



# BLACKWATER TESTING INC.

7341 Westport Place Suite 1A, West Palm Beach, FL 33413

Phone: 561-508-2830 E-mail: Engdep@blackwatertesting.com

REPORT NO: BT-EUW-16-002A

MIAMI-DADE CERTIFICATION #15-1026.02



09/20/2016

Test Dates: Start: 08/24/16 End: 08/24/16

## TESTING FOR LARGE MISSILE IMPACTS TAS 201-94 (ASTM E1996-03), AND POSITIVE AND NEGATIVE CYCLIC LOADS TAS 203-94 (ASTM E1886-02) OF "EURO-C3 FOLDING DOOR SYSTEM"

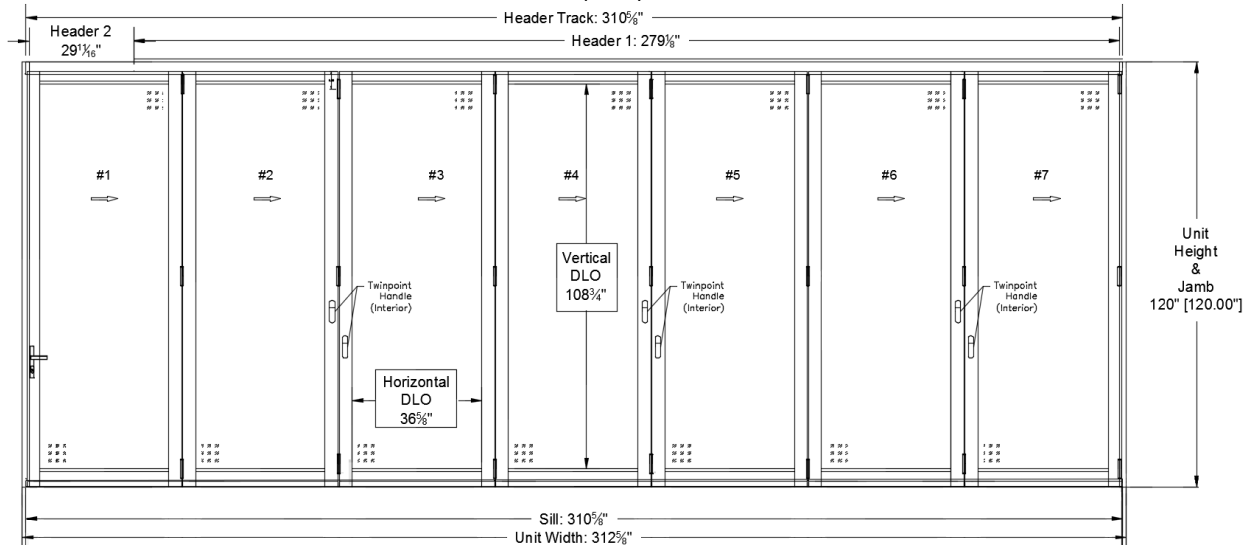
Client:

### *Euro-Wall*

24100 Tiseo Blvd

Port Charlotte, FL 33980

Phone: (888) 989-3876



**Product Description of Unit:**

Euro-C3 Folding Door System

**Overall Size:**

312-5/8" w x 120" h

**Rough Opening:**

313-5/8" w x 120-1/2" h

**Configuration:**

7R Inswing

**No. and size of Panels:**

(7) Panel 1: 43-13/16" w x 115-7/8" h

Panel 2-6: 44" w x 115-7/8" h

Panel 7: 44-5/16" w x 115-7/8" h

**Test Protocol: TAS 201-94---TAS 203-94@+60/-65psf**

**Disclaimer:**

This is a general statement and does not supersede the specific product descriptions in this report. The specimens are in conformance with attached Drawings. These drawings have been marked to indicate the appropriate portions descriptive of this test series. Blackwater Testing Inc. does not take responsibility of product performance and whose only purpose is to test and gather pertinent data under test report format for the client.

