



**NFRC SIMULATION IN ACCORDANCE WITH  
ANSI/NFRC 100, ANSI/NFRC 200 and NFRC 500**

CLEB laboratory Inc.	Submitted to:	Reissued To:
Report No.: NS-02757-1 Rev.1	Aluminco S.A.	
Reissued Report No.: N/A	Inofita Greece 32011 +30 22620 47000	N/A

Report Summary			
Operation Type:	DATT	Product Line ID Number:	N/A
Series/Model:	AL 450	Report Type:	Initial Certification
Report Date:	2016-10-28	Simulation Date :	2016-10-28
Revision Date:	2017-04-18	Number of Pages:	6

Reissue Information			
Model:	N/A	Date of Reissue:	N/A
Reason for submittal:	N/A	Revision Date:	N/A
Product Line ID Number:	N/A		

Validation test sample configuration			
Operation Type:	DATT	Door description:	N/A
Series/Model:	AL 450	Panel	N/A
Frame Type:	AT	Core Fill:	N/A
Sash Type:	AT	Skin:	N/A
Reinforcement:	None	Sub-Structure:	N/A
Size:	1200 mm W. x 1500 mm H. (47.24" x 59.06")		

**Glazing: FZTE\_SB70XL#2-Arg90-ClrPPG**

Type: Double Sealed Unit  
 Spacer Type: S6-D  
 Overall Thickness: 28.98 mm (1.14")  
 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
<b>Glass 1</b>	5.0	0.20	0.842	0.018						
<b>Glass 2</b>	6.0	0.24			0.840	0.840				
<b>Glass 3</b>	N/A	N/A					N/A	N/A		
<b>Glass 4</b>	N/A	N/A							N/A	N/A
<b>Gap 1</b>	17.98	0.71								
<b>Gap 2</b>	N/A	N/A								
<b>Gap 3</b>	N/A	N/A								

**U:2.07 W/(m².K); 0.36 BTU/(hr.ft².F)**

Note: Reference must be made to CLEB laboratory Inc. complete report for specimen description and detailed simulation results.

Simulated by:

Dave Deshaies Mc Mahon, Eng.  
 Simulator, Thermal Evaluation  
 CLEB laboratory Inc.

Approved by:

Ingrid Volbert  
 NFRC Certified Simulator, Person in Responsible Charge  
 CLEB laboratory Inc.

**Montréal**  
 1320 boul. Lionel-Boulet  
 Varennes, Québec J3X 1P7  
 montreal@cleb.com

**Québec**  
 420 boul. Charest Est, suite 300  
 Québec, Québec G1K 8M4  
 quebec@cleb.com

**Ottawa**  
 29 Capital Drive, suite 200  
 Ottawa, Ontario K2G 0E7  
 ottawa@cleb.com

**Truro**  
 64 Inglis Place, suite 203  
 Truro, Nova Scotia B2N 4B4  
 truro@cleb.com

**New York**  
 747 Third Avenue, 2<sup>nd</sup> Floor  
 New York, NY 10017  
 newyork@cleb.com

www.cleb.com  
 T 855.353.CLEB [2532]

CLEB usa



## TABLE OF CONTENTS

1	INTRODUCTION .....	1
2	SPECIFICATION .....	1
3	DISCLAIMER.....	1
4	PRODUCT DESCRIPTION .....	2
5	SIMULATION RESULTS.....	4
6	REVISION LOG .....	6

## LIST OF TABLES

TABLE 1: CENTER OF GLAZING RESULTS.....	4
TABLE 2: OVERALL FENESTRATION PRODUCTS RESULTS .....	5

## APPENDIX A: DRAWINGS AND PRODUCT INFORMATION



## NFRC SIMULATION IN ACCORDANCE WITH: ANSI/NFRC 100, ANSI/NFRC 200 AND NFRC 500

### 1 INTRODUCTION

---

**CLEB laboratory Inc.** has been retained by Aluminco S.A. to evaluate a *tilt turn* in accordance with ANSI/NFRC 100 Procedure for Determining Fenestration Product U-Factors, ANSI/NFRC 200 Solar Heat Gain Coefficient and Visible Transmittance and NFRC 500 Procedure for Determining Fenestration Product Condensation Resistance Values. The product components and manufacturing details are documented in section 4 of this report. Rounding is per NFRC 601 NFRC Unit and Measurement Policy. All imperial values are for reference only. Appendix A of this report includes drawings and information of the product.

Rating values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes.

The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Simulations were conducted in full compliance with NFRC requirements.

### 2 SPECIFICATION

---

ANSI/NFRC 100-2014:	Procedure for Determining Fenestration Product U-Factors
ANSI/NFRC 200-2014:	Solar Heat Gain Coefficient and Visible Transmittance
NFRC 101-2014:	Procedure for Determining Thermophysical Properties of Materials for Use in NFRC-Approved Software
NFRC 500-2014:	Procedure for Determining Fenestration Product Condensation Resistance Values
NFRC 601-2010:	NFRC Unit and Measurement Policy
WINDOW 7:	Software by Lawrence Berkeley National Laboratory
THERM 7:	Software by Lawrence Berkeley National Laboratory

### 3 DISCLAIMER

---

Data required for this evaluation were taken from the best available sources and every effort was taken to accurately perform the simulation documented in this report. Because of the large amount of input data and analysis it is possible that errors or omissions could occur. Neither CLEB laboratory Inc. nor any of its employees shall be held responsible for any loss or damage resulting directly or indirectly from any default, error or omission.

Report No: **NS-02757-1 Rev.1**, Reissued: **N/A**

**AL 450**

**Simulation in accordance with ANSI/NFRC 100, 200, NFRC 500**

*The results in this report relate only to the items evaluated. This report shall not be reproduced except in full, without the written approval of CLEB laboratory Inc.*



## 4 PRODUCT DESCRIPTION

---

### 4.1 OPERATOR TYPE:

DATT, Tilt Turn

### 4.2 SERIES/MODEL:

AL 450

### 4.3 FRAME:

- 4.3.1 Material: AT, Aluminium w/ Thermal breaks - All members
- 4.3.2 Finish: Painted Aluminum
- 4.3.3 Reinforcement: None
- 4.3.4 Weatherstrippings: Compression bulb at all perimeter  
Compression weatherstripping at all perimeter
- 4.3.5 Continuous Hardware: No hardware was required to be modeled
- 4.3.6 Overall dimensions: 1200 mm W. x 1500 mm H. (47.24 "x 59.06")

### 4.4 SASH(ES)

- 4.4.1 Material: AT, Aluminium w/ Thermal breaks - All members
- 4.4.2 Sash 1:
  - 4.4.2.1. Finish: Painted Aluminum
  - 4.4.2.2. Reinforcement(s): None
  - 4.4.2.3. Weatherstripping(s): Compression bulb at all perimeter
  - 4.4.2.4. Continuous Hardware: No hardware was required to be modeled
- 4.4.3 Sash 2: N/A
- 4.4.4 Sash 3: N/A
- 4.4.5 Sash 4: N/A



**4.5 GLAZING METHOD:**

- 4.5.1 Exterior face: EPDM gasket
- 4.5.2 Interior face: EPDM gasket

**4.6 SPACER:**

Spacer type:	Material:	Primary sealant:	Secondary
sealant:			
Fenzi Thermal Edge (S6-D) Polysulphide	Vinyl and Steel	Polyisobutylene	

**4.7 GRID:**

- 4.7.1 Grid: None
- 4.7.2 Material and finish: N/A
- 4.7.3 Standard NFRC Grid Pattern: N/A

**4.8 GLAZING:**

- 4.8.1 Filling Technique: Single probe
- 4.8.2 Capillary tube: No
- 4.8.3 Gas fill percentage: 90% Argon, 10% Air
- 4.8.4 Comment: None



## 5 SIMULATION RESULTS

**Table 1: Center of glazing results**

ID	Name	Insulating Glass Unit										U factor		SHGC	VT
		Glass 1				Gap 1		Glass 2				W/m2-K	Btu/hr-ft2-F		
		Type	mm	Emissivity		mm	gas	Type	mm	Emissivity					
				Surface #1	Surface #2					Surface #3	Surface #4				
10	SB70XL#2-Arg90-ClrPPG	Solarban70xl	5.0	0.842	0.018	17.98	Arg 90%	Clear, PPG	6.0	0.840	0.840	1.428	0.251	0.270	0.628

