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SCIENTIFIC RESEARCH CONSTRUCTION INSTITUTE – NISI – LTD
NOTIFIED RESEARCH LABORATORY
License № CPR 11-NB 2032 / 02.12.2014 of Ministry of Regional Development and Public Works
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PROTOCOL
OF PRODUCT TYPE DETERMINATION
№ PTD-17.8 / 30th May 2017

The test is performed in accordance with the requirements of *Regulation No 305/2011/EU of the European Parliament and the EU Council* of 9th March 2011 (CPR) on C*onstruction Products.*

Name of the product	**Window of VIVAPLAST PVC profiles, series "8700"**
Manufacturer	VIAS Ltd. production site, The town of Shumen, 68 A Rishki prohod Blvd.
Assignor	VIAS Ltd. production site, The town of Shumen, 68 A Rishki prohod Blvd.
Assignment document	Contract 5 / 2017
System for conformity assessment	System "3" under Annex ZA of БДС EN 14351 – 1:2006 +A1:2010/NA:2015
Sample for the test	One window to the dimensions of 1750 / 2550 mm., produced in February 2017 Annex 1 consists of all detailed data of the tested window.
Date (period) of the test	From 7th March 2017 to 12th May 2017.
Assessment of the performance	**The provided sample of an window of VIVAPLAST PVC profiles, series "8700"complies with the requirements for Class 8A and 7B of water tightness, class C2 – wind resistance, class 4 – load bearing of the protection devices, thermal transfer coefficient of: profiles Uf = 0.81 W/(m².K), window Uw= 0.63 W/(m².K), as well as rated index of insulation of air borne noise: R_w (C; C_{tr}) = 35 (-2; -3) dB.**

Head of testing laboratory by SCIENTIFIC RESEARCH CONSTRUCTION Institute Signature: /illegible/ Chief assistant engineer Tsv. Gyurova	Manager of SCIENTIFIC RESEARCH CONSTRUCTION Institute: Signature: /illegible/ Eng. V. Davidov

This protocol consists of 13 sheets. Extracts of the record can be copied only after a written consent, given by NISI Ltd.

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Test data:

No	Index	Unit	Test method	Test results	Requirements under the technical specification
1	2	3	4	5	6
1.	Water tightness at static pressure* - A method: P=450 Pa - B method: P = 300 Pa	class	BDS EN 1027 Method A	8A 7B	BDS EN 12208 Requirements are listed in Annex 2 of the Protocol
*Detailed test results are listed in Annex 2.					
2. Wind load resistance *					
2.1	Deformations(f) of the wing against the frame at wind load to the pressure of P=± 800 Pa - Ist vertical axis (p. 2); - IInd vertical axis (p. 5); - IIIrd vertical axis (p. 8); - IVth vertical axis (p. 11);	mm	BDS EN 12211	+ 0.98/ - 0.51 + 3.52/ - 2.48 + 2.26 / - 2.32 + 0.80 / - 0.54	BDS EN 12210 For class C2: P= ± 800 Pa and f<1/300 L < ±5.33 < ±5.33 < ±5.33 < ±5.33
2.2	Behavior at 50 times repeated positive and negative pressure of 400 Pa	-	BDS EN 12211	The functional qualities and casing joints are preserved	BDS EN 12210 Preserving of the functional qualities of the window and the casing joints
2.3	Safety during storm with a single pressure 1200 Pa	-	BDS EN 12211	The functional qualities and casing joints are preserved	BDS EN 12210 Preserving of the functional qualities of the window and the casing joints
*Detailed test results are listed in Annex 3.					
3.	Bearing load capacity of the safety devices **				
3.1	Bending at load with horizontal force up to 350 N for a period of 1 min., applied onto wing with hinges, turning along a vertical axle and fixed in its upper end.	mm	BDS EN 14609	91.6 The functional qualities and casing joints are preserved	BDS EN 13115 For class 4: Preserving of the functional qualities of the window and the casing joints
3.2	Bending at load with horizontal force up to 350	mm	BDS EN 14609	57.0	BDS EN 13115 For class 4:

