



ERGOSUN INTEGRATED SOLAR ROOF TILES INSTALL GUIDE 2025 - V05041625

*BUILDING INTEGRATED PHOTOVOLTAIC (BIPV)
MECHANICAL, ELECTRICAL & SAFETY INSTALLATION MANUAL*

GO SOLAR, BEAUTIFULLY.

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🌐 www.ergosun.com

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About Ergosun

Ergosun manufactures **state-of-the-art integrated solar roof tiles** that eliminate the need for bulky external solar panels or reflective glass surfaces. Our sleek, embedded PV tiles create **aesthetically pleasing, energy-efficient rooftops**.

We proudly offer roofing contractors and solar professionals a next-generation solution that:

- ✓ Blends seamlessly with modern architecture
- ✓ Maintains roofline integrity
- ✓ Provides long-term performance and energy output

Whether you're a contractor, architect, or homeowner — **go solar, beautifully.**

General Information

This manual provides essential **electrical, mechanical, and safety installation instructions** for the Ergosun Solar Roof Collectors. These instructions must be followed during installation and maintenance.

- ⚠ **Only certified Ergosun installers** may install this product.
- ⚠ Improper installation may result in electrical shock, equipment damage, or system failure.

Ergosun Holdings LLC does not assume responsibility for damage or loss resulting from improper installation or use. This manual may be updated without prior notice.

- All installation and commissioning must be done in accordance with:
 - **IEC 62446**
 - **IEC 60364**
 - **UL 61730-1:2022**

All electrical data provided assumes standard test conditions (STC: 1000 W/m², 25°C ± 2°C, AM 1.5 per IEC 60904-3).

⚠ **Important Note:**

Photovoltaic (PV) modules can produce higher voltages or currents than listed under STC. Always apply a **1.25 safety factor** to I_{sc} and V_{oc} when sizing wire, inverters, and protective devices.



CERTIFIED INSTALLERS

Ergosun is proud to partner with companies around the world to deliver **advanced and reliable solar energy solutions**.

Solar Installers & Roofing Contractors

Our **plug-and-play design** simplifies solar integration into residential roofing systems. Installers benefit from:

- Faster installation timelines
 - Minimal wiring complexity
 - Seamless integration into concrete tile roofing systems
-

General Contractors

We collaborate directly with GCs and EPC firms to:

- Integrate Ergosun systems into custom architectural plans
 - Assist with permitting and design compliance
 - Ensure code-certified solar tile installations across the U.S.
-

Distributors

Ergosun supports national and regional distributors with:

- On-demand training
 - Supply chain integration
 - Scalable delivery from our **Coralville, IA manufacturing facility**
-

 **Looking to become a certified Ergosun installer or distributor?**
Visit www.ergosun.com or contact us directly.

SECTION 1: PRODUCT DATA

All electrical data shown is based on **Standard Test Conditions (STC)**:

- **Irradiance:** 1000 W/m²
- **Cell Temperature:** 25°C ± 2°C
- **Air Mass:** AM 1.5
- **Test Method:** IEC 60904-3

Electrical Characteristics (at STC)

Parameter	Value
Rated Power (Pmax)	15.0 W
Max Power Voltage (Vmp)	10.0 V
Max Power Current (Imp)	1.55 A
Open Circuit Voltage (Voc)	12.0 V
Short Circuit Current (Isc)	1.45 A
Module Efficiency	19.22%
Fill Factor (FF)	0.7617
Voltage Temp Coefficient	-0.35% / °C

Power Temp Coefficient

-0.45% / °C

Current Temp Coefficient

+0.05% / °C

 *Note: All modules are equipped with two MC4 connectors and tested for 600V DC max system voltage.*



Installation Overview per CER

Installation of Ergosun Integrated Solar Tiles must comply with the published installation instructions in this document, QAI Code Evaluation Report CERus-1047, and the applicable code(s).

Ergosun Integrated Solar Tiles require installation onto 2-inch by 2-inch (38 mm x 38 mm) wood battens over plywood of minimum 15/32-inch (12 mm) thickness complying with the applicable code. Battens are attached using fasteners with size and spacing complying with the applicable code and of sufficient length to penetrate the framing at least 1-inch (25 mm) depth. Each tile is fastened to battens using two (2) No. 8 by 2-1/2-inch (64 mm) length corrosion resistant screws at preformed holes on tiles. Attachment of the sheathing and battens to underlying framing elements shall be sufficient to resist service loads.

Ergosun Integrated Solar Tile products are intended for installation onto minimum 2-1/2:12 or greater roof slopes.

Flashing, counterflashing, and valley flashing shall be sheet metal complying with the applicable code. Sheet metal must be G90 galvanized of minimum 0.0179 inches (0.455 mm) uncoated thickness. Valley flashing shall be a minimum 15 inches (381 mm) wide sheet metal of minimum 0.0179 inches (0.455 mm) uncoated thickness. Flashing, including fasteners, shall not be in contact with dissimilar metals to avoid corrosion. Flashing shall prevent moisture from entering the wall and roof in accordance with the applicable code.

ENVIRONMENTAL CONDITIONS

Ergosun modules are engineered to endure harsh conditions and are designed for **25+ years of performance**, tested to meet **UL 61730-1:2022** standards.

Operating Parameters:

Parameter	Specification
Operating Temperature Range	-40°C to 85°C
Nominal Operating Cell Temperature (NOCT)	25°C to 55°C
Ambient Temperature Range	-40°C to 40°C
Storage Temperature	-20°C to 40°C

Certifications & Compliance:

This product is **evaluated and certified** under:

- **QAI Code Evaluation Report CERus-1047**
(For compliance with the Florida Building Code)
- **UL 61730-1:2022**
- **CAN/CSA C22.2 No. 61730-1:2019**
- **IEC/EN 61730-1 & 61730-2**
- **IEC/EN 61215-1:2016**
- **ASTM D3161-16 / TAS 107 – Class F Wind Uplift**
- **TAS 100-23 – Wind-Driven Rain Test (Passed)**
- **ASTM E108-17 – Class A Fire Rating**
- **BS 476-3:2007 – AB Exposure Class (Flame & Burn Test)**



ergosun[®]
INTEGRATED
SOLAR ROOF TILES

ERGOSUN HOLDINGS
428 WESTCOR DR.
CORALVILLE, IA 52241

Model: Ergosun 17.5W Black
Serial Number: EH175BDEC23

Max. Power (Pw) +/- 5%	17.5W Tolerance: +/-3%	Power measured in the standard condition (STC). Irradiation 1000Wm2 AM = 1.5 Temp 25C Application Class A and Safety Class II per UL/CSA/IEC/EN 61730-2 Tested and certified to harmonized IEC/UL 61730-2 & IEC 61215 standards ATTENTION!Lattention ne se Never connect orconnecte jamais ou disconnect underne se deconnecte load currentpas sous charge
Open Circuit Voltage (voc)	12.8V Tolerance: +/-3%	
Short circuit current (isc)	1.85A Tolerance: +/-3%	
Volt. at max. Power	10V	
Current at MPP (imp)	1.45A	
Current temp coefficient	0.05%	
Voltage temp coefficient	0.35%	
Power temp coefficient	0.35%	
Max series overcurrent protection device where required	15A	
Maximum System Voltage	600VDC	

