

Notified Body number: 2018

RANDYMAT  
ISO/IEC 17025

Nr. LA.01.031

**TEST REPORT Nr. 084 SF/22 OVA en**  
**15<sup>th</sup> of April 2022**

Page (pages)  
1 (7)

**Air permeability, water tightness and resistance to wind load measurement**

(designation of the test)

Test methods: LST EN 1026:2016 Windows and doors- Air permeability -Test method.  
LST EN 1027:2016 Windows and doors – Water tightness -Test method.  
LST EN 12211:2016 Windows and doors – Resistance to wind load - Test method.  
(number of normative document)

Specimen description: Wooden window with aluminium cladding (ARKA lux Scandinavian slimline). Size 1230x1480 mm.  
Product frame/sash material: wooden with aluminium cladding. Filling the product sash /frame: glazed.  
System: ARKA lux. Type of opening: outward opening. Fittings: Mila garant. Locks / handles: Prolinea.  
Fastening (number of sash locking points): 3 locking points. Gaskets: main sealing gasket Schlegel / external wind gasket Stemeseder. Other details: drainage cover cap. Glazing: 2k4+4LowE1.0-18SW9005. Producer and date of the glazing unit: Stiklu Centrs SIA 10.03.2022. Date of production of window: 11.04.2022.  
(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", "Pori", Virgas pag., Dienvidkurzemes nov., LV-3433, 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    | <b>4</b>      |
| Water tightness, class                           | LST EN 12208:2002    | <b>AE1200</b> |
| Resistance to wind load, test pressure, class    | LST EN 12210:2016    | <b>5</b>      |
| Resistance to wind load, frame deflection, class | LST EN 12210:2016    | <b>C</b>      |

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: 12/4/2022 Date of test: 12/4/2022

Sampling: The test specimen sampled by customer. Order description: No. 084/22, 6/4/2022

Additions information: Application 6/4/2022, drawing  
(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 (+13 pages)  
(the numbers of the annexes should be pointed out)

Technical manager:  
(approving test results)

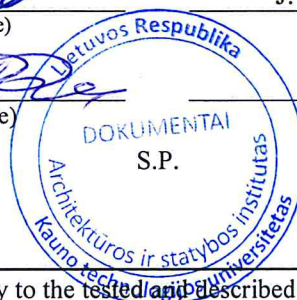
(signature)

J. Ramanauskas  
(n., surname)

Test performed by:  
(person responsible for a test)

(signature)

R. Rauckis  
(n., surname)



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### Installation of the sample

Sample has been installed into test rig KS 3035/650 PC No. 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:  $\pm 3000$  Pa,
3. Ranges of measurement: I – (0,5...50) m<sup>3</sup>/h II – (0,5...300) m<sup>3</sup>/h,
4. Range of displacement sensors  $\pm 25$  mm.

Test rig KS 3035/650 PC No. P2130 tried LEI No. 30/20-D; 31/20-D; 85/20-B; 119/20-S  
2020-10-20 and MC KRL No.085981 2020-12-01

- 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

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

Original

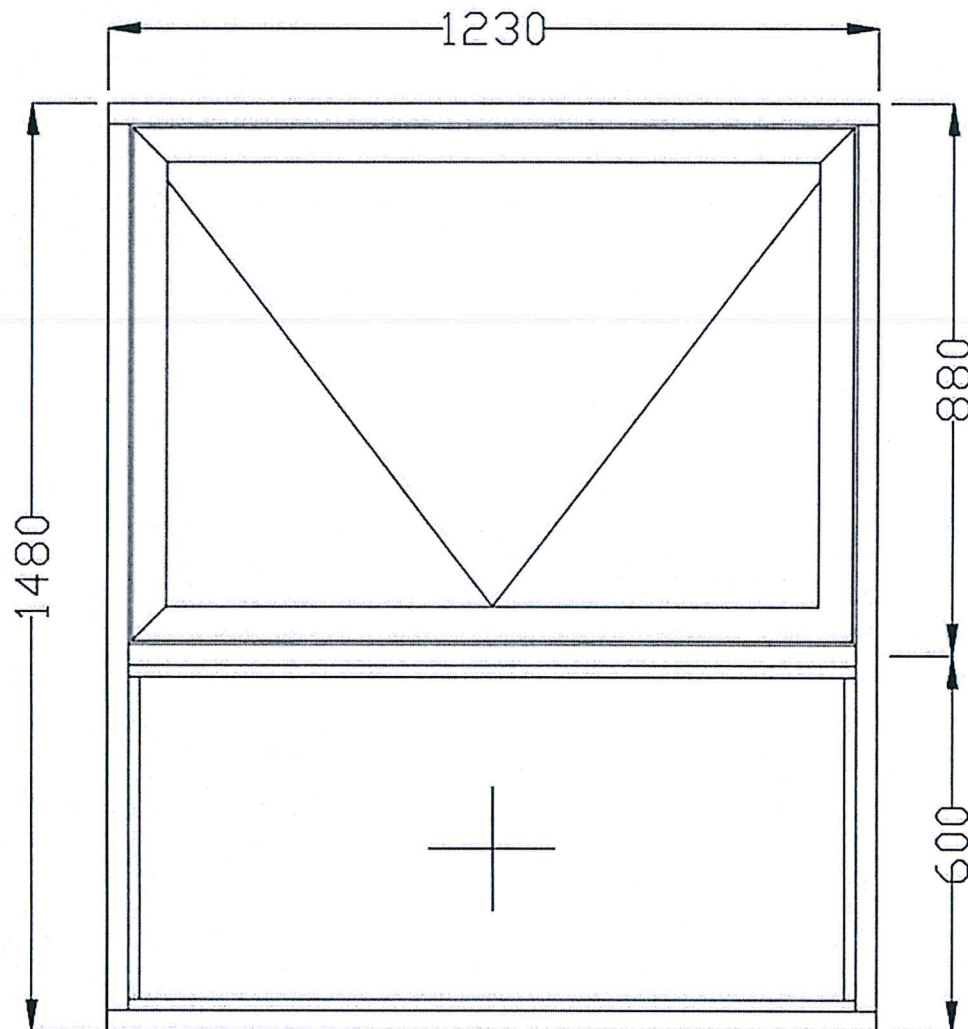
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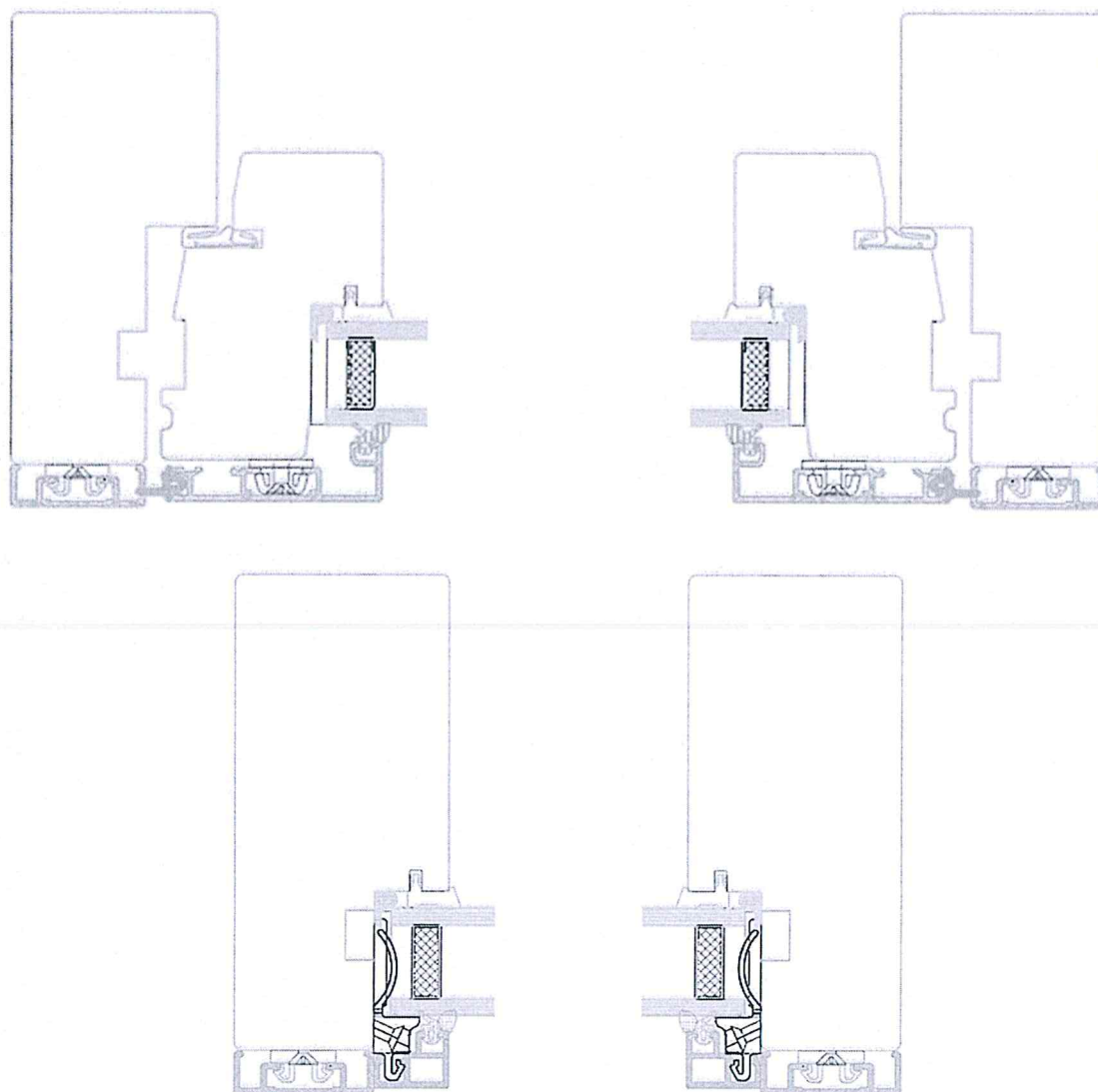
**Designation of the product tested:**

