

Evaluation Report "5V Crimp" & "Millennium-V" Metal Roof Assembly

Manufacturer:

Millennium Metals, Inc.

10200 Eastport Road

Jacksonville, FL 32218

(877) 358-7663

for

Florida Product Approval

FL 5211.1 R3

Florida Building Code 2010

Per Rule 9N-3

Method: 1 - D

Category: Roofing

Sub - Category: Metal Roofing

Product: "5V Crimp" & "Millennium-V"

Material: Steel

Panel Thickness: 26 gauge

Panel Width: 24"

Support: Wood Deck

Prepared by:

James L. Buckner, P.E., S.E.C.B.

Florida Professional Engineer # 31242

Florida Evaluation ANE ID: 1916

Project Manager: Diana Galloway

Report No. 12-117-5V-S6W-ER

Date: 2 / 6 / 12

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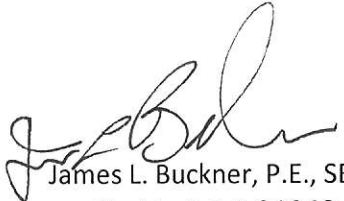
Evaluation Report

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James L. Buckner, P.E., SECB
Florida P.E. # 31242
2/17/12

Manufacturer: Millennium Metals

Product Name: "5V Crimp" & "Millennium-V"

Product Category: Roofing

Product Sub-Category: Metal Roofing

Compliance Method: State Product Approval Rule 9N-3.005 (1) (d)

Product/System Description: "5V Crimp" & "Millennium-V"
26 gauge Steel roof panel mechanically attached to Plywood Deck with screws.

Product Assembly as Evaluated: Refer to Page 4 of this report for product assembly components/materials & standards:

1. Roof Panel
2. Fasteners
3. Underlayment
4. Insulation (Optional)

Support: **Type:**
Wood Deck
(Design of support and its attachment to support framing is outside the scope of this evaluation.)

- Description:**
- 15/32 (min.) or 19/32" (min.) or greater plywood,
 - or Wood plank (min. specific gravity of 0.42)

Slope: Minimum slope shall be in accordance with manufacturer's recommendations, FBC Section 1507.4.2 and applicable code sections.

Performance: Wind Uplift Resistance:
• Design Uplift Pressure: **Refer to Table A**
(Refer to "Table A" attachment details herein)

Performance Standards:	<p>The product described herein has demonstrated compliance with:</p> <ul style="list-style-type: none">• UL580-06 – <i>Test for Uplift Resistance of Roof Assemblies</i>• UL 1897-04 – <i>Uplift test for roof covering systems</i>• TAS 125-03 – <i>Standard Requirements for Metal Roofing Systems</i>
Standards Equivalency:	<p>The UL 580-94 & UL 1897-98 standard version used to test the evaluated product assembly is equivalent with the prescribed standards in UL 580-06 & UL 1897-04 adopted by the Florida Building Code 2010.</p>
Code Compliance:	<p>The product described herein has demonstrated compliance with Florida Building Code 2010, Section 1504.3.2.</p>
Evaluation Report Scope:	<p>This product evaluation is limited to compliance with the structural requirements of the Florida Building Code, as related to the scope section to Florida Product Approval Rule 9N-3.001.</p>
Limitations and Conditions of Use:	<ul style="list-style-type: none">• <u>Scope of “Limitations and Conditions of Use” for this evaluation:</u> This evaluation report for “Optional Statewide Approval” contains technical documentation, specifications and installation method(s) which include “Limitations and Conditions of Use” throughout the report in accordance with Rule 9N-3.005. Per Rule 9N-3.004, the Florida Building Commission is the authority to approve products under “Optional Statewide Approval”.• <u>Option for application outside “Limitations and Conditions of Use”</u> Rule 9N-3.005(1)(e) allows engineering analysis for “project specific approval by the local authorities having jurisdiction in accordance with the alternate methods and materials authorized in the Code”. Any modification of the product as evaluated in this report and approved by the Florida Building Commission is outside the scope of this evaluation and will be the responsibility of others.• Design of support system is outside the scope of this report.• Fire Classification is outside the scope of Rule 9N-3, and is therefore not included in this evaluation.• This evaluation report does not evaluate the use of this product for use in the High Velocity Hurricane Zone code section. (Dade & Broward Counties)
Quality Assurance:	<p>The manufacturer has demonstrated compliance of roof panel products in accordance with the Florida Building Code and Rule 9N-3.0005 (3) for manufacturing under a quality assurance program audited by an approved quality assurance entity through Keystone Certifications, Inc. (FBC Organization #: QUA 1824).</p>

