

Notified Body number: 2018

BANDYMAI
ISO/IEC 17025

Nr. LA.01.031

TEST REPORT No. 057 SF/23 OVA en
4th of April 2023

Page (pages)
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**Window air permeability, water tightness
and resistance to wind load measurement**

(designation of the test)

Test LST EN 1026:2016 Windows and doors- Air permeability.
methods: LST EN 1027:2016 Windows and doors – Water tightness.
LST EN 12211:2016 Windows and doors – Resistance to wind load.

(number of normative document)

Specimen description: wooden window (ARKA lux Scandinavian slimline). Size 1230x1480 mm. Product frame/sash material: wood. Filling the product sash /frame: glazed. System: Wood window. Type of opening: outward opening. Fittings: IPA Canopy stays, IPA Espagnolettes with side bolts, IPA Receivers. Locks / handles: FIX 83 handle. Fastening (number of sash locking points): 2 locking points. Gaskets: main sealing gasket Schlegel. Other details: no. Glazing: 3k4LowE1.0+4+4LowE1.0-14SW9005; 12SW9005. Producer and date of the glazing unit: Stiklu Centrs SIA 03/2023. Date of production of window: 20/03/2023.
(name, description and identification details of a specimen; information submitted by the customer)

Customer: SIA "ARKA lux", "Pori", Virgas pag., Dienvidkurzemes nov., LV-3433, Latvia
(the name and address)

Manufacturer: SIA "ARKA lux", Veca ostamala 10, LV-3401 Liepaja, Latvia
(the name and address)

Results of test:

Name of the indicator and unit	Method reference no.	Test result
Air permeability, class	LST EN 12207:2017	4
Water tightness, class	LST EN 12208:2002	AE1200
Resistance to wind load, test pressure, class	LST EN 12210:2016	5
Resistance to wind load, frame deflection, class	LST EN 12210:2016	C

Note. 1) The testing are carried out in purpose for conformity assessment of the product according to LST EN 14351-1:2006+A2:2016;
2) Conformity of test results is evaluated using the decision rule in accordance with ILAC-G8: 09/2019 point 4.2.1.

Place of test: Building Physics Laboratory, Institute of Architecture and Construction of Kaunas University of Technology

(name of the test laboratory)

Specimen delivery date: 24/03/2023

Date of test: 30-31/03/2023

Sampling: The test specimen sampled by customer, task No. 057/23, 15/03/2023

Additions information: Application 15/03/2023, drawings

(other deviations, other tests and any information related to the test)

Annex: 1– Test photos, 2– schematical view of the test rig, 3– measurement results (+11 pages)

(the numbers of the annexes should be pointed out)

Technical manager:

(approves the test report)

(signature)

J. Ramanauskas

(n., surname)

Test performed by:

(responsible for testing and results)

(signature)

R. Rauckis

(n., surname)

Validity – the named data and results refer exclusively to the tested and described specimens.

Notes on publication – no part of this document may be photocopied, reproduced or translated to another language without the prior written consent of the Building Physics Laboratory.

Installation of the sample

Sample has been installed into test rig KS 3035/650 PC Nr.P2130 opening by workers of the laboratory. An opening of the test rig was adjusted that it size would meet the dimensions of the sample.

The ambient temperature and humidity close to the specimen shall be within the range 10 °C to 30 °C and 25 % to 75 % RH and the specimen shall be conditioned thus for at least 4 h immediately before test.

Methods and equipment

Air permeability has been tested in accordance with requirements of *test method* standard.

Test rig KS 3035/650 PC includes:

1. Test wall,
2. Air flow control block,
3. Water sprinkling system,
4. Indication and control equipment,
5. Deflection sensors.

Technical data of test rig:

1. Max size of the sample should be tested: width – 2400 mm, height – 2350 mm,
2. Max developed test pressure: ± 3000 Pa,
3. Ranges of measurement: I – (0,5...50) m³/h II – (0,5...300) m³/h,
4. Range of displacement sensors ± 25 mm.

Test rig KS 3035/650 PC No. P2130 tried LEI No. 83/22-D; 84/22-D 2022-10-20; 92/22-B 2022-10-21; 162/22-S 2022-10-21 and Nordic Metrology Science No.106698-3-1 2022-11-21.

- Sources:** [1] *LST EN 1027:2016 Windows and doors – Water tightness – Test method.*
[2] *LST EN 12208:2002 Windows and doors – Water tightness - Classification.*
[3] *LST EN 1026:2016 Windows and doors- Air permeability – Test method*
[4] *LST EN 12207:2017 Windows and doors- Air permeability – Classification.*
[5] *LST EN 12211:2016 Windows and doors – Resistance to wind load – Test method.*
[6] *LST EN 12210:2016 Windows and doors – Resistance to wind load – Classification.*
[7] *LST EN 14351-1:2006+A2:2016 Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets.*

Distribution: Customer

Laboratory of Building Physics,
Institute of Architecture and Construction of Kaunas
University of Technology

Original

Copy

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Designation of the product tested:

wooden window (ARKA lux Scandinavian slimline). Size 1230x1480 mm. Product frame/sash material: wood. Filling the product sash /frame: glazed. System: Wood window. Type of opening: outward opening. Fittings: IPA Canopy stays, IPA Espagnolettes with side bolts, IPA Receivers. Locks / handles: FIX 83 handle. Fastening (number of sash locking points): 2 locking points. Gaskets: main sealing gasket Schlegel. Other details: no. Glazing: 3k4LowE1.0+4+4 LowE1.0 0-14SW9005; 12SW9005. Producer and date of the glazing unit: Stiklu Cents SIA 03/2023. Date of production of window: 20/03/2023.