UK
CA

CE



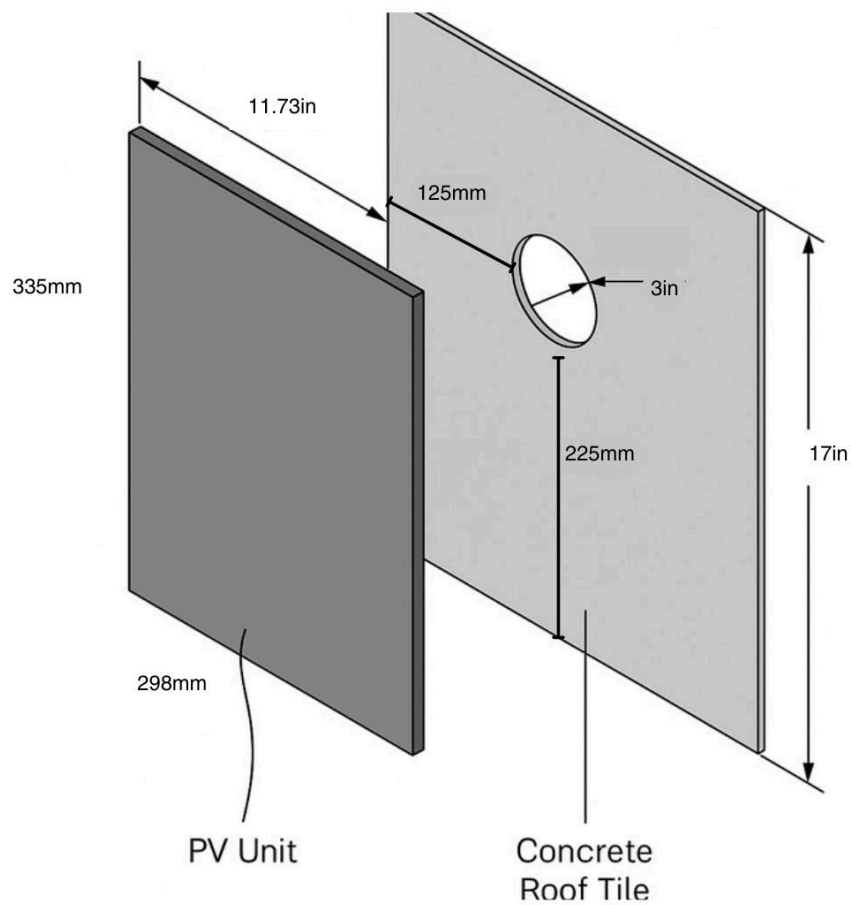








Ergosun Integrated Solar Tile – 15.0W



 Module Construction

Feature	Specification
Dimensions (L × W × H)	11.73" × 13.19" × 0.12"
Thickness	3 mm
Substrate Material	Concrete

Solar Cells per Module	20
Tiles per m ²	10
Connectors	MC4 (x2)
Max System Voltage	600 VDC
Module Weight (Approx.)	7–9 lbs

Available Colors

- **Shadow Black**
 - **Terracotta**
 - Custom colors available upon request.
-

Tile Variants

Type	Weight Class
Westlake Saxony 900	~940 lbs/square

SECTION 2: SCOPE OF WORK

◆ Recitals

The Contractor is licensed and qualified to perform roofing and electrical work in the state where the system is being installed. The Contractor shall comply with all local, state, and federal laws regarding taxes, permits, licensing, and insurance.

The Contractor is an independent business and not an exclusive agent of Ergosun.

◆ Agreement

This agreement outlines the responsibilities and expectations between Ergosun and the Contractor.

◆ Scope of Work

The Contractor shall:

- Provide all materials **except Ergosun solar tiles**.
 - Complete all **roof and solar installation** tasks as described in **Exhibit A**.
 - Submit all required **installation documentation**, including inspection photos, permits, and as-built diagrams.
-

◆ Timeline

Work must begin **on or before [Start Date]** and be completed **by [End Date]**, unless otherwise approved in writing by Ergosun.

◆ Contract Price

The Contractor shall provide a detailed quote for labor and materials (excluding Ergosun tiles) to the project owner or developer.

◆ General Provisions

Any scope changes must be agreed upon by both Ergosun and the Contractor in writing. All cost adjustments for labor or materials are the sole responsibility of the Contractor.

💰 Payment Schedule

All payments must follow the agreed-upon project schedule.

Accepted payment methods include:

- Personal Check
 - Wire Transfer
 - Credit/Debit Card (initial deposit only)
 - Bank Draft
-

🏗️ Work Quality

All installation work shall be:

- Performed to a **high standard of craftsmanship**
 - In compliance with all applicable **building codes, electrical codes, and utility interconnection requirements**
-

✅ Project Approval

The Contractor shall provide Ergosun with:

- Complete plans and specifications submitted for local permitting
 - Final “as-built” documents upon completion
-

🔧 Licensing

All work must be completed by individuals who are:

- Properly licensed and authorized
 - Qualified for the scope of their assigned tasks
-

Subcontractors

The Contractor may subcontract portions of the work, under the following conditions:

- The subcontractor must be paid directly by the Contractor
- The Contractor remains **fully responsible** for all work quality and compliance under this contract

Insurance Requirements

The Contractor must maintain, at a minimum:

- **\$1,000,000** per occurrence in commercial general liability insurance (including contractual liability and product coverage)
 - **\$2,000,000** aggregate annual limit
 - **Workers' Compensation Insurance**, as required by law
-

Permits

The Contractor is responsible for:

- Obtaining all necessary permits
- Scheduling inspections
- Paying all associated fees

If required, the Contractor must provide **engineering calculations** to secure the building permit.

Site Maintenance

During installation, the Contractor agrees to:

- Maintain a **clean and professional jobsite**
 - Remove debris and restore disturbed areas
 - Leave the site in **equal or better condition** than it was found
-

Work Warranty

The Contractor warrants all labor and workmanship for a period of **sixty (60) months** after project completion.

Theft Prevention

The Contractor is responsible for implementing **proper theft prevention measures** for any system components stored or installed outside (e.g., modules, inverters, receivers).

 **Note:** Ergosun is not liable for lost or stolen materials after delivery and signed receipt.

Contractor Status

The Contractor operates as an **independent contractor**, not an employee of Ergosun.

- The Contractor is responsible for all necessary tools, equipment, labor, and subcontractors.
- Ergosun is not liable for any decisions made in the execution of work.

Non-Disclosure

The Contractor agrees to maintain confidentiality regarding all sensitive or proprietary information belonging to Ergosun or its partners.

This includes—but is not limited to—project documents, specifications, pricing, installation practices, and client data.

This clause shall survive termination of this agreement.

Conflict of Interest

Contractor represents that no conflict of interest currently exists that could interfere with performance.

If a conflict arises during the term of this agreement, the Contractor shall:

- **Immediately notify Ergosun in writing**
- Work in good faith to resolve any issues as directed by Ergosun

Termination of Contract

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This contract may be terminated by either party:

- **Upon completion** of the installation, or
- With **15 days' written notice** by either party

Indemnification & Limitation of Liability

Each party agrees to **defend, indemnify, and hold harmless** the other—including their officers, employees, agents, and affiliates—from any losses, damages, claims, or legal actions arising from:

- Negligent or wrongful acts
- Breach of contract
- Employment misclassification claims

This includes **reasonable attorney fees, litigation expenses**, and any settlement amounts.

Arbitration Clause

Any disputes arising under this contract that cannot be resolved through negotiation shall be resolved via **binding arbitration**.

- Claims under **\$50,000** will be resolved before a **single arbitrator**.
 - Parties may mutually agree to outside arbitration services.
 - All arbitration outcomes are considered **confidential**.
-

Notices

All formal notices must:

- Be delivered in writing to the address listed in this agreement
 - Be sent via mail or in person
 - Be considered delivered **after 3 business days** (if mailed) or **immediately upon personal delivery**
-

Force Majeure

Neither party shall be held liable for delays caused by factors outside their control, including:

- Natural disasters (acts of God)
- War or civil unrest
- Government intervention or material shortages

Governing Law & Venue

All parties agree that any disputes shall be governed by the laws of the **State of California**.

- Venue shall be **Johnson County, Iowa Superior Court**
 - Each party waives any objection to this jurisdiction
-

Attorney Fees & Costs

In any arbitration or legal action to enforce this agreement, the **prevailing party** is entitled to:

- Reasonable **attorney fees**
 - Court costs and appeal expenses
 - Fees related to enforcement or collections (including bankruptcy court)
-

Contract for Sale of Goods

This Sale Agreement is made between:

Seller: Ergosun Holdings LLC
428 Westcor Drive, Coralville, IA 52241
Buyer: [Buyer's Name & Address]

Goods Description:

- Integrated Solar Roofing Tiles (per invoice dated [Insert Date])
 - Delivery Location: [Insert Address]
 - Delivery Deadline: [Insert Date]
 - Total Quantity: [Insert # of Tiles]
-

Terms of Sale:

- Buyer may change the delivery date with **7 days' written notice**
- Buyer has the right to inspect goods prior to acceptance

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- If nonconforming, Seller must cure the issue within **10 business days**
- Risk of loss remains with Seller until goods are transferred to the shipping agent
- Seller warrants goods are **free of liens, encumbrances, or third-party claims**

Sample Information – Project Sheet

This sample layout provides reference fields for a full Ergosun project submission.

