



TEST REPORT

Report No.: E9580.02-301-47

Rendered to:

CR LAURENCE CO., INC.
Vernon, California

PRODUCT TYPE: Out-Swing Aluminum Bi-Fold Door
SERIES/MODEL: Monterey S80

Title	Summary of Results
Deflection Test	±1000 Pa
Operating Force Test	8.9 N
Air Infiltration Test	0.1 L/s/m ²
Water Penetration Resistance Test Pressure	150 Pa
Ultimate Strength Test	±1500 Pa

Reference must be made to Report No. E9580.02-301-47, dated 08/13/2015 for complete test specimen description and detailed test results.

1.0 Report Issued To: CR Laurence Co., Inc.
2100 East 38th Street
Vernon, California 90058

2.0 Test Laboratory: Architectural Testing, Inc.
an Intertek company (Intertek-ATI)
4 Rancho Circle
Lake Forest, California 92630
949-460-9600

3.0 Project Summary:

3.1 Product Type: Out-Swing Aluminum Bi-Fold Door

3.2 Series/Model: Monterey S80

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test methods. Test specimen description and results are reported herein.

3.4 Test Dates: 07/15/15

3.5 Test Record Retention End Date: All test records for this report will be retained until July 07, 2019.

3.6 Test Location: CR Laurence Co., Inc. test facility in Vernon, California. Calibration of test equipment was performed by Intertek-ATI in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

3.7 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Intertek-ATI for a minimum of four years from the test completion date.

3.8 Drawing Reference: The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen reported herein. Test specimen construction was verified by Intertek-ATI per the drawings located in Appendix C. Any deviations are documented herein or on the drawings.

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Marco Ramirez	CR Laurence Co., Inc.
Jarod S. Hardman	Intertek-ATI

4.0 Test Methods:

AS 4420.0-1996, *Windows – Methods of test – Part 0: General introduction and list of methods*

AS 4420.1-1996, *Windows – Methods of test – Method 1: Test sample, preparation for tests, and test sequence.*

AS 4420.2-1996, *Windows – Methods of test – Method 2: Deflection test*

AS 4420.3-1996, *Windows – Methods of test – Method 3: Operating force test*

AS 4420.4-1996, *Windows – Methods of test – Method 4: Air infiltration test*

AS 4420.5-1996, *Windows – Methods of test – Method 5: Water penetration resistance test*

AS 4420.6-1996, *Windows – Methods of test – Method 6: Ultimate strength test*

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 7.60 m ² (81.86 ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall Size	2926	115-3/16	2599	102-5/16
Locking Jamb Panel	941	37-1/16	2434	95-13/16
Center Panel	923	36-5/16	2434	95-13/16
Hinge Jamb Panel	929	36-9/16	2434	95-13/16

5.0 Test Specimen Description: (Continued)

5.2 Frame Construction:

Frame Member	Material	Description
Head, Sill, and Jambs	Aluminum	Compensation channel, see attached part #MD80007ML, secured to opening with #8 x 1-5/8" Phillips head screws, two fasteners 3" from each corner and one fastener at 12" on center spacing along the channel.
Sill	Aluminum	Raised bottom track, see attached part #MD80002ML, secured through compensation channel with #10 x 2-1/2" Phillips round head screws 2" from each corner and 12" on center spacing.
Head	Aluminum	Head track, see attached part #MD80001ML, secured through compensation channel with #10 x 2-1/2" Phillips round head screws 2" from each corner and 12" on center spacing.
Jambs	Aluminum	Lateral frame, see attached part #MD80002ML, secured through compensation channel with #10 x 3" Phillips round head screws 2" from each corner and 12" on center spacing.
Corners	Steel	<i>See attached part #MDS80ENDDAM.</i>

	Joinery Type	Detail
All Corners	Flush	End dam sealed at corners with structural silicone sealant and cap bead applied to compensation channel to frame joint and compensation channel to buck joint full perimeter at interior and exterior.

