

Notified Body number: 2018

BANDYMAI
ISO/IEC 17025

Nr. LA.01.031

TEST REPORT No. 058 SF/23 U en

Date: 30th of March 2023

page (pages)

1 (7)

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 aluminum cladding (ARKA lux Scandinavian slimline). Size 1230x1480 mm. Product frame/sash material: wooden with aluminum cladding. Filling the product sash/frame: glazed. System: Wood-aluminum 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/external wind gasket Stemeseder. Other details: no. Glazing: 3k4LowE1.0+4+4LowE1.0 0-20SW9005; 18SW9005. 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

(name and address)

Manufacturer: SIA "ARKA lux", Veca ostamala 10, LV-3401 Liepaja, 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	0,77	0.02111

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: 24/03/2023 Date of testing: 29/03/2023

Sampling: The test specimen sampled by customer. Description No. 058/23, 15/03/2023

Additional information: Application 15/03/2023

(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 report)

(signature)

J. Ramanauskas

(n., surname)

Tested by:

(responsible for testing and results)

(signature)

A. Burlingis

(n., surname)

S.P.

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.

Annex 1. Test results:

Data element	unit	Value
Air velocity on warm side, downwards, v_i	m/s	0.32
Air velocity on cold side, upwards, v_e	m/s	4.60
Total power input to metering box, Φ_{in}	W	42.51
Heat flow density through a specimen, q_{sp}	W/m ²	15.59
Warm side air temperature, θ_{ci}	°C	19.53
Cold side air temperature, θ_{ce}	°C	-0.10
Environmental temperature of the warm side, θ_{ni}	°C	19.61
Environmental temperature of the cold side, θ_{ne}	°C	-0.03
Measured thermal transmittance of a specimen, U_m	W/(m ² ·K)	0.794
Standardized total thermal resistance, $\Delta R_{tot,st}$	m ² ·K/W	0.128
Thermal transmittance of a specimen, U_{st}	W/(m ² ·K)	0.7678
Uncertainty of the measurement, ΔU_m	W/(m ² ·K)	± 0.02111

Tested by: A. Burlingis



Date: 29/03/2023

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.

Annex 2. Specimen data

Specimen description:

wooden window with aluminum cladding (ARKA lux Scandinavian slimline). Size 1230x1480 mm. Product frame/sash material: wooden with aluminum cladding. Filling the product sash/frame: glazed. System: Wood-aluminum 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/external wind gasket Stemeseder. Other details: no. Glazing: 3k4LowE1.0+4+4LowE1.0 0-20SW9005; 18SW9005. Producer and date of the glazing unit: Stiklu Centrs SIA 03/2023. Date of production of window: 20/03/2023.

- height, 1.48 m;
- width, 1.23 m;
- projected area, 1.83 m²;
- frame thickness, 125 mm
- photos and drawings of the sample:



Fig.1 Photos of the sample

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.

