



AB ONAYLANMIŞ KURULUŞ

2271

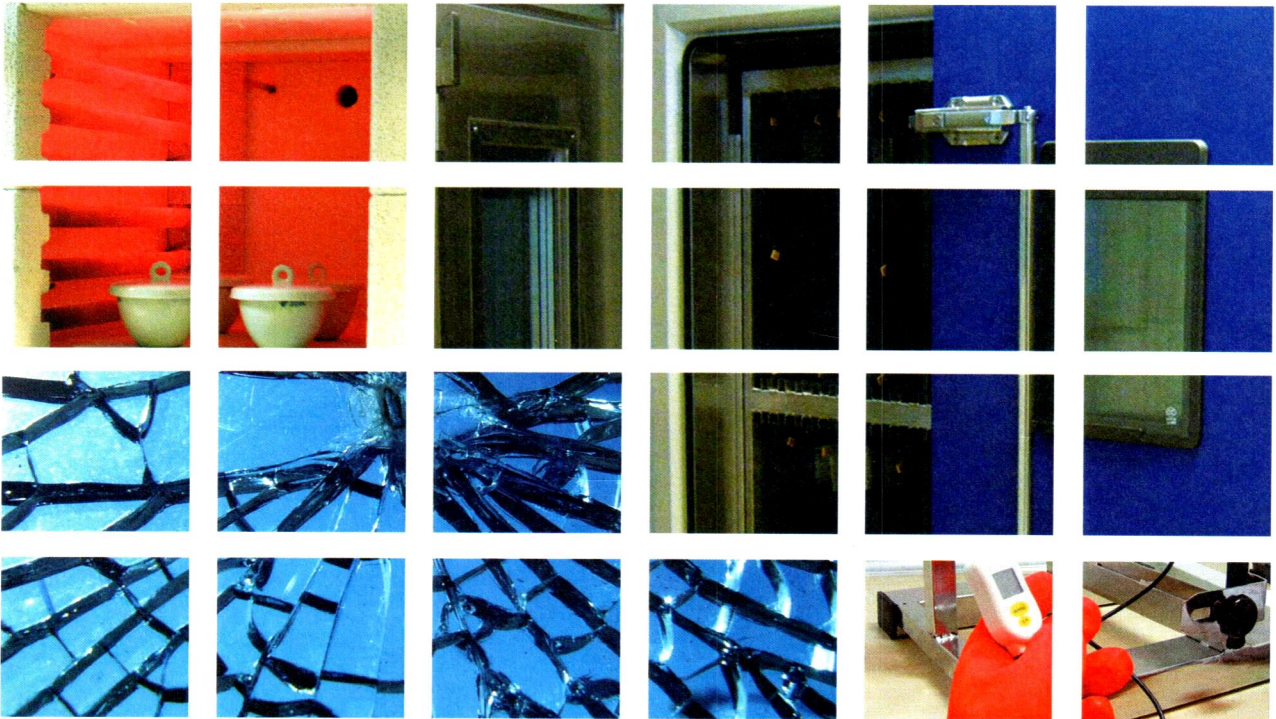
EU NOTIFIED BODY

PERFORMANCE ASSESSMENT REPORT

Jaluzi Cam San. ve Tic. Ltd. Şti.

TS EN 1279-2:2018 Glass in building-Insulating glass units-Part 2: Long term test method and requirements for moisture penetration

Report No: DY01-2470-1



Summary of Performance Assessment Report

This certificate was issued according to the Annex-5 Clause 1.4 of the regulation published in the Official Gazette dated 2 October 2014 related to the revision of Construction Products Regulation (305/2011/EC) published in the Official Gazette No. 28703 dated 10 July 2013.

