



NATIONAL CERTIFIED TESTING LABORATORIES

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SUPERSEAL MFG. COMPANY
AAMA/WDMA/CSA 101/I.S.2/ A440-05
TEST SUMMARY REPORT

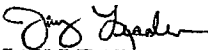
Report No: NCTL-110-10971-5S
Expiration Date: 11/30/11

Test Specimen

Manufacturer: Superseal Mfg. Company
Product Type: Double Hung Aluminum Prime Window
Series/Model: Series "7102"
Primary Product Designation: H-C50 1400 x 2300 (56x91)
Optional Product Designation: Not Applicable
Test Completion Date: 11/05/07

Reference should be made to Structural Performance Test Report Number NCTL-110-10971-5 for complete specimen description and test data.

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JAY LEADER
Technician



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STRUCTURAL PERFORMANCE TEST REPORT

Report No: NCTL-110-10971-5
Test Date: 11/05/07
Report Date: 11/08/07
Expiration Date: 11/30/11

Client: Superseal Mfg. Company
125 Helen Street, P.O. Box 795
South Plainsfield, NJ 07080

Test Specimen: Superseal Mfg. Company's Series "7102" Double Hung Aluminum Prime Window H-C50 1400 x 2300 (56x91).

Test Specification: AAMA/WDMA/CSA 101/I.S.2/A440-05, "Standard/Specification for Windows, Doors and Unit Sky Lights."

TEST SPECIMEN DESCRIPTION

General: The test specimen was a one-over-one tilt double hung aluminum prime window measuring 1400 mm (56") wide by 2300 mm (91") high overall. The top sash measured 1316 mm (51-13/16") wide by 1155.7 mm (45-1/2") high. The bottom sash measured 1333.5 mm (52-1/2") wide by 1150.9 mm (45-5/16") high. The frame and sash were thermally broken using poured urethane thermal barriers. The top sash was removable via a double block and tackle balance. The bottom sash employed one (1) single spiral balance with locking tilt shoe located in each jamb track. One (1) metal cam-type sweep lock was located at 234.95 mm (9-1/4") from each end of the interior meeting rail. The metal keeper was located on the exterior meeting rail at the lock positions. One (1) metal spring-loaded snap lock was located at the full length of the bottom rail. The continuous keeper was extruded on the sill. One (1) plastic tilt latch with thumb actuator was located at each end of the top rail and interior meeting rail. One (1) metal pivot bar was fastened with one (1) screw at each end of the exterior meeting rail and bottom rail. The frame was of double screw butt-type corner construction with a small joint sealant at the jamb/sill corners. The sash were of double screw butt-type corner construction. A rigid parting vinyl was employed at each jamb and interior meeting rail.

Glazing: Both sash were channel glazed using sealed insulating glass with a flexible vinyl wrap-around gasket. The overall insulating glass thickness was 22.2 mm (7/8") consisting of two (2) lites of double strength annealed glass and one (1) space created by a U-shaped aluminum spacer system(A1-D).

Weatherseals: Double strips of center fin weatherstrip 5.58 mm (0.220" high) were located at all sash stiles. One (1) strip of center fin weatherstrip 5.58 mm (0.220" high) was located at the interior and exterior meeting rails and the top rail. One (1) strip of center fin weatherstrip 5.58 mm (0.220" high) was located at the sill and head.

Weeps: One (1) weep hole measuring 38.1 mm (1-1/2") x 6.35 mm (1/4") and employing a plastic weep cover was located at 55.5 mm (2-3/16") from each end of the exterior sill face. One (1) weep hole measuring 6.35 mm (1/4") x 3.1 mm (1/8") was located at the ends of the exterior meeting rail.

Interior & Exterior Surface Finish: painted aluminum.

Sealant: A small joint sealant was applied at the jamb/sill corners.

Installation: The specimen was mounted into a standard 51 mm (2") x 250 mm (10") lumber wood buck. The specimen was held in place with 19 mm (3/4") x 19 mm (3/4") wood blind stops employed at the interior and exterior frame perimeters with #8 x 4mm (1-5/8") drywall screws. All stops were secured to the buck at 152.4 mm (6") from the ends and 355.6 mm (14") on center. The exterior perimeter was sealed with a silicone sealant.