**Witness to Testing:**

Dennis Duffy, BT CEO  
Erik Coppola, BT Lab Technician  
Yamil G. Kuri, P.E. Test Engineer



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## Glazing Material:

1" IG Impact Clear (3/16" Annealed + 5/16" Air Space + 3/16" Annealed + 0.090" Sentryglass + 3/16" min Tempered)

## Glass Bite:

Panel 1-7: 3/4" For Both Vertical and Horizontal Sections

## Glass DLO:

Panel 1-7: 108-3/4" w X 36-5/8"

## Spacer Detail:

5/16"x5/16" XL Edge, Stainless Steel with airtight bend corners and a dual seal construction of compressed polyisobutylene (PIB) and Silicone.

## Gasket Detail:

ASTM C 864-05 EPDM Dry Glazed Gaskets

## Setting Block:

7/16"x1 1/8" rubber

## Weather Strips:

Pro-Ion (Urethane Foam) weather strips were used on the head, sill, and jambs of the frame and on each of the seven panels

## Hardware:

304 Stainless Steel hinges, Pull Handle, Twinpoint Lock, and Multipoint Lock

## Testing Buck:

8" x 8" HSS members welded

## Substrate:

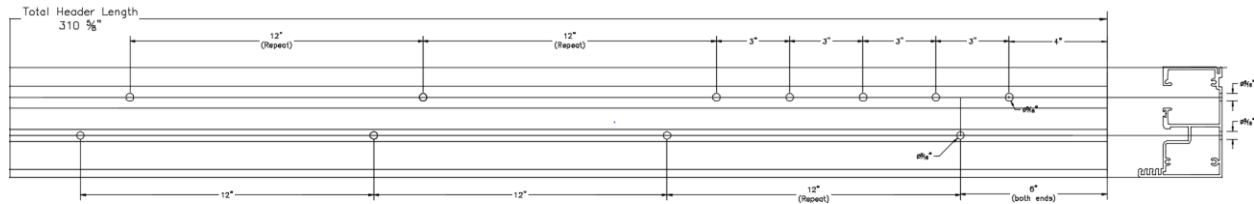
X2 2"X4" SYP for head and jambs. Concrete of typical strength for the length of the sill

## Anchor Detail:

**Note 1:** The provided figures for the anchor spacing used in the head and sill are taken from the rightmost side of the Euro-C3 Folding Door System. The spacing provided in the figures below were used consistently throughout the Euro-C3 Folding Door System on the head and sill.

### Head Anchor

Ø1/4" Tap cons at 2-1/4" long at spacing seen in figure below





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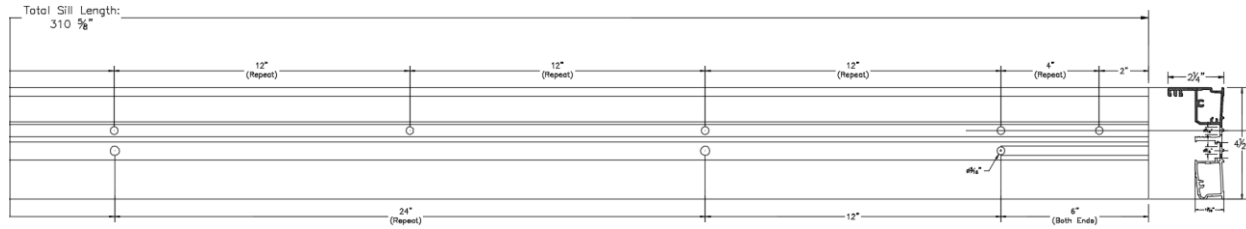
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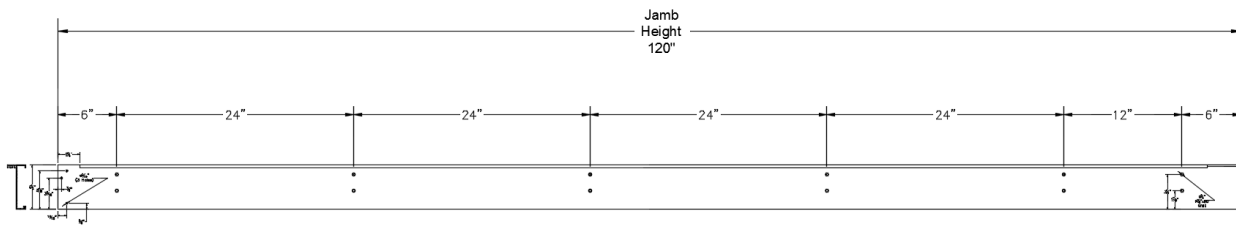
## Sill Anchor