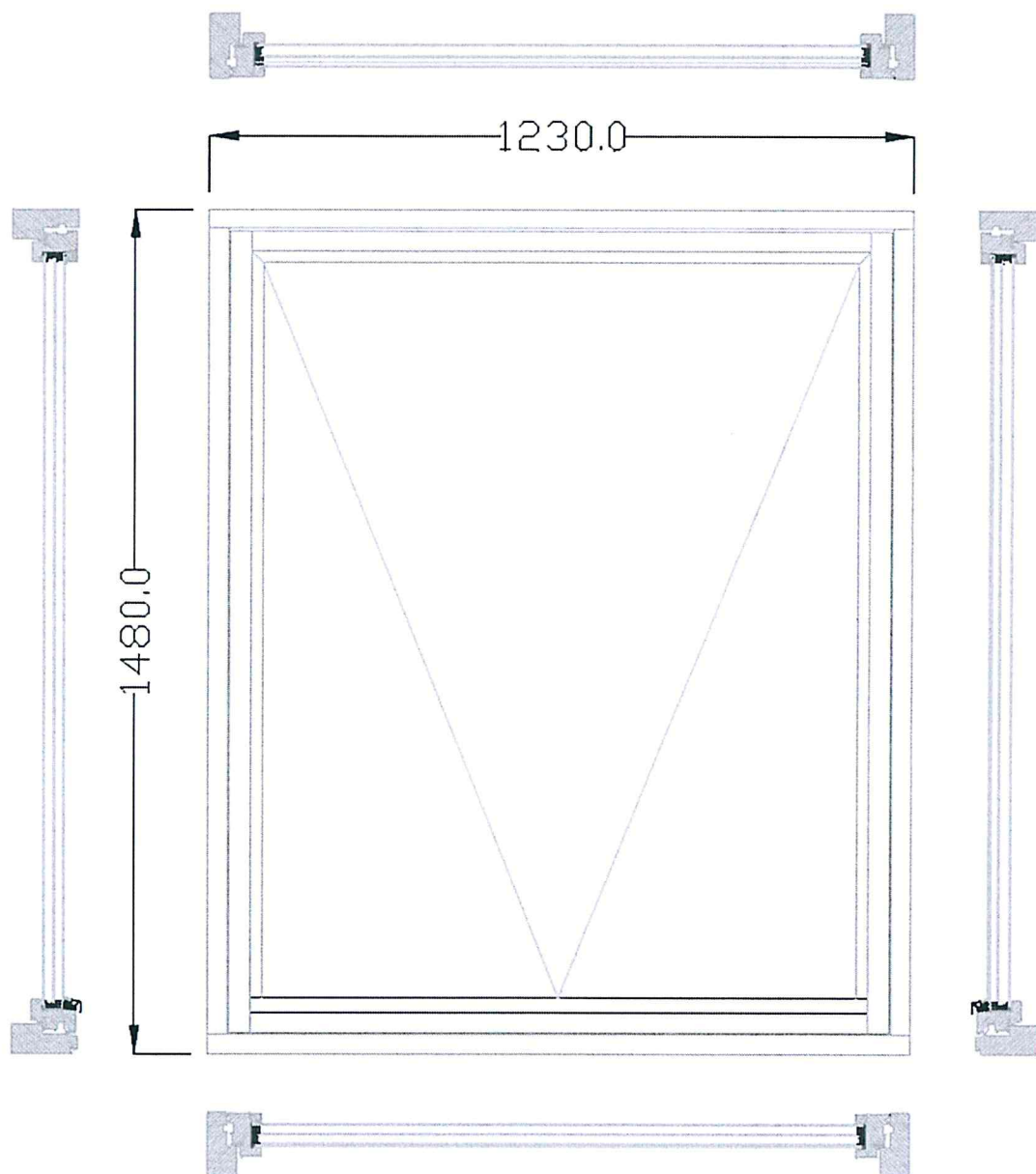
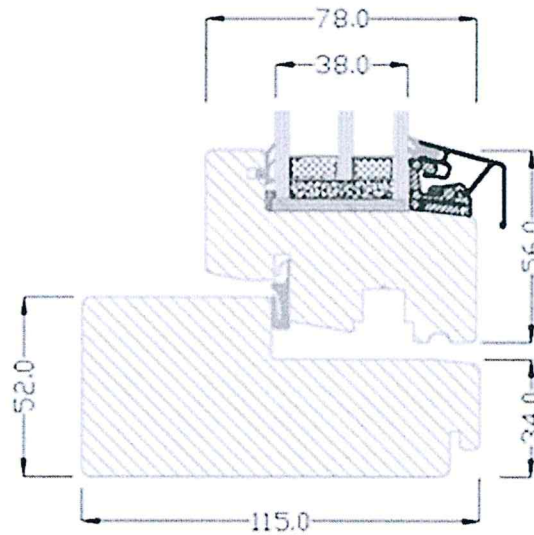
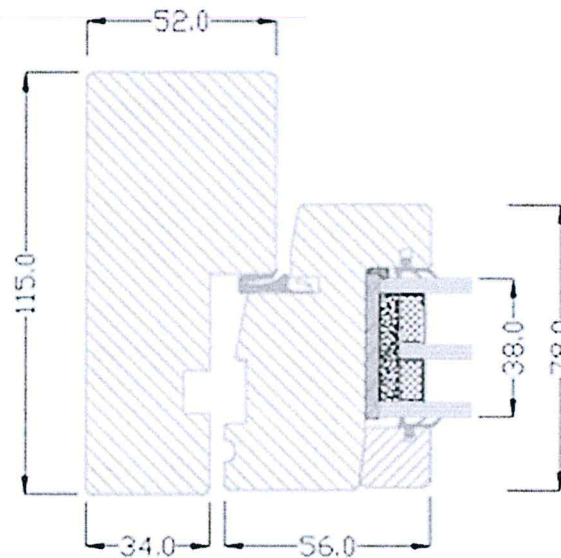