TEST RESULTS

| <u>Par. No.</u> | <u>Title of Test & Method</u> | <u>Measured</u> | <u>Allowed</u> |
|-----------------|--|--|--|
| 5.3.1.1 | Operating Force - ASTM E2068 | | |
| | Top Sash Initiate Open | 44.4 N (10 lbf) | ----- |
| | Maintain Open | 48.9 N (11 lbf) | 200 N (45 lbf) |
| | Initiate Close | 195.7 N (44 lbf) | ----- |
| | Maintain Close | 186.8 N (42 lbf) | 200 N (45 lbf) |
| | Bottom Sash Initiate Open | 111.2 N (25 lbf) | ----- |
| | Maintain Open | 106.7 N (24 lbf) | 200 N (45 lbf) |
| | Initiate Close | 115.6 N (26 lbf) | ----- |
| | Maintain Close | 120.1 N (27 lbf) | 200 N (45 lbf) |
| 5.3.1.1.3 | Latching Devices | Meets As Stated | |
| 5.3.2 | Air Infiltration - ASTM E283 75 Pa - (1.6 psf) (25 mph) | 1.0 L/ (sec • m ²) (0.2 cfm/ft ²) (0.19 cfm/ft ²) measured | 1.5 L/ (sec • m ²) (0.3 cfm/ft ²) |
| 5.3.3 | * Water Penetration - ASTM E547 3.4 L/ (min • m ²) 5.0 gph/ft ² WTP= 220 Pa (4.5 psf) | No Leakage | No Leakage |
| 5.3.4.2 | ** Uniform Load Deflection - ASTM E330 1440 Pa (30.0 psf) Exterior 1440 Pa (30.0 psf) Interior | 0.25 mm (0.010") 0.15 mm (0.006") | ----- ----- |
| 5.3.4.3 | ** Uniform Load Structural - ASTM E330 2160 Pa (45.0 psf) Exterior 2160 Pa (45.0 psf) Interior | 0.45 mm (0.018") 0.48 mm (0.019") | 3.86 mm (0.152") 3.86 mm (0.152") |

TEST RESULTS (con't.)

| <u>Par. No.</u> | <u>Title of Test & Method</u> | <u>Measured</u> | <u>Allowed</u> |
|-----------------|--|---------------------------|----------------|
| 5.3.5 | Forced Entry Resistance Test – ASTM F588 | Meets As Stated | |
| 5.3.6.3 | Deglazing – ASTM E987 | | |
| | Top Sash | | |
| | Top Rail 320 N (70lbf) | 8.2 % (1.04 mm / 0.041") | <90% |
| | Exterior Meeting Rail 320 N (70lbf) | 7.2 % (0.91 mm / 0.036") | <90% |
| | Left Stile 320 N (50lbf) | 10.2 % (1.29 mm / 0.051") | <90% |
| | Right Stile 320 N (50lbf) | 12.4 % (1.57 mm / 0.062") | <90% |
| | Bottom Sash | | |
| | Interior Meeting Rail 320 N (70lbf) | 10.2 % (1.29 mm / 0.051") | <90% |
| | Bottom Rail 320 N (70lbf) | 12.4 % (1.57 mm / 0.062") | <90% |
| | Left Stile 230 N (50lbf) | 3.0 % (0.38 mm / 0.015") | <90% |
| | Right Stile 230 N (50lbf) | 2.8 % (0.35 mm / 0.014") | <90% |

OPTIONAL PERFORMANCE

| | | | |
|---------|--|--------------------------------------|--------------------------------------|
| 5.3.3 | * Water Penetration - ASTM E331 3.4 L/(min • m ²) 5.0 gph/ft ² WTP= 360 Pa (7.5. psf) | No Leakage | No Leakage |
| 5.3.4.2 | ** Uniform Load Deflection - ASTM E330 2400 Pa (50.0 psf) Exterior 2400 Pa (50.0 psf) Interior | 14.8 mm (0.584") 16.1 mm (0.637") | ----- ----- |
| 5.3.4.3 | ** Uniform Load Structural - ASTM E330 3600 Pa (75.0 psf) Exterior 3600 Pa (75.0 psf) Interior | 0.88 mm (0.035") 1.39 mm (0.055") | 3.86 mm (0.152") 3.86 mm (0.152") |
| | * Tested without insect screen | | |
| | ** No glass breakage or permanent damage causing the unit to be inoperable | | |

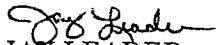
TEST COMPLETED 11/05/07


The tested specimen meets (or exceeds) the performance level specified in AAMA/WDMA/CSA 101/I.S.2/A440-05 for air leakage resistance. The listed results were secured by using the designated test methods and indicate compliance with the performance requirements of the referenced specification paragraphs for the H-C50 1400 x 2300 (56x91) product designation.

Detailed drawings were available for laboratory records and were compared to the test specimen at the time of this report. A list of the component drawings reviewed for product verification is included as an appendix to this report.