Location & Owner Info

- **Project Name:** [Property Name]
- **Address:** [Project Address]
- **Owner:** [Owner Name]

System Size & Layout

- **System Size:** [Size in kW]
- **Tile Quantity:** [# of Tiles]
- **Estimated Production:** [Estimated Output]
- **MC4 Connectors:** [# Connectors Supplied]
- **Tile Model:** Ergosun Integrated Solar Roof Tiles
- **Tile Wattage:** 15W or 17.5W, as applicable

Inverter Details

- **Brand/Model:** [e.g., Tesla]
- **Location:** [Exact installation location—e.g., garage wall]
- **Mounting Type:** Surface-mounted with required clearances

Interconnection

- Utility interconnection provided by Contractor
- Contractor must install monitoring system (see next page for specs)
- AC & DC disconnects located as per local code

Sample Information – Project Sheet (Continued)

Balance of System Components

(Provided by Contractor)

- Lockable **AC & DC disconnects** next to inverter
 - **Production meter base** and utility meter
 - **DC wiring** to junction box on roof
 - **System grounding hardware**
 - **DC surge protection**
 - All **roofing and mounting materials**, fully permit and code compliant
-

Balance of System Components

(Provided by District or Owner, if applicable)

- **Conduit & fittings** from roof junction box to DC disconnect
 - **AC wiring** from disconnects to inverter
 - **AC wiring** from inverter to main/sub-panel
 - Sub-panel upgrade (if required)
 - All required **electrical components**, fittings, fasteners, and materials to comply with **NEC and local AHJ**
-

Data Monitoring System

- **Monitoring Type:** Inverter-direct (e.g., Solis WiFi logger or Fronius Solar.web)
 - **Weather Station:** Monitors irradiance, ambient temp, and module temp
 - Brand/Model: [e.g., Solis Data Logger + Weather Box]
 - Contractor is responsible for setup and verification of data transfer to monitoring portal
-

Contractor Services Requested

The following tasks must be performed by the Contractor as part of their project responsibilities:



System Design

Contractor must:

- Submit final **site diagrams, electrical SLDs, and electrical calculations**
- Provide a detailed **scope of work** for all electrical components
- Submit a comprehensive **bill of materials**

All designs must be reviewed and approved by Ergosun before procurement or installation begins.



Material Procurement

The Contractor is responsible for purchasing **all materials** listed in the system design documentation, **excluding Ergosun Solar Tiles®**, which are supplied by Ergosun.



System Installation

The Contractor shall:

- Perform a **code-compliant, grid-tied PV installation**
 - Ensure alignment with **NEC 2014+** and the local AHJ
 - Follow approved system designs exactly
 - Submit change requests to the **Ergosun Project Manager** for any field modifications
-



Building Permit Responsibilities

Contractor must:

- Determine if a permit is required
- Obtain permits, schedule inspections, and pay all associated fees
- Submit structural or mechanical calculations if required by the jurisdiction

☀️ Data Monitoring Installation

Contractor will:

- Install the data logger and weather station
- Ensure proper internet connectivity
- Verify that the system is reporting live data to the monitoring portal



SECTION 3: GENERAL SAFETY

Read Before Installing

Do not handle, wire, operate, or service Ergosun Solar Roof Tiles without reading this manual in full.

Disclaimer

This manual is intended to assist in the proper installation of the Ergosun integrated solar tile system.

It does **not override** applicable local, state, or national building and electrical codes.

 Installation must be performed by a **licensed contractor**:

- **C-46 (Solar)** or **General Contractor (C-11, GC)** depending on jurisdiction
 - Coordination with a **licensed structural engineer** and **certified electrician** is required
-

Permitting & Site Approval

- Do not begin installation until **all permits** are approved by the local **AHJ (Authority Having Jurisdiction)**
 - Site conditions must be verified for structural readiness and roofing compatibility
 - Switching roofing materials? **Submit updated roofing permits before installation**
-

Responsibility

The **contracted solar installer** is responsible for:

- All materials and workmanship
 - Compliance with approved design and local laws
 - Following final, signed-off permit documents
-

Electrical Safety Warning

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DANGER:

Installation, maintenance, and servicing of a solar system involves risk of contact with **lethal voltages** and **electrical currents**.

Always follow NEC guidelines and use appropriate PPE.



Electrical Precautions

Ergosun Solar Roof Tiles produce **DC voltage when exposed to sunlight**. Always follow these guidelines:

- Cover tiles with **non-permeable material** during installation to prevent unintended voltage generation.
 - Connecting multiple modules in **series** increases system voltage — be aware of local **maximum voltage limits** per string.
 - Never exceed the voltage rating permitted by your local Authority Having Jurisdiction (AHJ).
 - Plan wiring to ensure safety during commissioning, testing, and maintenance.
-

Worksite Protection

- Only work in **dry conditions**
- Use **insulated tools** and **Class 0+ rated electrical gloves**
- Always wear **eye protection** and **non-conductive footwear**
- Keep a charged mobile phone or emergency radio accessible on site

 Never connect Ergosun tiles to other brands of solar modules

 Never install broken, cracked, or visibly damaged tiles — contact Ergosun for replacements

 Never lift or carry a module by its junction box or wiring

Fire Classification Requirements

To maintain a **ATSM E108 Class A fire rating**, the following must be met:

- Tiles must be mounted **no more than 3 inches** above the roof deck
 - The roof must be covered with fire-resistant Underlayment Titanium UDL 30.
 - Installation must be done using modules with **Type 2 fire classification**
 - Roofs must have a pitch of **2:12 or greater**
-

 Refer to **Section 4** for roofing and underlayment compatibility.

Engineering Precautions

Before installing, ensure the roof structure is rated to support concrete tile load requirements:

Tile Type	Load Requirement
Westlake Saxony 900 Series	940 lbs/square

Confirm roof integrity and load ratings with a **licensed structural engineer** prior to tile installation.

Installation Best Practices

- Always **fasten tiles to battens** using approved attachment methods
- Never move multiple interconnected tiles as a group
- Disconnect power and unplug strings before any maintenance
- Handle modules with care; avoid placing tiles face-down on abrasive surfaces
- Never drill or cut into an Ergosun tile
- Only walk on concrete tiles — never on solar modules

Weather Considerations

- **Do NOT install** during rain, snow, ice, or wind exceeding safe ladder conditions
- Always ensure dry conditions before working with live or connected equipment
- If you must pause installation, cover exposed arrays with non-reflective, waterproof tarps

Prohibited Practices

- Do not use harsh chemicals or solvents to clean modules
- Do not store combustible materials near installation areas
- Do not allow PV wiring to rest on sharp surfaces, edges, or metal objects
- Avoid sunlight magnification on panels via mirrors, glass, or other reflective objects
- Keep the **non-sun-facing side** of each tile **clear of foreign objects**

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SECTION 4: PRE-INSTALLATION PLANNING

Proper coordination before tile installation ensures safety, efficiency, and code compliance.



Team Coordination

For new builds and re-roofing projects:

- Coordinate with the **project's roofing contractor** to ensure seamless scheduling
 - Roofers may assist in **laying battens and placing tiles**, under supervision of the certified installer
-



Pre-Install Checklist

- Ensure **two qualified technicians** are available to begin prepping:
 - Inverter installation
 - PV combiners
 - Any sub-panels or disconnects
 - Have a **physical system layout** available to:
 - Label all tile strings and MC4 connections
 - Identify each string's start and end point
 - Mark all **receivers** beneath the tiles
-



Design and Shading Considerations

- Confirm that tile placement **avoids shaded areas**, chimneys, or obstructions
 - Review and approve the **string design and electrical line diagrams** before tile placement
 - Minimize roof penetrations; route wires near the **top of the array** if possible
 - Clearly mark all planned roof penetrations for conduit or cable entry
-



Once the pre-installation plan is verified, continue to **junction box sub-assembly** on the next page.

