CLEB
a UL company

VALIDATION TEST IN ACCORDANCE WITH NFRC 102-2017

CLEB laboratory Inc.	Submitted To:	Re-issued To:
Tested Report No.: **NV-02952** **Re-issued Report No.:** **N/A**	**Aluminco S.A.** **Viotia Inofita** **Greece, ,** **32011** **+30 22620 47090**	**N/A**

Test Report Summary

General Information :

Operation type :	FIXD
Model	Fixed Window
Type :	Production Line
Submitted for :	Initial certification
Product Line ID Number:	N/A
Test date	2017-12-15
Report date	2017-12-19
Revision date	N/A
Number of pages	8
U_s:	1.98 ± 0.08 W/(m²C) (0.35 ± 0.01 BTU/(hrft²°F))
U_{st}:	1.94 ± 0.08 W/(m²C) (0.34 ± 0.01 BTU/(hrft²°F))

Product description :

Frame type :	AT
Sash type :	NA
Door Description	N/A
Panel :	N/A
Core fill :	N/A
Skin :	N/A
Sub-Structure	N/A
Size in mm :	1200 mm W. x 1500 mm H.
Size in inch :	47.24" W x 59.06" H.
Comment :	

Glazing information

Type :	Double Sealed Unit
***Spacer type :**	A1-D
Overall thickness	25.83 mm (1.02")
***Filling Technique**	Single probe
***Design Gas Fill :**	Argon/Air
***Gas concentration :**	90% Argon, 10% Air

	Thickness		* Emissivity							
	mm	inch	S1	S2	S3	S4	S5	S6	S7	S8
Glass 1	5.79	0.12	0.840	0.025						
Glass 2	4.89	0.19			0.840	0.840				
Glass 3	N/A	N/A					N/A	N/A		
Glass 4	N/A	N/A							N/A	N/A
Gap 1	15.15	0.60								
Gap 2	N/A	N/A								
Gap 3	N/A	N/A								

Notes: Reference must be made to CLEB laboratory Inc. complete report for test specimen description and details test results.

**: Data obtained by the manufacturer.*

Re-issue Information

Model:	N/A	**Date of Re-issue:**	N/A
Submitted For:	N/A	**Product Line ID Number:**	N/A
Revision Date:	N/A		

Tested by:

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1 INTRODUCTION

CLEB laboratory Inc. has been retained by Aluminco S.A. to test a fixed window in accordance with NFRC 102 Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems. The sample components and manufacturing are documented in section 3.0. In this report, all values in parenthesis are for reference only.Ratings included in this report are for submittal to an NFRC-licensed IA for certification purposes and are not meant to be used for labelling purposes. Only those values identified on a valid Certification Authorization Report (CAR) are to be used for labelling purposes.

2 SPECIFICATION

NFRC 102-2017 Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems

3 DESCRIPTION OF THE TESTED SPECIMEN

3.1 OPERATOR TYPE

FIXD, Fixed

3.2 TYPE

Production Line

3.3 MODEL

Fixed Window

3.4 GLAZING DAYLIGHT OPENING

3.4.1 Lite 1: 1076 mm W. x 1377 mm H. (42,36" x 54,21")

3.4.2 Lite 2: N/A

3.4.3 Lite 3: N/A

3.4.4 Lite 4: N/A

3.5 DATE OF SAMPLE RECEPTION

2017-11-29

3.6 DATE OF TESTING

2017-12-15

3.7 FRAME

3.7.1 Material: AT, Aluminum w/ Thermal breaks - All members

3.7.2 Finish: Painted Aluminum

3.7.3 Joinery type: Mechanical assembly crimped and sealed

3.7.4 Reinforcement:

3.7.4.1 Reinforcement 1: None
3.7.4.2 Reinforcement 2: None
3.7.4.3 Reinforcement 3: None
3.7.4.4 Reinforcement 4: None
3.7.4.5 Reinforcement 5: None
3.7.4.6 Reinforcement 6: None

3.7.5 Weatherstripping:

3.7.5.1 Weatherstripping 1: None
3.7.5.2 Weatherstripping 2: None
3.7.5.3 Weatherstripping 3: None
3.7.5.4 Weatherstripping 4: None
3.7.5.5 Weatherstripping 5: None
3.7.5.6 Weatherstripping 6: None

3.7.6 Drainage:

3.7.6.1 Drainage 1: 2 Oblong Hole(s) 27 mm x 6 mm
3.7.6.2 Drainage 2: None
3.7.6.3 Drainage 3: None
3.7.6.4 Drainage 4: None
3.7.6.5 Drainage 5: None
3.7.6.6 Drainage 6: None

3.7.7 Overall dimensions: 1200 mm W. x 1500 mm H. (47.24” x 59.06”)

3.8 SASH(ES)

3.8.1 Material: NA, Not applicable

3.8.2 Finish: Not applicable

3.8.3 Joinery type: Not applicable

3.8.4 Reinforcement:

3.8.4.1 Reinforcement 1: Not applicable
3.8.4.2 Reinforcement 2: Not applicable
3.8.4.3 Reinforcement 3: Not applicable
3.8.4.4 Reinforcement 4: Not applicable
3.8.4.5 Reinforcement 5: Not applicable
3.8.4.6 Reinforcement 6: Not applicable

