The application and detail drawings in this Guide are strictly for illustration purposes and may not be applicable to all building designs or product installations. All projects should conform to applicable building codes for that particular area. It is recommended to follow all building regulations and standard industry practices.

Metal Sales Manufacturing Corporation is not responsible for the performance of the roof system if it is not installed in accordance with the suggested instructions referenced in this installation guide or in the product overview. (See Product Manual or Product Technical Literature). If there is a conflict between this guide and the actual erection drawings, the erection drawings are to take precedence.

Prior to ordering and installing materials, all dimensions should be verified by field measurements.

Metal Sales reserves the right to modify, without notice, any details, recommendations or suggestions. Any questions regarding proper installation of the roofing system should be directed to your Metal Sales representative, see pages 2 and 3.

Consult Metal Sales for any additional information not outlined in this Guide.

This manual is designed to be utilized as a guide when installing Corrugated Panel roofing systems. It is the responsibility of the erector to ensure the safe installation of this product system.

SAFETY

STUDY APPLICABLE OSHA AND OTHER SAFETY REQUIREMENTS BEFORE FOLLOWING THESE INSTRUCTIONS.

The installation of metal roof systems is a dangerous procedure and should be supervised by trained knowledgeable erectors. USE EXTREME CARE WHILE INSTALLING ROOF PANELS. It is not possible for Metal Sales to be aware of all the possible job site situations that could cause an unsafe condition to exist. The erector of the roof system is responsible for reading these instructions and determining the safest way to install the roof system.

These instructions are provided only as a guide to show a knowledgeable, trained erector the correct part placement one to another. If following any of the installation steps would endanger a worker, the erector should stop work and decide upon a corrective action.

Provide required safety railing, netting or safety lines for crew members working on the roof.

Do not use the roof panel as a walking platform. The roof panels will not withstand the weight of a person standing at the edge of the panel.

Do not stand on the roof panel until the panels have been attached.
For more than 50 years, Metal Sales Manufacturing Corporation has earned a reputation as the premier provider of innovative metal building components and accessories. We’ve backed this reputation with the industry’s largest professional sales and services team. We offer a full line of exceptional quality metal roof and wall panels for agricultural, commercial, architectural, industrial, and residential projects of every shape and size, new construction or retro-fit.
### Branch Locations

