

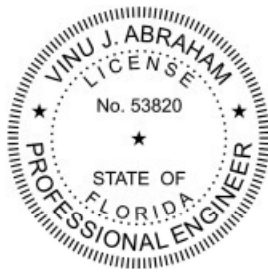
**UL 580 & UL 1897
TEST REPORT**

Report No.: C9079.03-450-44

Rendered to:

SHEFFIELD METALS INTERNATIONAL
Sheffield Village, Ohio

PRODUCT TYPE: Standing Seam Roof System (24 Ga. Steel)
SERIES/MODEL: SMI 2.0 SCH Mechanical Seam 22 Ga. B-Deck w/ISO



2014.02.18 11:07:14 -05'00

Test Date:	12/11/13
Report Date:	02/11/14
Test Record Retention Date:	12/11/17

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1.0 Report Issued To: Sheffield Metals International
5467 Evergreen Parkway
Sheffield Village, Ohio 44054
Voice: 904.413.7425
Contact: Jim Mitchell

2.0 Test Laboratory: Architectural Testing, Inc.
2658 Electronics Way
West Palm Beach, Florida 33407
561.881.0020

3.0 Project Summary:

3.1 Product Type: Standing Seam Roof System (24 Ga. Steel)

3.2 Series/Model: SMI 2.0 SCH Mechanical Seam 22 Ga. B- Deck w/ISO

3.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test methods. The test specimen was tested in accordance with UL 580 and UL 1897 and achieved an ultimate test load of -142 psf.

3.4 Test Date: 12/11/2013

3.5 Test Location: Architectural Testing, Inc. test facility in West Palm Beach, Florida.

3.6 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimens will be retained by Architectural Testing for a minimum of four years from the test completion date.

3.7 Test Specimen Installation: The test specimen was installed by representatives from Sheffield Metals International.

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

3.9 List of Official Observers:

<u>Name</u>	<u>Company</u>
Vinu Abraham, P.E.	Architectural Testing, Inc.
Jeff McGovern	Architectural Testing, Inc.
John Spallina	Architectural Testing, Inc.
Alan Rule	Architectural Testing, Inc.

4.0 Test Specification(s):

UL 580, Underwriters Laboratories, Inc., *Standard for Safety, Tests for Uplift Resistance of Roof Assemblies*, (Fifth Edition November 2, 2006, revised through July 9, 2009)

UL 1897, Underwriters Laboratories, Inc., *UL Standard for Safety for Uplift Tests for Roof Covering Systems* (Fifth Edition March 11, 2004, revised through May 22, 2008)

The purpose of this test is to evaluate the comparative resistance of roof assemblies to positive and negative pressures. This test simulates the effects of wind gusts by use of oscillating exterior pressure and constant interior pressures.

5.0 Test Specimen Description:

5.1 Product Sizes:

Test Specimen #1:

Overall Area: 100.0 ft ² (9.3m ²)	Width		Length	
	inches	millimeters	inches	millimeters
Overall size	120	3048	120	3048
Panel Size	18 3/4	476	120	3048

5.2 Test Deck Construction: The 10' 0" wide by 10' 0" long by 1' 3" deep test frame was fabricated from C15 by 33.9 steel channels. Two W6 x 12 steel purlins were located 30" from each side of the test frame (purlin spacing of 5' on center). A 1/4" steel plate was welded to each end of the purlins and bolted to the frame using two 1/2" x 1-1/2" bolts. Continuous 3-1/2" by 3-1/2" by 3/16" thick L-shaped steel angle was bolted around the interior perimeter of the test frame.

5.0 Test Specimen Description: (Continued)

5.3 Roof System:

Test Specimen #1:

Components	Details	Attachment Method
Type "B" roof decking	22 gauge steel roof decking, measuring 1-1/2" high and 10' long. Three full width panels (36" wide) and one partial width panel (12" wide) were lapped and utilized.	Seams were secured through the valleys of the deck with #12-14 x 3/4" long hex head self-drilling screws, spaced 6" on center. The deck was secured to the perimeter angle and the steel purlin through the valleys of the deck with #12-24 x 1-1/2" long hex head self-drilling screws, spaced 6" on center.
Insulation panel	One layer of 1" thick, 20 psi, 4' x 4' sheets of closed cell polyisocyanurate foam	Each insulation panel was attached using four #12 x 2-1/4" screws with bearing plates.
30# Asphalt saturated organic paper (ASTM D 226) meeting type II requirements.	A single layer of felt paper, lapped 4inches, attached to the B-deck substrate through the insulation.	The felt paper was secured using #12 x 2-1/4" screws with tin tabs spaced 24" on center and staggered.
SMI 2.0 SCH Mechanical Seam roof panel	The panels were constructed from 24 Ga steel. Six full width panels measuring 18 3/4" wide by 120" long and two partial panels measuring 3" wide by 120" long were tested.	The roof panels were secured to the Bdeck utilizing 2" Float Clips. The panels overlapped each other and were seamed using a hand seamer to 90° (stage one) and then using a mechanical seamer to 180° (stage two). The perimeter of the roof deck was secured with #12 x 2-1/4" pancake screws. The screws were spaced 2" on center at the panel ends and pairs of screws 2" apart were spaced 4" on center at the panel sides.
Clips	The G-90 galvanized 2" Float Clips measured 2.4" high by 4.3" wide and consisted of a 16 Ga. base and a 22 Ga. tab.	Each clip was attached using two #12 x 2-1/4" pancake screws. A clip was used at each panel end and 24" on center thereafter.

6.0 Test Results: One assembly was tested per UL 580 and UL 1897. The following summarizes observations made during the test at each class rating.

Test Specimen #1:

Test Class	Test Phase	Results
Class 30 Phases 1-5	No visible damage to the system Reference Table #1 for deflection measurements	PASSED
Class 60 Phases 1-5	No visible damage to the system Reference Table #2 for deflection measurements	PASSED
Class 90 Phases 1-5	No visible damage to the system Reference Table #3 for deflection measurements	PASSED
Supplemental Loads -112 psf to -142 psf	No visible damage to the system Reference Table #4 for deflection measurements	PASSED
Supplemental Loads -157 psf	Clip fasteners pulled out of the B-deck while increasing pressure to 157 psf.	FAILED

Notes:

- Reference Chart #1 located in Appendix A for test pressures and load durations.
- Reference Sketch #1 in Appendix B for location of deflection measurement devices.
- Deflection measurements are included in Table #1 through Table #4 in Appendix C of this test report.

General Test Note: A loose fitting, pleated 2-mil plastic film was utilized to assist in obtaining uniform pressure on the roof system. The plastic film was located between the panels and the underlayment to facilitate testing of the panels. In our opinion, this did not influence test results.

Architectural Testing 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 Architectural Testing, Inc. for the entire test record retention period.

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For ARCHITECTURAL TESTING, Inc.


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John Spallina
Technician


Digitally Signed by: Vinu Abraham

Vinu J. Abraham, P.E.
Vice President – Southeast Region