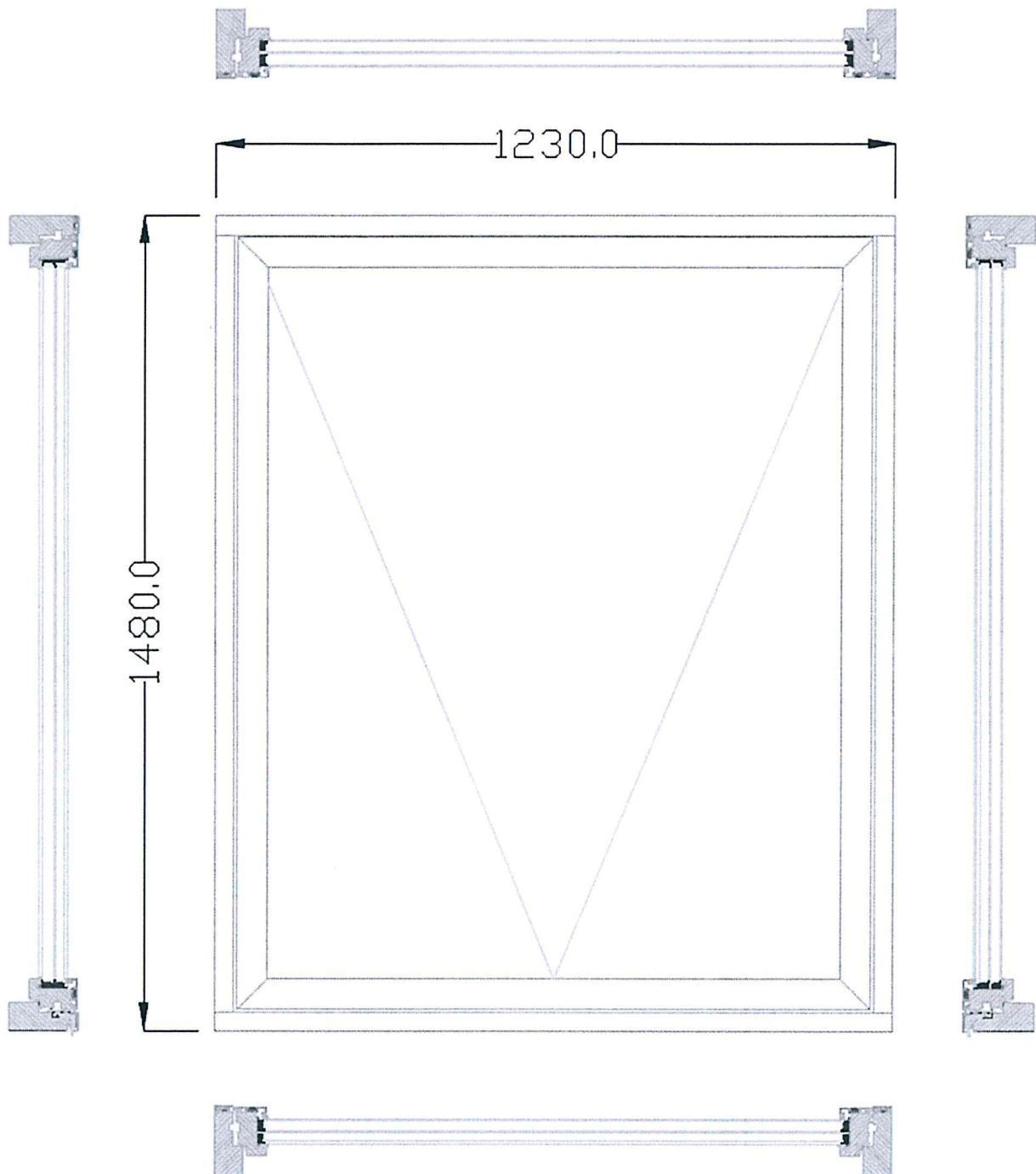


Fig.2 Drawing of the sample (information submitted by the customer)

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.