Client and Product Information

Client	Jaluzi Cam San. ve Tic. Ltd. Şti.
Client Address (Head Office)	Esenkent Mah. Nato Yolu Cad. Vildan Sokak No:61 Ümraniye - İstanbul
Manufacturer Name	Jaluzi Cam San. ve Tic. Ltd. Şti.
Manufacturer Address	Esenkent Mah. Nato Yolu Cad. Vildan Sokak No:61 Ümraniye - İstanbul
Product Name / Trade Name	Jaluzi Cam / Double Glass 4 +22 (Air) + 4
Specimen Data Form No. / Date	NBF.1279-2 / 12.07.2021
Date of Manufacture	9.07.2021
Test Report	DY01-2470-1
Test Standard	TS EN 1279-2:2018 Glass in building-Insulating glass units-Part 2: Long term test method and requirements for moisture penetration
Product Standard	TS EN 1279-5:2018 Glass in building-Insulating glass units-Part 5: Product standard

Test Results (TS EN 1279-2:2018)

Moisture Penetration Index	Test Result	Reference	Conclusion
Maximum	20,0%	< % (25,0 ± 0,01)	APPROPRIATE
Average	14,5%	< % (20,0 ± 0,2)	APPROPRIATE

Conclusion for Performance Assessment	SUCCESSFUL
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Remarks:

- 1) These test results apply only to the particular specimens tested. This certificate contains only the summary of the test results given in the relevant test report detailed above.
- 2) This certificate confirms that the insulating glass unit specimens of which client and product information are given above have been tested for moisture penetration according to the TS EN 1279-2:2018 Standard.
- 3) This certificate can only be used as the evidence of the test result and is an integral part of the relevant test report but it cannot be used on its own.
- 4) This certificate has been prepared to demonstrate the characteristics of the product related to the specified standard. The manufacturer can use the results found for CE marking of its product, but it should also take into account the requirements of the relevant product standard when CE marking.


Mehmet Yakut
Technical Manager

SBG laboratory issues this report against the request of the client which is the manufacturer of the specimens (The request by client is in scope of notified body). This report is published in accordance with the provisions of the Construction Products Regulation (305/2011) and the relevant regulations and standards. The notified body number of the SBG is "2271".

Standart Belgelendirme Denetim Deney Muayene ve Teknik Kontrol Ltd. Şti.

Mimar Sinan Mh. Üsküdar Cd. No:1, Yedpa Ticaret Merkezi, F Katı, No: 11-12-14-15, 34779 Ataşehir - İstanbul/TR
Tel: +90 216 471 33 17 | Faks: +90 216 471 33 14 | Web: www.sbg.com.tr | E-mail: info@sbg.com.tr

PDR.1279-2 (D) / 01 / 01.11.2021

Standart Belgelendirme Denetim Deney
Muayene ve Teknik Kontrol Ltd. Şti.

Mimar Sinan Mah. Üsküdar Cad. No: 1, Yedpa Ticaret Merkezi, F Katı, No: 11-
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PERFORMANCE ASSESSMENT REPORT

TEST REQUESTED BY

Client No.: 1176
Client Contract No.: 1
Date of Contract: 12.07.2021
Client: Jaluzi Cam San. ve Tic. Ltd. Şti.
Address: Esenkent Mah. Nato Yolu Cad. Vildan Sokak No:61 Ümraniye - İstanbul
Telephone: (216) 526 07 87

DEFINITION AND DESCRIPTION OF SPECIMENS

Manufacturer of Specimens: Jaluzi Cam San. ve Tic. Ltd. Şti.

Address of Manufacturer of Specimens: Esenkent Mah. Nato Yolu Cad. Vildan Sokak No:61 Ümraniye - İstanbul

Type of Specimens: Glass in Building - Insulating Glass Units

Trade Name and Description of Product: Jaluzi Cam / Double Glass 4 +22 (Air) + 4

Specimen Data Form No. / Date: NBF.1279-2 / 12.07.2021

Total Number of Specimens: 15

Date of Manufacture of Specimens: 9.07.2021

Date of Delivery of Specimens: 12.07.2021

Date of Completion of Tests: 17.01.2022

Test Standard Used: TS EN 1279-2:2018 Glass in building-Insulating glass units-Part 2: Long term test method and requirements for moisture penetration


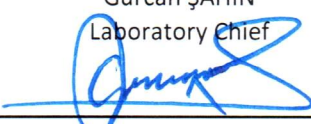
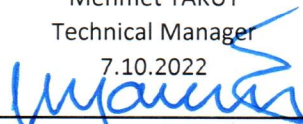
Product Standard: TS EN 1279-5:2018 Glass in building-Insulating glass units-Part 5: Product standard

Total Number of Pages of Report: 8 pages (Except cover page) + Annexes



Standart Belgelendirme Denetim Deney Muayene ve Teknik Kontrol Ltd. Şti. is accredited by TÜRKAK under the registration number AB-0411-T for TS EN 17025:2017 as a test laboratory.

