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CLIENT: Shanghai Superhouse Building Material
No. 10 Hangfan Rd. Pudong New Area
Shanghai, China 201316

Project No: 19AM11061

Report Date: 4/23/2020

SAMPLE ID: Aluminum Bi-fold Door

SAMPLE DESCRIPTION: 8'-10" (106 3/4") by 7'-10 3/8" (94 3/8") high; See page 4-5 for full description.

SAMPLING DETAIL: The test sample manufactured by Shanghai Superhouse Building Material was submitted directly to FTL by the client. Samples were not independently selected for testing.

DATE OF RECEIPT: Samples were received at the FTL Miami Laboratory on December 30, 2019.

TESTING PERIOD: March 16, 2020 to April 17, 2020.

TESTING LOCATION: Fenestration Testing Laboratory (FTL) – Miami, Florida, USA

AUTHORIZATION: Proposal 19AM11061, signed by Lillian Li, dated November 6, 2019.

TEST PROCEDURE: Testing to the following requirements:

- TAS 201-94
- TAS 202-94
- TAS 203-94

TEST RESULTS: The aluminum bi-fold door achieved passing results found on pages 6-9 of this test report when tested in accordance with the TAS 201, 202 and 203.

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Prepared By

Lusinda Delgado

Lusinda Delgado
Technical Report Writer

**Signed for and on behalf of
Fenestration Testing Laboratory**

Jose Sanchez

Jose Sanchez
Operation Manager

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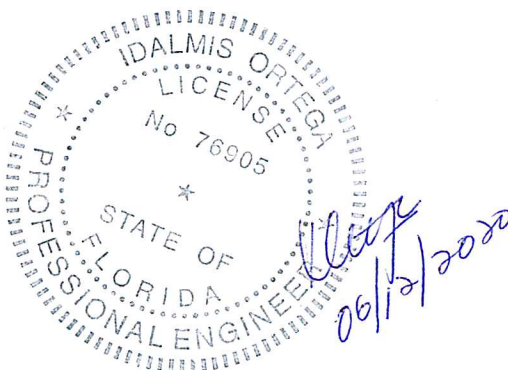
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Revision	Description	Effective Date
0	Initial Release	4/23/2020
1	Corrected glass composition and glazing compound	6/12/2020

Notes

* designates measurements by laboratory

** as per manufacturer

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Drawings referenced in this document are an integral part of this report, therefore, are required when distributing this test report. Test results obtained represent the actual value of the tested specimens and do not constitute opinion, endorsement or certification by this laboratory.

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At conclusion of above tests, there was no apparent damage to fasteners and after impact the glass did break, but remained in the panel and there wasn't any apparent tear in the inter layer film. Test specimens were covered with 1.5 mil plastic sheeting to seal from air leakage when load test were performed, however this had no effect on above results.

Remarks

Detailed drawings and digital video disc of testing will be retained by Fenestration Testing Laboratory for a period of five years from the original test date, and test report for a period of ten years. Due to the code cycle change of four years, it is recommended that this report be evaluated during the lifespan of this document.

This product was tested in accordance with the Florida Building Code (2017) TAS 201, 202 and 203, with no deviations. Samples tested meet Section 1626 of this Code.

DESCRIPTION OF SAMPLE	
Model Designation:	Bi-Fold Door
Overall Size:	8'-10 3/4" (106 3/4") by 7'-10 3/8" (94 3/8") high
Configuration:	XXX
Number of Panels:	Three
Size of Left Panel:	2'-9 1/2" (33 1/2") by 7'-5 7/8" (89 7/8") high
Size of Center Panel:	2'-9 1/2" (33 1/2") by 7'-5 7/8" (89 7/8") high
Size of Right Panel:	2'-10 3/4" (34 3/4") by 7'-5 7/8" (89 7/8") high
Sample A-1	

Frame Corners Construction	Number of Fasteners	Size of Fasteners
Upper corners fastened with	Three	10 by 1" PH SMS
Lower corners fastened with	Three	10 by 1" PH SMS

Panel Corners Construction	Number of Fasteners	Size of Fasteners
Top rail fastened with	N/A	Corner Key
Bottom rail fastened with	N/A	Corner Key

Glazing			
Glazing Location	Glazing Material	Glazing Compound	Compound Color
Panels	**9/16" nominal laminated glass composed of (2) 1/4" **heat strengthened glass	**Dow Corning 791	Black
Interlaying Film: **0.090" *Kuraray PVB		Laminator: **Shanghai Yaohua Tempered Glass Co. Ltd	
Glazing Penetration: **3/4			
Glazing Method: Interior glazed			
Glazing Compound Exterior side of glass: using silicone and a glazing tape			
Glazing Compound Interior side of glass: using silicone with a vinyl gasket and extruded aluminum glazing bead.			
Daylight Opening:	27 3/8" by 83 5/8" high		

