



# NATIONAL CERTIFIED TESTING LABORATORIES

8350 PARKLINE BLVD. STE. 12 • ORLANDO, FLORIDA 32809 • TELEPHONE (407) 240-1356  
FAX (407) 240 - 8882  
www.nctlinc.com

Florida Building Code TAS 201-94  
Florida Building Code TAS 202-94  
Florida Building Code TAS 203-94

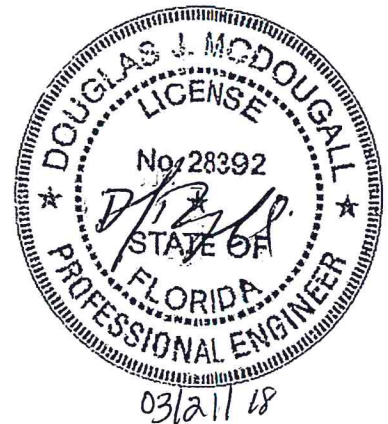
## STRUCTURAL, IMPACT & CYCLING TEST REPORT SUMMARY

### RENDERED TO:

Kommerling USA, Inc.  
3402 Stanwood Boulevard  
Huntsville, AL 35811

"76 MD" Vinyl Balcony Door

SUMMARY OF RESULTS					
<b>Installation: Screw Installation</b>					
Specimen 1	TAS	202	+ 65.0	psf. - 65.0	psf.
Specimens 2, 3, 4	TAS	201/203	+ 65.0	psf. - 65.0	psf.
Specimen 5 (Clips)	TAS	202 (Struct Only)	+ 65.0	psf. - 65.0	psf.
Specimen 5 (Clips)	TAS	201/203	+ 65.0	psf. - 65.0	psf.
Specimen 1					
<b>Air Infiltration per ASTM E283 in accordance with TAS 202-94</b>					
Infiltration: <0.01 cfm/ft <sup>2</sup>					
<b>Water Penetration Resistance per ASTM E331 in accordance with TAS 202-94</b>					
15.0 psf - Passed/No water penetration					
Specimens 1 & 5					
<b>Static Air Pressure per ASTM E330 in accordance with TAS 202-94</b>					
Design Load Pressure			+/- 65.0 psf		
Overload/ Structural Load Pressure			+/- 97.5 psf.		
<b>Forced Entry Resistance per ASTM F588 in accordance with TAS 202-94</b>					
Passed - Grade 10					
Specimens 2, 3, 4 & 5					
<b>Large Missile Impact/ Pressure Loading in accordance with TAS 201-94 and TAS 203-94</b>					
Impacts rejected without allowing penetration and the product shows no resultant failure or distress					





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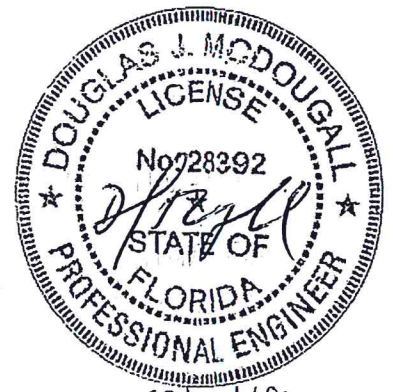
**Test Completion Date:** 12/11/17

Reference must be made to NCTL Report Number NCTL-210-4101-01 report dated 01/02/18 for complete test sample description and data.

## National Certified Testing Laboratories

A handwritten signature in black ink, appearing to read "Mark Bennett", is written over a horizontal line.