Turkish Accreditation Agency (TÜRKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

	Report Date	Person in charge of test	Approval
	7.10.2022	Gürcan ŞAHİN Laboratory Chief 	Mehmet YAKUT Technical Manager 7.10.2022 

Standart Belgelendirme Denetim deney Muayene ve Teknik Kontrol Ltd. Şti.

DY01-2470-0 Jaluzi Cam (PDR.1279-2-00-01.11.2021)

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PERFORMANCE ASSESSMENT REPORT

CONDITIONS OF ISSUE AND USE OF THE REPORT

- 1) This report is issued in accordance with the provisions of the Laboratory Test Contract approved in the specified date. The reports are invalid if not signed and stamped properly.
- 2) These results contained herein apply only to the particular specimens tested and to the specific measurements, tests and calculations carried out, as detailed in this report.
- 3) The issuing of this report does not indicate any measure of approval, certification, supervision, technical control and surveillance by SBG of any product.
- 4) This report is not a 'Product Certificate' and may not be used as a 'Product Certificate'
- 5) Any part of this report must not be copied or reproduced in any form without the written permission of the SBG laboratory. No extract, abridgement or abstraction from this report may be published or used to advertise a product without the written consent of the managing director, SBG. SBG reserves the absolute right to agree or reject all or any part of the details of any item or publicity for which consent may be sought.

SBG laboratory issues this report against the request of the client which is the manufacturer of the specimens. This report is published in accordance with the provisions of the Construction Products Regulation (305/2011) and the relevant legislations and standards. The notified body number of the SBG laboratory is "2271".

(SBG is the abbreviation of Standart Belgelendirme Denetim Deney Muayene ve Teknik Kontrol Ltd. Şti.)

INTRODUCTION

According to "TS EN 1279-5:2018 Glass in building – Insulating glass units - Part 2: Product Standard", the product type testing shall be carried out to establish if insulating glass units used in building conforms to the definition of insulating glass units. The product type testing shall consist of long term moisture penetration test in accordance with "TS EN 1279-2:2018 Glass in building – Insulating glass units - Part 2: Long term test method and requirements for moisture penetration" standard.

The SBG laboratory determines the long term moisture penetration index of insulating glass units defined in the standard and based on the test results assesses the durability and the conformity of the tested insulating glass units with respect to the product definition.

Upon the request of the client, the performance assessment method was explained to the client and the client agreed on the test method. The Laboratory Test Contract was signed and approved on the specified date between the client and SBG. The specimens of which technical specifications submitted by the client were detailed below were tested and assessed according to the applicable requirements of the relevant standard. The performance assessment results were shown on the following pages of this report.

The report is related to the actual units that have been tested and does not provide information on the ongoing production. The manufacturer may use the performance assessment results for "CE" marking but it must also take the requirements of the relevant product standard into consideration for "CE" marking.

DESCRIPTION AND TECHNICAL SPECIFICATIONS OF THE SPECIMENS

(Clauses 6.2 and 8)

SBG has not taken any responsibility and has not been involved in sampling and/or preparing and/or delivering the test items. The test items were delivered at the laboratory address. All information taking place in this report regarding the identity of the product, sampling method and test specimens are based on the information provided by the manufacturer.

The technical specifications of the test items were identified and recorded under the following laboratory project number. The test specimens have the following properties as declared by the manufacturer:

PERFORMANCE ASSESSMENT REPORT

Laboratory project no.: DY01-2470

Manufacturer of specimens: Jaluzi Cam San. ve Tic. Ltd. Şti.

