# Evidence of Performance

## Ageing behaviour of insulating glass units as per DIN EN 1279-2

**Test Report 17-002666-PR04 (PB-H01-09-en-02)**

| | |
|---|---|
| Client | ZHENGZHOU ZHONGYUAN SILAND HIGH TECHNOLOGY CO., LTD<br>No. 28 Dongqing West St,<br>Zhengzhou Hi-tech Development Zone<br>450001 Zhengzhou<br>China |
| Product | Insulating glass units - gas filled |
| Designation | Insulating glass units - gas filled |
| Exterior dimensions (W x H) | 500 mm x 350 mm |
| Configuration in mm | 4 / 12 / 4 |
| Spacers | Aluminum, PG 12 mm,<br>made by Lisec Shanghai Glass Machinery Co. Ltd. |
| Sealants<br>External<br>internal | <br>Silicone, MF881<br>Polyisobutylen, MF-DJ910 made by original client (desposited at ift) |

The insulating glass unit fulfils the requirements of

DIN EN 1279-2

**ift** Rosenheim
27.11.2017

Michael Freinberger, Dipl.-Ing. (FH)
Head of Testing Department
Material Testing

Miriam Keill, B.Eng.
Operating Testing Officer
Material Testing

**Basis**

DIN EN 1279-2 : 2003-06; Glass in building - Insulating glass units - Part 2: Long term test method and requirements for moisture penetration

Replaced Test Report No. 17-002666-PR04 (PB-H01-09-en-01) dated 23.10.2017

**Instructions for use**

This test report serves to demonstrate the moisture penetration of insulating glass units.

It serves as a basis (ITT) for CE-marking according to EN 1279-5.

**Validity**

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

The long term test does not imply any statement on characteristics regarding performance and quality.

**Publishing notes**

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 test report comprises a total of 6 pages





**ift** Rosenheim GmbH
Theodor-Gietl-Str. 7-9
D-83026 Rosenheim

Kontakt
Tel. +49.8031.261-0
Fax +49.8031.261-290
www.ift-rosenheim.de

# 1 Object

## 1.1 Description of test specimen

| | |
|---|---|
| Building element | Insulating glass unit, gas filled |
| Manufacturer | TIANJIN CSG ARCHITECTURAL GLASS Co. Ltd., CHI-Wuqing, Tianjin |
| Date of manufacture | March 15, 2007 |
| Product designation | Insulating glass units - gas filled |
| Exterior dimensions (W x H) | 500 mm x 350 mm |
| Total thickness | Approx. 20 mm |
| Configuration in mm | 4 / 12 / 4 |
| Spacers | |
| Material / Manufacturer | Aluminum, PG 12 mm, made by Lisec Shanghai Glass Machinery Co. Ltd. |
| Corner connection | 2 edges bended<br>2 edges with plastic corner key, with additional butylation on the spacer back |
| Desiccant | |
| Type / Manufacturer | Zeolith 3Å, made by Zhengzhou Fulong New Material Technical Company Ltd. |
| Amount / Type of desiccant | approx. 60 g / four sides filled |
| Sealing system | |
| External | two level |
| Type / Manufacturer | Silicone-based, MF881, made by original client (desposited at ift) |
| Design | thickness of sealant on spacer back: approx. 8.0 mm to 9.0 mm |
| Internal | |
| Type / Manufacturer | Polyisobutylen-based, MF-DJ910 |
| Design | visible width of butyle: approx. 3.5 mm to 4.5 mm<br>application of butyle: 4.7 g/m, on one side |
| Coating | none |
| Gas filling of cavity | manufacturers instructions |
| Type of gas | Argon |
| Nominal volume | 90 % |
| Closing plug for gas filling | none |

The description is based on inspection of the test specimen at the **ift**. Item designations / numbers as well as material specifications have been provided by the original client (desposited at ift).

