

НОТИФИЦИРАНА ИЗПИТВАТЕЛНА ЛАБОРАТОРИЯ
към Солар Проджект ООД
Разрешение № CPR 04 - NB 2145/ от 25.09.14
Валидност до 01.09.2019
от регистъра на Европейската комисия
ФК 510.01

NOTIFIED TESTING LABORATORY
AT SOLAR PROJECT LTD
Permit № CPR 04 - NB 2145/ from 25.09.14
with validity 01.09.2019
FK 510.01-2







SOLAR PROJECT

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PROTOCOL OF INITIAL TYPE TEST

№ ITT- 19 /19.10.2015 г.

Designation of the product:	Window triple glued wood-array
Producer:	„Stil-M 93 " LTD, Sofia 1000, 85 Georgi Sava Rakovski str.
Client:	„Stil-M 93 " LTD, Sofia 1000, 85 Georgi Sava Rakovski str.
Assigning document:	Contract № 16/07.10.2015
System of assessment for conformity:	System "3" as in Annex ZA of EN 14351-1:2003+A1:2011
Essential requirements:	
	3. Dangerous substance and water penetration
	4. Safe operation (resistance to wind load)
	5. Noise protection
	6. Power and heat saving (power efficiency) air permeability
Test sample:	1 piece sample - request of 07.10.2015
Period for conducting the testing:	From 12.10.2015 to 23.10.2015

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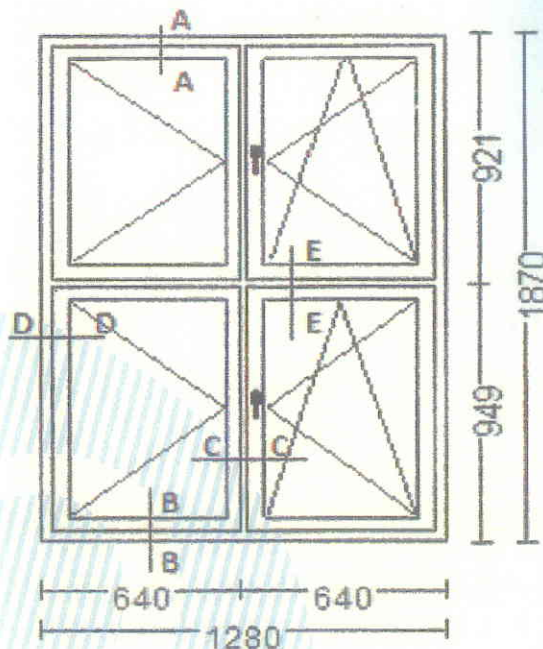


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Description of the product tested:



Overall dimension: 1280 mm x 1870 mm Hardware: G-U

Frame: 78/80

Locking: 6 in number

Sash: : 78/80

Drainage:

Glass bead: „18 mm”

Type of glass: „Rolplast”

Opening type:

Glass dimension: 40 mm (4mm high energy /

Right wings: AXLE opening

14+ Argon / 4mm White / 14+ Argon / 14mm

Left wings: Uniaxial opening

Ka

Sealing: EPDM K01,K02

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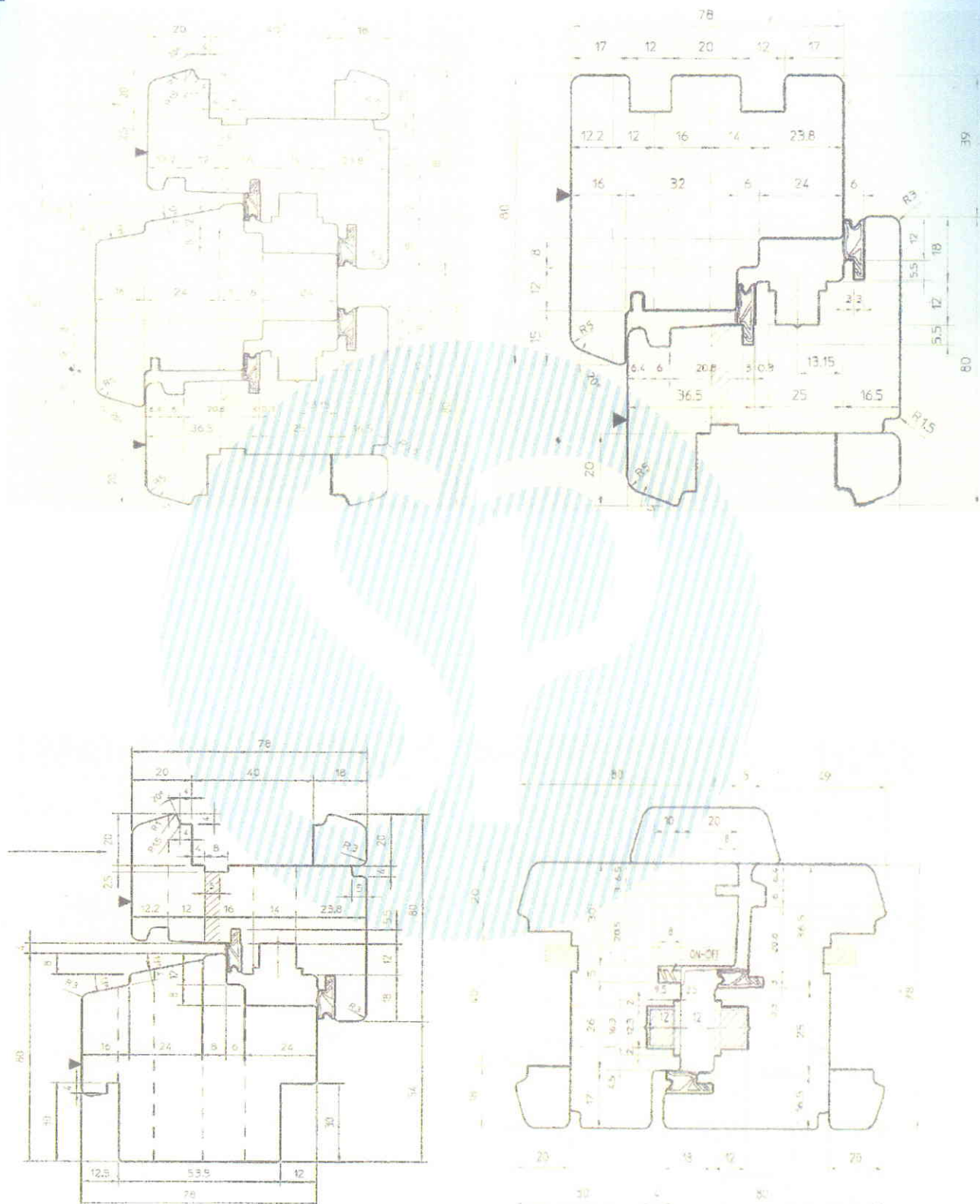
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Results from testing

3. Dangerous substance and water penetration

No in order	Indicator	Measure unit	Testing method	Test results	Requirements as in technical specification
1	2	3	4	5	6
1.	Watertightness	-	BDS EN 1027	Class A7	BDS EN 14351-1+1A

4. Safe operation (resistance to wind load)

No in order	Indicator	Measure unit	Testing method	Test results	Requirements as in technical specification
1	2	3	4	5	6
1.	Resistant to wind load	-	BDS EN 12211	Class 3C	BDS EN 14351-1+1A

5. Sound insulation

No in order	Indicator	Measure unit	Testing method	Test results	Requirements as in technical specification
1	2	3	4	5	6
1.	Sound insulation	dB	BDS EN ISO 10140-2	43	BDS EN 14351-1+1A

6. Power and heat saving (power efficiency) air permeability

No in order	Indicator	Measure unit	Testing method	Test results	Requirements as in technical specification
1	2	3	4	5	6
1.	Thermal transmittance	W/m ² K	BDS EN ISO 12567-1	0.8	BDS EN 14351-1+1A
2.	Air permeability	-	BDS EN 1026	Class 3	BDS EN 14351-1+1A

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USED TECHNICAL MEANS:

Indications of moving 1, 2, 3, 4, 5, 6 type 8712-50 – Certificate of calibration № 038A-E-15 / 27.03.2015g "Metrologiya Holding";