Wooden window with aluminium cladding (ARKA lux Scandinavian slimline). Door size 1230x1480 mm. Product frame/sash material: wooden with aluminium cladding. Filling the product sash /frame: glazed. System: ARKA lux. Type of opening: outward opening. Fittings: Mila garant. Locks / handles: Prolinea. Fastening (number of sash locking points): 3 locking points. Gaskets: main sealing gasket Schlegel / external wind gasket Stemeseder. Other details: drainage cover cap. Glazing: 2k 4+4LowE1.0-18SW9005. Producer and date of the glazing unit: Stiklu Centrs SIA 10.03.2022. Date of production of window: 11.04.2022.



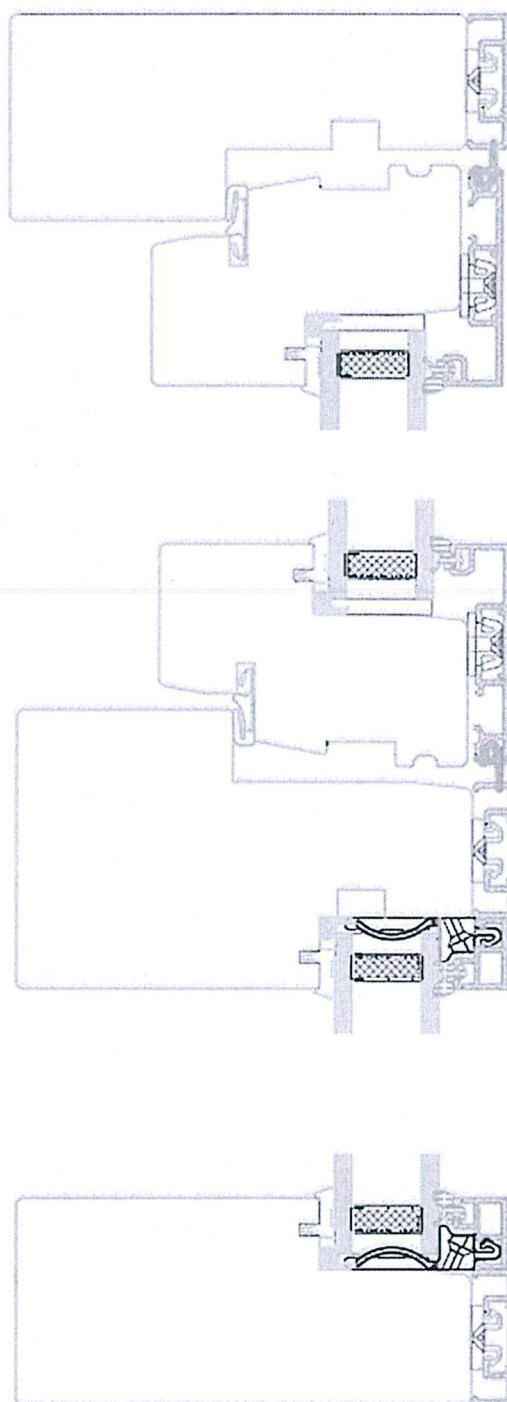
*Fig.1 Drawing of the sample (information submitted by the customer)*

