TDI | Texas Department of Insurance

PO Box 12030 | Austin, TX 78711 | 800-578-4677 | tdi.texas.gov

Product Evaluation

RC665 | 0621

Engineering Services Program

The following product has been evaluated for compliance with the wind loads specified in the International Residential Code (IRC) and the International Building Code (IBC).

This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.

This product evaluation is intended for use by those individuals who are following the design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code, and the Texas Engineering Practice Act.

For more information, contact TDI Engineering Services Program at (800) 248-6032.

Evaluation ID: RC-665

Effective Date: June 1, 2021
Re-evaluation Date: June 2025

Product Name: Polyset® RTA-1 Roof Tile Adhesive

Manufacturer: ICP Building Solutions Group
150 Dascomb Road
Andover, MA 01810
(954) 304-3890

General Description:
Polyset® RTA-1 roof tile adhesive is used for adhering concrete and clay roof tiles to roof underlayment systems. The single component polyurethane foam roof tile adhesive is used with flat, low, and high profile roof tile systems.

Adhesive Attachment: Concrete and clay roof tiles must be installed in accordance with this product evaluation report and in accordance with the Polyset® RTA-1 Installation Instructions published by ICP Building Solutions Group, © 2018. General installation requirements for the roof tiles must be as specified in the roof tile manufacturer's installation instructions.

Licensed Applicators: Installation must be performed by applicators who hold a current and valid Qualified Applicator Card presented by ICP Building Solutions Group.

Tile Dimension Limitations: The Flat/Low profile, Medium profile, and High profile roof tiles must be between 12" and 21" in length. The exposed width of the roof tiles must be between 8" and 15". The maximum thickness of the tail of the roof tiles must not exceed 1-3/8". Each roof tile must have at least 2/3 of the tile's area free of adhesive contact.

Roof Tile Profile Classifications: Roof tile profiles are classified as one of the following:

- **Flat/Low profile:** Flat/Low profile tiles are defined as tiles having a rise equal to or less than 1/2" and a rise-to-width ratio of less than or equal to 1-1/2.
- **Medium profile:** Medium profile tiles are defined as tiles having a rise greater than 1/2" and a rise-to-width ratio of less than or equal to 1-1/2.
- **High/Barrel profile:** High/Barrel profile tiles are defined as those tiles having a rise to width ratio greater than 1-1/2.

Roof Slope Limitations: The minimum roof slope is: 2-1/2:12.

Installation:

Roof Framing and Roof Deck: Roof framing members must be in accordance with either the IRC or the IBC. The roof framing members must not be spaced greater than 24" on center. The roof deck must be solidly sheathed with minimum 15/32" wood structural panels. The minimum thickness and application of the roof sheathing to the roof framing members must be in accordance with either the IRC or the IBC to resist the required wind loads. If the existing roof deck is a spaced board roof deck, then the spaced boards must either be removed or covered with minimum 15/32" wood structural panels. The wood structural panels must be installed over the spaced boards in accordance with either the IRC or the IBC to resist the required wind loads.

Metal Drip Edge: A metal drip edge must be installed as specified in the roof tile manufacturer's installation instructions.

Underlayment (Use one of the following options):

Option 1: Hot Mop 30/90 Underlayment: The underlayment must consist of a two-ply 30/90 hot mop underlayment system.

- The base ply (anchor sheet) of the underlayment system must be an ASTM D 226 Type II (No. 30) asphalt-saturated organic felt. The base ply must be fastened to the wood roof deck with minimum 11-gauge (minimum 0.120" shank diameter) corrosion resistant roofing nails (smooth, ring, or screw shank) with a minimum 1" diameter flat head or with minimum 1-5/8" diameter tin caps. The fasteners must be long enough to penetrate a minimum of 1/4" through the bottom (underside) of the wood deck.
- The top ply of the underlayment system must consist of one layer of No. 90 ASTM D249 mineral surfaced roll roofing. The top ply must be applied over the base ply by first adhering the top ply to the base ply with a full mopping of ASTM D 312 Type IV asphalt. Next, the top ply must be backnailed to the base ply with minimum 11-gauge (minimum 0.120" shank diameter) corrosion resistant nails (smooth, ring, or screw shank) with a minimum 1" diameter flat head or with minimum 1-5/8" diameter tin caps. The fasteners must be long enough to penetrate a minimum of 1/4" through the bottom (underside) of the wood deck.

