SOLAR TILE ROOF™
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Presents the

EZ*NRG

Active Roof Tile and Passive Roof Tile.

North America Installation Manual & Code Compliance Guide

Prepared By:
EZ*NRG

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This document governs installation, structural attachment, fire classification assemblies, electrical interface boundaries, and warranty conditions for the Ez*nrg Solar Tile Roof System.

Installations shall comply with applicable building codes, including but not limited to:

- International Building Code (IBC) 2024 International Building Code (IBC)
- International Residential Code (IRC) 2021 International Residential Code (IRC)
- ASCE 7 ASCE 7 standard | ASCE
- National Electrical Code (NEC) NFPA 70, National Electrical Code (NEC)
- Florida Building Code (FBC) Florida Building Code Online
- Miami-Dade Building Code Product Control Search - Miami-Dade County
- Local Authority Having Jurisdiction (AHJ) requirements

In jurisdictions requiring specific approvals (ICC-ES ESR, FBC Product Approval, or Miami-Dade NOA), the governing approval document shall control where more restrictive.

TABLE OF CONTENTS

1. SCOPE

These installation instructions govern the installation of the Ez*nrg Solar Tile Roof System throughout North America. This document addresses structural attachment, wind resistance, fire classification, waterproofing integration, impact resistance, electrical interface boundaries, roof access limitations, and warranty conditions. Installations shall comply with the International Building Code (IBC), International Residential Code (IRC), ASCE 7, National Electrical Code (NEC), and all applicable local codes. In jurisdictions requiring Florida Building Code (FBC) or Miami-Dade approval, the governing approval document shall control where more restrictive. In addition to the written instructions, illustrations are provided in Appendix E and are noted as (fig.#).

2. SYSTEM DESCRIPTION

The Ez*nrg Solar Tile Roof System is a mechanically attached roof covering consisting of active solar roof tiles, passive composite roof tiles, access tiles, starter brackets, and associated flashings and accessories. Active tiles incorporate a factory-bonded photovoltaic laminate retained by a structural adhesive bond system and secondary mechanical displacement-limiting features. Passive tiles are polymer components of identical size and geometry without photovoltaic laminate. Access tiles are passive tiles with a removable cover providing access to third-party electrical components that may require service or replacement (attachment is the same as other passive tiles). Ez Eave Closure and Ez Starter Brackets are required to install the system properly.

The system is laminate-only and relies on third-party listed inverters, rapid shutdown devices (RSDs), and/or module-level power electronics (MLPE), and/or MCIs selected and installed by others. Ez*nrg does not manufacture or specify inverter or RSD brands or types.

3. DESIGN REQUIREMENTS

Installation shall comply with applicable building codes and project-specific engineered drawings. The Engineer of Record shall determine required allowable negative design pressures for Field, Edge, and Corner zones in accordance with ASCE 7. Fastener quantity and configuration shall be selected based on the allowable negative design pressures published in Table 12.X. Electrical system design, conductor sizing, grounding, bonding, and rapid shutdown compliance shall be performed in accordance with NEC Article 690 by qualified electrical professionals.

4. ROOF SLOPE AND DECK REQUIREMENTS

The minimum permitted roof slope is 2:12. Installation at slopes between 2:12 and 4:12 shall comply with applicable low-slope underlayment provisions. Underlayment assemblies shall be approved for the installed slope and installed in accordance with manufacturer instructions.

Deck type, thickness, span rating, and fastening shall comply with project engineering and applicable code requirements. Published allowable negative design pressures apply only to the deck type and thickness specified in the corresponding table. For HVHZ installations, minimum 15/32-inch plywood meeting required span and grade provisions shall be used as required by applicable approval documents.

