

**TEST REPORT No. 102 SF/14 U**

**Date: 11 of June 2014**

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**Determination of thermal transmittance of window**

(test title)

Test method: LST EN ISO 12567-1:2010 Thermal performance of windows and doors – Determination of thermal transmittance by hot box method – Part 1: Complete windows and doors (EN ISO 12567-1:2010/AC:2010; LST EN ISO 12567-1:2010/AC:2011)

(number of normative document or test method, description of test procedure, test uncertainty)

Specimen description: Wooden window. Measurements: width – 1480 mm, height – 1230 mm. Profiles: frame 94×80 mm, sash 94×80 mm; System type: GAMA 94. Opening: opens inwards, right hand. Hardware: ROTO. Fixing: 7 points in perimeter. Gaskets: SCHLEGEL of foam rubber two contours. Glazing: glass 56 mm, 4-22Ar-4-22Ar-4 (two glasses selective coated, spaces filled argon gases, spacers bars - aluminum).

(name, description and identification details of a specimen)

Customer: UAB „Langų gama“ Liepkalnio str. 160D, LT-02121 Vilnius

(name and address)

Manufacturer: UAB „Langų gama“ Liepkalnio str. 160D, LT-02121 Vilnius

(name and address)

Test results:

Name of the indicator and unit	Test method reference no.	Test result
Thermal transmittance, $W/(m^2 \cdot K)$	LST EN ISO 12567-1:2010; LST EN ISO 12567-1:2010/AC:2011	0,89

**Note.** The testing are carried out in purpose for conformity assessment of the product according to LST EN 14351-:2006+A1:2010

Tested at: Laboratory of Building Thermal Physics, Institute of Architecture and Construction of Kaunas University of Technology

(name of the test laboratory)

Specimen delivery date: 2014-06-06 Date of testing: 2014-06-10

Sampling: The test specimen sampled by customer. Description No. 102/14, 2014-06-25

Additional information: Application 2014-01-02, drawing.

(any deviations, complementary tests, exceptions and any information related with particular test)

Annexes: Annex 1. Test results.  
Annex 2. Specimen data.  
Annex 3. Scheme of climate chamber „Hot box“.

(indicate annex numbers and titles)

Technical manager:

(approves the test results)

J. Ramanauskas

(n., surname)

Tested by:

(technically responsible for testing)

A. Burlingis

(n., surname)

S.P.

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

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**Annex 1. Test results:**

<b>Data element</b>	<b>unit</b>	<b>Value</b>
Air velocity on warm side, downwards, $v_1$	m/s	0,32
Air velocity on cold side, upwards, $v_e$	m/s	2,68
Total power input to metering box, $\Phi_{in}$	W	51,43
Heat flow density through a specimen, $q_{sp}$	W/m <sup>2</sup>	19,02
Warm side air temperature, $\theta_{ci}$	°C	20,85
Cold side air temperature, $\theta_{ce}$	°C	0,08
Environmental temperature of the warm side, $\theta_{ni}$	°C	20,88
Environmental temperature of the cold side, $\theta_{ne}$	°C	0,12
Measured thermal transmittance of a specimen, $U_m$	W/(m <sup>2</sup> ·K)	0,92
Standardized surface thermal resistance, $\Delta R_{(s,t),st}$	m <sup>2</sup> ·K/W	0,17
Thermal transmittance of a specimen, $U_{st}$	W/(m <sup>2</sup> ·K)	0,890
Uncertainty of the measurement, $\Delta U_m$	W/(m <sup>2</sup> ·K)	± 0,02221