Address of manufacturer of specimens: Esenkent Mah. Nato Yolu Cad. Vildan Sokak No:61 Ümraniye - İstanbul

Manufacturing plant: Jaluzi Cam San. ve Tic. Ltd. Şti.

Address of manufacturing plant: Esenkent Mah. Nato Yolu Cad. Vildan Sokak No:61 Ümraniye - İstanbul

Type of specimens: Glass in Building - Insulating Glass Units

Trade name and description of specimens/product: Jaluzi Cam / Double Glass 4 +22 (Air) + 4

Specimen data form no. / date: NBF.1279-2 / 12.07.2021

Date of manufacture of specimens: 9.07.2021

Width and length: 352 mm x 502 mm

Total nominal thickness: 30 mm

Thicknesses of glass panes: 4 mm - 4 mm

Construction of IGU / Glass type: 4mm - 22mm - 4mm and Soda Lime Silicate Flat Glass

Spacer (Manufacturer/Trade name): Nedex Kimya / 22 mm Warm-Edge Spacer With Pre-applied Inner Sealant

Spacer material: Warm-Edge Polymer Spacer

Corner construction: Corner keys

Corner keys: Jaluzi Cam / Corner keys

Linear (side) connector: Jaluzi Cam / Linear side connectors

Desiccant: Nedex Kimya / Zeolan K

Desiccant type: Zeolite / 3 Å

Standard moisture adsorption

capacity: 17,10%

Desiccant filled sides: Two long sides

Desiccant amount:	Total (g):	52,95	Quantity per length (g/m):	31
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Desiccant amount (For polymeric spacer): NA

Outer sealant (OS): Nedex Kimya / KU 83

OS polymer type: Polysulfide

Average OS depth on spacer back

(u): 4,72 mm

Average OS depth on glass surface

(s): 12,43 mm

Inner sealant (IS): Warm-Edge Spacer With Pre-applied Inner Sealant

IS polymer type: Polyisobutylene

Average IS width (r): 6,6 mm

Amount of IS per length (R): 2,5 g / m

Cavity: 22 mm

Gas in cavity: Air

Coating: NA

Edge deletion for coating: NA

Closing of gas filling holes: NA

Special features: Jalousie

PERFORMANCE ASSESSMENT REPORT**TEST METHOD****Conditioning and Dimensional Measurements (Clauses 6.2 and 6.4)**

The insulating glass units were received at SBG laboratory, kept in the special shelves and stored under the standard laboratory conditions of (23±2) °C and %(50±5) for a period of not less than 3 days. It was noted that the test specimens were stored for fourteen days after production but before conditioning. The variation in temperature and relative humidity did not fall outside of the limits during the 3-day conditioning period. During this period each insulating glass unit was measured for length, width and thickness. The thickness of each glass pane was assessed and the cavity thickness was evaluated. The dimensions of the test items were found to be appropriate according to the requirements of the standard for the further tests. The test results were given in the following pages of the test report.

Allocation of Specimens (Clauses 6.2 and 6.4)

The test specimens were numbered randomly. The units were selected for tests as shown in the table below:

Specimen number	Tests to be conducted
1, 2, 3 and 4	Measurement of initial moisture content of desiccant
5, 6, 7, 8 and 9	Climate testing and measurement of final moisture content of desiccant
10, 11, 12 and 13	Spare units to replace the broken units for measurement of final moisture content of desiccant after the complete climatic testing (In case of breakage, spare units shall be subjected to the complete climatic testing, including the cyclic test)
14 and 15	Rejected or returned to the client or measurement of the standard moisture adsorption capacity of desiccant

Initial Moisture Content Test (Clause 7 and EN 1279-4 Annex-E.1)

The desiccant from each of the four units (1, 2, 3 and 4) was removed by drilling a 10 mm diameter hole approximately 60 mm away from a corner. A sample of approximately 25 g was taken from each unit after discarding approximately the first 4 g from the unit. Waste material from the sealant and spacer bar was removed from the sample. The sample was collected in a porcelain dish and a lid was used to ensure that the sample remained uncontaminated.