<table>
<thead>
<tr>
<th>1.25” Corrugated</th>
<th>2.50” Corrugated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.) DENVER BRANCH</strong>&lt;br&gt;7990 E. I-25 Frontage Road&lt;br&gt;Longmont, CO 80504&lt;br&gt;303.702.5440 Phone&lt;br&gt;800.289.7663 Toll Free&lt;br&gt;800.289.1617 Toll Free Fax</td>
<td><strong>8.) SPOKANE BRANCH</strong>&lt;br&gt;East 2727 Trent Avenue&lt;br&gt;Spokane, WA 99202&lt;br&gt;509.536.6000 Phone&lt;br&gt;800.572.6565 Toll Free&lt;br&gt;509.534.4427 Fax</td>
</tr>
<tr>
<td><strong>2.) JACKSONVILLE BRANCH</strong>&lt;br&gt;7110 Stuart Avenue&lt;br&gt;Jacksonville, FL 32254&lt;br&gt;904.783.3660 Phone&lt;br&gt;800.431.3470 Toll Free (Outside WA)&lt;br&gt;800.742.7900 Toll Free (Inside WA)&lt;br&gt;253.872.2008 Fax</td>
<td><strong>9.) SEATTLE BRANCH</strong>&lt;br&gt;20213 84th Avenue, South&lt;br&gt;Kent, WA 98032&lt;br&gt;253.872.5750 Phone&lt;br&gt;800.394.4419 Toll Free&lt;br&gt;509.534.4427 Fax</td>
</tr>
<tr>
<td><strong>3.) JEFFERSON BRANCH</strong>&lt;br&gt;352 East Erie Street&lt;br&gt;Jefferson, OH 44047&lt;br&gt;440.319.3779 Phone&lt;br&gt;800.289.7663 Toll Free&lt;br&gt;440.576.9242 Fax&lt;br&gt;800.289.1617 Toll Free Fax</td>
<td><strong>10.) NEW ALBANY BRANCH</strong>&lt;br&gt;999 Park Place&lt;br&gt;New Albany, IN 47150&lt;br&gt;812.944.2733 Phone&lt;br&gt;812.944.1418 Fax</td>
</tr>
<tr>
<td><strong>4.) INDEPENDENCE BRANCH</strong>&lt;br&gt;1306 South Powell Road&lt;br&gt;Independence, MO 64057&lt;br&gt;816.796.0900 Phone&lt;br&gt;800.431.3470 Toll Free (Outside WA)&lt;br&gt;800.742.7900 Toll Free (Inside WA)&lt;br&gt;253.872.2008 Fax</td>
<td><strong>11.) ROCK ISLAND BRANCH</strong>&lt;br&gt;8111 West 29th Street&lt;br&gt;Rock Island, IL 61201&lt;br&gt;309.787.1200 Phone&lt;br&gt;800.747.1206 Toll Free&lt;br&gt;309.787.1833 Fax</td>
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<td><strong>5.) SELLERSBURG BRANCH</strong>&lt;br&gt;7800 State Road 60&lt;br&gt;Sellersburg, IN 47172&lt;br&gt;812.246.1866 Phone&lt;br&gt;800.999.7777 Toll Free&lt;br&gt;812.246.0893 Fax&lt;br&gt;800.477.9318 Toll Free Fax</td>
<td><strong>12.) DEER LAKE BRANCH</strong>&lt;br&gt;29 Pinedale Industrial Road&lt;br&gt;Orwigsburg, PA 17961&lt;br&gt;570.366.2020 Phone&lt;br&gt;800.544.2577 Toll Free&lt;br&gt;570.366.1648 Fax&lt;br&gt;800.544.2574 Toll Free Fax</td>
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<tr>
<td><strong>6.) ROGERS BRANCH</strong>&lt;br&gt;22651 Industrial Boulevard&lt;br&gt;Rogers, MN 55374&lt;br&gt;763.428.8080 Phone&lt;br&gt;800.999.7777 Toll Free&lt;br&gt;763.428.8525 Fax&lt;br&gt;800.938.9119 Toll Free Fax</td>
<td><strong>13.) TEMPLE BRANCH</strong>&lt;br&gt;3838 North General Bruce Drive&lt;br&gt;Temple, TX 76501&lt;br&gt;254.791.6650 Phone&lt;br&gt;800.543.4415 Toll Free&lt;br&gt;254.791.6655 Fax&lt;br&gt;800.543.4473 Toll Free Fax</td>
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<tr>
<td><strong>7.) NASHVILLE BRANCH</strong>&lt;br&gt;4314 Hurricane Creek Boulevard&lt;br&gt;Antioch, TN 37013&lt;br&gt;615.229.6570 Phone&lt;br&gt;800.289.7663 Toll Free&lt;br&gt;615.283.4283 Fax&lt;br&gt;800.419.4372 Toll Free Fax</td>
<td><strong>14.) WOODLAND BRANCH</strong>&lt;br&gt;1326 Paddock Place&lt;br&gt;Woodland, CA 95776&lt;br&gt;530.668.5690 Phone&lt;br&gt;800.759.6019 Toll Free&lt;br&gt;530.668.0901 Fax</td>
</tr>
<tr>
<td><strong>15.) FONTANA BRANCH</strong>&lt;br&gt;14213 Whitttram Avenue&lt;br&gt;Fontana, CA 92335&lt;br&gt;909.829.8618 Phone&lt;br&gt;800.782.7953 Toll Free&lt;br&gt;909.829.9083 Fax</td>
<td><strong>16.) ANCHORAGE BRANCH</strong>&lt;br&gt;4637 Old Seward Highway&lt;br&gt;Anchorage, AK 99503&lt;br&gt;907.646.7663 Phone&lt;br&gt;866.640.7663 Toll Free&lt;br&gt;907.646.7664 Fax</td>
</tr>
<tr>
<td><strong>17.) BAY CITY BRANCH</strong>&lt;br&gt;5209 Mackinaw Avenue&lt;br&gt;Bay City, MI 48706&lt;br&gt;989.686.5879 Phone&lt;br&gt;888.777.7640 Toll Free&lt;br&gt;989.686.5870 Fax&lt;br&gt;888.777.0112 Toll Free Fax</td>
<td><strong>18.) DETROIT LAKES BRANCH</strong>&lt;br&gt;1435 Egret Avenue&lt;br&gt;Detroit Lakes, MN 56501&lt;br&gt;218.847.2988 Phone&lt;br&gt;888.594.1394 Toll Free&lt;br&gt;218.847.4835 Fax&lt;br&gt;888.594.1454 Toll Free Fax</td>
</tr>
<tr>
<td><strong>19.) MOCKSVILLE BRANCH</strong>&lt;br&gt;188 Quality Drive&lt;br&gt;Mocksville, NC 27028&lt;br&gt;704.859.0550 Phone&lt;br&gt;800.228.6119 Toll Free&lt;br&gt;704.859.0157 Fax&lt;br&gt;800.228.7916 Toll Free Fax</td>
<td><strong>20.) FORT SMITH BRANCH</strong>&lt;br&gt;7510 Ball Road&lt;br&gt;Fort Smith, AR 72908&lt;br&gt;479.646.1176 Phone&lt;br&gt;877.452.3915 Toll Free&lt;br&gt;479.646.5204 Fax</td>
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<tr>
<td><strong>21.) SIOUX FALLS BRANCH</strong>&lt;br&gt;2700 West 3rd Street, Suite 4&lt;br&gt;Sioux Falls, SD 57104&lt;br&gt;605.335.2745 Phone&lt;br&gt;888.299.0024 Toll Free</td>
<td><strong>TECHNICAL SUPPORT</strong>&lt;br&gt;545 South 3rd Street, Suite 200&lt;br&gt;Louisville, KY 40202&lt;br&gt;502.855.4300 Phone&lt;br&gt;800.406.7387 Toll Free&lt;br&gt;502.855.4290 Fax</td>
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# 1.25" Corrugated Panel Information

## Panel Profile

<table>
<thead>
<tr>
<th>Color Side</th>
<th>5/8&quot;</th>
<th>1¼&quot;</th>
<th>12&quot;</th>
<th>¼&quot;</th>
</tr>
</thead>
</table>

## Slope

The minimum recommended slope for any 1.25" Corrugated roof panel is 3:12.

