

Test report

Test report relating to a glass product according to European standard EN 1279-3, concerning the product marked as: Isolar Neutralux advance // 1.3, manufactured by: Energy Glas GmbH

Report number	89213207-03
Date	3 May 2018
Author(s)	Mr. M.A.A.M. Schets, B.Sc.
Client	Fenzi Belgium nv/sa Levisstraat (Gustaaf) 25 1800 Vilvoorde Belgium
Project number	89213207
Project name	EN1279-3 - Energy Glas
Number of pages	12



All rights reserved.

No part of this report may be reproduced, provided to and/or examined by third parties, and/or published by print, photoprint, microfilm, in electronic form or any other means without the explicit previous written consent of TÜV Rheinland Nederland B.V.

In case this report was drafted within the context of an assignment to TÜV Rheinland Nederland B.V., the rights and obligations of contracting parties are subject to the General Terms & Conditions for Advisory, Research and Certification assignments to TÜV Rheinland Nederland B.V and/or the relevant agreement concluded between the contracting parties.

© 2013 TÜV Rheinland Nederland B.V.

Contents

1	Introduction	3
1.1	Purpose	3
1.2	Description of the test specimen	3
1.3	Sampling procedure	4
1.4	Application	4
1.5	Method of testing	4
1.6	Put out to contract	4
1.7	Period of testing	4
1.8	Privacy statement	4
1.9	Remark concerning this ITT report	4
1.10	Notifications, accreditations, designations	4
2	Test results	5
2.1	Description of the test	5
2.2	Detailed test results	6
3	Conclusion	7
4	References	8
5	Signatures	9
	Appendix A, Summary of test results	10
	Appendix B, Pictures of the test specimen	11

1 Introduction

1.1 Purpose

The tests have been performed in order to establish whether or not the product meets the requirements of the European standard EN 1279-3 [1].

1.2 Description of the test specimen

Insulating glass units – Declaration manufacturer	
Name of the manufacturer	Energy Glas GmbH
Address of the manufacturer	Zur Frado 1, 34466 Wolfhagen
Production plant of the samples	Zur Frado 1, 34466 Wolfhagen
Line ID where the samples are made	Automatic Lisec line
Production date	01.11.17
Trade mark and /or product name	Isolar Neutralux advance // 1.3
System description, file number	Isolar
Exterior dimensions:	502 x 352 mm
Total thickness:	20 mm
Construction:	4/12/4 mm, Low-e Guardian ClimaGuard premium 2, Guardian float extra clear
Spacer:	Alu- Pro
Spacer material:	aluminium
Corner construction:	Bent
Corner keys:	no
Linear connector:	Plastic, W. Schmitz GmbH
Desiccant:	GEWE-sorb, Schollglas
Desiccant type:	3 Å Zeolite
Standard Moisture adsorption capacity (T_c)	18,00%
Desiccant amount:	2 sides, 1 long, 1 short
Outer sealant:	Fenzi Poliver AC-E
Polymer type:	two part polyurethane
Average sealant depth on spacer back (u)	3 mm
Average sealant width on glass surface (s)	5 mm
Inner sealant:	Fenzi Butylver XL
Polymer type:	polyisobutylene
Average sealant width (r):	4 mm
Mass of inner sealant/length and side (R)	2,5 g/m
Coating:	Guardian ClimaGuard premium 2
Edge deletion:	Yes
Gas filling:	Argon > 90%
Temperature during production	20°C
Pressure during production	1013hPa / mbar
Altitude during production	240 m above sea level

Closing of gas filling holes:	no
Special features:	

1.3 Sampling procedure

TÜV Rheinland B.V., acting as Notified Test Laboratory, has had no influence on the selection of the sample. All test specimen within the sample were test-worthy and were received on 19 December 2017.

1.4 Application

The request for testing was submitted by the client on 1 March, 2018, order or reference number or name: 450002338. Quotation number / assignment number: 17.A335 rev 1.

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 Period of testing

The tests took place in the period week 2 till week 14, 2018.

1.8 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.

1.9 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]: 89213207-02.

1.10 Notifications, accreditations, designations

TÜV Rheinland Nederland B.V. has been notified by the Dutch Ministry of Infrastructure and the Environment as Notified Laboratory (number 1750) and Notified (Factory Production Control) Certification Body (number 0336) for the European Construction Products Regulation 305/2011 (EU).

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 Germany (KBA – E1) and the Netherlands (RDW – E4) for automotive safety glass (ECE R43, 92/22/EC, 2009/144/EC).

TÜV Rheinland Nederland B.V. has been recognised by the German Institute for building technics (DIBt) under number NL005 as test, control and certification body.

