

# Evidence of Performance

## Thermal transmittance

### Test report

No. 11-002134-PR02

(PB-A01-06-en-01)



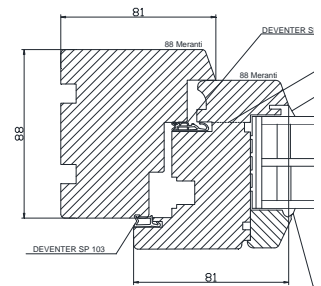
Client	WINDOWS 2000 ul. Sobieskiego 23 84-230 Rumia Poland
Product	Single window, single leaf
Designation	IV 88
External dimensions (W x H)	1,230 mm x 1,480 mm
Frame material	Wood (Meranti / laminated) with weather bar made of Aluminium / powder coated
Type of opening	Tilt and turn Insulating glass unit: TERMO HP U=0,5 Configuration: 4 / 18 / 4 / 18 / 4 mm Gas filling : 68 % / 92 % Argon IR-Coating: Pos. 2 and 5, $\epsilon_n = 0,03$ (measured value)
Infill panel	Spacer: Thermix TX.N
Special features	--

### Basis

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

### Representation

(further cross sections see chapter 1.2)



### Instructions for use

The present test report serves to demonstrate the thermal transmittance  $U_w$ .

### Validity

The data and results given relate solely to the tested and described specimen.

Testing thermal transmittance does not allow any statement to be made on any further characteristics relevant to performance and quality of the present construction.

### Notes on publication

The ift Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies.

The cover sheet can be used as abstract.

### Contents

The report comprises a total of 7 pages.

- 1 Object
- 2 Procedure
- 3 Detailed results

### Thermal transmittance



$$U_w = 0,84 \text{ W}/(\text{m}^2 \cdot \text{K})$$

ift Rosenheim

05.04.2012

Manuel Demel, Dipl.-Ing. (FH)  
Deputy Head of Testing Department  
Building Physics

Konrad Huber, Dipl.-Ing. (FH)  
Deputy Head of Testing Department  
Building Physics

Test report 11-002134-PR02 (PB-A01-06-en-01) dated 05. April 2012  
Client WINDOWS 2000, 84-230 Rumia (Poland)



## 1 Object

### 1.1 Description of test specimen

<b>Product</b>	Single window, single leaf
Manufacturer*	WINDOWS 2000, 84-230 Rumia, Poland
Date of manufacture	08 March 2012
Product designation	IV 88
Profile system	IV 88
Type of opening	Tilt and turn
Opening direction	Inwards
Casement member external size (W x H)	1,230 mm x 1,480 mm
Frame member external size (W x H)	1,153 mm x 1,388 mm
Material	Wood (Meranti / laminated) and drainage system of aluminium / powder coated
Volume weight / density	Meranti: $\rho = 700 \text{ kg/m}^3$
Moisture content	13 %
<b>Frame member</b>	
Profile number	IV 88
Profile cross section (W x D)	81 mm x 88 mm
<b>Casement member</b>	
Profile number	IV 88
Profile cross section (W x D)	81 mm x 88 mm
<b>Rebate design</b>	
Rebate drainage	drainage system: SPREE 27 OF / Fa. Gutmann
Rebate seals	1 overlap gasket in casement member 1 central gasket in casement member 1 lip seals in the drainage system
<b>Infill panel</b>	
Type	TERMO HP U=0,5
Manufacturer	Comfortglass
Visible size (W x H)	982 mm x 1218 mm
Depth of infill element	14 mm
Total thickness at edge	47,5 mm
Total thickness in pane centre	46,7 mm
Construction	4 / 18 / 4 / 18 / 4 mm
Spacer	
Material	Thermix TX.N
Coating	
Type	TERMO
Manufacturer	--
Coating level	Pos. 2 and 5
Emissivity $\epsilon_n$	
Measured value	0,03
Gas filling in cavity	
Gas	Argon
Filling degree	68 % / 92 %

Test report 11-002134-PR02 (PB-A01-06-en-01) dated 05. April 2012  
 Client WINDOWS 2000, 84-230 Rumia (Poland)



#### Louver system in cavity

Type, Manufacturer --  
 Construction --

#### Extra equipment

Type, Manufacturer --

#### Mounting of infill panels

##### Sealing system

##### exterior

Type / Material with elastic sealing

##### interior

Type / Material with elastic sealing

Vapour pressure equalization on hinge and locking side: 2 slots (4 mm x 7 mm) at bottom and top

#### Hardware

Opening Tilt and turn

Type / Producer Roto NT

Hinges / pivots 1/1

Number of lockings on top: 2, at bottom: 2, on hinge side: 2, on lock side: 2

#### Special features

--

Article designations / numbers as well as material specifications were given by the client.