Weather Stripping		
Quantity	Description	Location
Single row	Fabric coated foam	Lock stile
Single row	Vinyl bulb with flap	Panel top and bottom rails
Single row	Vinyl gasket	Panel hinge stiles on the interior and exterior
Single row	Fabric coated foam	Perimeter of frame
Single row	Vinyl gasket	Left frame jamb

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Hardware				
Quantity	Description	Distance	Location	Method of Attachment
One	Flush mount metallic multi-point lock system with activating lever type handle and key operator on the interior and exterior with product marking Roto	36" from bottom	Lock stile	(1) 10-32 by 1 1/2" FH MS
One	Surface mount metallic strike plate with no visible product markings	40" from bottom	Right frame jamb	(3) 10 by 1 1/2" FH SMS
Two	Surface mount metallic keepers with no visible product markings	65 1/2" and 90" from bottom	Right frame jamb	(2) 10 by 1 1/2" FH SMS
Two	Flush mouth metallic multi point lock system with activating lever type handle and no visible product markings	39 1/2" from bottom	One at each hinge stile	(2) 10-24 by 1 3/8" FH MS
Nine	Surface mount metallic hinges with no visible product markings	One at each end and midspan	Three at each hinge stile	frame and panel: (4) 10-32 by 1/2" FH MS

Weep Holes			
Quantity	Description	Distance	Location
Two	5/16" diameter drain hole	Frame sill in pairs	8" on center

Sealants	
Sealant Color	Location
Clear	Frame corners
Clear	Frame sill installation fasteners

Additional Information
The sample was tested using an extruded aluminum weatherstrip adaptor at the panel lock stile fastened using a single row of No. 6 by 1" PH SMS located at 4", 15 1/2", 27 1/8", 39", 50 1/2", 62 1/8", 74 1/4" and 85 3/4".

Sample Installation
The sample was installed into a single 2" by 12" pressure treated wood test buck. There was an 1/8" shim space between the frame and test buck at the perimeter. The frame head was installed using a single row of No. 10 by 1 1/2" FH SMS. The frame sill was installed using a double row of No. 10 by 1 1/2" PH SMS. The frame jambs were installed using a single row of No. 10 by 1 1/2" PH SMS. The location of the installation fasteners are as follows: frame head and frame sill from left 6 1/4", 18 1/4", 30 1/4", 42 1/4", 54 1/4", 66 1/4", 78 1/4", 90 1/4" and 102 1/4"; frame jambs from bottom 6 1/4", 18 1/4", 30 1/4", 42 1/4", 54 1/4", 66 1/4", 78 1/4" and 90 1/4".

Sample: A-1	Temperature: 76.8°F	Barometric Reading: 30.08 inches Hg
Notes:		
Title of Test	Pressure	Reading
Air Infiltration Test: (ASTM E283)	1.57psf	0.02 cfm/sq.ft
		Results
		Passed

Sample: A-1	Temperature: 76.8°F	Barometric Reading: 30.08 inches Hg
Title of Test	Pressure	Notes
1/2 Structural Load Test Positive Load	41.3 psf	
	Results	Passed

Sample: A-1	Temperature:	76.8°F	Barometric Reading: 30.08 inches Hg	
Title of Test		Pressure	Notes	
Design Load Test Positive Load		55.0psf		
see appendix A				
Reading#	Deflection	Permanent Set	Results	Add. Info
1	0.147"	0.001"	Passed	
2	0.073"	None	Passed	
3	0.545"	0.003"	Passed	
4	0.563"	0.005"	Passed	

Sample: A-1	Temperature: 76.8°F	Barometric Reading: 30.08 inches Hg
Title of Test	Pressure	Notes
1/2 Structural Load Test Negative Load	41.3 psf	
	Results	Passed

Sample: A-1	Temperature: 76.8°F	Barometric Reading: 30.08 inches Hg		
Title of Test		Pressure	Notes	
Design Load Test Negative Load		55.0 psf		
see appendix A				
Reading#	Deflection	Permanent Set	Results	Add. Info
1	0.080"	0.001"	Passed	
2	0.039"	0.001"	Passed	
3	0.529"	0.029"	Passed	
4	0.512"	0.017"	Passed	

Sample: A-1	Temperature: 76.1°F	Barometric Reading: 30.08 inches Hg		
Notes:				
Title of Test	Pressure		Results	Add. Info
Water Resistance Test	8.25 psf	15 minutes	Passed	ASTM E331