3.8.5 Weatherstripping:

3.8.5.1 Weatherstripping 1: Not applicable
3.8.5.2 Weatherstripping 2: Not applicable
3.8.5.3 Weatherstripping 3: Not applicable
3.8.5.4 Weatherstripping 4: Not applicable
3.8.5.5 Weatherstripping 5: Not applicable
3.8.5.6 Weatherstripping 6: Not applicable

3.8.6 Drainage:Not applicable

3.8.6.1 Drainage 1: Not applicable
3.8.6.2 Drainage 2: Not applicable
3.8.6.3 Drainage 3: Not applicable
3.8.6.4 Drainage 4: Not applicable
3.8.6.5 Drainage 5: Not applicable
3.8.6.6 Drainage 6: Not applicable

3.8.7 Overall dimensions:

3.8.7.1 Sash 1:N/A
3.8.7.2 Sash 2: N/A
3.8.7.3 Sash 3: N/A
3.8.7.4 Sash 4: N/A

3.9 DOOR SLAB

3.9.1 Description: N/A, N/A

3.9.2 Panel: N/A, N/A

3.9.3 Material:

3.9.3.1 Core fill: N/A, N/A
3.9.3.2 Skin: N/A, N/A
3.9.3.3 Sub-structure: N/A, N/A

3.9.4 Lite frame

3.9.4.1 Material: N/A, N/A

3.9.4.2 Joinery type: N/A

3.9.4.3 Weatherstripping: N/A

3.9.4.4 Overall dimensions: N/A

3.9.5 Drainage: N/A

3.10 HARDWARE

3.10.1 Operator: N/A

3.10.2 Lock: N/A

3.10.3 Quantity of Keepers: N/A

3.10.4 Quantity of Hinges: N/A

3.10.5 Quantity of Snubbers: N/A

3.11 GLAZING METHOD

3.11.1 Exterior face: EPDM Gasket

3.11.2 Interior face: EPDM Gasket and Silicone

3.12 SPACER

3.12.1 *Spacer Type: A1-D, Aluminum

3.12.2 *Spacer Name: A1-D

3.12.3 *Primary sealant: Aluminum (Mill Finish)

3.12.4 *Secondary sealant: Hot-Melt Butyl

3.13 GRID

3.13.1 Grid: N, No Grids

3.13.2 Grid type: N/A

3.13.3 Grid size: N/A

3.14 GLAZING

3.14.1 Type: Double Sealed Unit

3.14.2 Overall thickness: 25.83 mm (1.02")

3.14.3 *Filling Technique: Single probe

3.14.4 *Design Gas Fill: Argon/Air

3.14.5 *Gas Concentration: 90% Argon, 10% Air

3.14.6 Capillary tube: No

GLASS AND CAVITY PROPERTIES

	Thickness		*Emissivity							
	mm	inch	S1	S2	S3	S4	S5	S6	S7	S8
Glass 1	5.79	0.23	0.840	0.025						
Glass 2	4.89	0.19			0.840	0.840				
Glass 3	N/A	N/A					N/A	N/A		
Glass 4	N/A	N/A							N/A	N/A
Gap 1	15.15	0.60								
Gap 2	N/A	N/A								
Gap 3	N/A	N/A								

**: Data obtained from the manufacturer*

4 SPECIMEN PREPARATION PRIOR TO TEST

The test specimen was preconditioned at ambient laboratory conditions prior to the test. The surround panel-to-specimen interfaces were sealed with a non-reflective tape. The specimen was sealed on the exterior with a non-reflective tape.

5 TEST PARAMETERS

Tests to determine the Standardized Thermal Transmittance (Ust) of the specimen were performed in the guarded hot box located at Varennes, Quebec. The most recent calibration of the hot box apparatus was in 2017-11-15. The thermal performance evaluations were completed in accordance with the NFRC Test Procedure using a dynamic wind perpendicular to the specimen on the weather side and simulated natural convection on the room side. A zero static pressure differential was maintained across the specimen during the test by pressurizing the guard box on the room side. Data was collected over two successive 2 hour periods after 4 hours of steady state conditions as defined in section 5.2.1.A of the NFRC Test Procedure.

Heat Flow vs EMF Equation: Qmb (W) = -1.4 EMF (mV) + -1.5.