## Substrate

The recommended substrates are ⅝" plywood with a 30 pound felt moisture barrier or open framing. To avoid panel distortion, use a properly aligned and uniform substructure.

## Coverage

1.25" Corrugated is available in 24" width with a ½" rib height.

## Length

Lengths under 5'-0" are available with some cutting restrictions. Maximum recommended panel length is 45'-0". Longer panels require additional consideration in packaging, shipping and erection. Please consult your Metal Sales branch for recommendations (see pages 2-3 for branch locations).

## Availability

26 Gauge standard. (Optional 29 Ga. Contact your local Metal Sales branch for availability)

## Application

Architectural and Residential panel

## Performance Test

UL 790, UL 263, UL 2218

## Fastening System

Direct fastened (exposed)

## Fasteners

The fastener selection guide should be consulted for choosing proper fasteners for specific applications. Quantity and type of fastener must meet necessary loading and code requirements (see page 12).

## Materials

Steel grade 50, per ASTM A 792

## Finish

- "Acrylic Coated Galvalume" (ACG) / ASTM A 792 - AZ55
- Pre-painted Galvalume, MS Colorfast45® / ASTM A 792 - AZ50
- "PVDF

* Differential appearance of Acrylic Coated Galvalume roofing materials is not a cause for rejection.

** Meets both Kynar 500 and Hylar 5000 specifications.
**ROOF & WALL FASTENING PATTERN**

**Ends and Field of Panel**

- Side Lap 1/4-14 x 7/8" Stitch Fastener (1'-0" o.c.)
- Panel Fastener
- Tape Sealant

---

**SECTION PROPERTIES**

<table>
<thead>
<tr>
<th>Ga</th>
<th>Width</th>
<th>Yield</th>
<th>Weight</th>
<th>Top In Compression</th>
<th>Bottom In Compression</th>
<th>Inward Load</th>
<th>Outward Load</th>
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<tr>
<td></td>
<td>in</td>
<td>ksi</td>
<td>psf</td>
<td>Ixx in^4/ft</td>
<td>Sxx in^3/ft</td>
<td>1' 1.25'</td>
<td>1.5' 1.75' 2'</td>
</tr>
<tr>
<td>29</td>
<td>24</td>
<td>50</td>
<td>0.64</td>
<td>0.0010</td>
<td>0.0070</td>
<td>165</td>
<td>84  49  31  21 11</td>
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<tr>
<td>26</td>
<td>24</td>
<td>50</td>
<td>0.81</td>
<td>0.0015</td>
<td>0.0087</td>
<td>196</td>
<td>126  73  46  31 16</td>
</tr>
</tbody>
</table>

1. Theoretical section properties have been calculated per AISI 2007 'North American Specification for the Design of Cold-Formed Steel Structural Members'. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.
2.5" CORRUGATED PANEL INFORMATION

SLOPE
The minimum recommended slope for any 2.5" Corrugated roof panel is 3:12.

SUBSTRATE
The recommended substrates are 5/8" plywood with a 30 pound felt moisture barrier or open framing. To avoid panel distortion, use a properly aligned and uniform substructure.

COVERAGE
2.5" Corrugated roof coverage is 21-1/3" wide with a 1/2" rib height.
2.5" Corrugated wall coverage is 24" wide with a 1/2" rib height.

LENGTH
Lengths under 5'-0" are available with some cutting restrictions. Maximum recommended panel length is 45'-0". Longer panels require additional consideration in packaging, shipping and erection. Please consult your Metal Sales branch for recommendations (see pages 2-3 for branch locations).

AVAILABILITY
26 gauge standard. (Optional 24 ga. and 29 ga. Contact your local Metal Sales branch for availability)

APPLICATION
Architectural and Residential panel

PERFORMANCE TEST
UL 790, UL 263, UL 2218, Texas Windstorm Evaluation RC-159, 2010 FBC Approval FL14645.1, ICC Evaluation Report ESR-2385

FASTENING SYSTEM
Direct fastened (exposed)

FASTENERS
The fastener selection guide should be consulted for choosing proper fasteners for specific applications. Quantity and type of fastener must meet necessary loading and code requirements (see page 12).