Fig.1 Drawing of the sample (information submitted by the customer)

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Bottom part



Side/Top part

Fig.2 Drawing of the sample (information submitted by the customer)

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1 Annex. Test photos

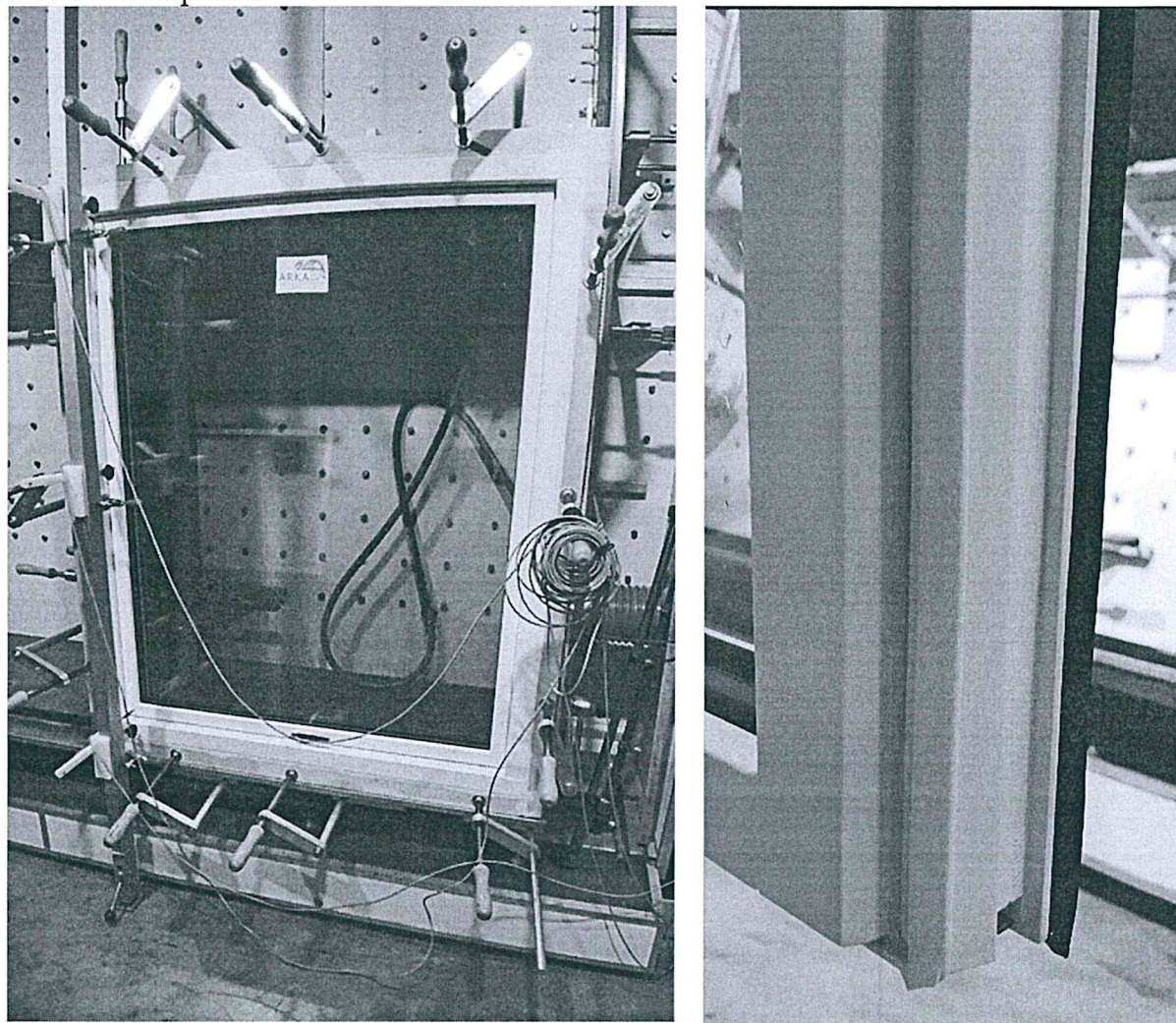


Fig 3. Photos of the sample

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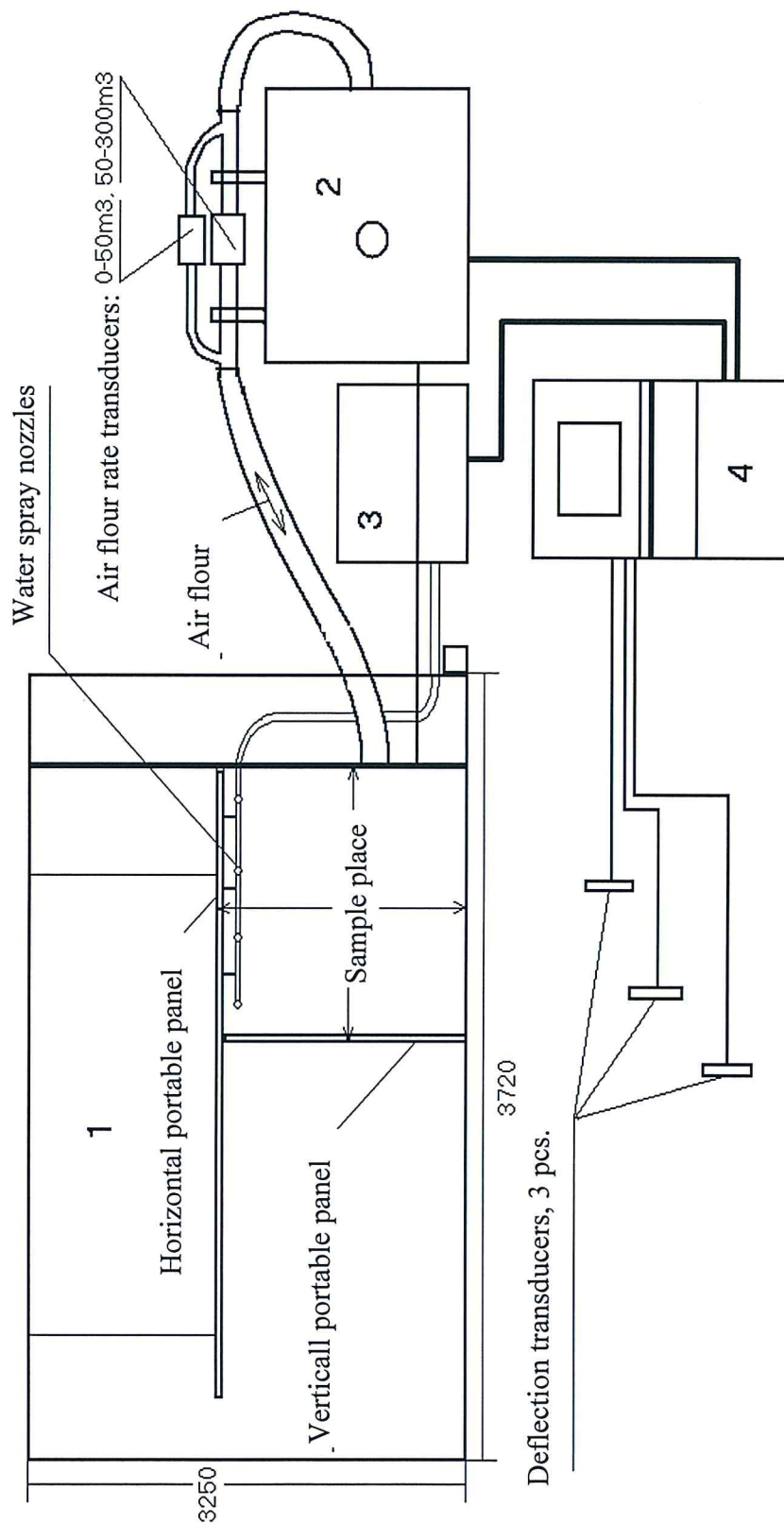


Fig 4. Equipment for window, door, roof window, industrial door and screen wall air permeability, rain water resistance and resistance to wind load measurements scheme: 1 – test measurement wall, 2 – air flow control and regulation block, 3 – water spray device, 4 – indicator and control equipment

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Test protocol

KTU Architektūros ir statybos institutas
Statybinės fizikos laboratorija
Tunelio g. 60, Kaunas
Lietuva



Client : Order 307 057/23-2 OV
Test number: 01