6 RESULTS

6.1 MEASURES TEST DATA

		Metric unit (Imperial unit)
6.1.1	Glass Thickness and Glazing Deflection	
6.1.1.1	*Glazing Deflection Before Test:*	*4.04 mm (0.16 inch)*
6.1.1.2	*Glazing Deflection During Test:*	*6.42 mm (0.25 inch)*
6.1.2	Heat Flows	
6.1.2.1	*Total Measured Input into Metering Box (Q):*	*187.20 W (639.33 BTU/hr)*
6.1.2.2	*Surround Panel Heat Flow (Q_{sp}):*	*46.69 W (159.44 BTU/hr)*
6.1.2.3	*Metering Box Wall Heat Flow (Q_{mb}):*	*-1.96 W (-6.68 BTU/hr)*
6.1.2.4	*Net Specimen Heat Loss (Q_s):*	*138.56 W (473.21 BTU/hr)*
6.1.3	Areas	
6.1.3.1	*Test Specimen Projected Area (A_s):*	*1,80 m² (19,38 ft²)*
6.1.3.2	*Test Specimen Interior Total (3-D) Surface Area (A_h):*	*1,92 m² (20,71 ft²)*
6.1.3.3	*Test Specimen Exterior Total (3-D) Surface Area (A_c):*	*1,85 m² (19,93 ft²)*
6.1.3.4	*Metering Box Opening Area (Amb):*	*5,95 m² (64,00 ft²)*
6.1.3.5	*Metering Box Baffle Area (A_{b1}):*	*5.57 m^2 (60.00 ft^2)*
6.1.3.6	*Surround Panel Interior Exposed Area (A_{sp}):*	*4,15 m² (44,62 ft²)*
6.1.4	Test Conditions	
6.1.4.1	*Average Metering Room Air Temperature (t_h):*	*20.93 °C (69.67 °F)*
6.1.4.2	*Average Cold Side Air Temperature (t_c):*	*-17.86 °C (-0.15 °F)*
6.1.4.3	*Average Guard/Environmental Air Temperature:*	*22.50 °C (72.50 °F)*
6.1.4.4	*Metering Room Maximum Relative Humidity:*	*14 % (14 %)*
6.1.4.5	*Measured Cold Side Wind Velocity:*	*6.44 km/h (4.00 mph)*
6.1.4.6	*Measured Maximum Static Pressure Difference Across Specimen:*	*0.11Pa (0.00 psf)*
6.1.4.7	*Surround Panel Thickness*	*102 mm (4 inches)*
6.1.4.8	*Surround Panel Conductance (C_{sp})*	*0,30 W/(m²C) (0,05 BTU/(hrft²°F))*
6.1.5	Surface Temperature Data	
6.1.5.1	*Area-Weighted Surround Panel Warm Side Surface Temperature (t_{sp1}):*	*20.20 °C (68.37 °F)*
6.1.5.2	*Area-Weighted Surround Panel Cold Side Surface Temperature (t_{sp2}):*	*-17.08 °C (1.26 °F)*
6.1.6	Results	
6.1.6.1	*Thermal Transmittance of Test Specimen (U_s)[1]:*	*1.98 ± 0.08 W/(m²C) (0.35 ± 0.01 BTU/(hrft²°F))*
6.1.6.2	*Standardized Thermal Transmittance of Test Specimen (U_{st})*	*1.94 ± 0.08 W/(m²C) (0.34 ± 0.01 BTU/(hrft²°F))*

7 CALCULATED DATA TEST

		Metric unit (Imperial unit)
7.1.1	Method B (Equivalent CTS Method)	
7.1.1.1	*Emittance of Glass (e_1):*	*0,84 (0,84)*
7.1.1.2	*Warm Side Baffle Emittance (e_{b1}):*	*0,91 (0,91)*
7.1.1.3	*Equivalent Warm Side Surface Temperature (t_1):*	*10.79 °C (51.42 °F)*
7.1.1.4	*Equivalent Weather Side Surface Temperature (t_2):*	*-15.23 °C (4.58 °F)*
7.1.1.5	*Warm Side Baffle Surface Temperature (t_{b1}):*	*20.25 °C (68.44 °F)*
7.1.1.6	*Measured Warm Side Surface Conductance (h_h):*	*7.59 W/(m²C) (1.34 BTU/(hrft²°F))*
7.1.1.7	*Measured Weather Side Surface Conductance (h_c):*	*29.28 W/(m²C) (5.16 BTU/(hrft²°F))*
7.1.1.8	*Test Specimen Thermal Conductance (C_s):*	*2.96 W/(m²C)(0.52 BTU/(hrft²°F))*
7.1.1.9	*Convection Coefficient (K):*	*2,04 W/(m2C1,25) (0,31) BTU/(hrft2°F1,25)*
7.1.1.10	*Radiative Test Specimen Heat Flow (Q_{r1}):*	*72.05 W (246.08 BTU/hr)*
7.1.1.11	*Conductive Test Specimen Heat Flow (Q_{c1}):*	*66.51 W (227.13 BTU/hr)*
7.1.1.12	*Radiative Heat Flux of Test Specimen (q_{r1}):*	*40.03 W/m² (12.70 BTU/(hr ft²))*
7.1.1.13	*Convective Heat Flux of Test Specimen (q_{c1}):*	*36.95 W/m² (11.72BTU/(hr ft²))*
7.1.1.14	*Standardized Warm Side Surface Conductance (h_{sth}):*	*6.95 W/(m²C) (1.22 BTU/(hrft²°F))*
7.1.1.15	*Standardized Cold Side Surface Conductance (h_{stc}):*	*30,00 W/(m²C) (5,28 BTU/(hrft²°F))*
7.1.1.16	*Standardized Thermal Transmittance (Ust) [1]:*	*1.94 ± 0.08 W/(m²C) (0.34 ± 0.01 BTU/(hrft²°F))*
7.1.2	Test Duration	
7.1.2.1	*The environmental systems were started on:*	*2017-12-14 at 08:22 AM*
7.1.2.2	*The test parameters were considered stable for two consecutive two hours test periods on:*	*2017-12-15 from 02:22 AM to 06:17 AM*
7.1.2.3	*The thermal performance test results were derived from:*	*2017-12-15 from 04:22 AM to 06:17 AM*

[1] *Uncertainty : 95% confidence interval*

8 GENERAL COMMENTS

None

9 CONCLUSION

This test method does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which may be expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that may occur due to the specific design and construction of the fenestration system opening. Therefore, it should be recognized that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage, and thermal bridge effects.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report, representative sections of the test specimen will be retained by CLEB laboratory Inc. for a period of 2 1/2 years and report will be retained by CLEB laboratory Inc. for a period of 5 years. The results obtained apply only to the specimen tested. Testing described in this report was conducted in full compliance with NFRC requirements.

