PV-ezRACK®

SolarRoof™ Slate Tile

Code-Compliant Planning and Installation Guide V1.0
Complying with AS/NZS1170.2-2011 AMDT 2-2016


Ver 1.0 / Last Updated - Oct. 2021

Introduction

The Clenergy PV-ezRack® SolarRoof™ has been developed as a universal PV-mounting system for roof-mounting on pitched and flat roofs. The use of patented aluminium base rails, Z-Module technology and telescopic mounting technology eliminates custom cutting and enables fast installation.
Please review this manual thoroughly before installing PV-ezRack® SolarRoof™ on slate tiles. This manual provides
1) Supporting documentation for building permit applications relating to PV-ezRack® SolarRoof™ Universal PV Module Mounting System,
2) Planning and installation instructions

The PV-ezRack® SolarRoof™ installation on slate tiles, when installed in accordance with this guide, will be structurally sound and will meet the AS/ NZS1170.2:2011 Amdt 2- 2016 standard. During installation, and especially when working on the roof, please comply with the appropriate Occupational Health and Safety regulations. Please also pay attention to any other relevant State or Federal regulations. Please check that you are using the latest version of the Installation Manual, which you can do by contacting Clenergy Australia via email at tech@clenergy.com.au or contacting your local distributor in Australia.
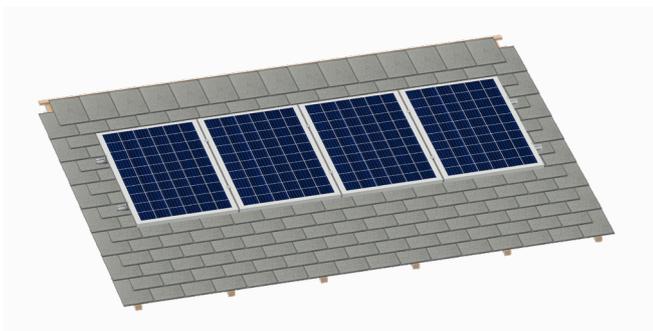
The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any updates that may supersede this manual;
- Ensuring that PV-ezRack and other products are appropriate for the particular installation and the installation environment;

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- Using only PV-ezRack parts and installer- supplied parts as specified by PV-ezRack project plan (substitution of parts may void the warranty and invalidate the letter of certification);
- Recycling: Recycle according to the local relative statute;
- Removal: Reverse installation process;
- Ensuring that there are no less than two professionals working on panel installation;
- Ensuring fitted roof hooks are not used as a ladder, as this could damage tiles
- Ensuring extra slate tiles are accounted for in case of slate tiles breaking during installation
  Ensuring the installation of related electrical equipment is performed by licenced electricians;
- Ensuring safe installation of all electrical aspects of the PV array This includes adequate earth bonding of the PV array and PV-ezRack® SolarRoof™ components as required in AS/ NZS 5033-2014 AMDT 2 2-2018;
- Ensuring that the roof, its rafters/purlins, connections, and other structural support members can support the array under building live load conditions;
- Ensuring that screws to fix interfaces have adequate pull-out strength and shear capacities as installed;
- Maintaining the waterproof integrity of the roof, including the selection of appropriate flashing;
- Verifying the compatibility of the installation considering preventing electrochemical corrosion between dissimilar metals. This may occur between structures and the building and also between structures, fasteners and PV modules, as detailed in AS/NZS 5033: 2014.
- Verifying atmospheric corrosivity zone of installation site by referring to AS 4312-2008 or consulting local construction business to determine appropriate products and installations.

Tools and Components

Tools

Angle Grinder with Stone Disk	Screw Driver (for M8 Hexagon Socket Screw)	Torque Spanner	Spanner	5m Tape
String & Marker Pen	Slate Rip	Lead Flashing		

Components (Manufacturer: Clenergy)

ER-EC-ST End Clamp	ER-IC-ST Inter Clamp	C-U/30/46-G Universal Clamp with Grounding Clip	C-U/30/46 Universal Clamp	ER-EC-DU35/40 End Clamp, Dual 35 or 40mm
ER-EC-DU40/46 End Clamp, Dual 40 or 46mm	ER-R-ECO ECO Rail	ER-SP-ECO Splice for ECO Rail	ER-I-02 Flat Tile Interface	SCO-ECO/380 Side Channel Cover for Cutter-Rail, length 380mm

Components   (Manufacturer: Clenergy)

