



PERFORMANCE ASSESSMENT REPORT

Jaluzi Cam San. ve Tic. Ltd. Şti.

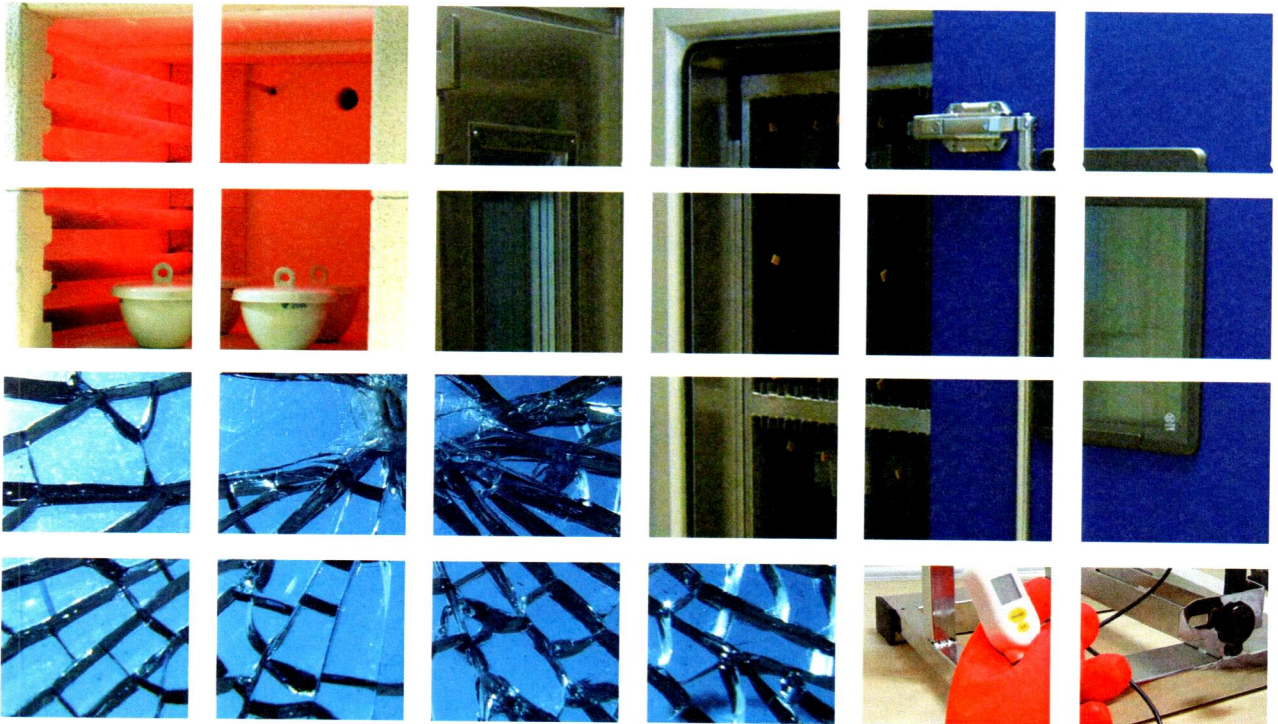
Product Standard:

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

Test Standard:

EN 1279-6:2018 Annex B.4 Glass in building-Insulating glass units-Part 6: Factory production control and periodic tests

Report No: DY02-2558-1



Summary of Performance Assessment Report

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 / 25.04.2022
Date of Manufacture	24.04.2022
Test Report	DY02-2558-1
Test Standard	EN 1279-6:2018 Annex B.4 Glass in building-Insulating glass units-Part 6: Factory production control and periodic tests
Product Standard	EN 1279-5:2018 Glass in building-Insulating glass units-Part 5: Product standard

Assessment of Test Findings (EN 1279-6 Annex B.4)

Assessment Criteria	Test Result	Reference	Assessment
Maximum initial moisture content	1,74%	< % (3,00 ± 0,01)	APPROPRIATE
Maximum moisture penetration index	1,6%	< % (8,5 ± 0,1)	APPROPRIATE
Average moisture penetration index	1,6%	< % (8,5 ± 0,2)	APPROPRIATE

Performance Assessment Result	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 thermally toughened soda lime silicate safety glass specimens of which client and product information are given above have been tested for fragmentation and mechanical strength tests according to the relevant 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.