Ø1/4" Tap cons at 2-1/4" long at a spacing seen in the figure below



## Jamb Anchor

Ø1/4" Tap cons at 3-1/4" long at a spacing seen in the figure below



## Folding Door - C3 - BILL OF MATERIALS

ITEM #	PART #	DESCRIPTION	MATERIAL	MANUFACTURER
1	C3 Header	Header Track	Aluminum 6063 - TS	SAPA
2	C3-Sill-St	Standard Sill (with riser)	Aluminum 6063 - TS	SAPA
3	C3 Jamb	Jamb	Aluminum 6063 - TS	SAPA
4	C3-R Stile	Active Stile	Aluminum 6063 - TS	SAPA
5	C3-MP Stile	Recessed Stile	Aluminum 6063 - TS	SAPA
6	C3-Rail	Rail	Aluminum 6063 - TS	SAPA
7	C3-Bead	Glazing Bead	Aluminum 6063 - TS	SAPA
8	C3-Hinge	Hinges	Assembly	EuroWall
9	C3-TPL	Twinpoint Lock	Assembly (304 SS)	EuroWall
10	C3-MPL	Multipoint Lock	Assembly (304SS)	EuroWall
11	C3-Ast	Astragal	Aluminum 6063 - TS	SAPA
12	C3-Glass	Glass		Varies
13	C3-DGG	EPDM Dry Glazing Gaskets	ASTM C 864-05	Trelleborg
14	C3-WS	Weather Strip	Pro-Ion (Urethane Foam)	SealMax

### Hardness:

A "Webster" gauge was used to determine the material hardness of aluminum components.



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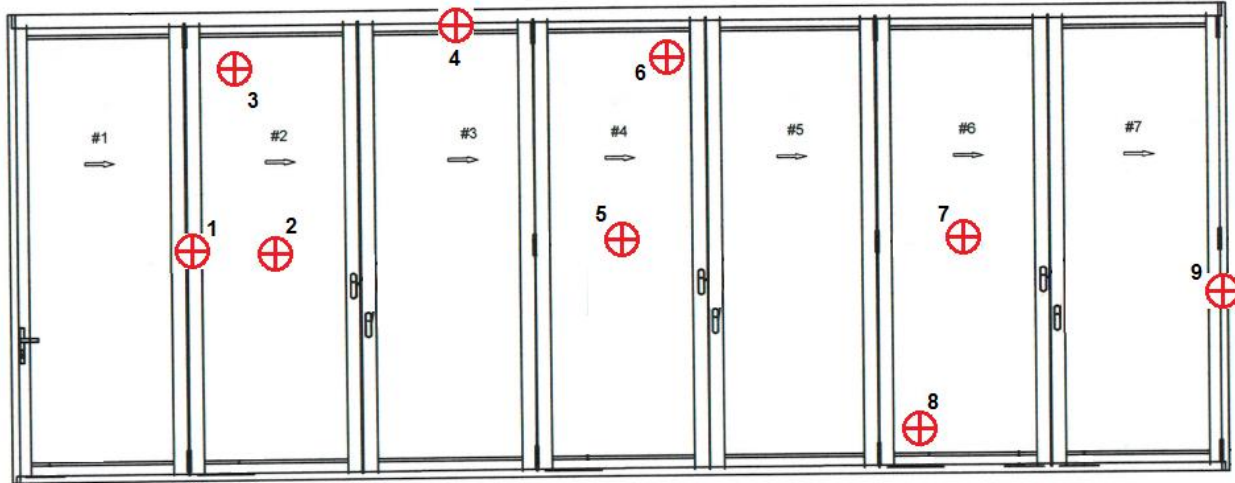
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## Test Results