Examiner : R.Rauckis

Date: 30.03.2023

Carried out tests:

- 1.) Air Permeability: EN 12207 in accordance with BS EN 1026
- 2.) Watertightness: EN 12208

Bandinio charakteristikos

Bandinio tipas : Langas

Varstymo tipas : atidaromas i isore

Measurement of the element (W x H) : 1.230 x 1.480 m Area : 1.820 m²

Measurements of the sash (W x H) : 1.150 x 1.370 m Area : 1.575 m²

Seal length : 5.040 m

Profilio duomenys

Remas :	Stikl. paketo skirtukas :
Varcia :	Skersinis remas :
Remo elementai :	Stiklajuostes :
Sandarinimas :	Drenazinis kanalas :
Tech. iranga :	Kita :
Medziagiskumas :	Uzraktas :
Apdaila :	Vyriai :

Istiklinimas

Tipas :	Uzpildas :
Uzpildas :	Stiklo plotas :
Stiklo matmenys :	Kitas :

Classification

Air permeability EN 12207	Target Class 4	Actual Class 4
Water tightness EN 12208	Target Class AE1200	Actual Class AE1200
Wind resistance EN 12210	Target Class 0-	Actual Class 0-

Temperature: 19 Celsius Humidity: 38 Air pressure: 999.6 HPa

Remark:

Place:.....