**Components/Materials
(by Manufacturer):****Roof Panel:**

Material: Steel
Thickness: 26 gauge (min.)
Panel Width: 24" (max.) Coverage
rib Height: 7/16"
Yield Strength: 40 ksi min.
Corrosion Resistance: In compliance with FBC Section 1507.4.3:

- ASTM A792 coated, or
- ASTM A653 G90 galvanized steel

Fastener:

Type: Hex-Head Wood Screw with WSW
Size : #9 x 1"
Corrosion Resistance: Per FBC Section 1506.6 and 1507.4.4
Standard: Per ANSI/ASME B18.6.4

Underlayment:

Per roofing manufacturer's guidelines in compliance with FBC Section 1507.4.5

**Components/Materials
(by Others):****Insulation (Optional):**

Type: Rigid Insulation Board
Thickness: 3" (max.)
Properties:
Density: 2.25 pcf (lbs/ft³) min.
Or Compressive Strength: 20 psi min.

Insulation shall comply with FBC Section 1508. When insulation is incorporated, fastener length shall conform to penetrate thru bottom of support a minimum of 3/16".

Installation:

Installation Method:

(Refer to drawings on Pages 6-8 of this report.)

- Fastener spacing: **Refer to Table "A" Below**
(along the length of the panel)
- Row Spacing: **Refer to Table "A" Below**
(along the row, across the panel profile)
- Rib Interlock: Lapped
- Minimum fastener penetration thru bottom of support, 3/16".
- For panel construction at the end of panels, refer to manufacturer's instructions and any site specific design.

TABLE "A"		
	METHOD 1:	METHOD 2:
Design Pressure:	- 112.5 PSF	- 113.75 PSF
Deck Thickness:	19/32"	15/32"
Row Spacing:	12"	12"
Fastener Spacing:	12"	6"
Fastener Location:	Corrugation Peaks	Corrugation Peaks & between ribs
Refer to Drawing #:	A-1 & A-2	B-1 & B-2

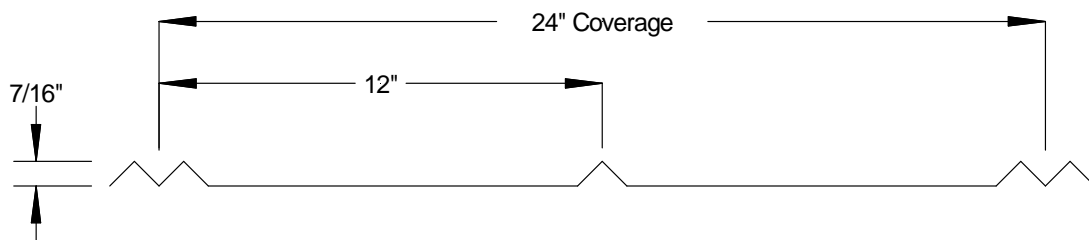
Install the "5V Crimp" roof panel assembly in compliance with the installation method listed in this report and applicable code sections of FBC 2010. The installation method described herein is in accordance with the scope of this evaluation report. Refer to manufacturer's installation instructions as a supplemental guide for attachment.

Referenced Data:

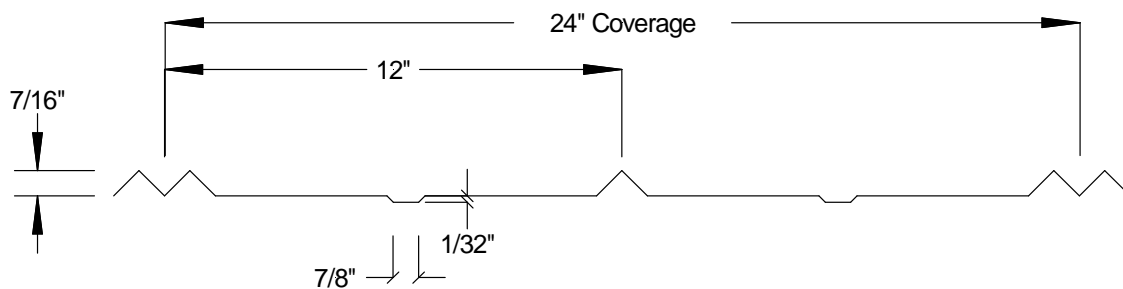
1. UL580-94 & UL 1897-98 Uplift Test
By Hurricane Test Laboratory, LLC (FBC Organization #TST ID: 1527) Report #: 0232-0801-00, Report Date: 9/8/00, Specimens #2-4
0232-0910-05, Report Date: 11/18/05, Specimen #1
2. Quality Assurance
By Keystone Certifications, Inc. (QUA ID: 1824)
Millennium Metals Licensee # 423
3. Equivalency of Test Standard Certification
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)
4. Certification of Independence
By James L. Buckner, P.E. @ CBUCK Engineering
(FBC Organization # ANE 1916)