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

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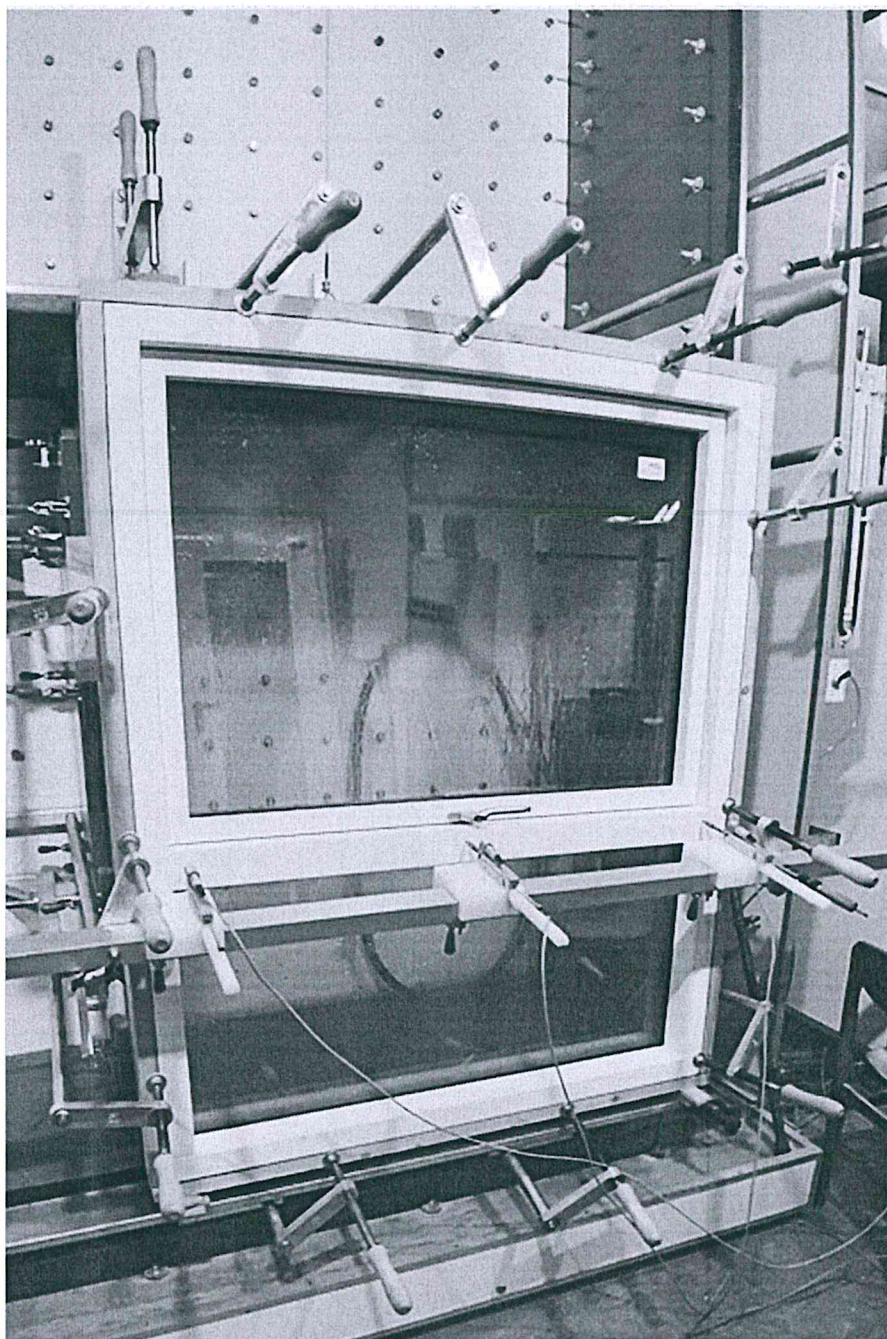


*Fig.3 Drawing of the sample (information submitted by the customer)*

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**1 Annex. Test photos**



*Fig 4. Photo of the sample (during the test)*

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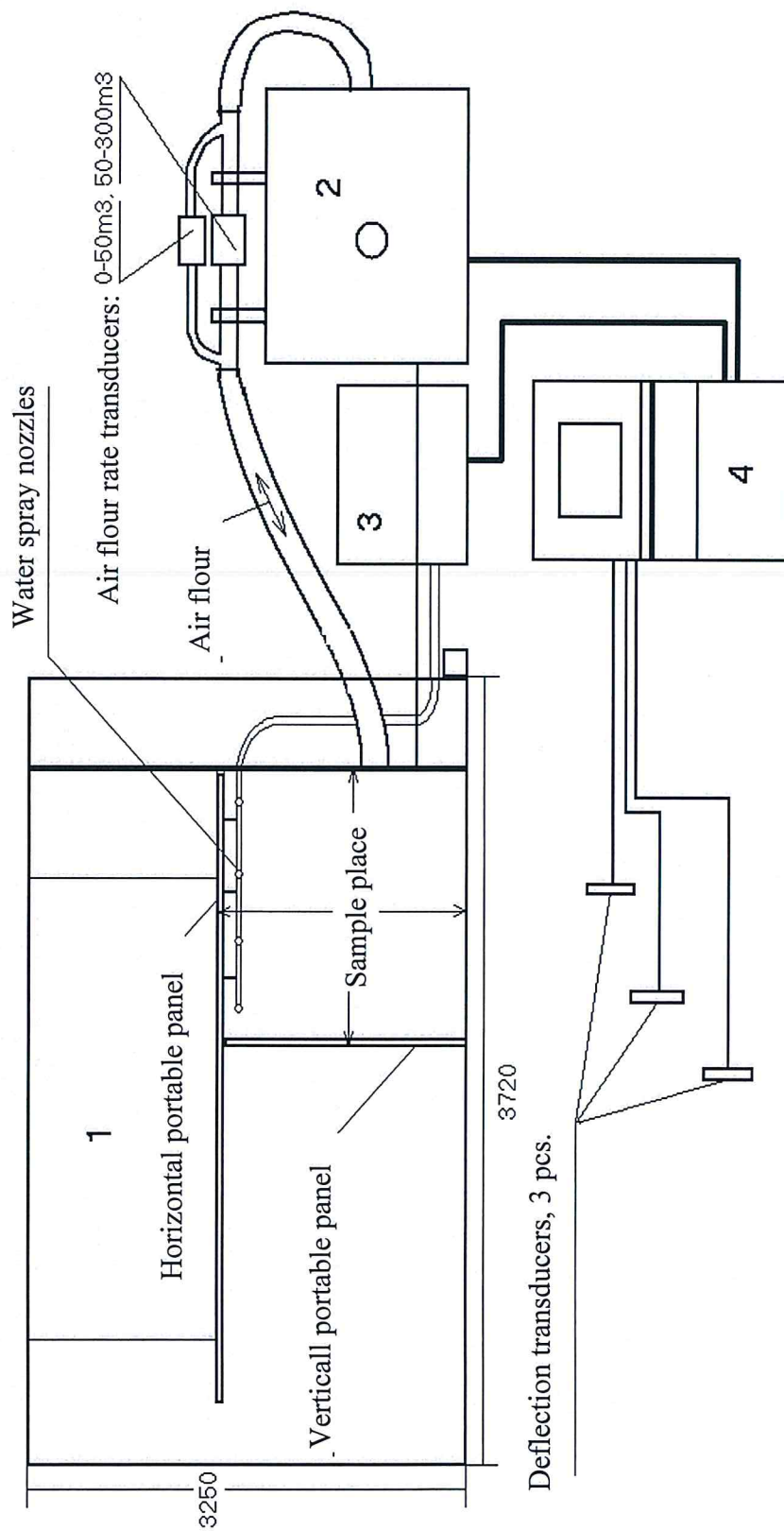


