

Stealth Energy PV Tile

Installation Guide

Roof Integrated Solution



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Introduction

The Stealth Energy TX instruction manual describes the process of in-roof installation of the Stealth Frameless Solar Photovoltaic Tiles using the Stealth Energy mounting system.

The necessary parts, recommendations on measuring and precautionary safety measures are discussed in this document.

This document assumes that all relevant statutory and best practice safety regulations will be adhered to by all installers.

The document also presumes that only qualified persons will carry out specific tasks, particularly related to roofing and electrical works.

There are installation guide videos available on You Tube. Search Stealth PV Tile.

Always check all deliveries on arrival. Count and confirm all parts and report any discrepancies immediately.

For any additional instruction or clarifications contact Infinity Innovations Ltd directly. We are happy to give additional assistance over the phone.

Stealth Energy PV tiles are MCS Accredited

**Stealth Energy Mounting has passed Fire, Wind Uplift Testing to 2.53Pa
and Weather Tightness Installations 17.5 to 45 degrees.**

System Design & Wiring

System design:

Prior to installation a system design must be carried out for each installation. Specifically this relates to both the electrical configuration and the layout of the installation. The electrical configuration determines the amount of strings per installation, which determines the plan for connecting the electrical connectors between the panels. The physical layout determines the space and dimensions of roof area required. The physical lay-out determines the quantity of parts required for the installation. Always review the physical layout and ordered parts prior to the installation in order to give enough time to order additional components should the need arise.

Wiring:

A wiring plan should be designed by an MCS accredited installer when designing the layout and installation of the Stealth Energy Tiles. This may include inserting some additional cables in order to link columns of panels. This plan should clearly demonstrate the flow of the cables and the entry point into the roof of the building.

The Stealth XT Tiles are fitted with standard MC4 male and female connections. These are weatherproof connections for connecting one panel to the next. There is no risk to making these connections as the Stealth Tiles are installed as long as the system is not connected to any power supply. The connection of the Stealth XT Tiles should be done according to your electrical configuration plan. Particular attention must be made to ensure connections are dry and clean when connecting. The cables can be passed above the batten and under the Stealth Tile through the air flow gap created by the Base Rail Brackets.

At some stage it may be necessary to create 'jumper cables' to continue the flow of the wiring. If this is the case please ensure that only accredited persons make up the necessary MC4 connections, and that the correct tools are used.

Before starting the installation, consider where the cables will need to enter the roof, and prepare the cabling accordingly.

Health & Safety

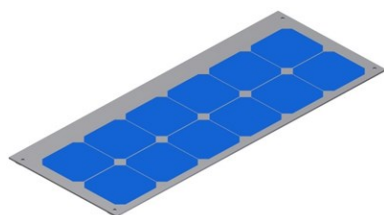
The installer is solely responsible for complying with all applicable local or national building codes, including any that may supersede this manual.

The installer is solely responsible for ensuring that the roof, its rafters, connections and other structural support members can support the array under building variable action conditions.

All appropriate Health and Safety regulations should be adhered to. Specific areas include the handling of photovoltaic panels, working at heights and working in poor weather conditions.

All roofing and tile courses should be laid according to British Standard 5534: 2003* 'code of practice for slating and tiling (including shingles) unless told otherwise. The Stealth Tiles are pre-wired with touch-proof connectors to prevent an electrical shock. Stealth Tiles do not present a risk as long as appropriate practices are followed at all times. All work must be carried out with the Stealth Tiles disconnected from any electrical supply.

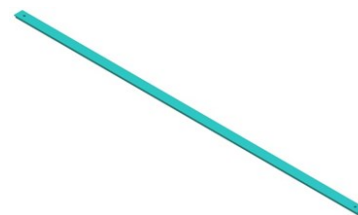
Parts & Components



Stealth Energy Tile TX-12M



Base Rail Bracket (Part No. XT-X001)



Base Rail (Part No. XT-X003)



Base Rail Bracket (Part No. XT-X002)



Mid Flashing (Part No. XT-X006)



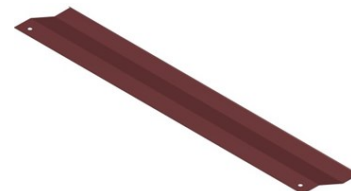
Edge Flashing (Part No. XT-X009)



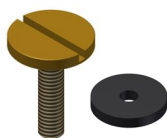
Side Flashing (Part No. XT-X007)



Ubbiflex Front Flashing (XT-X005)



Top Flashing (Part No XT-X013)



M6 Screw with Washer
(Part No XT-X010/012)



ST4.8 Tapping Screw
(Part No XT-X004)



Foam (Part No XT-X008)



Sealing Tape (Part No XT-X015)

**Parts are manufactured using Aluminium
AL6063-T5 and Stainless Steel SUS304**

Installation Jig



Installation Procedures:

Chapter 1

1.1 Pre Installation check

Ensure that you have prepared a plan for your installation. This plan should show the lay-out of the tiles for the proposed area with relevant measurements. The plan should show the proposed wiring of the tiles and the entry for the cables into the building.