MATERIALS
Steel grade 50, per ASTM A 792

FINISH
- 'Acrylic Coated Galvalume' (ACG) / ASTM A 792 - AZ55
- Pre-painted Galvalume, MS ColorFast45® / ASTM A 792 - AZ50
- **PVDF

* Differential appearance of Acrylic Coated Galvalume roofing materials is not a cause for rejection.
** Meets both Kynar 500 and Hylar 5000 specifications.
# 1.25" Corrugated 2.50" Corrugated

## 2.5" SECTION PROPERTIES & FASTENING PATTERNS

### ROOF FASTENING PATTERN

#### Ends of Panel

- Side Lap 1/4-14 x 7/8" Stitch Fastener (1'-0" o.c.)
- Panel Fastener
- Tape Sealant

#### Field of Panel

- Side Lap 1/4-14 x 7/8" Stitch Fastener (1'-0" o.c.)
- Panel Fastener
- Tape Sealant

### SECTION PROPERTIES

#### ALLOWABLE UNIFORM LOADS, psf

For various fastener spacings

<table>
<thead>
<tr>
<th>Ga</th>
<th>Width in</th>
<th>Yield ksi</th>
<th>Weight psf</th>
<th>Top In Compression</th>
<th>Bottom In Compression</th>
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<tbody>
<tr>
<td>29</td>
<td>21.33</td>
<td>80</td>
<td>0.70</td>
<td>0.0056</td>
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<td>26</td>
<td>21.33</td>
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<td>24</td>
<td>21.33</td>
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<td>1.17</td>
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<td>0.0354</td>
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1. Theoretical section properties have been calculated per AISI 2007 ‘North American Specification for the Design of Cold-Formed Steel Structural Members’. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.

### WALL FASTENING PATTERN

- Panel Fastener

### SECTION PROPERTIES

#### ALLOWABLE UNIFORM LOADS, psf

For various fastener spacings

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<tr>
<th>Ga</th>
<th>Width in</th>
<th>Yield ksi</th>
<th>Weight psf</th>
<th>Top In Compression</th>
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1. Theoretical section properties have been calculated per AISI 2007 ‘North American Specification for the Design of Cold-Formed Steel Structural Members’. Ixx and Sxx are effective section properties for deflection and bending.
2. Allowable load is calculated in accordance with AISI 2007 specifications considering bending, shear, combined bending and shear and deflection. Allowable load considers the 3 or more equal spans condition. Allowable load does not address web crippling, fasteners, support material or load testing. Panel weight is not considered.
3. Deflection consideration is limited by a maximum deflection ratio of L/180 of span.
4. Allowable loads do not include a 1/3 stress increase for wind.

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1. BASE MOLDING

2. J-CHANNEL

3. 14" UNIVERSAL RIDGE

4. SOFFIT

5. UNIVERSAL ENDWALL

6. UNIVERSAL SIDEWALL

1.25" Corrugated
2.50" Corrugated

FLASHING PROFILES

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1.25" Corrugated
2.50" Corrugated

**FLASHING PROFILES**

<table>
<thead>
<tr>
<th>7. MINI ANGLE</th>
<th>8. INSIDE CORNER</th>
<th>9. POST TRIM</th>
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<td><img src="image12" alt="Diagram" /></td>
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</tbody>
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POST FRAME FLASHING PROFILES

1.25" Corrugated
2.50" Corrugated

17 - DOOR POST TRIM
18 - FRAMING CLOSURE
20 - TRANSLUCENT PANEL

21 - EAVE MOLDING
22 - DOUBLE ANGLE
23 - WIDE Z-METAL

24 - UNIVERSAL GAMBREL
25 - RAKE / EAVE TRIM
26 - 3/8" F & J-CHANNEL
26 - 3/4" F & J-CHANNEL

LENGTHS: 8'-0", 10'-0", 12'-0"
1.25" Corrugated
2.50" Corrugated

RESIDENTIAL FLASHING PROFILES

1 - RIDGE / HIP COVER

2 - GABLE TRIM

3 - EAVE

4 - UNIVERSAL ENDWALL

4 - PITCH BREAK

5 - UNIVERSAL SIDEWALL

6 - VALLEY

© Metal Sales Manufacturing Corporation / Subject to change without notice / Effective 8/16
1.25" Corrugated
2.50" Corrugated

**EAVE**

Length 10'-2" - *Specify Slope Angle

**CLEAT**

Length 10'-2"

**VALLEY**

Length 10'-2", 20'-3" *Specify Slope Angle

**BOX GUTTER END**

Length 10'-2", 20'-3" *Specify Slope Angle

**DOWNSPOUT 4" x 3 1/2"**

Length 10'-2", 20'-3" *(Also available 6" x 4")

**RAKE**

Length 10'-2", 20'-3" *(Also available 6" x 4")

**RAKEWALL**

*Also available 6"

**PEAK**

**FORMED RIDGE**

1.25" CORRUGATED

Length 10'-2", 20'-3" 

**FORMED RIDGE**

2.5" CORRUGATED

Length 10'-2" 

