

Total energy transmittance

Test report no.: 12 - 003115 - PR07

(PB-H01-07-de- 01)



Certificate

Client: GLASTECH Produktions- und Verfahrenstechnik GmbH

Bahnhofstr. 34

3363 Hausmening

Austria

Product / type of Construction	Laminated insulating glass with integrated slats between panes
Nomenclature	Eurotherm IGS
Manufacturer	Glastech Produktions- und Verfahrenstechnik GmbH
Construction	6/29/6
Gas filling	90% Argon
Lamination	climagaurd Premium T on position 3 / Fa. Gaurdian
Sun protection	slat drop: AKTIV Light / Eclipse Global Pvt. Ltd.
Lamella width	15mm
Lamella division	12.5mm
Lamella surface	aluminium brush finished

Total energy transmittance g



$$g = 0.11 \text{ to } 0.27^*$$

* exact value depends on the angle of incidence and the position of lamella.

ift Rosenheim

06.08.2013

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Stv. Prüfstellenleiter

Bauphysik

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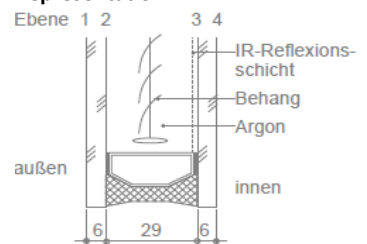
Stv. Laboratory management

be warm & climate

Principle

Procedure of “calorimetric determination of the total energy transmittance g ” 2002-06

Representation



Instructions for use

Instructions for use This test report serves for certification of the total energy transmittance g of the laminated insulation glass. Here it deals with the centre of glazing"-value. Effect of edge composite and the spacer are not considered. The value are related to direct radiation incidence, diffused radiation is to be separately considered.

Validity

The named data and results refer exclusively to the tested and described objects.

The testing of radiations physical attributes permits no testimony about further performance and quality decisive characteristics of the present construction.

Publication instructions

The ift-bulletin is valid" conditions and instructions for use of ift-test documentation"

The cover page can be used as a summary.

Content

The certification encloses in all 6 pages

1. Subject matter
2. Execution
3. Individual results

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1. Subject matter

1.1. sample Description (all measurements in mm)

Component	laminated Insulating glass with integrated slats between panes
Nomenclature	Eurotherm IGS*
Installation situation	vertical
Sample	
measurement of gasification	1200 mm x 1200 mm
construction	6 ESG - 29 - 6 ESG low-e*
Lamination	
Type/manufacturer	Climagaurd premium T/Fa. Guardian
Lamination level	position 3
Gas filling in SZR	
Gas type	Argon*
Filling degree in %	90*
Slat drop in SZR	
Type/manufacturer	AKTIV Light Fa. Eclipse Global Pvt Ltd.*
Lamella width	15mm*
Lamella distance	12.5mm*
Material	Aluminium alloy 6063T6*
Lamella Surface	Aluminium brush finished*
Pull cord	Polyester yarn with outer braided and inner Polyester fibre. Cord thermically treated.
Ladder cord	Polyester Yarn, Thermically fixed
Motor	Motor with planetary gear, current supply 24 V DC inclusive of encoder*
Type/manufacturer	RE- Max/Maxon*
Wrapping mechanism	Separate turning mechanism, end switch above and below, inclusive sp. cord storage in bearing block
Type/manufacturer	Eclipse Global Pvt. Ltd.*
Control	Eclipse*
Manufacturer	Eclipse Global Pvt. Ltd.*

The description based on evaluation of sample in ift.

Article nomenclature/number as well as material data are data of client.

(further manufacturer data are characterised with*)

Total energy transmittance

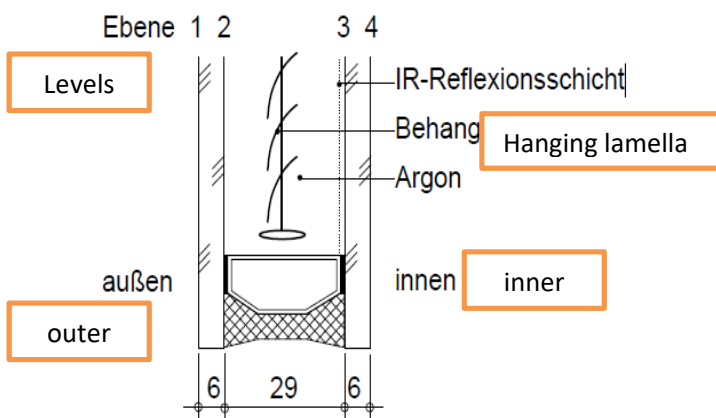
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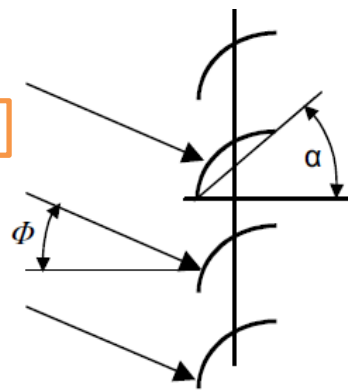


1.2 Sample representation

The drawing is created by ift as thematic representa



pic 1. Representation of pane construction



pic 2 representation of Lamella position α and the sun height angle ϕ



Pic 3. Sample view from outside, closed Lamella

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2 Execution

2.1 Trial

The selection of trial takes place through the client

Quantity	1
Delivery	18.12.2012 through the client
Registration number	33805/0011

2.2 Procedure

Basis

Procedure: 2002-06	Determining the total energy transmittance from transparent and translucent components as well as sun protection mechanism through calorimetric measurement.
Deviation	There are no deviations in the test procedure respectively in the test conditions

Summary

For the calorimetric testing, the to be tested component is irradiated with artificial sunlight.