Report No: **NS-02757-1 Rev.1**, Reissued: **N/A**

**AL 450**

**Simulation in accordance with ANSI/NFRC 100, 200, NFRC 500**

*The results in this report relate only to the items evaluated. This report shall not be reproduced except in full, without the written approval of CLEB laboratory Inc.*

**Page 4 of 6**



**Table 2: Overall fenestration products results**

ID	Option Name	Insulating Glass Unit								Overall Product				
		Glass 1		Gap 1				Glass 2		U Factor		SHGC	VT	CR
		Type	mm	mm	Gas	Spacer	Grid	Type	mm	W/m2-K	Btu/hr-ft2-F			
10	FZTE_SB70XL#2-Arg90-ClrPPG	Solarban70xl	5.0	17.98	Arg 90%	S6-D	None	Clear, PPG	6.0	2.07	0.36	0.20	0.44	48

Report No: **NS-02757-1 Rev.1**, Reissued: **N/A**

**AL 450**

**Simulation in accordance with ANSI/NFRC 100, 200, NFRC 500**

*The results in this report relate only to the items evaluated. This report shall not be reproduced except in full, without the written approval of CLEB laboratory Inc.*

**Page 5 of 6**



## 6 REVISION LOG

---

<b>Revision Number</b>	<b>Revision Date</b>	<b>Description</b>
NS-02757-1 Rev.1	2017-04-18	Replace some existing drawings (assembly drawing, BOM, parts) by new drawings





## APPENDIX A: DRAWINGS AND PRODUCT INFORMATION

Report No: **NS-02757-1 Rev.1**, Reissued: **N/A**

**Simulation in accordance with ANSI/NFRC 100, 200, NFRC 500**

*The results in this report relate only to the items evaluated. This report shall not be reproduced except in full, without the written approval of CLEB laboratory Inc.*

**Build of materials (BOM):**

<b>AI-04639-A1 &amp; AI-04639-B1</b>			
<b>A/A</b>	<b>Code</b>	<b>Description</b>	<b>Material</b>
1	<b>450-108</b>	Frame profile	15m
2	<b>450-232</b>	Casement profile	10m
3	<b>450-302</b>	Transom profile	4m
4	<b>540-771</b>	Bead profile	21m
5	<b>EA450-153</b>	Extra crimping corner for casement	8pcs
6	<b>EA450-186</b>	Crimping corner for frame	8pcs
7	<b>EA450-169</b>	Crimping corner for frame	8pcs
8	<b>EA450-161</b>	Crimping corner for casement	8pcs
9	<b>EA410-216</b>	Alignment corner	8pcs
10	<b>EA450-141L/R</b>	Transom connector	8pcs
11	<b>EA450-875</b>	Vulcanized epdm corner for central gasket	12pcs
12	<b>EA450-874M</b>	Vulcanized epdm corner for sash gasket	8pcs
13	<b>EA410-874B</b>	Vulcanized epdm corner for frame gasket	12pcs
14	<b>US530-3PRM</b>	Glazing gasket	9m
15	<b>EA570-448M</b>	External epdm glazing gasket	9m
16	<b>EA410-408M</b>	Epdm gasket for sash & frame with weatherstrips foam	17m
9m	<b>EA450-411M</b>	Epdm central gasket	9m
18	<b>US710-01IA</b>	Handle for perimetrical mechanism Siegenia	2pcs
19	<b>Favorit Siegenia</b>	Perimetric mechanism ALU16	-





## **AL450 DUAL-ACTION WINDOW**

Manufacturer ALUMINCO S.A, Inofita Viotias  
Designation / Type / Item No. AL450/ ALU16/ AI-04639-A1  
Material Aluminium profiles with thermal break  
Type of opening Turn/ tilt and turn  
Opening directions Active casement: right inwards opening

### **Frame member**

Further details are given in drawings  
Designation / Type / Item No. 450-108  
Overall dimensions in mm ~~1200 x 1800mm~~  
Type of joint Mitred, compressed by using crimping corner EA450-186 and EA450-169 and sealed with pourable sealant

### **Casement member**

Further details are given in drawings  
Designation / Type / Item No. 450-232  
Overall dimensions in mm Active casement: 1748 x 1148mm  
Type of joint Mitred, internal with crimping corner EA450-161, crimping corner EA450-153 and alignment corner EA410-216

### **Rebate design**

Rebate drainage  
In frame member 2 slots 6x30mm to the outside with cover caps EA410-836M  
In frame member 2 slots 6X25mm to the inside

### **Rebate seal external**

EA410-408M  
Material EPDM with foam  
Corner design At top and bottom butt jointed and bonded on end caps EPDM corner EA410-874B & EA410-874M

### **Centre seal**

EA450-411  
Material EPDM  
Corner design At top and bottom in each case butt to overlap end caps and bonded using EPDM corner EA450-875M

### **IGU double**

Thickness in mm 27  
Configuration in mm Float 6/ SZR16/ Float 5

### **Incorporation on infill panel**

Vapour pressure equalisation

2 slots 6x25mm at the bottom of the casement  
2 slots 6x25mm at the top of the casement  
and 1 drills Ø6mm at the top of each side of the  
frame

**Glazing gasket external**

Designation / Type / Item No.

EA570-448M

Material

Sealing material-EPDM

Corner design

Continuous, at top centre mitred and bonded

**Glazing gasket internal**

Designation / Type / Item No.

US530-3PRM

Material

Sealing material-EPDM

Corner design

Continuous, at top centre mitred and bonded

**Glazing bead**

Designation / Type / Item No.

540-773

Type of joint

Butt-jointed

Fixing method

Clamped

**Tilt and turn hardware**

Manufacturer

Siegenia

Designation / Type / Item No.