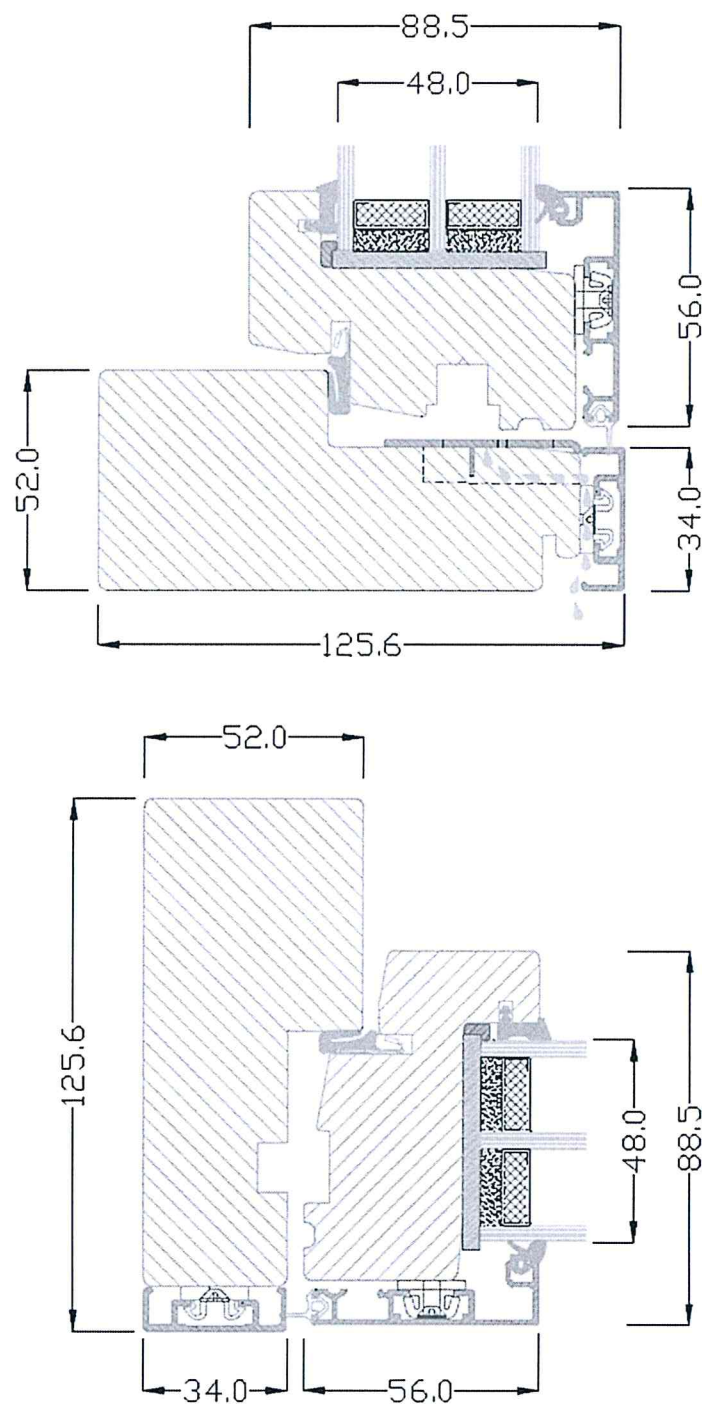
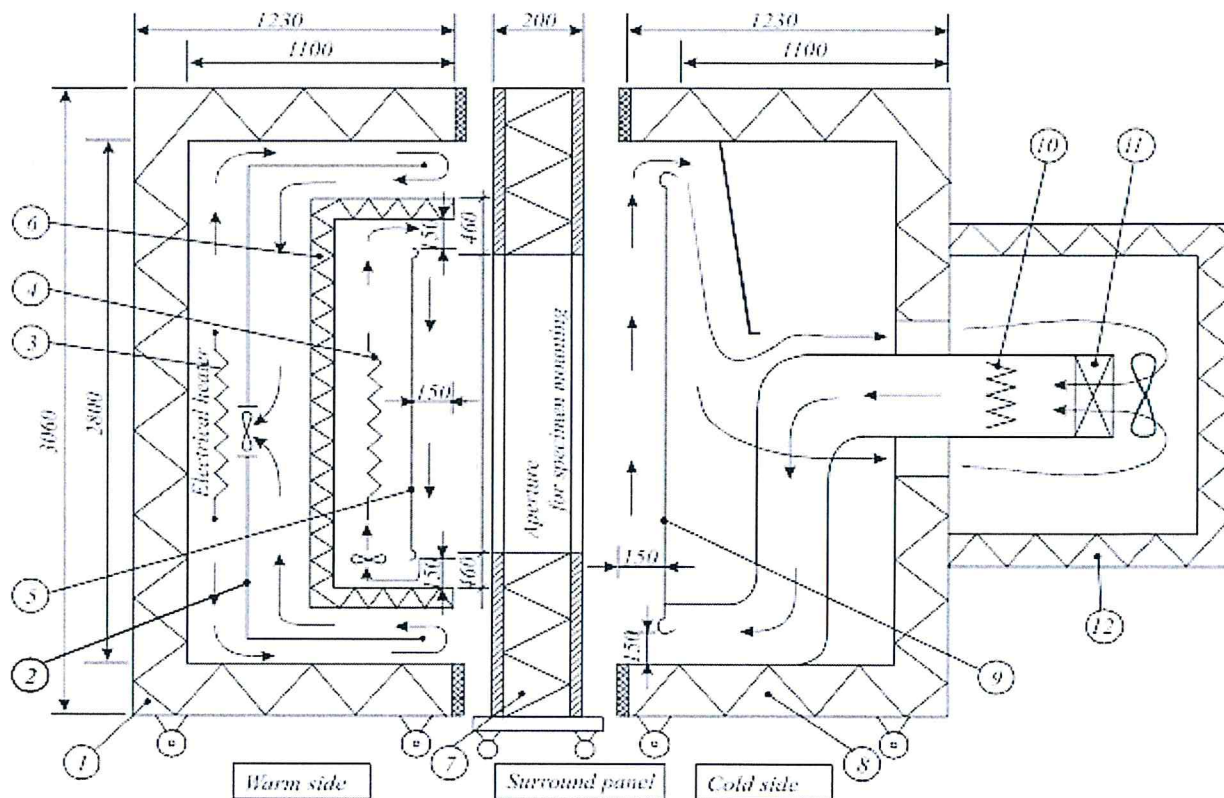


Fig.3 Drawing of the sample bottom part and side/top part (information submitted by the customer)

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.