Mark Bennett  
Manager of Testing Services



03/21/18



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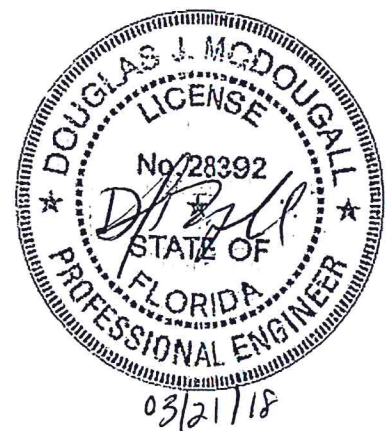
## STRUCTURAL, IMPACT & CYCLING PERFORMANCE TEST REPORT

### NCTL-210-4101-01

Kommerling USA, Inc.  
3402 Stanwood Boulevard  
Huntsville, AL 35811

REPORT NUMBER: NCTL-210-4101-01  
REPORT DATE: 01/02/18

"76 MD"  
Vinyl Balcony Door





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**Report Number** NCTL-210-4101-01

**Report Date** 01/02/18

**Report To** Kommerling USA, Inc.  
3402 Stanwood Boulevard  
Huntsville, AL 35811

**Test Start Date** 12/06/17  
**Test End Date** 12/11/17

**Specification:** Florida Building Code TAS 201-94  
Impact Test Procedures

Florida Building Code TAS 202-94  
Criteria for Testing Impact and Non-Impact Resistant Building Envelope  
Components using Uniform Static Air Pressure

Florida Building Code TAS 203-94  
Criteria for Testing Products Subjected to Cyclic Pressure Loading

### ***Description of Sample Tested***

Note: All dimensions are in the order (Width x Height x Thickness) unless otherwise noted.

**Model/Type** "76 MD" Vinyl Balcony Door

**Configuration** X

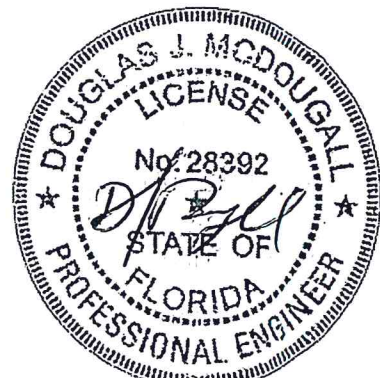
**Frame Size** 1168 mm x 2108 mm (46" x 83")

**Sash Size** 1073 mm x 2026 mm (42.25" x 79.75")

**Viewing Area** 914 mm x 1867 mm (36" x 73.5")

**Frame Type** Extruded vinyl

**Joint Construction** Frame & Sash  
Mitered, welded



03/21/18



Head/sill and jambs (Profine Equal Leg Rigid Vinyl)  
 The extruded vinyl main frame had an overall measurement of 76 mm x 74.1 mm x 2.2 mm (2.994" x 2.916" x 0.087")

The top, bottom and rails shared the same equal leg extrusion and had an overall measurement of 76 mm x 57 mm x 2.2 mm (2.994" x 2.246" x 0.087")

**Glazing Components**

Overall 30.48 mm (1.2") Nominal

Glass Thickness (1) Lite of 6.4 mm (0.25") nominal tempered glass to the exterior  
 (1) Lite of laminated glass to the interior

**Laminated Glass**

(2) Lites of 5 mm (0.1875") nominal heat strengthened glass separated by a 2.29 mm (0.090") "SentryGlas" interlayer by Kuraray America, Inc.

**Spacer Type/ Size**

9.65 mm (0.380") Swiss spacer aluminum

**Glazing System**

Interior glazed with a silicone back-bedding "SikaFlex 552" and a snap-in (2)-leaf dual durometer rigid vinyl glazing bead with an overall measurement of 47.6 mm x 24.5 mm x 1.78 mm (1.875" x 0.965" x 0.07"). The glazing gasket (EPDM Rubber 70 Dur.) had an overall measurement of 11.2 mm (0.44") wide.

**Weatherstrip**

Type Interior frame gasket (EPDM Rubber 70 Dur.)

Size 15.7 mm (0.619") Wide

Location On frame under sash

Type Sash gasket (EPDM Rubber 70 Dur.)