The energy transmitted through the component is measured according to the component with the help of a liquid calorimeter in stationary condition. The total energy transmittance g is directly derived from the quotients of the measured transmitted energy, as well as the radiation efficiency on the component that is to be evaluated. The derived and the given g values refer at this point to the direct solar radiation. Diffused radiation is to be separately considered. For this there exists till now no standard measuring procedure.

Following boundary conditions are carried out during measurement.

Radiation spectrum	near AM 1.5
Radiation angle	0°
Outer Heat transmission coefficient h_e	$23 \pm 3 \text{ W / (m}^2 \text{ K)}$
Inner heat transmission coefficient h_i	$8 \pm 1 \text{ W / (m}^2 \text{ K)}$
outer temperature	$24 \text{ °C} \pm 2 \text{ °C}$
internal temperature	$24 \text{ °C} \pm 2 \text{ °C}$
aperture for specimen	1.1 m X 1.1 m

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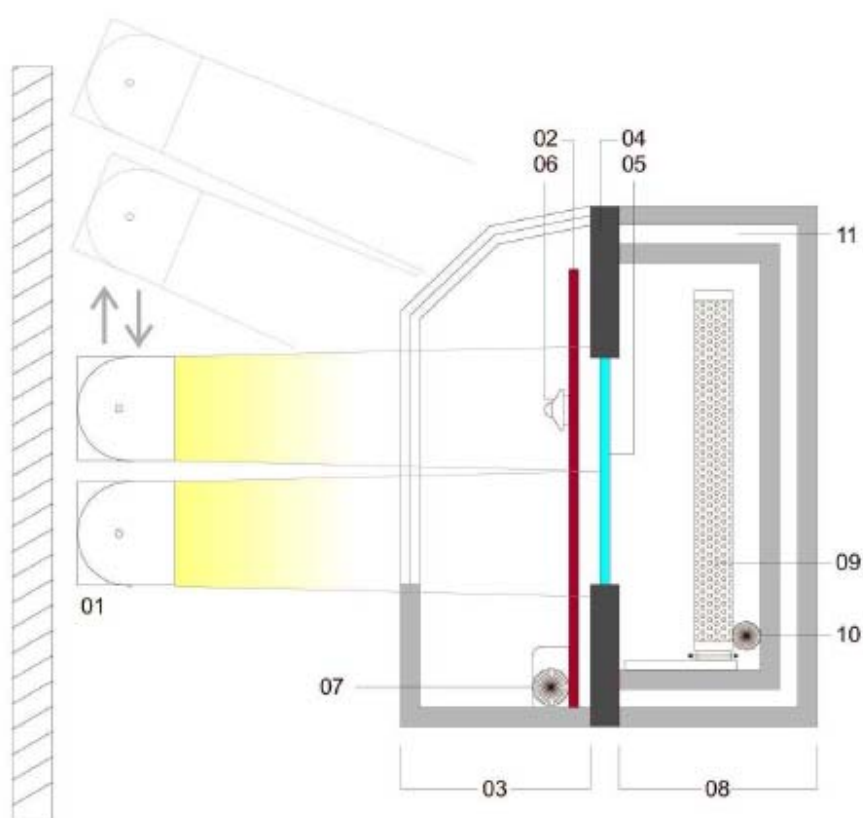
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2.3 Testing equipment

Calorimetric test condition

INV 22647



- 01 solar simulator
- 02 scan mechanism
- 03 outer chamber
- 04 sample attachment
- 05 sample
- 06 solaimeter
- 07 outer chamber loop blower
- 08 inner chamber
- 09 ribbed cooler
- 10 loop blower inner area
- 11 protection box

Pic 4 Schematic representation of measuring apparatus

2.4 Test execution

Date /period 26.06 2013 to 02.07.2013

Tester Michael Freinberger

3. Individual results

Table 1. Individual results of calorimetric measurements

	Measurement number		1077	1075	1076
Φ	Sun height angle		0°	30°	60°
α	Lamella position		closed	Approx 35°	0°/open
θ_{ni}	Environment temp inner side	°C	24.0	24.0	24.0
θ_{ne}	Environment temp outer side	°C	24.0	24.0	24.0
ΔT	Temperature difference of cool liquid in inner box	K	1.87	2.19	1.87
Q_v	Flow rate of cool liquid in inner box	m^3/h	0.19	0.19	0.18
P_{cool}	Cooling capacity	W	425	488	405
I_r	Radiation intensity	W/m^2	874	749	440
E	Radiation capacity	W	1058	907	532
P_{box}	loss	W	-6.9	-4.9	-9.9
P_{el}	Heating capacity	W	301	251	251
g_{total}	Total energy transmittance g	-	0.11	0.26	0.27