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	N for a period of 1 min., applied onto wing with hinges, turning along a horizontal axle and fixed in one of the sides.			The functional qualities and casing joints are preserved	Preserving of the functional qualities of the window and the casing joints
** Detailed test results are listed in Annex 4.					
4.	Insulation of air borne noise* - assessed index of sound transmission Rw (C; C_{tr})**	dB	BDS EN ISO 10140-2	35 (-2; -5)	-
*Detailed test results are listed in Annex 5. **The weighted index of sound transmission, Rw(C;C_{tr})dB, shall be determined as per BDS EN ISO 717-1.					
5.	Heat transfer coefficient of: - Wing profile - Frame profile - Divisor profile - Profiles together - Glazing unit - Window	W/(m^2.K)	BDS EN ISO 12567-1	 0,75 0,38 0,84 0,81 0,57 0.63	 - - - -
3.	Air permeability	class	BDS EN 1026	4	BDS EN 12207 The requirements are listed in Annex 6 of the Protocol

Applicable technical documents:

БДС **EN 14351-1:2006 + A1:2010/ NA:2015 -**	Windows and doors Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics
БДС **EN 1027:2003**	Windows and doors – Water tightness - Test method
БДС **EN 12208:2003**	Windows and doors - Watertightness - Classification
БДС **EN 12211:2003**	Windows and doors - Resistance to wind load - Test method
БДС **EN 12210:2003**	Windows and doors - Resistance to wind load - Classification
БДС **EN 14609:2005**	Windows - Determination of the resistance to static torsion
БДС **EN 13115:2004**	Windows - Classification of mechanical properties - Racking, torsion and operating forces
БДС **EN ISO 10140-2:2010**	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation
БДС **EN ISO 717-1:2013**	Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation
БДС **EN 1026:2003**	Windows and doors - Air permeability - Test method
БДС **EN ISO 12207:2003**	Windows and doors - Air permeability – Classification

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Annex 1

Data of the tested window

Name of the product: A window of VIVAPLAST PVC profiles, series "8700"

Description of the test sample: a window with one non-opening part, one single-plane and one double-plane opening parts:

- Overall dimensions – 1750/2550 mm
- Glazing –glazing unit: Glass 1: 4 mm LowE – outside, Frame 1: 15.56 mm Alu Argon; Glass 2: 4 mm clear; Frame 2: 15.56 mm Alu Argon, Glass 3:4* 4S – inside);
- Aluminum profiles used:
  - Frame – 87030;
  - Wing – 87040;
  - Divisor – 87050;
  - Glass holders – 63090;

Reinforcing elements (metal):

- Frame – 26/35/26;
- Wings – 26/35/26;
- Divisor – 26/35/26.

Sealant: TPV sealant; EPDM central sealant.
Draining: as per scheme
Ventilation: as per scheme
Hardware: ROTO NT

Note: Detailed drawings of the test sample are shown on the pages 6 and 7.