Tested by: A. Burlingis

Date: 2014-06-10

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**Annex 2. Specimen data**

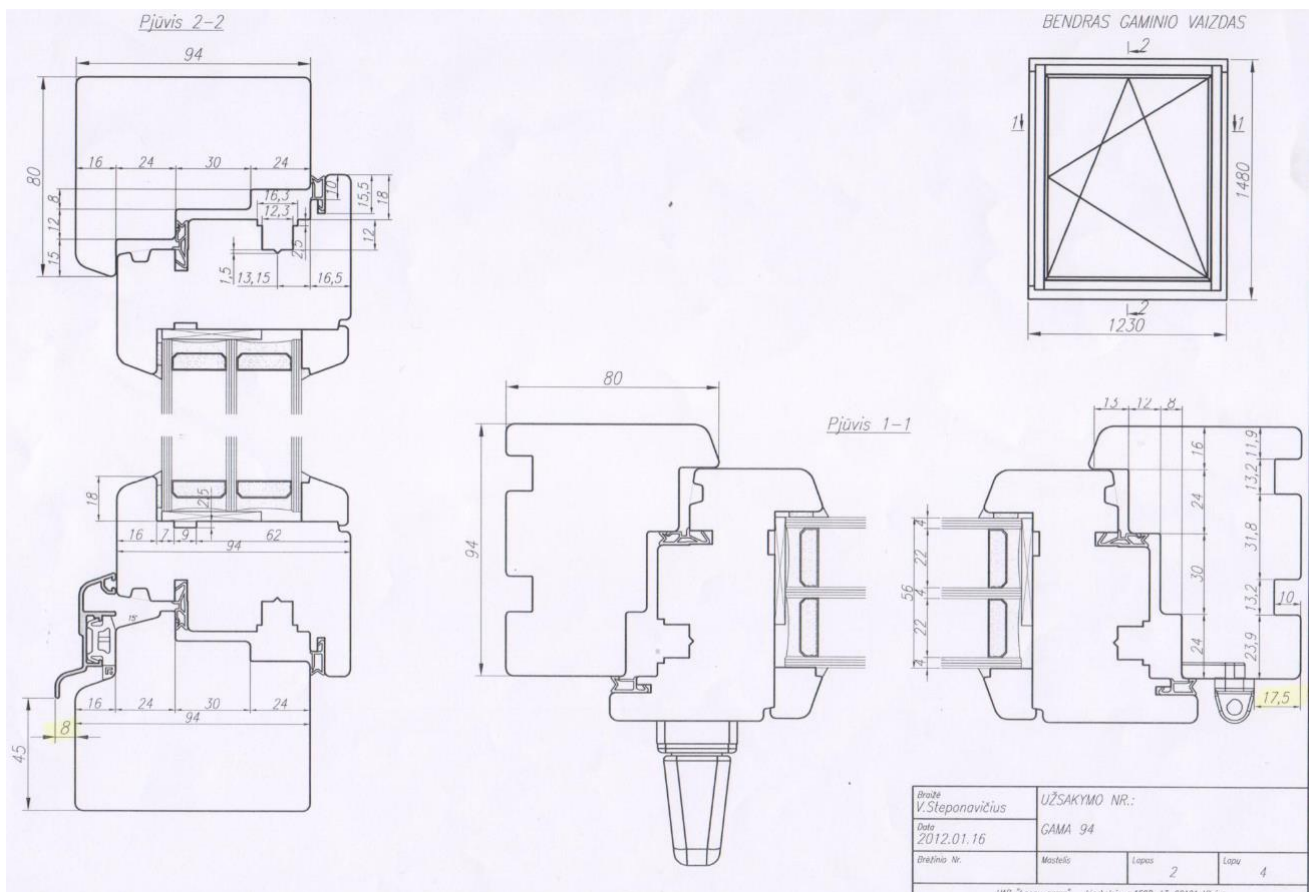
**Specimen description:**

a) Wooden window. Measurements: width – 1480 mm, height – 1230 mm. Profiles: frame 94×80 mm, sash 94×80 mm; System type: GAMA 94. Opening: opens inwards, right hand. Hardware: ROTO. Fixing: 7 points in perimeter. Gaskets: SCHLEGEL of foam rubber two contours. Glazing: glass 56 mm, 4-22Ar-4-22Ar-4 (two glasses selective coated, spaces filled argon gases, spacers bars - aluminum).

**b) specimen dimensions**

- height, 1,48 m;
- width, 1,23 m;
- projected area, 1,83 m<sup>2</sup>;
- frame thickness, 94mm.

