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

Notified Body number: 2018

LIETUVOS NACIONALINIS AKREDITACIJOS BIURAS

BANDYMAI ISO/IEC 17025 Nr. LA.01.031

TEST REPORT No. 084 SF/22 U en
Date: 20th of April 2022

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: 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: 2k 4+4LowE1.0-18SW9005 Argon gas Ug=1.1 W/m^{2}K. 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

(name and address)

Manufacturer SIA "ARKA lux", "Pori", Virgas pag., Dienvidkurzemes nov., LV-3433, Latvia

(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	**1.3**	0.03010

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: 12/4/2022 Date of testing: 20/4/2022

Sampling: The test specimen sampled by customer. Description N$_o$. 084/22, 6/4/2022

Additional information: Application 6/4/2022

(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) — (signature) — J. Ramanauskas (n., surname)

Tested by: (technically responsible for testing) — (signature) — A. Burlingis (n., surname)

S.P.

Annex 1. Test results:

Data element	unit	Value
Air velocity on warm side, downwards, v_1	m/s	0.24
Air velocity on cold side, upwards, v_e	m/s	2.90
Total power input to metering box, Φ_{in}	W	62.81
Heat flow density through a specimen, q_{sp}	W/m^2	26.83
Warm side air temperature, θ_{ci}	°C	19.79
Cold side air temperature, θ_{ce}	°C	-0.14
Environmental temperature of the warm side, θ_{ni}	°C	19.78
Environmental temperature of the cold side, θ_{ne}	°C	-0.08
Measured thermal transmittance of a specimen, U_m	$W/(m^2 \cdot K)$	1.351
Standardized surface thermal resistance, $\Delta R_{(s,t),st}$	$m^2 \cdot K/W$	0.150
Thermal transmittance of a specimen, U_{st}	$W/(m^2 \cdot K)$	1.316
Uncertainty of the measurement, ΔU_m	$W/(m^2 \cdot K)$	± 0.03010

Tested by: A. Burlingis Date: 20/4/2022

Annex 2. Specimen data

Specimen description:

a) 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: 2k 4+4LowE1.0-18SW9005 Argon gas Ug=1.1 W/m^{2}K. Producer and date of the glazing unit: Stiklu Centrs SIA 10.03.2022. Date of production of window: 11.04.2022 specimen dimensions

— height, 1.48 m;
— width, 1.23 m;
— projected area, 1.83 m^2;
— frame thickness, 125 mm