Date:30.03.2023

Tester:.....

Test protocol

KTU Architektūros ir statybos institutas



Air Permeability: EN 12207 in accordance with BS EN 1026

Window surface: 1.820 m² Seal length: 5.040 m

1. Air Permeability pressure / Air Permeability suction

3 Pressure bump 653 Pa durchgeführt
3 Pressure bump -646 Pa durchgeführt

Pressure Pa Nominal	Real	Qc m ³ /h	Qtc m ³ /h	Window surface m ³ /h/m ²	surface class	Joints length m ³ /h/m	length class
+							
50	49	0.00	0.36	0.20	4	0.07	4
100	100	0.00	0.87	0.48	4	0.17	4
150	150	0.00	1.29	0.71	4	0.25	4
200	200	0.00	1.59	0.87	4	0.31	4
250	250	0.00	1.87	1.02	4	0.37	4
300	298	0.00	2.12	1.16	4	0.42	4
450	446	0.00	2.75	1.51	4	0.54	4
600	599	0.00	3.27	1.80	4	0.65	4
-							
-50	-50	0.00	0.40	0.22	4	0.08	4
-100	-99	0.00	1.13	0.62	4	0.22	4
-150	-150	0.00	1.62	0.89	4	0.32	4
-200	-200	0.00	2.06	1.13	4	0.40	4
-250	-250	0.00	2.52	1.38	4	0.50	4
-300	-298	0.00	2.94	1.62	4	0.58	4
-450	-451	0.00	4.16	2.28	4	0.82	4
-600	-598	0.00	5.42	2.97	4	1.07	4
Average							
50	49	0.00	0.38	0.21	4	0.07	4
100	99	0.00	1.00	0.55	4	0.19	4
150	150	0.00	1.45	0.80	4	0.28	4
200	200	0.00	1.83	1.00	4	0.36	4
250	250	0.00	2.19	1.20	4	0.43	4
300	298	0.00	2.53	1.39	4	0.50	4
450	448	0.00	3.46	1.90	4	0.68	4
600	598	0.00	4.34	2.39	4	0.86	4

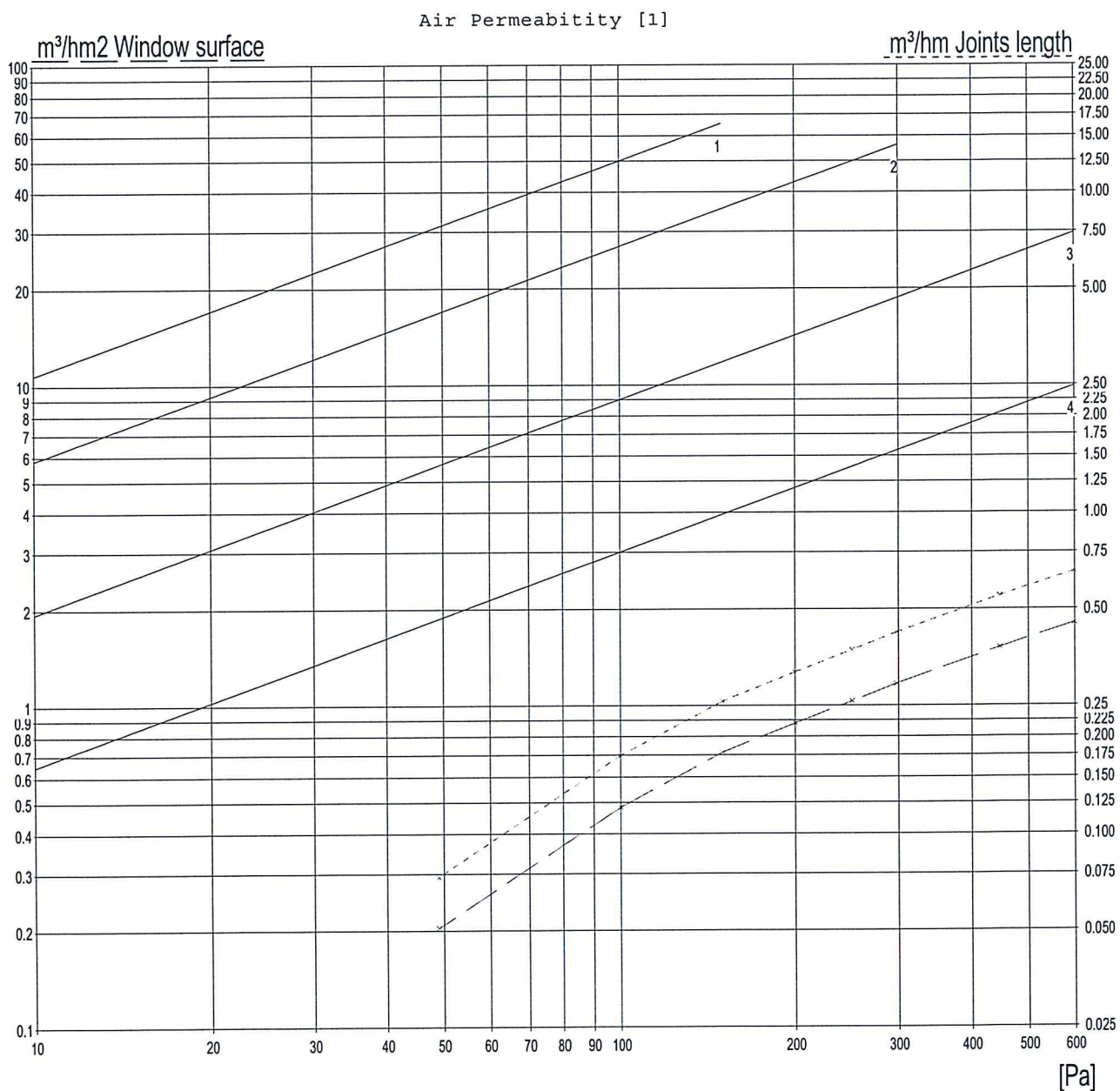
Pressure: 4 Suction: 4 Average value: 4

Test protocol

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Air Permeability pressure: _____