EZ-RE-200	ER-HB-8/150	ER-HB-MP/8/150EP
Roof Hook Extender	Hanger Bolt for wood purlin	Hanger Bolt for metal purlin

PV-ezRACK®

System Overview

PV-ezRack® SolarRoof™ Slate Tile with Tile Interface
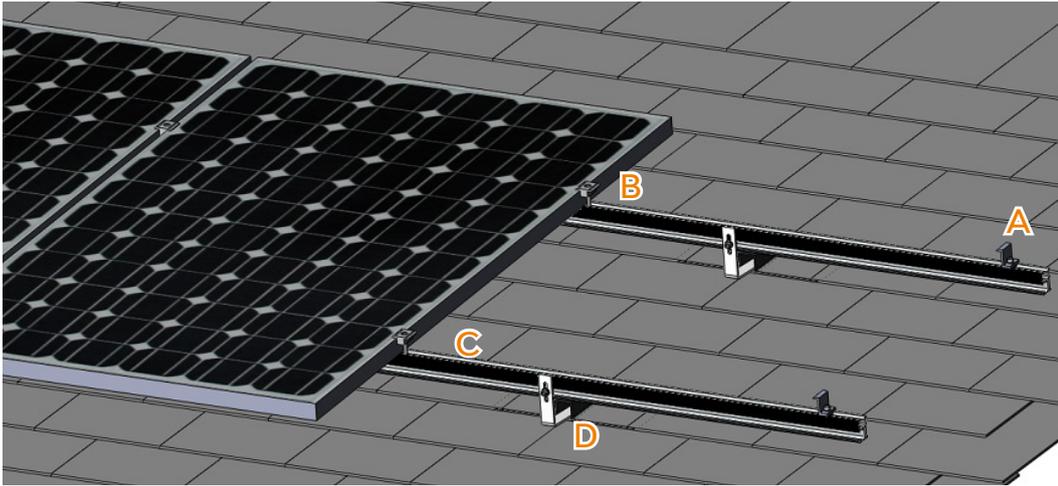
A. End Clamp   B. Inter Clamp   C. ECO Rail   D. Tile interface

PV-ezRack® SolarRoof™ Slate Tile with Hanger Bolt
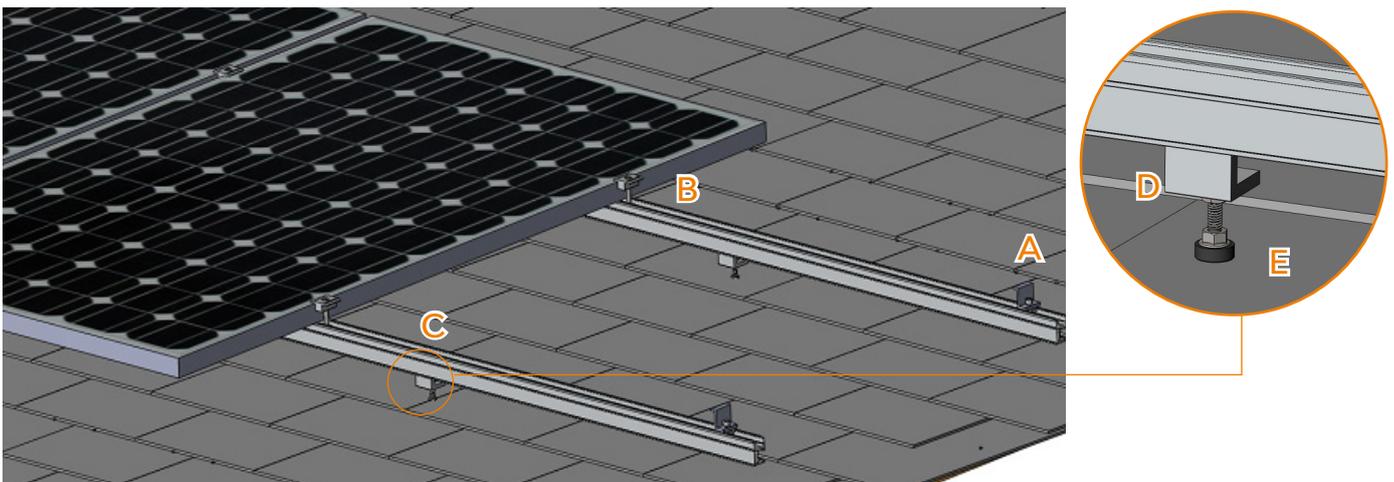
A. End Clamp   B. Inter Clamp   C. ECO Rail   D. Tin interface   E. Hangar Bolt

