INSTITUTE OF ARCHITECTURE AND CONSTRUCTION OF KAUNAS UNIVERSITY OF TECHNOLOGY
BUILDING PHYSICS LABORATORY

Notified Body number: 2018

NACIONALINIS AKREDITACIJOS BIURAS
Bandymai / tyrimai ISO/IEC 17025
Nr. LA.01.031

ilac-MRA

TEST REPORT No. 109 SF/24 U en
Date: 29th of April 2024

Determination of thermal transmittance

(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); LST EN ISO 12567-1:2010/AC:2011

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

Specimen description: inward opening wooden window with external aluminium cladding. Sample dimensions: width 1230 mm, height 1480 mm. Product frame/sash material: wooden (pine). Filling the product sash /frame: glass. System: ARKA lux. Type of opening: inward opening turn & tilt. Fittings: UNI JET (Gretsch-Unitas). Locks / handles: GreenteQ stainless steel. Fastening: 9 points. Gaskets: Schlegel QL-3091; Stemeseder AD 1432. Other details: no another details. Glazing: triple glass 3k4LowE1.0+4+4LowE1.0-20SW9005;18SW9005. Producer and date of the glazing unit: SIA „Stiklu Centrs“ 24.11.2023. Date of production of sample: 15.12.2023.

(name, description and identification details of a specimen; information submitted by the customer)

Customer: SIA “ARKA lux”, Vecā ostmala 10, Liepāja, LV-3401, Latvia

(name and address)

Manufacturer SIA „ARKA lux“, „Pori“, Virgas pag., Dienvidkurzemes nov., LV-3433

(name and address)

Test results:

Name of the indicator and unit	Test method reference no.	Test result	Expanded uncertainty ±%
Thermal transmittance, W/(m^2·K)	LST EN ISO 12567-1:2010; LST EN ISO 12567-1:2010/AC:2011	**0.82**	0.02224

Notes 1) The testing are carried out in purpose for conformity assessment of the product according to LST EN 14351-1:2006+A2:2016
2) *The expanded uncertainty is calculated by multiplying the sum of the standard uncertainty by the coverage factor k = 2, which, in the case of a normal distribution, corresponds to a confidence level of 95%. The standard uncertainty is calculated according to EA-4/02.*
3) Conformity of test results is evaluated using the decision rule in accordance with ILAC-G8: 09/2019 point 4.2.1.

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

(name of the test laboratory)

Specimen delivery date: 15/04/2024 Date of testing: 25/04/2024

Sampling: The test specimen sampled by customer. Description N$_o$. 109/24, 04/04/2024

Additional information: Application 04/04/2024

(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: (signature) R. Ramanauskas
(approves the test report) (n., surname)

Tested by: (signature) A. Burlingis
(responsible for testing and results) (n., surname)

S.P.

Lietuvos Respublika DOKUMENTAI Architektūros ir statybos institutas Kauno technologijos universitetas

Annex 1. Test results:

Data element	unit	Value
Air velocity on warm side, downwards, v_1	m/s	0.31
Air velocity on cold side, upwards, v_e	m/s	4.50
Total power input to metering box, Φ_{in}	W	43.86
Heat flow density through a specimen, q_{sp}	W/m^2	16.15
Warm side air temperature, θ_{ci}	°C	19.46
Cold side air temperature, θ_{ce}	°C	0.43
Environmental temperature of the warm side, θ_{ni}	°C	19.55
Environmental temperature of the cold side, θ_{ne}	°C	0.41
Measured thermal transmittance of a specimen, U_m	W/(m^2·K)	0,844
Thermal transmittance of a specimen, U_{st}	W/(m^2·K)	0.8163
Uncertainty of the measurement, ΔU_m	W/(m^2·K)	0.02224

Tested by: A. Burlingis

Date: 25/04/2024

Annex 2. Specimen data

Specimen description:

inward opening wooden window with external aluminium cladding. Sample dimensions: width 1230 mm, height 1480 mm. Product frame/sash material: wooden (pine). Filling the product sash /frame: glass. System: ARKA lux. Type of opening: inward opening turn & tilt. Fittings: UNI JET (Gretsch-Unitas). Locks / handles: GreenteQ stainless steel. Fastening: 9 points. Gaskets: Schlegel QL-3091; Stemeseder AD 1432. Other details: no another details. Glazing: triple glass 3k4LowE1.0+4+4LowE1.0-20SW9005;18SW9005. Producer and date of the glazing unit: SIA „Stiklu Centrs“ 24.11.2023. Date of production of sample: 15.12.2023.

