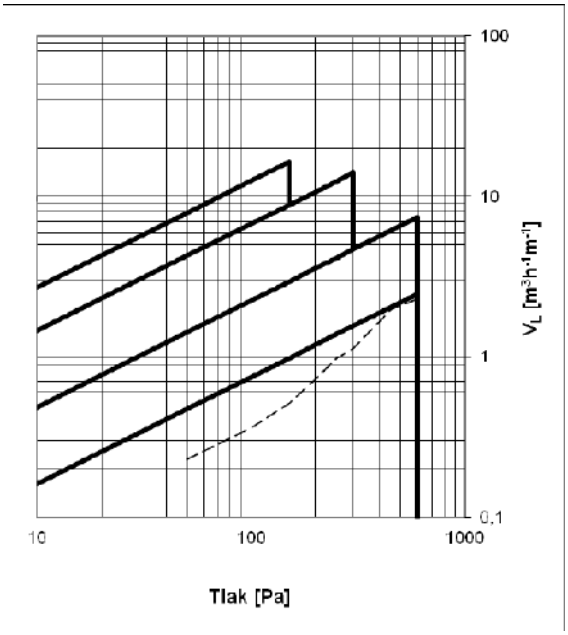

Figure No. 2 Reference air permeability V_L

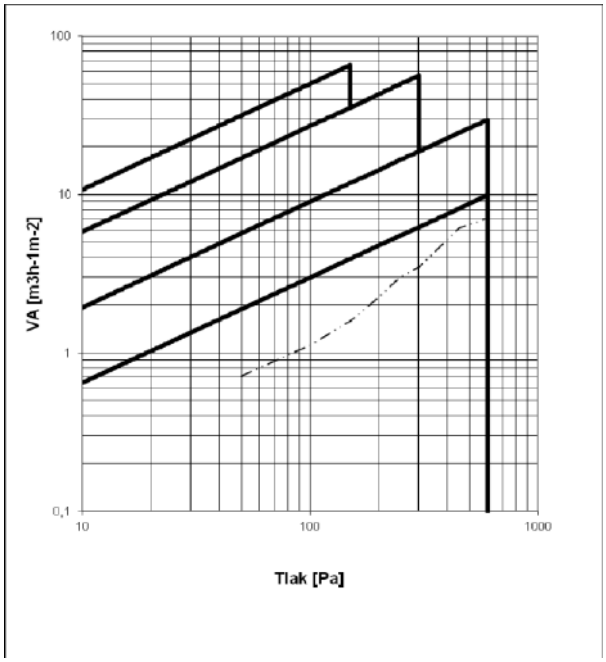

Figure No. 3 Reference air permeability V_A

Air permeability – before resistance to wind load

Median value found in the pressure and vacuum

Marking of samples	*Reference air permeability*	*Pressure/vacuum p (Pa)*							
		50	100	150	200	250	300	450	600
Sample 03	V_L [$m^3h^{-1}m^{-1}$]	0,21	0,33	0,43	0,59	0,77	0,96	1,61	2,07
	V_A [$m^3h^{-1}m^{-2}$]	0,64	1,02	1,32	1,82	2,38	2,98	4,99	6,39

Enlarged uncertainty of measurement at k = 2: U=1,3%

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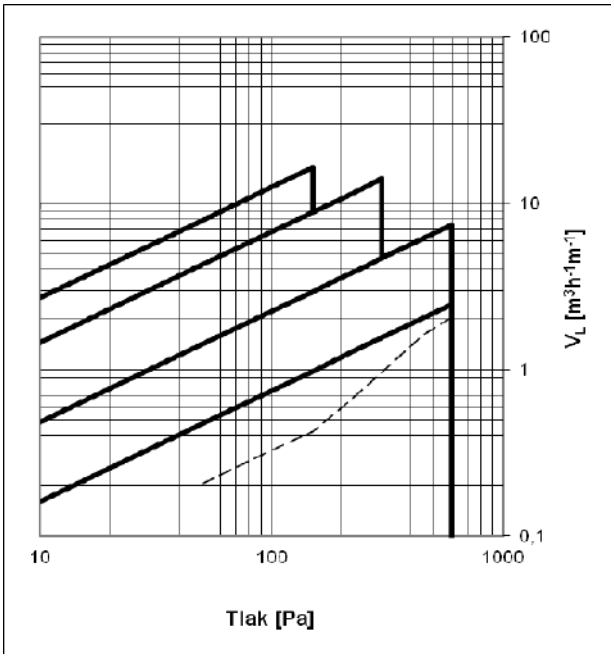