Installation Instruction

1. Tile Interface Installation

1) Choice of Tile Bracket

ER-I-02 would be the most appropriate tile interface for slate tile application. Given slate tiles are generally flat and low-lying, nailed into the roof battens.
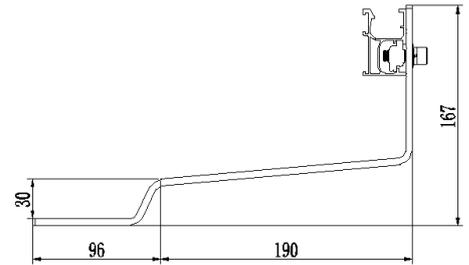

Figure 4.1.1

2) Removing Slate Tiles

Determine the positions of the tile brackets according to your plans. Take out the nails on the slate tiles and remove two or three slate tiles at the marked positions.

Slate tiles are removed by using a slate rip which unhooks the nail that secures the slate. By hitting the slate rip handle with a hammer, the nail is pulled out. Thus, allowing slate to be removed, as shown in Figure 4.1.2.
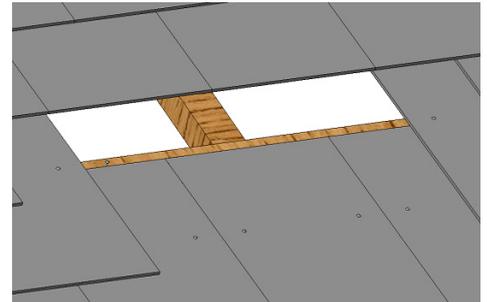

Figure 4.1.2

3) Cutting Slate Tile

Grind a small section off the base tile to show the rafter on which the roof hook would be installed. This is shown in Figure 4.1.3.
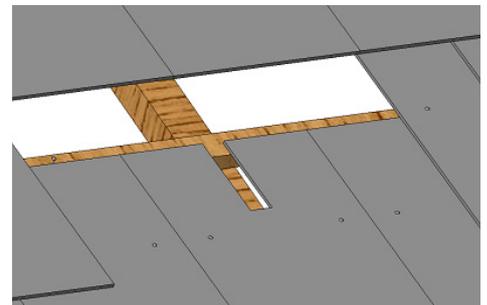

Figure 4.1.3

4) Fixing Tile Bracket to Rafters

Fix the tile brackets to the slate tiles using Clenergy provided 2x Buildex 14-gauge Hex Head Zips screws as shown in the figure on the right following the Buildex screws installation guide below:
- Use a 3/8" Hex Socket.
- Use a mains powered or cordless screw driver with a drive speed of 3,000 RPM maximum.
- Fit the driver bit into the screw and place at the fastening position.
- Apply consistently firm pressure (end load) to the screwdriver until the screw is fastened.

Use wooden packers to lift the tile bracket so that the base does not rest on the tile, as shown in Figure 4.1.4B.
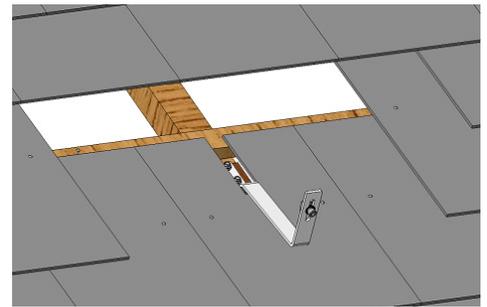

Figure 4.1.4A
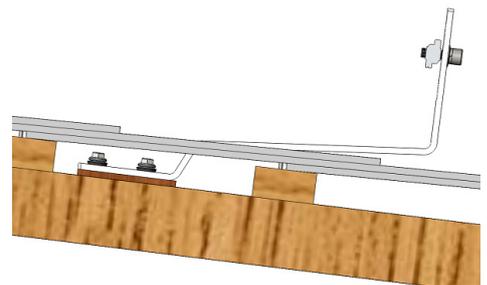
Figure 4.1.4B

5) Apply flashing around Tile Bracket

For prevention of water leakage, it is important to using flashing to secure the installation against rainwater.

Cut out lead flashing to fit the profile of the tile bracket. Cover the bracket with the flashing and fix it to the batten with a nail, as shown in Figure 4.1.5.

