

Test report

**Test report relating to a glass product according to European standard EN 1279-2:2018, concerning the product marked as: Isicam
Manufactured by: Ozan Cam ve Ayna Tic.San. Ltd. Şti**

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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 1279-2 [1].

1.2 Description of the test specimen

Insulating glass units – Declaration manufacturer	
Manufacturer	Ozan Cam ve Ayna Tic.San. Ltd. Şti
Address of manufacturer	Kale, Ankara Yolu Cd. No:96, 16450 Ahmet Vefik Paşa Osb/Kestel/Bursa
Plant	Kale, Ankara Yolu Cd. No:96, 16450 Ahmet Vefik Paşa Osb/Kestel/Bursa
Line ID where the samples are made	Line 1
Date of production	17.09.2019
Product Name	Isicam
System description, file number	Ozan
Exterior dimensions	502 mm x 352 mm
Total thickness	20 mm
Construction	4 float / 12 / 4 float (mm)
Spacer	Nedex Nanobar
Spacer material	Plastic
Corner construction	with corner keys
Corner keys	Nedex corner keys
Linear connector	none
Desiccant	Nedex Nanomol-C
Desiccant type	Calcium oxide
Standard Moisture adsorption capacity (T_C)	18.1±0.5 %
Desiccant amount	2 sides filled (one long side, one short side)
Outer sealant	Nedex PS 018
Polymer type	Polysulfide
Average sealant depth on spacer back (u)	± 3 mm
Average sealant width on glass surface (s)	± 4 mm
Inner sealant:	Nedex PIB-996
Polymer type:	Polyisobutylene
Average sealant width (r):	± 4 mm
Mass of inner sealant per length and side (R)	2.5 – 3.5 g/m
Coating	None
Edge deletion	None
Gas filling	None
Nominal gas concentration	-/-
Temperature during production	± 25°C
Pressure during production	1001.2 hPa
Altitude during production	155 m above sea level

Closing of gas filling holes	None
Special features	None

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 (15) within the sample were test-worthy and were received on 24 October 2019.

1.4 Application

The request for testing was submitted by the assignor on 18 November 2019, order or reference number or name: -/- . TRN Quotation number / assignment form number: 19.A367.

1.5 Method of testing

All applicable tests have been performed according to the European standard EN 1279-2 [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 47, 2019 till week 9, 2020.

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 type test report

For any other manufacturer this type test (TT) report is not automatically valid. The manufacturer for this TT report is defined under 1.2.

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 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 test specimens (insulating glass unit or IGU's) are conditioned for a minimum of 3 days at standard laboratory conditions i.e. (23±2) °C and (50±5) % relative humidity (RH). Five specimens are submitted to the specified climate test.

The climate test consists of two parts. The first part consists of 56 cycles of 12 hours from -18 °C to +53 °C with slopes of (14±4) °C/h where at -18 °C and at +53 °C the temperature is constant for 1 hour. The RH is maintained > 95% during the phase at 53 °C.

This part is followed by a second part consisting of a period of 7 weeks at a constant temperature of 58 °C and RH > 95 %.

After the climate test the specimens are stored at standard laboratory conditions for at least 1 week before measuring the moisture content (T_i). With the average initial moisture content (T_i) the standard moisture absorption capacity (T_c) the moisture penetration index is calculated for each IGU after the climate test.

2.2 Results and requirement

Prior to ageing, all 15 IGU's were visually inspected. No special deviations above variations due to the production process were found. The test specimens were randomly numbered and the moisture contents (T_i & T_f) were determined with drying method (540 °C). From these results the individual penetration indices I and I_{av} were calculated.

Evaluation of the moisture penetration index measured in accordance with EN1279-2:2018 [1]

Exterior dimensions:	502 x 352 mm
Total thickness before ageing	20 mm
Corner construction	corners keys
Desiccant amount: only for desiccant in bulk	1 short, 1 long side filled approx. 30 g
Average sealant depth on spacer back (u)	3 - 4.5 mm
Average sealant width on glass surface (s)	5.5 - 6.5 mm
Average inner sealant width (r):	5 - 6 mm
Edge deletion	No
Special features	No
Marking	No

Detailed test results

Initial values				
Unit no.	m_o [g]	m_i [g]	m_r [g]	T_i [%] $(m_i - m_r) / (m_r - m_o)$
1	34.9002	55.0969	54.9078	0.95
2	34.8013	55.2650	55.0954	0.84
3	37.5496	58.9983	58.9093	0.42
4	34.7004	60.0370	59.9316	0.42
Average				0.65

After climate exposure					
Unit no.	m_o [g]	m_i [g]	m_r [g]	T_i [%] $(m_i - m_r) / (m_r - m_o)$	$I^*)$
5	65.7830	88.4750	87.8390	2.88	0.13
6	55.5767	85.7026	84.7927	3.11	0.14
7	63.0931	83.1025	82.4639	3.30	0.15
8	66.9988	95.8780	94.8845	3.56	0.17
9	67.9182	88.1074	87.6575	2.28	0.09
Average					0.14