**11" RIDGE/HIP COVER**

Length 10'-2", 20'-3" - *Specify Slope Angle

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### FLASHING PROFILES

<table>
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#### ACCESSORIES

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<th>CORRUGATED CLOSURES</th>
<th>TUBE SEALANT</th>
<th>TAPE SEALANT</th>
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<tbody>
<tr>
<td><strong>1 1/4&quot; CORRUGATED</strong></td>
<td>10.3 oz. Cartridge Urethane</td>
<td>Single Bead Sealant 3/4&quot; Bead x 50' Butyl - Grey</td>
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<tr>
<td><strong>2 1/2&quot; CORRUGATED</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; x 2'-0&quot; Polyethylene Foam</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RUBBER ROOF JACK</th>
<th>TOUCH-UP PAINT</th>
<th>UNIVERSAL CLOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round or Square</td>
<td>Available in pints</td>
<td>1&quot; x 1-1/2&quot; x 50'-0&quot;</td>
</tr>
<tr>
<td>Mini (3/8&quot; to 1 1/8&quot; O.D. Pipe)</td>
<td>MS Colorfast45 or PVDF</td>
<td>1&quot; x 1-1/2&quot; x 10'-0&quot;</td>
</tr>
<tr>
<td>#2 (1 1/4&quot; to 3&quot; O.D. Pipe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#4 (3&quot; to 6&quot; O.D. Pipe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6 (6&quot; to 9&quot; O.D. Pipe)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#8 (7&quot; to 13&quot; O.D. Pipe)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| ms-HT UNDERLAYMENT | | |
|---------------------|-------------------|
| High-Temperature Underlayment | | |

*C- Indicates color side of flashing.*
### FASTENER SELECTION GUIDE

#### POP RIVET

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; x 3/16&quot;</td>
<td>A</td>
<td>Unpainted</td>
<td>Flashing to Panel, Flashing to Flashing</td>
</tr>
<tr>
<td>1/8&quot; x 1/16&quot;</td>
<td>A</td>
<td>Painted</td>
<td>Flashing to Panel, Flashing to Flashing</td>
</tr>
</tbody>
</table>

#### PANCAKE HEAD WOODSCREW

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-12 x 1&quot;</td>
<td>A</td>
<td>Plated</td>
<td>Panel or Flashing to wood substructure</td>
</tr>
</tbody>
</table>

#### WOODSCREW

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10-14 x 1&quot;</td>
<td>A</td>
<td>Painted</td>
<td>Panel or Flashing to wood substructure</td>
</tr>
<tr>
<td>#10-14 x 1 1/2&quot;</td>
<td>A</td>
<td>Painted</td>
<td>Panel or Flashing to wood substructure</td>
</tr>
<tr>
<td>#10-14 x 2&quot;</td>
<td>A</td>
<td>Painted</td>
<td>Flashing to Panel, Flashing to Flashing, Panel Sidelap</td>
</tr>
</tbody>
</table>

#### STITCH SCREW

<table>
<thead>
<tr>
<th>SIZE</th>
<th>TYPE</th>
<th>FINISH</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; - 14 x 7/8&quot;</td>
<td>Stitch</td>
<td>Painted</td>
<td>Flashing to Panel, Flashing to Flashing, Panel Sidelap</td>
</tr>
</tbody>
</table>

### FASTENER INSTALLATION TECHNIQUE

- **Recommended Tool Type** - Use depth locating nose or adjustable clutch on screw gun to prevent overdrilling and strip out. Do not use impact tools or runners.
- **Seating the washer** - Apply sufficient torque to seat the washer - do not overdrive the fastener.
- **To prevent wobbling** - Make sure fastener head is completely engaged in the socket. If the head does not go all the way in the socket - tap the magnet deeper into the socket to allow full head engagement. Metal chips will build up from drilling and should be removed from time to time.
- **Protect drill point** - Push only hard enough on the screw gun to engage clutch. This prevents excess friction and burn out of the drill point. Correct pressure will allow screw to drill and tap without binding.
- **Drilling through sheet and insulation** - Ease up on pressure when drilling through insulation to avoid striking the purlin or girt with the point - apply more pressure after drill point contacts purlin or girt.

```
<table>
<thead>
<tr>
<th>CORRECT</th>
<th>TOO LOOSE</th>
<th>TOO TIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sealing material slightly visible at edge of metal washer. Assembly is watertight.</td>
<td>Sealing material is not visible; not enough compression to seal properly.</td>
<td>Metal washer deformed; sealing material pressed beyond washer edge.</td>
</tr>
</tbody>
</table>
```

Drilling through purlin overlaps - Drilling through lapped purlins requires extra care. Excessive voids between purlins sometimes damages drill points and two self-drillers might be necessary to complete the operation. It is sometimes advantageous to predrill.
1.25" Corrugated  
2.50" Corrugated

**DESIGN / INSTALLATION CONSIDERATIONS**

**GENERAL**

Metal Sales’ panels are designed to be installed over open framing and/or directly over a wood substrate (minimum 5/8”) with 30# felt moisture barrier (or an Ice and Water Shield when required by Local Building Codes).

Always check with local building codes prior to all installations for any additional requirements that may be specific to your area.

Galvanized and Galvalume panels should not be in contact with, or subject to, water runoff from copper, lead, or uncoated steel materials.

