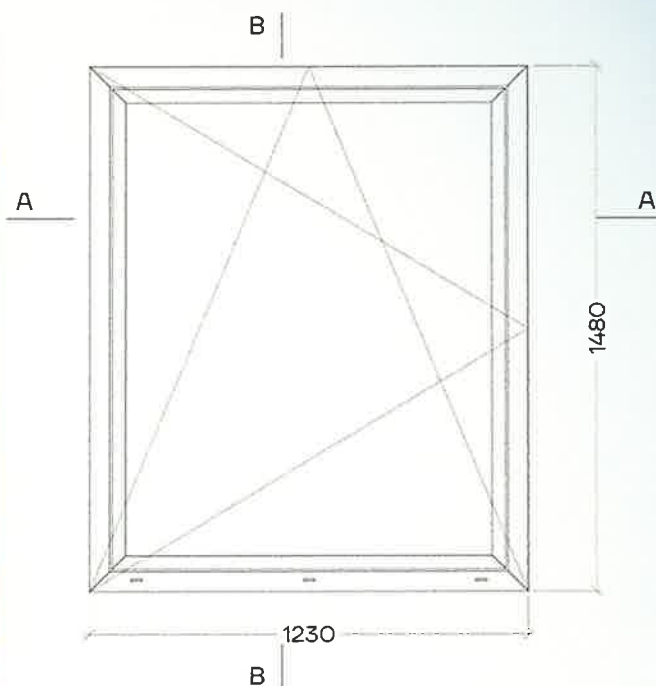


TEST PROTOCOL

№ 11 / 10.07.2025

Designation of the product:	Window KW60
Producer:	KÖMMERLING SEE, Sofia, Slavyanska Street 5
Client:	KÖMMERLING SEE, Sofia, Slavyanska Street 5
Assigning document:	Contract: № 08/10.06.2025
System of assessment for conformity:	System "3"
Standard:	EN 14351-1:2006+A2:2016
Essential requirements:	
	3. Watertightness
	4. Resistant to wind load
	6.3. Air permeability
Test sample:	1 piece sample – request of 10.06.2025
Period for conducting the testing:	16.06.2025 - 27.06.2025

Description of the product tested:



Overall dimension: 1230 mm x 1480 mm

Frame: 201000

Sash: 201001

Glass bead: PLAGC.23.601

Opening type: Tilt & Turn

Sealing: EPDM

Hardware: Siegenia

Locking point: 5

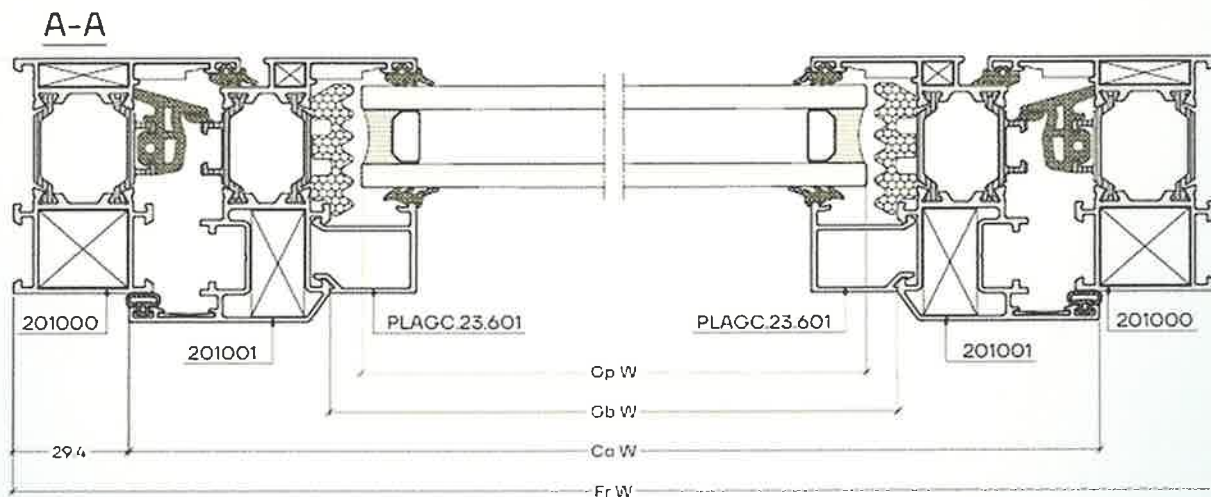
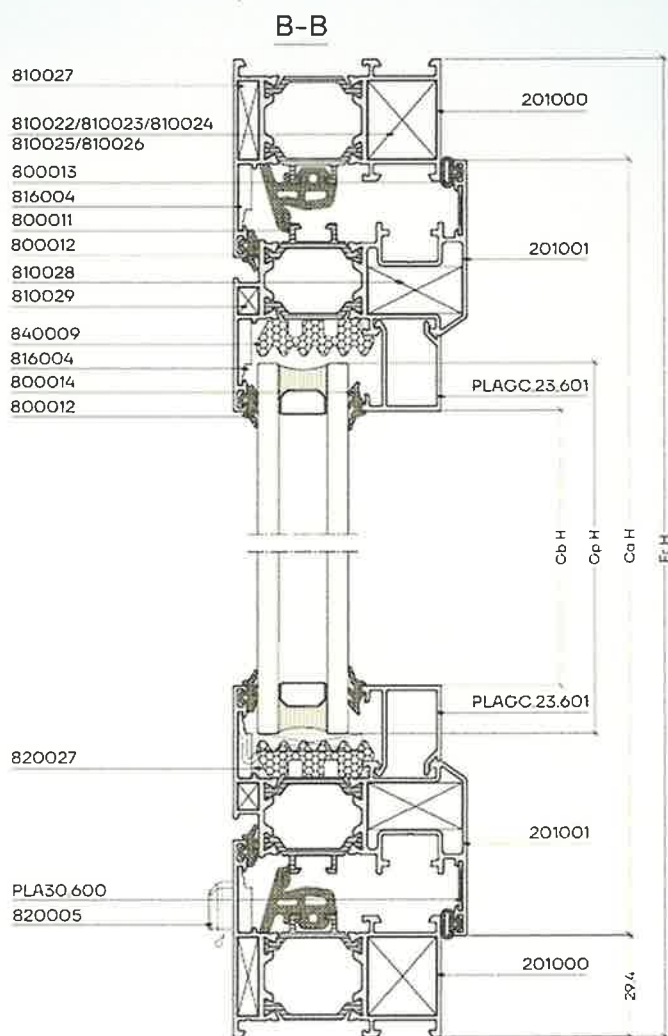
Hinges: 2

Drainage: 3

Type of glazing: 24 mm (6/14/6) / white + white /



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Results from testing

№ in order	Essential characteristics	Measure unit	Testing method	Performance	Harmonised technical specification
1	2	3	4	5	6
1.	Watertightness	-	EN 1027	Class A9	EN 14351-1+A2
2.	Resistant to wind load	-	EN 12211	Class 5C	EN 14351-1+A2
3.	Air permeability	-	EN 1026	Class 4	EN 14351-1+A2

Technical devices used:

Indications of moving 1, 2, 3, 4, 5, 6 type 8712-50 – Certificate of calibration № 1985A-D-24/13.05.2024, № 1986A-D-24/13.05.2024, № 1987A-D-24/13.05.2024, № 1988A-D-24/13.05.2024, № 1989A-D-24/13.05.2024, № 1990A-D-24/13.05.2024 "Metrologiya Holding";

Shtrih measure to the U-shaped manometer, Type: Pa / UI-γ 0,88, ID № 1695 calibration certificate № 1566A-Д-25/04.04.2025, "Mertologia Holding";

Flowmeter type: "Aqua metro" sensor type water: JMD / IFMA 0035, № ID 4628833 - calibration certificate № 02-OP-04/14.02.2025 "Kalibra-Bulgaria" LTD;

Mini Air 60 - Macro - 40 m / s Anemometer pressure - Inspection report № 30499 / / 09.06.2022 - K.Schulten;

Mini Air 60 –Macro - 40 m / s Vacuum anemometer - Inspection report № 30500 / 09.06.2022 Serial № 16311/001 - K.Schulten;

Mini Air 60 - Mini; 40 m / s Anemometer pressure - Inspection report № 30498 / 09.06.2022 Serial № 67080 - K.Schulten;

Mini Air 60 - Mini; 40 m / s Vacuum anemometer - Inspection report: № 30497 / 09.06.2022 Serial № 67080 - K.Schulten

Vacuum sensor PU +/- 4000 Pa - Inspection report: № 30496 / 09.06.2022 Serial № 9002.1998.KF25545 +/- 4000Pa - K.Schulten;

Pressure sensor PU +/- 4000 Pa - Inspection report: № 30495 / 09.06.2022 Serial № 9002.1998.KF25545 +/- 4000Pa - K.Schulten;

Meter speed air type: Testo 415 Idn № 02512879, certificate of calibration: № 21129/ 28.01.2025 "Total-Test" LTD;

TECHNICAL DOCUMENTATION USED: (list of technical specifications with requirements and methods for testing, rules and regulations etc. documents related with a performance evaluation.).