Shtrih measure to the U-shaped manometer, Type: Pa / UI-γ 0,88, ID № 1695 calibration certificate № 0331-D-03 / 03.27.2013, the "KALABSI" - LTD;

Flowmeter type: "Aqua metro" sensor type water: JMD / IFMA 0035, № Id 4628833 - calibration certificate № 02-OP-20 / 11.03.2013 "Kalibra-Bulgaria" LTD;

Mini Air 60 - Mini; 40 m / s Anemometer - pressure vacuum Protocol check № 22522 / 18.02.2014g. K.Schulten;

Pressure sensor PU +/- 4000 Pa -Protocol verification № 22521 / 18.02.2014, the K.Schulten;

Meter speed air type: Testo 416 Idn № 02512879, certificate of calibration from 03.04.2013 № 07 473 "TOTAL-TEST" LTD.



TECHNICAL DOCUMENTATION USED: (list of technical specifications with requirements and methods for testing, rules and regulations etc. documents related to initial type testing)

BDS EN 14351-1:2003+A1:2011 – Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics

BDS EN ISO 10077-1,2 – Thermal performance of windows, doors and shutters - Calculation of thermal transmittance Part 1: General (ISO 10077-1:2006)
Thermal performance of window, doors and shutters - Calculation of thermal transmittance - Part 2 : Numerical method for frames (ISO 10077-2:2012)

EN ISO 10140-2 – Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010)

BDS EN 1027:2003 – Windows and doors - Watertightness - Test method

BDS EN 1026:2003 - Windows and doors - Air permeability - Test method

BDS EN 12211:2003 - Windows and doors - Resistance to wind load - Test method

BDS EN 12210/AC:2012 classification;

BDS EN 12208:2012 classification;

BDS EN 12207:2012 classification

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Applications essential requirement:

3. Dangerous substance and water penetration

BDS EN 1027 – Windows and doors - Watertightness - Test method

Watertightness: EN 12208 -

Spaying method A Number of nozzles: 3 Vol. Water: 360.0 litre/hour
Spaying angle:24 Degree : 6.0 litre/minute
Add. spraying pipe Number of nozzles: 0 Vol. Water: 0.0 litre/hour
(0.0 litre/nozzle) : 0.0 litre/minute

1. Watertightness pressure

Pressure Pa		Time	Remark
Nominal	Real		
0	0	00:15:00	OK
50	50	00:05:00	OK
100	101	00:05:00	OK
150	150	00:05:00	OK
200	201	00:05:00	OK
250	252	00:05:00	OK
300	302	00:05:00	OK
450	-11	00:05:00	Flow:00:04:10 trickling:00:02:15
600	0	00:05:00	-

Watertightness Class: A7

Point of water ingress :

Probable cause of leakage :

4. Safe operation (resistance to wind load)

BDS EN 12211 - Windows and doors - Resistance to wind load - Test method

Wind Resistance: EN 12210

Temperature: 21 Celsius Humidity: 58 % Air pressure: 1013.0 HPa

Wind Resistance: EN 12210		
P1 for deflection	1200	-1200
P2 for cycles	-600	600
P3 for safety test	-1800	1800

Deflection:

Distance between the way transducers

a01 <-> c03 = 792 mm

A = 1/150 B = 1/200 C = 1/300

Wind Resistance P1 pressure

3 Pressure pulses 1320 Pa implemented

Pressure		Distortion Absolute			Distortion Relative		Distortion class
Desired	Actual	a01=	b02=	c03=	f01=		
1200	1204	-0.12	-0.72	-0.93	-0.20		C (1/>999)
0	0	0.00	0.00	0.00	0.00		

Class: 3

Wind Resistance P1 suction

3 Pressure pulses -1320 Pa implemented

Pressure		Distortion Absolute			Distortion Relative		Distortion class
Desired	Actual	a01=	b02=	c03=	f01=		
-1200	-1205	0.19	1.13	1.32	0.37		C (1/>999)
0	0	0.11	0.12	0.06	0.03		