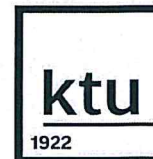
Fig 5. Scheme of test equipment for air permeability, wind load resistance and water tightness of building materials and products testing: 1 – test measurement wall, 2 – air flow control and regulation block, 3 – water spray device, 4 – indicator and control equipment

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**Statybinės fizikos laboratorija**  
**Tunelio g. 60, Kaunas**  
**Lietuva**



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Client : Order 288 084/22 OVA  
Test number: 01  
Examiner : R.Rauckis

Date: 04.04.2022

### **Carried out tests:**

- 1.) Air Permeability: EN 12207 in accordance with BS EN 1026
- 2.) Watertightness: EN 12208
- 3.) Wind Resistance: EN 12210
- 4.) Air Permeability: EN 12207 in accordance with BS EN 1026
- 5.) 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) : 1.120 x 0.780 m Area : 0.873 m2

Seal length : 3.800 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 5C     | Actual Class 5C     |

Temperature: 21 Celsius Humidity: 34 Air pressure: 1011.3 HPa

Remark:

Place:.....

Date:04.04.2022

Tester:.....



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## Air Permeability: EN 12207 in accordance with BS EN 1026

Window surface: 1.820 m<sup>2</sup> Seal length: 3.800 m

### 1. Air Permeability pressure / Air Permeability suction

3 Pressure bump 651 Pa durchgeführt  
3 Pressure bump -654 Pa durchgeführt

| Pressure Pa |      | Qc<br>m³/h | Qtc<br>m³/h | Window surface |       | Joints length |       |
|-------------|------|------------|-------------|----------------|-------|---------------|-------|
| Nominal     | Real |            |             | m³/h/m³        | class | m³/h/m        | class |
| +           |      |            |             |                |       |               |       |
| 50          | 48   | 0.00       | 1.61        | 0.88           | 4     | 0.42          | 4     |
| 100         | 104  | 0.00       | 1.28        | 0.70           | 4     | 0.33          | 4     |
| 150         | 149  | 0.00       | 1.74        | 0.95           | 4     | 0.45          | 4     |
| 200         | 199  | 0.00       | 1.90        | 1.04           | 4     | 0.50          | 4     |
| 250         | 249  | 0.00       | 2.12        | 1.16           | 4     | 0.55          | 4     |
| 300         | 299  | 0.00       | 2.47        | 1.35           | 4     | 0.65          | 4     |
| 450         | 448  | 0.00       | 3.31        | 1.82           | 4     | 0.87          | 4     |
| 600         | 599  | 0.00       | 4.20        | 2.31           | 4     | 1.10          | 4     |
| -           |      |            |             |                |       |               |       |
| -50         | -50  | 0.00       | 0.25        | 0.13           | 4     | 0.06          | 4     |
| -100        | -100 | 0.00       | 1.01        | 0.55           | 4     | 0.26          | 4     |
| -150        | -150 | 0.00       | 1.50        | 0.82           | 4     | 0.39          | 4     |
| -200        | -200 | 0.00       | 1.96        | 1.08           | 4     | 0.51          | 4     |
| -250        | -249 | 0.00       | 2.41        | 1.32           | 4     | 0.63          | 4     |
| -300        | -300 | 0.00       | 2.84        | 1.56           | 4     | 0.74          | 4     |
| -450        | -449 | 0.00       | 4.04        | 2.22           | 4     | 1.06          | 4     |
| -600        | -598 | 0.00       | 5.23        | 2.87           | 4     | 1.37          | 4     |
| Average     |      |            |             |                |       |               |       |
| 50          | 49   | 0.00       | 0.93        | 0.51           | 4     | 0.24          | 4     |
| 100         | 102  | 0.00       | 1.15        | 0.63           | 4     | 0.30          | 4     |
| 150         | 149  | 0.00       | 1.62        | 0.89           | 4     | 0.42          | 4     |
| 200         | 199  | 0.00       | 1.93        | 1.06           | 4     | 0.50          | 4     |
| 250         | 249  | 0.00       | 2.27        | 1.24           | 4     | 0.59          | 4     |
| 300         | 299  | 0.00       | 2.65        | 1.46           | 4     | 0.69          | 4     |
| 450         | 448  | 0.00       | 3.68        | 2.02           | 4     | 0.96          | 4     |
| 600         | 598  | 0.00       | 4.72        | 2.59           | 4     | 1.24          | 4     |

Pressure: 4 Suction: 4 Average value: 4

### 2. Air Permeability pressure / Air Permeability suction

0 Pressure bump 0 Pa durchgeführt  
0 Pressure bump 0 Pa durchgeführt

| Pressure Pa |      | Qc<br>m³/h | Qtc<br>m³/h | Window surface |       | Joints length |       |
|-------------|------|------------|-------------|----------------|-------|---------------|-------|
| Nominal     | Real |            |             | m³/h/m³        | class | m³/h/m        | class |
| +           |      |            |             |                |       |               |       |
| 50          | 49   | 0.00       | 0.39        | 0.21           | 4     | 0.10          | 4     |
| 100         | 100  | 0.00       | 1.04        | 0.57           | 4     | 0.27          | 4     |
| 150         | 149  | 0.00       | 1.43        | 0.78           | 4     | 0.37          | 4     |
| 200         | 199  | 0.00       | 1.77        | 0.97           | 4     | 0.46          | 4     |
| 250         | 250  | 0.00       | 2.06        | 1.13           | 4     | 0.54          | 4     |
| 300         | 299  | 0.00       | 2.33        | 1.28           | 4     | 0.61          | 4     |
| 450         | 448  | 0.00       | 3.09        | 1.70           | 4     | 0.81          | 4     |
| 600         | 596  | 0.00       | 3.85        | 2.11           | 4     | 1.01          | 4     |
| -           |      |            |             |                |       |               |       |
| -50         | -50  | 0.00       | 0.33        | 0.18           | 4     | 0.08          | 4     |
| -100        | -99  | 0.00       | 1.12        | 0.61           | 4     | 0.29          | 4     |
| -150        | -149 | 0.00       | 1.77        | 0.97           | 4     | 0.46          | 4     |
| -200        | -200 | 0.00       | 2.35        | 1.29           | 4     | 0.62          | 4     |