Installation Method Millennium Metals "5V Crimp" & "Millennium-V" Roof Panel Attached to Wood Deck

Profile Drawings



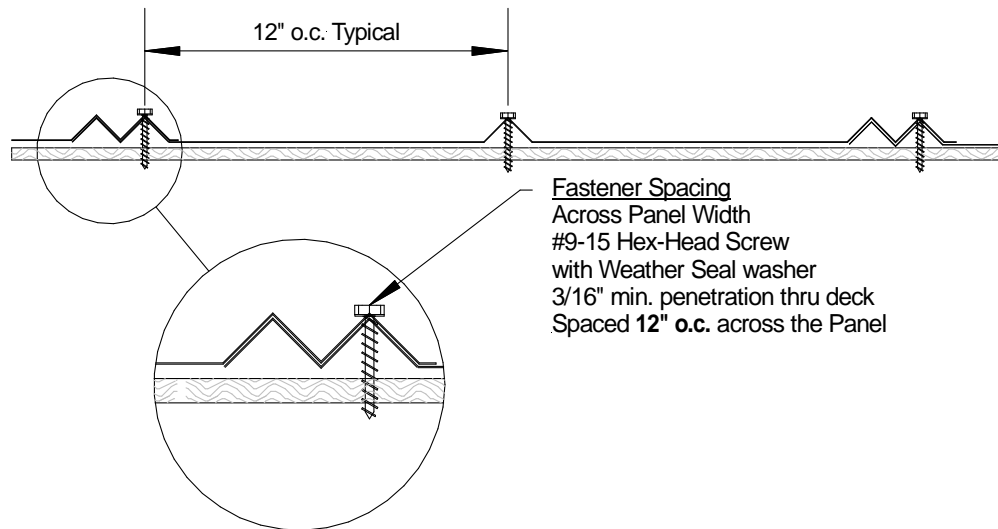
"5V-Crimp" Typical Panel Profile View



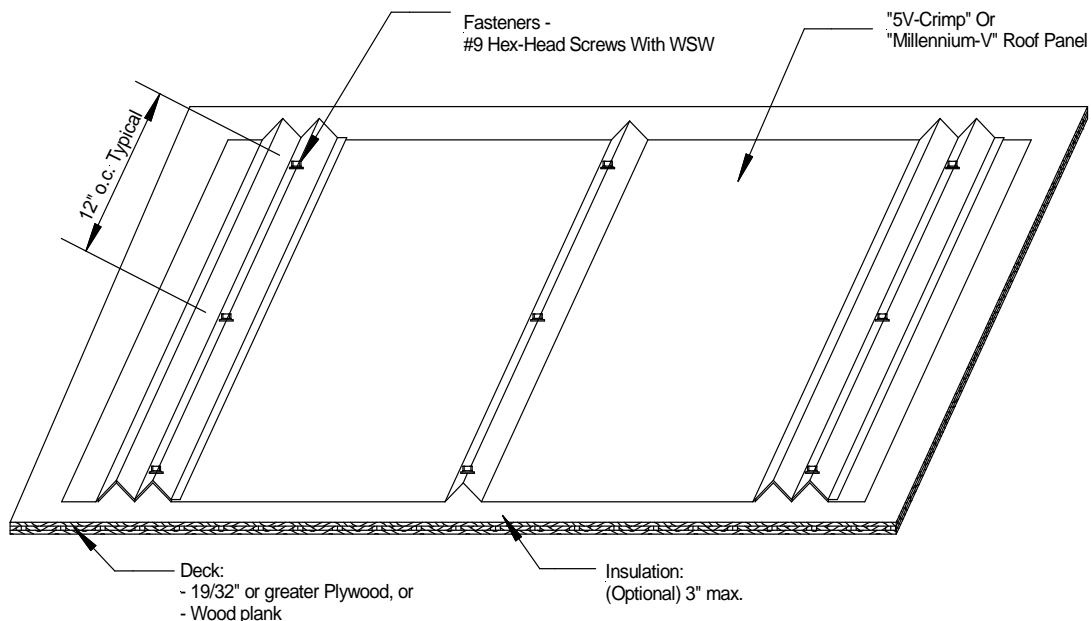
"Millennium-V" Typical Panel Profile View