5.0 Test Specimen Description: (Continued)

5.3 Panel Construction:

Panel Member	Material	Description
Top Rail, Bottom Rail, and Stiles	Aluminum	Panel frame (<i>see attached part #MD80008ML</i>)
Lock Stile	Aluminum	Jamb extender (<i>see attached part #MD35101</i>), snap fit to lock stile of primary panel and secured with #8 x 1-1/2" Phillips pan head screws 4" from each end and approximately 18" on center spacing.
Top Rail, Bottom Rail, and Stiles	Aluminum	Glass stop (<i>see attached part #MD94302</i>)

	Joinery Type	Detail
All Corners Exterior Side of Thermal Break	Mitered	Secured at corners with corner block (<i>see attached part #MDCORNERW and MDCORNERWBH</i>), each corner block inserted into adjoining member and retained by three dimples in metal of panel member. Corner block with hole utilized at lock stiles only.
All Corners Interior Side of Thermal Break	Mitered	Secured at corners with corner block (<i>see attached part #MDAC3501108</i>), each corner block inserted into adjoining member and retained by three dimples in metal of panel member.

5.4 Weatherstripping:

Description	Quantity	Location
Rigid EPDM Finger Gasket (<i>see attached part #MDAC350209</i>)	1 row	Inserted into head and sill full length of span.
Bulb Gasket w/ Foam (<i>see attached part #WH343</i>)	1 row	Inserted into innermost leg of frame full perimeter.
Bulb Gasket w/ Foam (<i>see attached part #WH343</i>)	3 rows	Inserted into jambs full length of span.
Bulb Gasket w/ Foam (<i>see attached part #WH343</i>)	3 rows	Inserted into stiles of all panels full length of span, except for primary panel lock stile.
Bulb Gasket w/ Foam (<i>see attached part #WH343</i>)	2 rows	Inserted into stile of primary panel lock stile full length of span.
Rigid EPDM Finger Gasket (<i>see attached part #MDAC350209</i>)	2 rows	Inserted into top and bottom rail of each panel full length of span.

5.0 Test Specimen Description: (Continued)

5.5 Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	Aluminum Spacer – Dual Seal (A1-D)	5/32" tempered	5/32" tempered	Interior glazed with snap in glazing stop, interior side of glazing pocket sealed with bulb gasket (<i>see attached part #WH343</i>) and exterior side sealed with EPDM wedge gasket (<i>see attached part #MDAC350217</i>).

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Locking Jamb Panel	1	792 x 2301	31-3/16 x 90-19/32	1/2"
Center Panel	1	791 x 2300	31-5/32 x 90-9/16	1/2"
Hinge Jamb Panel	1	793 x 2300	31-7/32 x 90-9/16	1/2"

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weep Hole	2" x 1/8"	6	Through top horizontal member of the bottom rail of each panel between center and outer leg of extrusion to allow glazing pocket to drain, located at each end of the glazing pocket.
Weep Hole	2" x 1/8"	6	Through lower horizontal member of the bottom rail of each panel between center and outer leg of extrusion to allow glazing pocket to drain, located at each end of the glazing pocket.
Weep Hole	2" x 1/8"	6	Through top horizontal member of the bottom rail of each panel between inner and center leg of extrusion to allow glazing pocket to drain, located at each end of the glazing pocket.

5.0 Test Specimen Description: (Continued)

5.6 Drainage: (Continued)

Drainage Method	Size	Quantity	Location
Weep Hole	2" x 1/8"	6	Through lower horizontal member of the bottom rail of each panel between inner and center leg of extrusion to allow glazing pocket to drain, located at each end of the glazing pocket.
Weep Hole	2" x 1/4"	5	Through top horizontal member of the raised bottom track between inner and center leg of extrusion at each jamb and directly below each stile joint.
Weep Hole	2" x 1/4"	5	Through lower horizontal member of the raised bottom track between inner and center leg of extrusion at each jamb and directly below each stile joint.
Weep Hole	2" x 3/8"	5	Through top horizontal member of the raised bottom track between center and outer leg of extrusion at each jamb and directly below each stile joint.
Weep Hole	2" x 3/8"	5	Through lower horizontal member of the raised bottom track between center and outer leg of extrusion at each jamb and directly below each stile joint.
Weep Hole	3/4" x 3/16"	3	Through bottom of exterior leg of compensation channel and fitted with weep hole cover (<i>see attached part #MDWHC</i>), 8" from each end and mid-span.