1.2 Roof Preparation

The existing roof tiles (for retro fit) should be removed from the area allowing at least one additional course to be removed from the sides and the top of the area.

1.3 Roof integrity

The existing roof integrity must be assessed and if necessary reinstated to British standard 5534: 2003 (Code of practice for slating and tiling (including shingles)).

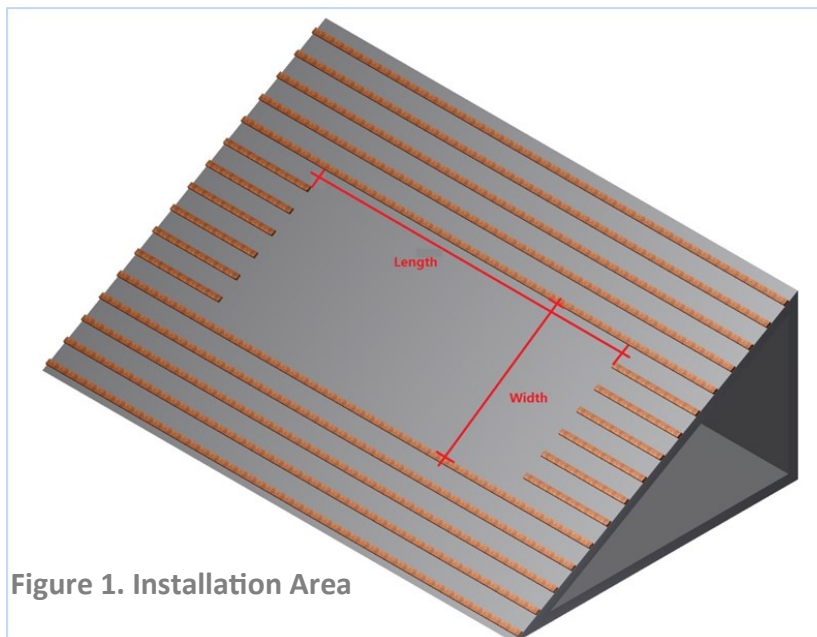


Figure 1. Installation Area

Installation Procedures:

Chapter 2

2.1. Battening the roof area

KEY NOTE:

- THIS SYSTEM REQUIRES ACCURACY OF BATTEN SPACING
- ALWAYS CHOOSE STRAIGHT BATTENS

Properly dried softwoods in accordance with DIN1052 should be used for the battens. Standard 25 x 50mm battens or 35 x 50mm battens can be used.

2.2 Location of the roof battens:

L1: 80-100mm (for first base bracket Install)

L2: 150mm (for front flashing Install)

L3: 348mm (for module Install)

L4: 150mm (for top flashing Install)