⊕ Large Missile Impact Locations

Mock Up 1

### LARGE MISSILE IMPACT DATA SHEET

Ambient Temperature	T=93°F	Location			Keyence	Results
Sample	Shot	Area	X (in.)	Y (in.)	ft/s	Pass/Fail
Mock-up 1	1	Center Mullion	44	60	49.9	Pass
Mock-up 1	2	Center Glass	66	60	50	Pass
Mock-up 1	3	Top Left Corner Glass	50	110	50	Pass
Mock-up 1	4	Head Center	110	115	50.1	Pass
Mock-up 1	5	Center Glass	154	60	50	Pass
Mock-up 1	6	Top Right Corner Glass	167	110	49.9	Pass
Mock-up 1	7	Center Glass	242	60	49.9	Pass
Mock-up 1	8	Bottom Left Corner Glass	224	10	50.1	Pass
Mock-up 1	9	Center Jamb	308	40	50	Pass

Notes:

- Missile Velocity 50 ft/s Measurements taken from bottom left corner.
- Impacted with a 9.05 lb., 96 "long, S4S, 2x4, of No. 2 Southern Pine lumber.
- Impact location is given on Cartesian Grid, right (x) and up (y) from lower left hand corner.
- The location description is relative to the product assembly i.e. Corner, Center, and Left Center.
- Impact velocity measured with a Keyence KV-16DR, verified by the video method.

1. Large



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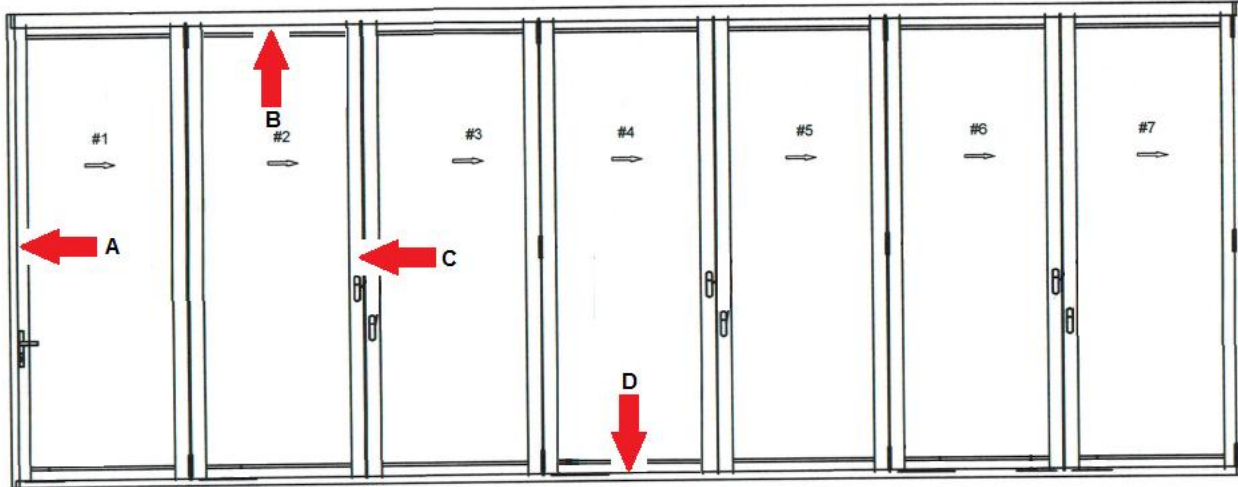
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**← Gauge Locations**

Mock Up 1

CYCLIC LOAD DATA SHEET					Pd psf		T= 93° F					
					High	Low						
					60	-65						
Positive Pressure												
No. of cycles	Range	Load (psf)	LOW Load (H <sub>2</sub> O)	HIGH Load (H <sub>2</sub> O)	A		B		C		D	
					Deflection (in.)	Permanent Set (in.)	Deflection (in.)	Permanent Set (in.)	Deflection (in.)	Permanent Set (in.)	Deflection (in.)	Permanent Set (in.)
3500	20% to 50%	30	2.31	5.77	0.031	0.000	0.031	0.000	0.750	0.063	0.031	0.000
300	0% to 60%	36	0	6.92	0.063	0.000	0.031	0.000	0.875	0.063	0.031	0.000
600	50% to 80%	48	5.77	9.23	0.063	0.000	0.063	0.000	1.000	0.094	0.063	0.000
100	30% to 100%	60	3.46	11.54	0.094	0.000	0.094	0.000	1.156	0.094	0.094	0.000
Negative Pressure												
No. of cycles	Range	Load (psf)	LOW Load (H <sub>2</sub> O)	HIGH Load (H <sub>2</sub> O)	A		B		C		D	
					Deflection (in.)	Permanent Set (in.)	Deflection (in.)	Permanent Set (in.)	Deflection (in.)	Permanent Set (in.)	Deflection (in.)	Permanent Set (in.)
50	30% to 100%	-65	3.75	12.50	0.156	0.000	0.094	0.000	1.094	0.094	0.094	0.000
1050	50% to 80%	-52	6.25	10.00	0.125	0.000	0.094	0.000	1.000	0.063	0.094	0.000
50	0% to 60%	-39	0	7.50	0.094	0.000	0.063	0.000	0.938	0.063	0.063	0.000
3550	20% to 50%	-32.5	2.50	6.25	0.063	0.000	0.063	0.000	0.875	0.063	0.063	0.000