EN 14351-1:2006+A2:2016 – Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets;

EN 1027:2016 – Windows and doors - Watertightness - Test method;

EN 1026:2016 - Windows and doors - Air permeability - Test method;

EN 12211:2016 - Windows and doors - Resistance to wind load - Test method;

EN 12210:2016 - Windows and doors - Resistance to wind load – Classification;

EN 12208:2003 - Windows and doors - Watertightness – Classification;

EN 12207:2017 - Windows and doors - Air permeability – Classification;



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Applications:

3. Watertightness

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	100	00:05:00	OK
150	151	00:05:00	OK
200	200	00:05:00	OK
250	251	00:05:00	OK
300	303	00:05:00	OK
450	451	00:05:00	OK
600	605	00:05:00	OK

Watertightness Class: A9

Point of water ingress :

Probable cause of leakage :



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4. Resistant to wind load

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

Wind Resistance: EN 12210

Temperature: 20 Celsius Humidity: 45 % Air pressure: 1013.0 HPa

Wind Resistance: EN 12210			
P1 for deflection	2000	-2000	
P2 for cycles	-1000	1000	
P3 for safety test	-3000	3000	

Deflection:

Distance between the way transducers

a01 <-> c03 = 1470 mm a04 <-> c06 = 1470 mm

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

Wind Resistance P1 pressure

3 Pressure pulses 2200 Pa implemented

Pressure		Distortion						Distortion	Distortion	
Desired	Actual	Absolute						Relative	class	
2000	2000	a01=	-0.98	b02=	-1.93	c03=	-2.06	f01=	-0.41	C (1/>999)
2000	2000	a04=	-0.98	b05=	-1.92	c06=	-2.06	f02=	-0.40	C (1/>999)
0	0	a01=	0.00	b02=	-0.01	c03=	0.00	f01=	-0.01	
0	0	a04=	0.00	b05=	0.01	c06=	0.02	f02=	0.00	

Class: 5

Wind Resistance P1 suction

3 Pressure pulses -2200 Pa implemented

Pressure		Distortion						Distortion	Distortion	
Desired	Actual	Absolute						Relative	class	
-2000	-2004	a01=	0.62	b02=	1.07	c03=	0.85	f01=	0.34	C (1/>999)
-2000	-2004	a04=	0.64	b05=	1.06	c06=	0.85	f02=	0.31	C (1/>999)
0	0	a01=	0.01	b02=	0.02	c03=	0.01	f01=	0.01	
0	0	a04=	0.01	b05=	0.00	c06=	0.00	f02=	0.00	

Class: 5

Rolling shutter box

Roll shutter box P1 pressure

3 Pressure pulses 2200 Pa implemented

Pressure		Distortion						Distortion	Distortion	
Desired	Actual	Absolute						Relative	%	
2000	2002	a01=	-1.06	b02=	-2.09	c03=	-2.29	f01=	-0.41	1 / 3000
2000	2002	a04=	0.00	b05=	0.00	c06=	0.00	f02=	0.00	1 / 0
0	0	a01=	0.00	b02=	0.00	c03=	0.00	f01=	0.00	1 / 0
0	0	a04=	0.00	b05=	0.00	c06=	0.00	f02=	0.00	1 / 0