5. ROOF DECK PREPARATION

The roof deck shall be structurally sound, dry, clean, and securely fastened per applicable code to structural framing prior to installation of underlayment or roofing components. The installer shall verify that the deck is capable of supporting the roof covering system in accordance with applicable building codes and project-specific engineering requirements. Damaged, deteriorated, delaminated, warped, uneven, or water-compromised decking shall be repaired or replaced prior to installation. Installation over rotted, deteriorated, improperly fastened, or structurally deficient decking is strictly prohibited. Any installation performed under such conditions shall automatically void all applicable Ez*nrg warranties. The deck surface shall be free of debris, protruding fasteners, sharp edges, or irregularities that may interfere with proper underlayment placement or tile seating. Any plywood fasteners that miss a framing member shall be removed prior to underlayment installation. Where re-roofing is performed, existing roofing materials shall be removed to the structural deck including all fasteners; installation over existing tile, metal, or other roofing systems is not permitted. The deck shall be dry at the time of underlayment installation.

6. UNDERLAYMENT INSTALLATION

Underlayment shall be installed over the prepared roof deck in accordance with applicable building code requirements, manufacturer instructions, and the TRI Manual – General Practices. ASTM D1970 self-sealing underlayment is required at minimum for a Class C installation. To achieve a Class A fire classification, a layer of APPROVED fire-resistant (FR) underlayment shall be installed over the ASTM D1970 underlayment. At slopes between 2:12 and 4:12, installation shall comply with low-slope provisions. Underlayment shall be installed under all metal accessories before they are installed with a minimum of 6 inches showing after accessories are installed, (a full layer of underlayment is accepted also) then after drip edge, eave closure, valley, wall flashing and gable trim, the full layer of underlayment is installed with positive water flow beginning at the eave and progressing toward the ridge, covering the metal accessories, with laps consistent with code and/or manufacturer requirements. The underlayment system provides a secondary water barrier and shall be fully completed prior to tile installation.

7. DRIP EDGE INSTALLATION

Drip edge (DE) shall be installed at eaves and rakes in accordance with applicable building code requirements. At eaves, DE shall be installed over a layer of underlayment extending a minimum of 6 inches past the top of the DE, and beneath (sandwiched) the underlayment that is installed with positive water flow over the entire roof surface unless otherwise required by code. DE shall be installed straight even if the eave has curvature or irregularities. *DE must be straight as the tile rows alignment is determined by the straightness of the DE and the EC*. At rakes, DE shall be installed in the same manner unless otherwise required by local code. DE joints shall be lapped per code and fastened sufficiently to maintain alignment until additional components are installed. Additional fasteners from eave closure and gable trim will provide the fastening to code. Fasteners should not be placed where they will interfere with fasteners for the gable trim, eave closure, and the starter brackets. Installation shall provide continuous water shedding at roof perimeters.

8. Ez EAVE CLOSURE INSTALLATION

Ez Eave Closure (EC)(Fig 1) shall be installed at all eave conditions prior to full underlayment and starter bracket placement. The EC shall be positioned directly over the installed drip edge and aligned parallel to the eave. *This must be straight as the tile rows alignment is determined by the straightness of the DE and the EC*. The EC may be centered using any of the factory-formed alignment notches (Fig 2) located along the top edge of the EC. The EC shall be fastened to the roof deck using corrosion-resistant 1½-inch stainless steel ring shank roofing nails installed between the factory-formed weep holes. Fasteners shall not be installed in locations that would interfere with subsequent starter bracket fasteners. Nails shall be installed one nail between each weephole.

Factory-formed weep holes shall remain unobstructed to allow drainage and ventilation at the eave. Sealants shall not be applied in a manner that blocks weep openings. The EC shall sit flat against the drip edge and roof deck, and any gaps or irregularities shall be corrected prior to starter bracket installation. EC sections shall butt together without overlap and are factory-manufactured to maintain consistent weep hole alignment when brackets are properly installed.

Starter brackets shall be installed over the EC in accordance with Section 11 and secured using the specified stainless steel screw configuration. The EC fastening pattern is coordinated to avoid interference with bracket screw locations.

9. VALLEY FLASHING

Valley flashing (Fig 9) shall be installed over a layer of underlayment extending a minimum of 6 inches past the valley edge, with flexible flashing at the bottom to direct water back onto the tiles. The valley metal shall be lapped beneath the full field underlayment installed with positive water flow. The center of the valley metal shall remain free of underlayment a minimum of 4 inches on each side prior to tile placement. Valley metal shall extend a minimum of 12 inches on each side of the valley centerline unless otherwise required by code. Sections shall be lapped according to code in the direction of water flow and fastened along outer edges only. Fasten to code and do not penetrate the central water channel. Valley installation shall provide an unobstructed drainage path.