Annex 3. Scheme of climate chamber „Hot box“

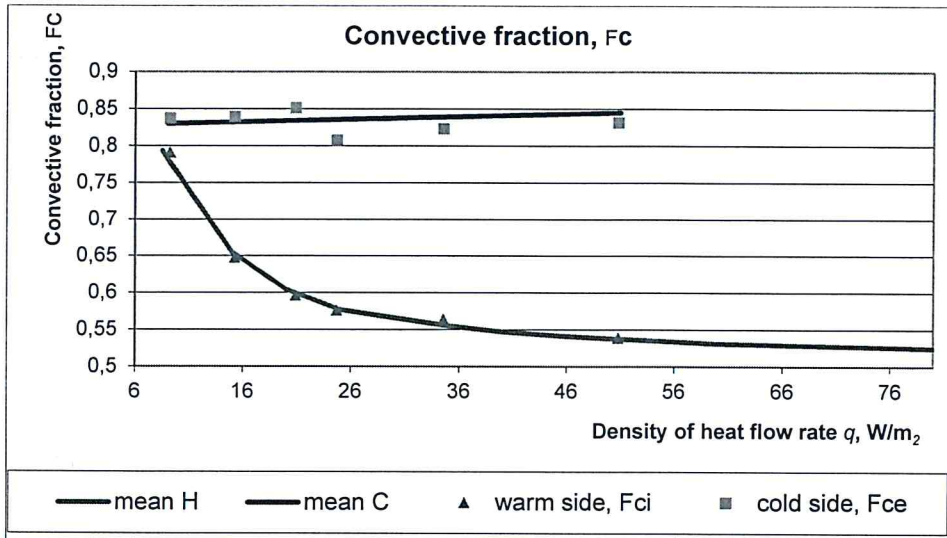


1. Warm side guard box:
 - internal dimensions $2800 \times 2800 \times 1100$ mm;
 - wall thickness 130 mm, total thermal resistance about $3 \text{ m}^2 \cdot \text{K/W}$.
2. Guard air flows deflecting screen.
3. Electrical heater, power 660 W, controlled according to a set point temperature in metering box (6).
4. Electrical heater of metering box, power control from 13 W to 660 W.
5. Warm side baffle (of metering box) with surface and air temperature sensors.
6. Metering box – internal dimensions $2400 \times 2400 \times 360$ 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 $6 \text{ m}^2 \cdot \text{K/W}$; 1484 mm (h) $\times$ 1234 mm aperture for window specimen mounting, 2055 mm (h) $\times$ 1234 mm aperture for door specimen mounting.
8. Cold side box:
 - internal dimensions $2800 \times 2800 \times 1100$ mm;
 - wall thickness 130 mm, total thermal resistance about $3 \text{ m}^2 \cdot \text{K/W}$.
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. Calibration curves:

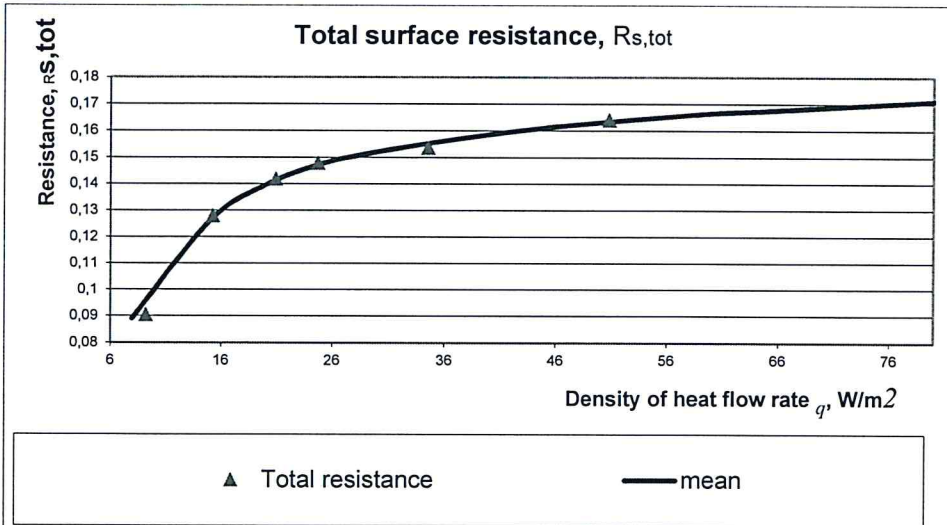
Validity – the named data and results refer exclusively to the tested and described specimens.

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.

Convective fraction



Total surface resistance



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

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.