Size 9.7 mm (0.382") Wide

Location On interior and exterior of active sash

**Operating Hardware**

Type Handle

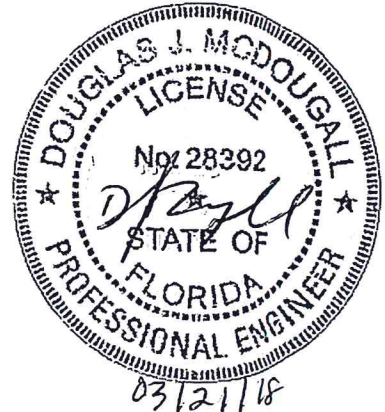
Location Located at approximately 1009.7 mm (39.75") from the panel top rail.

Type Keepers

Location Located on the head at approximately 533.4 mm & 952.5 mm (21" & 37.5") from the frame hinge jamb. Located on the sill at approximately 457.2 mm & 952.5 mm (18" & 37.5") from the frame hinge jamb. located on the hinge jamb at approximately 190.5 mm, 736.6 mm, 1238.3 mm & 1746.3 mm (7.5", 29, 48.75 & 68.75") from frame head. On lock jamb at approximately 685.8 mm & 1371.6 mm (27" & 54") from frame head.

Type Locks

Location Located on the head at approximately 533.4 mm & 952.5 mm (21" & 37.5") from the frame hinge jamb. Located on the sill at approximately 457.2 mm & 952.5 mm (18" & 37.5") from the frame hinge jamb. Located on the hinge jamb at approximately 190.5 mm, 736.6 mm, 1238.3 mm & 1746.3 mm (7.5", 29,



48.75 & 68.75") from frame head. On lock jamb at approximately 685.8 mm & 1371.6 mm (27" & 54") from frame head.

**Auxiliary**

Type Anchor strap (Galvanized Steel 16 GA.)  
 Size 25.4 mm x 190 mm x 1.5 mm (1" x 7.375" x 0.059")  
 Location Specimen 5 only

**Reinforcement**

Type Frame reinforcement (Galvanized Steel)  
 Size 31.8 mm x 28 mm x 2.01 mm (1.25" x 1.1032" x 0.079")  
 Location Frame

Type Sash reinforcement (Galvanized Steel)  
 Size 31.8 mm x 28.1 mm 2.01 mm (1.25" x 1.1057" x 0.079")  
 Location Sash

Type Sash glazing reinforcement  
 Size 51.8 mm x 2.01 mm (2" x 0.079")  
 Location Sash

**Weep Description**

Location 203.2 mm (8") from each end of the exterior frame sill face. **Note:** Panel weep holes were silicone prior to water test.

**Interior/Exterior Surface Finish**

White vinyl (PVC)

**Sealant**

Location Employed around interior & exterior perimeters of the frame sealed specimen to the wood test buck.  
 Material Silicone

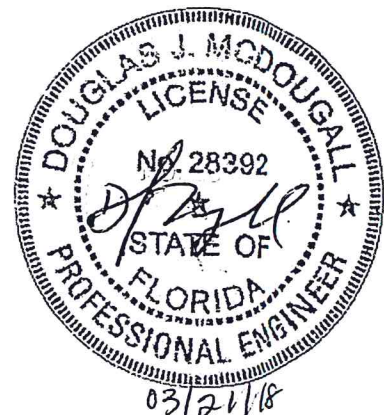
**Installation Method**

Specimens 1, 2, 3 & 4

The specimen was installed in a 50.8 mm x 304.8 mm (2" x 12") spruce-pine-fir lumber test buck and was fastened #10 x 50.8 mm (2") flat head screws. (1) screw was located on the head and sill at approximately 139.7 mm (5.5") and at approximately midspan of the frame. (1) screw was located on each jamb at approximately 177.8 mm (7") from each end and 584.2 mm (23") on center thereafter through each frame member. The exterior perimeter was sealed with silicone sealant.