# 2 Procedure

## 2.1 Sampling

The test specimen were manufactured and selected by the original client (desposited at ift).

| | |
|---|---|
| Number | 50 pieces |
| Delivered on | April 24, 2007 |
| Number of registration | 21844 |

## 2.2 Methods

Basis

| | |
|---|---|
| DIN EN 1279-2 : 2003-06 | Glass in building, Insulating glass units – Part 2: Long term test method and requirements for moisture penetration. |
| Boundary conditions | As specified by the standards |
| Deviation | There have been no deviations from the test method and test conditions |

## 2.3 Test equipment

| | |
|---|---|
| Cyclic test cabinet | Device No. 22601 |
| Constant climate cabinet | Device No. 22173 |
| Normal climate chamber | Device No. 22040 |
| Balance (moisture content) | Device No. 22534 |
| Furnace | Device No. 22567 |

## 2.4 Testing

| | |
|---|---|
| Date/Period | May 21 to August 20, 2007 |
| by | Irina Hausstetter |

# 3 Detailed results

## 3.1 DIN EN 1279-2

The initial dew point temperature of all units supplied in new condition was < -60 °C.

**Table 1** Moisture content of desiccant

| Unit No. | Moisture content of desiccant T in % | | Moisture penetration I in % |
|---|---|---|---|
| | $T_i$ | | |
| 7 | 2.5 | $T_{i,av}$ = 2.2 | |
| 8 | 3.3 | | --- |
| 9 | 0.9 | | --- |
| 10 | 2.2 | | --- |
| | | $T_f$ | |
| 4 | --- | 3.8 | 8.9 |
| 5 | --- | 2.9 | 3.8 |
| 6 | --- | 4.4 | 12 |
| 11 | --- | 3.3 | 6.0 |
| 12 | --- | 5.8 | 20 |
| Average values | --- | $T_{f,av}$ = 4.0 | $I_{av}$ = 10 |

The following symbols were used:

$T_i$ initial moisture content of desiccant
$T_{iav}$ average initial value of moisture content of desiccant
$T_f$ final moisture content of desiccant
$T_{fav}$ average final value of moisture content of desiccant
$T_{cav}$ average standard moisture adsorption capacity of desiccant
$I_{av}$ average value of moisture penetration in %

## 4 Evaluation

Calculation of the moisture penetration index $I_{av}$ was based on the average standard moisture adsorption capacity of the desiccant $T_{cav}$ = 20 % (DIN EN 1279-2, Annex D, Table D.1).

In summary, the results were as follows:

| | |
|---|---|
| – Average initial moisture content of desiccant | $T_{iav}$ = 2.2 % |
| – Average final moisture content of desiccant | $T_{fav}$ = 4.0 % |
| – Average value of moisture penetration index | $I_{av}$ = 10 % |
| – Maximum individual value of moisture penetration index | I = 20 % |
| – Requirements set out by DIN EN 1279-2 for average value | $I_{av} \leq$ 20 % |
| – Requirements set out by DIN EN 1279-2 for individual values | I $\leq$ 25 % |

Based on the results listed in Table 1 the insulating glass system

**Insulating glass units - gas filled**

fulfils the requirements according to DIN EN 1279-2.

## 5 Summary of test report No. 17-002666-PR04 (PB-H01-09-en-02)

**Insulating glass units –**
**Moisture penetration results according to DIN EN 1279-2**

For details, see the test report.

Company:

**ZHENGZHOU ZHONGYUAN SILAND HIGH TECHNOLOGY CO., LTD**
No. 28 Dongqing West St,
Zhengzhou Hi-tech Development Zone
450001 Zhengzhou
China

Plant:

**TIANJIN CSG ARCHITECTURAL GLASS Co. Ltd.**
West Section Fuyuan Road
Development Park
Wuqing, Tianjin
China

| | |
|---|---|
| System description: | Not submitted to test body |
| Product designation: | Insulating glass units - gas filled |
| Moisture penetration index | $I_{av}$ = 10 % |

System conforms: **YES**

**ift** Rosenheim