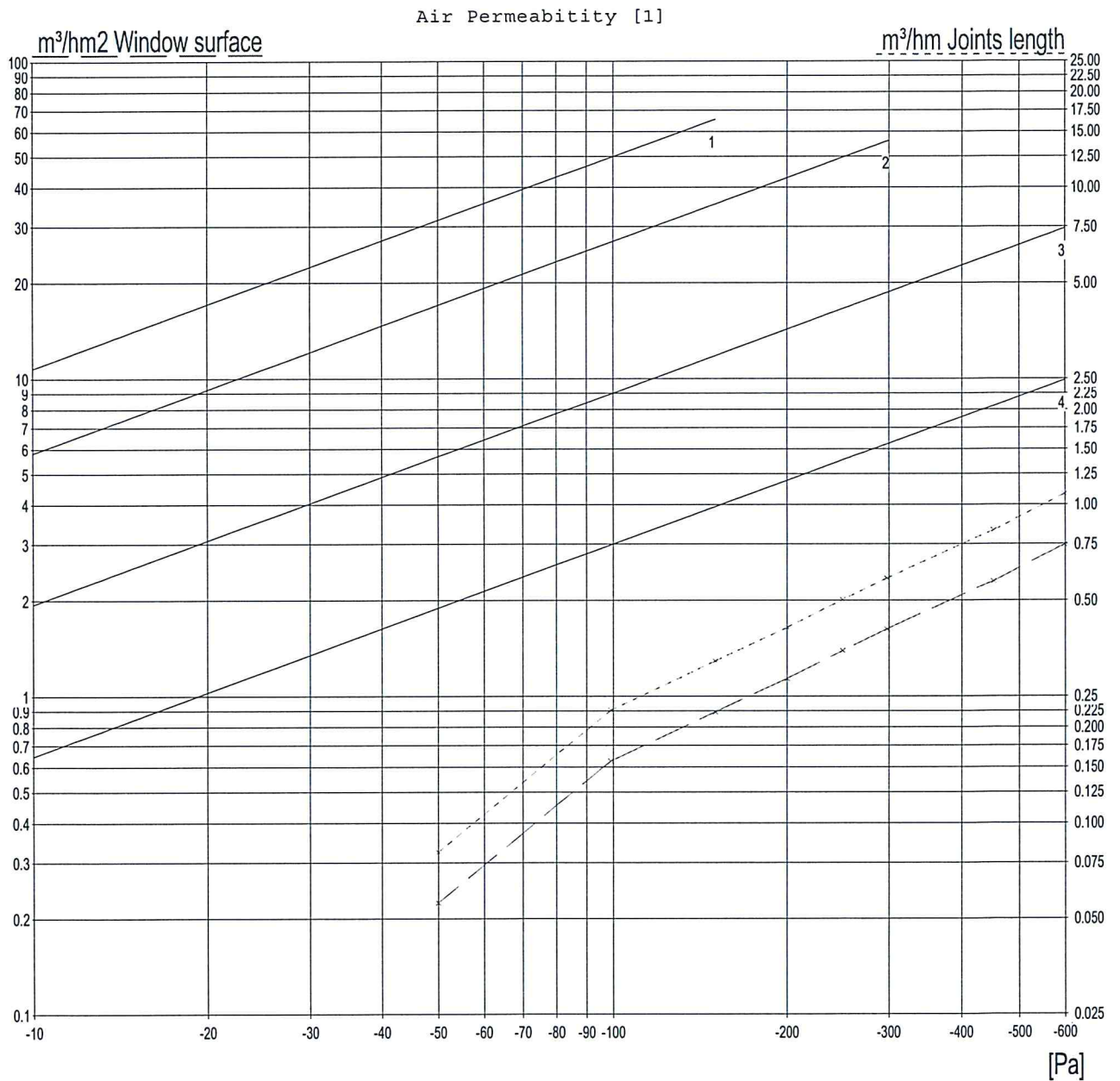


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Air Permeability suction:

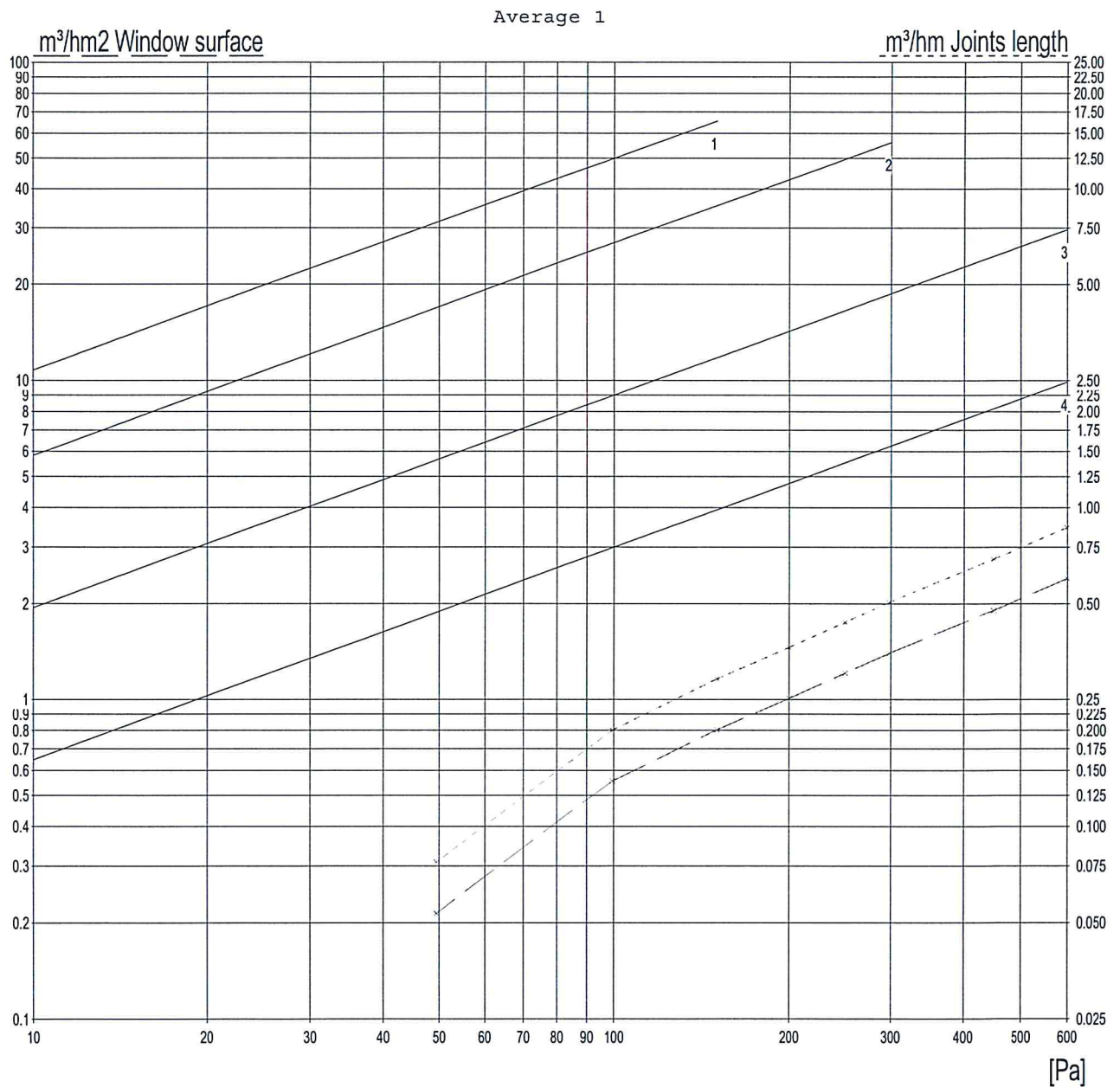


Test protocol

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Air Permeability Average:



Test protocol

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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	150	00:05:00	OK
200	201	00:05:00	OK
250	251	00:05:00	OK
300	302	00:05:00	OK
450	449	00:05:00	OK
600	603	00:05:00	OK
750	753	00:05:00	OK
900	904	00:05:00	OK
1050	1053	00:05:00	OK
1200	1205	00:05:00	OK

Watertightness Class: AE1200

Point of water ingress :

Probable cause of leakage :