Remark

The reported tests were performed under ISO 17025 accreditation.

2 Test results

2.1 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. 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 ± 200 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 (490 Micro GC). This is repeated at least six times.

The amount of gas leaking out the IGU into the frame is then determined. The amount of gas leakage (L_i) per time (year) of the IGU is calculated based on the measured amount of argon gas per standing time (m_i), the internal gas volume of the IGU (V_{int}) and the argon gas concentration (c_i),

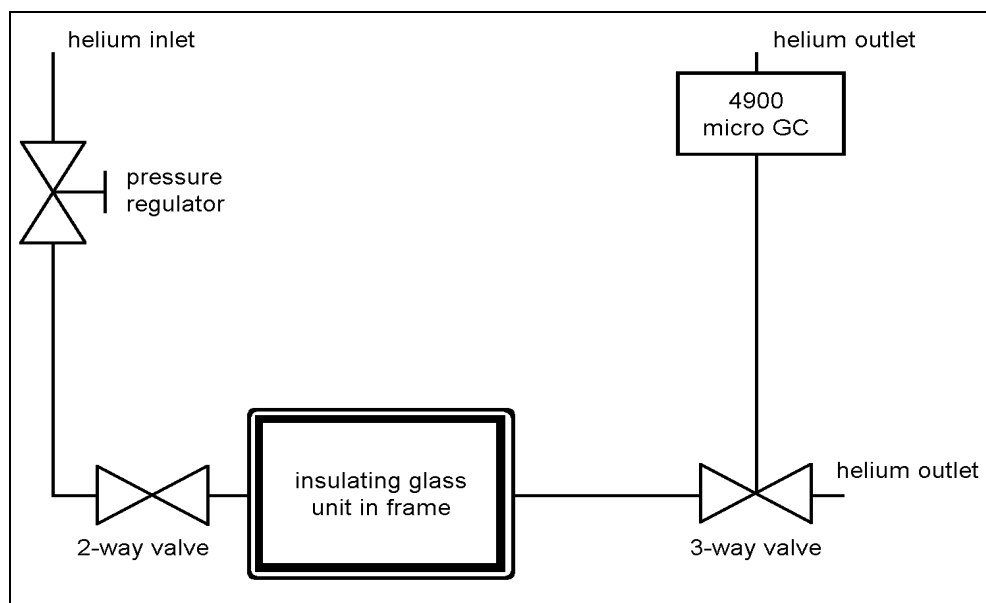
$$L_i = 87,6 \cdot 10^6 \frac{m_i}{c_i \cdot V_{int} \cdot \rho_{o,i}} \cdot \frac{T}{T_o} \cdot \frac{P_o}{P} \text{ in } \% \cdot \text{a}^{-1}$$

With $\rho_{o,Ar} = 1,762$; $\rho_{o,Kr} = 3,690$; $\rho_{o,Xe} = 5,897 \mu\text{g}/\text{mm}^3$ at $T_o = 293 \text{ K}$ (20 °C) and $P_o = 1000 \text{ hPa}$ (mbar)

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 value is greater.

The schematic diagram of the equipment is as follows:



2.2 Detailed test results

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

Gas leakage rate determination

Six insulating glass units were visually inspected. No special deviations above variations due to the production process were found. Two units showed a low gas concentration (< 80%) and were not used for testing. The other four test specimens were randomly numbered and the units were aged. After ageing the gas leakage rate was determined on minimal two insulating glass units.

For the calculation of the gas leakage rate 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 1000 hPa are used.

Evaluation of the gas leakage rate and gas concentration measured in accordance with EN1279-3:2002

Corner construction	bent corners
Average sealant depth on spacer back (u)	3-4.5 mm
Average sealant width on glass surface (s)	4-6 mm
Average inner sealant width (r)	4-5 mm
Closing of gas filling holes	n/a
Edge deletion	yes
Special features	No
Markings	On spacer bar

Test specimen	Thickness [mm]	V _{int} [mm ³]	c _i [% Ar]	L _i [% a ⁻¹]	Pass / fail
1	20.2	2024304	89.0	0.78	pass
2	20.3	2036155	89.1	0.74	pass
3	-		-	-	not applicable
4	-		-	-	not applicable
Average					

Requirements and end result

Required	Pass / fail
EN1279-3:2002 §4.1 Gas leakage rate	
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)	pass

3 Conclusion

The tested glass product, marked by the client or manufacturer as: Isolar Neutralux advance // 1.3, manufactured by: Energy Glas GmbH, with inner sealant with trade mark/type: Fenzi Butylver XL and outer sealant with trade mark/type: Fenzi Poliver AC-E, 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

When and if changes are made in production method and/or equipment, assessment according to this standard shall be reconsidered and re-tests shall be performed when the changes can lead to different specifications of the glass. The decision and responsibility lies at the manufacturer.