b) drawings of the sample

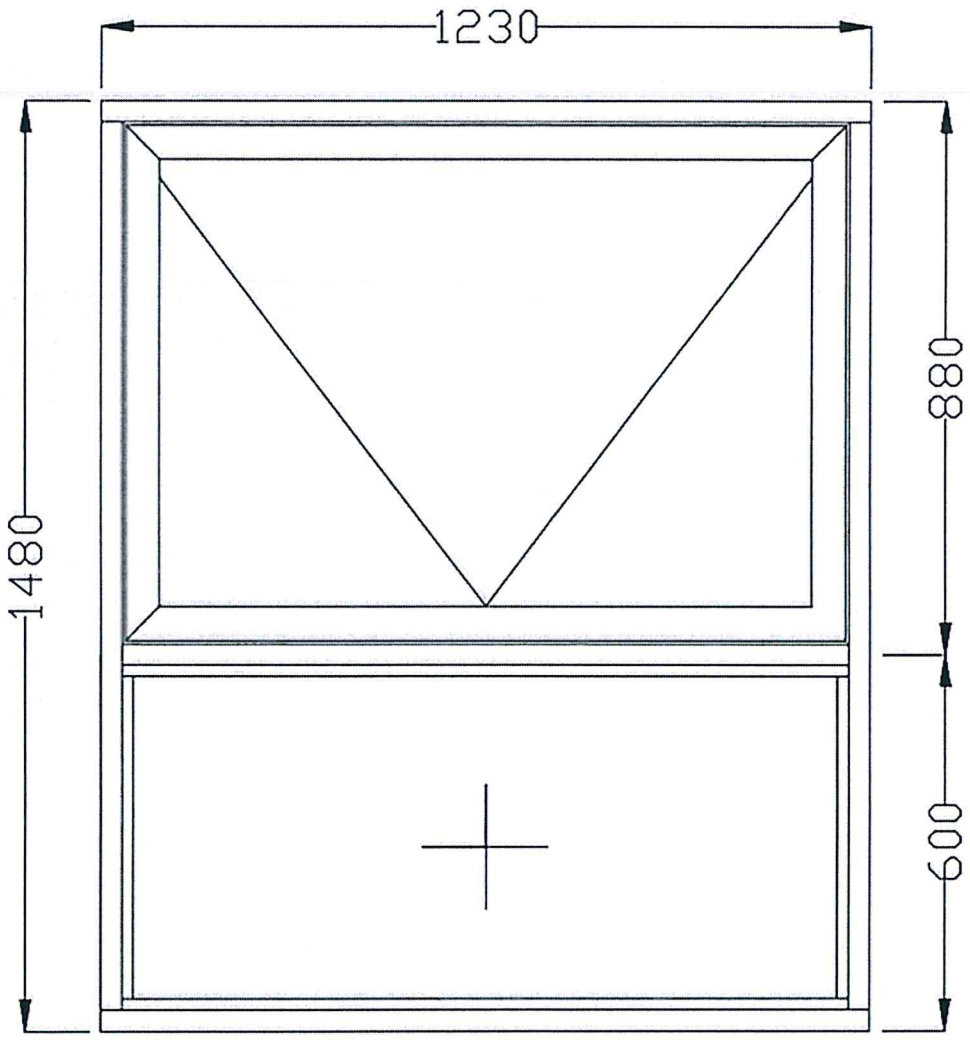


Fig.1 Drawing of the sample (information submitted by the customer)