Junction Box Sub-Assembly

Each Ergosun Solar Tile includes a rear junction box with two MC4 pigtails. Follow these steps to connect the junction box using the **ErgoSnap™ tool**.

Steps for Connecting an Ergosun Junction Box

1. **Align the Junction Box (JB)**
 - Locate the **flat side** of the JB and match it to the black enclosure on the rear of the solar tile.
 - Push both pieces together until they are snugly aligned.
 2. **Position the ErgoSnap Tool**
 - Slide the ErgoSnap tool **between the PV wire pigtails** so it lays flat against the box housing.
 3. **Engage the First Lock**
 - Apply pressure to **one handle** of the ErgoSnap tool.
 - You should hear a **distinct click** — this is the **first lock**.
 4. **Roll and Reposition the Tool**
 - Roll the tool so it lays flat on the **top** of the junction box.
 5. **Engage the Second Lock**
 - Press down on the **second handle**.
 - A **second click** confirms the full engagement.
 6. **Verify the Connection**
 - Gently **pull on both MC4 pigtails** to ensure the connection is secure.
 - The tile is now **electrically and mechanically ready for installation**.
-

 *After confirming connection, the tile is officially waterproofed and fully integrated into the string.*

SECTION 5: ROOFING MATERIALS

Ergosun systems are designed to integrate with standard concrete tile roof components. The following materials are required or commonly used when installing Ergosun tiles:

 Approved Roofing Components

Component	Description
Westlake Saxony 900 Slate Series	Concrete roof tiles compatible with Ergosun modules
Hip & Ridge Caps	Decorative caps for hips and ridges; used for ventilation and tile coverage
Rake Tiles	Edge tiles for rake (gable) ends to ensure a clean visual and functional finish
Wooden Battens	2x2 battens for mounting tiles and providing ventilation space
Underlayment	Fire-rated membrane beneath battens and tiles (e.g., Titanium UDL 30)
Metal Flashings	Pre-bent metal strips used in valleys and roof penetrations for water control
Ice & Water Shield	Self-adhering waterproof barrier placed in critical roof areas

Ridge Vents	Installed beneath ridge caps to allow warm air to escape the attic
Attic Vents	Static or powered vents that support airflow through attic spaces
Plastic Cap Roofing Nails	Used to fasten underlayment or moisture barriers

 **Note:** Only fire-rated, code-approved materials should be used to maintain system certification (see **ATSM E108**, QAI CERus-1047).



On-the-Roof Tools

The following tools are required for safe and efficient rooftop installation of Ergosun Solar Roof Tiles:

General Tools & Roofing Equipment

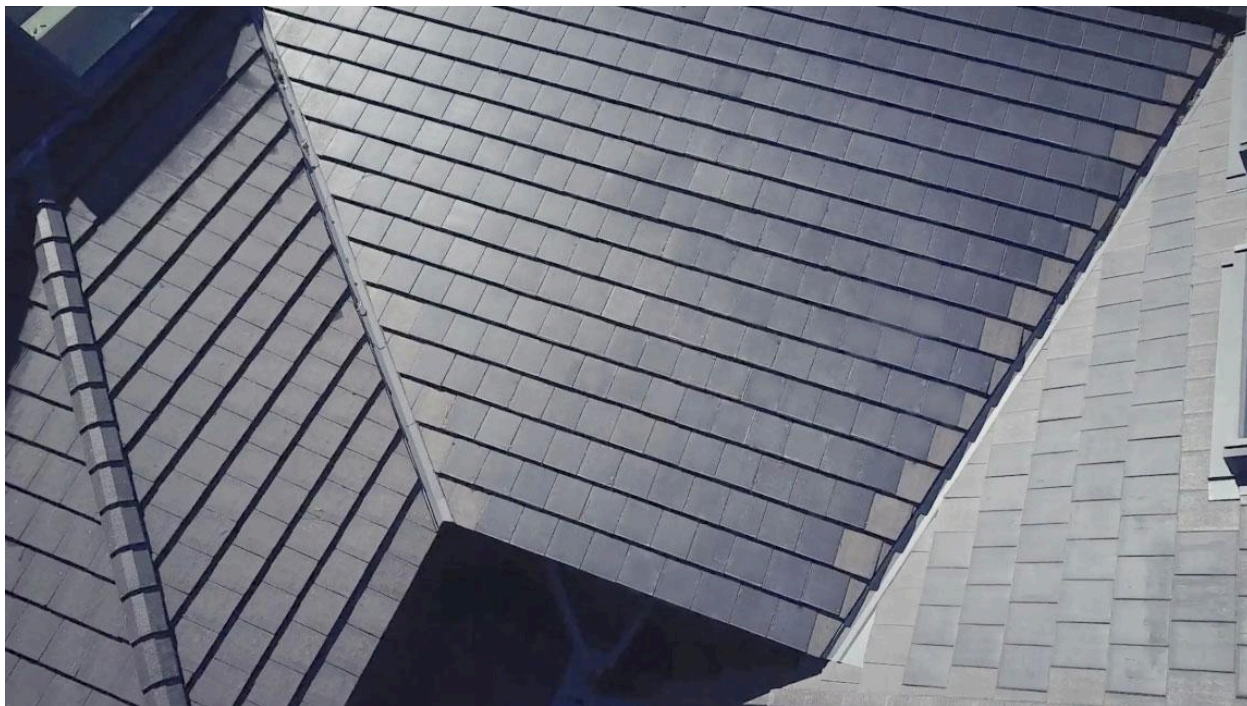
Tool	Purpose
Tile Loader	To transport and lift concrete tiles onto the roof
Scaffolding (as required)	Ensures safe work access and material handling
Claw Hammer	Used for nailing battens or removing damaged components
Cordless Power Drill	Drills pilot holes and fastens battens and tiles
Screwdrivers / Wire Strippers	Used during electrical terminations and MC4 prep

Chalk Line	Marks straight batten or tile layout lines
Concrete Tile Cutter	For trimming non-solar tiles only (⚠️ Do NOT cut Ergosun tiles)
Multimeter	Verifies voltage output of tile strings and system
Tape Measure	Ensures proper batten spacing and alignment

Safety Gear (PPE)

- Fall Protection Harness & Anchors
- Class 0+ Electrical Insulating Gloves
- Safety Goggles
- Hard Hat
- Non-slip Roofing Footwear
- Weather-appropriate Clothing

 **NEVER cut or modify Ergosun Solar Roof Tiles.** Only trim standard concrete tiles using approved tools.



Labeling & Certification Summary

Each Ergosun solar tile includes a factory-applied certification label listing all necessary compliance data for permitting, inspections, and warranty tracking.

System Label Includes:

- **Model Number:** ICON 17.5
- **Power Rating:** 17.5W
- **Open Circuit Voltage (Voc):** 12.1V
- **Short Circuit Current (Isc):** 1.7A
- **Maximum System Voltage:** 600 VDC
- **Fire Rating:** Class A (**ATSM E108**)
- **Production Date & Serial Number**
- **Certifications:** UL 61730-1, IEC 61215, CAN/CSA, and others

Evaluations & Standards Met

Standard/Test	Purpose
UL 61730-1:2022	PV module electrical safety
ASTM D3161 / TAS 107-2016 (Class F)	Wind uplift resistance
ASTM D635-2014	
ASTM E108-2017	
TAS 100 2023	Wind-driven rain protection

 Each tile label is visible on the rear MC4 junction box and can be scanned into digital project records.

Reroofing Guidelines

When performing a reroof over an existing structure, ensure that all conditions and materials meet code, structural, and fire-rating requirements.