Favorit ALU16

Type of opening turn/ tilt and turn

Turn/ tilt and turn

Hinges/Bearings

Active casement: 2 hinges, 1 tilt mechanism

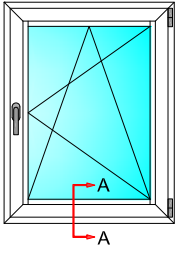
Number of locks

Active casement: 9 lockings

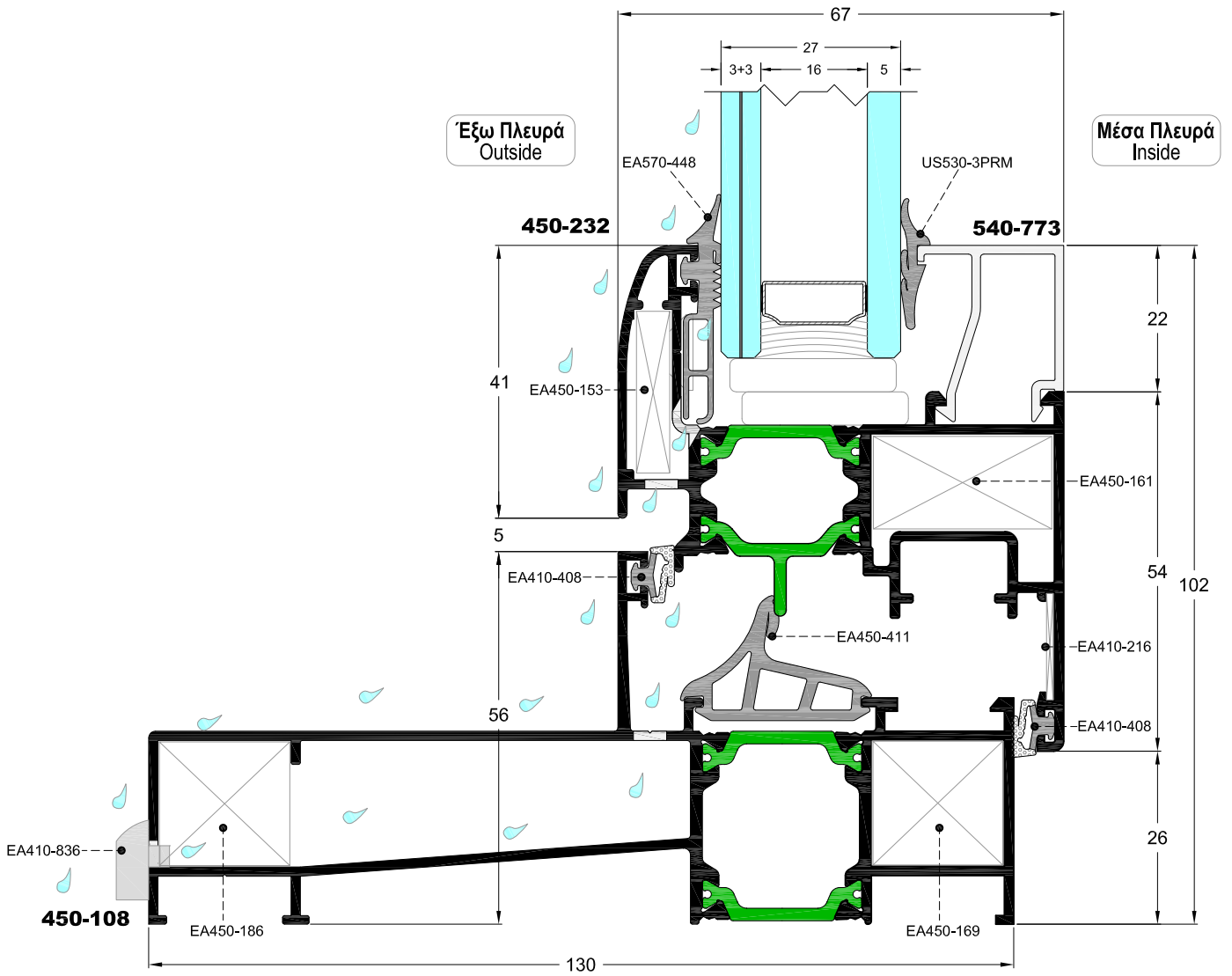
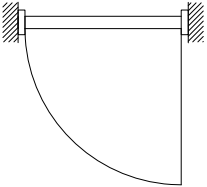


**AI-04639-A1**  
**DUAL-ACTION WINDOW**

**ΟΨΗ**  
**FRONT VIEW**

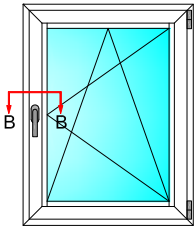


**ΚΑΤΟΨΗ**  
**TOP VIEW**

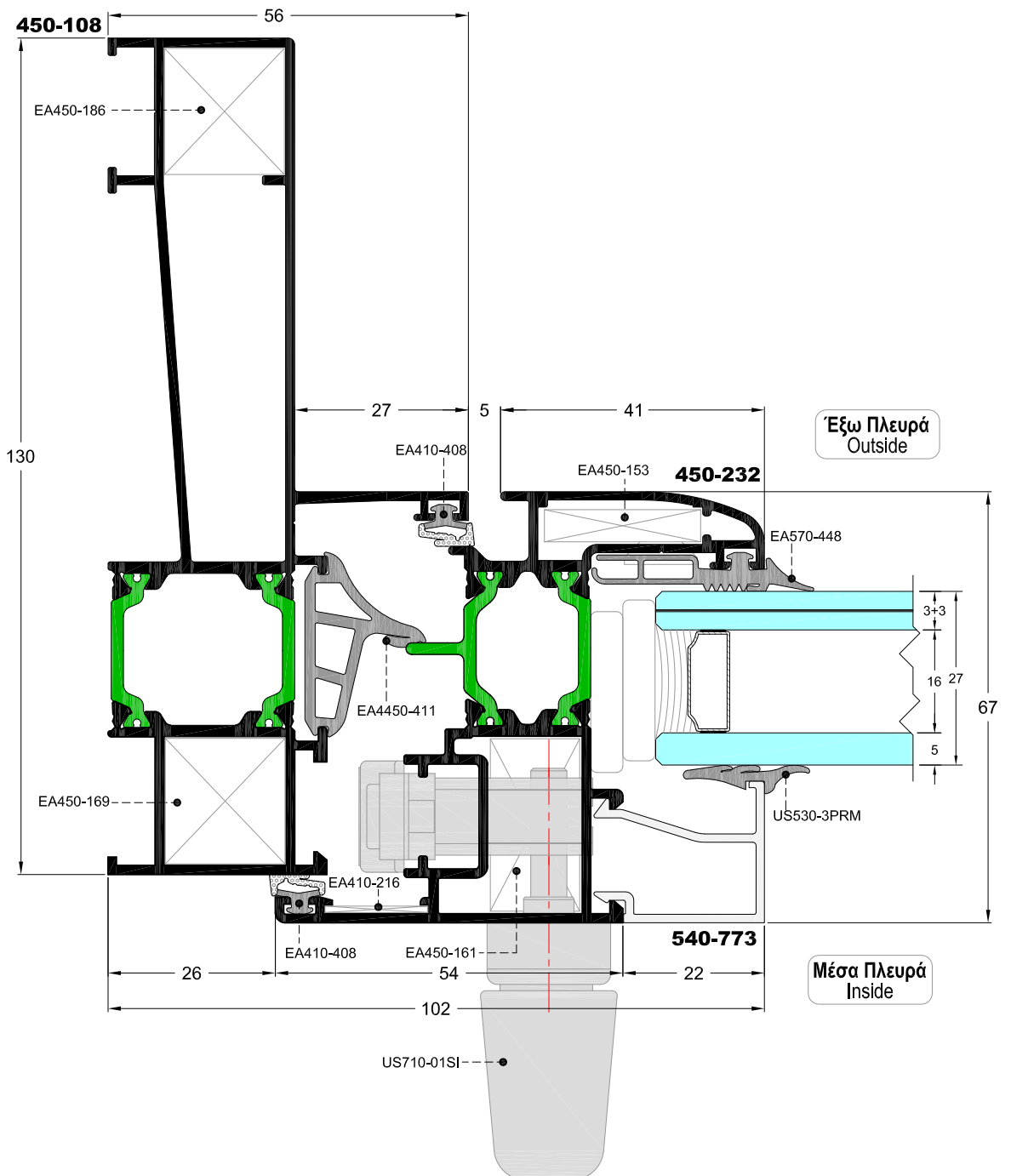
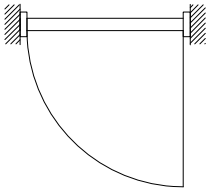