Appendix A of this report includes drawings and information of the product.

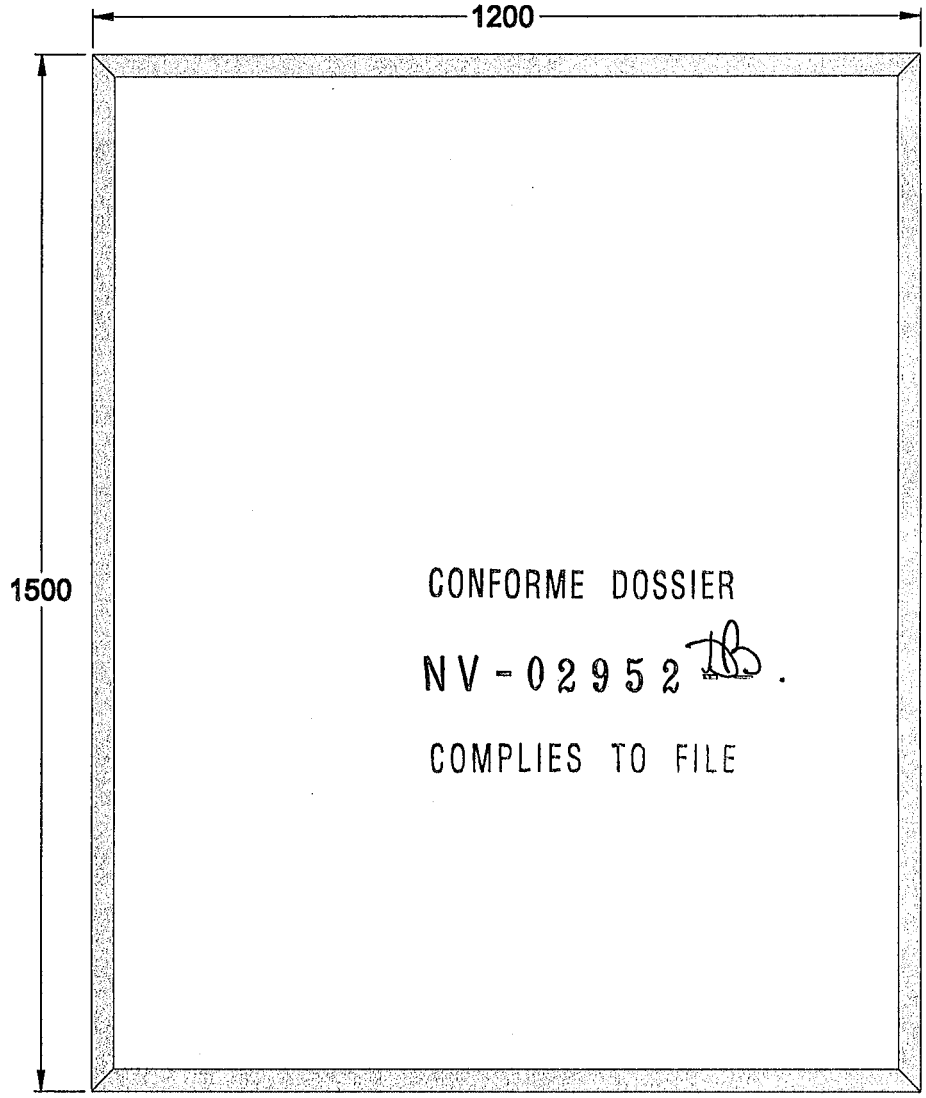
10 REVISION LOG

Revision Number	Revision Date	Description

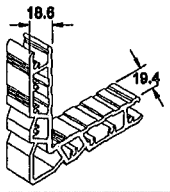
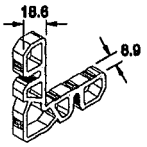
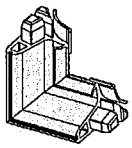
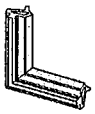
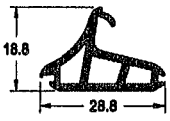
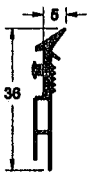
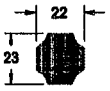
APPENDIX A – DRAWINGS AND PRODUCT INFORMATIONS

Build of Materials

A/A	Code	Description	Material
1	**450-107**	Frame profile	5.4m
2	**540-773**	Bead profile	5.2m
3	**EA450-362**	Joint corner for frame	4pcs
4	**EA450-361**	Joint corner for frame	4pcs
5	**EA450-875**	Vulcanized epdm corner for central gasket	4pcs
6	**EA410-874B**	Vulcanized epdm corner for frame gasket	4pcs
7	**US530-3PRM**	Glazing gasket	5.4m
8	**EA570-448M**	External epdm glazing gasket	5.4m
9	**EA450-411M**	Epdm central gasket	5.4m
10	**EA450-388M**	Insulation Bars Neocoat EPS (λ=0,03 W/m x K)	5.4m
11	**E2900-585M**	Foam Insulation 35x10mm (λ=0,038 W/m x K)	5.4m
12	**E2900-586M**	Foam Insulation 19x5mm (λ=0,038 W/m x K)	5.4m

