

Test report no.: <i>Testrapport nr.:</i>	89223462-01	Order No.: <i>Opdracht nr.:</i>	89223462	Page 1 of 9 Pagina 1 van 9
Client Reference No.: <i>Klantreferentie nr.:</i>	23.A311 retest	Order date: <i>Opdrachtdatum:</i>	2023-11-09	
Client: <i>Klant:</i>	Glasindustrie La Paloma B.V., Molenstraat 145, 7312 BD Apeldoorn, Netherlands			
Test item: <i>Testvoorwerp:</i>	Insulating glass			
Identification/ Type No.: <i>Benaming / Type nr.:</i>	JEAR - Glass			
Order content: <i>Inhoud opdracht:</i>	Type test			
Test specification: <i>Testomschrijving:</i>	EN1279-3:2018 Glass in building - Insulating glass units – Part 3 ^a Long term test method and requirements for gas leakage rate and for gas concentration tolerances			
Date of sample receipt: <i>Ontvangstdatum monster:</i>	2023-08-11			
Test sample No: <i>Testproefstuk nr.:</i>	23.A311			
Testing period: <i>Testperiode:</i>	2023-11-27 - 2024-02-26			
Place of testing: <i>Testlocatie:</i>	Arnhem, the Netherlands			
Testing laboratory: <i>Testlaboratorium:</i>	TÜV Rheinland Nederland NoBo 0336			
Test result*: <i>Testresultaat*:</i>	Pass			
tested by: <i>getest door:</i>	authorized by: <i>geautoriseerd door:</i>			
Date: 2024-02-29 <i>Datum:</i>	Issue Date: 2023-02-29 <i>Datum uitgave:</i>			
Position / functie:	Position / functie:			
Others / <i>Andere:</i>				
Condition of the test item at delivery: <i>Toestand van het test voorwerp bij ontvangst:</i>	Test item complete and undamaged			
* Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested * Legenda: P(ass) = voldoet aan test omschrijving F(ail) = voldoet niet aan test omschrijving N/A = niet van toepassing N/T = niet getest				
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark. <i>Dit testrapport heeft alleen betrekking op het voorgenoemde test voorwerp. Zonder toestemming van het testcentrum mag dit testrapport niet in delen worden vermenigvuldigd. Dit keuringsrapport geeft geen recht op het dragen van enig keurmerk.</i>				

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Remarks
Opmerkingen

- | | |
|---|---|
| 1 | <p>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. The decision rule for statements of conformity in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance to and ILAC-G8:09/2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account.</p> <p><i>De apparatuur die tijdens de gespecificeerde testperiode is gebruikt, is gekalibreerd volgens ons testlaboratoriumkalibratieprogramma. De apparatuur voldoet aan de eisen die zijn opgenomen in de relevante normen. De traceerbaarheid van de gebruikte testapparatuur wordt gewaarborgd door naleving van de voorschriften van ons managementsysteem. De beslisregel voor conformiteitsverklaringen in dit testrapport is gebaseerd op de "Zero Guard Band Rule" en "Simple Acceptance" in overeenstemming met en ILAC - G8:09/2019 en IEC Guide 115:2021, tenzij anders aangegeven in de toegepaste norm vermeld op pagina 1 van dit rapport of aangevraagd door de klant. Dit betekent dat er geen rekening wordt gehouden met de meetonzekerheid.</i></p> |
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Clause deel	Product description Product omschrijving
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1.	Product details: Insulating glass units – Declaration manufacturer	
	Manufacturer	Glasindustrie La paloma b.v.
	Address of manufacturer	Molenstraat 145 – 7321 BD Apeldoorn
	Plant	Molenstraat 145 – 7321 BD Apeldoorn
	Line ID where the samples are made	Line 1
	Date of production	07-2023
	Product Name	JEAR – Glass
	System description, file number	O2 / L1
	Exterior dimensions	502 x 352 mm (W x H)
	Total thickness	20 mm
	Construction	4 – 12 – 4
	Spacer	Profilglass
	Spacer material	Aluminium
	Corner construction	Bend
	Corner keys	N/A
	Linear connector	Steel ek
	Desiccant	Fenzi
	Desiccant type	Molver MGM
	Standard Moisture adsorption capacity (T_C)	≥15,5%
	Desiccant amount	0,70 – 0,80 g/ml
	Outer sealant	Fenzi Thiover
	Polymer type	Polysulfide
	Average sealant depth on spacer back (u)	3 mm
	Average sealant width on glass surface (s)	6 mm
	Inner sealant:	Fenzi butylver
	Polymer type:	polyisobutylene
	Average sealant width (r):	4 mm
	Mass of inner sealant per length and side (R)	4,6 g/m
	Coating	AGC iplus 1.1
	Edge deletion	10 mm
	Gas filling	Argon
	Nominal gas concentration ($c_{i,0}$)	90 %