Each sample, contained in a porcelain dish, was weighed and then placed in a pre-heated furnace. The temperature in the furnace was raised to (540±10) °C before placing the samples into the furnace. The samples were kept in the furnace at (540±10) °C temperature for a period of at least 120 minutes.

The dish containing the sample were allowed to cool down to room temperature in desiccators and then weighed.

The initial moisture content was calculated using the following formula:

$$\text{Initial moisture content (T}_i\text{)} = (m_i - m_r) \times 100 / (m_r - m_0)$$

m_i : Mass of dish, desiccant and adsorbed water before drying in the furnace

m_r : Mass of porcelain dish and the dried desiccant (after drying in the furnace)

m_0 : Mass of porcelain dish when empty, clean and dry

The initial moisture contents of the units are shown in the following pages of the report.

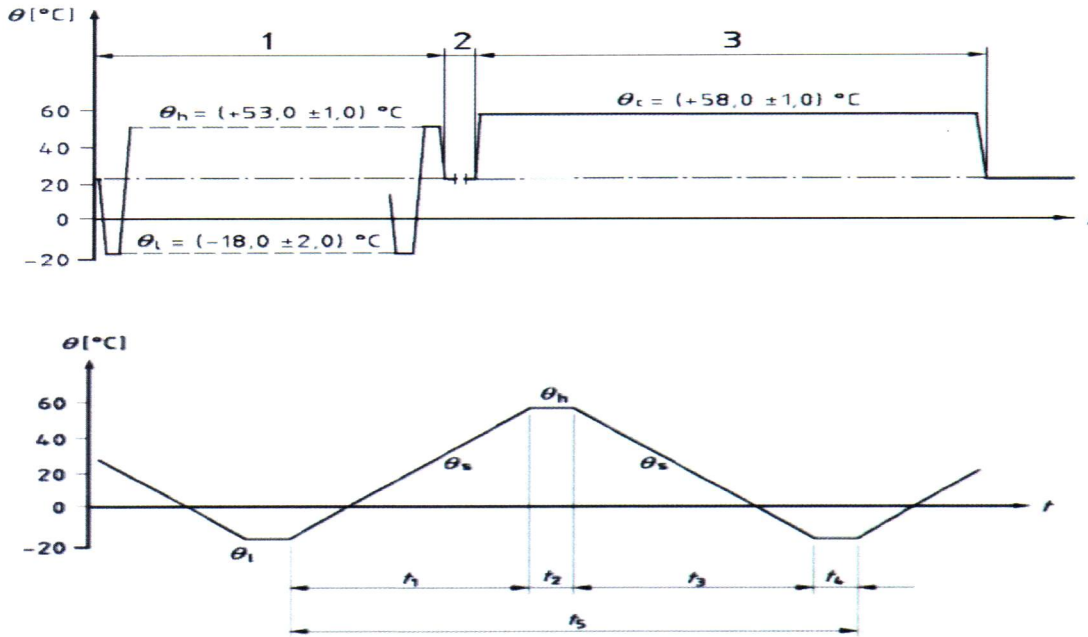
Climate Test (Clause 6.3)

Units 5, 6, 7, 8 and 9 were placed in the climatic test chamber. The remaining spare units and the units to be used to measure the standard moisture adsorption capacity were stored in the standard laboratory conditions.

PERFORMANCE ASSESSMENT REPORT

The climatic test consisted of two parts: The first part was 56 cycles each of 12 hours. The temperature dwells were for 1 hour (± 5 min) at $(-18,0 \pm 2,0)$ °C and for 1 hour (± 5 min) at $(+53,0 \pm 1,0)$ °C with ramps of (14 ± 4) °C/hour (± 5 min) between the dwells; the relative humidity was maintained at 95% or greater for the upper temperatures. The second part was a period of seven weeks [49 days = (1.176 ± 4) hour]) at the constant conditions of $(+58,0 \pm 1,0)$ °C temperature and $\geq 95\%$ relative humidity.