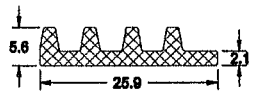


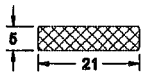
ACCESSORIES

	Code: **EA450-361U**	Description CRIMPING CORNER 19.4 x 18.6 mm (SIEGENIA)
	Code: **EA450-362U**	Description CRIMPING CORNER 8.9 x 18.6 mm
	Code: **EA450-875M**	Description VULCANIZED EPDM CORNER FOR CENTRAL GASKET EA450-411M
	Code: **EA410-874B**	Description VULCANIZED EPDM CORNER FOR FRAME GASKET EA410-408M
	Code: **US530-4PRM** (4mm)	Description GLAZING GASKET
	Code: **EA450-411M**	Description EPDM CENTRAL GASKET
	Code: **EA570-448M**	Description EPDM GLAZING GASKET
	Code: **EA450-388M**	Description Insulation Bars Neocoat EPS (λ=0,03 W/m x K)

CONFORME DOSSIER
NV-02952
COMPLIES TO FILE

ACCESSORIES

	Code: **E2900-585**	Description: FOAM INSULATION 35x10mm (λ=0,038 W/m x K)

	Code: **E2900-586**	Description: FOAM INSULATION 19x5mm (λ=0,038 W/m x K)

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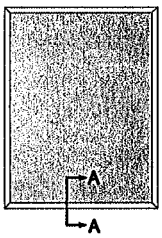
NV-02952 DB.

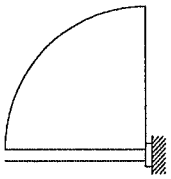
COMPLIES TO FILE

FIX WINDOW

ΟΨΗ
FRONT VIEW



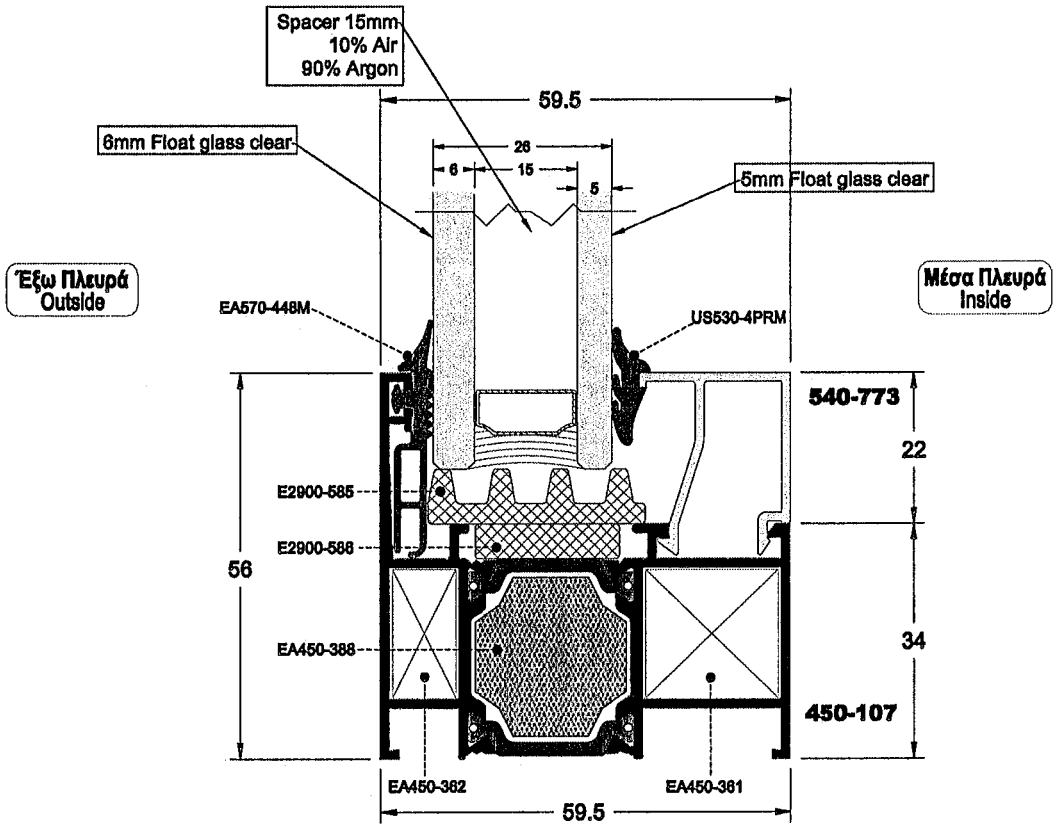
ΚΑΤΟΨΗ
TOP VIEW



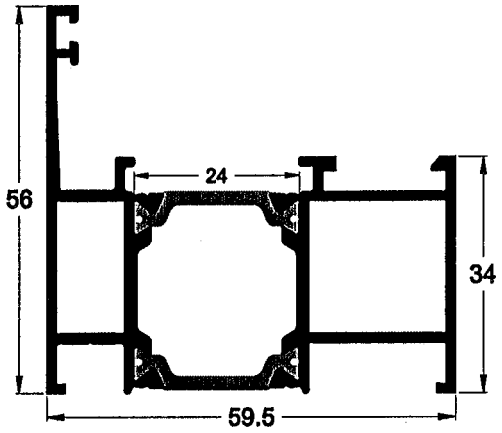
CONFORME DOSSIER

NV-02952 DB.