TABLE "A"		
	METHOD 1:	METHOD 2:
Design Pressure:	- 112.5 PSF	- 113.75 PSF
Deck Thickness:	19/32"	15/32"
Row Spacing:	12"	12"
Fastener Spacing:	12"	6"
Fastener Location:	Corrugation Peaks	Corrugation Peaks & between ribs
Refer to Drawing #:	A-1 & A-2	B-1 & B-2

Installation Method Millennium Metals "5V Crimp" & "Millennium-V" Roof Panel Attached to Wood Deck

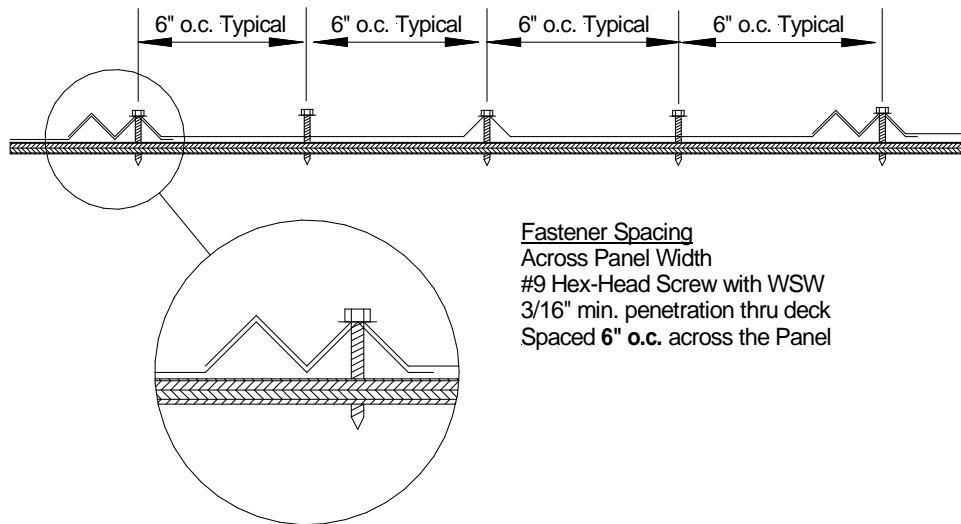


Drawing A-1
Typical Assembly Profile View (METHOD 1)

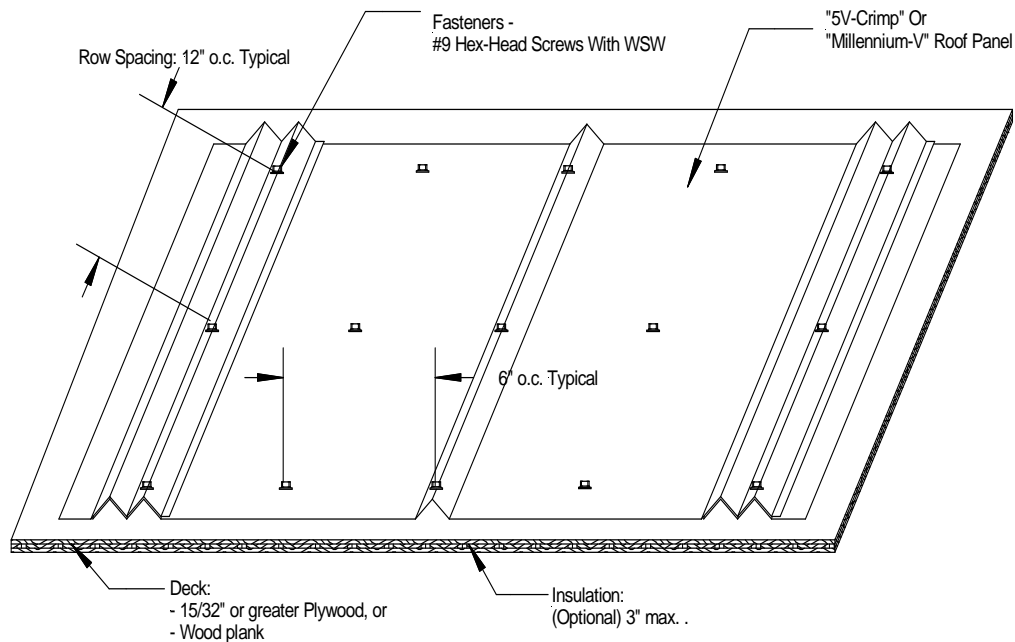


Drawing A-2
Typical Assembly Isometric View (METHOD 1)

Installation Method Millennium Metals "5V Crimp" & "Millennium-V" Roof Panel Attached to Wood Deck



Drawing B-1
Typical Assembly Profile View (METHOD 2)



Drawing B-2
Typical Assembly Isometric View (METHOD 2)