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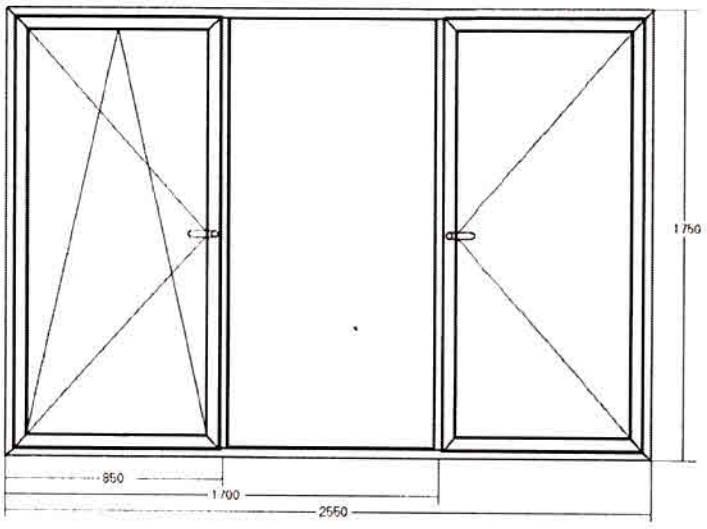
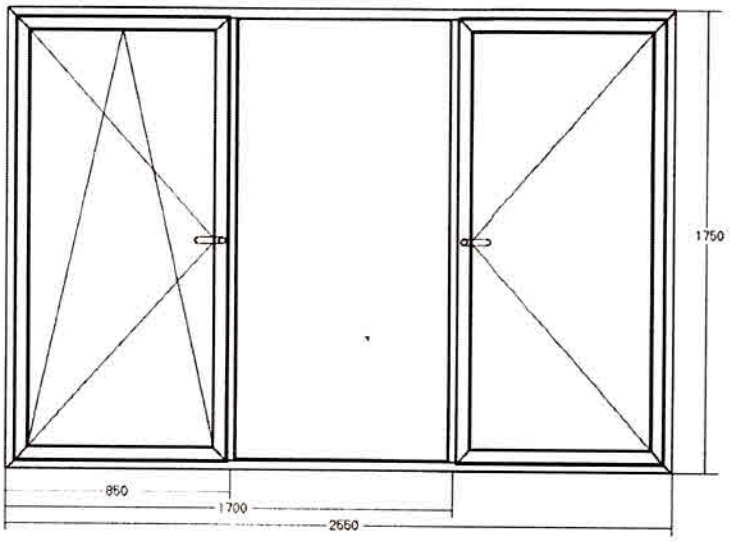
From outside



From inside



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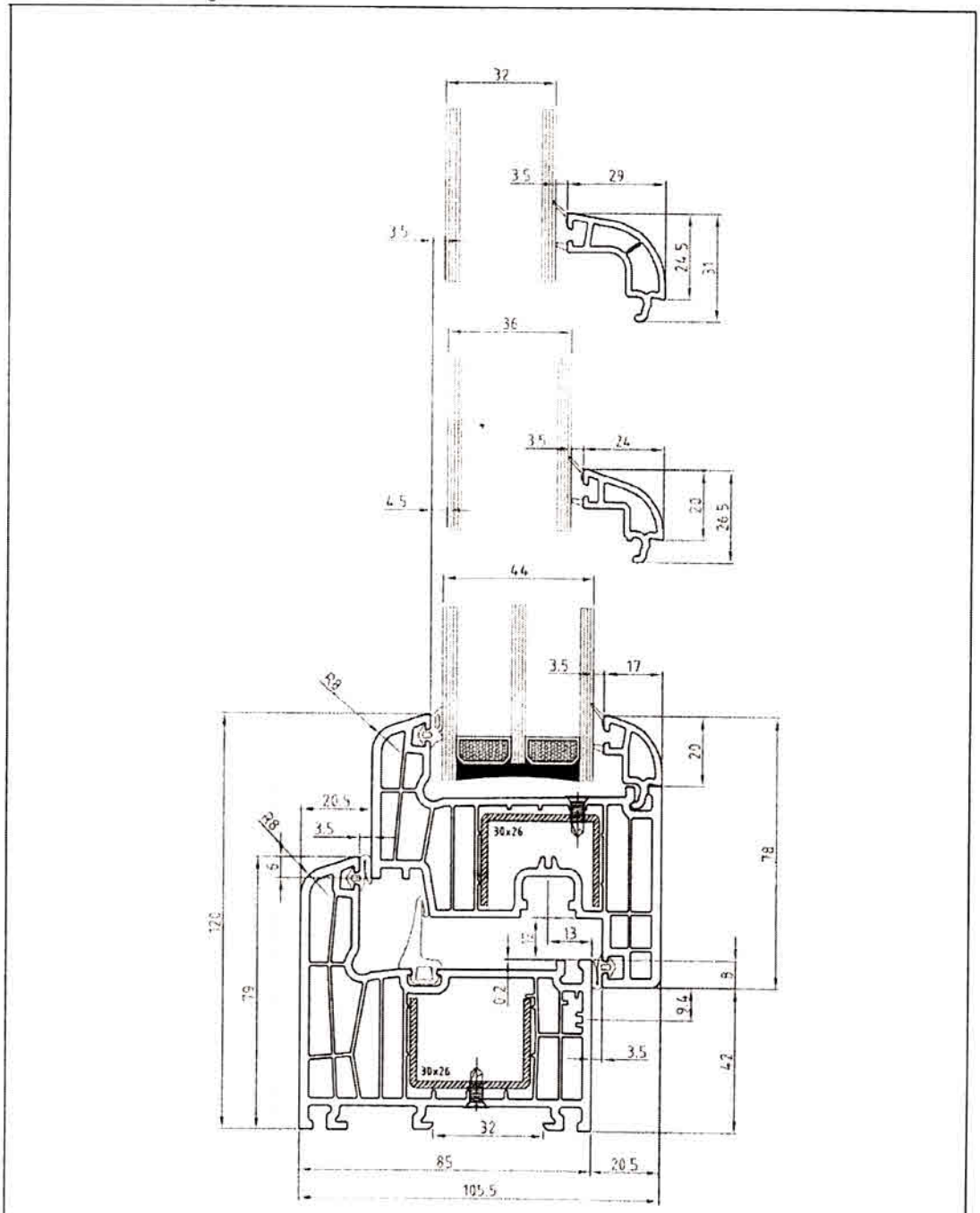