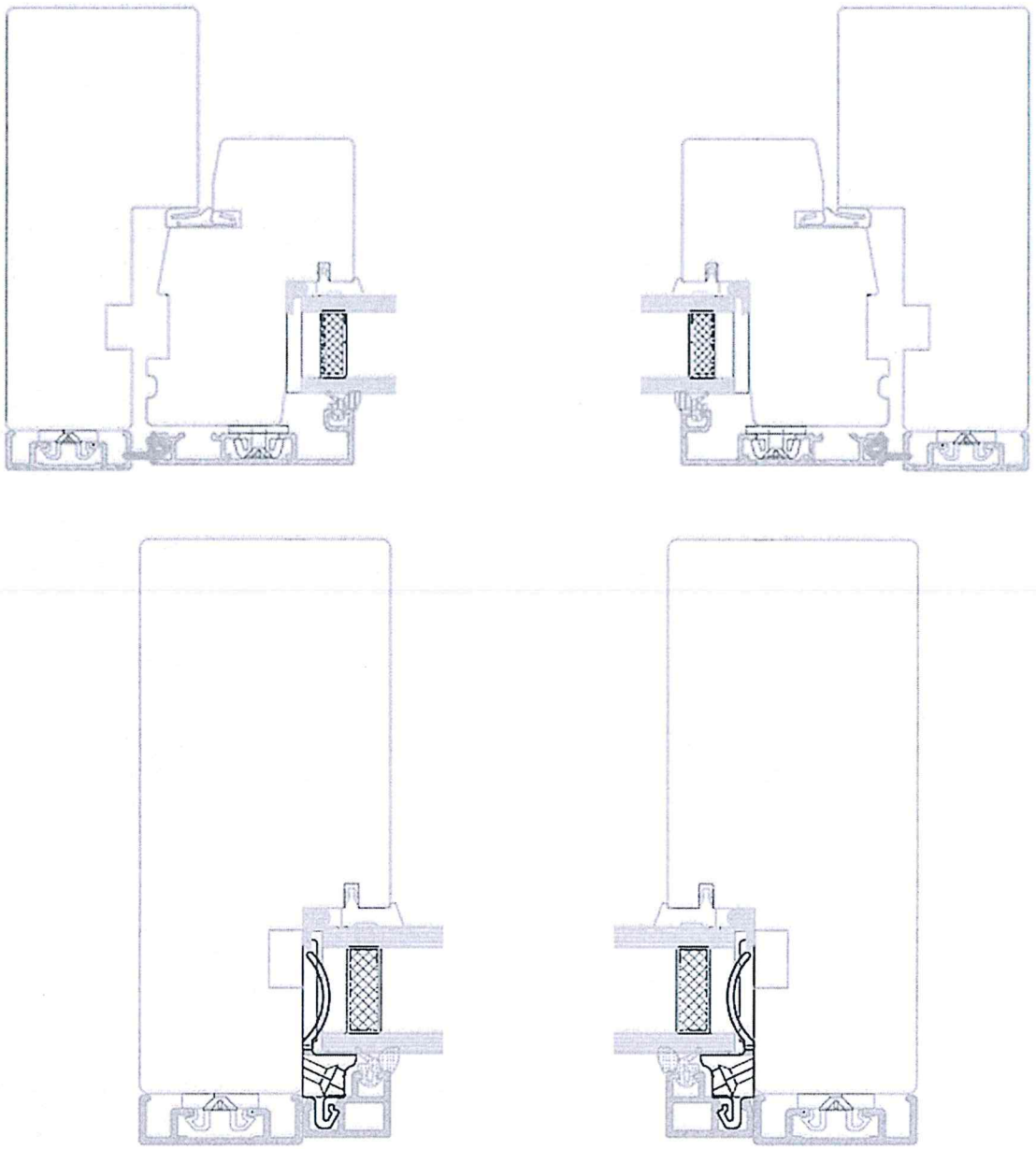


Fig.2 Drawing of the sample (information submitted by the customer)