Attachment of 30/90 Underlayment to Roof Deck:

- The required underlayment design pressure is determined using analysis based on the Building Exposure, the mean roof height of the structure, the location of the structure, and the roof slope of the structure.
- The allowable uplift resistance for the underlayment attachment is specified in Table 1. Either Attachment Method A, B, or C from Table 1 may be used as long as the allowable uplift resistance of the underlayment attachment is greater than the required underlayment design pressure determined from analysis.

Option 2: Self-Adhering Underlayment:

Self-adhering underlayment may be used in accordance with one of the following requirements:

- The self-adhering underlayment must be listed in a current ICC-ES Evaluation Report as approved for use with Polyset® RTA-1, or
- Document through testing at an accredited test laboratory as having met the requirements set forth in ICC-ES AC152 Section 3.4. For testing in accordance with ICC-ES AC152, Section 3.4.5, the tensile adhesion/long term aging tests must have been completed using Polyset® RTA-1 with the subject self-adhering underlayment.

Attachment of Self-Adhering Underlayment to Roof Deck:

- The self-adhering underlayment must be installed in accordance with the self-adhering underlayment manufacturer's published installation instructions. The allowable uplift resistance of the self-adhering underlayment must be in accordance with the underlayment manufacturer's test and/or evaluation documentation. The underlayment must be back-nailed to the roof deck with minimum 11-gauge (minimum 0.120" shank diameter) corrosion resistant nails (smooth, ring, or screw shank) with minimum 1-5/8" diameter tin caps spaced 12" on center. The fasteners must be long enough to penetrate a minimum of 1/4" through the bottom of the wood deck.

Moment of Resistance: The overturning resistance (moment of resistance) due to wind of the roof tiles based on the installation method for the roof tiles are shown in Table 2 and Table 3.

Aerodynamic Uplift Moment: The aerodynamic uplift moment for the roof tile is calculated using Equation 16-34 from the 2018 IBC. The aerodynamic uplift moment is calculated based on the mean roof height for the installation and the required wind speed and Exposure condition for the installation location using ASCE 7-16.

Permissible Tile Installation: The roof tiles may be installed if the Moment of Resistance for the roof tile specified in this evaluation report is greater than the Aerodynamic Uplift Moment for the roof tile calculated for the structure location.

Battens: Battens must be installed as required by the roof tile manufacturer. If battens are installed, then they must be installed over the underlayment. If battens are used, then Polyset® RTA-1 must not applied to the battens.

Table 1
Allowable Uplift Resistance for Two-Ply Underlayment Attachment (psf)

Attachment Method (See Below)	Field (Inches o.c.)	Lap (Inches o.c.)	Backnail Cap Sheet (Inches o.c.)	Allowable Uplift Resistance (psf)			
				15/32" Plywood		19/32" Plywood	
				Smooth	Deformed[1]	Smooth	Deformed[1]
A	6	12	12	41.6	47.4	52.7	60.0
		11		43.1	49.1	54.6	62.1
		10		44.9	51.0	56.8	64.6
		9		47.0	53.5	59.5	67.7
		8		49.6	56.5	62.9	71.5
		7		53.0	60.3	67.2	76.4
		6		57.6	65.5	72.9	82.9
		5		63.9	72.7	81.0	92.0
		4		73.5	83.6	93.0	105.8
		3		89.3	101.6	113.2	128.6
B	6	12	12	49.6	56.5	62.9	71.5
		11		51.8	58.9	65.6	74.6
		10		54.4	61.9	68.9	78.3
		9		57.6	65.5	72.9	82.9
		8		61.5	70.0	78.0	88.6
		7		66.6	75.8	84.4	96.0
		6		73.5	83.6	93.0	105.8
		5		83.0	94.4	105.1	119.5
		4		97.3	110.7	123.2	140.1
		3		121.1	137.8	153.4	174.4
C	6	12	12	58.6	66.6	74.2	84.3
		11		61.4	69.9	77.8	88.5
		10		64.9	73.9	82.2	93.5
		9		69.2	78.7	87.6	99.6
		8		74.4	84.7	94.3	107.2
		7		81.3	92.4	102.9	117.0
		6		90.3	102.8	114.4	130.1
		5		103.0	117.2	130.5	148.4
		4		122.1	138.9	154.6	175.8
		3		153.9	175.1	194.9	221.6

[1]Deformed shank includes either ring shank or screw shank nails

Attachment Method A: One row at the minimum 2" wide base sheet side laps; two staggered rows in the field of the base sheet; and one row backnailed within the minimum 3" wide cap sheet side lap.