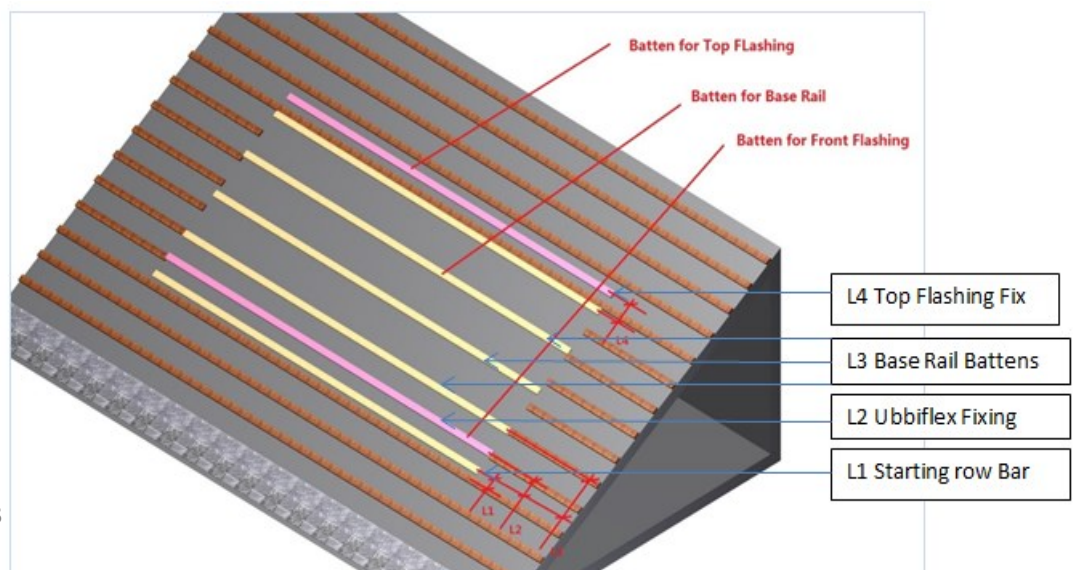


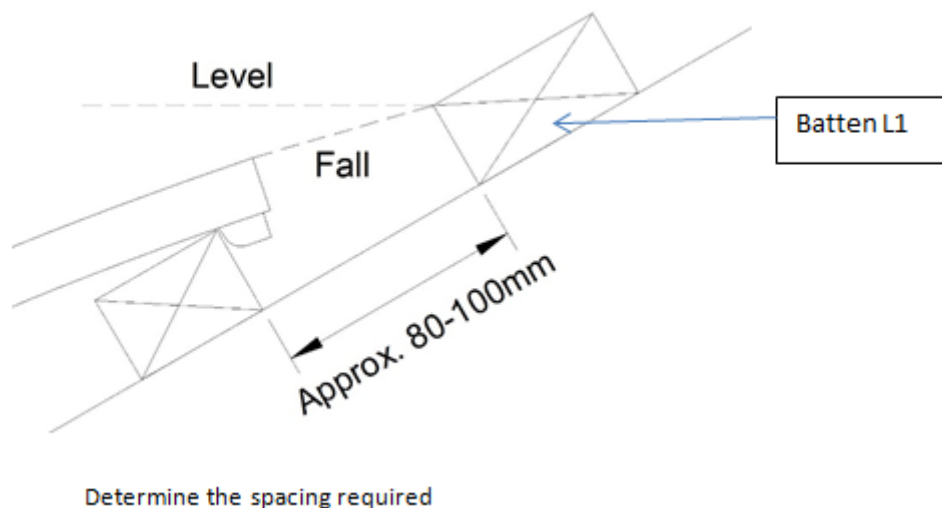
Figure 2. Batten locations

Installation Procedures:

Chapter 3

3.1 L1 Batten for Starting Row Bars

Working from the bottom, the first row of new battens (shown as L1) should be around 80-100mm from the existing roof tile batten. This first row will carry the flashing from its bottom corner down over the roof tiles. This first row must therefore have a natural fall (for water flow) from the bottom of the L1 batten to the top of the roof tile.



The positioning of the first row is therefore affected according to the thickness of the existing roof tiles. Use a spirit level to ensure that there is a fall from L1 to the top of the roof tile. Measure this distance (usually around 80-100mm), and then fix the first row of battens to this gap **CONSTANTLY** checking the distance when fixing.

Installation Procedures:

Chapter 4

4.1 L2 Batten for Bottom Flashing fixing

The Bottom Flashing will need to cover 150mm of the roof tile, go over the top of the L1 Batten and be fixed with a return to the L2 Batten. Check the spacing requirement and install the L2 Battens.

4.2 L3 Battens at 348mm

The next battens are fitted at exactly 348mm gaps from the first L1 batten. Use the Installation tool to constantly pull the battens to exactly this spacing as you fix them down. These battens are installed according to the number of Stealth Tiles per column. One L3 batten is required per tile in a column.

4.3 L4 Batten for Top Flashing Fixing

The Top Flashings will need a batten at 150mm from the top L3 batten to fix to.

Parts Preparation - Attach the Sealing Tape

Attach a length of Self Adhesive Tape to each Base Rail bar running the length of the bar in between the pre drilled holes. Do not remove the adhesive film as you will need the bar to move freely for any adjustments. This tape is solely used for cushioning between the bars and the toughened glass of the Stealth Tile.

TIP: Prepare all sealing tape before you start the installation.

Attach a length of Self Adhesive Tape to the Starting Row Bars running the length between the pre drilled holes.

TIP: Cut the tape around 4cm too long on one end, and remove the foam for that 4 cm section creating a plastic tab. This tab will be used later to peel off the top adhesive side.

Attach a length of Self Adhesive Tape to each Stealth Energy Tile. Attach a length on the top of the tiles between the pre drilled holes.

TIP: Cut the tape around 4cm too long on one end, and remove the foam for that 4 cm section creating a plastic tab. This tab will be used later to peel off the top adhesive side.

Installation Procedures:

Chapter 5

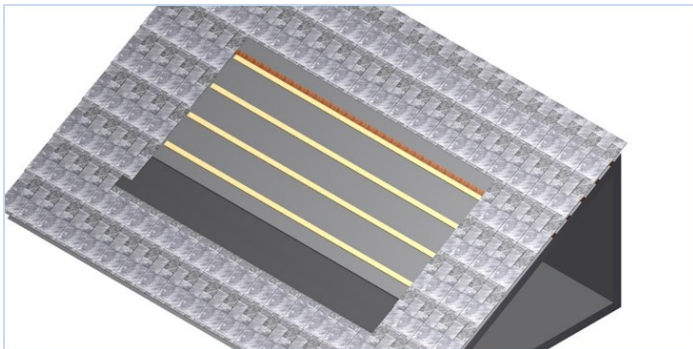
5.1 Installing the Bottom flashing

The bottom flashing is Ubbiflex Lead Free Flashing roll. For all information on the Ubbiflex Lead Free Flashing please check the installation brochure on the Ubbink Website www.ubbink.co.uk

This runs up over the roof tiles, under the Starting Row bar and is fixed to the batten L2. The bottom of the flashing should cover 150mm of the roof tiles and be fixed down with the relevant silicon. The top of the flashing can be fixed down to the batten L2. If it is necessary to overlap the flashing, run a bead of silicon down the join and ensure an overlap of 10cm.

