



Farabaugh Engineering and Testing Inc.

Project No. T133-21

Report Date: April 30, 2021

No. Pages: 8 (inclusive)

UL 580 / UL1897 UPLIFT RESISTANCE TESTING

**CMP SERIES NAIL STRIP ROOF PANEL
16" WIDE X 26 GA. STEEL
(WITH SEALANT IN JOINT)**

FOR

CONSTRUCTION METAL PRODUCTS INC.
2204 WEST FRONT STREET
STATESVILLE, NC. 28677



DANIEL G. FARABAUGH, P.E.
255 Saunders Station Rd
Trafford, PA 15085
412-417-5153

Prepared by:

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Approved by:

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DADE COUNTY
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Project No. T133-21

Purpose

This test method covers the evaluation of uplift resistance of roof assemblies per UL 580-06, rev. 2009 and UL 1897-12 and as provided herein

Test Specimen

Manufacturer: Construction Metal Products Inc.
2204 West Front Street.
Statesville, NC. 28677

Specimen: Series Nail Strip Metal Roof Panel, 16" wide X 26 ga. steel

Substrate: 15/32" plywood

Sealant: APS 500 Advance Polymer Sealant
(Note: Sealant cured for 17 days before testing)

Test Completion Date

March 9, 2021

Testing Apparatus

Test Chamber: The test chamber consisted of three sections: a top section to create a uniform vacuum, a center section in which the roof assembly is constructed, and a bottom section to create a uniform positive pressure.

Pressure Chamber: The air pressure in the pressure chamber was measured at five points. Each of four points were located 42" from chamber corners at a 45 degree angle, with the fifth tube located 18" from the center of the air inlet opening. The end of each tube was 7" above the chamber floor. The tubes were connected to a manifold that, in turn was connected to a manometer.

Vacuum Chamber Measurement: The air pressure in the vacuum chamber was measured at five points. Each of four points was located 18" from chamber corners at a 45 degree angle and 8" above the chamber floor. The fifth tube located 12" from the center of the exhaust opening and 6" below the opening. The tubes were connected to a manifold that, in turn was connected to a manometer. The pressure in the vacuum chamber was controlled by an automatic damper. The damper door was moved by means of an air motor hooked to an air line and controlled by pressure switches located in the control console. An additional pressure line from the manifold to pressure switches controlled the automatic damper.

Installation

- The 15/32" APA Plywood sheathing was attached to 2 x 10 wood structural framing supports using 8d x 2-1/2" long ring shank nails. Wood supports were located at 2'-0" o.c. The nail pattern was 6" o.c. in the field and 6" o.c. around the perimeter.
- The metal roof panels were attached to the wood deck substrate using #10 -13 x 1" long, pancake head screws spaced at 4-1/2" o.c. along the length of the panel as shown on attached drawings. The panel joint was a lap joint with sealant applied between panels at lap joint. The outer perimeter of the assembly was secured with perimeter fastening as required to maintain a periphery seal.
- A plastic barrier was located between the panels and the underlying substrate.

Test Procedure

- The test assembly was subjected to positive and negative pressures to form an uplift pressure at the values and time duration per UL 580 as shown in the attached table.
- Upon completion of each 60 minute oscillation phase and at the conclusion of each class level, the assembly was examined and observations recorded.
- Vertical movement of the assembly during the tests was recorded.
- Subsequent to the completion of Phase 5 of the Class 90 test sequence, the test specimen was subjected to higher static uplift pressures. The positive pressure supplied from below was maintained at 48.5 psf while the negative uplift pressure supplied from above was increased in increments until failure or the desired uplift pressure was obtained.

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TEST #1
UL 580 UPLIFT TEST

Test Specimen: Series Nail Strip Metal Roof Panel, 16" wide x 26 ga. steel

Fastener Spacing: 4-1/2" o.c. along length of panel with sealant in panel joint.