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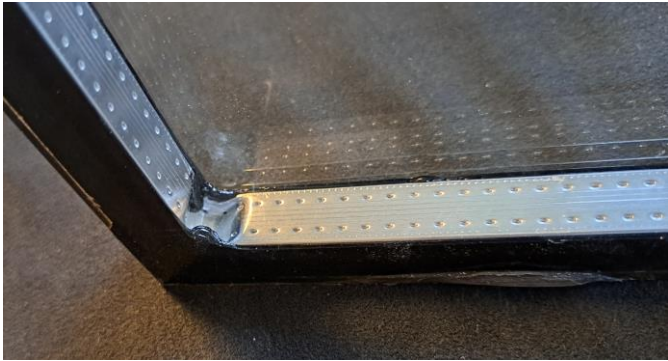
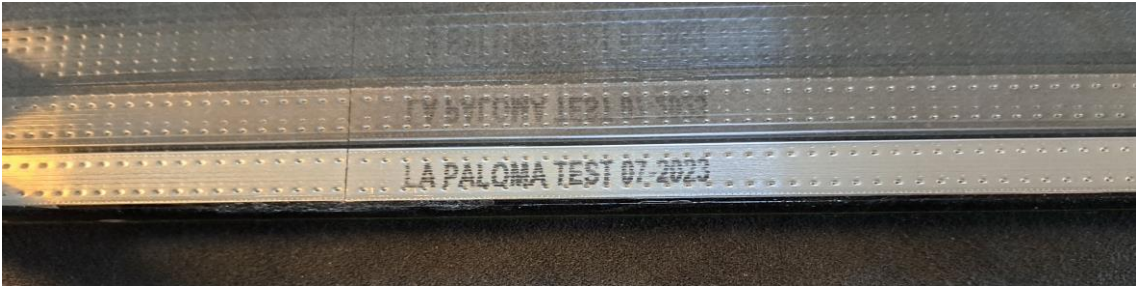
Clause <i>deel</i>	Product description <i>Product omschrijving</i>
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	Temperature during production (T)	18 °C
	Pressure during production (P)	1016 hPa
	Altitude during production	16 m above sea level
	Closing of gas filling holes	N/A
	Special features	No
2.	Other: <i>Andere:</i>	Test sample(s), as well sample information, description, product details and intended usage was provided by customer.
3.	Test sample obtaining: <i>Selectie van het proefstuk:</i>	☒ Sending by customer ☐ Sampling by TÜV Rheinland Group ☐ others:
4.	Number of test items <i>Aantal proefstukken</i>	6

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Clause deel	Product description Product omschrijving
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5.	Pictures of test object(s)
 	
	
	