Mehmet Yakut
Technical Manager

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

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PERFORMANCE ASSESSMENT REPORT

TEST REQUESTED BY

Client No.: 1176

Client Contract No.: 3

Date of Contract: 25.04.2022

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

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

Specimen data form no. / Date: NBF.1279-2 / 25.04.2022

Quantity of specimens: 5

Date of manufacture of specimens: 24.04.2022

Date of delivery of specimens: 25.04.2022

Date of completion of tests: 26.10.2022

Test standard used: EN 1279-6:2018 Annex B.4 Glass in building-Insulating glass units-Part 6: Factory production control and periodic tests

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

Total Number of Pages of Report: Total 7 pages (Except the 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

28.11.2022

Person in Charge of Test

Gürcan ŞAHİN
Laboratory Chief

Approval

Mehmet YAKUT
Technical Manager

28.11.2022

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

DY02-2558-1 Jaluzi Cam (PDR.1279-6.EK.B.4-01-01.11.2022)

Sayfa 1 / 7

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) The 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 SBD 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, SBD. SBD 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: Standart Belgelendirme Denetim Deney Muayene ve Teknik Kontrol Ltd. Şti.nin kısaltılmışıdır.)

INTRODUCTION

According to "Glass in building – Insulating glass units - Part 5: Product Standard" (EN 1279-5 / TS EN 1279-5), the product testing shall be carried out to establish if "glass used in building - insulating glass units" conforms to the requirements of the factory production control and periodic tests. The factory production control and periodic tests shall consist of the short term moisture penetration index test in accordance with "Glass in building – Insulating glass units - Part 6: Factory production control and periodic tests" standard (EN 1279-6:2018 Annex B.4). The SBG laboratory determines the short term moisture penetration index of insulating glass units defined in the standard and based on the test results assesses whether the insulating glass units conforms to the requirements of the standard,i.e, factory production control requirements or not.

Upon the request of the client,the performance assessment method was explained to the client and the client agreed on the test method by approving the contract 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.

DESCRIPTION AND TECHNICAL SPECIFICATIONS OF THE SPECIMENS (Clauses B.2.2)

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 quantitative information that the laboratory could measure was verified and the verified data has been written on this report.

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:

Laboratory project no.: DY02-2558

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

PERFORMANCE ASSESSMENT REPORT

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

Address of manufacturing plant: Esenkent Mah. Nato Yolu Cad. Vildan Sokak No: 61 Őmraniye - 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 / 25.04.2022

Date of manufacture of specimens: 24.04.2022

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 - 12mm - 4mm and Soda Lime Silicate Glass

Spacer (Manufacturer/Trade name): Nedex Kimya / 22 mm Warm Edge Polymer Spacer

Spacer material: Polymer Spacer

Corner construction: With Corner Keys

Corner keys: Jaluzi Cam / Corner Keys

Linear (side) connector: Additional polyisobuthylene strip (At corners)

Desiccant: Nedex Kimya / Zeolan K

Desiccant type: Zeolite / 3 Å

Standard moisture adsorption

capacity: 17,10%

Desiccant filled sides: Two long sides

Desiccant quantity:	Total (g):	51,75	Quantity per length (g/m):	30,3
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Desiccant quantity (For polymeric

spacer): NA

Outer sealant (OS): Tremco / JS 443

OS polymer type: Polyurethane

Average OS depth on spacer back

(u): 4,89 mm

Average OS depth on glass surface

(s): 7,46 mm

Inner sealant (IS): Tremco / JS 680

IS polymer type: Polyisobutylene

Average IS width (r): 5,21 mm

Quantity 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 Measurement of Dimensions (Clauses B.4.1, B.4.2 and B.4.3)**

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 should be 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 (Clause B.4.2 ve Table B.1)

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 and 2	Measurement of initial moisture content of desiccant
3 and 4	Climate testing and measurement of final moisture content of desiccant
5	(a) Spare unit to replace the broken units for measurement of final moisture content of desiccant after the complete climatic testing (In case of breakage, spare unit shall be subjected to the complete climatic testing) (b) Rejected or returned to the client or measurement of the standard moisture adsorption capacity of desiccant

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

The desiccant from each of the two units (1 and 2) 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:

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

m_i : Mass of dish, desiccant and initial water already adsorbed (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 B.4.3)

Units 3 and 4 were placed in the climatic test chamber. The remaining spare unit to be used to measure the standard moisture adsorption capacity was stored in the standard laboratory conditions.