Class: 3

Rolling shutter box

Roll shutter box P1 pressure

3 Pressure pulses 1320 Pa implemented

Pressure		Distortion Absolute			Distortion Relative		Distortion %
Desired	Actual	a01=	b02=	c03=	f01=		
1200	1206	-0.19	-0.76	-0.96	-0.19		1 / 9894
0	0	-0.01	0.00	0.01	0.00		1 / 0

Deflection OK

Roll shutter box P1 suction

3 Pressure pulses -1320 Pa implemented

Pressure		Distortion Absolute			Distortion Relative		Distortion %
Desired	Actual	a01=	b02=	c03=	f01=		
-1200	-1207	0.05	1.01	1.27	0.35		1 / 5371
0	0	0.00	0.00	-0.01	0.00		1 / 0

Deflection OK



5. Sound insulation

EN ISO 10140-2 – Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010)

Frequency f Hz	L_n one-third octave dB
50	-
63	-
80	-
100	36.3 dB
125	35.6 dB
160	41.9 dB
200	46.3 dB
250	35.7 dB
315	39.3 dB
400	40.2 dB
500	45.8 dB
630	43.9 dB
800	46.1 dB
1000	35.7 dB
1250	45.7 dB
1600	42.3 dB
2000	40.7 dB
2500	42.6 dB
3150	47.4 dB
4000	42.7 dB
5000	41.7 dB



Legend: R-index, volume down, dB
f - frequency, Hz

Classification in accordance with ISO 717-1:

$$R_w (C; C_{tr}) = 43 (-2; -3) \text{ dB} \quad C_{50-3150} = (-2, 0) \text{ dB}; C_{50-5000} = (-2, 0) \text{ dB}; C_{100-5000} = (-2, 0) \text{ dB}$$

Evaluation based on results from laboratory measurements obtained engineering method:

$$C_{tr50-3150} = (-3, 0) \text{ dB}; C_{tr50-5000} = (-3, 0) \text{ dB}; C_{tr100-5000} = (-3, 0) \text{ dB}$$

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6. Power and heat saving (power efficiency) air permeability

6.1. BDS EN ISO12567-1 – Thermal performance of windows and doors - Determination of thermal transmittance by the hot-box method - Part 1: Complete windows and doors (ISO 12567-1:2010)

Air temperature in hot chamber:	$T_h = 22.3 \text{ }^{\circ}\text{C}$
Air temperature in cold chamber:	$T_c = 2.0 \text{ }^{\circ}\text{C}$
Environment temperature:	$T_o = 22.9 \text{ }^{\circ}\text{C}$
Thermal stream:	$F = 36 \text{ W}$
Density of the thermal stream:	$f = 20 \text{ W/m}^2$
Total thermal resistance:	$R = 1.05 \text{ m}^2\text{K/ W}$
Thermal transmittance:	$U_w = 0.8 \text{ W/m}^2\text{K}$
Uncertainty in quantitative testing:	± 0.03



6.2 BDS EN 1026 - Windows and doors - Air permeability - Test method

Air Permeability: EN 12207 in accordance with BS EN 1026

Window surface: 2.393 m² Seal length: 13.020 m

1. Air Permeability pressure / Air Permeability suction

Pressure Pa		Qc mih	Qtc mih	Window surface		Joints length	
Nominal	Real			mi/h/mi	class	mi/h/m	class
+							
50	49	0.00	20.05	8.38	2	1.54	2
100	98	0.00	30.51	12.75	2	2.34	2
150	148	0.00	38.42	16.05	2	2.95	2
200	197	0.00	42.02	17.56	2	3.22	3
250	250	0.00	43.96	18.37	2	3.37	3
300	299	0.00	42.79	17.88	3	3.28	3
450	450	0.00	46.70	19.51	3	3.58	3
600	599	0.00	55.65	23.25	3	4.27	3
-							
-50	-51	0.00	19.17	8.01	2	1.47	2
-100	-100	0.00	29.02	12.13	2	2.22	3
-150	-149	0.00	36.73	15.35	2	2.82	3
-200	-200	0.00	41.78	17.46	2	3.20	3
-250	-250	0.00	43.64	18.23	2	3.35	3
-300	-301	0.00	46.40	19.39	2	3.56	3
-450	-450	0.00	48.37	20.21	3	3.71	3
-600	-600	0.00	63.97	26.73	3	4.91	3
Average							
50	50	0.00	19.61	8.19	2	1.50	2
100	99	0.00	29.77	12.44	2	2.28	2
150	148	0.00	37.58	15.70	2	2.88	3
200	198	0.00	41.90	17.51	2	3.21	3
250	250	0.00	43.80	18.30	2	3.36	3
300	300	0.00	44.59	18.63	3	3.42	3
450	450	0.00	47.54	19.86	3	3.65	3
600	599	0.00	59.81	24.99	3	4.59	3