Attachment Method B: One row at the minimum 2" wide base sheet side laps; three staggered rows in the field of the base sheet; and one row backnailed within the minimum 3" wide cap sheet side lap.

Attachment Method C: One row at the minimum 2" wide base sheet side laps; four staggered rows in the field of the base sheet; and one row backnailed within the minimum 3" wide cap sheet side lap.

Table 2
Summary of Allowable Overturning Moment (Field Tiles)

Tile Profile	Material	Paddy	Allowable Overturning Moment (ft-lbf)
Low/Flat	Clay or Concrete	2-Paddy	50
Low/Flat	Concrete	Hybrid	73
Medium	Concrete	2-Paddy	79
Medium	Concrete	Hybrid	65
High	Clay	2-Paddy	40
High	Clay	2-Paddy	44
High	Concrete	2-Paddy	60
High	Concrete	Hybrid	63
Cap & Pan (Barrel)	Clay or Concrete	2-Paddy	93

Table 3
Summary of Allowable Overturning Moment (Hip and Ridge Tiles)

Substrate	Material	Attachment Method	Allowable Overturning Moment (ft-lbf)
2x PT Ridge Board	Clay or Concrete	Interdependent: Head: One (1) #10x2-1/2" Screw; Overlap: 1"x6" x ~10.5-gram	125
East Coast Metals Trim Lock™: or Trim Lock™ Plus: aluminum, galvanized, galvalume® or stainless steel	Clay or Concrete	Interdependent: On Trim-Lock™ metal: One (1) ~7" long x ~10-gram oblong shaped paddy centered on metal. At Tile Headlap: One (1) ~7" long x ~10-gram oblong shaped bead at tile headlap	90
East Coast Metals Trim Lock™: galvanized, galvalume® or stainless steel	Clay or Concrete		116

Roof Tile Installation: The roof tiles and the underlayment system must be clean and dry at the time of application.

The roof tiles must be adhered to the underlayment using Polyset® RTA-1 in accordance with ICP Building Solutions Group published installation instructions and the paddy application methods provided in this product evaluation report. A brief overview of the installation instructions is presented in this section.

The roof tiles must be adhered directly to the underlayment system. Battens are permitted but are not required. If battens are used, then the roof tiles must not be adhered to the battens. Roof tiles must be adhered directly to freshly applied adhesive. The roof tile must be set within 1 to 2 minutes after the adhesive has been dispensed depending on the ambient temperature.

The adhesive is dispensed in the form of paddies. The following paddy application methods are acceptable:
(1) Two paddy placement
(2) Hybrid placement
(3) Two-Piece Barrel placement

Presented below are brief overviews of the installation instructions for flat/low profile, medium profile, high profile, and two-piece barrel profile roof tiles.

Flat/Low Profile, Medium Profile, and High Profile Roof Tiles:
General Installation Requirements: Apply a paddy of Polyset® RTA-1 adhesive vertically under the tile at the starting side of the roof. Install the first course of the tile over the paddy of Polyset® RTA-1 adhesive. Make certain that the tiles overhang the eave drip edge evenly along the entire first course. Apply a paddy of Polyset® RTA-1 adhesive vertically under the pan closest to the underlock of the previously installed tile. For flat tiles, place adhesive under the strengthening rib closest to the overlock of the tile being set.

Paddy Placement Application: Refer to either the two paddy or hybrid placement applications shown in Figures 1 thru 3 or the hybrid placement applications shown in Figures 5 thru 7 at the end of this product evaluation report for proper placement and sizes of adhesive paddies. Fasteners must be installed in addition to the adhesive as required based on roof slope. The fasteners must be as specified in the IRC or the IBC.