Class 30 Deflection Measurements

Phase	Time Duration (min.)	Negative Pressure (psf)	Positive Pressure (psf)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
Initial	0	0	0	5-9/16	6-5/16	6-1/8	6-5/16
1	5	16.2	0	5-1/2	6	6-1/16	6
2	5	16.2	13.8	5-1/2	5-7/8	6	5-7/8
3	60	8.1 – 27.7*	13.8	5-7/16	5-3/4	5-15/16	5-3/4
4	5	24.2	0	5-1/2	5-15/16	6	5-3/4
5	5	24.2	20.8	5-7/16	5-13/16	5-7/8	5-5/8

Class 60 Deflection Measurements

Phase	Time Duration (min.)	Negative Pressure (psf)	Positive Pressure (psf)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
1	5	32.3	0	5-7/16	5-3/4	5-15/16	5-11/16
2	5	32.3	27.7	5-3/8	5-5/8	5-13/16	5-1/2
3	60	16.2 – 55.4*	27.7	5-1/4	5-3/8	5-3/4	5-5/16
4	5	40.4	0	5-3/8	5-5/8	5-13/16	5-1/2
5	5	40.4	34.6	5-1/4	5-1/2	5-11/16	5-1/4

Class 90 Deflection Measurements

Phase	Time Duration (min.)	Negative Pressure (psf)	Positive Pressure (psf)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
1	5	48.5	0	5-5/16	5-5/8	5-3/4	5-3/8
2	5	48.5	41.5	5-3/16	5-5/16	5-5/8	5-1/8
3	60	24.2 – 48.5*	41.5	5-3/16	5-5/16	5-5/8	5-1/8
4	5	56.5	0	5-1/4	5-7/16	5-11/16	5-5/16
5	5	56.5	48.5	5-1/8	5-1/4	5-9/16	5-1/16

* Oscillation frequency as specified in UL 580.

Results: Upon completion of the above loading, there were no specimen failures.

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TEST #1 (cont.)

UL 1897 UPLIFT TEST

Test Specimen: Series Nail Strip Metal Roof Panel, 16" wide x 26 ga. steel

Fastener Spacing: 4-1/2" o.c. along length of panel with sealant in panel joint.

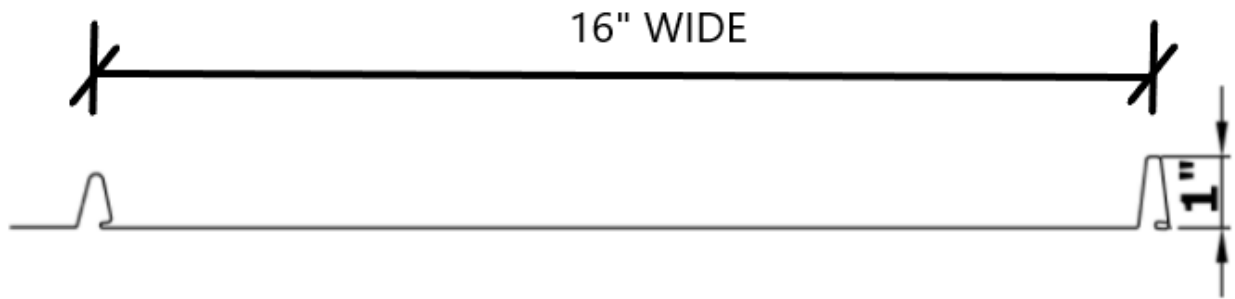
Deflection Measurements

Total Uplift Pressure (psf)	Time Duration (min.)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
112	1				