10. SIDEWALL, HEADWALL, AND PENETRATION FLASHING

Wall flashing shall be installed at all roof-to-wall transitions over underlayment with a minimum of 6 inches of underlayment showing. A “dry-in” sidewall flashing shall be installed that is sandwiched between underlayment and a headwall flashing that goes over the underlayment. A second “in-tile” headwall and step flashing will be integrated into the tile installation. All flashing and counterflashing shall be installed to ensure watertight termination. All roof penetrations shall be flashed in accordance with applicable codes and manufacturer instructions. Flashings shall integrate with the underlayment to maintain continuous water shedding and shall not interfere with tile attachment per the TRI roofing manual.

11. Ez STARTER BRACKET INSTALLATION

Ez Starter Brackets shall be installed immediately to the right of each weep hole location when viewed facing the eave from the exterior and shall seat flat against the roof deck. Ez Starter Brackets are spaced to align with the Ez Self aligning hooks on the rear of the tiles. In standard wind regions, brackets shall be secured using a minimum of two #10 1½-inch stainless steel hex head neoprene washer screws in the holes closest to the upright section of the bracket. In HVHZ installations, brackets shall be secured using four screws of the same type. Nails shall not be used for starter bracket attachment. Ensure decking materials are installed properly to the roof's edge to give fasteners ample attachment.

12. Ez ROOF TILE INSTALLATION AND Ez SELF ALIGHNMENT HOOK ATTACHMENT

Installation shall begin at the lower right corner of the roof. Tile Ez Alignment Hooks shall fully engage the Ez Starter Brackets and sit flat against the underlayment prior to fastening. Fasteners shall be installed only in factory-provided fastener holes. Fasteners shall be driven perpendicular to the roof deck and seated flush without over-driving. Screws shall be tightened only until the neoprene washer is seated sufficiently to form a seal.

For standard wind regions, each tile shall be secured using two stainless steel ring shank roofing nails in the designated primary nail holes. Where higher allowable negative design pressures are required, fastening shall be increased to four nails or four #10 1½-inch stainless steel screws in the primary holes. For HVHZ installations, each tile shall be secured using four #10 1½-inch stainless steel screws plus two #8 stainless steel tile screws in designated secondary holes.

Subsequent courses shall be installed from right to left utilizing the Ez Alignment Hooks on the rear of the tiles. The Ez Alignment Hooks allow for stacked or staggered installations without any need for layout once the first row is installed straight. Access tiles may be used over third party electrical components that may need servicing. Install passive areas first when possible to mitigate traffic on solar tiles. Only passive tiles may be cut. ***Active solar tiles shall not be modified under any circumstances.***

13. HIPS AND RIDGES

Hip and ridge base shall be installed after underlayment but before tile installation. Hip and Ridge tiles shall be installed after completion of field tile installation. Flexible flashing shall be installed prior to ridge cap placement over the base. Ridge and hip caps shall be mechanically fastened in accordance with approved attachment methods and applicable design pressures.

14. ELECTRICAL INSTALLATION

Active tiles shall be interconnected in accordance with project electrical design. Conductor routing, grounding, bonding, and rapid shutdown provisions shall comply with NEC Article 690. Ez*nrg does not manufacture or specify inverter or rapid shutdown equipment. Electrical system design and installation are the responsibility of qualified electrical professionals. Solar tiles are connected via MC-4 connectors. Test each completed row for proper continuity and polarity before connection. Do not connect the strings to any equipment that would complete the circuit until installation is complete.

15. ROOF ACCESS AND SAFETY

The roof system is not intended to function as a walking surface. When roof access is required, weight shall be applied only to supported overlap zones where load transfers directly to the roof deck (the 3-inch lap and where air baffles contact the tile below). Stepping on unsupported spans or pushing off from the center of tiles is prohibited. All work shall comply with OSHA fall protection requirements.

16. MAINTENANCE AND CLEANING

The roof system requires minimal maintenance when properly installed. Annual inspection by a licensed professional is recommended. Pressure washing, harsh chemicals, abrasive cleaners, or solvents are prohibited. Cleaning shall be performed using water and mild neutral detergent as needed to maintain optimal electrical performance.