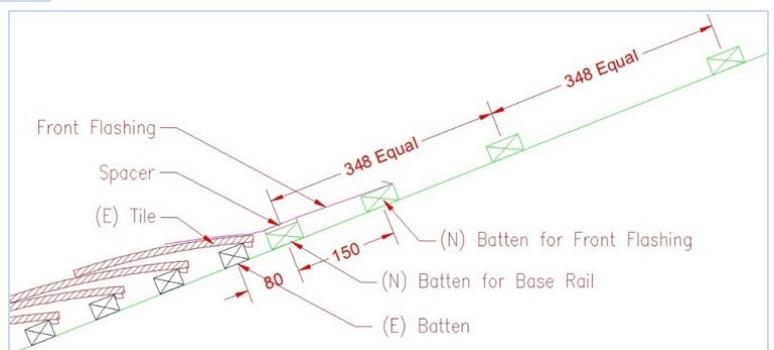
At the side of each row leave an overlap of the Ubbiflex sufficient to carry one additional roof covering course.

Where you have a STEP in your installation at the bottom, treat each separate step as you would the sides of each installation row, and leave sufficient overlap of the Ubbiflex at the sides.



Above: Figure 3. Bottom Flashing Installation top view

Below: Figure 4. Bottom Flashing installation side view



Installation Procedures:

Chapter 6

6.1 Assemble the Base Rails and the Base Rail Brackets

As with the Starting Row Bars, the Base Rail Brackets have a thin groove line running on one side. This is because there is a top and a bottom to the Base Rail Brackets.

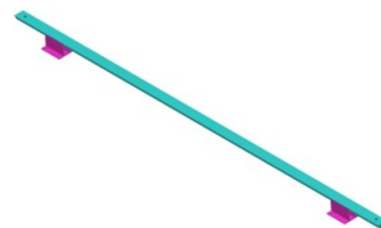
Slide two Base rail Brackets onto each base rail ensuring that the grooves on both brackets are on the same side. When fixed down the Base Rail Brackets must be a minimum of 15cm from the outside of the Base Rail to allow for the Central and Side flashings to slide underneath the joins.

When fixing the Base Rail Brackets to the battens, the thin grooves must be on the LOWER or BOTTOM side of the pitched roof.

6.2 Install the Base Rails

Always use the Installation Tool to correctly locate each Base Rail before fixing to the batten.

Each Base Rail Bar should have two Base Rail brackets joined to them with the thin grooves on the lower side. The Base Rail Bars slide into the profile of the Base Rail Brackets. By using the installation tool, you can locate into the outside holes of a fixed down base rail, to locate the exact installation position for the next Base rail.



The Base Rails are installed onto the Battens L3. Having installed the first one, use the installation tool to correctly locate the next Base Rail and fix each one down by screwing to the L3 batten through the holes in the Base Rail Brackets.

The Base Rail Brackets must be at least 20 cm from the outside of the Base rail in order to allow space for the flashings.

The end of the Base rail should be directly above the centre of the Side of Central flashings.

The Base rails should be flush against each other when installed side by side on each row.

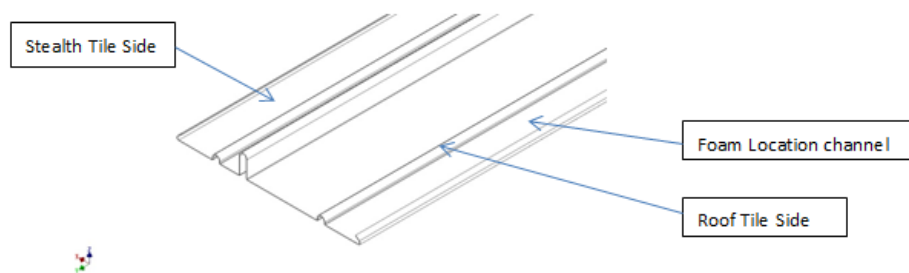
Fix all Base Rail Brackets down using the appropriate screws.

Installation Procedures:

Chapter 7

7.1 Install the Side Flashing

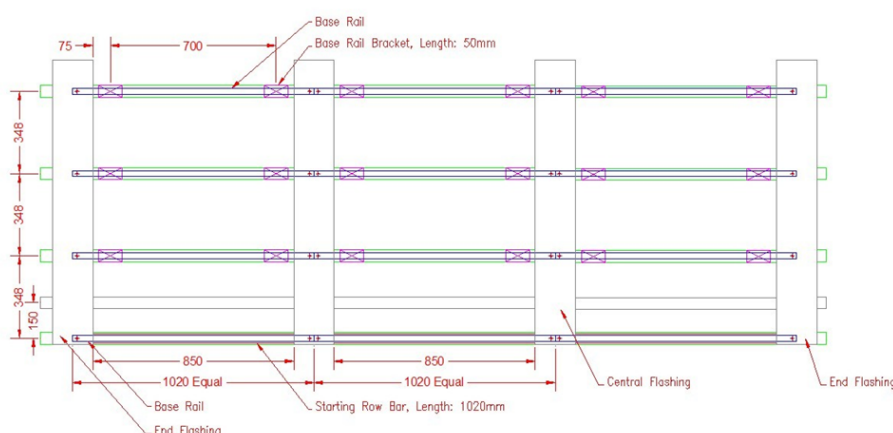
Install the Side Flashings vertically up the sides of the installation area. This flashing only has one raised ridge which is installed on the Stealth Tile side. The lower profile side is installed on the roof covering side (if there were a ridge on both sides the roof tiles would kick up on installation). The raised ridge should be on the Stealth Tile side, and the flat side on the roof tile side.