Condensate water from air conditioning units typically contains dissolved copper. This condensate should be discharged through a plastic pipe extended beyond the edge of the roof.

**CONDITION OF SUBSTRUCTURE**

The roof should be inspected for any trapped moisture or structural damage such as bowing or sagging rafters and warped or loose roof purlins or solid decking. These areas should be repaired prior to installing new metal panels.

Prior to installation, make sure there are no nails or fasteners protruding from the roof framing or wood substrate which could damage the panels and impede the installation process.

When installed, panel distortion may occur if not applied over properly aligned and uniform substructure.

Whether installing over new or existing roof, the installer should check the roof deck for squareness before installing panels. Several methods can be used to verify squareness of the structure for proper installation of the panels.

METHOD “A” - One method for checking the roof for squareness is to measure diagonally across one slope of the roof from similar points at the ridge and eave and obtain the same dimension.

METHOD “B” - The 3-4-5 triangle system may also be used. To use this system, measure a point from the corner along the edge of the roof at a module of three (3). Measure a point from the same corner along another edge at a module of four (4). By measuring diagonally between the two points established, the dimension should be exactly a module of five (5) to have a square corner. Multiple uses of this system may be required to determine building squareness. If the endwall cannot be made square, the roof system cannot be installed as shown in these instructions.
1.25" Corrugated
2.50" Corrugated

HANDLING MATERIAL

RECEIVING MATERIAL

It is the responsibility of the installer to unload material from the delivery truck. The installer shall be responsible for providing suitable equipment for unloading of material from the delivery.

After receiving material, check the condition of the material, and review the shipment against the shipping list to ensure all materials are accounted for. If damages or shortages are discovered, it should be noted on the Bill of Lading at the time of delivery. A claim should be made against the carrier as soon as possible. Metal Sales is not responsible for any damages or shortages unless they are documented in writing and presented to Metal Sales within 48 hours.

GENERAL HANDLING

Each bundle should be handled carefully to avoid being damaged. Care should be taken to prevent bending of the panel or abrasion to finish. Whenever possible, the bundle should remain crated until it is located in its place of storage. If bundles must be opened, we recommend you re-crate them before lifting. To avoid damage please lift the bundle at its center of gravity.

CAUTION

Improper loading and unloading of bundles and crates may result in bodily harm and/or material damage. Metal Sales is not responsible for bodily injuries and/or material damages resulting from improper loading and unloading.

MECHANICAL HANDLING

Forklift - A forklift may be used for panels up to 20'-0" long. Please make sure the forks are at their maximum separation. Do not transport open bundles. When transporting bundles across rough terrain, or over a longer distance, some means of supporting the panel load must be used.

Crane - A crane should be used when lifting panels with lengths greater than 20'-0". Please be sure to utilize a spreader bar to ensure the even distribution of the weight to the pick up points. As a rule when lifting panels, no more than \( \frac{1}{3} \) of the length of the panel should be left unsupported. Never use wire rope because this will damage the panels.
When handling painted steel, care should be taken to prevent scratching of material. Clean gloves should be worn at all times to prevent a reaction with salts found on bare skin. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

Handling of individual panels should be done carefully and properly to avoid bending or damaging. Panels should be carried by grasping the edge of the panel so that the panel is vertical to the ground. The panel should not be carried horizontal to the ground as this could cause the panel to buckle or bend in the center.

Normally, individual panels can be handled by people placed every 6'-0" to 8'-0" along the length of the panel.
GENERAL

Please inspect panels for moisture accumulation. If moisture has formed, the panels should be unbundled, wiped dry, and allowed to dry completely. Once dry, carefully re-stack the panels and loosely recover allowing for ample air circulation.

Bundled sheets should be stored high enough off of the ground to allow for air circulation and prevent contact with accumulating water. Elevate one end of the bundle to allow any moisture to run off the panels. Metal Sales recommends covering the bundle with a tarpaulin. Do not use tight fitting plastic-type tarps as panel bundle covers. While they may provide protection from heavy downpours, they can also retard necessary ventilation and trap heat and moisture that may accelerate metal corrosion. If panels are to be stored in possible bad weather, we suggest they be stored inside. Extended storage of panels in a bundle is not recommended. **Under no circumstances should the panels be stored near or come in contact with salt water, corrosive chemicals, ash, or fumes generated or released inside the building or nearby plants, foundries, plating works, kilns, fertilizer, and wet or green lumber.**

FOOT TRAFFIC

Care of metal panels and flashings must be exercised throughout erection. Foot traffic can cause distortion of panel and damage to finish. Traffic over the installed system must be kept to an absolute minimum. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

When walking on the roof panels is unavoidable, walk only in the flats of the panel. Walking on the ribs can cause damage to the panels.