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Adjustable Leveler (see attached Part #AC/35.01.130)	38	Screwed into frame full perimeter approximately 4" from each end and 12" on center spacing.
Large-Handle Catch Assembly (see attached part #MDAC350170580EXT)	2	Located 40" from sill on each lock stile and secured to stile with two #10 x 1-1/2" Phillips oval head SMS through predrilled holes.
1/4"-20 Threaded Rod	4	Attached to the top and bottom of the Large-Handle Catch Assembly, inserted into the lock stile of panels with handle hardware, cut to length for the attachment of catch bolt.
Catch Bolt (see attached part #MDBOLT)	4	Threaded on the threaded rod at the top and bottom of each lock stile.
Rod Spacer (see attached part #AC35.01.55)	4	Inserted into the top and bottom rail at lock stile to guide catch bolt.
Bottom Hinge Assembly (see attached part #MDAC350153B)	1	Located 1-1/8" from bottom rail of stile opposite lock jamb stile and secured to each stile with two #8 x 1/2" Phillips pan head Tek screws.
Top Hinge Assembly (see attached part #MDAC350153T)	1	Located 1-1/8" from top rail of stile opposite lock jamb stile and secured to each stile with two #8 x 1/2" Phillips pan head Tek screws.
Fixed Hinge Assembly (see attached part #MDAC350150)	6	Located 32-1/2" and 64" from sill of each panel to panel joint and at fixed jamb, secured to each stile and lateral frame with two #8 x 1/2" Phillips pan head Tek screws.

5.8 Reinforcement: No reinforcement was utilized.

5.9 Screen Construction: No screen was utilized.

6.0 Installation:

The specimen was installed into a Pine wood buck. The rough opening allowed for a 1/4" shim space at sill of unit. The exterior perimeter of the window was sealed with structural silicone sealant.

Location	Anchor Description	Anchor Location
Through compensations channel at head and jambs, through raised lower track and compensation channel at sill	#10 x 1" Phillips flat head screw at head and jambs and #10 x 1-1/2" Phillips pan head screw at sill	2" from each corner and 12" on center spacing

7.0 Test Results: The temperature during testing was 25°C (77°F). The results are tabulated as follows:

AS 4420.2, Deflection Test

Load (Pa)	Indicator Location	Measured Displacement (mm)	Mid-span deflection (mm)	Allowed (mm)	Deflection /Span Ratio	Note
+1000	1	7.87	14.22	16.25	1:171	1, 2, 3, 4, 5
	2	22.09				
	3	7.87				
	4	12.70	14.22	16.25	1:171	
	5	26.16				
	6	11.18				
-1000	1	13.21	13.76	16.25	1:177	1, 2, 3, 4, 5
	2	28.96				
	3	16.76				
	4	15.75	13.34	16.25	1:183	
	5	28.45				
	6	14.48				

AS 4420.3, Operating Force Test

Title of test	Measured force (N)	Allowed (N)	Note
To Initiate Movement	66.7	180	1, 5
To Sustain Movement	31.1	110	1, 5

7.0 Test Results: (Continued)

AS 4420.4, Air Infiltration Test

Title of test	Measured infiltration (L/s m ²)	Allowed (L/s m ²)	Note
Positive Air Infiltration	0.1	1.0	1, 5
Negative Air Infiltration	0.1	1.0	1, 5

AS 4420.5, Water Penetration Resistance Test

Title of test	Results	Allowed	Note
Water Penetration at 200 Pa	Pass	No uncontrolled water	1, 5

AS 4420.6, Ultimate Strength Test

Title of test	Results	Allowed	Note
+1500 Pa	Pass	No collapse	1, 2, 5, 6
-1500 Pa	Pass	No collapse	1, 2, 5, 6

General Note: All testing was performed in accordance with the referenced standard(s).

Note 1: Operation and preloading as described in AS 4420.1 were performed prior to testing.

Note 2: Location of all displacement measuring devices in Appendix A.

Note 3: Span length between supports is 2438 mm.

Note 4: Loads were held for 60 seconds.

Note 5: Test specimen complied with test requirements of AS 2047.1.

Note 6: Loads were held for 10 seconds.

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period.

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For Intertek-ATI



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Jarod S. Hardman
Laboratory Manager



Digitally Signed by: Leaton Kirk

Leaton Kirk
Director – Regional Operations

JSH: ms

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix A: Diagrams (1)
Appendix-B: Drawings (33)