Note: It is recommended to use lead flashing for their durability and ability to withstand corrosion.
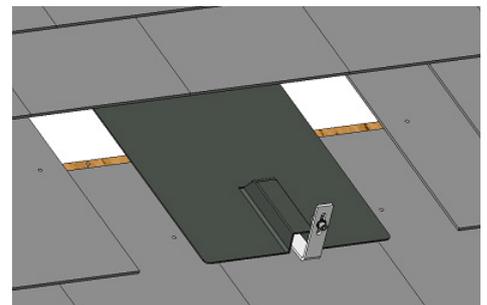
Figure 4.1.5

6) Cut Slate to fit around Tile Bracket

Cut the removed tiles around the position of roof hook and flashing to suit the flashing.
Slightly put the slate tiles back and fix with nails as shown in the Figures 4.1.6A and 4.1.6B.
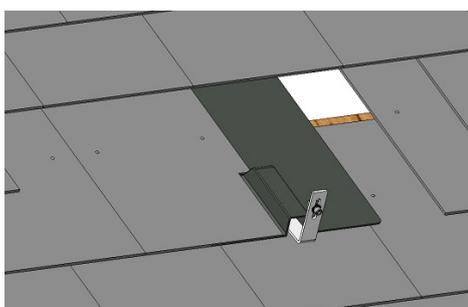
Figure 4.1.6A
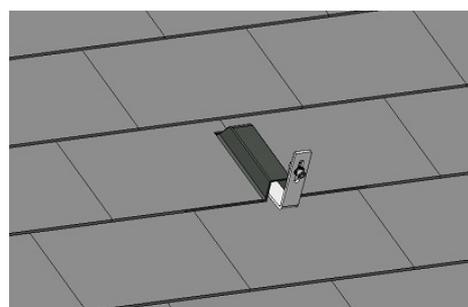
Figure 4.1.6B

7) Rail, clamps, and panel installation

Please refer to PV-ezRack® Solar Roof Installation Guide for steps on installing rails, clamps and PV panels.
The guide also gives our standard engineering spacing for tile interface based on site conditions.

2. Hangar Bolt Installation

1) Purlins are to be identified when opening tiles and their positions are marked out on the tiles.

2) Based on installation plan and Hanger bolt spacing information, hanger bolt locations are marked on the tiles.

Note: Hangar bolt spacing is equivalent to the tin spacing which is provided in our PV-ezRack® Solar Roof Installation Guide.

3) Drill 10 mm hole on the marked location of tile and stop when reaching the purlins.
Note: For some installations, there is a need to drill through two tiles (overlap) to reach the purlin
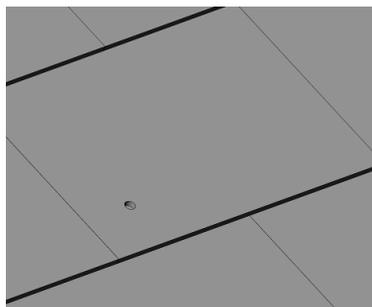

Figure 4.2.3A
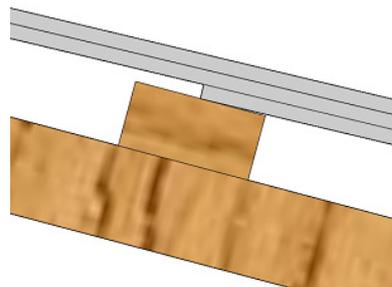
Figure 4.2.3B

4) Through 10 mm hole on the tiles, pre-drill 6 mm hole on the wood purlin for hanger bolt. The tiles are not removed when drilling this hole. After the drilling, clean the dust around 10 mm hole.
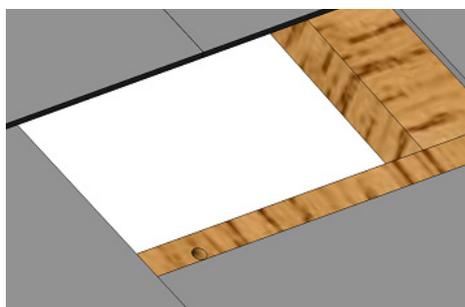
Figure 4.2.4

5) Adjust the position of rubber seal on the hanger bolt (ER-HB-8/150) to ensure hanger bolt have minimum 25 mm penetration depth into the wood purlin.

Drive the hanger bolt on the wood purlin till the rubber seal is firmly flush on the tile and turn the nut down till touching the rubber seal. Please turn another 4 threads cycle to press the rubber seal.