COMPLIES TO FILE



FIX WINDOW

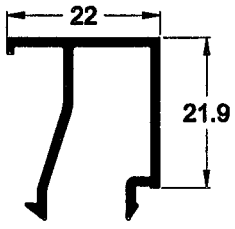


Κωδικός | Code	450-107
Βάρος | Weight	1197 gr/m
Περιγραφή	Κάσα
Description	Frame

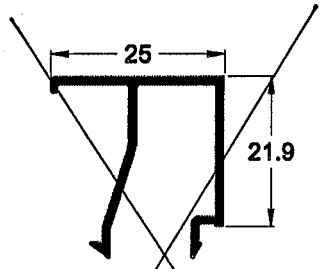
CONFORME DOSSIER

NV-02952

COMPLIES TO FILE

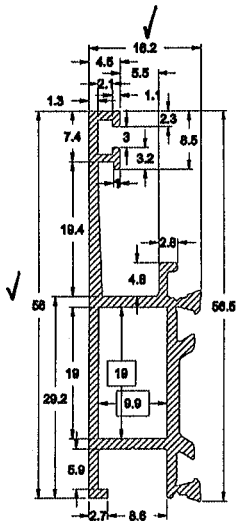


Κωδικός | Code	540-773
Βάρος | Weight	275 gr/m
Περιγραφή	Πηχάκι
Description	Bead

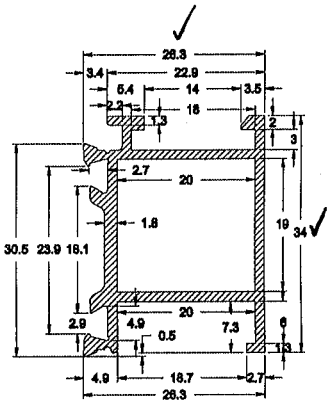


Κωδικός | Code	540-774
Βάρος | Weight	286 gr/m
Περιγραφή	Πηχάκι
Description	Bead

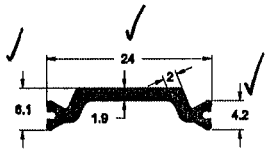
CASEMENT WINDOW



Code	450-1K7
Weight	545 gr/m
Description	Frame



Code	450-1B1
Weight	512 gr/m
Description	Frame

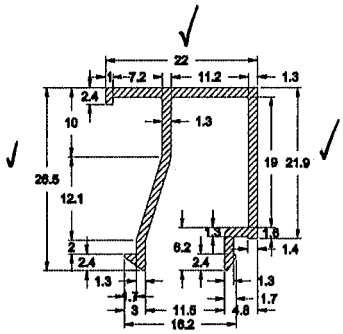


Code	3120-024
Weight	70 gr/m
Description	Polyamide

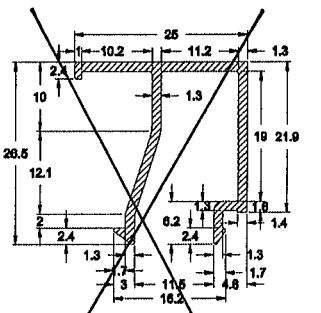
CONFORME DOSSIER

NV - 02952 DB.

COMPLIES TO FILE



Code	540-773
Weight	275 gr/m
Description	Bead



Code	540-774
Weight	286 gr/m
Description	Bead DB.

Material Data sheets

Insulating Profiles made of **PA 66 GF 25 / Recycled PA 66 GF25** – dry impact resistant

No.	Characteristic	Reference standard	Unit	Samples prepared from extruded insulating strips		Injected-moulded samples
				Dry[1]	Equilibrium[2] moisture content	Dry[1]
1	Melting temperature	EN ISO 11357-3	°C	min. 250 [3]	min. 250 [3]	min. 250 [3]
2	Density	EN ISO 1183-1 or -3	g/cm³	1.3 +/- 0.05	1.3 +/- 0.05	1.3 +/- 0.05
3	Annealing residue (glass fibre content)	EN ISO 1172	%	25 +/- 2.5	25 +/- 2.5	25 +/- 2.5
4	Shore hardness D	EN ISO 868	-	82 +/- 4 [4]	78 +/- 4 [4]	84 +/- 2
5	Impact strength	EN ISO 179-1	kJ/m²	min. 30 or without break [5]	min. 40 or without break [5]	min. 35 [6]
6	Tensile strength	EN ISO 527-2 and -4	N/mm²	min. 80 [7]	min. 50 [7]	min. 110 [8]
7	Young's modulus	EN ISO 527-2 and -4	N/mm²	min. 4500 [7]	min. 2000 [7]	min. 6000 [8]
8	Elongation at break	EN ISO 527-2 and -4	%	min. 3 [7]	min. 7 [7]	min. 3 [8]

(1) Sample water content less than 0.2 % by weight (2) Fast conditioning acc. to EN ISO 1110 (23°C/50%) (3) Maximum temperature 300°C
(4) Specimen thickness 2mm, unstacked (5) Specimen Typ 2fU (50 mm x 10 mm x 2mm) (6) Specimen Typ 1fU (80 mm x 10 mm x 4mm) (7) Specimen Typ 1BA
(8) Specimen Typ 1A