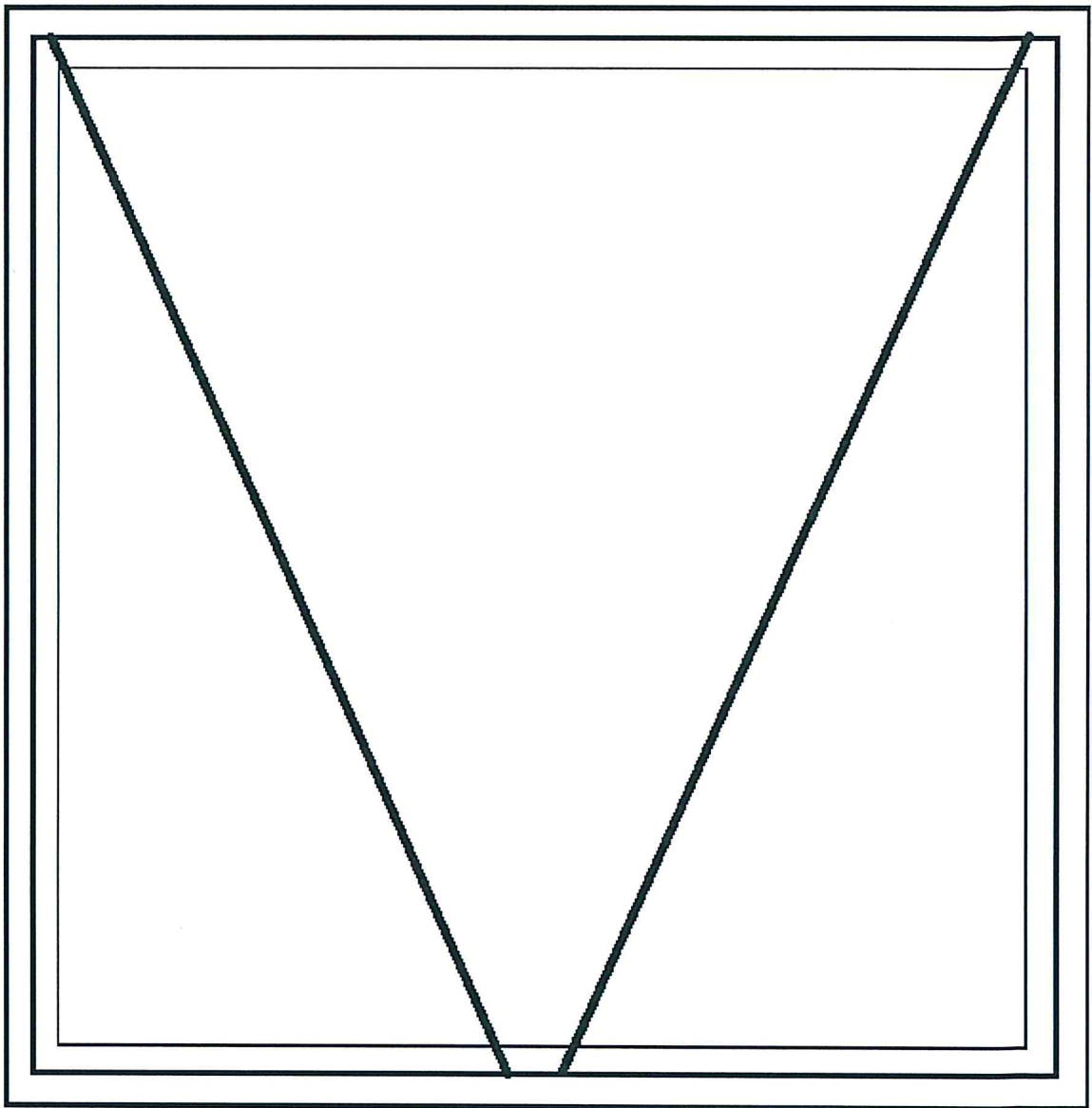
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Window sketch:

Dimensions (W x H) : 1.230 m x 1.480 m
Joints length: 5.040 m
Window surface: 1.820 m²
Sash surface: 1.575 m²



Test protocol

KTU Architektūros ir statybos institutas
Statybinės fizikos laboratorija
Tunelio g. 60, Kaunas
Lietuva



Client : Order 308 057/23 A
Test number: 01
Examiner : R.Rauckis

Date: 31.03.2023

Carried out tests:

- 1.) Wind Resistance: EN 12210
- 2.) Safety test

Bandinio charakteristikos

Bandinio tipas : Langas

Varstymo tipas : atidaromas i isore

Measurement of the element (W x H): 1.230 x 1.480 m Area : 1.820 m2

Measurements of the sash (W x H): 1.150 x 1.370 m Area : 1.575 m2

Seal length : 5.040 m

Profilio duomenys

Remas :	Stikl. paketo skirtukas :
Varcia :	Skersinis remas :
Remo elementai :	Stiklajuostes :
Sandarinimas :	Drenazinis kanalas :
Tech. iranga :	Kita :
Medziagiskumas :	Uzraktas :
Apdaila :	Vyriai :

Istiklinimas

Tipas :	Uzpildas :
Uzpildas :	Stiklo plotas :
Stiklo matmenys :	Kitas :

Classification

Air permeability EN 12207	Target Class 0	Actual Class 0
Water tightness EN 12208	Target Class A0	Actual Class A0
Wind resistance EN 12210	Target Class 5C	Actual Class 5C

Temperature: 18 Celsius Humidity: 48 Air pressure: 989.0 HPa

Remark:

Place:.....

Date:31.03.2023

Tester:.....

Test protocol

KTU Architektūros ir statybos institutas



Wind Resistance: EN 12210

Temperature: 18 Celsius Humidity: 48 % Air pressure: 989.0 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 = 1330 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	2011	a01= -1.17	b02= -2.66	c03= -1.84	f01= -1.16	C (1/>999)
0	0	a01= 0.00	b02= 0.07	c03= 0.02	f01= 0.06	

Class: 5

Wind Resistance P1 suction

3 Pressure pulses -2200 Pa implemented

Pressure		Distortion			Distortion	Distortion
Desired	Actual	Absolute			Relative	class
-2000	-2004	a01= 1.42	b02= 3.67	c03= 1.57	f01= 2.18	C (1/ 610)
0	0	a01= -0.02	b02= 0.00	c03= 0.02	f01= 0.00	

Class: 5

Pressure pulses

50 Cycles -1000 Pa / 1000 Pa implemented

Remark :

Class: 5C

Test protocol

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Safety test

P3 = Pa Des/Est: -3000 / -3009 : 0 / 0

Remark Suction :

P3 = Pa Des/Est: 3000 / 2978 : 0 / 0

Remark Pressure :

Test protocol

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Window sketch:

Dimensions (W x H) : 1.230 m x 1.480 m
Joints length: 5.040 m
Window surface: 1.820 m²
Sash surface: 1.575 m²