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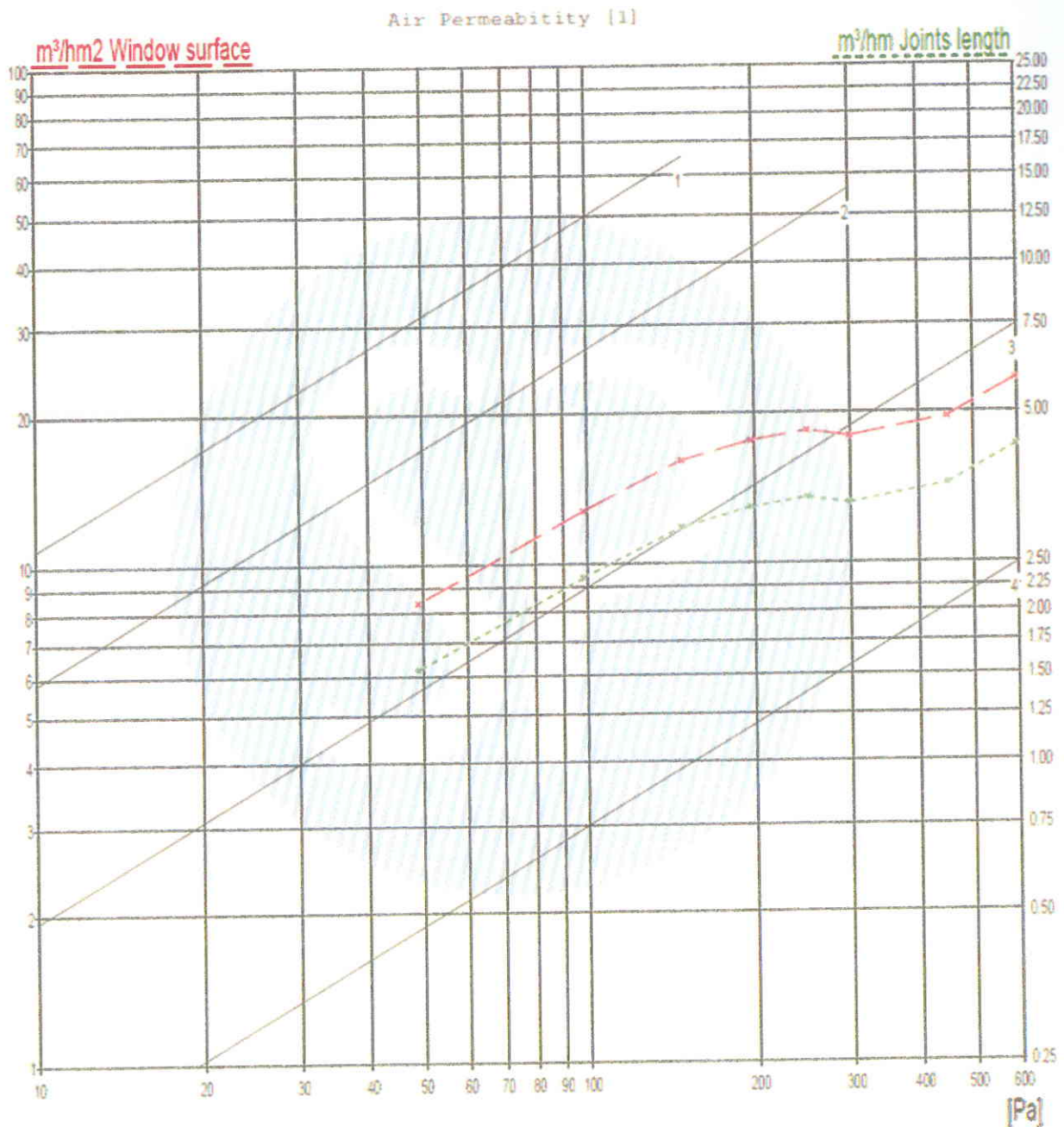
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Air Permeability pressure:



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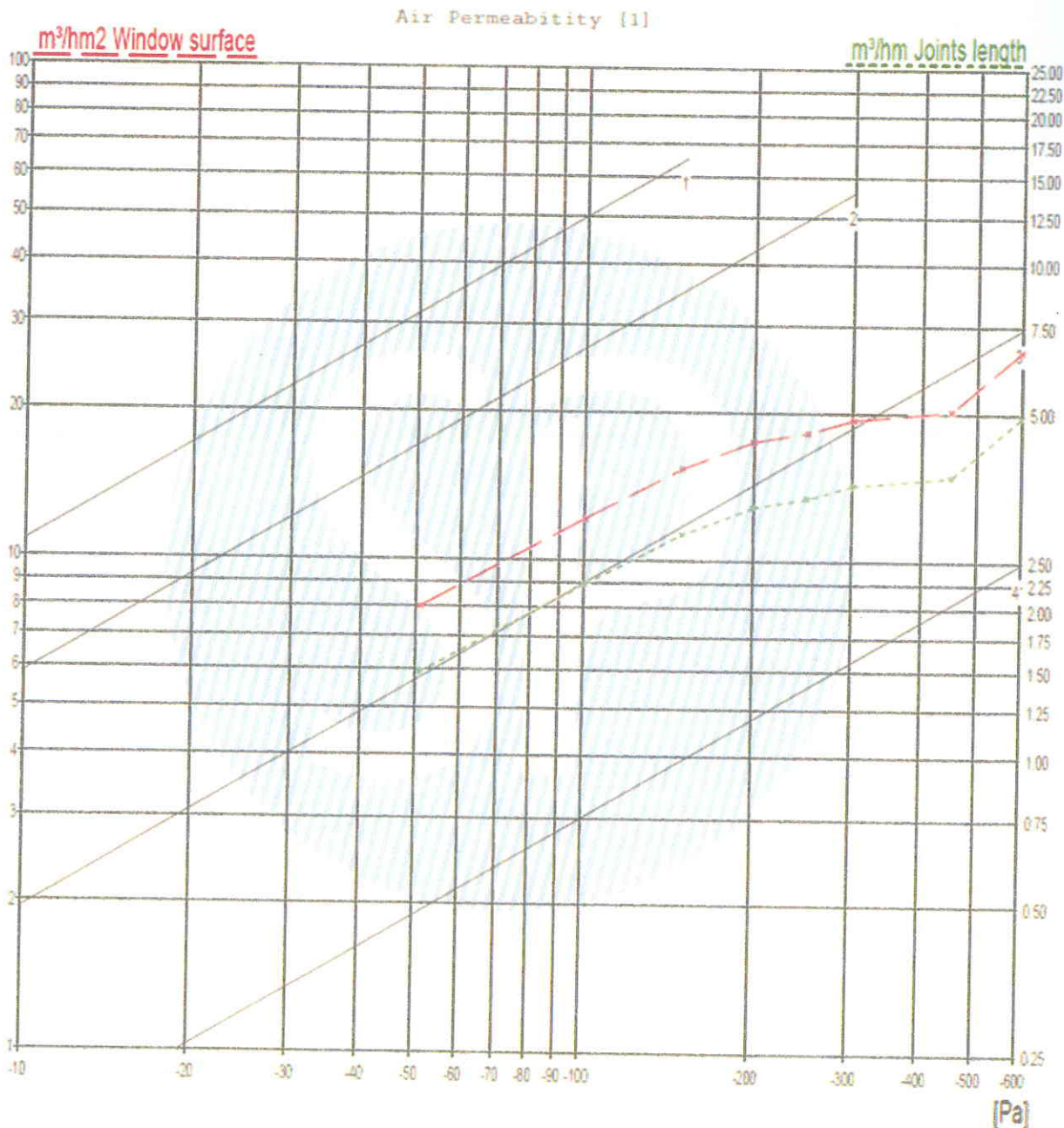
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Air Permeability suction:



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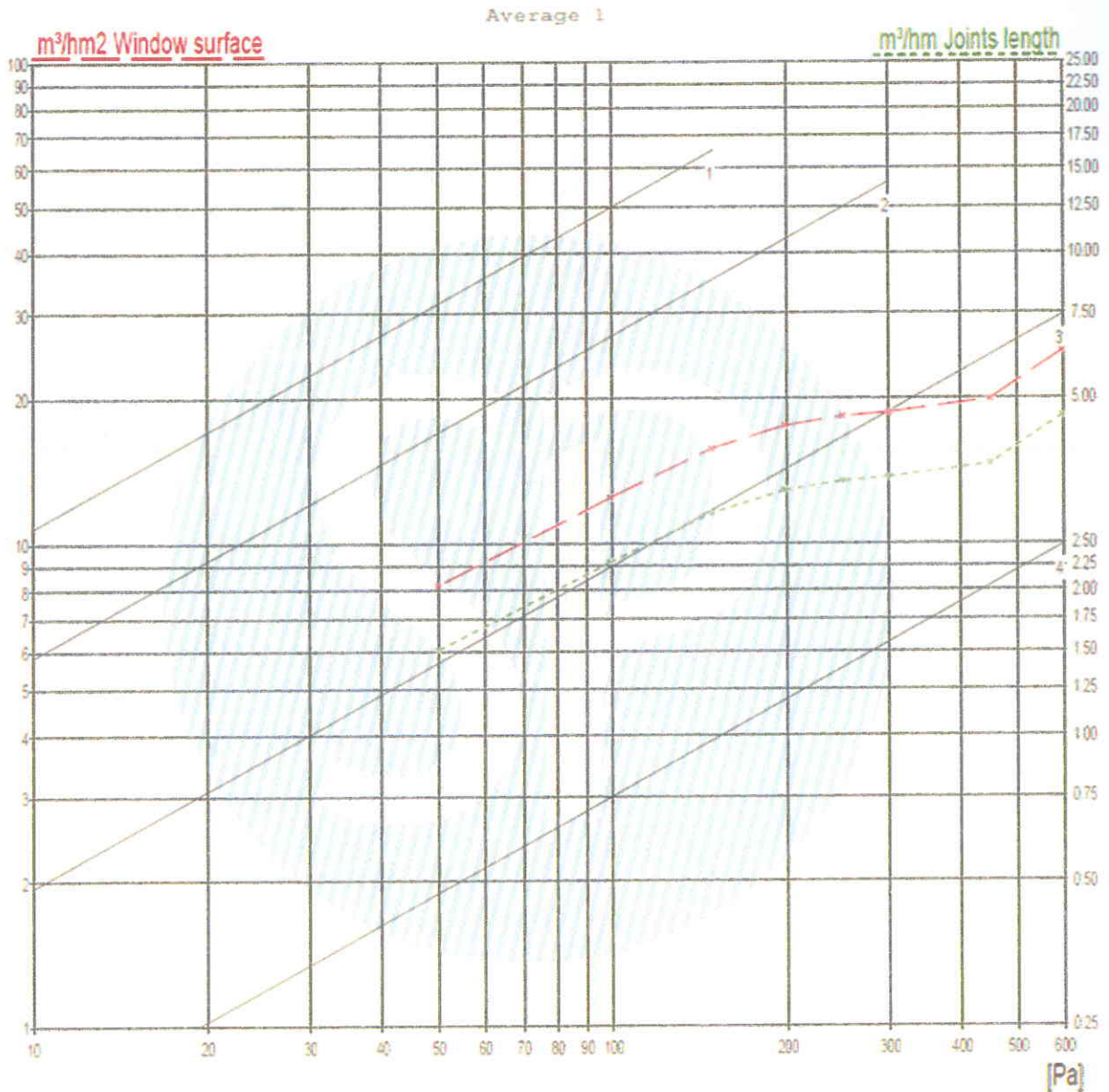
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Air Permeability Average:



Head of test:

(Signature)
 /M. Aliev/

Head of laboratory:

/PhD. eng. P. Naydenova/