A copy of this report along with representative sections of the test specimen will be retained by NCTL for a period of four (4) years. The results obtained apply only to the specimen tested. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen may be drawn from this test. This report does not constitute certification of the product which may only be granted by a certification program validator.

NATIONAL CERTIFIED TESTING LABORATORIES


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Vice-President Engineering & Quality

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APPENDIX A
Forced Entry Resistance Test Results

Test Method: ASTM F588-04, "Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact".

TEST RESULTS

| <u>Paragraph No.</u> | <u>Loads</u> | <u>Duration</u> | <u>Measured</u> | <u>Allowed</u> |
|--------------------------|--|-----------------|-----------------|----------------|
| A2.1 -Disassembly Test | N/A | 5 Minutes | No Entry | No Entry |
| A2.2 -Lock Manipulation | N/A | 5 Minutes | No Entry | No Entry |
| A2.3 -Sash Manipulation | N/A | 5 Minutes | No Entry | No Entry |
| A2.4.2 -Test A1 | | | | |
| Interior Sash | L1=150 lbf | 1 Minute | No Entry | No Entry |
| Exterior Sash | L1=150 lbf | 1 Minute | No Entry | No Entry |
| A2.4.3 -Test A2 | | | | |
| Interior Sash | L1=150 lbf L2= 75 lbf interior | 1 Minute | No Entry | No Entry |
| Exterior Sash | L1=150 lbf L2= 75 lbf interior | 1 Minute | No Entry | No Entry |
| A2.4.4 -Test A3 | | | | |
| Interior Sash | L1=150 lbf L2= 75 lbf exterior | 1 Minute | No Entry | No Entry |
| Exterior Sash | L1=150 lbf L2= 75 lbf exterior | 1 Minute | No Entry | No Entry |
| A2.4.5-Test A4 | | | | |
| Interior Sash | L1=150 lbf L2= 75 lbf interior | 1 Minute | No Entry | No Entry |
| Exterior Sash | L1=150 lbf L2= 75 lbf interior | 1 Minute | No Entry | No Entry |
| A2.4.6 -Test A5 | | | | |
| Interior Sash | L1=150 lbf L2= 75 lbf exterior | 1 Minute | No Entry | No Entry |
| Exterior Sash | L1=150 lbf L2= 75 lbf exterior | 1 Minute | No Entry | No Entry |
| A2.4.7-Test A6 | | | | |
| Interior Sash | L1=150 lbf L2= 75 lbf exterior L3= 25 lbf exterior | 1 Minute | No Entry | No Entry |
| A2.4.8 -Test A7 | | | | |
| Interior Sash | L1=150 lbf L2= 75 lbf interior L3= 25 lbf interior | 1 Minute | No Entry | No Entry |
| A2.2 - Lock Manipulation | N/A | 5 Minutes | No Entry | No Entry |
| A2.3 - Sash Manipulation | N/A | 5 Minutes | No Entry | No Entry |

APPENDIX B

Estimated Uncertainty of Measurements

As required by Section 5.10.3 of ISO 17025, "General Requirements for the Competence of Testing and Calibration Laboratories", listed below is the estimated expanded uncertainties for the applicable measurements in this report:

| | |
|---------------------------------|---|
| <i>Operating Force:</i> | $\pm 2.7 \text{ N } (\pm 0.6 \text{ lb}_f)$ |
| <i>Test Pressures:</i> | $\pm 10 \text{ Pa } (\pm 0.2 \text{ psf})$ |
| <i>Air Leakage:</i> | $\pm 0.06/A \text{ L}/(\text{sec} \bullet \text{ m}^2) (\pm 0.12/A \text{ cfm}/\text{ft}^2)$ <i>where A is the area of the test specimen</i> |
| <i>Deflection Measurements:</i> | $\pm 0.05 \text{ mm } (\pm 0.002 \text{ inches})$ |
| <i>Deglazing Force:</i> | $\pm 3.1 \text{ N } (+ 0.7 \text{ lb}_f)$ |
| <i>Forced Entry Loads:</i> | $\pm 3.1 \text{ N } (\pm 0.7 \text{ lb}_f)$ |

All of the above expanded uncertainties are determined from combined standard uncertainties and a coverage factor $k = 2.00$ based on a normal distribution, and define an interval estimated to have a level of confidence of 95%.

APPENDIX C

List of Component Drawings Reviewed for Product Verification

See Attached Bill of Materials

Note: The above referenced component drawings along with representative sections of the test specimen will be retained by NCTL for a period of four (4) years.