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VIVA PLAST

Maßstab 1:1	Vivaplast System 85			Zeichnungs - Nr. vivKatalog-b
Lage	Toleranzen +/-0,3	Oberfläche	Werkstoff PVC	Type / Kurzzeichen / Auftragsnummer

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Annex 2

Water tightness at static pressure – BDS EN 1027

1. Conditions and details of the test apparatuses

The test is conducted on a stand system "Rosenheim" type "VH AE" of company "HOLTEN", located in the Building Physics Laboratory by NISI LTD. The stand consists of a chamber and measuring and control board. The measuring chamber is airtight and only one of its side is opened. Closure on this side is done by appropriate attaching of the window tested, oriented with its external side towards the chamber.
The tested window (sample) is fastened to the spacers (the sides of the chamber), by means of manual clamps. Good sealing between the window frame and the walls of the chamber is achieved by micro-porous rubber seals.

Quantity of the water – 2 dm^3 at l m^2/min
The air temperature in the chamber and laboratory t = 18 °C
Air humidity in the chamber and the laboratory 65%

2. Test results

Difference in pressure between the chamber and the outer side of the window Pa	Lasting, min	Observation results of the inner surface of the window		Classification БДС EN 12208		Requirements BDS EN 12208
		Method A	Method B	Method A	Method B	
-	-	-	-	0	0	no requirement
0	15	no	no	1A	1B	Do not leak a water 15 min
50	5	no	no	2A	2B	As class 1 + 5 min
100	5	no	no	3A	3B	As class 2 + 5 min
150	5	no	no	4A	4B	As class 3 + 5 min
200	5	no	no	5A	5B	As class 4 + 5 min
250	5	no	no	6A	6B	As class 5 + 5 min
300	5	no	no	7A	7B	As class 6 + 5 min
450	5	no	no	8A	-	As class 7 + 5 min
600	5	no	no	9A	-	As class 8 + 5 min

