Evidence of Performance

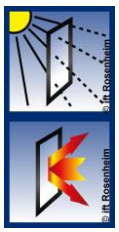
Determination of luminous and solar characteristics of glazing

Test Report
No. 20-001682-PR01

(PB-H01-07-en-01)

Client	Metalotehnika LLC Prilep Gjorche Petrov no.23 7500 Prilep Macedonia
Product	Coated glass
System designation	TermoStop Invisible
Thickness of pane	4 mm
Coating	Liquid coating
Name of coating	TermoStop Invisible

Solar direct transmittance τ_e
Light transmittance τ_v
Normal emissivity ε_n



$\tau_e = 0.61$
$\tau_v = 0.80$
$\varepsilon_n = 0.90$

ift Rosenheim
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Basis

EN 410 : 2011-02
Glass in building - Determination of luminous and solar characteristics of glazing

EN 12898 : 2019-03
Glass in building - Determination of the emissivity

Deviation from the test method: Integral measurement of the coated surface

Instructions for use

This test report serves to demonstrate the above characteristics for glazing.

Validity

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

This test does not allow any statement to be made on further characteristics of the glazing submitted regarding performance and quality, in particular the effects of weathering and ageing.

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 an abstract.

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The report contains a total of 4 pages

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2 Procedure
3 Detailed results

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1 Object

1.1 Description of test specimen (All dimensions in mm)

Product	Coated glass
System designation	Termostop Invisible
Float glass	
Type	Float glass 4 mm
Coating	
Type / manufacturer	Liquid coating / Metalotehnika LLC Prilep, Republic North Macedonia
Material of coating	Polyurethane / ATO dispersion

For the determination of the spectral data test specimen of single panes were used:

Dimensions (W × H)	40 × 70, 400 x 400
Glass thickness	4

The description is based on inspection of the test specimen at **ift**. Item designations/numbers as well as material specifications were given by the client. (Additional data provided by the client are marked with *.)

2 Procedure

2.1 Sampling

The samples were selected by the client.

Number	3 small samples and 3 big samples
Delivered on	10 June 2020 by the client
Registration number	50804

2.2 Method/s

2.2.1 Determination of luminous and solar characteristics

Basis

EN 410 : 2011-02	Glass in building - Determination of luminous and solar characteristics of glazing
Deviation	There have been no deviations from the test methods and/or test conditions.

2.2.2 Determination of emissivity

Basis following	
EN 12898 : 2019-03	Glass in building - Determination of the emissivity
Deviation	There have been following deviations from the test methods and/or test conditions: In deviation from the standard requirements, the spectral reflectance was not determined. An integral measurement was carried out in the wavelength range 2.5 µm to 40 µm

2.3 Test equipment

2.3.1 Test equipment to determine the luminous and solar characteristics

UV-VIS-NIR spectrometer	device number 22133
Type	Shimadzu UV-3102PC with LISR-3100, integration sphere Ø150 mm
Measuring range	190 nm to 2,500 nm
Resolution	variable, value applied: 2 nm
Reflection standard	calibrated reflection standard, Co. Labsphere; aluminium mirror
Measurement conditions	approx. 20 °C, 50 % RH
Averaging	average of three measurements

2.3.2 Test equipment to determine the emissivity

TIR 100-2	Device number 20839
Type	TIR 100-2 by INGLAS, temperature of device T=100°C
Measuring range	2.5 µm to 40 µm, integral
Procedure	Measurement of the integral IR-reflection using a thermopile sensor (angle 12°)
Controller	Microcontroller in base device
Reflection standard	Aluminium block, black body standard, both connected to certificated NPL standards of the device manufacturer
Measurement conditions	approx. 20 °C, 50 % RH
Averaging	average of three measurements

2.3 Testing

Date/period 17 June 2020
Testing personnel Virginia Miguel Saez, Dipl.-Phys.

3 Detailed results

Table 1 Normal emissivity following EN 12898

	Material	ε_n
1	TermoStop Invisible on float glass 4 mm	0.90

Table 2 luminous and solar characteristics according to EN 410

System designation	τ_v	ρ_v	ρ_v'	τ_e	ρ_e	ρ_e'	τ_{UV}
TermoStop Invisible on float glass 4 mm	0.80	0.08	0.08	0.61	0.07	0.07	0.24

Key:

τ_v light transmittance
ρ_v light reflectance (uncoated side)
ρ_v' light reflectance (coated side)
τ_e solar direct transmittance
ρ_e solar direct reflectance (uncoated side)
ρ_e' solar direct reflectance (coated side)
τ_{UV} ultraviolet transmittance

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