Inspection of fogging behavior of fixtures in space between slabs of laminatedinsulating glass

Test report no.: 12 - 003115 - PR02 (PB-H01-09-de- 01)

Certificate

External dimensions

Construction in mm

(BxH) in mm

Fixture in SZR

Spacer

Features

| (| Client: | GLASTECH Produktions- and Verfahrenstecchnik GmbH | | |
|---------|---------|---|--|--|
| | | Bahnhofstr. 34 | | |
| | | 3363 Hausmening | | |
| Austria | | Austria | | |
| Prod | | ıct | laminated insulating glass with internal blind between | |
| | | | Panes | |
| | Nome | enclature | Eurotherm IGS | |
| | Manu | facturer | Glastech Produktions- and Verfahrenstecchnik GmbH | |

500 x 500

4/30/4 Basis aluminium, Eclipse Global aluminium blinds withpull cord and conducting cord -/-



The fixtures in laminated inner area of system **Eurotherm IGS**

shows no fogging while testing acc. To DIN EN 1279-6, attachment C as well as the test acc. to **ift** guidelines VE-07/2 with increased temperature $(80 + 7)^{\circ}$ C

ift Rosenheim 12. March 2013

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Principle

EN 1279-6, 2002-07; Glass in construction, lamination-insulating glass, part 6, productions control and periodic testing, Attachment C, Fogging test

ift guidelines VE-07/2 (2005-08): sun protection system integrated with slab inner space of laminated insulation glass

Instructions for use

This test report serves for certification of the foggging behaviourof fixtures in slab inner area of laminated insulation glass.

Validity

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

The testing of fogging behaviour permits no testimony about further performance and qualitydescisive 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 7 pages

- 1. Subject matter
- 2. Execution
- 3. Individual results

1. Subject matter

1.1. sample

| Product | laminated Insulating glass, with inner blind | | |
|--------------------------|--|--|--|
| Product name | Eurotherm IGS | | |
| Component in SZR | Eclipse Global Pvt Ltd. | | |
| Lamella | Aluminium brush finished | | |
| | Width : 15mm | | |
| | Distance : 12.5mm | | |
| Pull cord | split cord from polyester yarn, with braided polyester yarn coat net | | |
| Conducting cord | Polyester yarn thermically fixed | | |
| External dimension (BXH) | | | |
| of slab in mm : | 500 x 500 | | |
| Construction in mm | 4 / 30 / 4 | | |
| Spacer | | | |
| Material/manufactureer | Basis Aluminium, Eclipse Global Pvt. Ltd. | | |
| Corner design | corners hidden | | |
| Sealing of edge seal | two levelled | | |
| External | Basis polysulfide, Thiover Fa. Fenzi | | |
| | A: 1171302 | | |
| | B: 1171032-S | | |
| Internal | Basis Polysiobutylen, PIB 969 Fa. H. B. Fuller | | |
| | Charge: 1034042 | | |
| Gas filling in SZR | lt. data of manufacturer 90% | | |
| Gas type | Argon | | |

The description bases itself on the inspection of sample in **ift**. Article nomenclature number as well as material data is data of the client.

| Annual | | |
|---|--------|---------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | Bild 1 | Probekörper Gesamtansicht |

Pic 1. Sample total view

| Bi | ild 2 Prüfaufbau Referenzscheibe | Pic 2 .test construction reference slab |
|----|----------------------------------|--|
| | ild 3 Prüfaufbau Prüfkörner | Pic 3 Test construction of sample |
| Bi | ild 4 Detaildarstellung Jalousie | Pic 4 detailed representation of blinds |

2 Execution

2.1 Trial

The selection of trial takes place through the client

| Quantity | 6 pieces laminated insulation glass |
|---------------------|-------------------------------------|
| Delivery | 18.12.2012 through the client |
| Registration number | 33805 |

2.2 Procedure

| Basis | |
|------------------------------|---|
| EN 1279-2: 2002-06 | Glass in construction – lamination –insulating glass- part 6 production control andperiodic testing, attachment C fogging test. |
| ift guidelines VE-07/2 | sun protection integrated in inbetween disc space by MIG: procedure for certification of usablity of laminated insulating glass with big internal disc space and integrated features. paragraph 5.3 |
| Edge condition Deviations | corresponding to standard requirement of guidelines and norms There are no deviations of test procedure respectively of test conditions |

2.3 Testing equipment

Cooling device Device number 22006 UV lamps, ultra Vitalux, 300 W

2.4 Test execution

| Date /period | 10. January 2013 to 24. january 2013 |
|--------------|--------------------------------------|
| Tester | Thomas E,Thomas Breu |

The radiation takes place on the half oppened blinds (pic 5) The quantity of encased materials corresponds in relation to size of test disc/slab. Respectively a sample is irradiated from the silver and gray blind side



Pic 5 irradiation of sample with half oppened blinds

The data logging takes place over thermo elements of a slab/disc and on two samples with fixtures. The temperatures are recorded on the glass surface of cooled and irradiated sides. On the reference disc, additionallythe temperature in inbetween disc space is measured.

2.4.1 Test acc. to DIN EN 1279-6 Attachment C

The test construction corresponds to Pic C3 in attachment C of the DIN EN 1279-6. The fogging test is carried out on glass surface with the given standard temperature $(55\pm5)^{\circ}$ C and difference (30 ± 3) K in cooled area

2.4.2 Test acc. to ift guidelines

Subsequent to the test acc. to DIN EN 1279-6 the temperature on the same sample is increased acc. to **ift** guidelines. The air temperature in inbetween slab area should be minimum (80 ± 5)°C. The surface end temperature of cooled area should be (25 ± 5)°C

3. Separate results

3.1 Temperatures during the irradiation

The temperature, which is measured during the test acc. to DIN EN 1279-6 on the glass surface, in the inner area of slab and in cooled area, are presented in table 1:

 Table 1 Temperature during the irradiation acc. to DIN EN 1279-6

| System Eurotherm IGS | Glass surface | Temperature in °C | Glass surface cooled |
|----------------------|-----------------------|---------------------|------------------------|
| | irradiated | Inbetween slab area | |
| Sample 1 (grey) | Approx 53 °C to 57°C | | Approx 23 °C to 25 °C |
| Sample 2 (silver) | Approx 52° C to 58 °C | | Approx. 23 °C to 24 °C |

The temperature, which is measured during the irradiation acc. to ift guidelines are summarised in table 2

Table 2 Temperatures during the irradiation acc. to ift guidelines

| System Eurotherm | Glass surface irradiated | Temperature in °C | Glass surface cooled |
|-------------------|--------------------------|-----------------------|-----------------------|
| IGS | | Inbetween slab area | |
| Sample 1 (grey) | Approx 116 °C to 125°C | approx. 75 °C to 81°C | Approx 23 °C to 24 °C |
| Sample 2 (silver) | Approx 115 °C to 124°C | | Approx 22 °C to 24 °C |

3.2 Visual assessment of fogging behaviour

The result of the visual assessment shows table 3

Table 3 results of visual assessment

| Test according to | assessment |
|-------------------|---|
| DIN EN 1279-6 | No visible fogg build up (condensation) on the inbetween area showing towards innerside of slab of laminated insulating glass |
| ift guidelines | No visible fogg build up (condensation) on the inbetwen area showing towards innerside of slab of laminated insulating glass |

Summarising it can be determined, that the fixtures in inbetween slab area of the systems

Eurotherm IGS

With the described sample acc. to test with the determined Procedure, DIN EN1279-6, appendix C and **ift** guidelines leads to no fog build up.

ift Rosenheim

12. March 2013