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## SUMMARY OF TESTING FOR "EURO-C3 FOLDING DOOR SYSTEM"

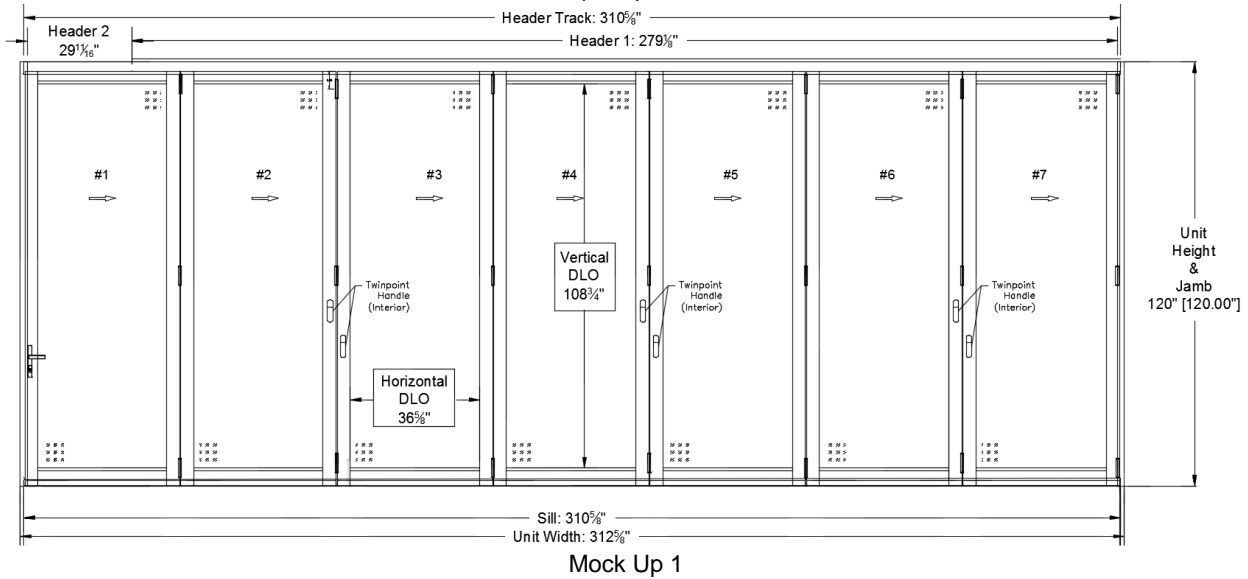
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**IMPACTS:** Mock Up 1 was impacted in accordance with **TAS 201-94**. Mock Up 1 did not fail as a result of large impact missiles.

**CYCLIC WIND LOADS:** Mock Up 1 was subjected to cyclic wind loads in accordance with **TAS 203-94**. Mock Up 1 successfully completed the cyclic wind loads to verify a **Design Load of +60/-65 PSF**.

**CONCLUSION:** Following testing Mock Up 1 was disassembled. No failures were observed in the doors, fastenings, or anchorages. **The "EURO-C3 FOLDING DOOR SYSTEM" product was tested in accordance with and meets the requirements to comply with the Florida Building Code 2014.**

Respectfully submitted,

## BLACKWATER TESTING INC.

(Miami-Dade Certification #15-1026.02)

Dennis Duffy, CEO \_\_\_\_\_

Yamil, Kuri, PE, Engineer \_\_\_\_\_

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