*) I is calculated with standard value of 17.9 % for T_c as declared by manufacturer

Requirements	Value of the test	Pass / fail
EN 1279-2:2018 §5		
The average moisture penetration index I_{av} of the five test specimen shall not exceed 0.20	I_{av} over the five test specimen = 0.14	pass
The moisture penetration index of any test specimen shall not exceed 0.25	Highest moisture penetration index $I = 0.17$	pass

3 Conclusion

The tested glass product, marked by the client or manufacturer as: Isicam, manufactured by: Ozan Cam ve Ayna Tic.San. Ltd. Şti, with inner sealant with trade mark/type: Nedex PIB-996 and outer sealant with trade mark/type: Nedex PS 018, meets the applicable requirements as stated in the European standard EN 1279-2 [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 type test are representative to the production and deviations from perfection were included in the delivered test samples.




4 References

- 1 European standard EN 1279-2:2018 (E),
Glass in Building – Insulating Glass Units – Part 2: Long term test method and requirements for moisture penetration, European Committee for Standardization, July 2018.
- 2 European standard EN 1279-4:2018 (E),
Glass in Building – Insulating Glass Units – Part 4: Methods of test for the physical attributes of edge seal components and inserts, European Committee for Standardization, July 2018.

5 Signatures

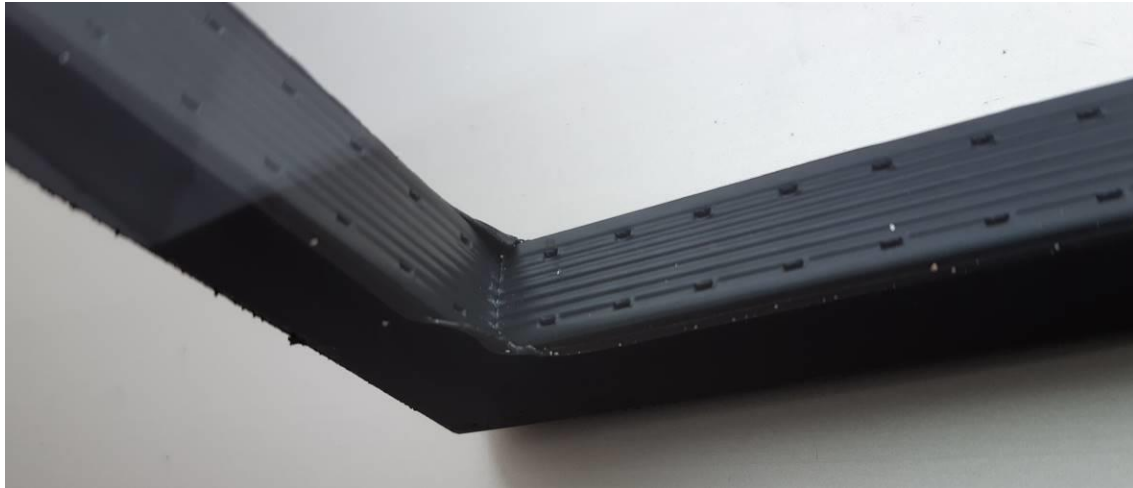
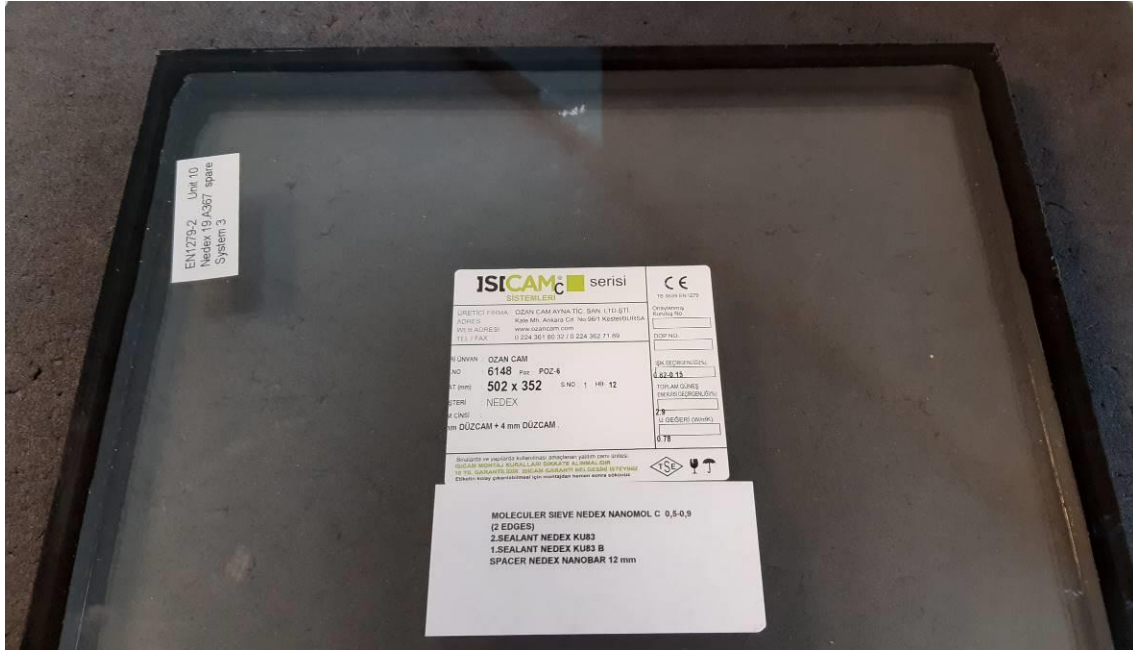
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Expert	
Approved by Mr. W. Notten	Signature 
Local Business Field manager	