Structural Support Requirements

- Roof framing must support the **full tile load** (concrete or solar tile weight)
 - Cracked or broken roof tiles must be removed and replaced
 - Existing roof **flashing must be evaluated** and replaced if rusted or improperly sized
-

Alignment & Prep

- Verify **horizontal and vertical alignment** before placing any tile
 - Clean **foreign material** from all tile interlocking areas
 - Ensure ventilation pathways are not blocked
-

Roofing Over Wood Shakes or Shingles

- All **existing shake or shingle material must be removed**
 - Install solid sheathing (plywood)
 - Apply **one layer of ASTM D226 Type II (No. 30) or ASTM D4869 Type IV** underlayment
 - Installation of underlayment must be in compliance with the applicable code(s)
 - Flashings and battens must be installed **per new construction guidelines**
-

Spaced Sheathing Conversions

If reroofing over spaced sheathing boards:

- Use only underlayments **recognized by the local building code**
- Battens may be installed **with or without underlayment** as permitted
- If underlayment is not provided, the local **building official** may determine if the existing covering is acceptable

 *Installation standards sourced from Westlake North America – Saxony 900 Series*



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INTEGRATED
SOLAR ROOF TILES



Roof Decking & Underlayment Requirements

Decking Specifications

The roof deck must be capable of supporting live and dead loads associated with concrete tile and solar installations.

Decking Material	Minimum Requirement
Solid Lumber	Nominal 1" thick
Plywood	Minimum 15/32" thick
Other Materials	Must be approved by the local building official or listed in a code evaluation report

Approved Underlayments

Underlayment is critical for waterproofing and fire classification. Use only **Class A fire-rated**, code-approved underlayments.

Recommended Products:

- **Westlake TileSeal®** (self-adhering asphalt underlayment with slip-resistant surface) **(Not for use in Fire-Rated required Assemblies or HVHZ)**
- **Titanium UDL 30** (*Required for ATSM E108 2017 Class A Fire Rating and QAI CERus-1047 compliance*)

 No substitutions are permitted unless listed in the official QAI report (CERus-1047).
Contact Ergosun to verify alternate underlayments if needed.

Installation of underlayment must be in compliance with the applicable code(s)

 *Westlake TileSeal® is a registered trademark of Westlake Ltd.*

Batten System Requirements

Battens are **mandatory** for the installation of Ergosun Solar Roof Tiles. They create the space necessary for MC4 connectors, junction boxes, rapid shutdown components, and ventilation.

Recommended System

Westlake 2x2x8 Elevated Wood Batten System (EBS)

 Ensure all installations meet **local building codes** and wind zone specifications.

Installation Guidelines for 2x2 EBS Battens

- Use **nominal 2"x2" treated wood** battens
- Fasten through the batten and plastic support pads into the roof deck
- **Pad locations are marked** with a target symbol and spaced **12" on center**
- Use fasteners long enough to **penetrate at least ¾" into the roof deck**

Each tile is fastened to battens using two (2) No. 8 by 2-1/2-inch (64 mm) length corrosion resistant screws at preformed holes on tiles.

For High-Velocity Hurricane Zones (HVHZ)

- Follow **roofing manufacturer specifications** for batten spacing, fastening, and uplift resistance
 - In HVHZ regions, you may need:
 - Closer fastener spacing
 - Corrosion-resistant hardware
 - Adhesive + mechanical fastening for battens
-

Alternate Approved Batten Systems

- **2x2x8 Cross Batten System** (Consult Ergosun for layout spacing and clearances)

Roof Access & Fire Setbacks

To ensure firefighter access and code compliance, all Ergosun installations must follow local regulations regarding **roof access pathways**, **setbacks**, and **fire venting areas**.

 Refer to your **local fire authority** and **AHJ (Authority Having Jurisdiction)** for current codes.

California Residential Code Reference – R324.6

The following code applies to **residential buildings** with photovoltaic systems:

R324.6 – Roof Access and Pathways

- Provide **at least two 36-inch-wide** pathways on **separate roof planes** from **lowest edge to ridge**
 - One pathway must be on the **street or driveway side** of the roof
 - Pathways must be located over areas that support firefighter weight
 - Avoid pathways with obstructions like **vents, conduit, or equipment**
-

! Exceptions:

- Detached, non-habitable structures (e.g., garages, carports)
 - Where the fire code official determines rooftop operations will **not be employed**
-

 For non-California projects, use this as a baseline and confirm with your **local fire code**.

Ventilation Guidelines

Proper ventilation ensures:

- Lower attic temperatures
 - Improved solar tile efficiency
 - Compliance with building codes for both solar and roofing systems
-

Hips & Ridges

Ergosun recommends the use of:

FIGAROLL® PLUS Premium Ridge Vent & Weather Block

- Installed beneath ridge and hip caps
 - Eliminates the need for large, visible roof or gable vents
 - Enhances curb appeal and attic airflow
-

Attic Ventilation

Per building code, attic ventilation is required unless using a **sealed attic system**. Check local regulations before installation.

- Install **at least one solar-powered attic vent** directly beneath the solar tile array for enhanced airflow
 - Improves overall system output, particularly in warmer climates
-

 Reference: International Building Code (IBC) ventilation requirements for tile roofs

 *Photo shown: Westlake® North America ridge ventilation detail*

 **FIGAROLL®** is a registered trademark of Westlake Ltd.

SECTION 5: SOLAR INSTALLATION - MATERIALS

Ergosun manufactures **solar tiles only**. Below is a sample bill of materials provided by a solar contractor for a standard **8 kW Ergosun system**.

 This is a **reference list only**. Actual materials may vary by project design and site conditions.

Required Ergosun Components

Item	Description
Ergosun Integrated Solar Roof Tiles	Concrete roof tile with integrated monocrystalline PV module
Junction Box (MC4)	Rear-facing component used to connect tiles together in series
ErgoSnap™ Tool	Handheld device for locking and sealing junction box connections

Electrical & Rapid Shutdown Components

Item	Purpose
String Inverter	Must be approved by Ergosun (see approved inverter list)

Midnite Solar MNPV Combiner Box	Combines tile strings into inverter inputs
Midnite LSOB Receiver (600V)	Enables string-level rapid shutdown (NEC 690.12 compliant)
Midnite LSOB A/C Transmitter	Sends signal to LSOB receivers from inverter area

Other Accessories

- **Wire Caps** – Used to seal and protect exposed ends of MC4 cables
- **Standard Westlake Tiles** – Non-solar concrete tiles used between solar tile groupings
- **Mounting Hardware** – Fasteners, battens, clips (see Section 4 for roof structure materials)

Section 7: Solar Installation – Additional Materials

The following components may be required depending on project scope and system size:

Electrical & Panel Components

Component	Function
100A Sub-Panel (if applicable)	Distributes AC power locally (garage, guest house, etc.)
30A AC Disconnect	Rapid disconnect switch located near inverter
2A DC Fuses & Holders (600V)	Used in combiner boxes for overcurrent protection
MC4 Male & Female Ends	For string terminations and custom cable builds
10 AWG PV Wire (Red/Black)	Main DC wiring between solar tiles and inverter (THHN or PV rated)

Conduit & Cable Management

Component	Function
Metal Trunking	Protects and organizes multiple cable runs

Rigid or Flexible Conduit	Required by many AHJs to protect exterior PV wiring
Conduit Fittings (LB, T-Joint, Flex Ends)	Allow directional changes, watertight entries, and secure routing
Cable Ties / Clamps / Clips	Secure PV wire to battens or structural members per AHJ requirements

Waterproofing & Finishing

- **Sealant & Flashing Tape** – Protects penetrations and conduit runs
- **Wire Caps / End Stops** – Covers any exposed MC4 ends beneath tiles

 All equipment and wiring must meet **NEC 690**, **UL 9703**, and **local AHJ standards**.

Designing an Ergosun System

Use this process to determine how many Ergosun tiles are required and how to size strings for inverter compatibility.



Step 1: Measure the Roof

- Record total roof **square footage** and **pitch**
 - Measure all **ridges, hips, valleys, and eaves** to determine tile layout
 - Identify the **south-facing roof plane** (or the plane with the best sun exposure)
-



Step 2: Determine System Size (kW)

- Review the homeowner's **monthly electric bill**
 - Use historical energy use to calculate the system size
 - Typical tile output: **15W per tile**
-



Step 3: Calculate Number of Tiles

Use the formula:

$$(\text{System size in kW} \times 1000) \div 15 = \# \text{ of tiles required}$$

Example:

$$7.56 \text{ kW system} \rightarrow (7.56 \times 1000) \div 15 = \mathbf{504 \text{ tiles}}$$



Step 4: Determine Number of Strings

Each tile string should contain **38–42 tiles** to maintain voltage under **600 VDC**.