REQUIRED TOOLS

Standard required tools for field installation include:

- Screw Guns
- Magnetic Bits
- Metal Nibbler or Shear
- Tin Snips (Right, Left and Center)
- Tape Measure
- Hammer
- Chalk Line
- Drill with bits
- Pop Rivet Tool
- Safety Goggles
- Gloves
- Ear Plugs
- Fall Protection
FIELD CUTTING

Tin snips or a "nibbler" type electric tool are recommended for field cutting metal panels. Cutting the steel generates slivers or metal chips. These slivers and metal chips must be immediately removed from the panels because they will damage the finish and shorten the life of the product.

One method of preventing this problem is to flip the panels over when cutting. This allows the slivers and metal chips to be brushed from the back side and avoids damaging the paint on the top side of the panels.

When cutting metal panels and flashings, goggles must be worn for eye protection.

CAUTION

All product surfaces should be free of debris at all times. Installed surfaces should be wiped clean at the end of each work period. Never cut panels over metal surfaces. Metal shavings will rust on the surface, voiding the warranty.

TOUCH-UP PAINT

All painted panels and flashings have a factory applied baked on finish. Handling and installing panels may result in some small scratches or nicks to the paint finish. Touch-up paint is available in matching colors from Metal Sales. It is recommended that a small brush be used to apply touch-up paint to those areas that are in need of repair. Touch-up paint does not have the superior chalk and fade resistance of the factory applied paint finish and will normally discolor at an accelerated rate. Aerosol paint should not be used because of the over-spray that may occur.

VENTILATION

Proper design and installation of vapor barriers and ventilation systems are important to prevent condensation and the resulting problems of moisture damage and loss of insulation efficiency.

Condensation occurs when moisture laden air comes in contact with a surface temperature equal to or below the dew point of the air. This phenomenon creates problems that are not unique with metal buildings; these problems are common to all types of construction.

The underside of the metal roof on a typical metal building (no attic) should be protected from condensation by insulating with a faced insulation. This should reduce the potential of condensation forming on the underside of the panels.

On buildings that have an attic space or are being retrofitted with a metal roofing system, vents should be placed at both the eave and peak of the roof in order to prevent a buildup of moisture (humidity) in the attic space.
PANEL INSTALLATION

NOTE: - Eave, Gutter and Valley Flashings must first be installed before panel installation can begin. - Panels can be installed going from either left to right or right to left, looking from eave to peak.

INSTALLING INSIDE CLOSURES

STEP 1
1. Apply a row of Tape Sealant across the top leg of the Eave Flashing along the width of the building.
2. Align and place Inside Closures over the Single Bead Tape Sealant. It is critical that Inside Closures are square to building as this will control the alignment of the panels. (See page 11 to check building square).
3. Apply a row of Tape Sealant across the top of the Inside Closure (Not shown for clarity).

INSTALLING FIRST PANEL

STEP 2
1. Install the first panel over the Inside Closure to allow for desired overhang. Make sure the panel is square to the eave and rake.
2. Fasten through panel, closure, and sealants into decking with appropriate amount of fasteners to meet local building code. (See fastening patterns on page 7). Fasteners must penetrate closure and Tape Sealant.
3. After securing panel at eave, repeat the fastening pattern at the appropriate spacing to meet local building codes.
1.25" Corrugated
2.50" Corrugated

EAVE DETAIL

3:12 Slope
Minimum

- #10-12 x 1" Pancake Head Woodscrew (4'-0" o.c.)
- Single Bead Tape Sealant
- Corrugated Inside Closure
- Single Bead Tape Sealant
- Corrugated Panel
- #10-14 x 1" Wood screw (see below)
- Moisture Barrier (by others)
- Eave
- #10-14 x 1" Wood screw (see below)

1.25" Corrugated
2.50" Corrugated

BOX GUTTER DETAIL

3:12 Slope
N

- Corrugated Panel
- Moisture Barrier (by others)
- #10-12 x 1" Pancake Head Woodscrew (1'-0" o.c.)
- Single Bead Tape Sealant
- Corrugated Inside Closure
- #9-15 x 1" Wood screw (see below)
- Single Bead Tape Sealant
- Universal Gutter/Downspout Strap
- 1/8" x 3/16" Pop-Rivet (1 per gutter strap)
- Box Gutter
- #10-14 x 1" Wood screw

Corrugated Fastening Pattern
1. Apply a row of Tape Sealant across and over the ribs of the first panel about 3" from panel end.
2. Install the second panel over the first panel and Tape Sealant with a 6" Endlap. Fasten through both panels and Tape Sealant into support with appropriate amount of fasteners to meet local building code. (See fastening patterns on page 7). Fasteners must penetrate Tape Sealant.
3. After securing panel at eave, repeat the fastening pattern at the appropriate spacing to meet local building codes.