Two-Piece Barrel Roof Tiles:
General Installation Requirements: Apply a paddy of adhesive vertically under the pan tile at the starting side of the roof. Install the first course of tile over the paddy of Polyset® RTA-1 adhesive. Make certain that the tiles overhang the eave drip edge evenly along the entire first course. Turn the cover tile over on its back to allow for the application of Polyset® RTA-1 adhesive. Apply a bead of Polyset® RTA-1 adhesive directly onto the inner edge of each side of the cover tile. The cover tile is then turned over and placed onto previously installed pan tiles such that the adhesive is in contact with barrel edges of the pan tiles.

Paddy Placement Application: Refer to the application for two-piece barrel tiles shown in Figure 4 at the end of this product evaluation report for proper placement and size of adhesive paddies. Fasteners must be installed in addition to the adhesive as required based on roof slope. A 2"x4" nailer, placed on edge, straw nail or a wire and nailing system, may be required for fastening two-piece barrel tiles on steeper pitches.

Additional Attachment Requirements for Roof Tiles:

- For roof slopes above 6:12, the eave course must be fastened with a single corrosion resistant fastener in addition to the adhesive. The fasteners must be as specified in the IRC or the IBC. Flashing cement must be applied to seal all fastener penetrations when required by the underlayment manufacturer.
- For roof slopes above 6:12 up to and including 7:12, every third tile in every fifth course must be fastened with a single corrosion resistant fastener in addition to the adhesive. The fasteners must be as specified in the IRC or the IBC. Flashing cement must be applied to seal all fastener penetrations when required by the underlayment manufacturer.
- For roof slopes greater than 7:12, every tile must be fastened with a single corrosion resistant fastener in addition to the adhesive. The fasteners must be as specified in the IRC or the IBC. Flashing cement must be applied to seal all fastener penetrations when required by the underlayment manufacturer.
- For roof slopes > 24:12, the nose end of all tiles must be fastened to the roof deck with a nose clip in addition to a large paddy of adhesive. The fasteners used to secure the nose clip to the roof deck must be as specified in the IRC or the IBC. Flashing cement must be applied to seal all fastener penetrations.

Note: The Polyset® RTA-1 Installation Instructions published by ICP Building Solutions Group must be available on the job site during installation. Use fasteners that are corrosion resistant as specified in the IRC and the IBC.