Side Flashing Profile

Use a plumb line to mark the vertical, and install the centre of the flashing sections to the line. Use the provided Self tapping screws and fix down the flashings in place to the battens, use the outside channels when screwing through the flashing sections. Wherever you overlap the flashings ensure the higher piece is over the top of the lower piece for water flow.

Another line of Side flashings will need to be installed when you get to the other side of the installation. Check you have the raised section on the Stealth Tile side, and the lower section on the roof covering side.



Installation Procedures:

Chapter 8

8.1 Install the Starting Row Bars

The Starting Row bars have a thin groove running along the length on one side. When positioning the starting row bars the groove should be on the LOWER or BOTTOM edge of the installed bar.

As the Starting Row Batten (L1) is now covered by the bottom flashing, use the installation tool and work down from the first row of installed Base Rails to correctly locate the Starting row Bars. The Starting row Bars have a top side and a bottom side, check the mark on each so they are the correct way up.

TIP: Take care to exactly fix the Starting Row Bar to the batten as if this is out, all the Base Rail Bars will be out. You can exactly fix a Base Rail bar to the first L3 Batten and use the tool to locate the Starting Row Bar below.

The base of the Starting Row Bar should locate against the edge of the Side Flashing with the overhang reaching the centre of the Side and Central flashings. The starting row bars should then be butted up to one another so they are touching.

TIP: Install the Central flashing sections as you go.

Installation Procedures:

Chapter 9

9.1 Install the Central flashings

The central and Side flashings should always be central to the edge or joint of a Stealth Energy Tile.

Install the Central Flashings as you install the Base Rails.

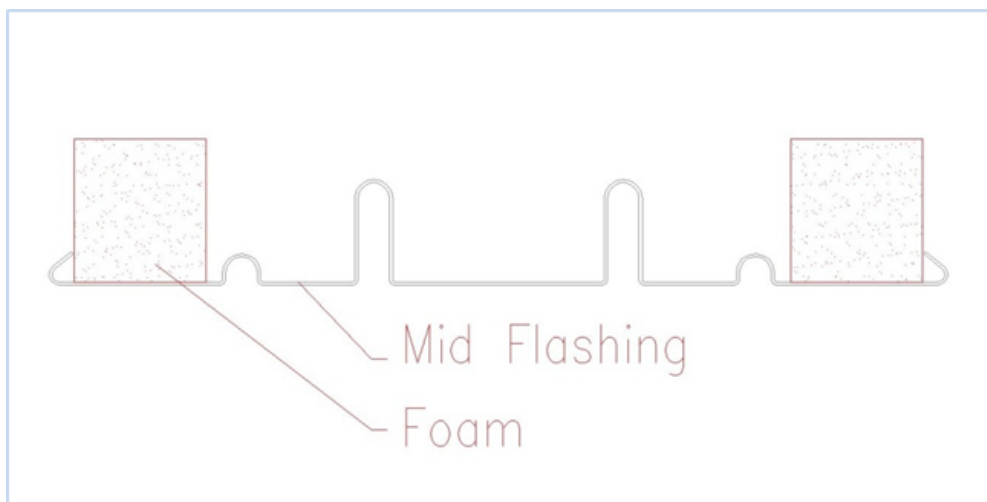
TIP: Use a plumb line to mark the vertical, and install the centre of the flashing sections to the line.

Use the provided Self tapping screws and screw down the outside channels to the battens. Wherever you overlap the flashings ensure the higher piece is over the top of the lower piece for water flow.

9.2 Install the Foam Sections

The Foam sections can now be located in the outside channels of the end flashing and in both outside channels of the central flashings.

TIP: The foam can be trimmed on the End Flashings if it is felt it will kick the tiles up.