Insulating strips of **Low Lambda PA 66 GF25** - dry impact resistant

No.	Characteristic	Reference standard	Unit	Samples prepared from extruded insulating strips	
				Dry[1]	Equilibrium[2] moisture content
1	Melting temperature	EN ISO 11357-3	°C	min. 250 [3]	min. 250 [3]
2	Density	EN ISO 1183-1 or -3	g/cm³	1.0 +/- 0.1	1.0 +/- 0.1
3	Annealing residue (glass fibre content)	EN ISO 1172	%	25 +/- 2.5	25 +/- 2.5
4	Shore hardness D	EN ISO 868	-	77 +/- 4 [4]	67 +/- 4 [4]
5	Impact strength	EN ISO 179-1	kJ/m²	min. 20 [5]	min. 30 [5]
6	Tensile strength	EN ISO 527-2 and -4	N/mm²	min. 50 [6]	min. 35 [6]
7	Young's modulus	EN ISO 527-2 and -4	N/mm²	min. 2900 [5]	min. 1300 [6]
8	Elongation at break	EN ISO 527-2 and -4	%	min. 5 [6]	min. 8 [6]

1) Sample water content less than 0,2% by weight 2) Fast conditioning acc. to EN ISO 1110 (23°C / 50%) 3) Maximum temperature 300°C
4) Specimen thickness 2mm, unstacked 5) Specimen Typ 2fU (50 mm x 10 mm x 2mm) 6) Specimen Typ 1BA

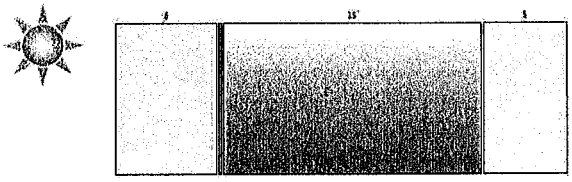
CONFORME DOSSIER
NV - 02952
COMPLIES TO FILE

GUARDIAN CONFIGURATOR
GLASS PERFORMANCE CALCULATOR

KIWA confirms to have verified the calculation engine of the software Guardian Configurator 4.1 TESTED BY kiwa to be compliant to EN 410 and EN 673.

Product code

69 / 38 / 1,0



total thickness = 26 mm

Glazing from external to internal:

	Pane 1		Pane 2
6 mm	Float Glass ExtraClear SunGuard SN 70/37 HT	5 mm	Float Glass Clear Guardian

	Spacer 1 - 15 mm
10%	Air
90%	Argon

Results

Visible light (EN 410 - 2011)		Solar energy (EN 410 - 2011)	
transmittance [%]	τ_v = 69,0	solar factor [%]	g = 38,0
reflectance external [%]	ρ_v = 12,3	shading coefficient [g/0.87]	sc = 0,44
reflectance internal [%]	ρ_v = 13,1	direct transmittance [%]	τ_e = 35,1
general colour rendering index [%]	R_a = 93,5	direct reflectance external [%]	ρ_e = 35,3
		direct reflectance internal [%]	ρ_e = 36,8
Thermal properties (EN 673 - 2011)		direct absorption [%]	a = 29,6
U-value [W/(m²K)]	U_g = 1,0	UV transmittance [%]	τ_{uv} = 25,1
slope α = 90°		secondary internal heat transfer factor [%]	q_i = 2,9
		Other data	
		estimated sound reduction index [dB]	R_w = NPD
		(EN 717-1)	C = NPD
			C_{tr} = NPD

CONFORME DOSSIER

NV - 02952 DB.

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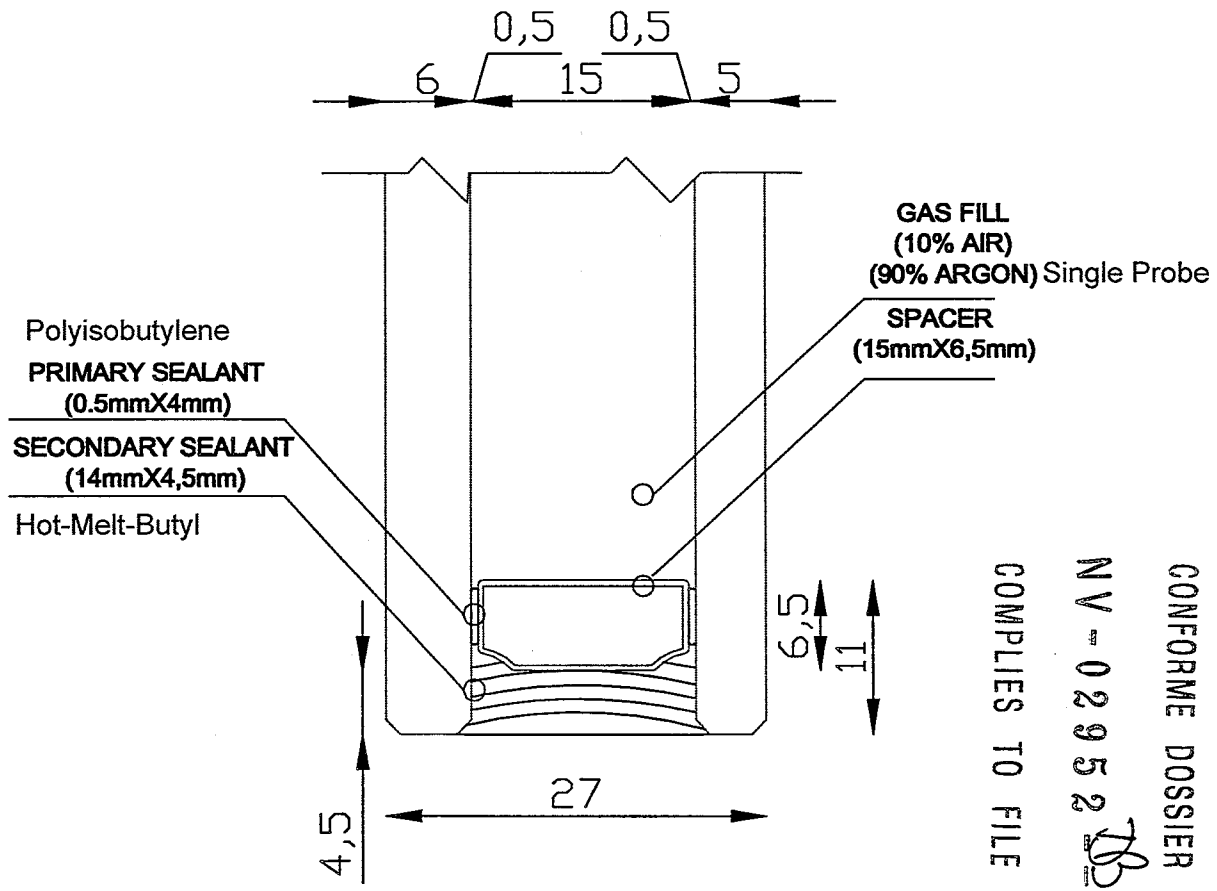
The calculated values are for orientation only and do not offer any guarantee regarding the fabrication of the un- intended end- product. Glass configurations do not amount to a guarantee of product availability.