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Sample: A-1	Temperature:	76.1°F	Barometric Reading: 30.02 inches Hg	
Title of Test		Pressure	Notes	
Uniform Structural Test Positive Load		82.5 psf		
see appendix A				
Reading#	Deflection	Permanent Set	Results	Add. Info
1	0.189"	0.008"	Passed	
2	0.131"	0.002"	Passed	
3	0.951"	0.052"	Passed	
4	0.896"	0.038"	Passed	

Sample: A-1	Temperature:	76.1°F	Barometric Reading: 30.02 inches Hg	
Title of Test		Pressure	Notes	
Uniform Structural Test Negative Load		82.5 psf		
see appendix A				
Reading#	Deflection	Permanent Set	Results	Add. Info
1	0.128"	0.003"	Passed	
2	0.080	0.008"	Passed	
3	0.986"	0.069"	Passed	
4	0.952"	0.042"	Passed	

Sample: A-1	Temperature:	78.1°F	Barometric Reading: 30.10 inches Hg
Title of Test		Results	
Forced Entry Test		Passed	
300 pound concentrated load perpendicular to the door within 3" of the lock at the active lock stile and within 6" of the top and bottom of the active and inactive panel.			

Sample: A-1	Temperature:	78.6°F	Barometric Reading: 29.86 inches Hg
Title of Test		Notes	
Large Missile Impact Test			
Missile Weight		Missile	
9.5 pounds		2" by 4" by 92" long	
see appendix B			
Impact	Speed	Results	Add. Info
1	50.4 ft/sec	Passed	
2	49.7 ft/sec	Passed	
3	50.1 ft/sec	Passed	
4	50.3 ft/sec	Passed	

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Sample: A-1		Temperature: 78.6°F			Barometric Reading: 29.86 inches Hg		
Title of Test		Positive Pressure				Notes	
Cyclic Wind Load Test		55.0 psf					
see appendix A							
Range	Cycle	Measured	Reading#	Deflection	Permanent Set	Recovery	Results
0.2-0.5	3500	1.0 sec	1	0.070"	0.005"	95%	Passed
0.0-0.6	300	1.0 sec	2	0.133"	0.024"	96%	Passed
0.5-0.8	600	1.0 sec	3	0.641"	0.032"	95%	Passed
0.3-1.0	100	1.0 sec	4	0.676"	0.023"	96%	Passed

Sample: A-1		Temperature: 78.6°F			Barometric Reading: 29.86 inches Hg		
Title of Test		Negative Pressure				Notes	
Cyclic Wind Load Test		55.0 psf					
see appendix A							
Range	Cycle	Measured	Reading#	Deflection	Permanent Set	Recovery	Results
0.2-0.5	3500	1.0 sec	1	0.080"	0.002"	97%	Passed
0.0-0.6	300	1.0 sec	2	0.113"	0.007"	93%	Passed
0.5-0.8	600	1.0 sec	3	0.487"	0.002"	99%	Passed
0.3-1.0	100	1.0 sec	4	0.524"	0.002"	99%	Passed

Sample: A-2		Temperature: 78.6°F		Barometric Reading: 29.86 inches Hg	
Title of Test		Notes			
Large Missile Impact Test					
Missile Weight		Missile			
9.5 pounds		2" by 4" by 92" long			
see appendix C					
Impact	Speed	Results		Add. Info	
1	50.1 ft/sec	Passed			
2	50.3 ft/sec	Passed			
3	50.0 ft/sec	Passed			
4	50.1 ft/sec	Passed			

Sample: A-2		Temperature: 78.6°F			Barometric Reading: 29.86 inches Hg		
Title of Test		Positive Pressure				Notes	
Cyclic Wind Load Test		55.0 psf					
see appendix A							
Range	Cycle	Measured	Reading#	Deflection	Permanent Set	Recovery	Results
0.2-0.5	3500	1.0 sec	1	0.074"	0.002"	97%	Passed
0.0-0.6	300	1.0 sec	2	0.140"	0.007"	95%	Passed
0.5-0.8	600	1.0 sec	3	0.466"	0.003"	99%	Passed
0.3-1.0	100	1.4 sec	4	0.430"	0.009"	97%	Passed

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Sample: A-2		Temperature: 78.6°F			Barometric Reading: 29.86 inches Hg		
Title of Test		Negative Pressure				Notes	
Cyclic Wind Load Test		55.0 psf					
see appendix A							
Range	Cycle	Measured	Reading#	Deflection	Permanent Set	Recovery	Results
0.2-0.5	3500	1.4 sec	1	0.037"	0.001"	97%	Passed
0.0-0.6	300	1.0 sec	2	0.102"	0.003"	96%	Passed
0.5-0.8	600	1.0 sec	3	0.445"	0.009"	97%	Passed
0.3-1.0	100	1.0 sec	4	0.398"	0.008"	97%	Passed