**AI-04639-A1**  
**DUAL-ACTION WINDOW**

**ΟΨΗ**  
**FRONT VIEW**

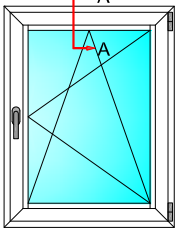


**ΚΑΤΟΨΗ**  
**TOP VIEW**

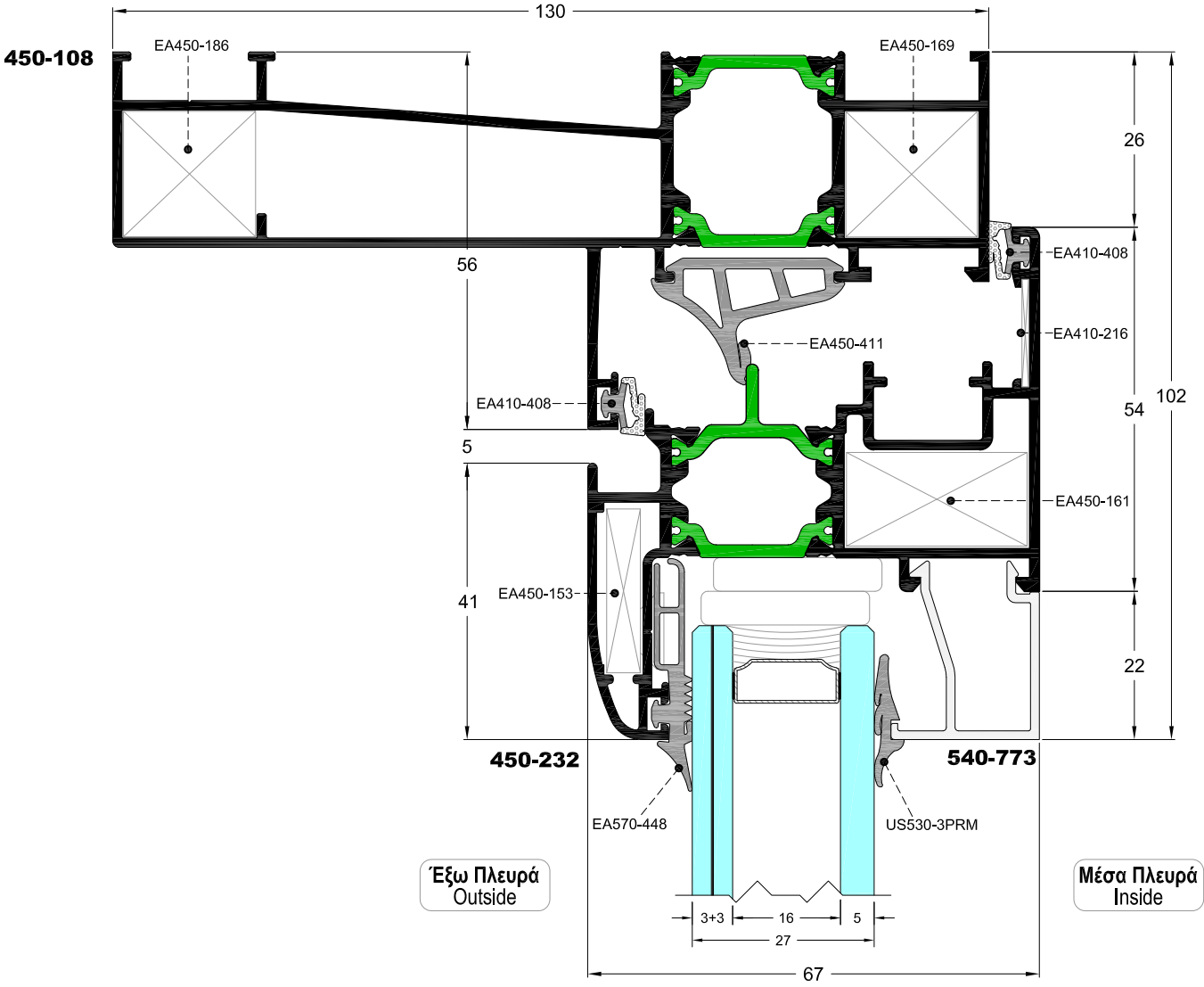
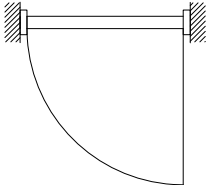


**AI-04639-A1**  
**DUAL-ACTION WINDOW**

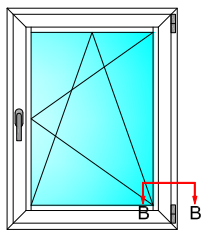
**ΟΨΗ**  
**FRONT VIEW**



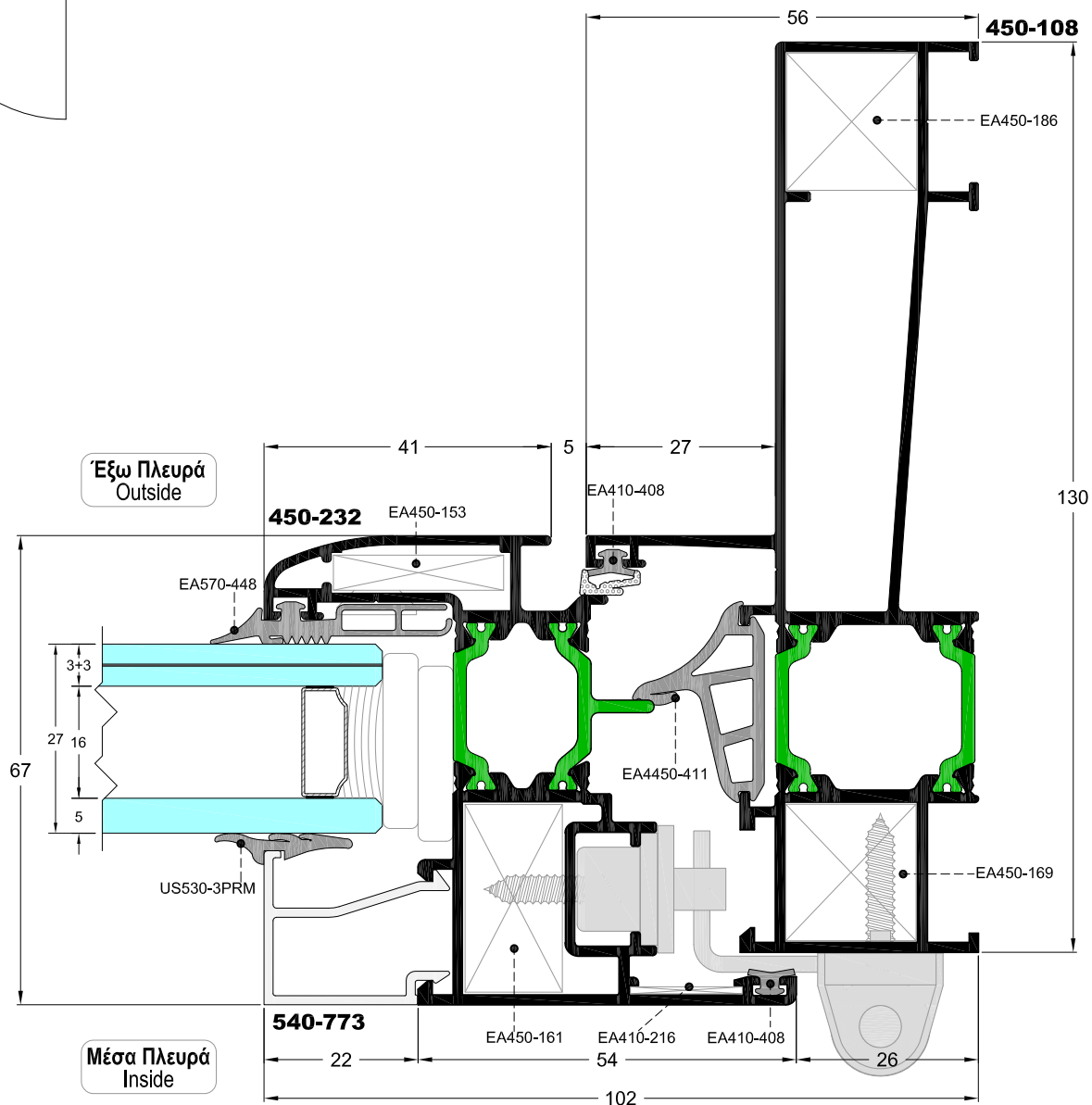
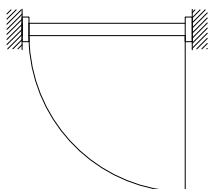
**ΚΑΤΟΨΗ**  
**TOP VIEW**