Specimen 5

The specimen was installed in a 50.8 mm x 304.8 mm (2" x 12") spruce-pine-fir lumber test buck and was fastened #10 x 50.8 mm (2") flat head screws and clip combinations. (1) screw and clip combination was located on the head and sill at approximately 139.7 mm (5.5) and at approximately midspan of the frame. (1) screw was located on each jamb at approximately 177.8 mm (7") from each end and 584.2 mm (23") on center thereafter through each frame



member. The exterior perimeter was sealed with silicone sealant.

**Test Results - TAS 202**

Test Sequence: TAS 202

1. Air Infiltration
2. 1/2 Test Pressure Positive
3. 1/2 Test Pressure Negative
4. Design Pressure Positive
5. Design Pressure Negative
6. Water Infiltration Positive Direction
7. Full Test Pressure Positive
8. Full Test Pressure Negative
9. Forced Entrance Resistance

Test Method  
ASTM E283-04(12)

Test  
Air Leakage Resistance

**Specimen 1**

Information at 1.6 psf:

Maximum Allowable = 0.3 cfm/ft<sup>2</sup>  
Infiltration Rate/ Area = <0.01 cfm/ft<sup>2</sup>

Test Method  
ASTM E331-00(09)

Test  
Water Resistance Test

**Specimen 1**

The test specimen complies with the requirements of TAS 202 at 5.0 gph/ft<sup>2</sup>  
No Leakage after 1 cycle of 15 minutes at 720 Pa (15.0 psf)

Test Method  
ASTM E330-14

Test  
Static Air Pressure Tests

**Specimen 1 (No Clips)**

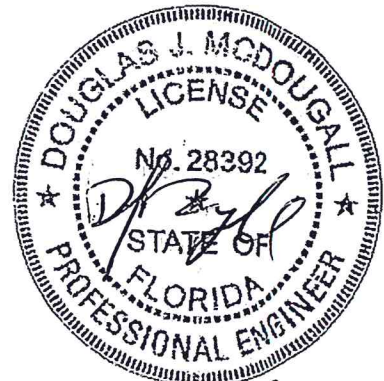
Half Test Load - ± 48.75 psf

Positive = No damage  
Negative = No damage

Design Loads - ± 65.0 psf

Midspan of active sash sill

Measured Deflection <sub>Positive</sub> = 0.182 inches  
Measured Deflection <sub>Negative</sub> = 0.106 inches



03/21/18



Midspan of bottom rail

Measured Deflection <sub>Positive</sub> = 0.114 inches  
 Measured Deflection <sub>Negative</sub> = 0.138 inches

Test Loads - ± 97.5 psf

Midspan of active sash sill

Measured Permanent Set <sub>Positive</sub> = 0.001 inches  
 Measured Permanent Set <sub>Negative</sub> = 0.015 inches

Midspan of bottom rail

Measured Permanent Set <sub>Positive</sub> = 0.043 inches  
 Measured Permanent Set <sub>Negative</sub> = 0.031 inches

**NOTE:** Deflection and Permanent Set measurements taken on midspan of active sash sill with a 0.4% x 2025.65 mm (79.75") permanent set limit.

**NOTE:** Deflection and Permanent Set measurements taken on midspan of bottom rail with a 0.4% x 1073.15 mm (42.25") permanent set limit.

**Specimen 5 (Clips)**

Half Test Load - ± 48.75 psf

Positive = No damage  
 Negative = No damage

Design Loads - ± 65.0 psf

Midspan of active sash sill

Measured Deflection <sub>Positive</sub> = 0.091 inches  
 Measured Deflection <sub>Negative</sub> = 0.229 inches

Midspan of bottom rail

Measured Deflection <sub>Positive</sub> = 0.086 inches  
 Measured Deflection <sub>Negative</sub> = 0.120 inches

Test Loads - ± 97.5 psf

Midspan of active sash sill

Measured Permanent Set <sub>Positive</sub> = 0.025 inches  
 Measured Permanent Set <sub>Negative</sub> = 0.024 inches