Divide total tiles by ~40 to estimate string count

Adjust slightly to reach whole strings (Ex: $504 \text{ tiles} \div 42 = 12 \text{ strings}$)



Final Notes

- Verify voltage output per string with your inverter spec sheet
- Reference Ergosun's standard system layout documents when possible
- Submit all final system designs for **Ergosun Project Manager approval** before procurement or installation



AC Wiring – System Overview (Ex: 7.56 kW System)

This section outlines best practices for connecting Ergosun tile strings to inverters through the AC disconnect and panel systems.

Disconnect Placement & Wiring

- Install the **AC disconnect** at least **6” to the right** of the inverter
 - Install the **Rapid Shutdown (RSD) switch** at least **6”** from the main electrical panel
 - Run AC wiring from the **AC disconnect to the inverter**, connecting:
 - **L1 and L2**
 - **Neutral**
 - **Ground bonding**
 - Terminate into a **30A double-pole breaker** in a 100A sub-panel
-

MPPT Input Connections

Use pre-approved wiring diagrams to assign tile strings to appropriate inverter inputs.

- **MPPT 1:** Connect tile strings using T1 input
 - **MPPT 2:** Connect tile strings using T2 input
-

3-MPPT Configuration (if applicable)

- **MPPT 3:** Wire additional tile strings via a third transmitter (T3)
 - Confirm your inverter supports **3 MPPTs** and configure accordingly
-

Voltage Expectations

- Each tile = ~12.1V
 - A string of 40 tiles = **~484V DC**
 - Voltage readings should be **±10V** of calculated string total
 - Record all voltage readings **in a logbook**
-

 Always confirm final connections meet **NEC 690** and local AHJ requirements.

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Sample System Layout – 7.56 kW (504 Tile System)

This example represents a complete Ergosun tile layout with string planning and associated BOS components.



System Summary

Metric	Value
Total Roof Squares	12.5
Roof Pitch	4/12
System Size	7.56 kW
Orientation	South
Tile Model	Westlake Saxony 900
Battery (if included)	BYD 10.0 kWh
Total Number of Tiles	504
Number of Arrays	12
Panels per String	42

Voltage per String	508 VDC
Roof Connections	12 sets (MC4)
Total Amps	~13.5 A
Total Solar Coverage	4.7 roof squares

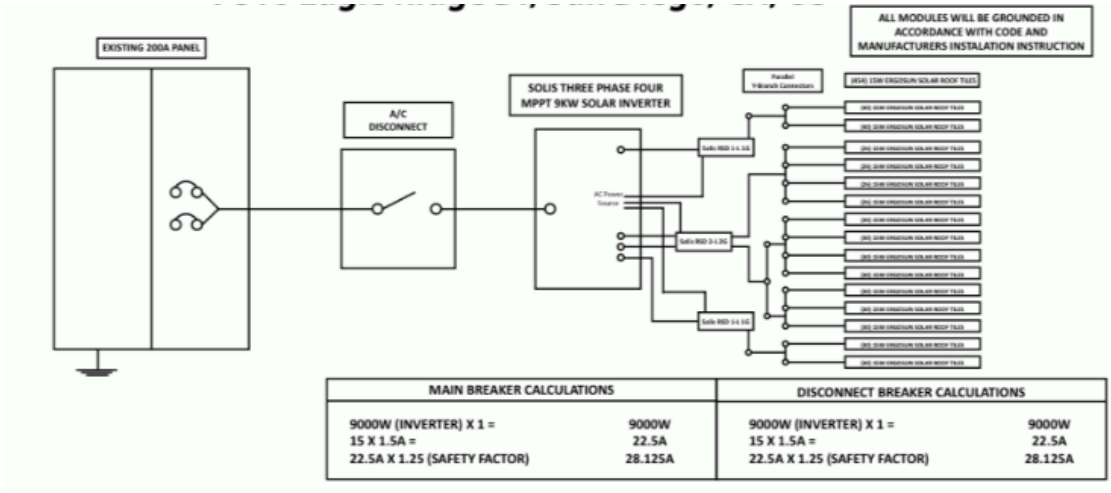
Sample Equipment List

Component	Qty
Ergosun 15W Solar Tiles	504
Solis 5K Hybrid Inverter	1
Midnite LSOB Transmitters	2
Midnite LSOB Receivers	2
SolaDeck Waterproofing Enclosure	1
Midnite MNPV8 Combiner Box	1

2 Amp DC Fuses	12
40A AC Disconnect	1
600V Din Rail Fuse Holders	9
10 AWG PV Wire (Red/Black, 1000ft)	2 rolls
MC4 Male & Female Ends	18 ea

📌 This system is wired using 12 strings of 42 tiles each.

EXAMPLE OF A 7.6KW ERGOSUN SYSTEM



Sample Project Layout – Solar + Battery Design

This layout shows a hybrid Ergosun system incorporating **PV and battery storage**, suitable for grid-tied systems with backup power.

System Overview

Metric	Value
System Size	6.0 kW
Tile Type	Ergosun 15W
Battery	BYD 10.0 kWh (Slate)
Total Roof Squares	12.5
Roof Pitch	4/12
Number of Tiles	400
Number of Arrays	9
Panels per Array	44
Voltage per Array	528 VDC

Roof Connections	9 MC4 male/female sets
System Amperage	~13.5 A
Solar Surface Area	4.7 squares

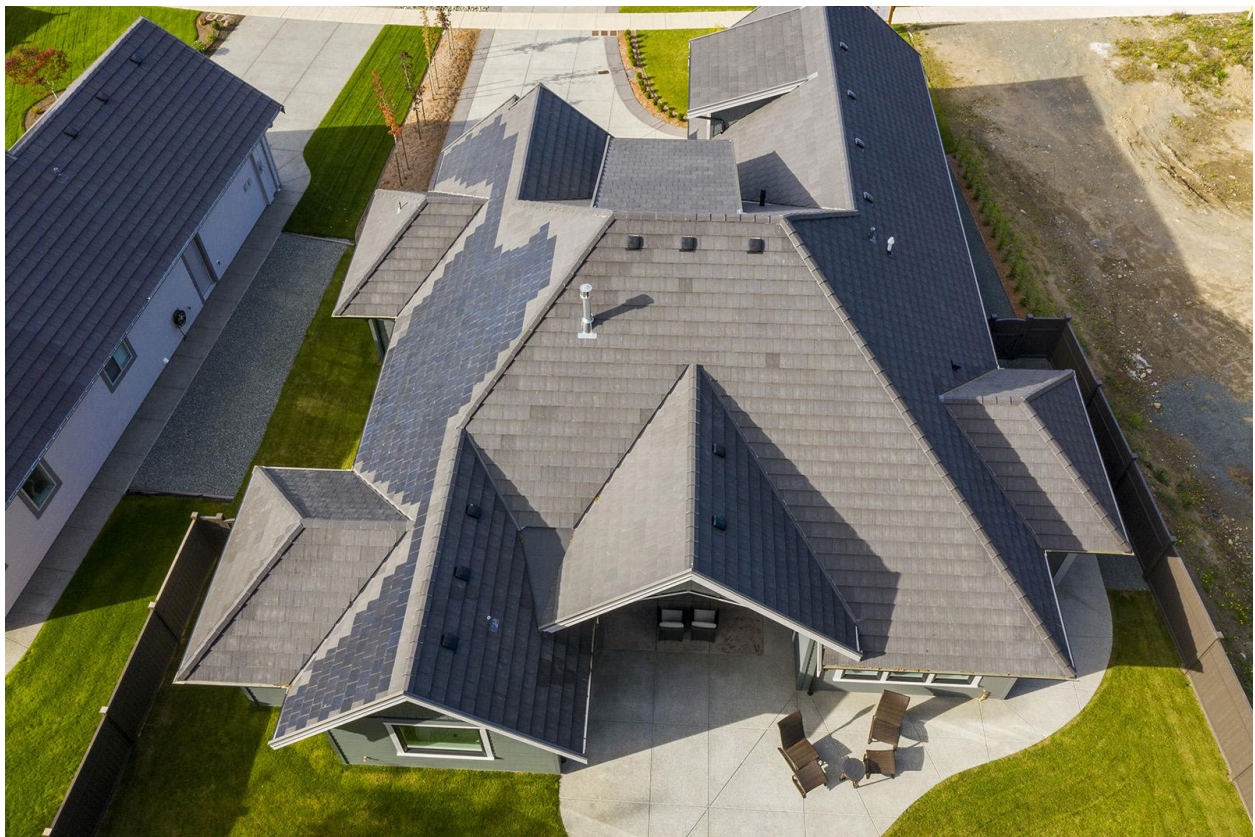
Additional BOS Components

Component	Qty	Purpose
40A AC Non-Fusible Disconnect Switch	1	Emergency AC disconnect
600V Din Rail Fuse Holders	9	Overcurrent protection in combiner box
30A Breaker (Panel Match)	1	Main panel breaker for solar system
10 AWG PV Wire (Red/Black)	2 rolls	DC wiring from array to combiner/inverter
MC4 Male & Female End Caps	18	Secure connections between tile strings