**AI-04639-A1**  
**DUAL-ACTION WINDOW**



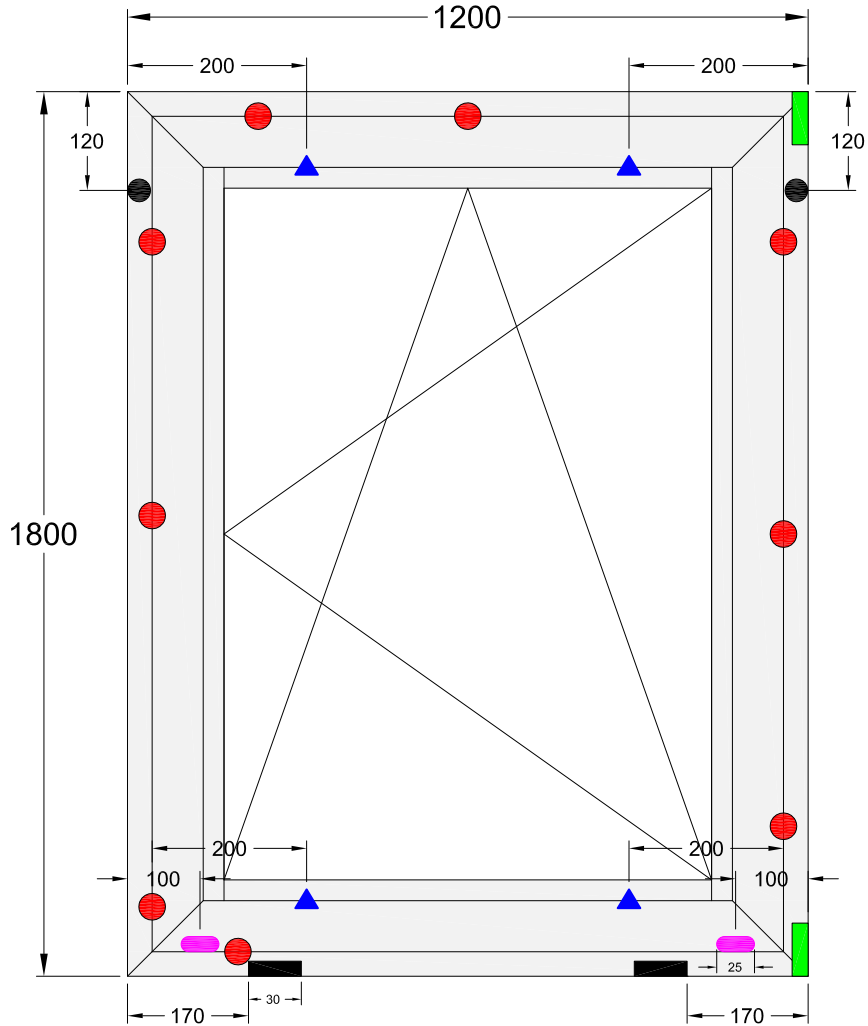
**ΚΑΤΟΨΗ**  
**TOP VIEW**

















# AI-04639-A1

## DUAL-ACTION WINDOW



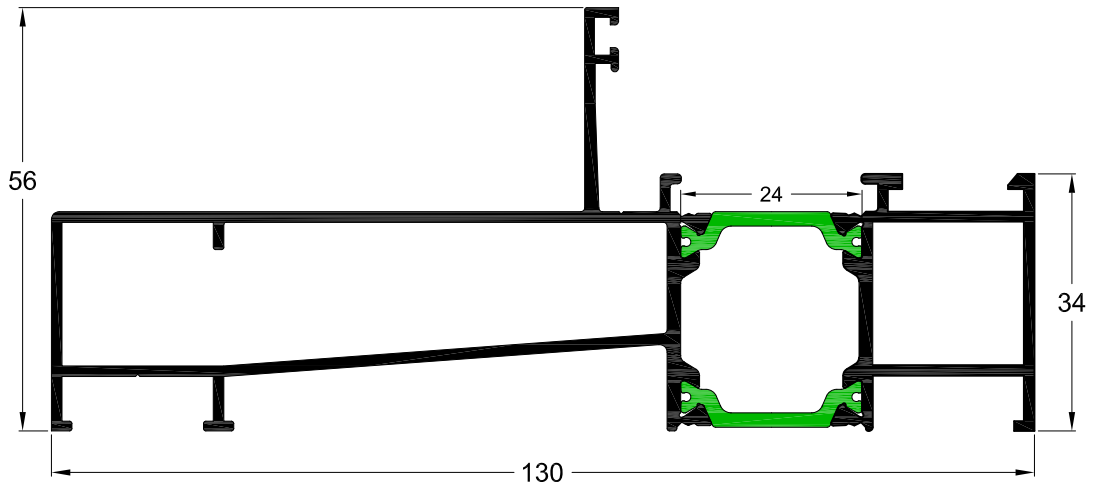
	9 LOCKINGS
	2 HINGES
	2 CASEMENT DRAINAGE 25mm
	2 INTERNAL FRAME DRAINAGE 25mm
	2 EXTERNAL FRAME DRAINAGE 30mm
	2 VENT HOLES Ø6mm



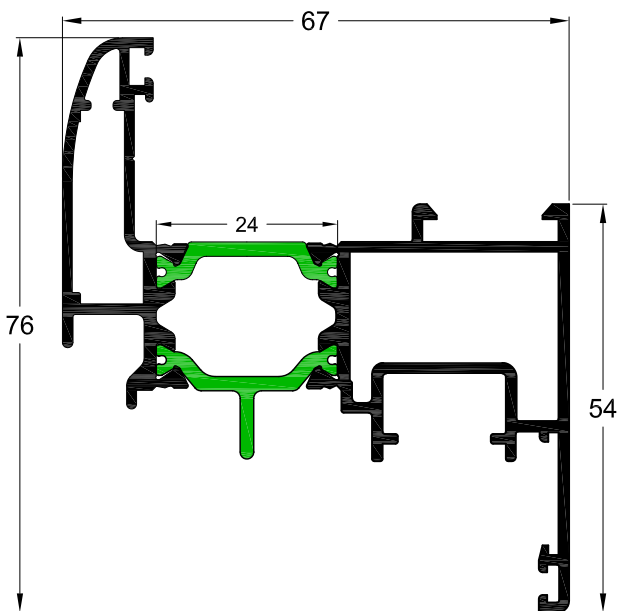
-  HINGES
-  LOCKINGS
-  EXTERNAL FRAME DRAINAGE
-  INTERNAL FRAME DRAINAGE
-  CASEMENT DRAINAGE
-  VENT HOLE

\*DIMENSIONS IN mm

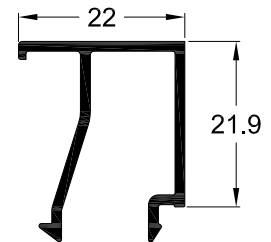
**AI-04639-A1**  
**DUAL-ACTION WINDOW**



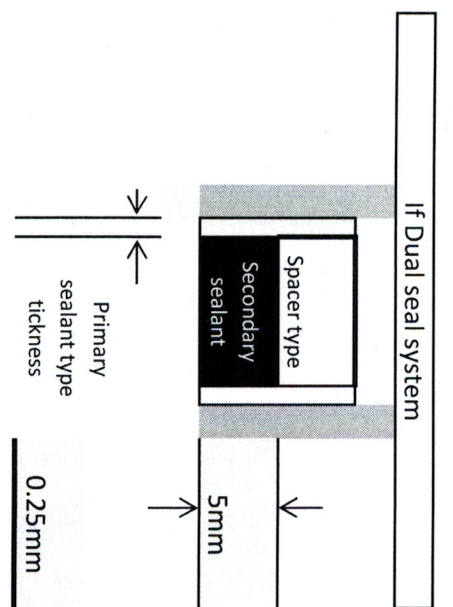
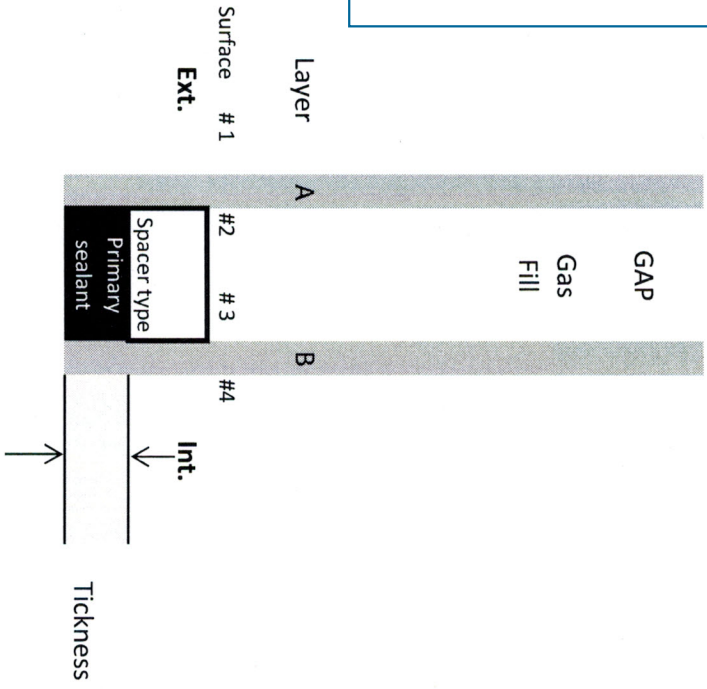
Κωδικός   Code	450-108
Βάρος   Weight	1796 gr/m
Περιγραφή	Κάσα
Description	Frame



