

Test report

Test report relating to a glass product according to European standard EN 1279-3, concerning the product marked as: Insulating Glass Unit, manufactured by: Zhengzhou Zhongyuan Silande High Technology Co., Ltd

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1 Introduction

1.1 Purpose

The tests have been performed in order to establish whether or not an insulating glass unit with sealant Silande MF910G and Silande MF881-25HM meets the requirements of the European standard EN 1279-3 [1].

Revision 1 was made because of some spelling errors.

Revision 2 was made because of a name change of the client.

1.2 Description of the samples

General

Name of the manufacturer	Zhengzhou Zhongyuan Silande High Technology Co., Ltd
Address of the manufacturer	No.28, Dongqing West St. Zhengzhou Hi-tech Development Zone, 450001 China
Production plant of the samples	Anonymous
Line ID where the samples are made	-
Production date	3 May 2014
Sampling date	5 May 2014
The product was marked as	Insulating Glass Unit
System description, file number	not applicable
Dimensions of the samples	(502 ±2) mm x (352 ±2) mm

Specific

Type of glass	Clear float glass
Configuration of the samples	4-12-4 mm
Type of gas content	Argon
Temperature (T) at which the unit was sealed [K]	277
Abs. Pressure (P) at which the unit was sealed [hPa]	1036
DESICCANT	
Trademark / type of desiccant	FULONG / 3A
INNER sealant	
Trademark / type of inner sealant	SILANDE MF910G
Kind of inner sealant	polyisobutylene (butyl)
OUTER sealant	
Trademark / type of outer sealant	SILANDE MF881-25HM
Kind of outer sealant	silicone 2 component structural sealant
SPACER	
Trademark / type of spacer	SILANDE ALU.SPACER - BENDABLE 12A
Trademark / type of corners	bent

1.3 Sampling procedure

The samples have been submitted by the assignor. The test house, acting as notified test body, has had no influence on the selection of the samples. The samples were received on 26 May 2014.

1.4 Application

The request for testing was submitted by the assignor on 21 May 2014. Assignment Form number: 14.A130.

1.5 Method of testing

All applicable tests have been performed according to the European standard EN 1279-3 [1].

1.6 Put out to contract

No tests were performed at third parties.

1.7 Privacy statement

Due to privacy reasons, the names of involved personnel that executed the tests, are not disclosed in the report. However, this information is available on internal work sheets, test forms etc. in the project file.

1.8 Remark concerning this ITT report

For any other manufacturer this initial type test (ITT) report is not automatically valid. The manufacturer for this ITT report is defined at 1.2.

Reference to test report for moisture penetration index according to EN 1279-2 [2]: 89205967-03 rev2.

1.9 Notifications, accreditations, designations

TÜV Rheinland Nederland B.V. has been notified by the Dutch Ministry of Infrastructure and the Environment as Notified Test Body (number 1750) and Notified Certification Body (number 0336) for the European Construction Products Directive 89/106/EEC.

TÜV Rheinland Nederland B.V. has been accredited by the Dutch Accreditation Council (RvA) as ISO 17025 Test Laboratory (nr. L 484) and ISO 17065 Certification Body (nr. C078).

TÜV Rheinland Nederland B.V. has been designated as Technical Service (Laboratory) by the Approval Authorities for the Netherlands (RDW – E4) and Germany (KBA – E1) to grant approvals as mentioned in Directive 70/156/etc. and in the 1958 Agreement of the Economic Commission for Europe of the United Nations (UN-ECE) for glass as used in the automotive sector: ECE Regulation 43, safety glazing; EC Directive 92/22, Safety glass; EC Directive 2009/144, Glazing cat. T.

TÜV Rheinland Nederland B.V. has been recognised by the German Institute for building technics (DIBt) under number NL005.

2 Test results

Description of the test

The six test specimens (insulating glass unit or IGU's) are conditioned for a minimum of one week at standard laboratory conditions. At least four pre-selected specimens are submitted to the specified climate test.

The climate test consists of two parts. The first part consists of 28 cycles of 12 hours from -18 °C to +53 °C with slopes of 14 °C/h where at -18 °C and at +53 °C the temperature is constant for 1 hour. This part is followed by a second part consisting of a period of 4 weeks at a constant temperature of 58 °C. For both parts a relative humidity of > 95 % is applied in case the temperature is above 0 °C.

After the climate test the specimens are stored at (23±2) °C and (50±5) % relative humidity for at least 4 weeks and maximal 7 weeks.