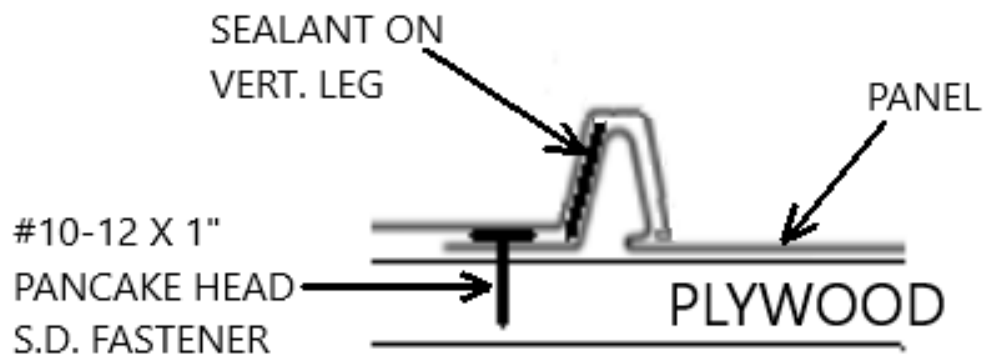
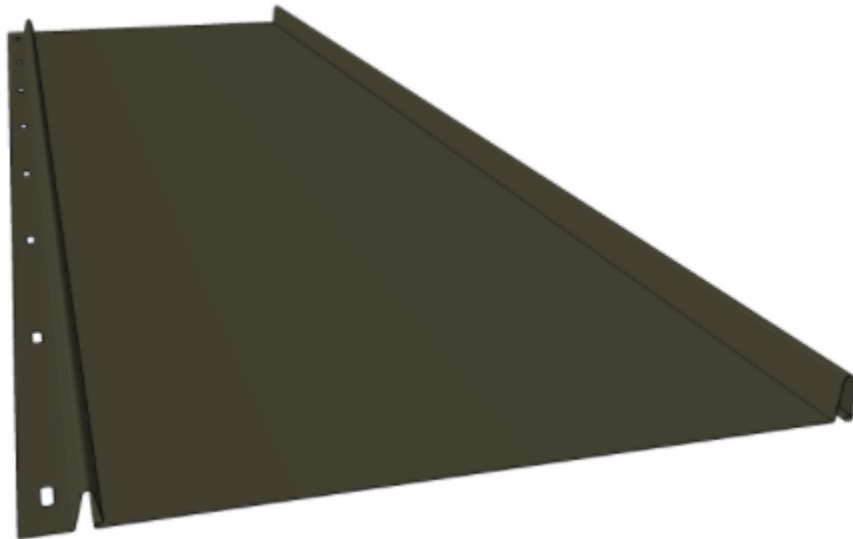
Results:

Maximum Total Uplift Pressure (sustained for 1 min.) = 105.6 psf

Maximum Total Uplift Test Pressure = 112 psf (Panel seam disengagement.)



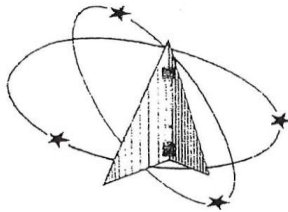
CMP NAIL STRIP PANEL



PANEL LAP

TENSILE TEST REPORT

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388; 221 Westmoreland Drive
Youngstown, PA 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com E-Mail: admin@wmtr.com
WMTR is a technical leader in the material testing industry.



TESTING CERT 921-01 & 621-02

CERTIFICATION

April 30, 2021
Farabaugh Engineering & Testing, Inc.
401 Wide Dr
McKeesport, PA 15135

Section 1 of 1

WMT&R Report No. 01-2100006931
P.O. No. Credit Card

Attention: Paul Farabaugh

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 11, dated 12/03/2008.

The following tests were performed on this order: Tensile

TENSILE RESULTS: ASTM A370-20, ASTM E8-16a¹

SPEED OF TESTING: 0.005 in./in./min., 0.05 in./min./in.

MATERIAL: Alloy

DISPOSITION: Report

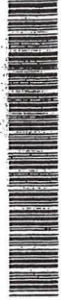
Sample ID	Test Log Number	Temp.	UTS ksi	0.2% YS ksi	Elong %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf	Orig. Width (in.)	Orig. Thick (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	AUIR
CMP Nailstrip	01-005GGH	Room	59.1	54.9	25	25.5	613	569	0.5007	0.0207	2.00	2.49	0.01036449	M36	R

AUIR: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

*NOTE: THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTE. THIS CERTIFICATE OR REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF WMT&R, INC.

Brian Lavelly
Brian Lavelly
Tensile Coordinator

April 30, 2021



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