Κωδικός   Code	450-232
Βάρος   Weight	1414 gr/m
Περιγραφή	Φύλλο (ALU 16)
Description	Casement (ALU 16)



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



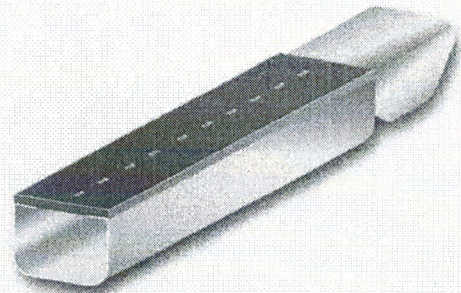
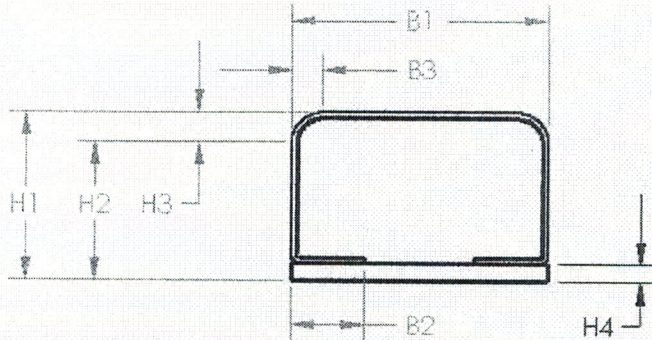
TECHNICAL DATA	
1- Unit thickness overall	30mm
2- Primary sealant type	BUTYLVER FENZI
3- Secondary sealant type	POLYSULPHIDE FENZI
4- Dessiccant type	MOLVER MGM-01 FENZI
5- Low-e glass type	PPG solarban 70
6- Surface # of Low-e coating	#2
7- Spacer type	FENZI WARMEDGE HYGRADE
8- Thickness of each layer A-B	5MM <del>6MM</del> 6MM
9- Gas type	Argon
10- Gas filling method	SGD-4 GAS FILLING MACHINE
11- % of gas filling	<del>AVERAGE 95%</del> 90%

TOPIC:  
FENZI THERMALEDGE (Hygrade Metal) Spacer  
Technical Specifications

DATE: January 2010

**1. Spacer Properties**

**Cross Section and Tolerances**



Description	Air Space Height * Fixed	PIB Flange * Fixed	Spacer Back Fill Cavity * Fixed	Thermal Bridge Thickness	Air Spacer Width * Varies	Metal Spacer Lip * Fixed	Spacer Cavity Back Fill
Spacer Bar Width	H1 +/- .05	H2 +/- .003	H3	H4 + / - .003	B1 +/- .005	B2 + / - .010	B3
1/4	.285	.215	.067	.036	.250	.105	.067
3/8	.285	.215	.067	.036	.375	.105	.067
7/16	.285	.215	.067	.036	.438	.105	.067
1/2	.285	.215	.067	.036	.500	.105	.067
17/32	.285	.215	.067	.036	.531	.105	.067
9/16	.285	.215	.067	.036	.563	.105	.067
5/8	.285	.215	.067	.036	.625	.105	.067
11/16	.285	.215	.067	.036	.688	.105	.067
3/4	.285	.215	.067	.036	.750	.105	.067

**\*Please Note:**  
Dimensions fixed, with only the spacer width varying  
Chrome steel thickness fixed at .008 +/- .005

Description		Internal Test Method
1.2	<b>Spacer geometry /shape</b> The spacer geometry shape is shown in the cross section picture above. Tolerances shown above	Go / No Go gauge
1.3	<b>Length and straightness</b> Standard length is 13 feet +/- .25 inches. Straightness deviation .125	Steel Ruler Visual
1.4	<b>Plastic</b> Rigid PETG bridge applied to perforations in the metal with heat	90° Bend Test
1.5	<b>Perforation See comments below **</b> Perforations are typically spaced at .275 distance on center	Visual inspection

**\*\*1.5 Level of perforation**

The Fenzi Warmedge (Hygrade Metal) standard perforation in the vinyl bridge will absorb moisture vapor, regardless of spacer width as perforations fixed

**\*\* 1.5 Function of the perforation**

The perforation holes are able to detain dust from the desiccant, from entering the air space.

**2. Spacer Material**

2.1	<b>Material</b> Chrome Steel PETG Plastic Extrusion Available in white, black and light & dark grey colors	
2.2	<b>Surface</b> The surface is clean and free of contaminates, free of any chemicals.	Visual test & Adhesion test
2.3	<b>Tolerances of the material</b> The wall thickness of the metal spacer is at .008 +/- .005	Measure with gauge
2.4	<b>Lubrication</b> During the roll forming process, some lubrication is used. The lubrication is cleaned off and will evaporate, leaving the surface without any volatile elements.	Adhesion test
2.5	<b>Volatile elements</b> Volatile elements are tested by Dallas Laboratories, Dallas, TX	Industry Standard Outgas Testing

**3. Quality Aspects**

**Quality Management**

Fenzi Warmedge (Hygrade Metal) spacer has many customers IGMAC / IGMA certified. It is currently listed in the IGMA Directory of Spacer Components.

**Tests of the Product**

Processes and routines are established to secure the quality of the delivered materials to our customers. During the production process the spacers are constantly monitored through random checks for consistency in the finished spacer materials.

**4. Customer Focus**

To secure the performance of the spacers and maintain stock levels of finished goods at an acceptable amount. To continue to focus on our customers needs and develop additional products to meet these needs.

## TECHNICAL DATA SHEET



### 'POLYISOBUTYLENE (PRIMARY SEAL) FOR INSULATING GLASS UNITS'

#### APPLICATION FIELD

Butylver<sup>®</sup>, is a one part polyisobutylene PIB based material, totally solvent free especially formulated for use as the primary seal in double sealed units. PIB allows for minimum water vapor and gas permeation. Butylver<sup>®</sup> has excellent adhesion properties to glass and metal spacer systems and can be used together with conventional secondary sealants.

#### TECHNICAL DATA

##### • BASE

Polyisobutylene

##### • COLOUR

Black/Grey

##### • CONSISTENCY

Solid mass.

##### • DENSITY

Black Approximately 1.08 gr/cm<sup>3</sup>  
Grey Approximately 1.20 gr/cm<sup>3</sup>

##### • PROPERTIES

Moisture vapor transmission maximum 0.03 [gr/m<sup>2</sup> . 24hrs-2mm],  
in accordance to EN 1279/4

##### • GAS PERMEATION ON FILMS

0.749 x 10<sup>-3</sup> [gr/m<sup>2</sup> . hrs] in accordance to EN 1279/4

##### • VOLATILE CONTENT (70°C)

Max. 0.02 [%] in accordance to EN 1279/6

#### APPLICATION

Application surface's must be clean, dry and free from oily residue. Butylver<sup>®</sup> shall be applied at a temperature between 110°C and 130°C (Approx. 230°F to 266°F)

Check with extruder equipment manufacture for optimum equipment settings

#### STORAGE

One year stored in a dry clean environment - normal storage conditions

#### PRODUCT CLASSIFICATION

Not dangerous according to regulations in force.

#### PACKING

Black Cylinder type cardboard 'slug' packing

##### Available in:

2 Kg (4.4 Lb) slugs - 12 per box - approx. 5" diameter x 6" high  
7 Kg (15.4 Lb) slugs - 4 per box - approx. 7 1/4" diameter x 9" high  
Tape - 210' per roll / 10 rolls per box  
Drums - 200 Kg (440 Lbs)

Grey Cylinder type cardboard 'slug' packing

##### Available in:

7 Kg (15.4 Lb) slugs - 4 per box - approx. 7 1/4" diameter x 9" high



## TECHNICAL DATA SHEET



### 'TWO-COMPONENT POLYSULPHIDE SEALANT FOR INSULATING GLASS'

#### APPLICATION FIELD

Thiover® is a polysulphide sealant especially formulated for insulating glass.