17. IMPACT RESISTANCE

Impact resistance ratings are based on testing in accordance with UL 2218 or FM 4473. Ez*nrg Roof Tiles are rated Class 4 under both standards.

18. PERFORMANCE WARRANTY (ACTIVE TILES)

Solar panels and tiles naturally degrade over time and produce varying output depending on environmental conditions. Active solar tiles are warranted to deliver not less than seventy-five percent (75%) of rated day-one power output at the fiftieth (50th) anniversary of installation. No intermediate performance levels are warranted. Baseline performance shall be recorded within thirty (30) days of commissioning and retained for the duration of ownership.

19. PASSIVE TILE WARRANTY

Passive tiles are warranted for structural integrity for fifty (50) years when installed in accordance with these instructions. Normal weathering is not considered a defect.

20. INSTALLATION DOCUMENTATION

Installers shall retain photographic documentation of deck condition, underlayment installation, flashing integration, bracket fastening, tile attachment configuration, and initial system output performance. Documentation of these items, along with weather conditions and time of day during performance recording, shall be provided upon request for warranty claims.

21. LIMITATION OF LIABILITY

Ez*nrg's liability is limited to repair or replacement of defective product. Ez*nrg is not responsible for improper installation, water intrusion, consequential damages, or costs of removal or reinstallation. Total liability shall not exceed the purchase price of the affected product.

APPENDIX A

ALLOWABLE NEGATIVE DESIGN PRESSURE TABLES
(Preliminary – Subject to Confirmation by Testing)

The allowable negative design pressures listed below are preliminary engineering assumptions provided for planning and documentation purposes only. Final published values shall be based on full-scale uplift testing in accordance with applicable standards including, but not limited to, ASTM E330, TAS 114, and TAS 203 where applicable.

Allowable design pressures are expressed in pounds per square foot (psf) and are negative (uplift) pressures.

A1 – Non-HVHZ Installation

Deck: 7/16-inch OSB, minimum span rating 24/16, installed per code

Standard Attachment – (2) Stainless Steel Ring Shank Nails

Roof Zone	Allowable Negative Design Pressure (psf)
Field	-45 psf
Edge	-65 psf
Corner	-80 psf

Enhanced Nail Attachment – (4) Stainless Steel Ring Shank Nails

Roof Zone	Allowable Negative Design Pressure (psf)
Field	-70 psf
Edge	-95 psf
Corner	-115 psf

Screw Attachment – (4) #10 Stainless Steel Screws

Roof Zone	Allowable Negative Design Pressure (psf)
Field	-95 psf
Edge	-125 psf
Corner	-150 psf

A2 – HVHZ Installation

Deck: Minimum 15/32-inch Plywood, 32/16 span rating, C-D grade, minimum 3-ply

Maximum Wind Attachment –

(4) #10 1½-inch Stainless Steel Screws + (2) #8 2½-inch Secondary Screws

Roof Zone	Allowable Negative Design Pressure (psf)
Field	-130 psf
Edge	-170 psf
Corner	-200 psf

These values are preliminary and subject to confirmation by TAS 114 and TAS 203 cyclic testing.

APPENDIX B

FIRE CLASSIFICATION ASSEMBLIES

(Preliminary – Subject to Listing)

Fire classification is assembly-dependent. The following configurations represent intended tested assemblies.

B1 – Class C Assembly

Ez*nrg Solar Roof System installed over ASTM D1970 self-adhered underlayment in accordance with manufacturer instructions.

B2 – Class A Assembly

Ez*nrg Solar Roof System installed over ASTM D1970 self-adhered underlayment in combination with an approved XXXX (FR) fire-resistant underlayment.

Only tested and listed assemblies shall be considered approved.