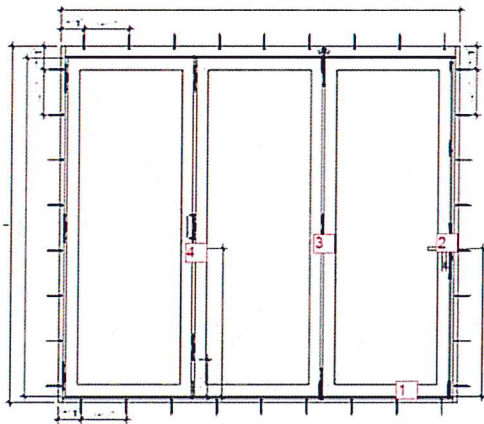
Sample: A-3		Temperature: 78.6°F		Barometric Reading: 29.86 inches Hg	
Title of Test		Notes			
Large Missile Impact Test					
Missile Weight		Missile			
9.5 pounds		2" by 4" by 92" long			
see appendix D					
Impact	Speed	Results		Add. Info	
1	49.4 ft/sec	Passed			
2	49.2 ft/sec	Passed			
3	50.1 ft/sec	Passed			
4	50.3 ft/sec	Passed			

Sample: A-3		Temperature: 78.6°F			Barometric Reading: 29.86 inches Hg		
Title of Test		Positive Pressure				Notes	
Cyclic Wind Load Test		55.0 psf					
see appendix A							
Range	Cycle	Measured	Reading#	Deflection	Permanent Set	Recovery	Results
0.2-0.5	3500	1.0 sec	1	0.061"	0.001"	98%	Passed
0.0-0.6	300	1.0 sec	2	0.146"	0.002"	98%	Passed
0.5-0.8	600	1.0 sec	3	0.612"	0.001"	99%	Passed
0.3-1.0	100	1.0 sec	4	0.638"	0.002"	99%	Passed

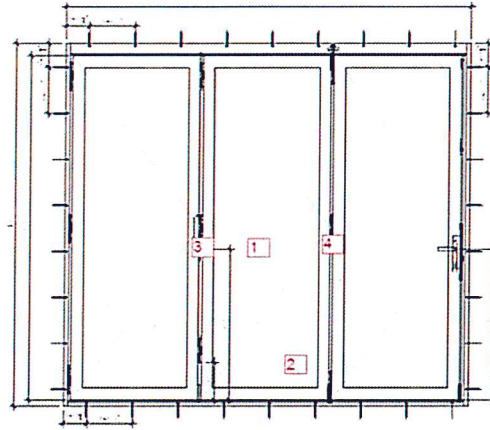
Sample: A-3		Temperature: 78.6°F			Barometric Reading: 29.86 inches Hg		
Title of Test		Negative Pressure				Notes	
Cyclic Wind Load Test		55.0 psf					
see appendix A							
Range	Cycle	Measured	Reading#	Deflection	Permanent Set	Recovery	Results
0.2-0.5	3500	1.0 sec	1	0.070"	0.001"	98%	Passed
0.0-0.6	300	1.0 sec	2	0.104"	0.001"	99%	Passed
0.5-0.8	600	1.0 sec	3	0.484"	0.001"	99%	Passed
0.3-1.0	100	1.0 sec	4	0.515"	0.001"	99%	Passed

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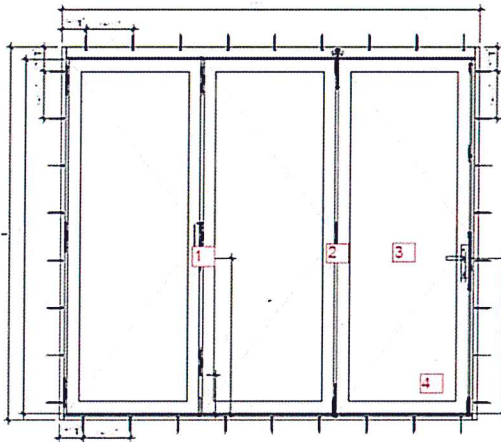
Appendix A



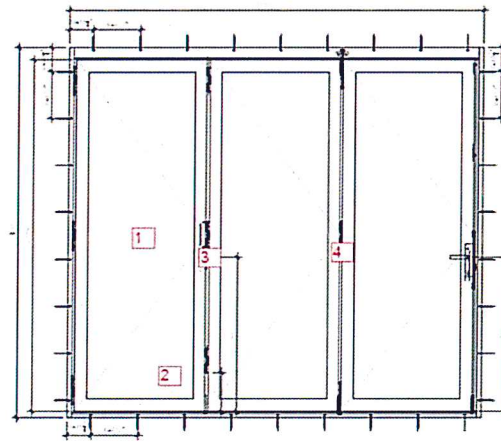
Appendix B



Appendix C



Appendix D



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