Deflection OK



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6.3. Air permeability

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

Air Permeability: EN 12207 in accordance with BS EN 1026

Window surface: 1.820 m² Seal length: 5.134 m

1. Air Permeability pressure / Air Permeability suction

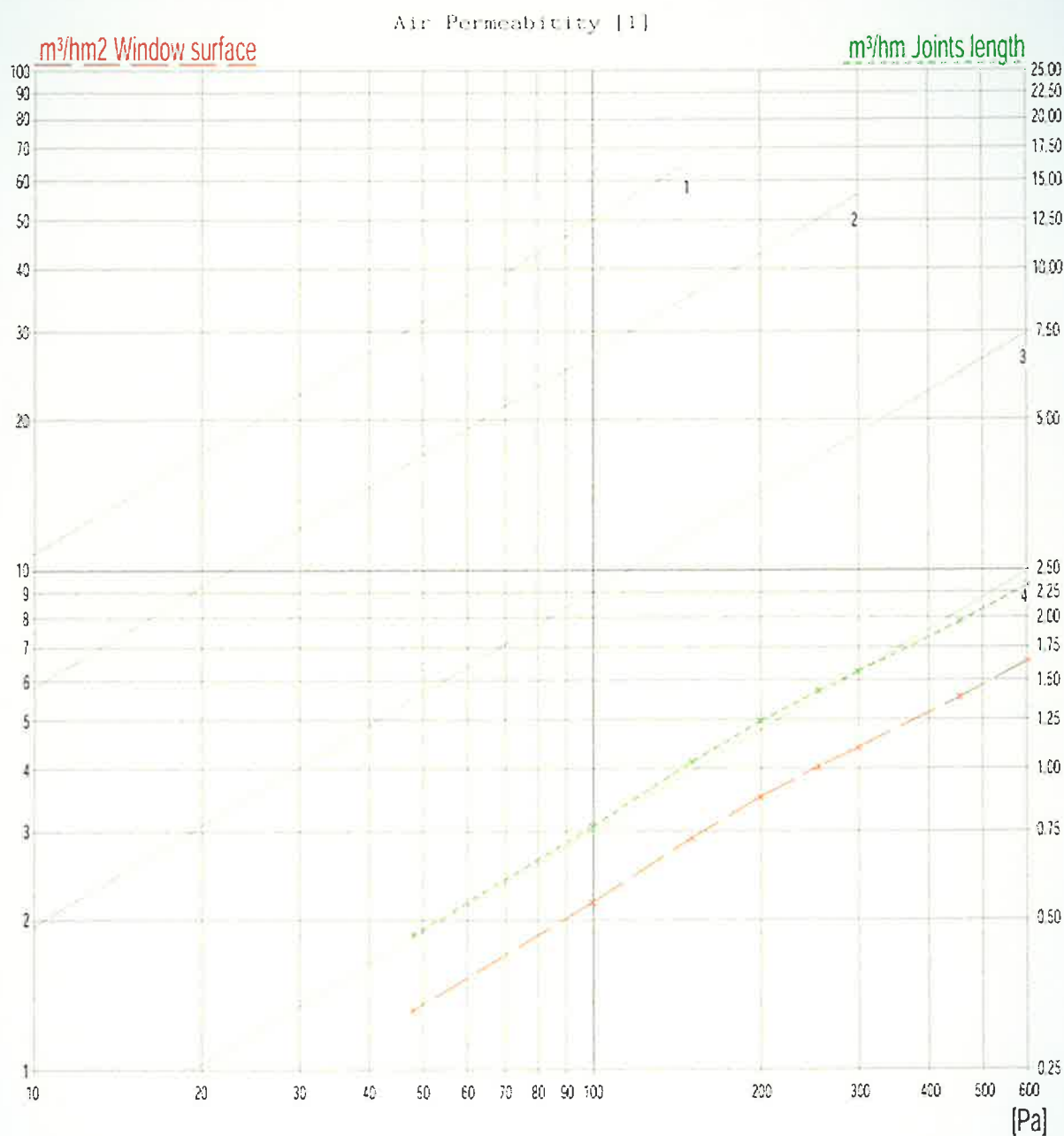
Pressure Pa Nominal	Pa Real	Qc m/h	Qtc m/h	Window surface m ² /h/m ²	class	Joints length m/h/m	length class
+							
50	48	0.00	2.39	1.31	4	0.46	3
100	100	0.00	3.92	2.15	4	0.76	3
150	151	0.00	5.27	2.90	4	1.02	3
200	200	0.00	6.37	3.50	4	1.24	3
250	254	0.00	7.31	4.02	4	1.42	3
300	299	0.00	7.98	4.38	4	1.55	4
450	455	0.00	10.07	5.53	4	1.96	4
600	601	0.00	11.89	6.53	4	2.31	4
-							
-50	-50	0.00	2.18	1.20	4	0.42	4
-100	-101	0.00	3.79	2.08	4	0.73	4
-150	-150	0.00	5.08	2.79	4	0.98	3
-200	-201	0.00	6.26	3.43	4	1.21	3
-250	-250	0.00	7.21	3.96	4	1.40	3
-300	-300	0.00	8.16	4.48	4	1.59	3
-450	-453	0.00	10.54	5.79	4	2.05	3
-600	-603	0.00	12.42	6.82	4	2.42	4
Average							
50	49	0.00	2.28	1.25	4	0.44	4
100	100	0.00	3.86	2.12	4	0.75	4
150	150	0.00	5.17	2.84	4	1.00	3
200	200	0.00	6.31	3.47	4	1.23	3
250	252	0.00	7.26	3.99	4	1.41	3
300	299	0.00	8.07	4.43	4	1.57	3
450	454	0.00	10.31	5.66	4	2.00	4
600	602	0.00	12.16	6.68	4	2.36	4