Wiring Schematic Notes

- **DC Combiner Boxes:** (e.g., Midnite MNPV8) placed near inverter for string grouping
- **Rapid Shutdown Disconnects:** Installed on DC input side, compliant with NEC 690.12
- **Solis Hybrid Inverter (2 MPPT):** Accepts power from tile arrays and feeds battery
- **Subpanel:** 100A backup-ready panel connected to home load center

 Be sure all conduit paths, breakers, and wire sizes are reviewed by a licensed electrician.



Combiner Box Installation

Ergosun systems require combiner boxes to consolidate tile strings and safely manage current before entering the inverter.

Recommended Products (MidNite Solar)

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Model	String Capacity	Bus Bar Rating	Max Voltage
MNPV6	Up to 3 strings	80A	600 VDC
MNPV12	Up to 10 strings	200A	600 VDC
MNPV16	Up to 16 strings	240A	600 VDC

 Only use **MidNite HV models** rated for 600 VDC. Do not use LV models.

Sample 7.6kW System (12 Strings)

- **MNPV12 #1:** Combines Strings 1–6 into MPPT 1
 - **MNPV12 #2:** Combines Strings 7–12 into MPPT 2
 - Each combiner must include:
 - **DC fuses** (e.g., 2A 600V)
 - **Neutral and ground bar connections**
 - **Labeling for each string input**
-

Wiring Guidelines

- **Positive wires:** Connected to fuse holders
- **Negative wires:** Routed through the negative bus bar
- **Ground wires (green/white):** Connected to ground bus bar
- **DC Output:** Routed to DC disconnect and then to the inverter

In transformerless inverters, only the positive side requires overcurrent protection.

Inverter Installation Instructions

Follow these steps to properly install inverters and associated BOS components. Always refer to the **inverter manufacturer's manual** in conjunction with these guidelines.

Mounting the Inverter

1. **Clearance:** Mount inverter with a **minimum of 24" horizontal spacing** from other equipment
 2. **Hardware:** Use **six (6) self-tapping 3" × ¼" screws with flat washers**
 3. **Location:** Inverter should be mounted vertically on a **structurally sound surface** (e.g., plywood or concrete wall)
-

Combiner & Disconnect Box Placement

- Mount **DC Combiner Box** (e.g., Midnite MNPV) at least **6" to the left** of the inverter
 - Install the **AC Disconnect** at least **6" to the right** of the inverter
 - Emergency Disconnect and Electrical Panel should also be installed with **6" spacing between units**
-

Work Area Requirements

- Ensure all boxes are **accessible and labeled**
 - Maintain a **clear working space** of at least **36" in front** of all electrical gear
 - Confirm **sunlight exposure and venting** requirements for inverter model used
-

 *Use only inverters approved by Ergosun. Contact support for compatibility list.*

PV Wiring to the Roof – Pre-Tile Installation

Before laying any solar tiles, you must pre-wire the roof for each string of the Ergosun system.

Step 1: Determine String Layout

- Confirm number of strings (e.g., 12 strings of 42 tiles)
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- Route **positive (+) conductors on the left side** of the array
 - Route **negative (–) conductors on the right side** of the array
 - Plan all conduit or cable runs according to **local AHJ requirements**
-

Step 2: Prepare Battens for Wiring

- Cut a **2” gap** in the horizontal batten at the **first and last tile of each string**
 - Install **wire clips** on each side of the cut to hold cable securely:
 - Clip on the **left side** of cut = positive
 - Clip on the **right side** of cut = negative
-

Step 3: Run Conductors

- Use **#10 PV wire** (or **#12 AWG in conduit**, if required)
- Route each string’s conductors to the **bottom edge of the array**
- Connect tile MC4s to roof wiring using:
 - Male MC4 = Positive lead
 - Female MC4 = Negative lead

 If using conduit:

- Install **T-junctions** at each string’s start and end
 - Route all strings to a central **vertical conduit run** down to the combiner box
-

Step 4: Label and Log

- Label each string **clearly (e.g., S1+, S1–, S2+, etc.)**
 - Record all string IDs on the **system design and as-built plans**
-

 Complete all wiring prep **before tile installation begins** to avoid lifting or modifying installed strings.

Solar Tile Installation – String Connections

This section outlines best practices for physically laying and connecting Ergosun Solar Roof Tiles.

Before You Begin

- Only install strings on the **same roof plane** (orientation)
 - Ensure all **AWG wire runs are prepped and labeled** (see previous page)
 - A qualified technician must:
 - Supervise VOC testing
 - Confirm MC4 polarity
 - Verify all crimped ends and tile-to-tile connections
-

Tile Handling & Walking Guidelines

- **Walk only on the high side** of standard concrete tiles (e.g., Westlake Saxony 900)
 - Avoid walking on solar tiles to prevent cracking or microfractures
 - Handle tiles with care; never drag or stack face-down on rough surfaces
-

Installing a String

1. Start with **String #1 at the bottom** of the array
 2. Connect the **first tile's (+) MC4** to the corresponding conductor
 3. Snap tile-to-tile MC4s in sequence, moving up the batten row
 4. At the final tile, connect the **(-) MC4** to the designated roof wire or conduit
 5. Repeat for each string, checking connections before moving on
-

Marking Receivers & Maintenance Notes

- **Mark each tile string** location and ID on the system layout drawing
 - **Clearly indicate receiver tile locations** for future service
 - Plans must be stored for future system inspection or tile replacement
-

String Verification

- Confirm all **positive and negative string conductors** are labeled
 - Leave final voltage testing and commissioning for the appropriate section
-

Rapid Shutdown Compliance – NEC 690.12

To meet **NEC 690.12** and **IEEE 1547** fire safety standards, Ergosun systems must shut down DC voltage at the **string level** within seconds during an emergency.

System Behavior (Compliance Summary)

- Ergosun modules are **utility-interactive**
- When power is cut at the inverter or rapid shutdown switch:
 - The **signal from the transmitter stops**
 - The **receivers disconnect the tile strings**
 - **All voltage drops to <30V within 2 seconds** (per IEEE 1547)

 This satisfies shutdown requirements for **2017 NEC and later**, which are active in most U.S. states.

String-Level Shutdown (Default Configuration)

- Each tile string is wired through a **Midnite LSOB or Fronius Quattro receiver**
 - Receivers are installed at the start of each string
 - **Transmitters** (T1, T2, T3 if applicable) are wired back to the **emergency disconnect**
-

Installer Requirements

- Use **approved rapid shutdown components**
- Confirm that **receiver wiring and string positions match plans**
- Complete voltage testing after installation:
 - Confirm that **open-circuit voltage drops to <30V** upon activating RSD switch
 - Record all pre- and post-shutdown voltage values in system log

Transmitter & Receiver Wiring (RSD System)

Ergosun systems use **Midnite LSOB** or **Fronius Quattro** rapid shutdown components to control string-level power during emergencies.