Figure 1
Flat/Low Profile Tile

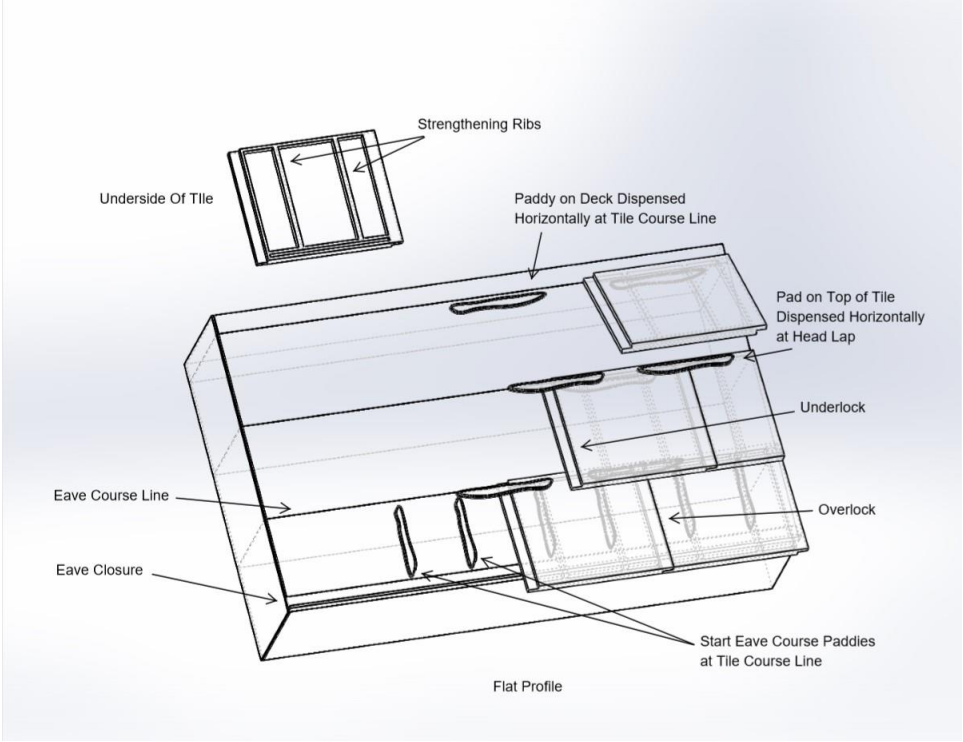

Figure 2
Medium Profile Tile

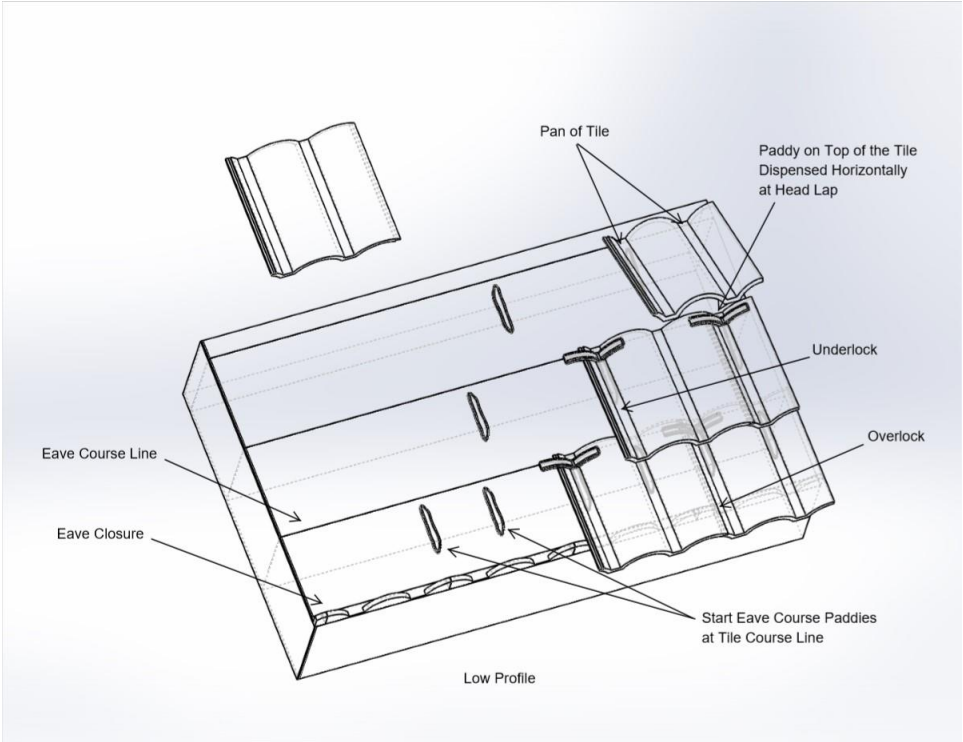

Figure 3
High Profile Tile