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Annex 3

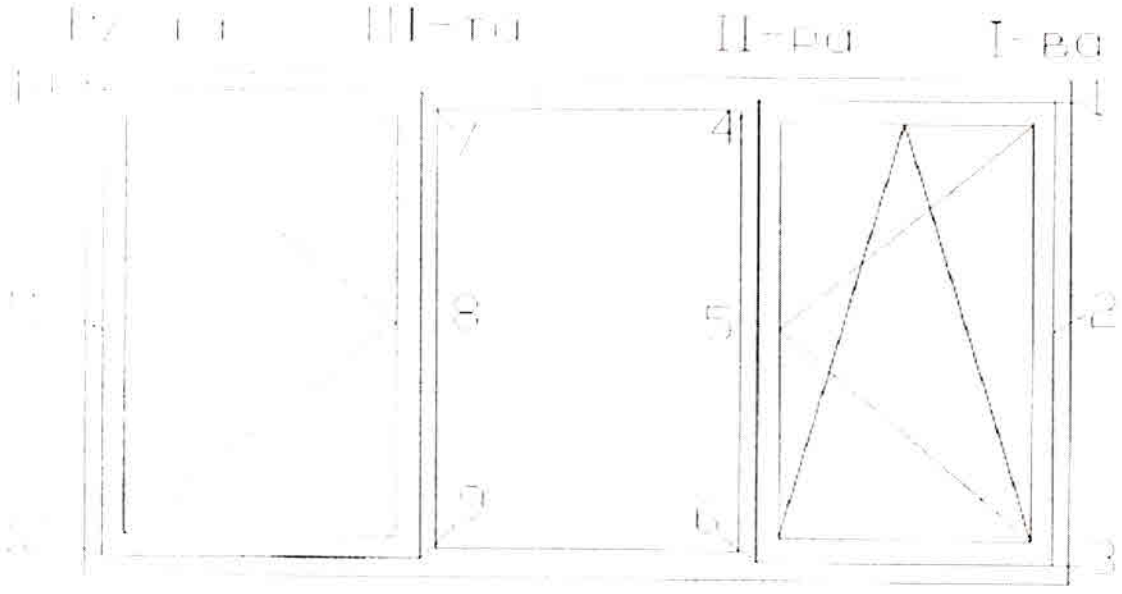
Wind resistance load – BDS EN 12211

1. Conditions and details of the test apparatuses

The testing stand and chamber are in accordance to Annex 2
The air temperature in the chamber and laboratory t = 15 °C
Air humidity in the chamber and the laboratory 68 %

2. Deformations test

The measurement of the deformation (relocations) of the linear elements at the height of the window wings is performed by means of timer indicators for relocation type TGL 7682 (produced by SUHL - Germany) to an accuracy of 0.01 mm



Arrangement scheme of the clock indicators

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Test results

Difference in pressure between the chamber and the external side of the window Pa	I st vertical axis		
	F ($f_{ост}$) in point 1, Mm	F ($f_{ост}$) in point 2, Mm	F ($f_{ост}$) in point 3, Mm
+ 400 / - 400	+ 0.20 / - 0.24 (+ 0.00 / - 0.06)	+ 0.47 / - 0.41 (+ 0.02 / - 0.05)	+ 0.14 / - 0.14 (0.00 / - 0.02)
+ 800 / - 800	+ 0.22 / - 0.45 (+ 0.03 / - 0.12)	+ 1.28 / - 0.91 (+ 0.10 / - 0.15)	+ 0.12 / - 0.35 (+0.06 / - 0.07)
	II nd vertical axis		
	F ($f_{ост}$) in point 4, Mm	F ($f_{ост}$) in point 5, Mm	F ($f_{ост}$) in point 6, mm
+ 400 / - 400	+ 0.72 / - 0.67 (+ 0.08 / - 0.11)	+ 2.02 / - 1.88 (+ 0.16 / - 0.22)	+ 0.92 / - 0.79 (+ 0.13 / - 0.13)
+ 800 / - 800	+ 1.16 / - 1.46 (+ 0.48 / - 0.28)	+ 4.70 / - 4.13 (+ 0.64 / - 0.52)	+ 1.20 / - 1.84 (+ 0.29 / - 0.31)
	III rd vertical axis		
	F ($f_{ост}$) in point 7, Mm	F ($f_{ост}$) in point 8, Mm	F ($f_{ост}$) in point 9, Mm
+ 400 / - 400	+ 0.97 / - 0.78 (+ 0.14 / - 0.12)	+ 2.21 / - 1.97 (+ 0.22 / - 0.19)	+ 1.11 / - 0.91 (+ 0.17 / - 0.14)
+ 800 / - 800	+ 2.18 / - 1.80 (+ 0.24 / - 0.28)	+ 4.58 / - 4.20 (+ 0.33 / - 0.36)	+ 2.45 / - 1.95 (+ 0.30 / - 0.31)
	IV th vertical axis		
	F ($f_{ост}$) in point 10, Mm	F ($f_{ост}$) in point 11, Mm	F ($f_{ост}$) in point 12, Mm
+ 400 / - 400	+ 0.07 / - 0.06 (+ 0.01 / - 0.01)	+ 0.47 / - 0.40 (+ 0.04 / - 0.05)	+ 0.19 / - 0.17 (+ 0.03 / - 0.02)
+ 800 / - 800	+ 0.18 / - 0.14 (+ 0.02 / - 0.02)	+ 1.10 / - 0.80 (+ 0.09 / - 0.09)	+ 0.43 / - 0.37 (+ 0.04 / - 0.04)