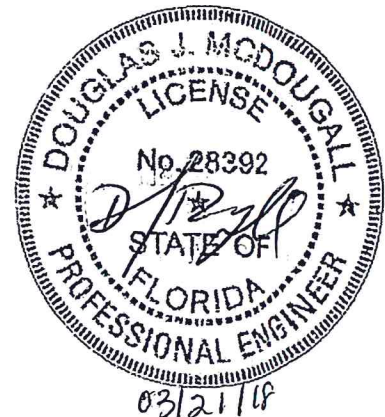
Midspan of bottom rail

Measured Permanent Set <sub>Positive</sub> = 0.048 inches  
 Measured Permanent Set <sub>Negative</sub> = 0.040 inches

**NOTE:** Deflection and Permanent Set measurements taken on midspan of active sash sill with a 0.4% x 2025.65 mm (79.75") permanent set limit.

**NOTE:** Deflection and Permanent Set measurements taken on midspan of bottom rail with a 0.4% x 1073.15 mm (42.25") permanent set limit.

**NOTE:** Upon completion of testing there was no structural distress indicative of failure





**Test Results - TAS 201**

Test

Large Missile Impact

Type and weight of missile

#2 Southern Yellow Pine 2x4, Length 92" & 9 lbs Speed 50.0 ft/ sec.

**Specimens 2-5**

Location

Impact

Midspan of Active Sash

Impact

Bottom Right Corner of Active Sash

**NOTE:** All missile impacts were rejected without penetration, tearing, or separation of the laminate. Shattered sacrificial and laminated glass. No visible damage to the frame was observed.

**Test Results - TAS 203**

Test

Cyclic Wind Pressure Loading

After completion of the impact tests, the test specimens were pressure cycled in accordance with Table 1626 of 2010 Florida Building Code Building.

Maximum Cyclic Load Test Pressure: +65.0 psf & -65.0 psf

**Specimens 2, 3, 4, 5**

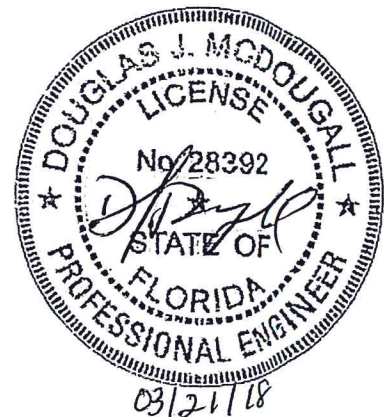
Positive Loads

Range of Test	Actual				# of Cycles
+0.2 to +0.5 DP	13.0	psf to	32.5	psf	3,500
+0.0 to +0.6 DP	0.0	psf to	39.0	psf	300
+0.5 to +0.8 DP	32.5	psf to	52.0	psf	600
+0.3 to +1.0 DP	19.5	psf to	65.0	psf	100

Negative Loads

Range of Test	Actual				# of Cycles
-0.3 to -1.0 DP	19.5	psf to	65.0	psf	50
-0.5 to -0.8 DP	32.5	psf to	52.0	psf	1,050
-0.0 to -0.6 DP	0.0	psf to	39.0	psf	50
-0.2 to -0.5 DP	13.0	psf to	32.5	psf	3,350

**NOTE:** Specimens showed no resultant failure distress or permanent deformation with a recovery of at least 90% over maximum deflection after cycle test. No failure of fasteners or separation of glass from the frame.



<u>Test Method</u>	<u>Test</u>	
AAMA 1304-02	Forced Entry Resistance	= Passed

Test Observers

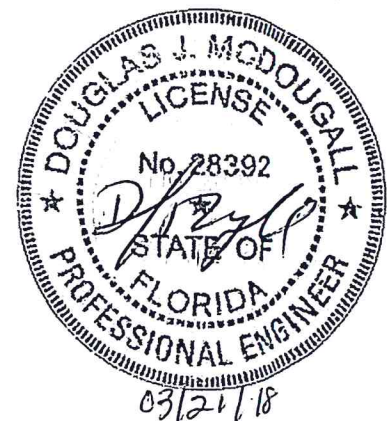
Mark Bennett	NCTL, Inc.
Christopher Bennett	NCTL, Inc.
Douglas J. McDougall	P.E.