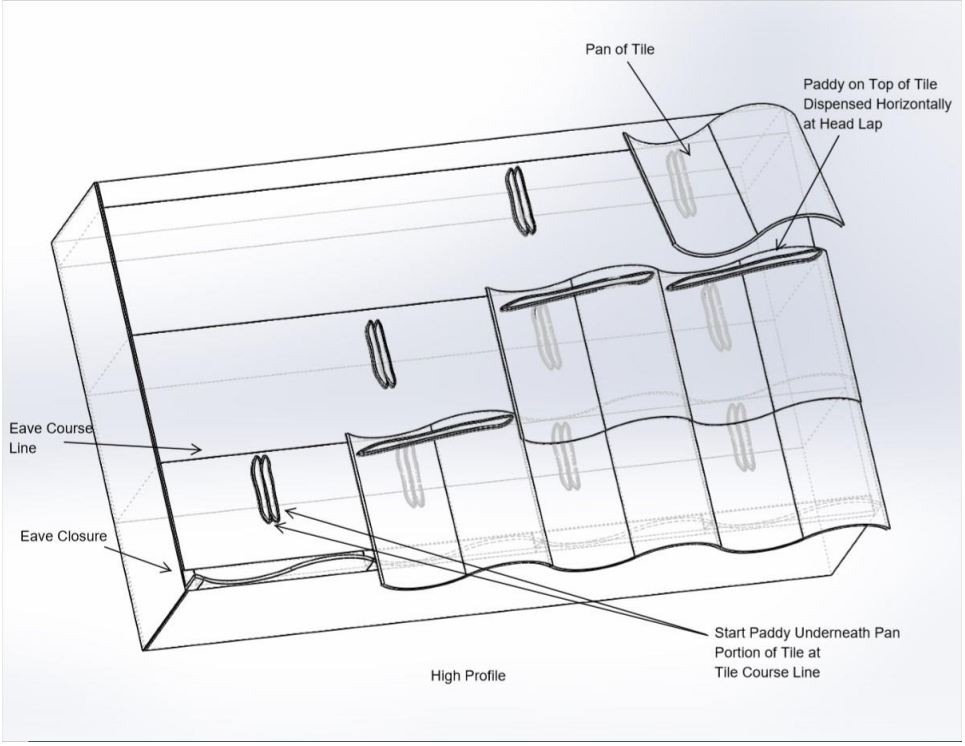

Figure 4
2-Piece Barrel (Cap & Pan) Tile

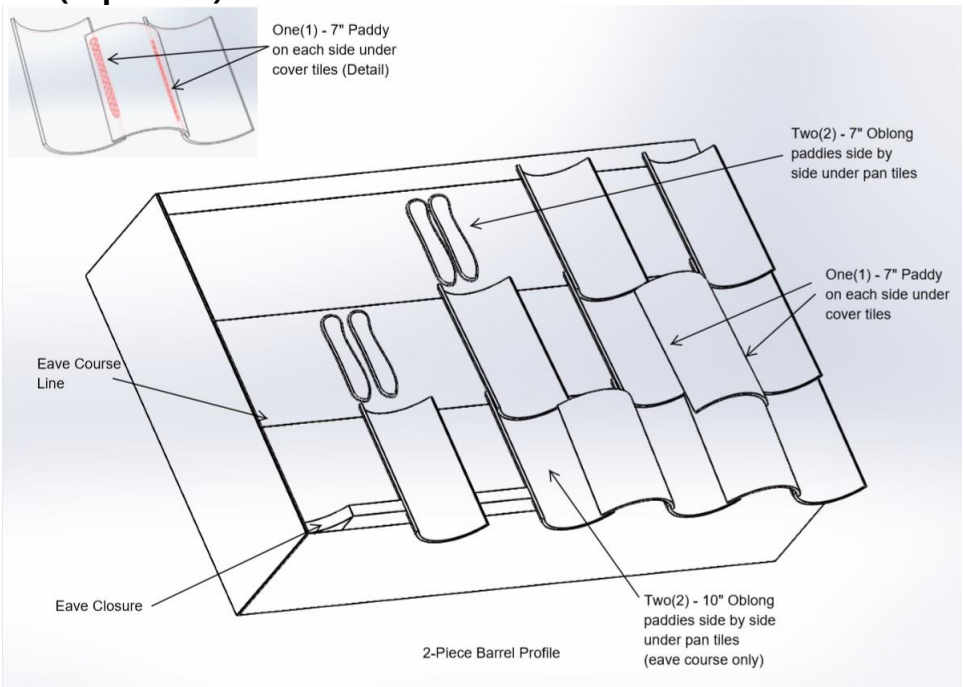

Figure 5
Flat/Low Profile Hybrid Tile