System Components

Component	Function
LSOB Receiver	Mounted under tiles; disconnects power at string
LSOB Transmitter	Located near inverter; sends keep-alive signal
T1 / T2 / T3 Ports	Assigned to each MPPT input or string set
RSD Switch	Disconnects AC power and transmitter signal

Wiring Best Practices

- **T1 → Strings 1–4**
 - **T2 → Strings 5–8**
 - **T3 → Strings 9–12** (*if applicable*)
 - Use **CAT5 or CAT6 shielded cable** to connect transmitters to the RSD switch
 - Each string's receiver should be grounded at the **first tile** using a green #10 wire to the system ground
-



Labeling & Logging

- Clearly label each receiver on the **as-built diagram**
 - Label T1, T2, and T3 lines in the inverter area
 - Note **tile ID** for each string start (e.g., “Array A1 Tile #4”)
-

 If the inverter is disconnected or utility power is lost, **all strings will enter safe mode** within 2 seconds.

Receiver Wiring & Grounding Overview

Proper grounding and wiring of tile strings and rapid shutdown receivers is critical for safety and code compliance.

Receiver Wiring Guidelines

- Each tile string begins with a **Midnite LSOB receiver**
 - Wire the **receiver's MC4 connectors** to the first tile in the string
 - **Do not overtighten or crimp wiring** during installation — leave a small service loop
 - Secure all MC4 connectors beneath the tile surface using clips or battens
-

Grounding Procedure

1. Identify the **farthest tile** electrically from the main ground
2. Attach a **#10 AWG green copper wire** to its **grounding lug**
3. Run the ground wire **through each array** toward the service panel
4. Terminate at the **main service ground or inverter ground bus bar**

 All exposed metallic components must be bonded to a common grounding point.

Final Mechanical Installation Checklist

Before proceeding to electrical testing or commissioning, confirm that all mechanical components are installed properly and meet Ergosun's quality standards.

Roofing & Mounting

- ✓ All tiles are securely fastened to battens per Section 4 guidelines
 - ✓ Hip & ridge caps are installed over FIGAROLL® or equivalent venting
 - ✓ Underlayment is intact and free from tears or overexposed seams
 - ✓ Valleys, rakes, and flashing are properly overlapped and sealed
 - ✓ Standard tiles and Ergosun solar tiles are flush and aligned
 - ✓ No broken, chipped, or cracked tiles are present
 - ✓ Fasteners do not penetrate underlayment directly (unless permitted by AHJ)
-

Ventilation & Water Protection

- ✓ Ridge vents and attic vents are unobstructed
 - ✓ All roof penetrations are flashed and sealed
 - ✓ No conduit or wiring blocks airflow or eave-to-ridge ventilation
 - ✓ Ice and water shield used at all low-slope transition areas
-

Layout Confirmation

- ✓ Tile layout matches approved system drawings
- ✓ Spacing around vents, chimneys, and skylights is $\geq 3"$
- ✓ Fire code setback zones are maintained (min. 36" where required)
- ✓ Marked string start/end tiles and RSD receivers on as-built plans

Final Electrical Testing Checklist

Before commissioning, perform the following tests to verify all electrical connections are safe, correct, and compliant with **NEC 690** and **QAI CERus-1047**.

Voltage & Polarity

- ✓ Measure **open-circuit voltage (VOC)** of each string
 - ✓ VOC should match expected value ($\pm 10V$) based on tile count
 - ✓ Confirm polarity of **MC4 connectors** (Positive = Male, Negative = Female)
 - ✓ Record VOC values in the system logbook
-

Continuity & Grounding

- ✓ Verify ground continuity from tiles to main service panel
 - ✓ Confirm all **metal conduits and combiner enclosures** are bonded to ground
 - ✓ Measure resistance to ground: must be < 25 ohms per NEC 250.53(A)(2)
-

Rapid Shutdown System (RSD) Testing

- ✓ Activate rapid shutdown switch
 - ✓ Verify each string voltage drops to **$< 30V$ within 2 seconds**
 - ✓ Confirm system meets **NEC 690.12** string-level shutdown requirements
 - ✓ Test return-to-operational state upon reactivating AC power
-

Inverter & Grid Tie

- ✓ Confirm inverter is wired correctly per manufacturer instructions
 - ✓ Input MPPT voltage range is met (typically 150–600V)
 - ✓ Check startup LED or LCD codes for errors
 - ✓ Confirm inverter auto-connects to grid and begins logging to the monitoring platform
 - ✓ Label inverter, disconnects, and combiner boxes per NEC 690.31 & 690.56
-

 **All testing must be performed by a licensed electrician.**

Submit testing results and photos to Ergosun for final system approval.

System Commissioning & Homeowner Walkthrough

Once all installation and testing steps are complete, perform the following actions to officially activate the system and hand it over to the homeowner.

Commissioning Steps

- ✓ Turn on **AC disconnect** and **main service panel breaker**
 - ✓ Turn on **inverter breaker** and observe LED/LCD startup status
 - ✓ Verify that inverter enters **operating mode** and begins power output
 - ✓ Check voltage/current on **Solar Monitoring Portal** (e.g., Solis, Fronius, SolarEdge)
 - ✓ Confirm data logging and RSD compliance
 - ✓ Take **photos of installed inverter screen**, monitoring page, and labeled equipment
-

Notify Ergosun

Submit the following to your Ergosun Project Manager:

- Final **as-built system layout** (marked strings, receiver locations, tile count)
 - All **test results** and RSD verification photos
 - **Commissioning photo set** (overview, inverter, AC/DC boxes, wire runs)
-

Homeowner Walkthrough Checklist

- ✓ Demonstrate inverter status lights and screen info
 - ✓ Show homeowner how to use their **solar monitoring app/portal**
 - ✓ Explain rapid shutdown system and emergency shutoff procedure
 - ✓ Review maintenance best practices (see Section 10)
 - ✓ Provide warranty documentation and system overview packet
-

 Encourage the homeowner to register for **support and warranty tracking** at www.ergosun.com

Maintenance & Long-Term Care

Ergosun Solar Roof Tiles are designed for low-maintenance performance over decades. However, regular inspections help ensure long-term system health and homeowner satisfaction.

Visual Inspection (Twice Annually)

 Check for:

- Broken, chipped, or displaced tiles
- Debris buildup between tiles or around vents
- Discoloration or signs of corrosion near MC4 connectors
- Obstructions that could cause shading (e.g., growing trees, debris)

 **Do not walk directly on solar tiles.** Inspect from a ladder or the ground when possible.

Performance Monitoring (Monthly)

 Use your inverter's web portal or mobile app to:

- Track daily and monthly energy production
- Set up alerts for inverter faults or low production
- Compare output to baseline expectations (available from Ergosun)

If production drops significantly, contact your installer or Ergosun support.

Cleaning Guidelines (As Needed)

- Most dirt and dust will be removed naturally by rain
 - In dry or dusty climates, rinse tiles with **clean water and a soft brush**
 - Clean early in the morning or evening to avoid thermal shock
 - **Never use a pressure washer**, harsh chemicals, or abrasives
-

Electrical Maintenance (Every 2–3 Years)

 Have a qualified electrician:

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- Check grounding continuity
- Inspect rapid shutdown devices
- Test string voltage under load and at open circuit
- Re-torque all combiner and inverter connections if required

 *Need help? Contact support at support@ergosun.com or call 888.219.1457*



Installer FAQ – Common Questions

 **Q: Can I walk on the solar tiles?**

A: No. Always walk on **concrete field tiles only**. Walking directly on Ergosun solar tiles can cause damage or microcracks not visible to the eye.

 **Q: Do the tiles require grounding?**

A: Yes. The Ergosun system must be **properly grounded** per NEC 250. A green #10 AWG ground wire must run from the **farthest metallic component** to the system ground. See grounding diagram on Page 48.

 **Q: How do I clean the tiles?**

A: Use a **garden hose and soft-bristle brush**. Never use a pressure washer, abrasive cleaner, or chemical solvent.

 Q: What kind of underlayment is required?

A: To maintain Class A fire rating, use **Titanium UDL 30** or other **ATSM E108**-approved fire-resistant underlayment. No substitutions unless listed in QAI CERus-1047.

 Q: Can I trim or cut the solar tile?

A: No. Solar tiles **cannot be cut, drilled, or modified**. Only standard concrete tiles should be trimmed.

 Need more support? Email support@ergosun.com for installer training videos and regional contact reps.