Figure No. 2 Reference air permeability V_L

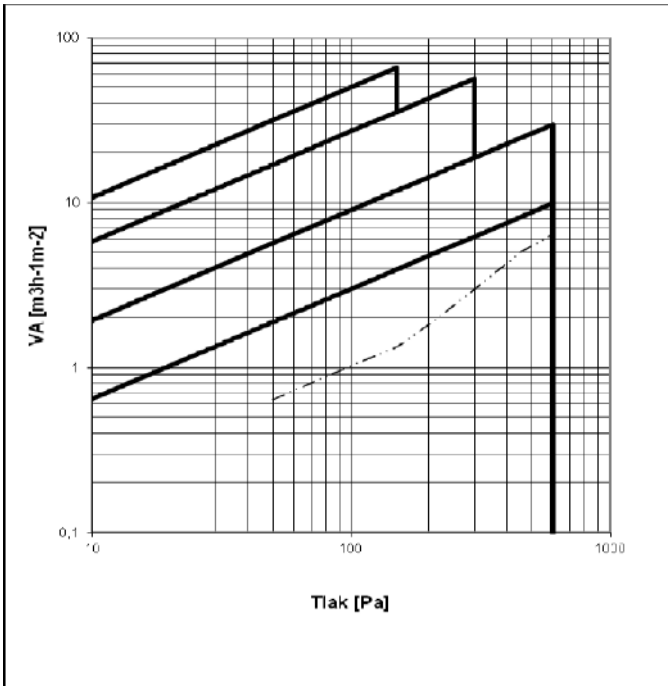

Figure No. 3 Reference air permeability V_A

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Sub-protocol

No. 810/20/0091/15 - 03

1. Test

1.1 Name

Watertightness

1.2 Test method

EN 1027: 2001 Windows and doors. Watertightness. Test method

2. Course of test

2.1 Testing equipment and meters

Testing equipment	SZ-01/24 K. Schulten KS MSD DIGITAL
Calibration certificates	T - 1267/2014, T - 1268A/2014, T - 1268B/2014
Meters	ČF - 02/24
Calibration certificates	0163/312.04/14

2.2 Test conditions

Air temperature	20 °C
Relative air humidity	50 %

2.3 Preparation of specimen

Test sample was mounted in an additional frame that was supplied by customer.

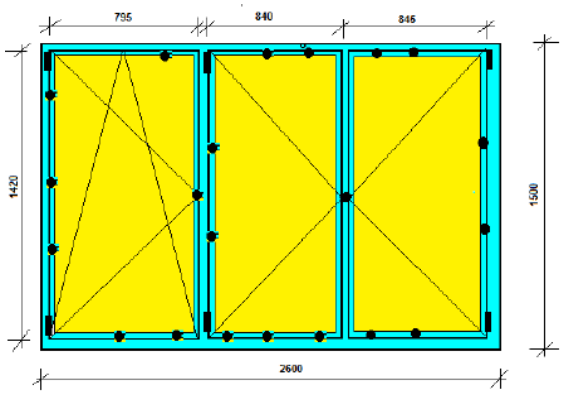
2.4 Involved personnel

Michal Beleš

3. Test results

Water penetration time

Marking of samples	*Pressure p [Pa] / Water penetration time t [min]*										
	0	50	100	150	200	250	300	450	600		
Sample 03	-	-	-	-	-	-	-	-	-		



Key

- hinge
- ● closure - stop
- △ water penetration - dropping
- ▲ water penetration - flowing