APPENDIX C -System Component Illustrations

Fig 1 Ez Eave Closure

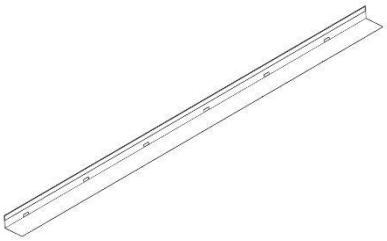

Fig 2 Ez Eave Closure centering notch

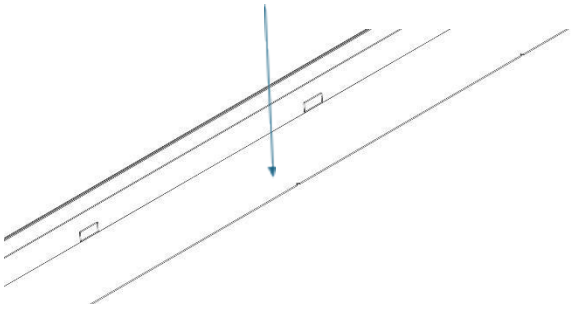

Fig 3 Ez Starter Bracket

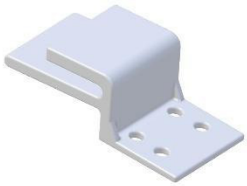

Fig 4 Ez Eave Closure and Ez Starter Bracket side view

Fig 5 Ez Eave Closure and Ez Starter Brackets

Fig 6 Center line on any notch to center tiles in the roof section

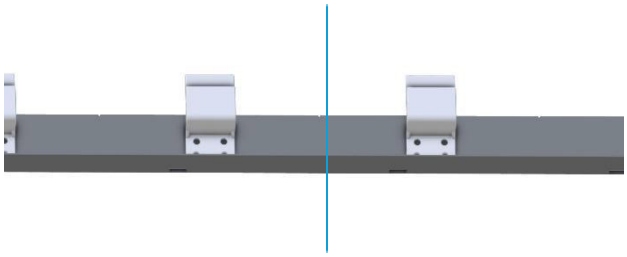

Fig 7 Gable Trim

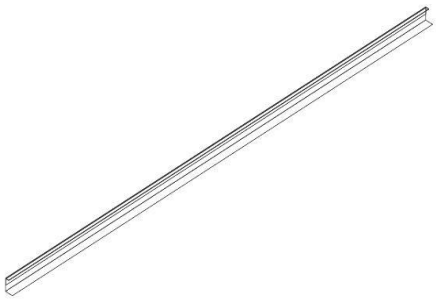

Fig 8 Gable Trim

Fig 9 Valley

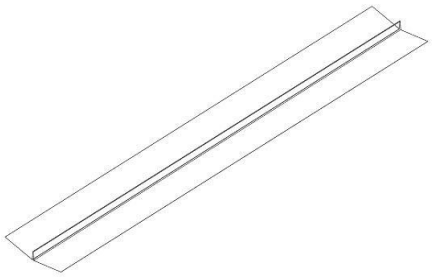

Fig 10 Valley

Fig 11 Side view Ez Solar Tile installation

Fig 12 Bottom view Ez Solar Tile installation

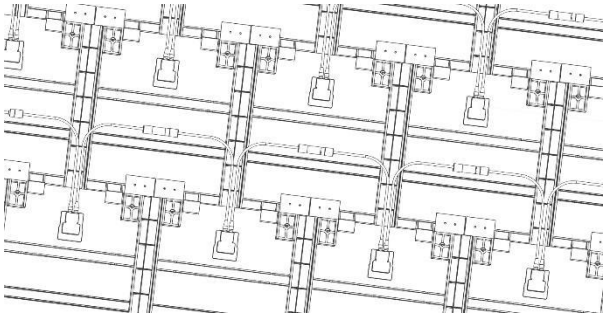

Fig 13. EZ Leveling Tubing

APPENDIX D

APPROVED ACCESSORIES AND COMPONENTS

The following accessory components are required for installation:

- Stainless steel ring shank roofing nails, 1½-inch minimum length
- #10 stainless steel 1½-inch hex head screws with neoprene washer
- #8 stainless steel 2½-inch tile screws
- Corrosion-resistant drip edge
- Corrosion-resistant valley metal
- Corrosion-resistant step and headwall flashing

Metal accessories shall be rated for a minimum 50-year service life appropriate to the installation region. Substitution of fasteners or flashing materials is not permitted unless approved by project engineering.