— height, 1.48 m;
— width, 1.23 m;
— projected area, 1.83 m^2;
— frame thickness, 100 mm
— photos and drawings of the sample:

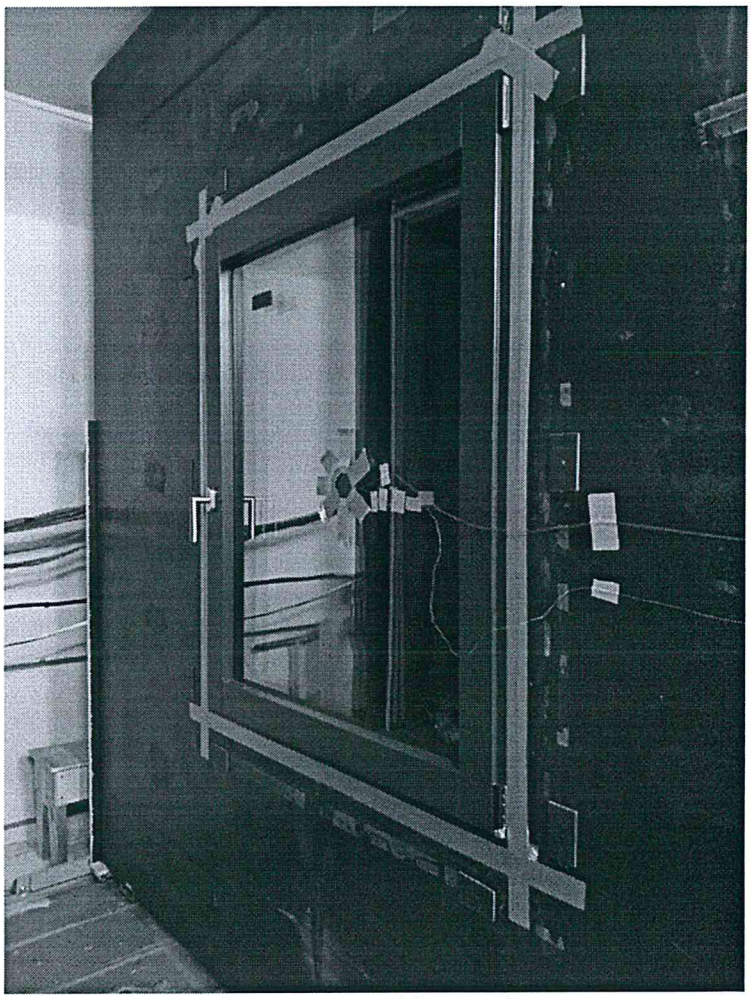


Fig.1 Photos of the sample

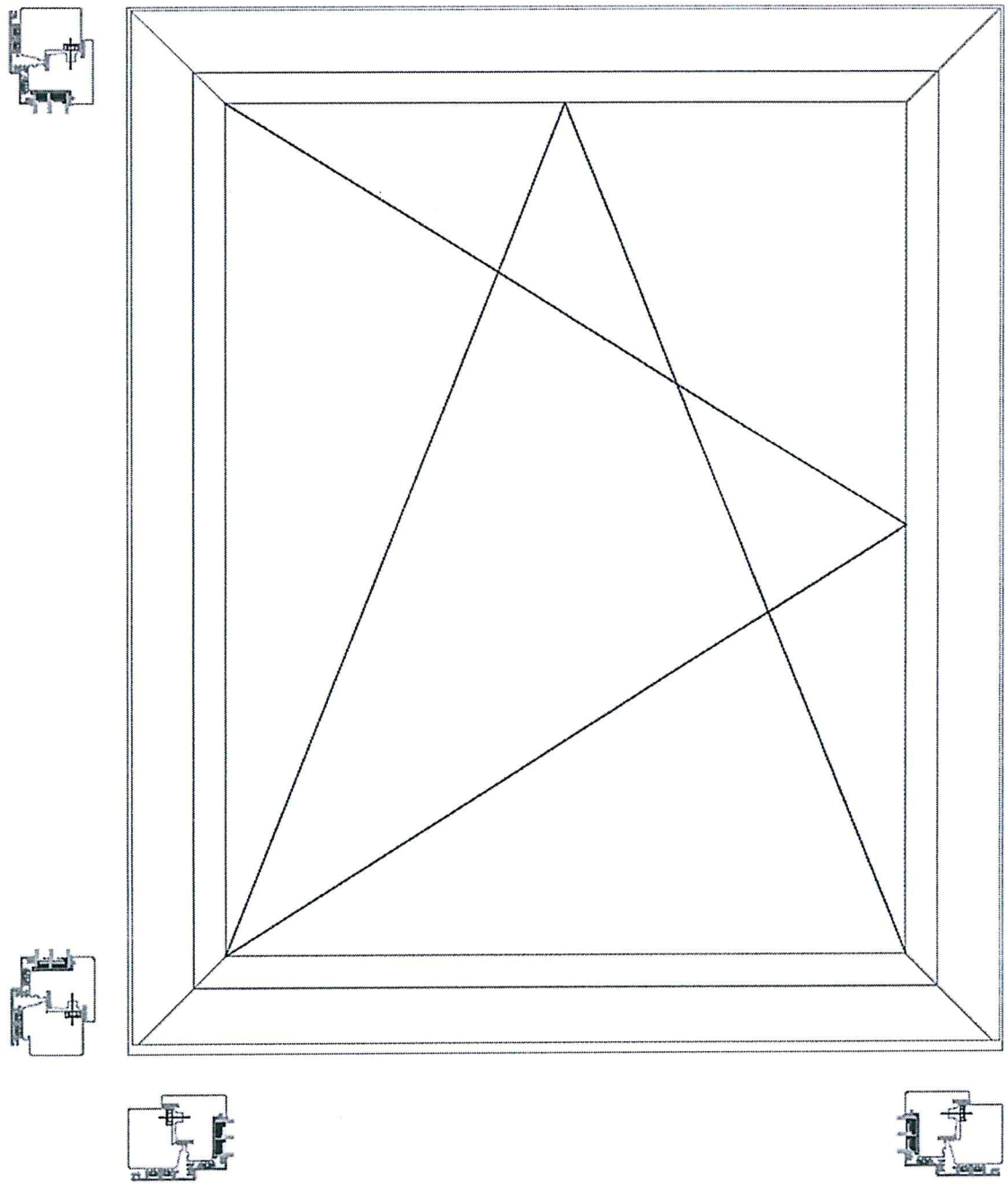
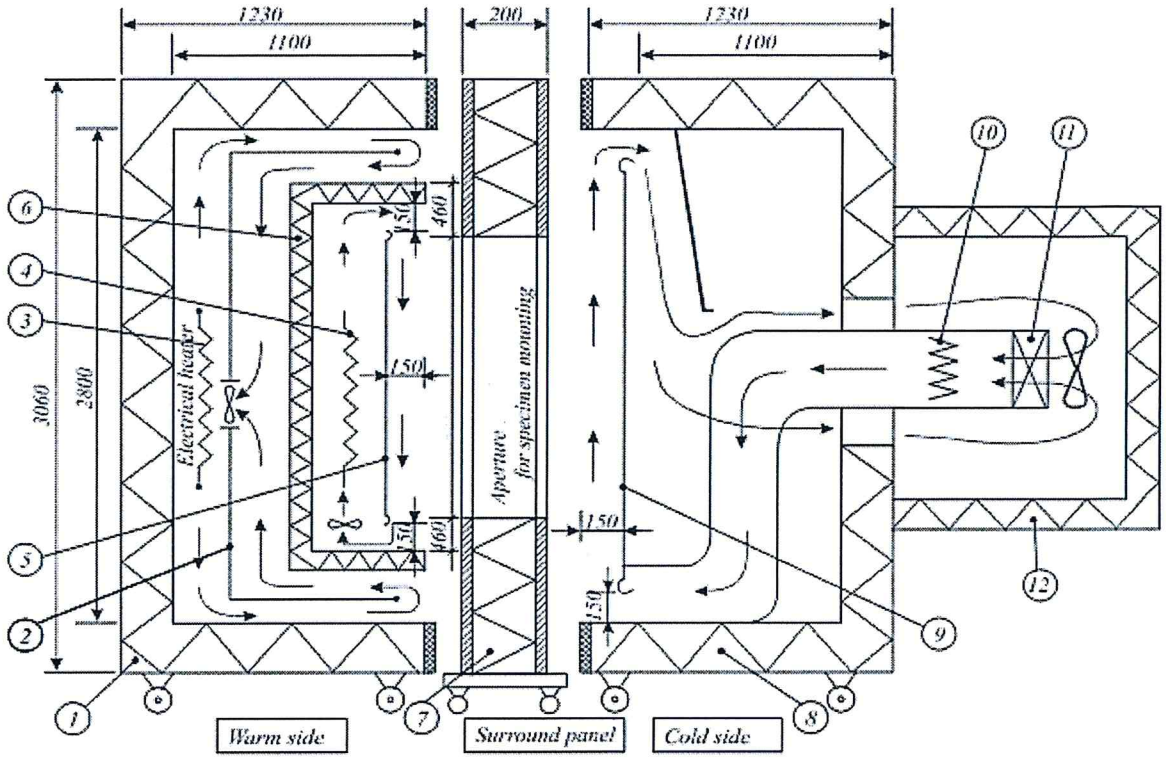