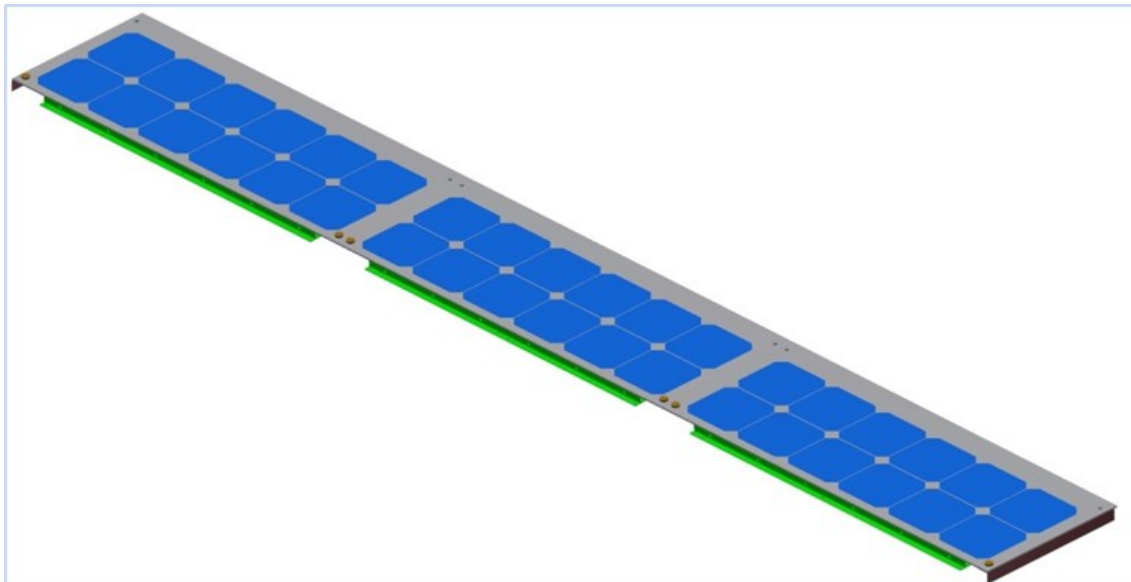
Installation Procedures:

Chapter 10

10.1 Start Stealth Tile Installation

Start to install the Stealth Energy Tiles. You may find it easier to start at the top of a column and work down. If you chose to do this you can install the top flashing to the top tile (See Install top flashing) and then install the tiles from top to bottom. You can only attach the top screws when moving from top to bottom as you will need to slide the lower tile under the one above as you move down the column.

The image below shows how the panels should be installed tight up to one another.

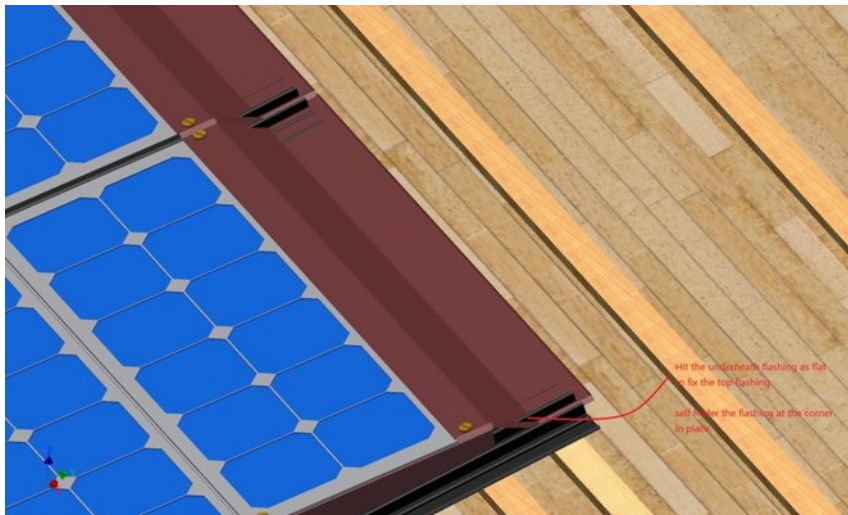


Installation Procedures:

Chapter 11

11.1 Install the Top Flashing

Install the top flashing to the Top Flashing batten L4 using the self-tapping screws.



Use a lump hammer (with some wood to dampen the impact) to gently work the top of the End and Central Flashings flat to allow the top flashing to sit flat to the batten.

The holes in the Top flashing line up with the hole in the Stealth energy tile. The Tile should have some sealing tape attached which can be activated once all is in place.

Installation Procedures:

Chapter 12

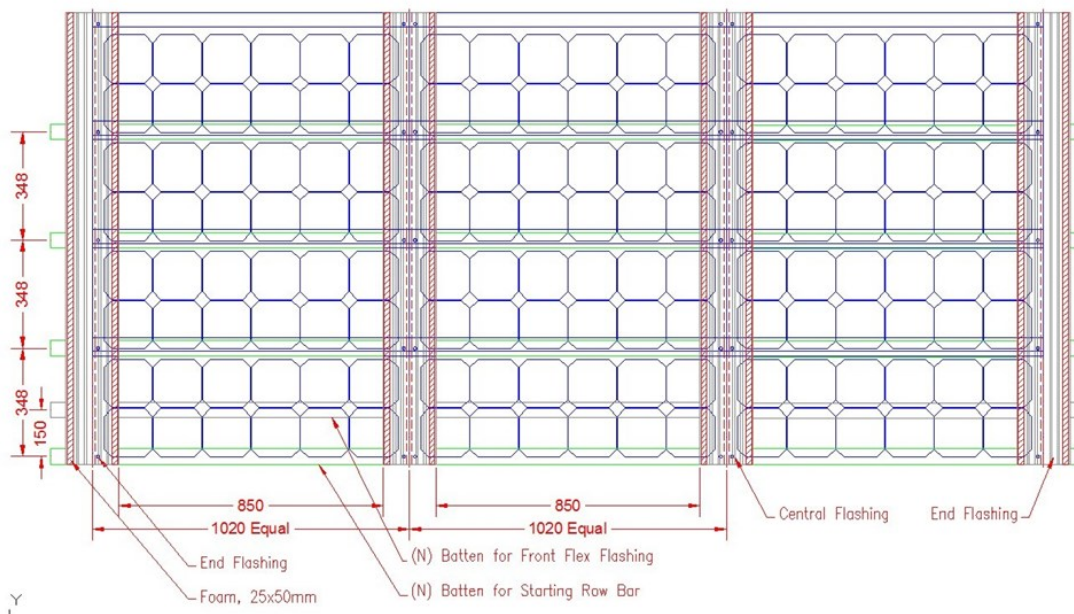
12.1 Install remaining Stealth Tiles

Install all the remaining panels, making sure you have planned the cable connections which are done as you go, and including the side flashings down the outside edges of the array (seen next section Side Flashings).

It is recommended to install the tiles from the top working down each column. This allows you to be working at eye level when fitting each Stealth Energy Tile. If you do install from the top, you will need to only fix each tile at the top until you have put the next tile underneath to create the overlap. Using this method you can release the tape and silicon the tiles as you move downwards.

The Large Headed Screws are only slightly tightened initially, they are fully tightened once a number of tiles are correctly positioned. Each tile is installed with the clear overlap strip at the top. The location of each tile is governed by locating the predrilled holes in the tiles with the pre-drilled holes on the in the Base Rail bars.

TIP: Ensure the plastic tabs you created are accessible as you will use them to peel the plastic off before tightening the installation down.



Installation Procedures:

Chapter 13

13.1 Edge Flashings

The Edge Flashing is used wherever the edge of a tile is on the outside. The Edge flashing is installed directly under the Stealth Energy Tile, and locates in line with the holes on the Stealth Energy Tile. Once installed should return to the centre of the Side Flashing, thus creating a physical barrier to weatherproof the installation.

The Edge flashings are not used in between the tiles where two tiles are next to each other.

13.2 Tighten the array

Once all the tiles are in place, or sufficient tiles are in place, remove the plastic coating of the self-adhesive tape to seal the joints between the tiles and firmly push down the tiles to activate the adhesive tape. Next tighten the large headed screws.

TIP: It is not recommended to use power tools as they can cause damage. Firm manual tightening is sufficient.

Figure 8. Install the remaining rows of tiles

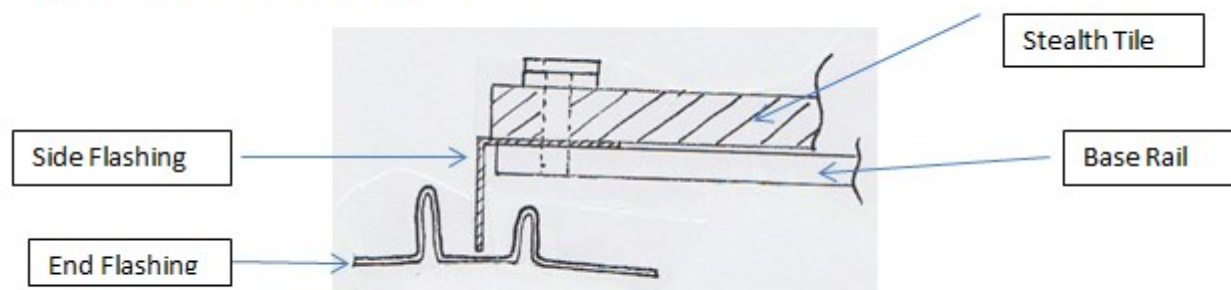


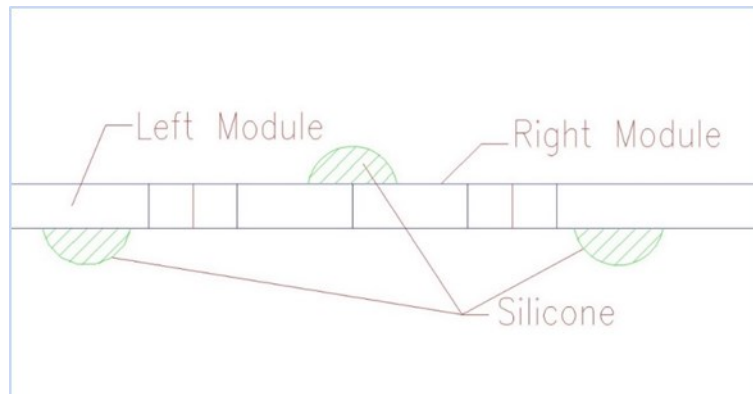
Figure 9. Side Flashing Position

Installation Procedures:

Chapter 14

14.1 Seal between the tiles

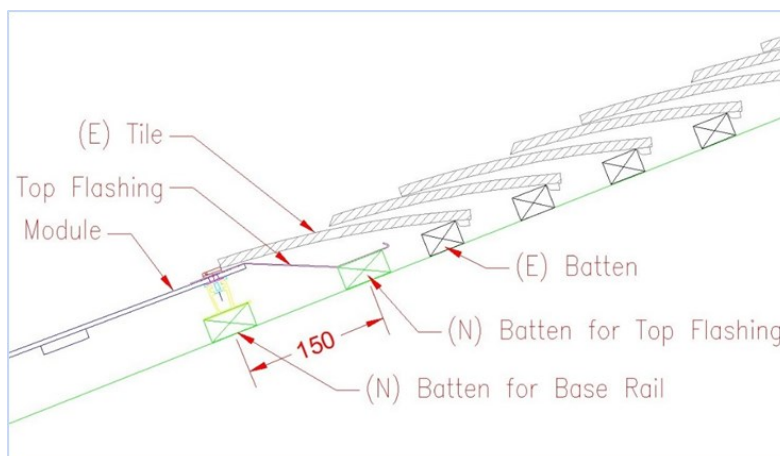
Using the silicon provided run a bead of silicon along the gap at the top of the tiles - where the sides of the tiles come together. The tiles already have a bead of silicon running down the back to ensure any water cannot run behind the panels, and drops into the central flashing.



14.2 Reinstall existing roof tiles

The existing tiles around the sides and top of the installation can now be installed.

Ensure that the roof tiles up the sides are reinstated as close to the Stealth Tiles as possible.



Warranty:

7.Warranty

STEALTH ENERGY WARRANTY TERMS AND CONDITIONS FOR ASSEMBLY SYSTEMS

SCOPE OF APPLICATION

This warranty terms and conditions (hereinafter referred to as WCT) of Stealth Energy Mounting shall apply in addition to the general terms and conditions (hereinafter referred to as GTC) of Infinity Innovations Ltd. at all sales of assembly systems to its buyers.

The services granted by this WTC shall only be regarded as a voluntary special service by Infinity Innovations Ltd. insofar as they exceed the minimal statutory requirements for warranty. The WTC shall not create an independent cause of action for the buyer but only modify the statutory regulations (dependent warranty). An independent promise of guarantee exceeding the contents of these WTC shall not be granted.

START AND PERIOD OF WARRANTY

The warranty period is ten (10) years and begins with the passing of risk of loss or damage to buyer in accordance with the ICC incoterms 2010.

EXERCISE OF WARRANTY RIGHTS

The warranty case shall be reported to Infinity Innovations Ltd. in writing, the kind and the extent of the alleged defect shall be described herein. The terms for inspection and objection according to GTC shall be observed. Noncompliance with the inspection and objection obligation shall make the warranty rights cease to exist.

SCOPE OF WARRANTY

Infinity Innovations Ltd. warrants that the goods to be supplied conform to the specifications stated in the contract and are free of essential deficits. However, this shall not be considered as an independent guarantee declaration, but as an agreement regarding condition of the goods.

Upon Infinity Innovations Ltd. choice the remedy of defects shall be made either by repair or by new delivery. Infinity Innovations Ltd. shall be entitled to engage a third party to arrange removal of defects.

In the case of culpably unjustified warranty demand the buyer shall refund the caused damage to Infinity Innovations Ltd.

PROPER USE AND EXEMPTION FROM WARRANTY

The warranty services described above can only be granted if the object of purchase is used, operated and assembled in a proper way. Therefore the defects of goods resulting not only from material or production defect will not be remedied by Infinity Innovations Ltd. This can especially (but not limited to) apply in the following cases.

-The buyer or the installer omits to follow the assembly, operation or maintenance instructions which causes defect (s) of the goods.

- Replacement (s) repair (s) or modifications (s) of the goods are not made by Gigabiz Ltd., a third party engaged by Infinity Innovations Ltd. or without consent of Infinity Innovations Ltd.

- Improper use of the goods or the use contrary to the way of use specified in contract/conventional way of use.

Vandalism, destruction by external influences and/or by human beings and/or animals.

Improper storage, transporting after passing of risk of loss or damage before the installation if that causes defects (s) of the purchased object.

Damages of the building stock or its incompatibility with the goods causing the defects of the goods.

Damages of the building stock or its compatibility with the goods causing the defects of the goods.

Use of the purchased object on mobile units such as vehicles or ships.

Acts of God, e.g. flooding, fire, explosions, rock, fall, direct or indirect lightning stroke or other extreme weather situations such as hail, hurricanes, tornados, sandstorms or other circumstances out of Infinity Innovations Ltd.'s influence.

Furthermore the warranty is excluded if the defect arises because of the use contrary to standard use condition described as follows.

Use of the goods only under sufficient statics, especially-installation on a carrying facility which is strong enough to carry the weight of the product and to stand possible weather-related charges such as water, wind, leaves or snow.

Wind velocities exceeding the limit values specified in the product description.

5.3 The warranty services shall be excluded if any when the manufacturer label(s) and or/serial number (s) of the goods is/are changed, erased, detached or unreadable.