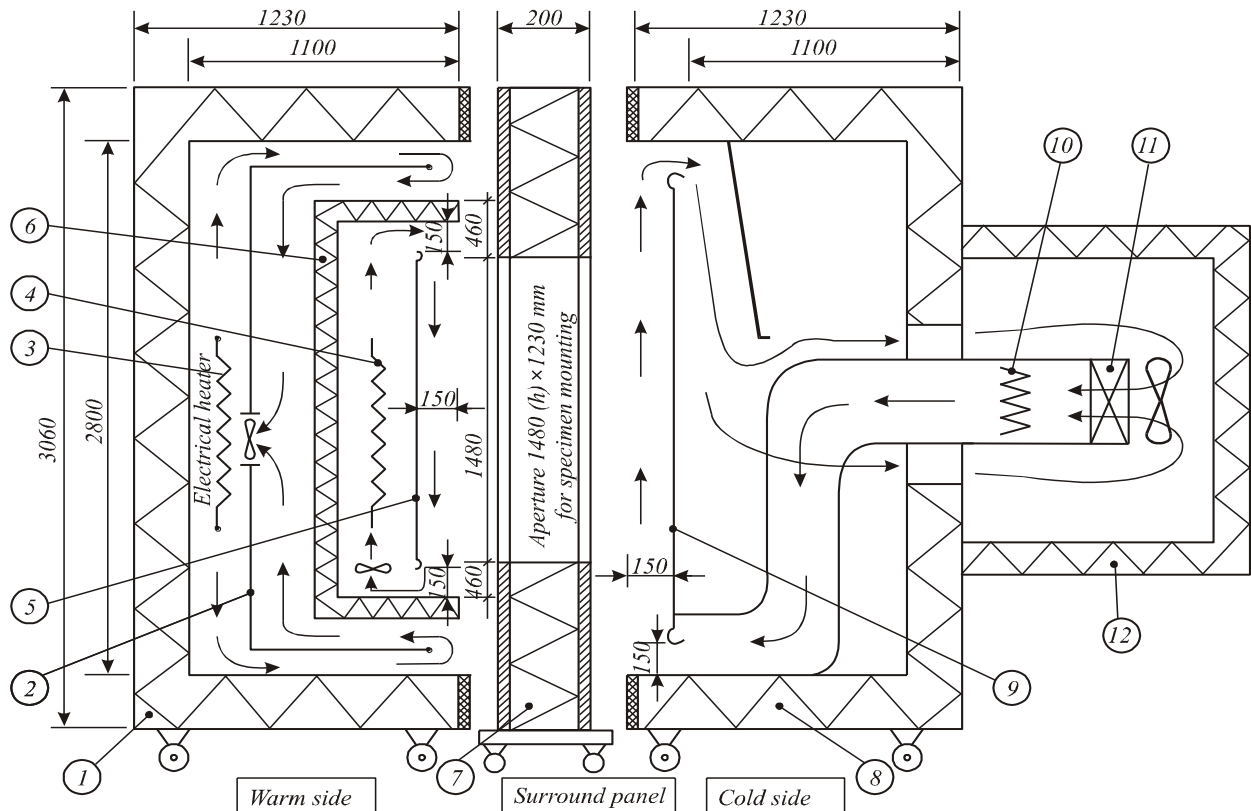
**c) cross-section:**



*Fig 1. Window drawing (by the customer submitted information)*

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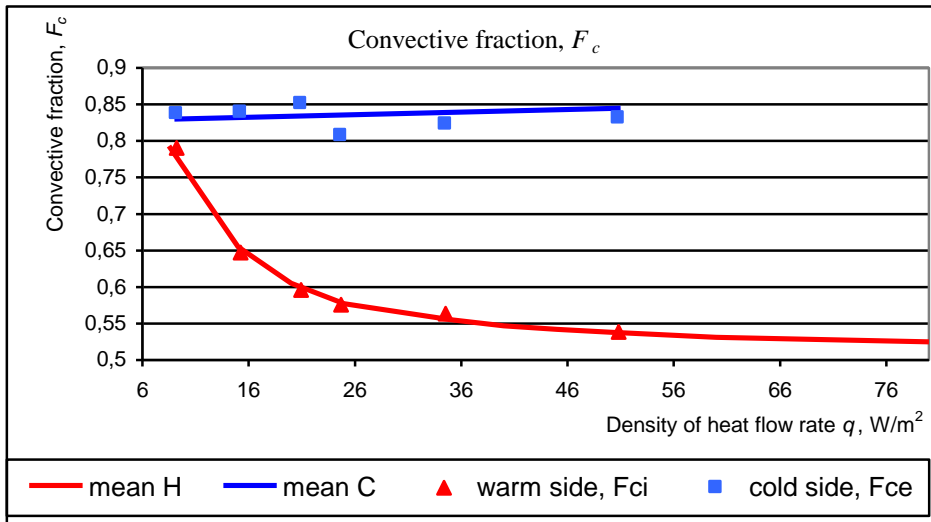
**Annex 3. Scheme of climate chamber „Hot box“**



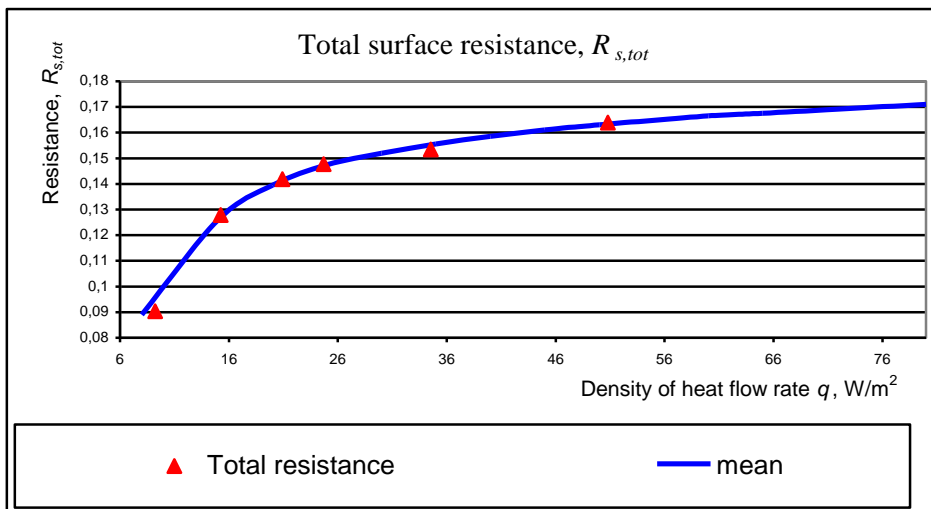
1. Warm side guard box:
  - internal dimensions 2800 × 2800 × 1100 mm;
  - wall thickness 130 mm, total thermal resistance about 3 m<sup>2</sup>·K/W.
2. Guard air flows deflecting screen.
3. Electrical heater, power 660 W, controlled according to a set point temperature in metering box (6).
4. Electrical heater of metering box, power control from 13W to 660 W.
5. Warm side baffle (of metering box) with surface and air temperature sensors.
6. Metering box – internal dimensions 2400 × 2400 × 360 mm.
7. Surround panel: 200 mm thick, core material EPS polystyrene (faced with 3 mm thick cellular PVC plastic sheet on either side), thermal resistance about 6 m<sup>2</sup>·K/W, 1484 x 1234 mm aperture for specimen mounting.
8. Cold side box:
  - internal dimensions 2800 × 2800 × 1100 mm;
  - wall thickness 130 mm, total thermal resistance about 3 m<sup>2</sup>·K/W.
9. Cold side baffle with surface and air temperature sensors.
10. Cold side box controlled
11. Cold side controlled cooling air unit, max. cooling power up to 3 kW.
12. Cold side air cooling box with 5 speed motor fan. electrical heater, max. power 2 kW.

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Calibration curves:  
Convective fraction



Total surface resistance



Thermal resistance of the surround panel:  $R_{sur} = 6,1918555 + 0,0518 \cdot t - 0,0075635 \cdot t^2$ .

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