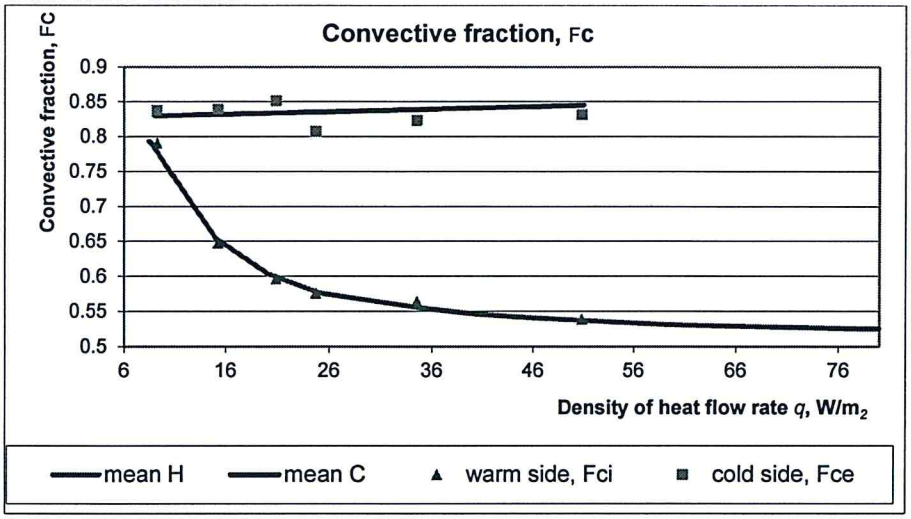
Fig.2 Drawing of the sample (information submitted by the customer)

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

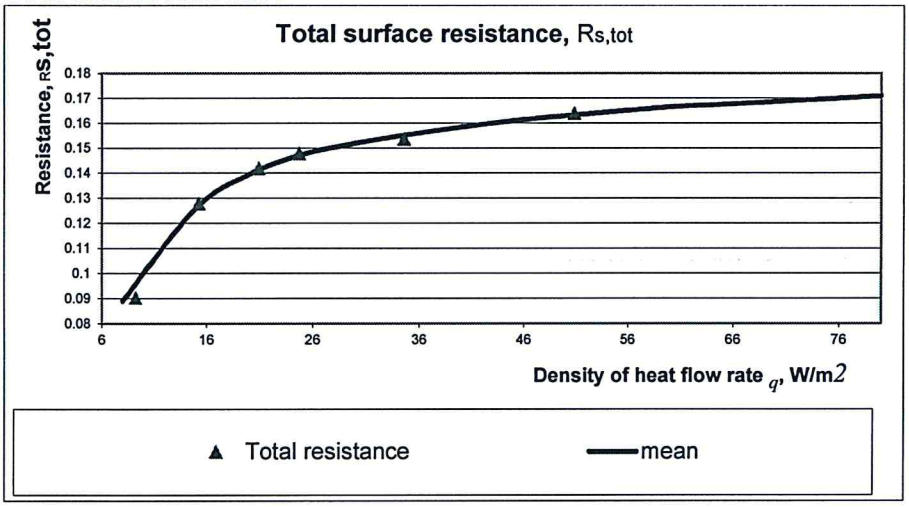


1. Warm side guard box:
   – internal dimensions 2800 × 2800 × 1100 mm;
   – wall thickness 130 mm, total thermal resistance about 3 $m^2 \cdot K/W$.
2. Guard air flows deflecting screen.
3. Electrical heater, power 660 W, controlled according to a set point temperature in metering box (6).
4. Electrical heater of metering box, power control from 13W to 660 W.
5. Warm side baffler (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 $m^2 \cdot K/W$; 1484 mm (h)×1234 mm aperture for window specimen mounting, 2055 mm (h)×1234 mm aperture for door specimen mounting.
8. Cold side box:
   – internal dimensions 2800 × 2800 × 1100 mm;
   – wall thickness 130 mm, total thermal resistance about 3 $m^2 \cdot K/W$.
9. Cold side baffler 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. Calibration curves:

Convective fraction



Total surface resistance



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