The graphs shown below detail the two parts of the climatic test:



Remarks:

- 1) SBG laboratory's climatic test chambers are calibrated and programmed to produce the conditions required by the specification. However, due to the uncertainty of measurement associated with the equipment calibration, it cannot be guaranteed that the tolerances specified in the standard for the conditions within the chamber were maintained throughout the whole of the conditioning period.
- 2) The standard allows maximum 96 hours to transfer the specimens from the cyclic climatic test chamber to the constant climatic test chamber. SBG laboratory follows this rule.
- 3) If any interruption occurs in the climate test conditions, the test duration is extended by the interruption time not exceeding a total of 96 hours. If the interruption time exceeds 96 h, the test is stopped and a new test with new specimens is restarted.

Final Moisture Content Test (Clause 7 and TS EN 1279-4 Annex-E.1)

Upon the completion of the climatic test the test items were conditioned at the standard laboratory conditions of (23 ± 2) °C temperature and $\%(50 \pm 5)$ relative humidity for a period of not less than 7 days.

The desiccant from each of the five units (5, 6, 7, 8 ve 9) was removed by drilling a 10 mm diameter hole approximately 60 mm away from a corner. A sample of approximately 25 g was obtained from each unit after discarding approximately the first 4 g from the unit. Waste material from the sealant and spacer bar was removed from the sample. The sample was collected in a porcelain dish and a lid was used to ensure that the sample remained uncontaminated.

Each sample, contained in a porcelain dish, was weighed and then placed in a pre-heated furnace. The temperature in the furnace was raised to (540 ± 10) °C before placing the samples into the furnace. The samples were kept in the furnace at (540 ± 10) °C temperature for a period of at least 120 minutes.

PERFORMANCE ASSESSMENT REPORT

The dish containing the sample were allowed to cool down to room temperature in desiccators and then weighed. The final moisture content was calculated using the following formula:

$$\text{Final moisture content } (T_s) = (m_s - m_r) \times 100 / (m_r - m_0)$$

m_s : Mass of dish, desiccant and adsorbed water before drying in the furnace

m_r : Mass of porcelain dish and the dried desiccant (after drying in the furnace)

m_0 : Mass of porcelain dish when empty, clean and dry

The final moisture contents of the units are shown in the following pages of the report.

Standard Moisture Adsorption Capacity (Clause 6.5 and TS EN 1279-4 Annex-E.3)

The standard moisture adsorption capacity used in this test report has to be determined according to TS EN 1279-4:2018 Annex-E.3.

This value should be taken from a test report prepared in accordance with the requirements of TS EN 1279-4: 2018 Annex-E.3 standard submitted to the laboratory by the customer. When the client fails to submit a test report meeting these requirements to our laboratory, our laboratory uses the value determined by performing this test.

The value used in the calculation was taken from the test report meeting the requirement of the standard, as declared by the client and/or its desiccant supplier.

Moisture Penetration Index (Clause 6.5)

Moisture penetration indices of the five insulating glass units which undergo the ageing were calculated using the formula below:

$$\text{Moisture Penetration Index } (I) = (T_s - T_{i,ort}) \times 100 / (T_{c,ort} - T_{i,ort})$$

T_s : Final moisture content of desiccant

$T_{i,ort}$: Average initial moisture content of desiccant

$T_{c,ort}$: Average standard moisture adsorption capacity of desiccant

TEST FINDINGS AND ASSESSMENTS**(1) Technical Specifications of Specimens and Dimensional Measurements**

Each insulating glass units was measured for length, width and thickness. The thickness of each glass pane was assessed and the cavity thickness was evaluated. The technical specifications of some specimens were measured and the measurement results were compared with the values given by the client. The dimensions of the test items were found to be appropriate according to the requirements of the standard. The measurement results are shown below:

Results of Dimensional Measurements

Specimen No.	Length (mm)	Width (mm)	Thickness (mm)	Cavity (mm)	Desiccant (g)	u (mm)	s (mm)	r (mm)	R (mm)
1	500	350	30,1	22,1	52,80	4,65	12,40	6,45	31,06
2	500	350	29,8	21,8	53,10	4,70	12,36	6,70	31,24
3	500	350	30	22	52,90	4,80	12,44	6,60	31,12
4	500	350	30,1	22,1	53,40	4,72	12,48	6,65	31,41
5	500	350	30,2	22,2	52,70	4,68	12,50	6,60	31,00
6	500	350	29,8	21,8	53,20	4,72	12,50	6,70	31,29