## 1.2 Representation of test specimen

The structural details were examined solely on the basis of the characteristics to be classified.

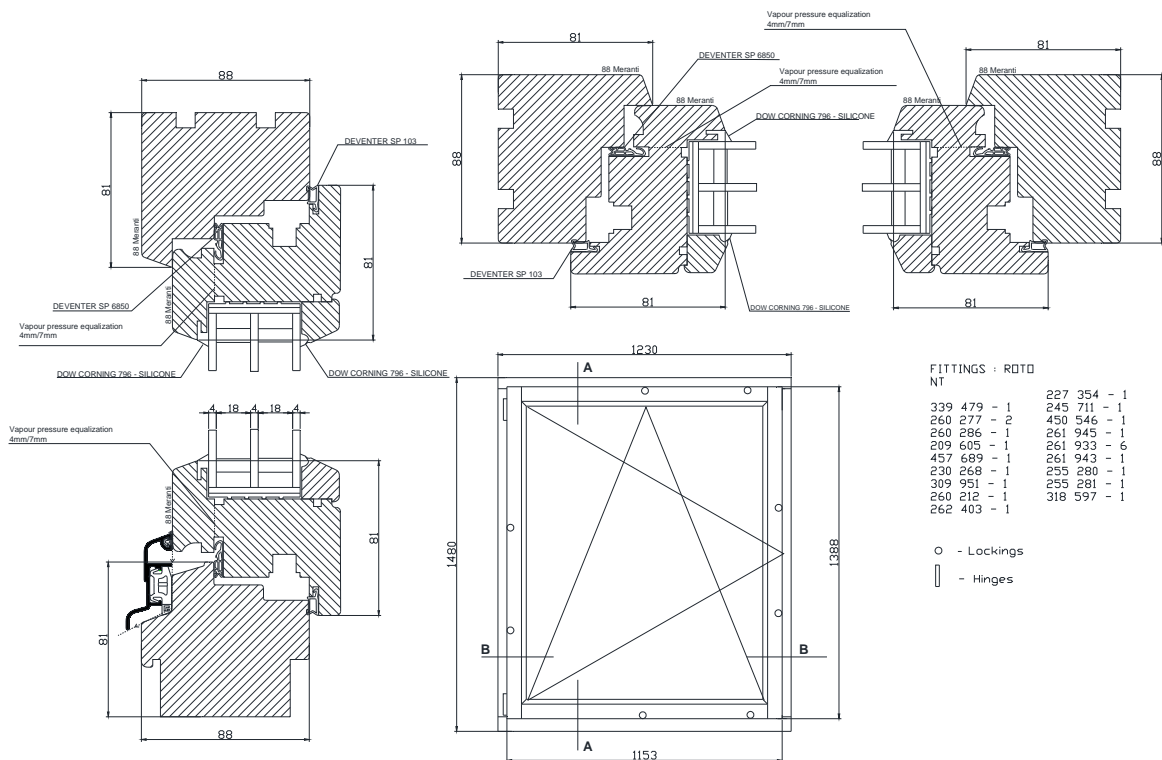


Fig 1 Cross sections

## 2 Procedure

### 2.1 Sampling

The samples were selected by the client.

Number 1  
 Delivery 13 March 2012 by the client  
 Registration No. 32040/001

### 2.2 Process

Basis

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

Boundary conditions

As required in the standard

Deviations

There are no deviations from the test procedure and/or test conditions.

Test report 11-002134-PR02 (PB-A01-06-en-01) dated 05. April 2012  
Client WINDOWS 2000, 84-230 Rumia (Poland)



### 2.3 Test equipment

Guarded hot box	Device no: 22762
External dimensions	Width 3 m, height 3 m, depth 2.3 m
Emissivity of inner surfaces	$\epsilon_n \geq 0,95$
Position of test specimen	vertical
Direction of heat flow	horizontal
Sensor layout	as specified in EN ISO 12567-1: 2010

### 2.4 Testing

Date / Period	19 March 2012
Testing personnel	Konrad Huber

Test report 11-002134-PR02 (PB-A01-06-en-01) dated **05. April 2012**  
 Client WINDOWS 2000, 84-230 Rumia (Poland)



### 3 Detailed results

#### Thermal transmittance

Project No.	11-002134-PR02	Task No.	11-002134
Client	WINDOWS 2000		
Basis of test	ISO 12567-1:2010-07 Thermal performance of windows and doors - Determination of thermal transmittance by the hot box method - Part 1: Complete windows and doors		
Used test equipment	Pst/022762 - Hot Box U value PstZ/022764 - wall 1 (Hot Box) Window		
Test specimen			
Test specimen No.	32040-001		
Date of test	19.03.2012		
Testing personnel in charge	Konrad Huber		