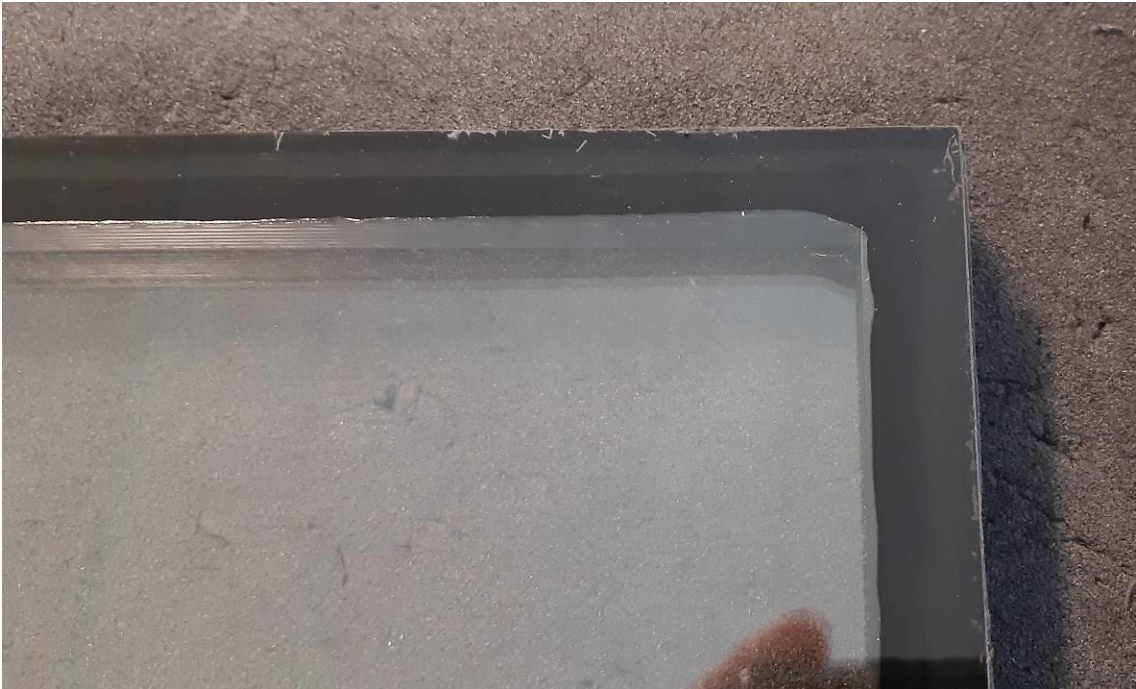
Appendix A, Summary of test results

 TÜVRheinland [®] Precisely Right. TÜV Rheinland Nederland B.V. P.O. Box 2220, 6802 CE Arnhem, The Netherlands Notified Laboratory no. 1750	
Summary of report no: 89216155-13	Date: 24 February 2020
Insulating glass units - Moisture penetration results according to EN 1279-2:2018 For details is referred to the complete test report.	
Company:	Name: Ozan Cam ve Ayna Tic.San. Ltd. Şti Address: Kale, Ankara Yolu Cd. No:96, 16450 Ahmet Vefik Paşa Osب/Kestel/Bursa Turkey
Plant:	Name: Ozan Cam ve Ayna Tic.San. Ltd. Şti Address: Kale, Ankara Yolu Cd. No:96, 16450 Ahmet Vefik Paşa Osب/Kestel/Bursa Turkey
Date of production:	17.09.2019
Product name:	Isicam
Edge seal composition:	inner sealant: Nedex PIB-996 outer sealant: Nedex PS 018 spacer: Nedex Nanobar
System conforms:	YES
NOTE: Comparisons of moisture penetration indices of different insulating glass unit systems are meaningless.	
	
Signature: M.A.A.M. Schets, B.Sc. Specialist	Signature: W. Notten Local Business Field manager

NOTE: This Summary is not a certificate.

Appendix B, Pictures of the test specimen





- End of report -