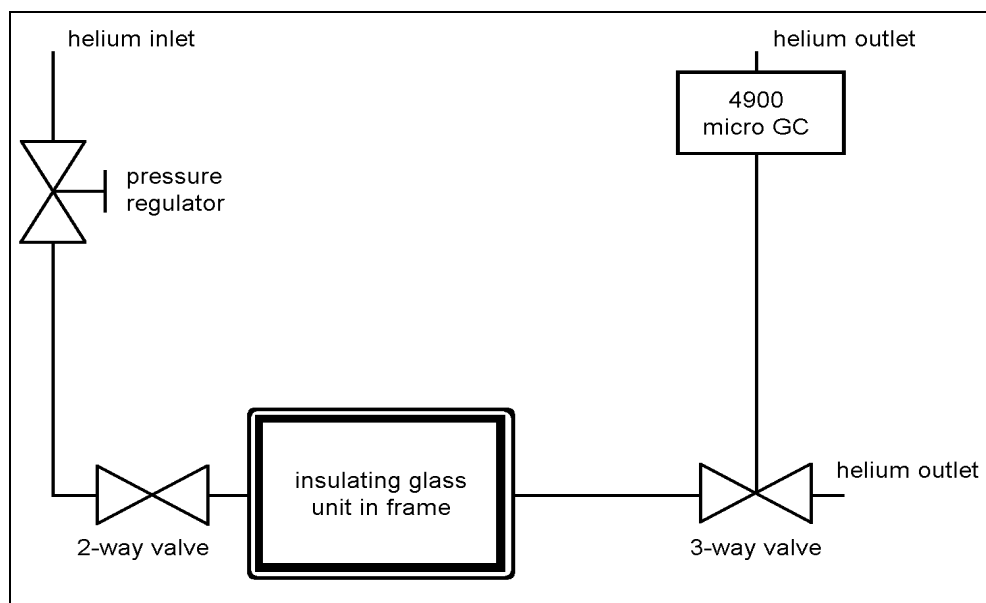
Minimal two specimens (IGU's) are installed into separate test frames. The frame encloses the unit with some space left between the IGU and the frame.

After placing the IGU's in the test frames, the test frames are hermetically closed and purged with a helium flow of ± 400 ml/min for 1 hour. At the end of this purge time, the inlet and outlet valves are closed in succession to ensure an atmospheric pressure inside the frame (start of standing time). After a minimum of 10 hours standing time, the helium in the frame is measured for its argon, oxygen and nitrogen concentration using gas chromatography (4900 Micro GC). This is repeated at least six times.

The amount of argon is then determined and by calculations based on the measured amount of argon gas per standing time, the internal gas volume of the IGU and the argon gas concentration, the amount of gas leakage per time (year) of the IGU can be determined. The requirement is an argon gas leakage rate of less than 1 % per year [%·a⁻¹].

The measurement uncertainty is estimated at 15 % or 0.05 %·a⁻¹, whichever is greater.

The schematic diagram of the equipment is as follows:



Test results after performing all applicable tests according to European standard EN 1279-3 [1].

Requirements and end result

Required	Value of the test	Pass / fail
4.1 Gas leakage rate	% a ⁻¹	
The gas leakage rate, L_i , for gases with concentrations higher than 15 %, and also for air, measured as described in clause 5 shall be: $L_i < 1.00$ in % a ⁻¹ (one year)	test specimen 1: 0.40 test specimen 2: 0.99	pass

Detailed test results

Gas leakage rate determination

Six insulating glass units were visually inspected. No special deviations above variations due to the production process were found. The test specimens were randomly numbered and the units were aged. After ageing the gas leakage rate was determined on four insulating glass units.

For the calculation of the gas leakage (m_i) of the IGU/specimen, the temperature (T) and the pressure (P) values during the sealing of the units are used or if no values are given/known a standard temperature of 293 K and pressure of 1013 hPa are used.

From the average gas leakage (M_{avg}), the internal gas volume of the IGU/specimen and the gas concentration measured after the climate exposure (C_i) the gas leakage rate (L_i) is determined.

The results are as follows:

Test specimen	$m_{i,1}$ [µg/h]	$m_{i,2}$ [µg/h]	$m_{i,3}$ [µg/h]	$m_{i,4}$ [µg/h]	M_{avg} [µg/h]
1	1.61	1.71	1.58	1.56	1.62
2	3.97	4.11	4.26	3.71	4.01

Test specimen	C_i [% Ar]	L_i [% a ⁻¹]
1	96.1	0.40
2	96.9	0.99

3 Conclusion

The tested glass product, marked by the client or manufacturer as: Insulating Glass Unit, manufactured by/for: Zhengzhou Zhongyuan Silande High Technology Co., Ltd, with inner sealant with trade mark/type: SILANDE MF910G and outer sealant with trade mark/type: SILANDE MF881-25HM, meets the applicable requirements as stated in the European standard EN 1279-3 [1].

The test results exclusively relate to the tested objects.

Remark 1

Due to the fact that the purpose of this test report is not an initial type test for a IG manufacturer no system description can be mentioned to be used as reference. This report is thus also not allowed to be used in cascading and/or shared ITT procedures (if allowed or applicable). The identification of the actual IG manufacturer for this ITT report is not relevant and is called anonymous or published only if the IG manufacturer has given written agreement that his/her name is allowed to be mentioned. When this statement is not communicated on forehand to TÜV Rheinland, then anonymous will be used per default.

4 References

- 1 European standard EN 1279-3:2002 (E),
Glass in building – Insulating glass units – Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances,
European Committee for Standardization, November 2002.
- 2 European standard EN 1279-2:2002 (E),
Glass in building – Insulating glass units – Part 2: Long term test method and requirements for moisture penetration, European Committee for Standardization, November 2002.

5 Signatures

Author Mr. M.A.A.M. Schets, B.Sc.	Signature 
Specialist	
Peer review Mr. R. Brandhorst	Signature 
Specialist	
Approved by Mr. H. van Ginkel	Signature 
Business field manager	

Pictures of the tested object(s)



- End of report -