PERFORMANCE ASSESSMENT REPORT

7	500	350	29,9	21,9	52,85	4,80	12,40	6,72	31,09
8	500	350	30	22	52,46	4,70	12,42	6,70	30,86
9	500	350	30	22	53,10	4,68	12,48	6,58	31,24
10	500	350	30,1	22,1	-	4,72	12,46	6,62	-
11	500	350	29,9	21,9	-	4,74	12,38	6,65	-
12	500	350	29,8	21,8	-	4,70	12,36	6,48	-
13	500	350	30,1	22,1	-	4,75	12,44	6,46	-
14	500	350	30	22	-	4,76	12,42	6,50	-
15	500	350	29,8	21,8	-	4,72	12,44	6,56	-

(2) Initial Moisture Content Results

The initial moisture contents of the units and the average of initial moisture contents are shown below:

Specimen No.	Initial Moisture Content	Average
1	2,47%	2,33%
2	2,47%	
3	2,28%	
4	2,10%	

(3) Standard Moisture Adsorption Capacity

The standard moisture adsorption capacity used in the moisture penetration index calculations was taken from the test report below:

Testing laboratory	TÜV Rheinland
Place of testing laboratory	Leek / Hollanda
Date of test report	20.01.2020
Test report number	89216381-01

(4) Results For Final Moisture Contents and Moisture Penetration Indices

The final moisture contents and moisture penetration indices of the units and the average moisture penetration index are shown below:

Specimen No.	Final Moisture Content	Moisture Penetration Index	Average Moisture Penetration Index
5	3,63%	8,8%	14,5%
6	4,81%	16,8%	
7	5,29%	20,0%	
8	4,45%	14,4%	
9	4,15%	12,3%	

PERFORMANCE ASSESSMENT REPORT**ASSESSMENTS AND CONCLUSION (Clause 5)**

The initial moisture contents and their average, final moisture contents, moisture penetration indices and their average were given above.

The test results were compared with the reference values given in TS EN 1279-2:2018 Standard and the following assessment was made based on this comparison:

Moisture Penetration Index	Test Result	Reference Value	Conclusion (Conformity Assessment)
MAXIMUM	20,0%	< % (25,0 ± 0,1)	APPROPRIATE
AVERAGE	14,5%	< % (20,0 ± 0,2)	APPROPRIATE

The test findings for long term test method for moisture penetration index requested by the client were shown above. As a conclusion the specimens having these test results in meeting the requirements of the Clause 5 of TS EN 1279-2 Standard are assessed as follows:

SUCCESSFUL

**Remarks:**

- 1) The conformity assessment was made taking into account the expanded uncertainty of measurement calculated. Please contact the laboratory to find out the measurement uncertainty. The decision rule was applied according to L.PR.16 Decision Rule Procedure. The procedure is available on our website.
- 2) When and if changes are made in production method and/or equipment and/or materials and components used, assessment according to this standard shall be reconsidered and re-tests shall be performed when changes can lead to different specifications of the insulating glass units. The decision and responsibility lies at the manufacturer.
- 3) The current standard regarding initial moisture content is TS EN 1270-4:2018. The loss on ignition test is performed to determine initial moisture content according to TS EN 1279-4:2018 Annex-E.1. On both TS EN 1279-4:2018 Clause 6.3.1 and TS EN 1279-6:2019 Clause B.4.4.1 it is stated that the initial moisture content shall not exceed the upper limit value of 3% by weight when used in IGU production. Therefore initial moisture contents given in this test report must also be assessed from this point of view.

OTHER EXPLANATIONS (REASONS OF REVISIONS, OPINIONS AND INTERPRETATIONS)

The Performance assessment report (DY012470-0 dated 01.02.2022) is invalid due to the wrong client number. This report was issued by correcting the client number and replaced the previous report (DY01-2470-0).

EKLER