Figure No.1 Position of closure elements and water penetration during the test

Bratislava 21.12.2015

Prepared by: Ing. Ján Remiar

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Proposal for the classification

1. Product

1.1 Name

Product: Plastic French window double leaf with one turn and tilt leaf and one side-hung leaf, system Spectrum Prestige 86 mm

1.2 Dimensions

Overall dimension (width x height): (1500x2200) mm

2. Classification standards

EN 12208: 1999	Windows and doors. Watertightness. Classification
EN 12210: 1999	Windows and doors. Resistance to wind load. Classification
EN 12207: 1999	Windows and doors. Air permeability. Classification

3. Values and classes of the product

Characteristic	Value and class
Watertightness	**class 4**
Resistance to wind load	**class C3**
Air permeability	**class 9A**

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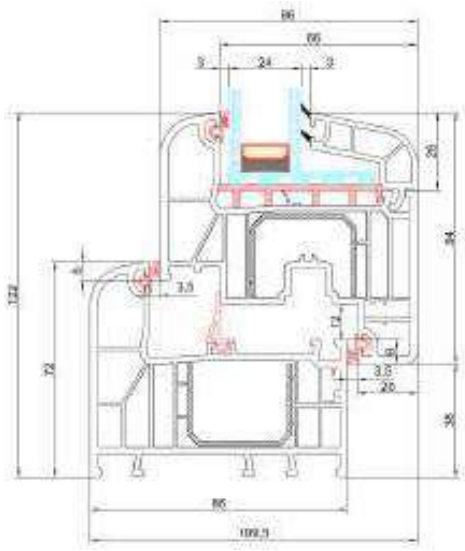
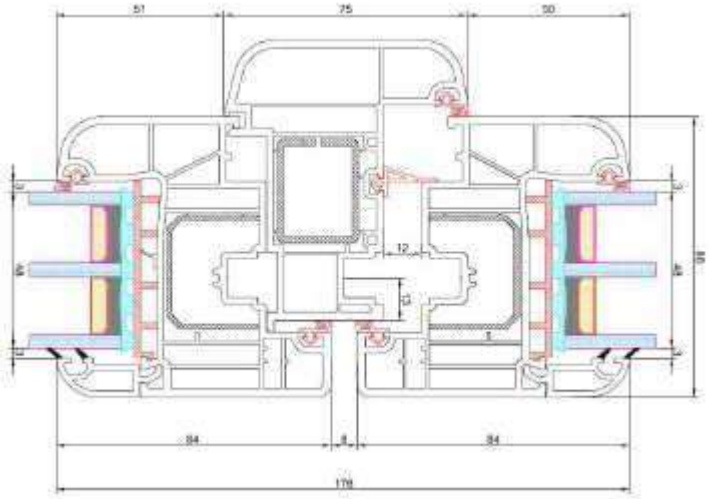
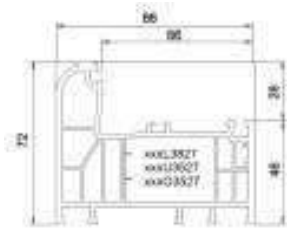


Picture No. 1 Frame - casement



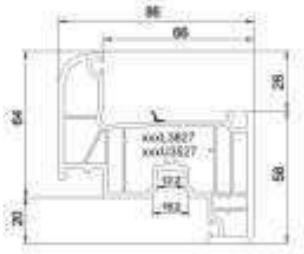
Picture No. 2 Casement - mullion

Picture No. 3 Casement - mullion



68610

Frame



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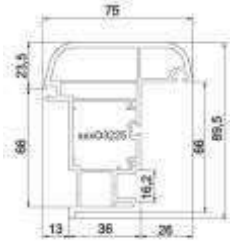
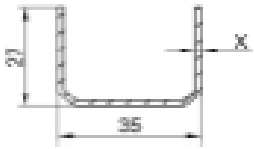
Casement

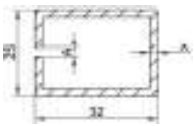


68631

Mullion



Reinforcement frame, casement



Reinforcement mullion