Thiover® is produced in different viscosities in order to suit the Individual requirements of the operator and of the equipment in use.

Thiover® is totally solvent free and can be used either for the production of single seal or dual seal Insulated glass units.

#### TECHNICAL CHARACTERISTICS

##### COLOUR

Part A (base): Ivory  
Part B (catalyst): Black  
Mixture (A+B): Anthracite

##### HARDENING TIME:

2 to 4 hours depending on pot life.

##### ADHESION:

Excellent on glass, aluminum, stainless steel, galvanized steel.  
Peel strength 180° to glass with cohesive failure: 110/25 mm.  
Application surface must be clean, dry and free from residue.

##### MIXING RATIO

Ratio by volume: 100:10  
Ratio by weight: 100:9:5

##### POT LIFE

Standard 40 to 90 minutes.  
Pot life is influenced by room conditions.

#### PHYSICAL - CHEMICAL CHARACTERISTICS

##### VISCOSITY (25°C / 77°F)

Part A (base)			
-Medium Viscosity	63000 ± 3000 [cPs]		DIN 53019
-Low Viscosity	53000 ± 3000 [cPs]		
Part B (catalyst)	30000 ± 2000 [cPs]		

##### DENSITY (20°C / 68°F)

Part A (base)	1.77 [gr/cm³]		DIN 53217
Part B (catalyst)	1.69 [gr/cm³]		

##### FINAL HARDNESS

min. 50 [Shore A]			EN 1279/6
-------------------	--	--	-----------

##### MOISTURE VAPOR TRANSMISSION

8.0 [gr/m² - 24hrs - 2mm]			EN 1279/4
---------------------------	--	--	-----------

##### GAS PERMEATION ON FILMS

5.80 ± 0.63 x 10 <sup>-3</sup> [gr/m² hrs]			EN 1279/4
--	--	--	-----------

##### ELONGATION TO FAILURE

approx. 0.50 [%]			EN 1279/4
------------------	--	--	-----------

##### COHESIVE FAILURE

approx. 0.9 [MPa]			EN 1279/4
-------------------	--	--	-----------

##### VOLATILE CONTENT (70°C / 158°F)

Max. 0.77 [%]			EN 1279/6
---------------	--	--	-----------

Part A & B

##### STORAGE

9 months in the original containers.  
It is recommended to store Thiover® in dry and fresh rooms at a temperature between +10°C (50°F) and +30°C (86°F)

**Fenzi North America**  
11 Dansk Court  
Toronto, Ontario M9W 5N6  
Phone: 416.674.3831 Fax: 416.674.9323  
info@fenzi-na.com





## **SURFACE PREPARATION**

**GLASS** - To achieve good adhesion, the glass surface must be clean and free of any residue. Your glass supplier can verify proper cleaning specifications.

**SPACER** - To achieve good adhesion, the spacer surface must be clean and free of any residue.

## **MIXING INSTRUCTIONS**

Correct proportions of base and catalyst are extremely important to achieve the best results. Please review with a Fenzi Technical Representative to ensure ratio of pumping equipment at correct settings. Given the various dispensing systems available, the Thiover® brand polysulphide should be metered to deliver base and catalyst at a ratio of 100:10 by volume and 100: 9.5 by weight.

## **PRODUCT CLASSIFICATION**

Fenzi Thiover® is not classified as dangerous

## **TEMPERATURE INFLUENCE ON VISCOSITY**

The viscosity of a fluid is the resistance of its particles to flow. In most liquids the viscosity is influenced by various factors, amongst which temperature has a key role. Viscosity values on our TDS are given based on the standard temperature at 25°C (77°F) While the viscosity changes due to temperature of the base material, the effect on the final mixture is negligible. It is recommended, that the material be stored in temperatures as close to those given above, for optimal applications characteristics.

## **PACKING - STEEL DRUMS**

BASE	42.07 Imp. Gal (50.5 US Gal)
CATALYST	4.18 Imp. Gal (5.05 US Gal)
DRUM KITS	46.25 Imp. Gal (55.55 US Gal)

## **EQUIPMENT SERVICE**

Fenzi North America will provide technical services. This includes assistance on dispensing equipment as well as literature for the Thiover® brand polysulphide. MSDS forms available through the Fenzi North America sales office.

## **PRODUCTION PLANT CONTROL**

The Fenzi laboratory can analyze a customer's extruded mixed material to establish the final mix ratio. A fast and extremely precise determination of the catalyst can be made, using a modern technique based on X-ray fluorescence. Doing so, allows the sample analyzed to have the ratio verified - ensuring equipment used to dispense the material is accurate to correct ratio for Thiover® polysulphide.

## **GLAZING PRACTICE**

Finished IG units should be glazed in accordance with industry recognized standards - such as IGMA, ASTM, CWDMA or WDMA, guidelines for the use of various tapes, setting blocks and sealants.

Thiover® made units typically are intended for use in both residential and commercial applications.

Thiover® brand polysulphide is found to be compatible with most glazing materials used in the market.

*However, verification of the particular type of material to be used should be done through your Fenzi representative.*