#### Information about the test method / results

Test method There have been no deviations to the standard / basis

#### Test performance / results

Designation	Symbol	Value	Unit
<b>Detailed results <math>DU</math></b>			
Air temperature warm side	$\theta_{in}$	21,7	°C
Air temperature cold side	$\theta_{re}$	2,1	°C
Environmental temperature - warm	$\theta_{in}$	22,0	°C
Environmental temperature - cold	$\theta_{re}$	2,1	°C
Air velocity internal (air flow down)	$v_i$	approx. 0,1	m / s
Air velocity external (air flow down)	$v_e$	1,7	m / s
Input power to hot box	$\Phi_{in}$	33,5	W
Heat flow density of specimen	$q_{sp}$	16,4	W / m <sup>2</sup>
Total surface resistance	$R_{st}$	0,189	W / m <sup>2</sup>
<b>Measured results <math>U_D</math></b>			
Thermal transmittance	$U_W$	0,84	W / (m <sup>2</sup> K)
Certainty of measurement	$\Delta U_W$	0,05	W / (m <sup>2</sup> K)



Diagram showing results of calibration measurement

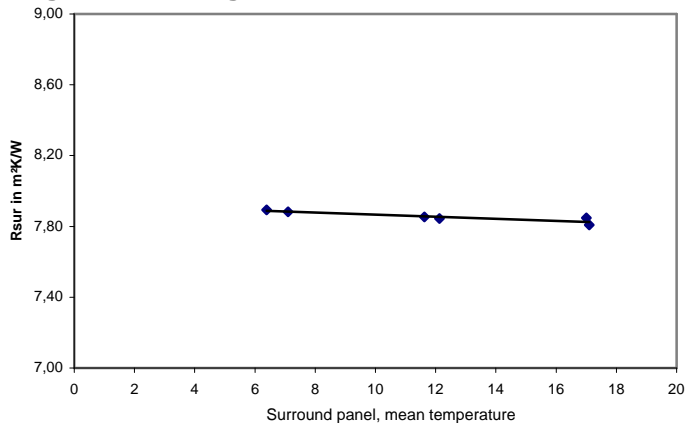


Fig 2 Thermal resistance of the surround panel

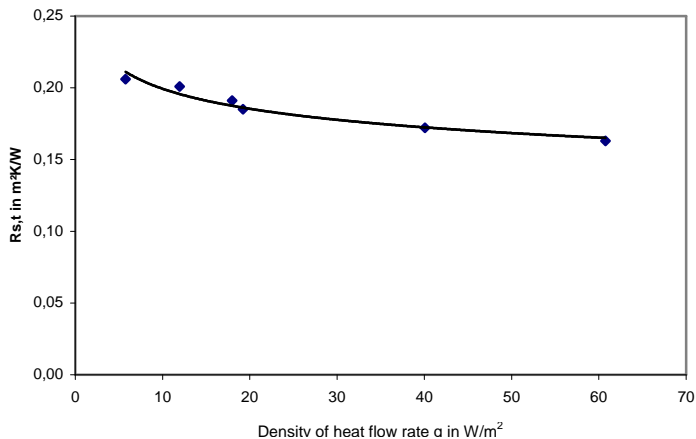


Fig 3 Total surface thermal resistance

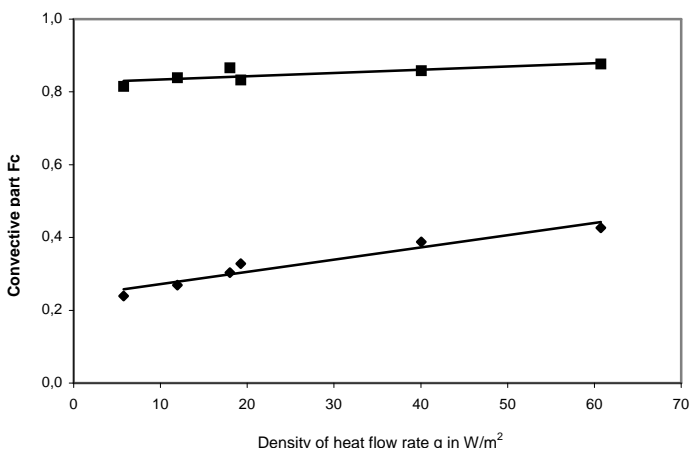


Fig 4 Convective fraction