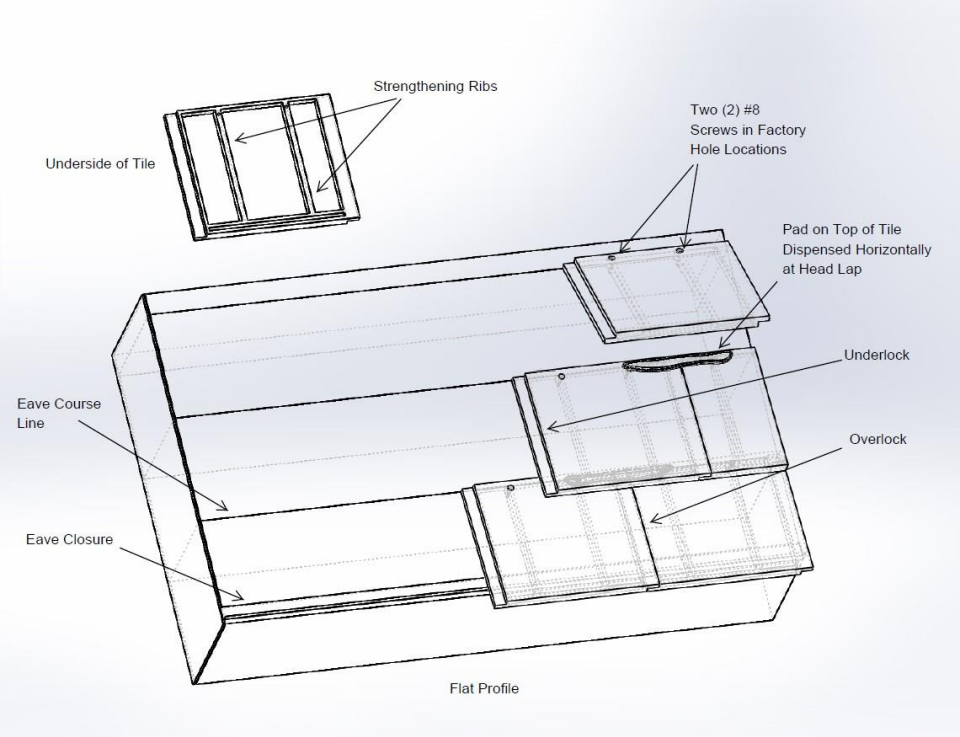

Figure 6
Medium Profile Hybrid Tile

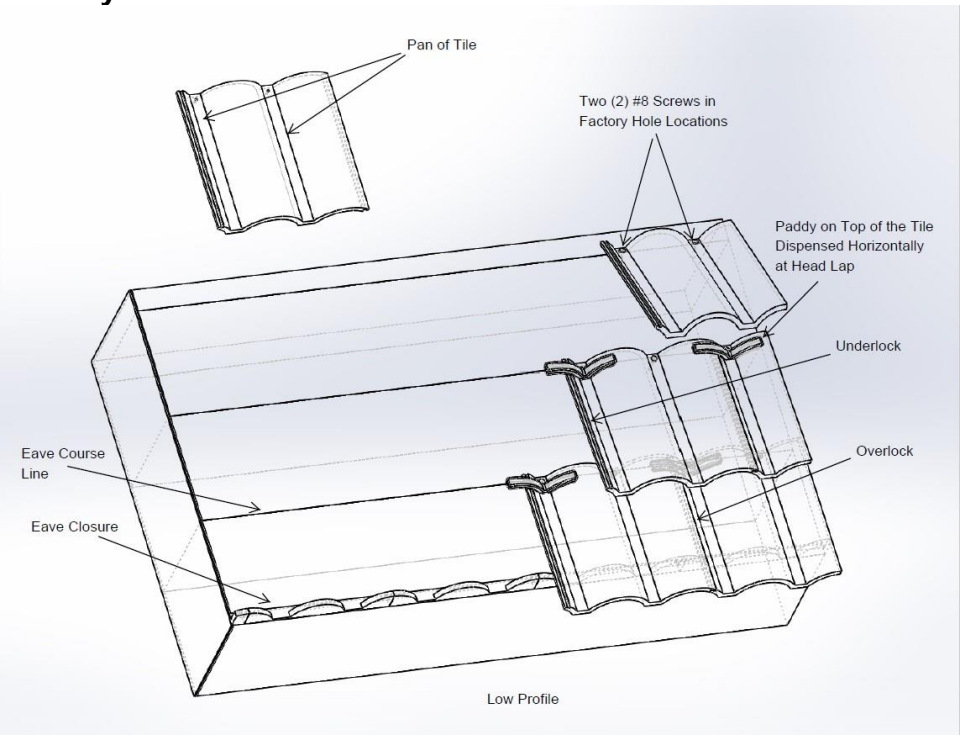

Figure 7
High Profile Hybrid Tile