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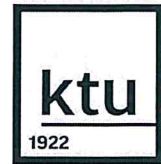
### 2. Air Permeability pressure / Air Permeability suction

| Pressure Pa |      | Qc<br>m <sup>3</sup> /h | Qtc<br>m <sup>3</sup> /h | Window surface                   |       | Joints length       |       |
|-------------|------|-------------------------|--------------------------|----------------------------------|-------|---------------------|-------|
| Nominal     | Real |                         |                          | m <sup>2</sup> /h/m <sup>2</sup> | class | m <sup>3</sup> /h/m | class |
| -250        | -249 | 0.00                    | 2.92                     | 1.60                             | 4     | 0.76                | 4     |
| -300        | -299 | 0.00                    | 3.48                     | 1.91                             | 4     | 0.91                | 4     |
| -450        | -448 | 0.00                    | 5.15                     | 2.83                             | 4     | 1.35                | 4     |
| -600        | -599 | 0.00                    | 6.96                     | 3.82                             | 4     | 1.83                | 4     |
| Average     |      |                         |                          |                                  |       |                     |       |
| 50          | 49   | 0.00                    | 0.36                     | 0.19                             | 4     | 0.09                | 4     |
| 100         | 99   | 0.00                    | 1.08                     | 0.59                             | 4     | 0.28                | 4     |
| 150         | 149  | 0.00                    | 1.60                     | 0.88                             | 4     | 0.42                | 4     |
| 200         | 199  | 0.00                    | 2.06                     | 1.13                             | 4     | 0.54                | 4     |
| 250         | 249  | 0.00                    | 2.49                     | 1.37                             | 4     | 0.65                | 4     |
| 300         | 299  | 0.00                    | 2.90                     | 1.59                             | 4     | 0.76                | 4     |
| 450         | 448  | 0.00                    | 4.12                     | 2.26                             | 4     | 1.08                | 4     |
| 600         | 597  | 0.00                    | 5.41                     | 2.97                             | 4     | 1.42                | 4     |

Pressure: 4      Suction: 4      Average value: 4

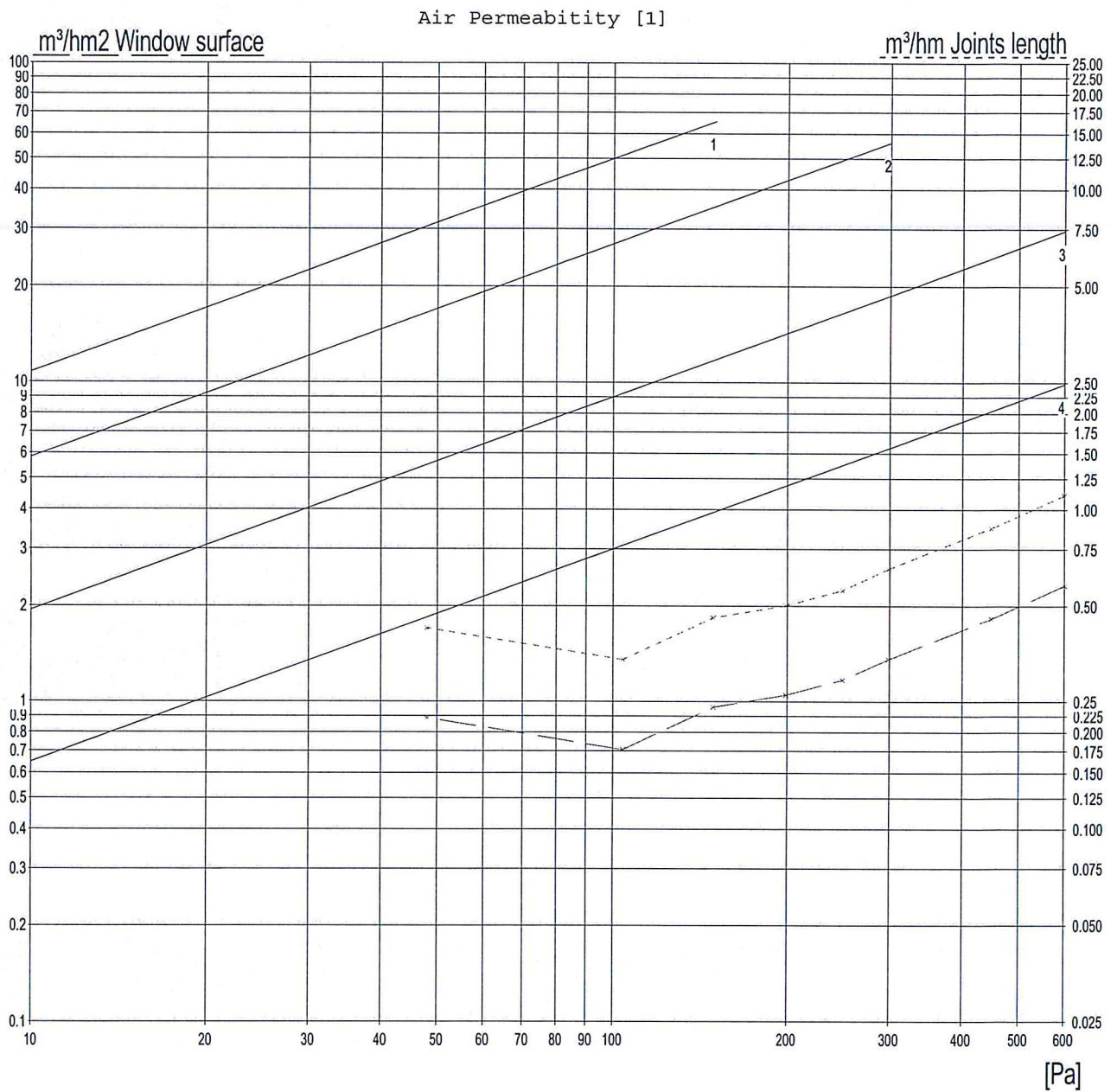
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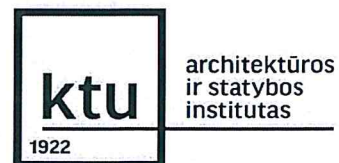
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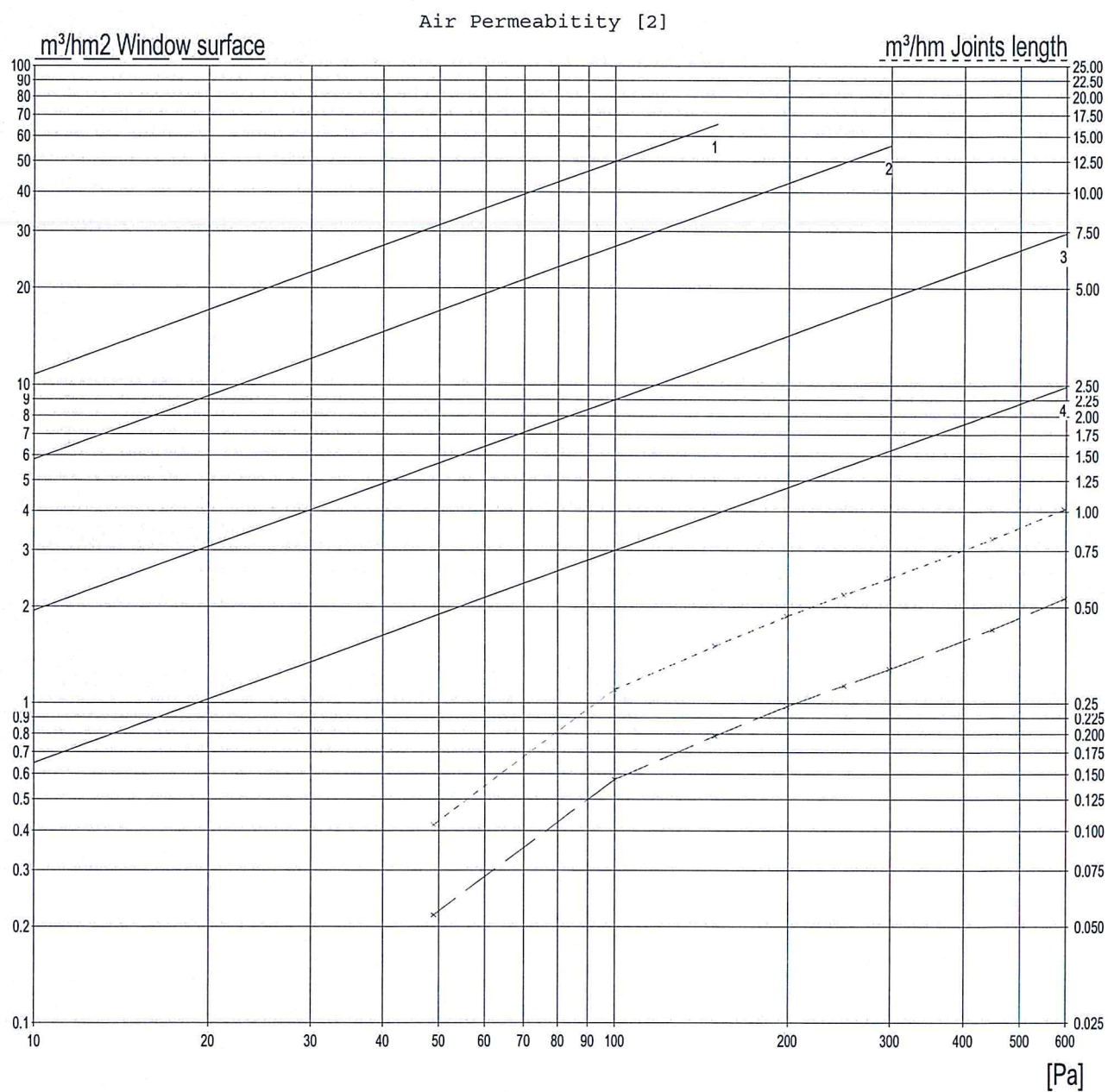