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Clause deel	Requirements - Tests Vereisten - Testen	
6.	Scope	Test method for the determination of gas leakage rate and specifies the requirements for limit values for gas leakage rate and gas concentration for gas filled insulating glass units made a) in accordance with EN 1279-1:2018 and manufactured to EN 1279-6:2018, or b) for the purpose to demonstrate that components (e.g. edge seals or spacers) will allow the insulating glass unit to conform to the requirements given in EN 1279-1:2018, Clause 6.
7.	Requirements: EN1279-3 clause 5.1	The gas leakage rate (GLR) L_i for IGU containing gas(es) in concentrations higher than 15 % by volume per gas shall be determined on an average of at least two specimens and maximum 4 specimens. $L_{i,av} \leq 1,0$ in % a⁻¹ (% per year). With an absolute limit of all individual $L_{i,max} \leq 1,20$ in % a⁻¹ Individual values shall be rounded to the second decimal place. Average value shall be rounded to one decimal place.
	clause 5.2	Gas concentration before and after the climate test procedure, shall not be lower than 5 % absolute below the nominal value used to calculate the U-value declared by the IGU manufacturer.
8.	Test method: EN1279-3 clause 6	The GLR is measured after subjecting the test specimens to a climate exposure. The climate test procedure consists of two subsequent steps. - First step includes a phase of 28 temperature cycles of 12 h (2 weeks) from (-18 ±2) °C to (+53 ±1) °C with slopes of plus or minus (14 ±4) °C/h. The relative humidity is maintained > 95 % at least during the phase at 53 °C. During the time of the cycle when temperature is below 20 °C, the humidity control is interrupted. - Second step includes four weeks (672 ±4) h exposure at (+58 ±1) °C and at > 95 % r.h. Condensation on the test specimens from time to time is allowed. After the climate test the units are stored at standard laboratory conditions for at least 2 weeks and no longer than 6 months before measuring the GLR. For the measurement of the GLR, the specimen is placed in a gastight container and, after a given time, the amount of gas which has leaked from the specimen is measured. The measurement of the gas leakage is repeated until sufficient constancy of the values is achieved. After this measurement, the gas concentration in the specimen is analysed and the GLR calculated. The GLR (L_i) in % per time (year) of the IGU is calculated based on the measured leaked amount of argon gas per 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 $\rho_{0,Ar} = 1,762$; $\rho_{0,Kr} = 3,690$; $\rho_{0,Xe} = 5,897$ µg/mm³ at $T_o = 293$ K and $P_o = 1000$ hPa
9.	Measurement Uncertainty	During the evaluation of the measurement uncertainty all contributions to measurement uncertainty are identified and evaluation. The conclusion of this evaluation is a measurement uncertainty in the gas leak rate of 20% relative or minimal 0.1%/y absolute.

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Clause deel	Requirements - Tests Vereisten - Testen
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10.	Test execution The units are randomly numbered and stored for minimal 1 week at laboratory conditions. Four units are exposed to the climate test. After the climate test of minimal 2 units the gas leak rate is measured at 21-23 °C. The gas concentration (average of 4 readings) is measured with spark ionization emission (Sparklike handheld) before and after the test (c_i). Depending on the construction of the unit measurement with Sparklike might not be possible. In that case the gas concentration is measured with gas chromatograph but only after the gas leak rate measurement. For the calculation of the gas leakage rate, the temperature (T) and the pressure (P) values during the sealing of the units are used for the calculation of the GLR. If no values are given/known a standard temperature of 293 K and pressure of 1013 hPa are used.
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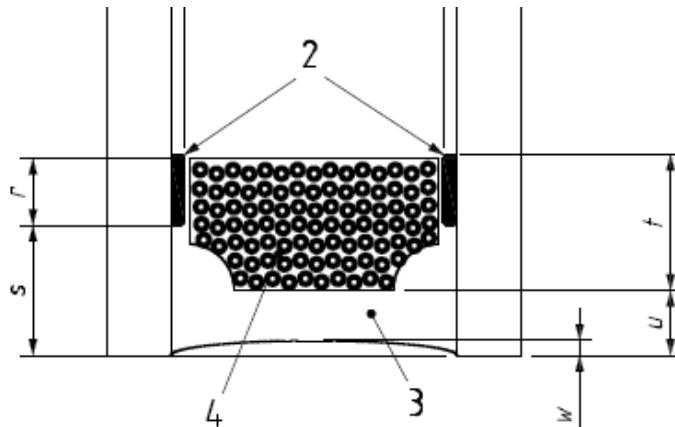
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Clause deel	Measuring results - Remarks meetresultaten - Opmerkingen	Result Resultaat
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11. Sample properties as measured by test laboratory

Exterior dimensions:	502 x 352 mm
Total thickness before ageing:	21
Corner construction:	bent corners
Sealant (3) depth on spacer back (u)	4 - 5 mm
Sealant (3) width on glass surface (s)	6 - 7 mm
Inner sealant (2) width (r):	4 – 5 mm
Edge deletion	Yes
Closing of gas filling holes	N/A
Special features	No



example edge seal

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Clause deel	Measuring results - Remarks meetresultaten - Opmerkingen	Result Resultaat
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12.	Test results summary						Pass ☒ Fail ☐ N/A ☐ N/T ☐
	unit	thickness [mm]	V _{int} [mm ³]	C _i [%]		L _i [%·a ⁻¹]	
				before	after		
	1	21,2	2152824	96,1	95,4	0,84	
	2	21,3	2148852	96,6	95,7	0,57	
	3			96,5	95,6		
	4			96,2	95,5		
	average					0,7	
13.	Remarks 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 product. The decision and responsibility lies at the manufacturer.						

- End of report -