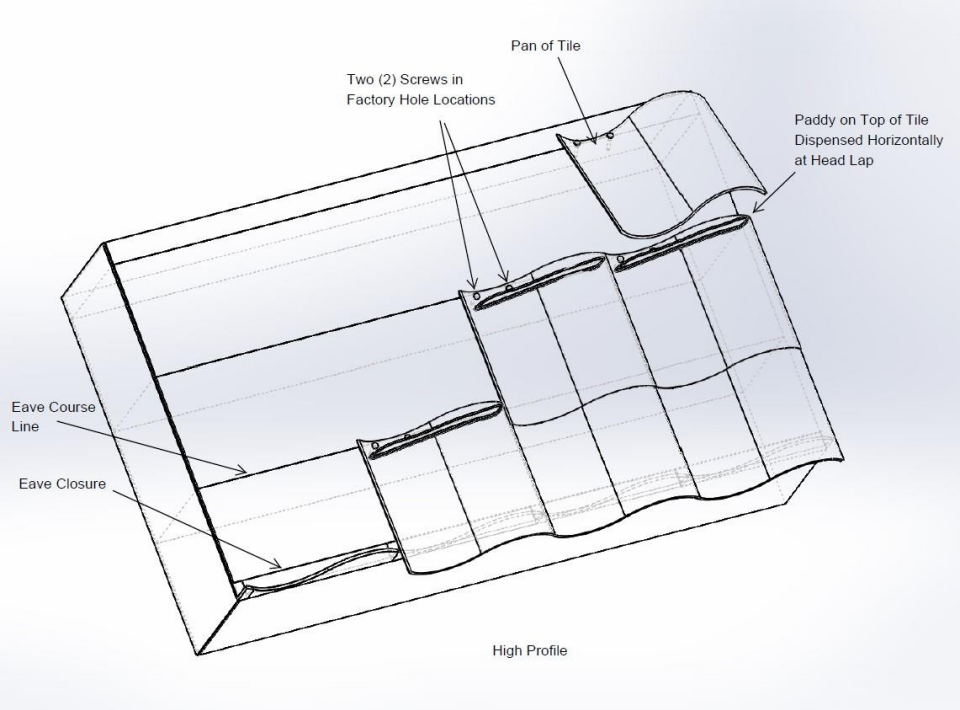

Figure 8
Hip & Ridge (Interdependent with Screw)

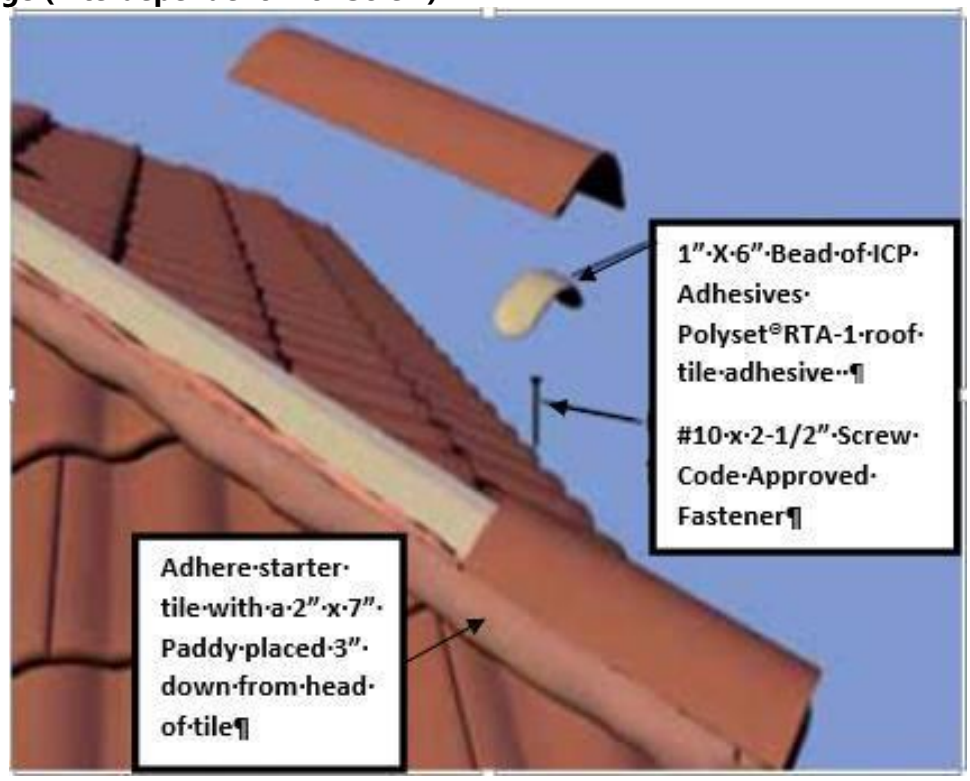

Figure 9
Hip & Ridge (Interdependent Placement)