Note:
1) Purlin thickness and tile thickness need to be verified to decide position of rubber seal for appropriate penetration depth;
2) It is recommended to apply Sikaflex on the area around 10 mm hole of the tile before fixing hanger bolt. Please refer Sikaflex instructions for use.
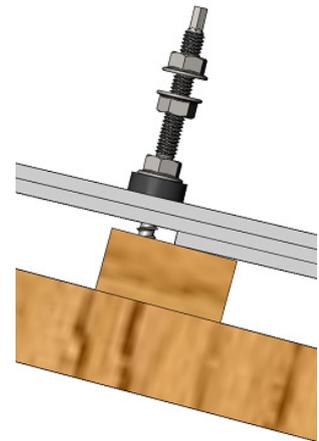
Figure 4.2.5

6) Screw out the top nut of hanger bolt, connect and adjust tin foot position and tighten the top nut with the recommended torque of 16~20 N•m.
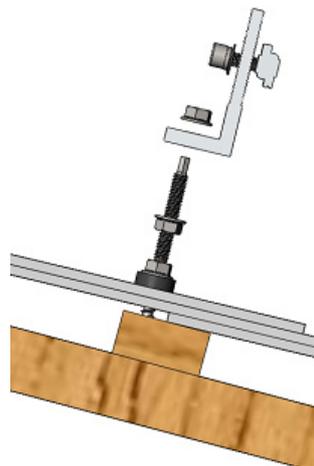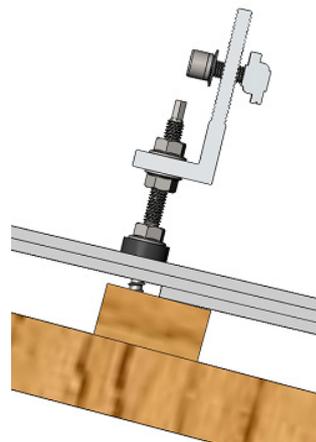
Figure 4.2.6A   Figure 4.2.6B

7) Rail, clamps, and panel installation

Please refer to PV-ezRack® Solar Roof Installation Guide for steps on installing rails, clamps and PV panels.

The guide also gives our standard engineering spacing of hangar bolts based on site conditions.

Note: Hangar bolt spacings are equivalent to tin feet spacings in the installation guide.

Certification Letter

The accredited spacings depend on the method of installation.
Please refer to table below for reference to the correct manual for your installation method:

Mounting System Setup	Manual
Tile Interface	PV-ezRack® Solar Roof Installation Guide
Hangar bolts	

Product Warranty

As the manufacturer of quality solar mounting systems, Clenergy Australia provides a warranty for all PV-ezRack® products it supplies in Australia and New Zealand ("Products"). The warranty provided by Clenergy Australia is subject to the conditions contained in this document ("Warranty"). No other warranty provision implied or otherwise is to be assumed. Your Warranty coverage is in accordance with this document. Based on choice of mounting setup, the letters are appended in their corresponding installation manuals hyperlinked in the table below:

Product Warranty Table for Installations in Corrosivity Category 1, 2, 3, 4 and 5 (ISO 9223)

Product		Material	Standard or Customized Product	Product Warranty		
				Corrosivity Category 1, 2 and 3	Corrosivity Category 4	Corrosivity Category 5
1	Aluminium Components	6005CL-T5 mill finish	Standard	10 years	10 years*	
		6005-T5 anodized to 10 microns				
		6005-T5 anodized to 15 microns	Customized			10 years*
		6005-T5 anodized to 20 microns				10 years
2	Galvanized Steel Components	Galvanized Steel at 85 microns in average	Standard		10 years	Not warranted
3	Stainless Steel Components	SUS304	Standard			10 years
4	Fasteners (bolts/ nuts/washers)	SUS304	Standard			
		SUS316	Customized			
5	Screws for Tile Interface	Carbon Steel SAE 1022 with Climaseal C3 Rated Finish	Standard		10 years**	
6	Screws for Tin Interface	Carbon Steel with C3 Rated Finish	Standard		Not warranted	
		Carbon Steel with C5 Rated Finish		30 years	25 years	10 years

* Subject to interface spacing reduction as advised by Clenergy Australia. Please contact us for more details.
** The screws under tile interface are assumed to be installed in category 1, 2 or 3 micro-climate within the roof structure.