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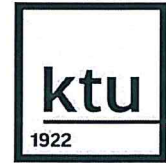


Air Permeability pressure:



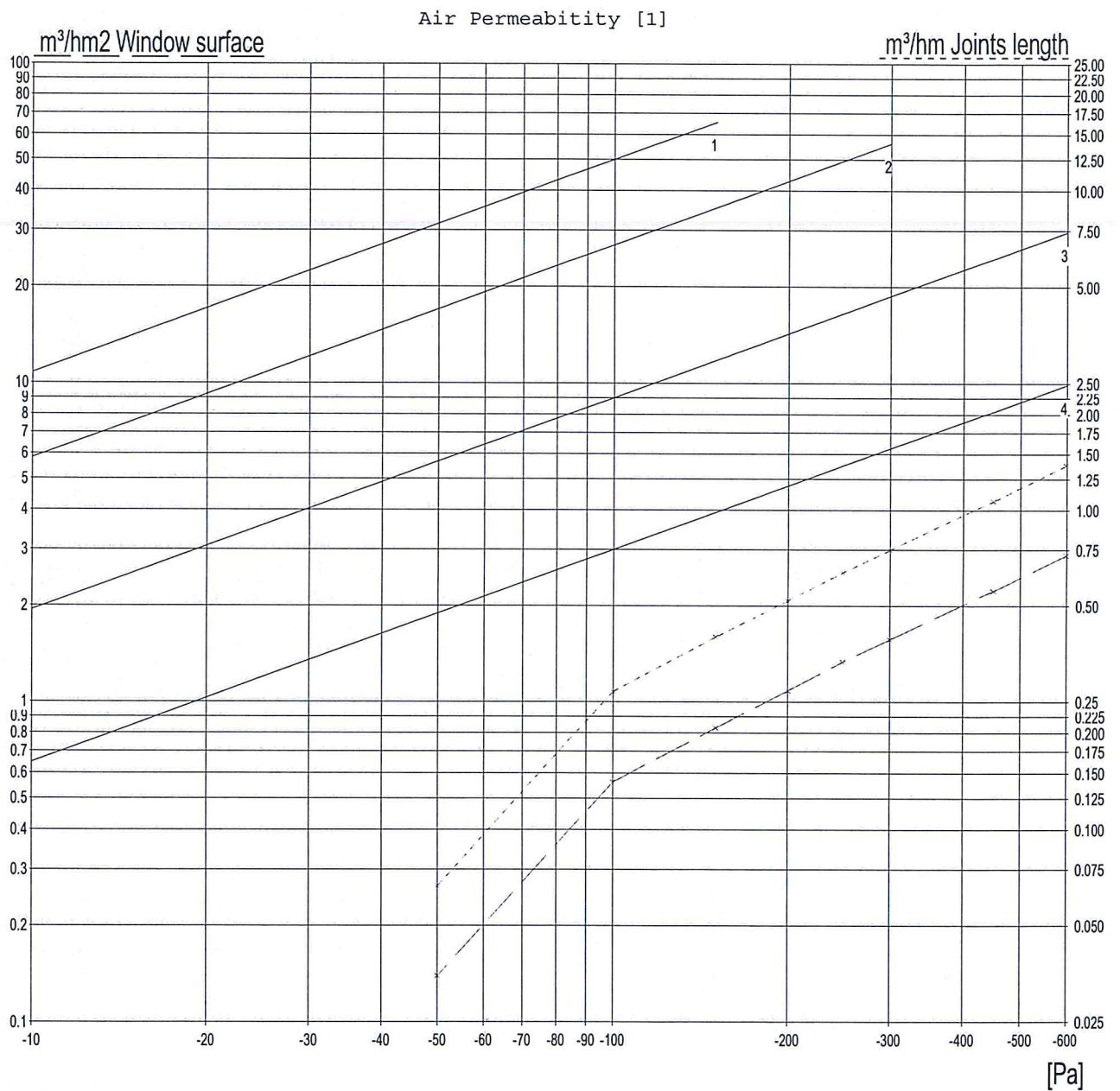
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Air Permeability suction:

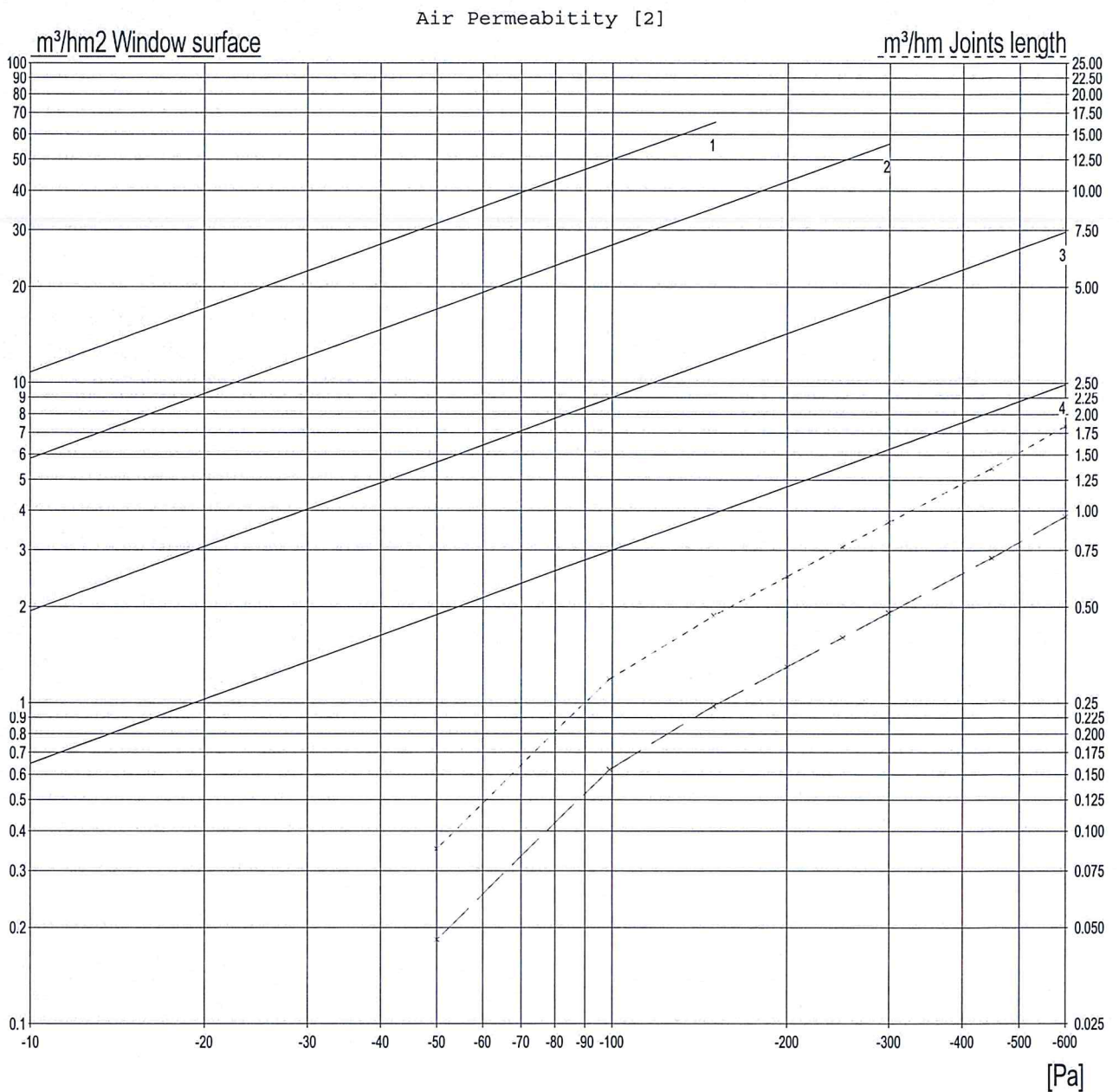


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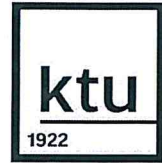
Air Permeability suction:





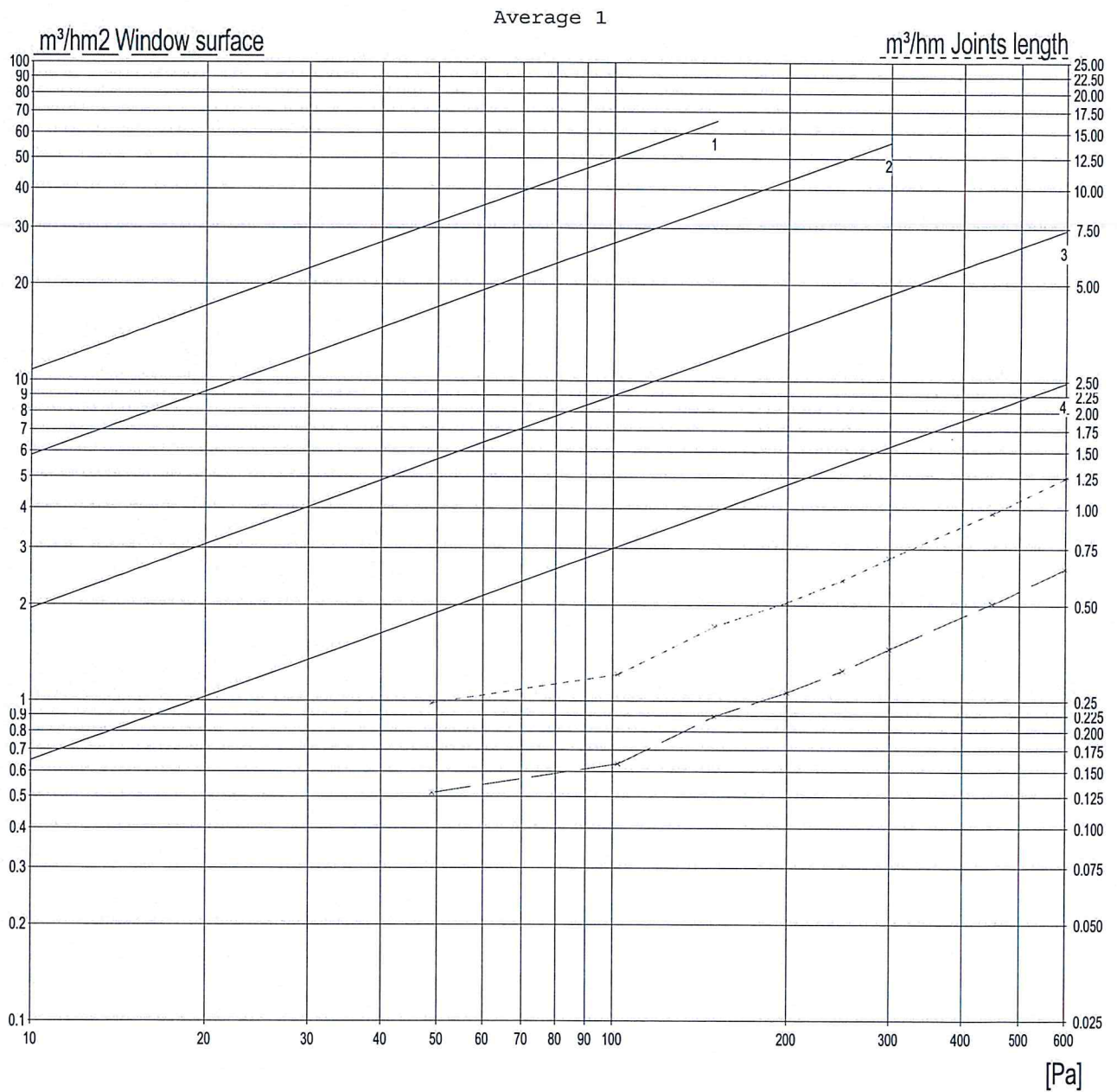
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Air Permeability Average:

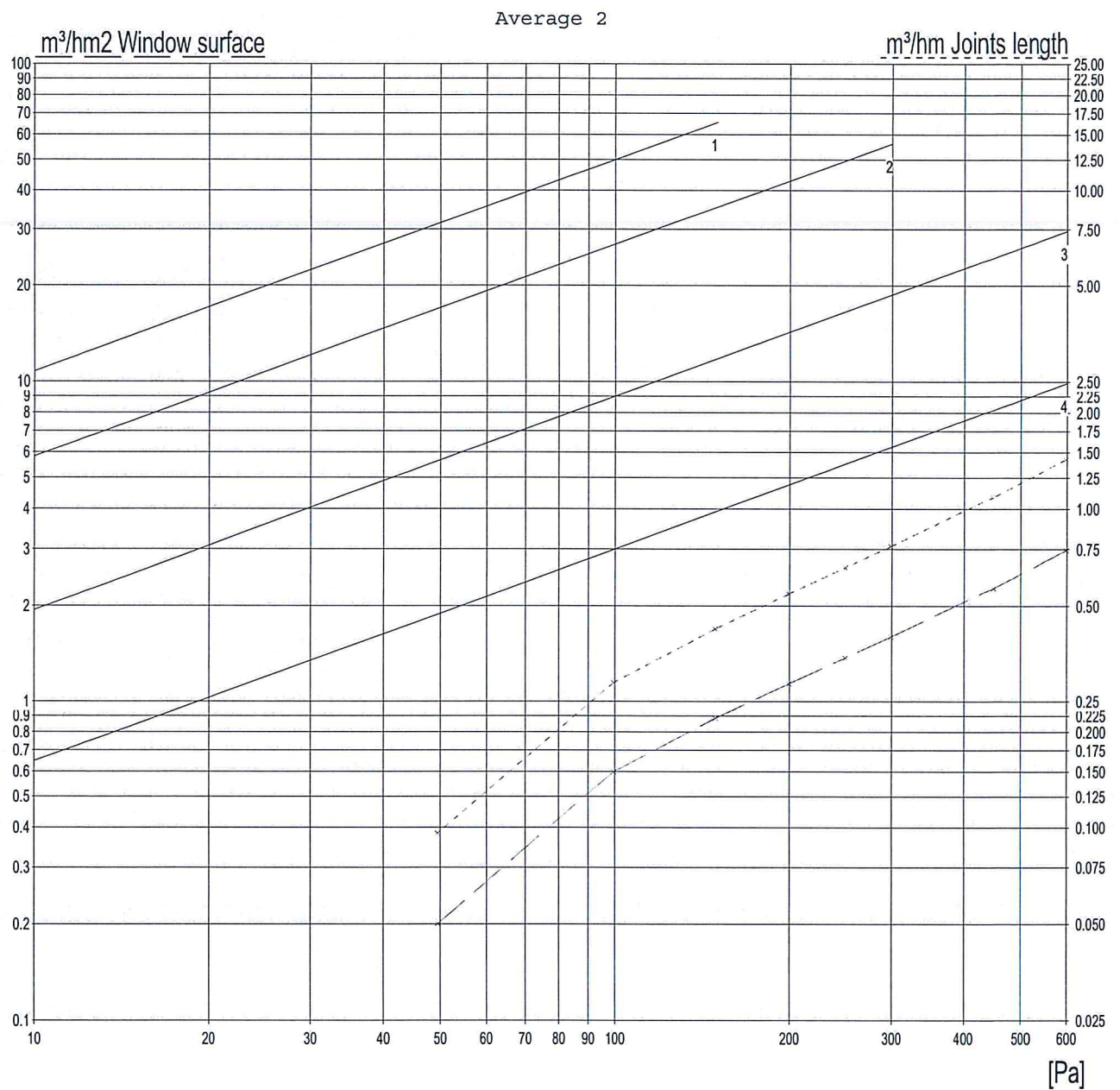


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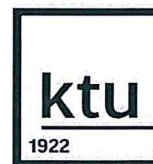


Air Permeability Average:



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## Watertightness: EN 12208 -

Spaying method A      Number of nozzles: 4      Vol. Water: 480.0 litre/hour  
Spaying angle: 24 Degree      : 8.0 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         | 252  | 00:05:00 | OK     |
| 300         | 302  | 00:05:00 | OK     |
| 450         | 451  | 00:05:00 | OK     |
| 600         | 605  | 00:05:00 | OK     |
| 750         | 753  | 00:05:00 | OK     |
| 900         | 904  | 00:05:00 | OK     |
| 1050        | 1053 | 00:05:00 | OK     |
| 1200        | 1203 | 00:05:00 | OK     |

Watertightness Class: AE1200

Point of water ingress :

Probable cause of leakage :



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## Wind Resistance: EN 12210

Temperature: 21 Celsius      Humidity: 34 %      Air pressure: 1011.3 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 = 1100 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     | 2002   | a01= -0.22 | b02= -0.59 | c03= -0.20 | f01= -0.38 | C (1/>999) |
| 0        | 0      | a01= 0.00  | b02= 0.02  | c03= 0.00  | f01= 0.02  |            |

Class: 5

Wind Resistance P1 suction

3 Pressure pulses      -2200 Pa implemented

| Pressure |        | Distortion |           |           | Distortion | Distortion |
|----------|--------|------------|-----------|-----------|------------|------------|
| Desired  | Actual | Absolute   |           |           | Relative   | class      |
| -2000    | -2003  | a01= 0.30  | b02= 0.64 | c03= 0.17 | f01= 0.40  | C (1/>999) |
| 0        | 0      | a01= 0.00  | b02= 0.00 | c03= 0.00 | f01= 0.00  |            |

Class: 5

Pressure pulses

50 Cycles -1000 Pa / 1000 Pa implemented

Remark :

Class: 5C

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Safety test

P3 = Pa Des/Est: -3000 / -2995 : 0 / 0

Remark Suction :

P3 = Pa Des/Est: 3000 / 3002 : 0 / 0

Remark Pressure :

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### Window sketch:

Dimensions (W x H) : 1.230 m x 1.480 m  
Joints length: 3.800 m  
Window surface: 1.820 m<sup>2</sup>  
Sash surface: 0.873 m<sup>2</sup>