1. Place the lapping seam of the second panel on top of previously installed panel so that panel ends are flush at eave (See below).
2. Fasten through panel, closure, and Tape Sealant into support with appropriate amount of fasteners to meet local building code. (See fastening patterns on page 7). Fasteners must penetrate closure and Tape Sealant.
3. After securing panel at eave, repeat the fastening pattern at the appropriate spacing to meet local building codes.
1.25" Corrugated
2.50" Corrugated

ENDLAP DETAIL

3:12 Slope
Minimum

Valley Detail

Moisture Barrier (by others)

Single Bead Tape Sealant

#10-14 x 1" Woodscrew (see below)

Corrugated Panel

Valley

Slope

6"

1.25" Corrugated
2.50" Corrugated

VALLEY DETAIL

3:12 Slope

Moisture Barrier (by others)

Single Bead Tape Sealant

#10-14 x 1" Woodscrew (see below)

Corrugated Inside Closure

Corrugated Panel

Valley

3" Minimum
1.25" Corrugated
2.50" Corrugated

RAKE DETAIL

#10-14 x 1" Wood screw (1'-0" o.c.)

Single Bead Tape Sealant

Corrugated Panel

Rake Flashing

RAKEWALL DETAIL

#10-14 x 1" Wood screw (1'-0" o.c.)

Rakewall

#10-14 x 1" Wood screw (1'-0" o.c.)

Single Bead Tape Sealant

Corrugated Panel
ENDWALL DETAIL

3:12 Slope
Minimum

1/4-14 x 7/8" Stitch Screw (every rib)
Corrugated Panel

- Fasteners (by others)
- Pitch Break
- Moisture Barrier (by others)
- Single Bead Tape Sealant
- Corrugated Outside Closure
- #10-14 x 1" Wood screw (see below)
- 1/8-14 x 7/8" Stitch Screw (every rib)
- Corrugated Panel

PEAK DETAIL

5V-CRIMP

3:12 Slope
Minimum

1/4-14 x 7/8" Stitch Screw (every rib)
Corrugated Panel

- Corrugated Panel
- 1/4-14 x 7/8" Stitch Screw (every rib)
- #10-14 x 1" Woodscrew (see below)
- Single Bead Tape Sealant
- Corrugated Outside Closure
- Single Bead Tape Sealant
- Moisture Barrier (by others)
- Peak
- Cleat
- #10-12 x 1" PHW (1'-0" o.c.)
**HIP DETAIL**

3:12 Slope
Minimum

- Corrugated Panel
- 1/4"-14 x 7/8" Stitch Screw (every rib)
- Single Bead Tape Sealant
- Universal Closure
- #10-14 x 1" Woodscrew (see below)
- 11" Ridge/Hip Cover
- Moisture Barrier (by others)

**5V-CRIMP**

RIDGE DETAIL

3:12 Slope
Minimum

- Corrugated Panel
- 1/4"-14 x 7/8" Stitch Screw (every rib)
- Single Bead Tape Sealant
- Corrugated Outside Closure
- #10-14 x 1" Wood screw (see below)
- 11" Ridge/Hip Cover
- Moisture Barrier (by others)
CHIMNEY / CRICKET DETAIL

1.25" Corrugated
2.50" Corrugated

ROOF PENETRATION DETAIL

ADDITIONAL DETAILS

Tape Sealant
Fastener
Tape Sealant
Vent Pipe
Rubber Roof Jack

AVAILABLE SIZES
MINI (¼" TO 1½" O.D. PIPE)
#2 (1½" TO 3" O.D. PIPE)
#4 (3" TO 6" O.D. PIPE)
#6 (6" TO 9" O.D. PIPE)
#8 (7" TO 13" O.D. PIPE)
Though factory applied pre-painted finishes are very durable and will last many years, eventually it may be desirable to thoroughly clean or repaint them.

Dirt pickup may cause apparent discoloration of the paint when it has been exposed in some dirt-laden environments for long periods of time. In areas of strong sunlight, slight chalking may cause some change in appearance. A good cleaning will often restore the appearance of these buildings and render repainting unnecessary. An occasional light cleaning will help maintain a good appearance.

In many cases, simply washing the building with plain water using a hose or pressure sprayer will be adequate. In areas where heavy dirt deposits dull the surface, a cloth or soft bristle brush and solution of water and detergent (1/2 cup of laundry detergent per gallon of water for example) may be used. This should be followed by an adequate rinse of water. Do not use wire brushes, abrasives, or cleaning tools which will damage the coating surface.

Mildew may occur in areas subject to high humidity but is not normally a problem due to the high inherent mildew resistance of the baked finish that is used. To remove mildew along with the dirt, the following solution is recommended.

\[
\frac{1}{3} \text{ cup detergent (Tide® or equivalent)} \\
\frac{2}{3} \text{ cup trisodium phosphate (Solex® or equivalent)} \\
1 \text{ quart of 5% sodium hypochlorite solution (Clorox® or equivalent)} \\
3 \text{ quarts of water}
\]

Strong solvents and abrasive type cleaners should be avoided. Most organic solvents are flammable and toxic and must be handled accordingly. When using a solvent, consult maintenance professionals and label instructions for proper handling and disposal of washings. If required, a mild solvent such as mineral spirits can be used to remove caulking compounds, oil, grease, tars, wax, and similar substances. Use a cloth dampened with mineral spirits and apply only to areas which are contaminated. Follow up the use of this mild solvent with detergent cleaning and rinsing.