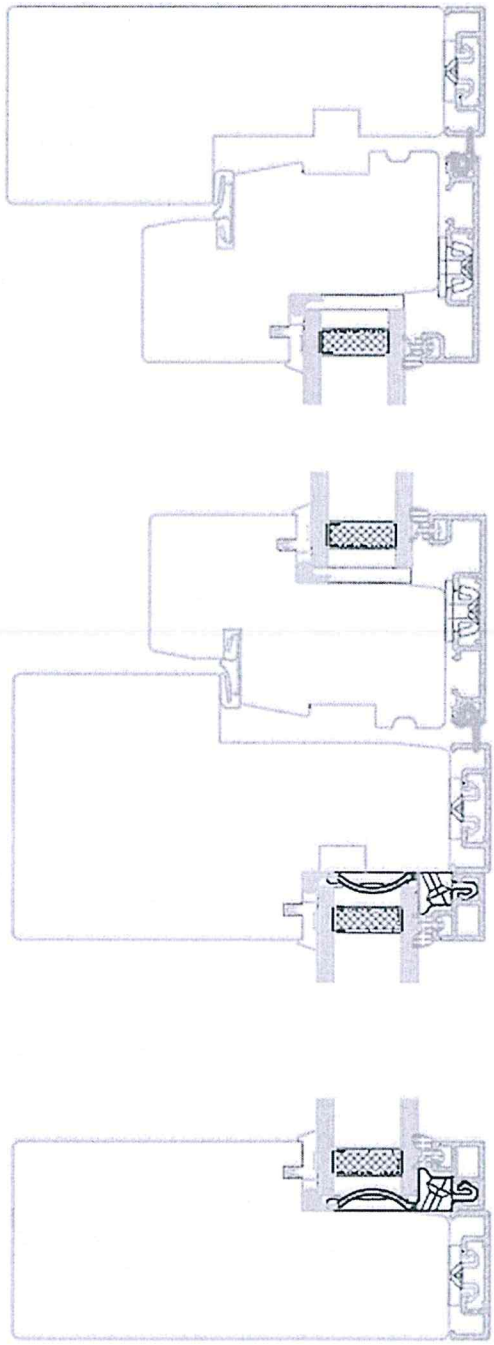
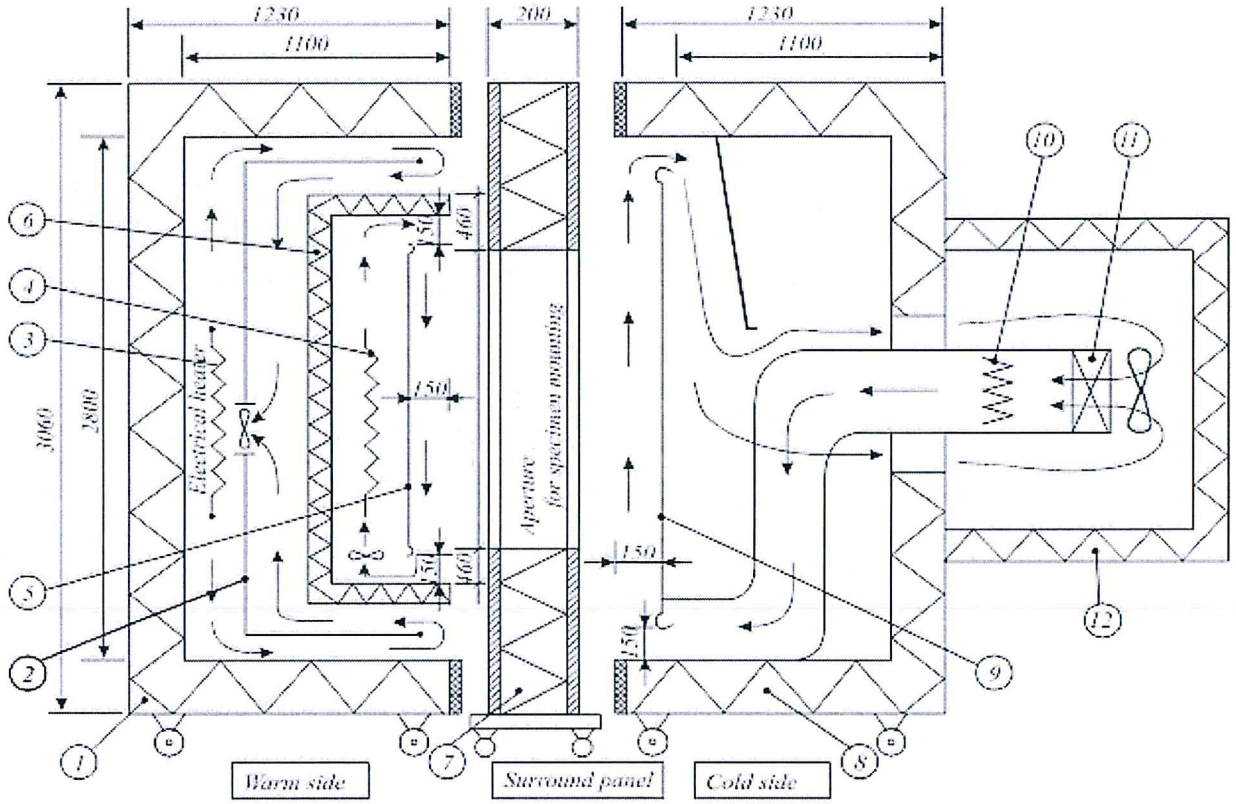