Remark 2

If no reference of the product description was supplied by the manufacturer, than that document shall be added to this test report by the manufacturer. It was to the manufacturer's responsibility that the samples delivered for initial type test are representative to the production and deviations from perfection were included in the delivered test samples.

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. S. el Bardai	Signature 
Specialist	
Approved by Mr. H. van Ginkel	Signature 
LSM	

Appendix A, Summary of test results



TÜV Rheinland Nederland B.V.
P.O. Box 2220, 6802 CE Arnhem, The Netherlands,
Notified Laboratory no. 1750

Summary of report n°: 89213207-03

Date: 3 May 2018

Insulating glass units - Evaluation of the gas leakage rate and gas concentration measured according to EN 1279-3

For details is referred to the complete test report.

Company: Name: Energy Glas GmbH
Address: Zur Frado 1, 34466 Wolfhagen
Germany


Plant: Name: Energy Glas GmbH
Address: Zur Frado 1, 34466 Wolfhagen
Germany

System description, file number: Isolar
Product name: Isolar Neutralux advance // 1.3
Edge seal composition:
inner sealant: Fenzi Butylver XL
outer sealant: Fenzi Poliver AC-E
and aluminium spacer

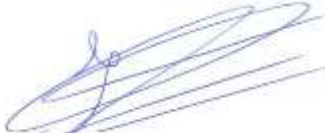
Reference to test report for moisture penetration index according EN 1279-2: 89213207-02

Applied gas(es) i :	Argon	Argon	Argon	Argon
Unit number	1	2	3	4
Measured concentration c_i , (in %):	89.0	89.1	-	-
Nominal concentration $c_{i,o}$, (in %):	90	90	-	-
Gas leakage rate L_i , (in %·a ⁻¹):	0.78	0.74	-	-

System conforms: **YES**



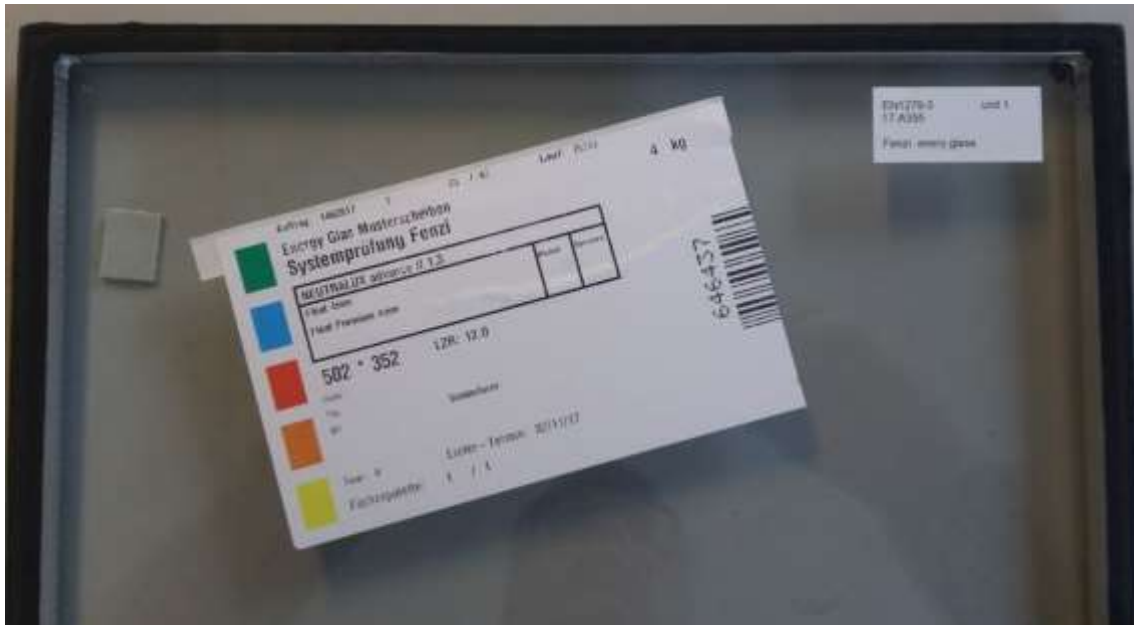
Signature: M.A.A.M. Schets
Specialist



Signature: H. van Ginkel
LSM

NOTE: This Summary is not a certificate.

Appendix B, Pictures of the test specimen





- End of report -