3. Testing of repeated positive and negative pressure

The test is performed at pressure of ± 400 Pa, repeated 50 times.
No defects and damages, affecting the operational qualities of the window, were ascertained during the test for 50 times repeated negative and positive pressure at 400 Pa, showing the behavior of the window by the wind impact (pressure force and suction).

4. Safety Test (storm)

The test is performed by single positive and negative pressure ± 1200 Pa.
No damages, affecting the functional qualities and the completeness of the façade element, were ascertained during the test for safety in case of a storm.

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Annex 4

Bearing load capacity of the safety devices – БДС EN 14609

1. **Data for the test apparatus**:
The measurement of the deformation of the linear elements of the wings is performed by means of inductive sensors for relocation type W 50 TS and amplifier carrier frequency KWS 673 A4 (produced by HBM - Germany) to an accuracy of 0.01 mm.

2. **Test results**
2.1 Bending for a time period of 5 min., at load with horizontal force F, N, applied to the one end of the wing with hinges, rotating at horizontal axis and fixed on the other side.

F = 20 N: a_o = 1,6 mm

F = 200 N: a_l = 30,4 mm; $a_r = a_l - a_o$ = 28,8 mm; $a_{ост.}$ = 5,8 mm

F = 250 N: a_l = 43,9 mm; $a_r = a_l - a_o$ = 42,3 mm; $a_{ост.}$ = 7,5 mm

F = 300 N: a_l = 51,4 mm; $a_r = a_l - a_o$ = 49,8 mm; $a_{ост.}$ = 7,8 mm

F = 350 N: a_l = 58,6 mm; $a_r = a_l - a_o$ = 57,0 mm; $a_{ост.}$ = 9,7 mm

The functional qualities and coupling with the ferrel are preserved.

2.2 Bending for a time period of 5 min., at load with horizontal force F, N, applied to the bottom of the wing with hinges, rotating at vertical axis and fixed on the upper end.

F = 20 N: a_o = 3,8 mm

F = 200 N: a_l = 69,0 mm; $a_r = a_l - a_o$ = 65,2 mm; $a_{ост.}$ = 9,5 mm

F = 250 N: a_l = 72,0 mm; $a_r = a_l - a_o$ = 68,2 mm; $a_{ост.}$ = 11,6 mm

F = 300 N: a_l = 83,5 mm; $a_r = a_l - a_o$ = 79,7 mm; $a_{ост.}$ = 13,7 mm

F = 350 N: a_l = 95,4 mm; $a_r = a_l - a_o$ = 91,6 mm; $a_{ост.}$ = 14,0 mm

The functional qualities and coupling with the ferrel are preserved.

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Annex 5

Airborne sound insulation – BDS EN ISO 10140-2, BDS EN ISO 717-1

1. Test conditions and details of the test apparatuses

The test is performed in Building Physics Laboratory:

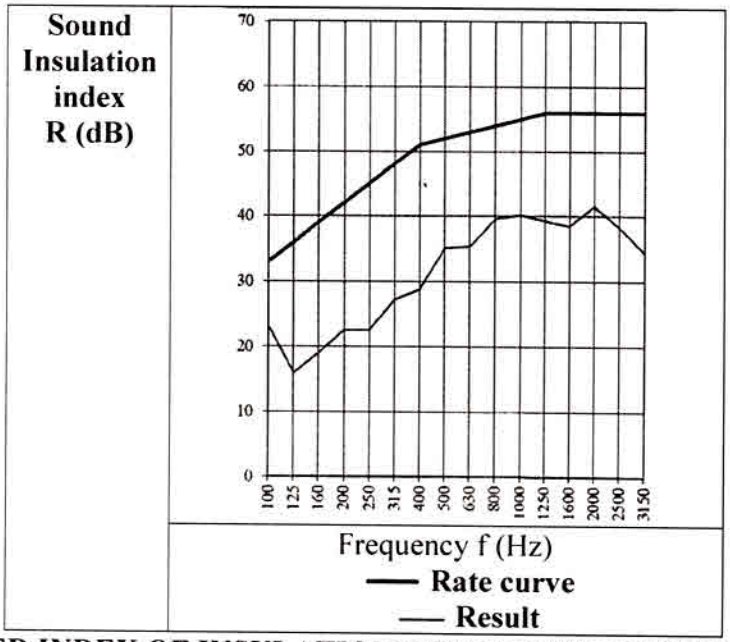
- Air temperature in the chambers t = 23 °C ; humidity – 62 %;
- Upper level chamber V = 170 m^3;
- Lower level chamber V = 119 m^3;
- Filling wall with Rw = 50 dB;
- Acoustic equipment of company Bruel & Kjaer – Denmark:

- Building acoustic analyzer type 2916
- Microphone type 4166
- Microphone preamplifier – type 2916;
- Sound source type 4224.

The installation is performed by specialists of the assignor.

2. Test results

F, Hz	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
R, dB	23.1	16.0	19.1	22.5	22.5	27.2	28.8	35.1	35.4	39.5	40.2	39.2	38.4	41.5	38.2	34.3



WEIGHTED INDEX OF INSULATION OF AIRBORNE NOISE
RW (C; C_{TR}) = 35 (-2; -5) dB

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Annex 6

Air Permeability of the Joints– BDS EN 1026

1. **Test conditions and details of the test apparatuses**
   The test apparatuses is in accordance with Annex 2
   Air temperature in the chamber and laboratory t = 14 °C ;
   Air humidity in the chamber and laboratory is 56 %.

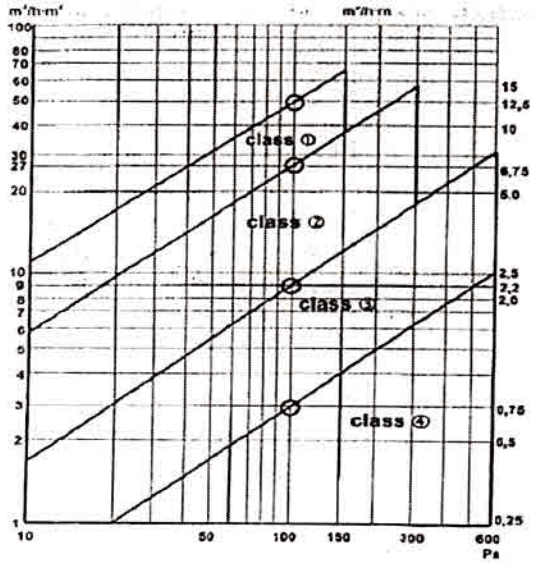
2. **Test results**

The length of the openable window joints is 9.60 m. and the total area of the window – 4.46 m^2

P, Pa	**50**	**100**	**150**	**200**	**250**	**300**	**40 0**	**500**	**6 00**
V, m^3/h	0.5	0.7	0.8	0.6	0.60	0.1	2.1	9.70	5.50
V_1, m^3/hm	0.04	0.06	0.08	0.09	0.10	0.12	0.22	1.00	0.60
Vw, m^3/hm^2	0.09	0.08	0.14	0.18	0.18	0.25	0.45	2.20	1.30

Air permeability – window classification by

- General area – class 4
- length of openable joints – class 4.



Graphics of the relation between the relative air permeability and the test pressure

I, the undersigned Stela Svetoslavova Lekova do hereby certify that this is true and correct translation I have made from Bulgarian into English of the document "Protocol № PTD-17.8 / 30.05.2017" attached hereto. The translation includes 14 pages.
Translator: Stela Svetoslavova Lekova, ...