

# Evidence of Performance

Ageing behaviour of insulating glass units  
according to DIN EN 1279-2 and DIN EN 1279-3

## Test Report 601 38734/4e U\*

\*) Translation of test report 601 38734/4 dated  
13 October 2009



Client **GSS German Spacer  
Solutions GmbH**  
Reichspräsidentenstr. 21-25

45470 Mülheim  
Germany

Product	Insulating glass units - gas filled
Designation	Clear Float Glass + Clear Float Glass
Exterior dimensions (W x H) in mm	350 x 500
Configuration in mm	4 / 12 / 4
Spacers	Aluminium, NEDEX Kimya Sanayi A.S.
Sealants	
External	Polysulfide, KU 83, NEDEX Kimya Sanayi A.S.
internal	Polyisobutylene, KU 83B, NEDEX Kimya Sanayi A.S.
Special features	-/-

### Basis

DIN EN 1279-2 : 2003-06;  
Glass in building - Insulating glass units - Part 2: Long term test method and requirements for moisture penetration  
DIN EN 1279-3 : 2003-05;  
Glass in building - Insulating glass units - Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances

Test report 601 38734/2e dated  
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### Instructions for use

This test report serves to demonstrate the moisture penetration, gas leakage rate and gas concentration tolerances of insulating glass units.

The determined results can be used as a basis (ITT) for CE-marking by the producer. The regulations according to EN 1279-5 have to be observed.

The insulating glass unit fulfils the requirements of



DIN EN 1279-2



DIN EN 1279-3

### 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.

### 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.

ift Rosenheim  
13. October 2009

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The report contains a total of 6 pages

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## 1 Object

### 1.1 Description of test specimen

Building element	Insulating glass unit, gas filled
Manufacturer	CAM YAPI CAM Pas Ins Taah. San. Tic Ltd. Sti
Date of manufacture	20 January 2008
Product designation	Clear Float Glass + Clear Float Glass
Exterior dimensions (W x H)	350 x 500
Total thickness in mm	20
Configuration in mm	4 / 12 / 4
Spacers	
Material / Manufacturer	Aluminium, NEDEX Kimya Sanayi A.S.
Corner connection	4 x bent including straight connector (plastic) with additional butylation on the spacer back
Desiccant	
Type / Manufacturer	Zeolith 3Å, NANOMOL, NEDEX Kimya Sanayi A.S.
Amount / Type of desiccant	approx. 35 g, two sides filled
Sealing system	two level
External	
Type / Manufacturer	Polysulfide, KU 83, NEDEX Kimya Sanayi A.S.
Design	thickness of sealant on spacer back: approx. 2.5 mm to 4.0 mm
Internal	
Type / Manufacturer	Polyisobutylene, KU 83B, NEDEX Kimya Sanayi A.S.
Design	visible width of butyle: approx. 2.5 mm to 4.5 mm Butyle coating: approx. 2.5 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	two plastic closing plugs with additional butylation

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 client.

## 2 Procedure

### 2.1 Sampling

The test specimen were manufactured and selected by the client.

The sampling report has been submitted.

Number	17
Delivered on	21 April 2009 by the client
Number of registration	25822

### 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.
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DIN EN 1279-3: 2003-05	Glass in building – Insulating glass units – Part 3: Long term test method and requirements for the gas leakage rate and for gas concentration tolerances.
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Boundary conditions	As specified by the standards
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Deviation	There have been no deviations from the test method and test conditions
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### 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. 22277
Furnace	Device No. 22567
Gas installation with gas chromatograph	Device No. 20351

### 2.4 Testing

Date/Period	04 May to 01 October 2009
Testing personnel	Irina Hausstetter, Thomas Eder, Rita Sanftl



### 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	2.0	$T_{i,av} = 2.0$	---
8	1.9		---
9	2.1		---
10	1.9		---
		$T_f$	
4	---	2.5	2.8
5	---	2.9	5.0
6	---	3.1	6.1
11	---	3.3	7.2
12	---	3.1	6.1
Average values	---	$T_{f,av} = 3.0$	$I_{av} = 5.4$

The following symbols were used:

- $T_i$  initial moisture content of desiccant
- $T_{i,av}$  average initial value of moisture content of desiccant
- $T_f$  final moisture content of desiccant
- $T_{f,av}$  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 %

### 3.2 Results of the DIN EN 1279-3

The results of the gas leakage rate for the gas type Argon / Krypton are represented in Table 2.

**Table 2** Results of the gas leakage rate

Sample No.	Gas leakage rate $L_I$ in % a <sup>-1</sup>	measured gas concentration $c_i$ in Vol.%	nominal value of the gas concentration $c_{i,0}$ in Vol.%	Difference $(c_i - c_{i,0})$ in Vol.%
1	0.99	94	90	+ 4
2	0.96	90	90	0
Requirements	$L_I < 1.00$ % a <sup>-1</sup>	----	----	The difference must be included within $c_{i,0} (-5/+10)$ Vol.%

## 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	$T_{lav} = 2.0$
- Average final moisture content of desiccant	$T_{fav} = 3.0$
- Average value of moisture penetration index	$I_{av} = 5.4$
- Maximum individual value of moisture penetration index	$I = 7.2$ %
- 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	$I \leq 25$ %
- Measured individual values as per DIN EN 1279-3	0.99 % a <sup>-1</sup> 0.96 % a <sup>-1</sup>
- Requirements set out by DIN EN 1279-3 for at least two individual values	$L_I < 1.00$ % a <sup>-1</sup>

Based on the results listed in Table 1 and Table 2 the insulating glass system

### Clear Float Glass + Clear Float Glass

fulfils the requirements according to DIN EN 1279-2 and DIN EN 1279-3.

## 5 Summary of test report No. 601 38734/4e U dated 13. October 2009

### Insulating glass units – Moisture penetration results according to DIN EN 1279-2 and evaluation of gas leakage rate and gas concentration, measured according to DIN EN 1279-3

For details, see the test report.

Company:

**Aerogas GmbH**  
Bahnhofstr. 31

45470 Mülheim  
Germany

Plant:

**Camyapi Cam Paz.**  
Abdurrahmangazi Mah.

Kartal – Istanbul  
Turkey

System description:

Not submitted to test body

Product designation:

Clear Float Glass + Clear Float Glass

Moisture penetration index  $I_{av} = 5.4 \%$

Gas leakage rate and gas concentration:

Applied gas	Argon / Krypton			
Unit number	1	2	3	4
$c_i$ in %	90	88	94	90
$c_{i,o}$ in %	90	90	90	90
$L_i$ in %/a	nr	nr	0.99	0.96

ift Rosenheim

13. October 2009



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