Where required, plastic film (2-mil) was used to seal against air leakage. The film did not affect the performance of the specimens or influence the results of the tests. All tests were conducted in accordance with the TAS 201, TAS 202 and TAS 203 test methods. Upon completion of all testing, the specimens meet the requirements of Sections 1606, 1620 and 1626 of the "Florida Building Code, Building" and the TAS 201, 202 and 203 protocols.

This test report was prepared by National Certified Testing Laboratory (NCTL), for the exclusive use of the above named client and it does not constitute certification of this product. The results are for the particular specimen tested and do not imply the quality of similar or identical products manufactured or installed from specifications identical to the tested product. All testing was performed in compliance with the referenced test method or specification and any deviations are noted. Ambient conditions during the referenced testing are available upon request. Any film employed during testing had no effect upon test results.

The test specimen was supplied to NCTL by the above named client. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen are to be drawn from the ASTM E330-02(10) test. Forced entry resistance test equipment used is in compliance with Section 7 of the ASTM F588 test method. NCTL is a testing lab and assumes that all information provided by the client is accurate and does not guarantee or warranty any product tested or installed.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report. Component drawings were reviewed for product verification. The bill of materials contains details with any deviations noted. Ambient conditions during the referenced testing are available upon request. A copy of this report along with representative sections of the test specimen will be retained by NCTL. This report does not constitute certification or approval of the product, which may only be granted by a certification program validator or recognized approval entity. All tests were conducted in full compliance with the referenced specifications and/or test methods. This report may not be reproduced, except in full, without the written consent of NCTL.



**National Certified Testing Laboratories**



Mark Bennett  
Manager of Testing Services



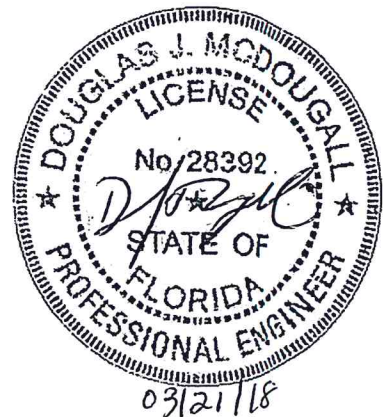
Christopher Bennett  
Division Manager

MB/ cb

Attachments

NCTL Certification No.: 16-0218.06

Douglas J. McDougall, P.E.  
Florida Registration No. 28392  
3180 Demaret Drive  
Titusville, Florida 32780  
(321) 298-8982 – CELL PHONE  
(321) 383-5097 – HOME PHONE





APPENDIX A

**Section 1:**

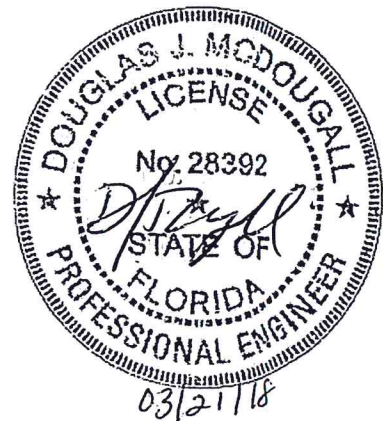
Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were reviewed (as submitted) for Product Verification (Reference: NCTL-210-4101-01)

See Attached Documentation;  
any deviations noted.

Note: The above referenced component drawings along with representative sections of the test specimen will be retained per procedure by NCTL. This testing facility assumes that all information provided by the client is accurate.

**Section 2:**

<u>Identification</u>	<u>Date</u>	<u>Revision</u>
Original Issue	01/02/18	Not Applicable



APPENDIX B  
DRAWINGS