Pressure: 4 Suction: 4 Average value: 3



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Air Permeability pressure:

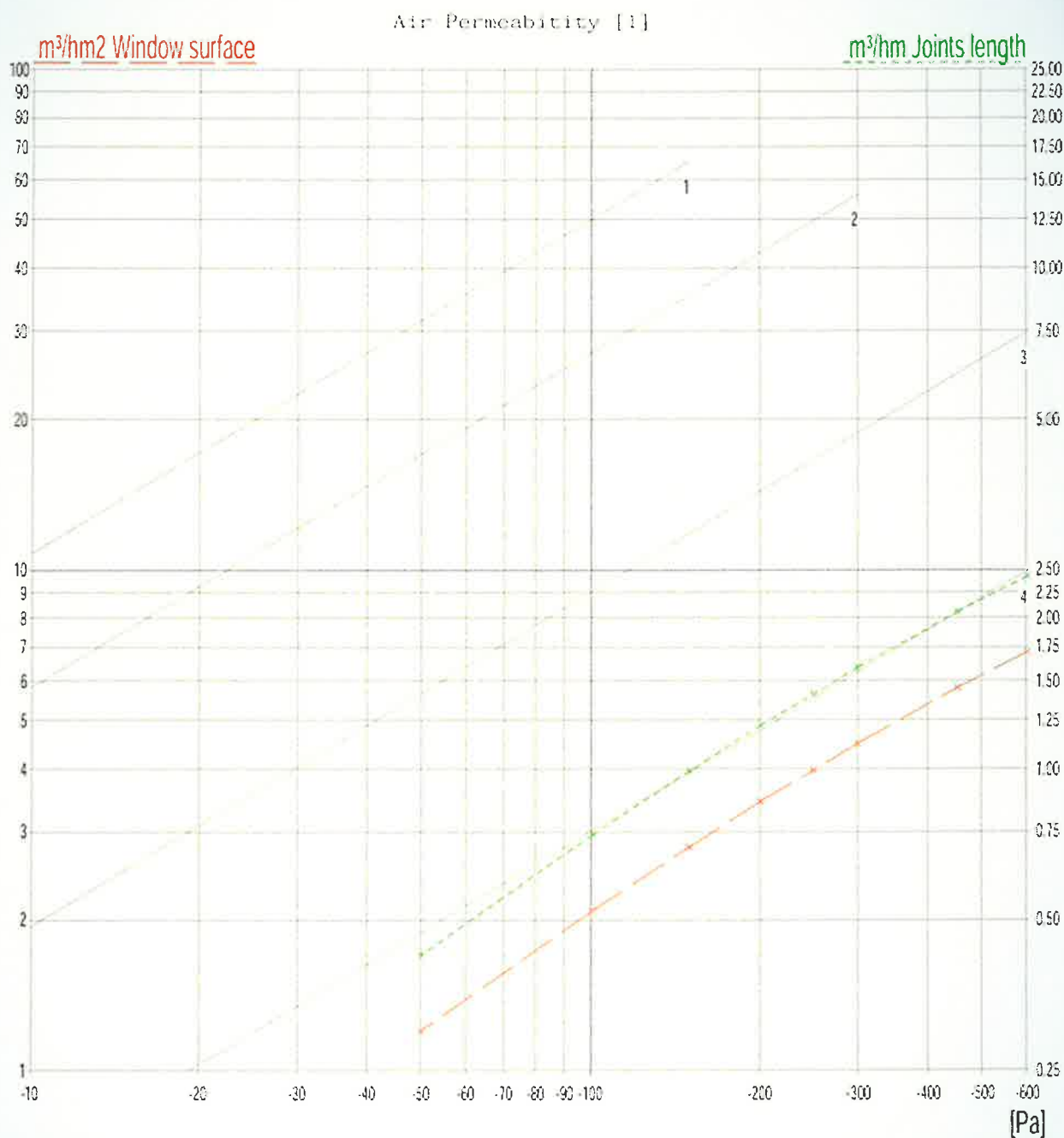




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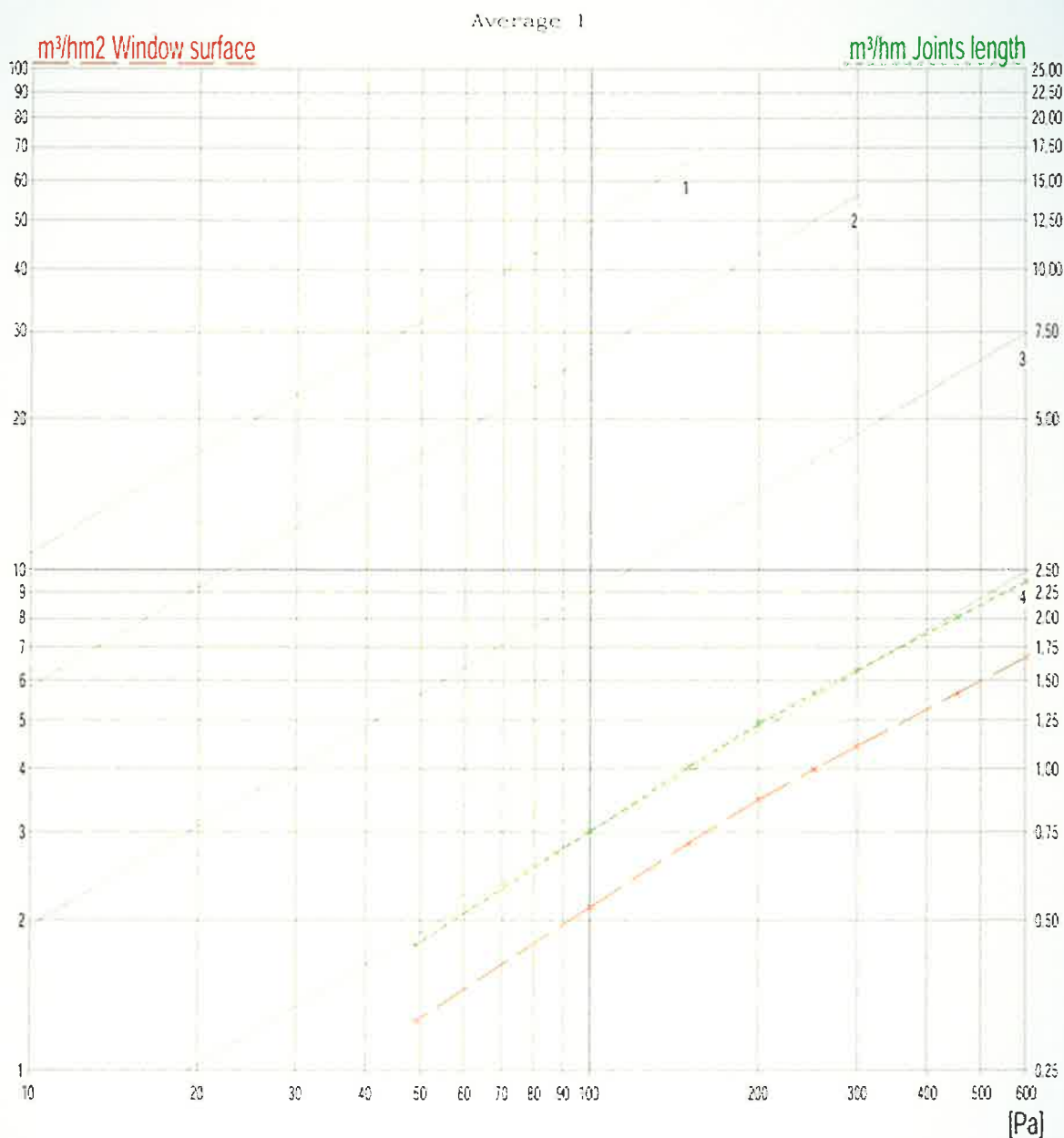
Air Permeability suction:





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Air Permeability Average:



Head of test:

/PhD eng. H. Georgiev/

Head of laboratory:

/PhD eng. H. Georgiev/