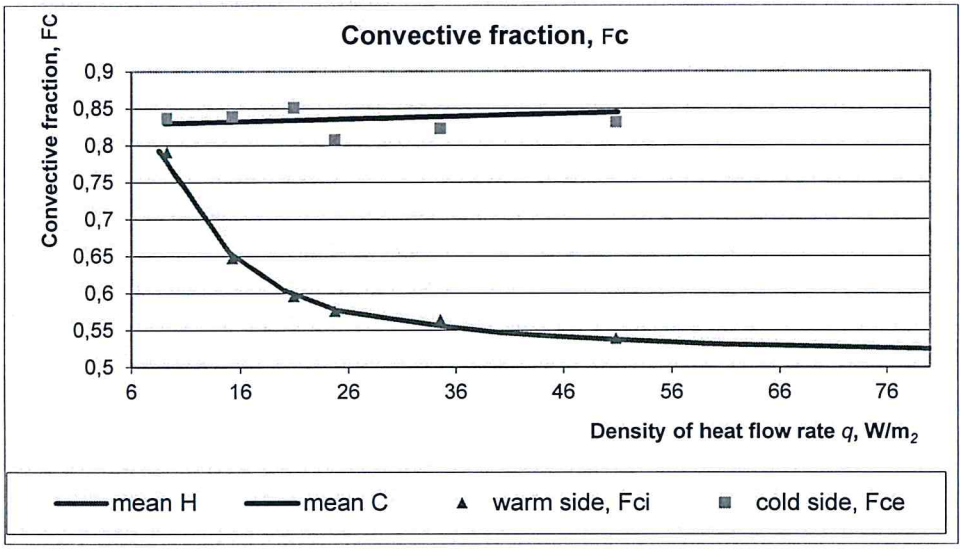
Fig.3 Drawing of the sample (information submitted by the customer)

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

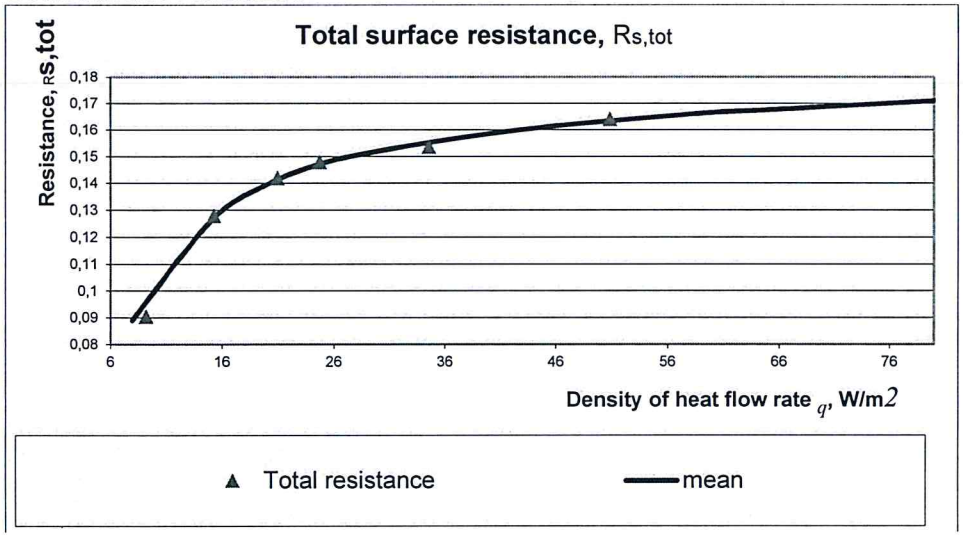


1. Warm side guard box:
   – internal dimensions 2800 × 2800 × 1100 mm;
   – wall thickness 130 mm, total thermal resistance about 3 m^2·K/W.
2. Guard air flows deflecting screen.
3. Electrical heater, power 660 W, controlled according to a set point temperature in metering box (6).
4. Electrical heater 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·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·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: $R_{sur} = 6{,}1918555 + 0{,}0518 \cdot t - 0{,}0075635 \cdot t^2$.