VASILIOU GLASS TECHNOLOGIES
KARAGIANNIS VAGELIS

Date: 16/10/2017
Database version: 20170118
Program version: 4.1.181



CONFORME DOSSIER
NV-02952
COMPLIES TO FILE

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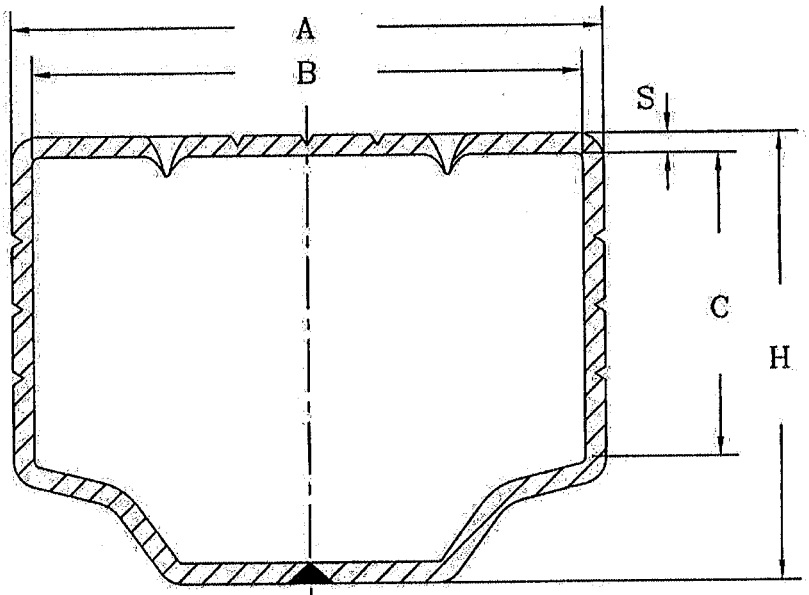

Mill finish Aluminum Spacer

PGS

RIFERIMENTI / TOLLERANZE / SIGLA (Profilo)	A + 0.05 - 0.15	H ± 0.10	S + 0.01 - 0.03	B ± 0.20	C + 0.20 - 0.10
P. 5.5 S.L.	5.60	6.55	0.36	4.70	4.20
P. 6.5	6.50	6.50	0.36	5.70	4.20
P. 7.5	7.50	6.50	0.36	6.70	4.20
P. 8.5	8.45	6.50	0.36	7.65	4.20
P. 9.5	9.45	6.50	0.36	8.65	4.20
P. 10.5	10.45	6.50	0.36	9.65	4.20
P. 11.5	11.45	6.50	0.36	10.65	4.20
P. 12.5	12.45	6.50	0.36	11.65	4.20
P. 13.5	13.45	6.50	0.36	12.65	4.20
P. 14.5	14.45	6.50	0.36	13.65	4.20
P. 15.5	15.45	6.50	0.36	14.65	4.20
P. 17.5	17.45	6.50	0.36	16.65	4.20
P. 18.5	18.45	6.50	0.36	17.65	4.05
P. 19.5	19.45	6.50	0.36	18.65	4.20
P. 21.5	21.45	6.50	0.36	20.65	4.05
P. 23.5	23.45	6.50	0.36	22.65	4.05
P. 26.5	26.45	6.50	0.36	25.65	4.05

CONFORME DOSSIER

NV - 02952

COMPLIES TO FILE

NOTE:

A) Sulla lunghezza si considera una tolleranza di ± 3 mm

B) Per i profili verniciati, le misure esterne sono maggiorate di una quota variabile tra 12 e 20 µ