The climatic test consisted of a period of three weeks [21 days = (504±4) hours] at the constant conditions of +(58,0±1,0) °C temperature and ≥%95 relative humidity.

PERFORMANCE ASSESSMENT REPORT**Remarks:**

- 1) Initial moisture content of each desiccant shall be at maximum 3,0% at 540 °C for desiccant in bulk. If the initial moisture content of specimens is higher than 3,0%, the other two specimens were not placed into the climatic test chamber and therefore their final moisture contents are not measured. In this case the specimens are assessed as "Unsuccessful" according to EN 1279-6:2018 Annex B.4.4.1.
- 2) 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.
- 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 re-test on new specimens is required.

Final Moisture Content Test (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±5) relative humidity for a period of not less than 7 days.

The desiccant from each of the two units (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 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.

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:

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

m_s : Mass of dish, desiccant and initial water already adsorbed (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 (EN 1279-4 Annex E.3)

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

This value should be taken from a test report prepared in accordance with the requirements of 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

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

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

PERFORMANCE ASSESSMENT REPORT

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**(1) Technical Specifications of Specimens and Dimensional Measurements Results**

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:

Dimensional Measurements Results

Specimen No.	Length (mm)	Width (mm)	Thickness (mm)	Cavity (mm)	Desiccant (g)	u (mm)	s (mm)	r (mm)	R (mm)
1	500	350	30,6	22,6	51,48	4,90	7,64	5,20	30,28
2	500	350	30,5	22,5	52,19	4,92	7,40	5,25	30,70
3	500	350	30,7	22,7	51,50	4,85	7,42	5,20	30,29
4	500	350	30,5	22,5	51,82	4,90	7,40	5,20	30,48
5	500	350	30,6	22,6	-	4,90	7,44	5,22	-

(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	1,74%	1,60%
2	1,45%	

(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	TűV Rheinland
Place of testing laboratory	Leek / Hollanda
Date of test report	20.01.2020
Number of test report	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
3	1,85%	1,6%	1,6%
4	1,84%	1,6%	

PERFORMANCE ASSESSMENT REPORT**ASSESSMENTS OF TEST RESULTS AND CONCLUSION (Clause B.4.4.1)**

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 EN 1279-6:2018 Annex B.4 Standard and the following assessments were made based on this comparison:

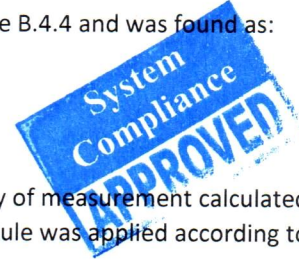
Assessment Criteria	Test Result	Reference Value	Assessment Result
Maximum initial moisture content	1,74%	< % (3,00 ± 0,01)	APPROPRIATE
Maximum moisture penetration index	1,6%	< % (8,5 ± 0,1)	APPROPRIATE
Average moisture penetration index	1,6%	< % (8,5 ± 0,2)	APPROPRIATE

The compliance of the specimens manufactured and/or delivered -as stated in the previous pages of this report- by

Jaluzi Cam San. ve Tic. Ltd. Őti.

was assessed according to the performance requirement of EN 1279-6:2018 Clause B.4.4 and was found as:

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 EN 1279-4:2018. The loss on ignition test is performed to determine initial moisture content according to EN 1279-4:2018 Annex E.1. On both EN 1279-4:2018 Clause 6.3.1 and EN 1279-6:2018 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 test report dated 01.11.2022 (No: DY02-2558-0) is invalid due to wrong specimen information. This report was issued by correcting the specimen information and replaces the the test report numbered DY02-2558-0.

ANNEXES

Annex-1: Complaint and feedback form

Annex-2: Letter regarding the disposal of the remaining specimens and specimens used in testing