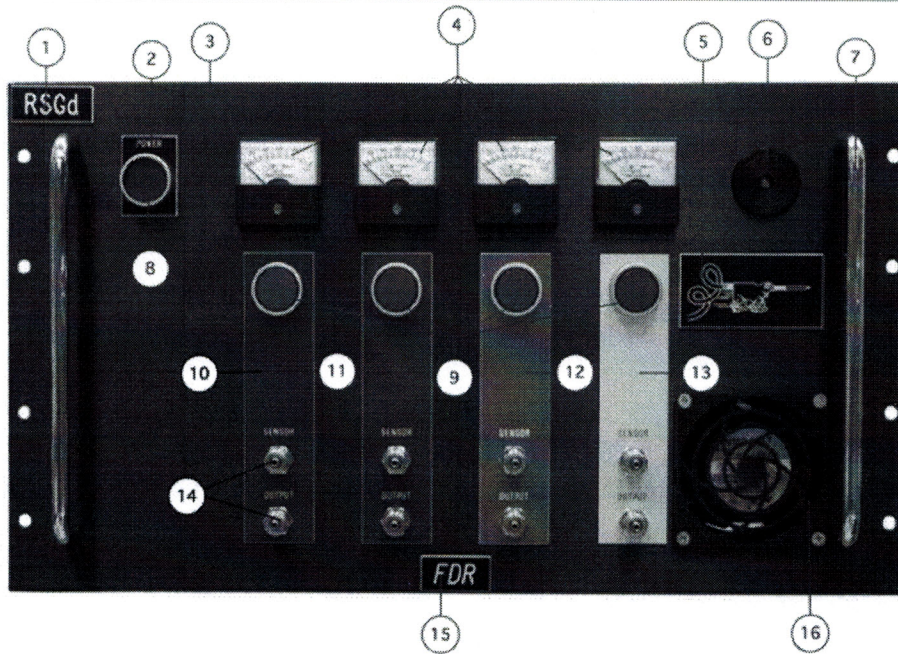
SGd-4 Gas Filling Machine

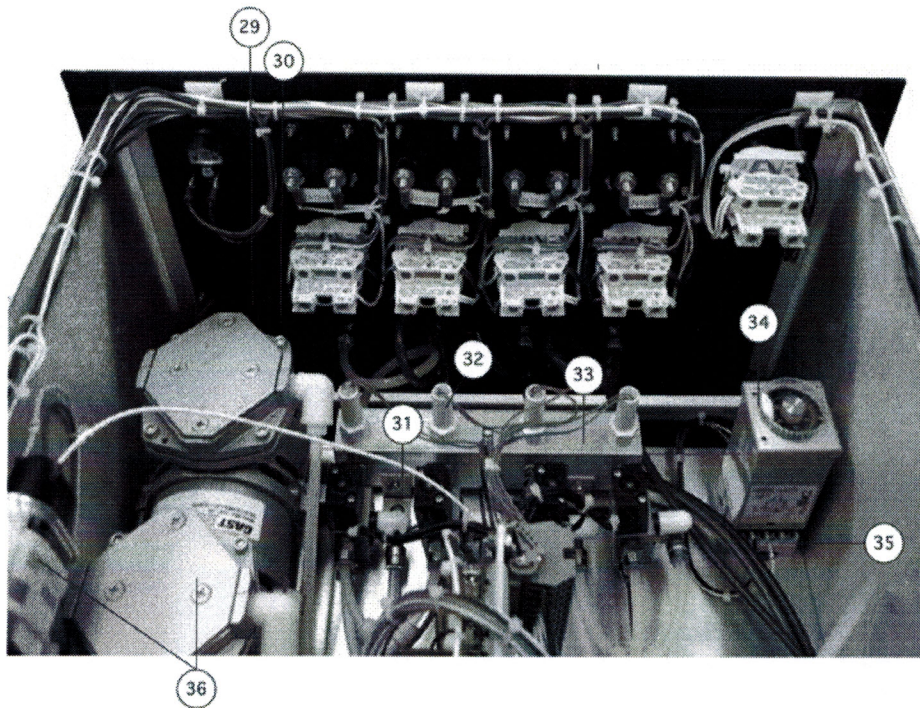
## RSGd 4

Upgradeable for one hole filling capability  
Two hole filling; vertical fill or tilted > 10 degrees  
Includes FDR gas sensor and computer control  
Gas sensor meter for visual display of filling process  
Gas flow shuts off automatically when IG unit is full  
Flow Rate = 9-18 Liters per minute (dependant on exhaust hole size)  
Time to fill = (2 hole filling) 71 seconds- (1 hole filling) 110 seconds. \*  
Complete with filling lance, sniffer, bottle regulator, and hoses  
Designed and manufactured in North America, serviced worldwide



### *RSGd 4 Exterior Front View*

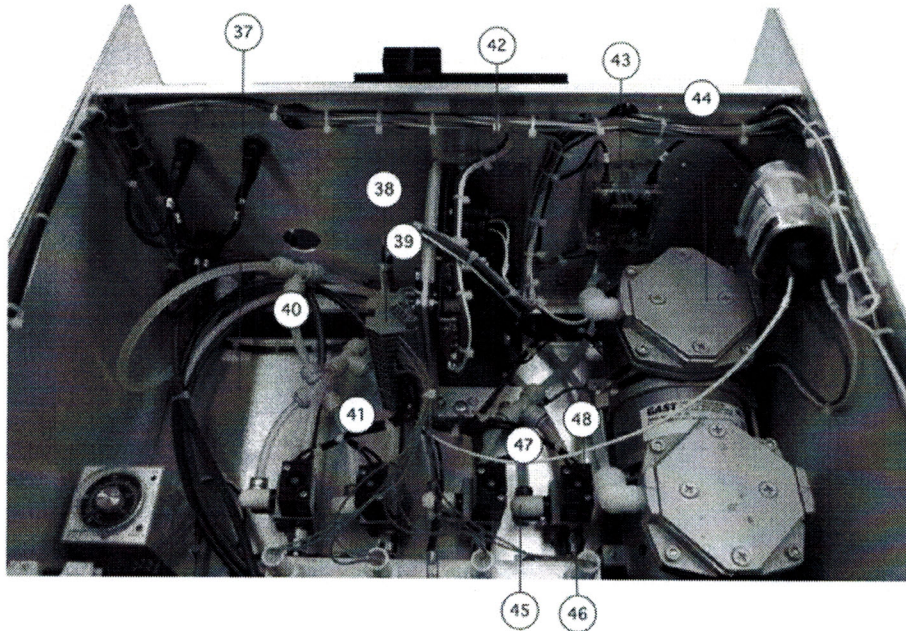




Reference #	Description	FDR Part #
29	Mini Fan 115 vac	<u>11115</u>
30	Black Plastic Fan Guard	<u>11114</u>
31	Gas Sensor Support Bracket	<u>10042</u>
32	Gas Sensor Element, Orange Leads	<u>10199</u>
33	Gas Sensor manifold block	<u>10240</u>
34	Omron Temperature Controller	<u>11474</u>
35	8 Pin Octal Type Socket	<u>11184</u>
36	Vac Pump 3 & 4	<u>11219</u>

***RSGd 4 Interior Back View***





**Reference # Description**

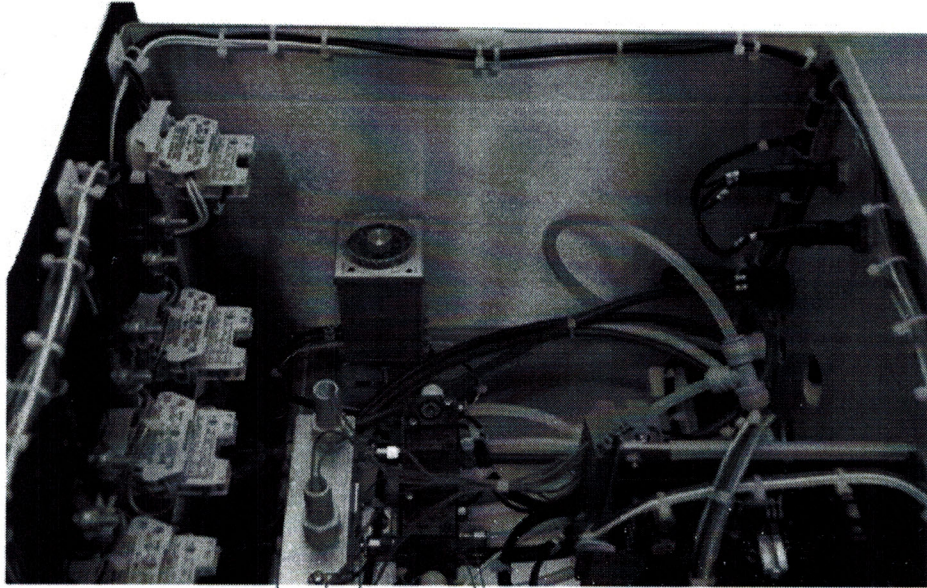
**FDR Part #**

37	Sheet Metal - Base Plate	<u>10246</u>
38	DN-M10 Mini Term Block PLC Direct Dinectors	<u>11360</u>
39	DN-EB15 End Bracket	<u>11361</u>
40	DN-2JM10 Jumper 12 Pole	<u>11363</u>
41	DN-ECM10 End Cover	<u>11362</u>
42	Power Supply 2.4 amp 24vdc (3&4)	<u>11156</u>
43	Solid State Relay 24 vdc/240 vac 10 amp	<u>11194</u>
44	Vac Pump 3 & 4	<u>11219</u>
45	Muffler	<u>11099</u>
46	1/4 OD Hose x 1/8 thread Pro-Fit Male Connector	<u>11756</u>
47	1/4 OD Hose x 1/8 Thread Pro-Fit Male Elbow Swivel	<u>11752</u>
48	Hi-Flow, 24 vdc Mac valve	<u>11206</u>

***RSGd 4 Interior Side View***



CONFORME DOSSIER  
NS-02757-1  
COMPLIES TO FILE



49	1/4" x 1/8-27 Barbed Fitting (Nylon)	<u>10802</u>
50	Type J Thermocouple	<u>11146</u>
51	1/4 x 1/8 Stem Adaptor	<u>11759</u>
52	1.2mm Nylon Barb Fitting Assembly Complete	<u>10555</u>

\* The "Time To Fill" that is listed for the individual machines is based on the following sized unit:

**Unit Size:**

**Spacer:**

21/32" - 0.665" - 17mm

**Height:**

48" - 1220mm

**Width:**

24" - 610mm

**Volume:**

767 cubic inches - 0.44 cubic feet - 12.6 liters

**Area:**

8 square feet - 0.74 square meters



**Note: There are a large number of variables when considering time to fill. The "Time To Fill" example is the result of filling an actual unit >90% using argon gas.**

**Price per Unit (piece):**

**\$12,151.00**

**Availability**

**Usually ships in:**

**4-6 Weeks**