Warranty Scope

Your solar mounting Product has been manufactured to high standards, however, should any manufacturing defect arise, please contact Clenergy Australia. We will arrange for an inspection of the affected Product(s) to determine the extent of the problem.

Details are provided below as to the extent of your Warranty coverage and any exclusions that may apply. Please read these provisions carefully to ensure you receive the appropriate assistance and support in a timely manner. Please also contact Clenergy Australia if any part of this Warranty is unclear, or you wish to discuss your rights and remedies under this Warranty.

If your Product fails during the Warranty periods set out in the Warranty table above due to a defect in:

(a) materials and/or workmanship on and from the date of the Product's delivery; or
(b) structural integrity on and from the date of the Product's installation,

Clenergy Australia will at its election either repair or resupply the defective Product provided that:

• The Product was installed correctly by a Clean Energy Council ("CEC") accredited or equivalent accreditation installer, following the Clenergy installation manual provided at time of purchase.
• The Product has been maintained correctly in accordance with section "Care of your Product" below.

Warranty Conditions

• Any and all costs for repair or replacement outside the Warranty period are the responsibility of the customer.
• Where Clenergy attends a site and finds that the Product is not faulty, the costs for the visit will be payable by the customer.
• Defective Products shall be uninstalled and/or reinstalled at the customer´s expense and risk.
• Under certain conditions, the Warranty can be extended to more than 10 years at an extra cost, available upon request.

Warranty Exclusions

• Product finish (natural surface oxidation) or any natural impairment or surface corrosion that does not compromise the structural integrity.
• Products sold or installed outside of Australia and New Zealand unless approved previously in writing by Clenergy Australia.
• Damage caused by transport, mishandling, incorrect storage, improper loading or willful conduct.
• Any Product not correctly installed in accordance with our installation manual, or any specific design instruction or special conditions as advised by Clenergy Australia.
• Damage caused by the Product being modified in any way unless previously agreed to in writing by Clenergy Australia.
• The use of the Product for purposes other than the mounting of PV solar panels.
• Installations where the environment is excluded in the "Products Warranty Table" above, and for galvanized steel ground system Products, where the pH level is outside the range of 6-8, unless agreed to in writing by Clenergy Australia prior to installation.
• Damage caused by extreme weather conditions or any other natural or man-made event outside of our control.
• Damage caused by attachments not designed or approved for connection to the Product.
• Damage caused by lightning strikes or excessive currents through the earthing/grounding clamps, clips or lugs.

Our Products may come with guarantees that cannot be excluded under the Australian Consumer Law. You may be entitled under statute to a replacement or refund for a major defect in the Products. You may also be entitled under statute to have the products repaired for any defect which does not amount to a major defect. The benefits given by this Warranty are in addition to any statutory rights and remedies you may have under Australian law.

Product Care

Clenergy Products are designed to be durable with minimal care, however it is important that you maintain your mounting Product in accordance with proper practices. This includes regular maintenance and inspection to avoid damage.

The aluminum components are made from either AL 6005CL-T5 or AL6005-T5 and may also have a clear anodization. The aluminum may undergo some surface oxidization in service. Please note that this is normal and part of the natural ageing process. The result may even be beneficial to the longevity of the Product, as the oxidization can provide additional protection against degradation by pollution and atmospheric corrosion.

- You should also ensure that if the Product is stored prior to installing that it is not contaminated by contact with rusty items or other impurities such as dirt and chemicals. Should this occur, you must clean the Product and make any repairs using approved methods such as galvanized paint and antirust treatments immediately before installation. Steel components should be inspected before and after installation and any damage to the galvanizing should be treated immediately to prevent rusting. It is normal for galvanized Products to develop a surface barrier (the 'patina'), which helps to protect the surface from contaminants in the atmosphere and does not adversely affect the Product.
- The torque values of fastener connections on mounting system must be checked annually and corrected if needed in accordance with Clenergy Australia's installation manual.
- Regular cleaning to remove any soil or other possible contaminants must also be performed. Cleaning should be performed in accordance with guidelines recommended by the Standards Association of Australia (AS 1231-2000) (for aluminium Products) and the Galvanizers Association of Australia (GAA) (for steel Products supplied in Australia) or the Galvanizers Association of New Zealand (GANZ) (for steel Products supplied in New Zealand) or any other similar organisations (as applicable). When using tin interfaces for installation works, screws not exposed to frequent rain should be washed down with fresh water at least every 6 months.

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