Installation guide

SOPRASOLAR® FIX EVO TILT

ALUMINUM & POLYAMIDE raisers

SOLAR
ENERGY
MANAGEMENT

SOPRASOLAR by SOPREMA

Overview

Who are we?

OUR EXPERTISE & PROJECTS ↙
soprasolar.com

Since its founding in 1908, **SOPREMA®** has remained an independent group and is now one of the world's leaders in waterproofing, insulation, and building protection.

The company installs millions of square meters of waterproofing, roofing, insulation, and protection systems across the globe. **SOPREMA®** plays a key role in many large-scale projects, such as the European Parliament in Strasbourg, Wembley Stadium, Ferrari World, and the George Washington Bridge.

With a workforce of 10,452 and sales reaching 4.82 billion euros in 2022, **SOPREMA®** has established a strong industrial and commercial presence worldwide. The company operates 123 plants, including around 20 in France, and has over 120 subsidiaries.

SOPREMA® is active in 100 countries, with 17 R&D centers focused heavily on Sustainable Development and 22 training centers across 8 countries.

SOPREMA®'s product offerings are the result of close collaboration between its marketing department and R&D centers, ensuring innovative solutions that meet market needs and current standards. With SOPREMA®, you can find the right solution for every type of project.

For more than 30 years, **SOPREMA®** has been committed to minimizing the impact of its products and activities on the environment and human health throughout the entire lifecycle of a structure, from construction to operation and eventual demolition.

SOPREMA®'s R&D policy emphasizes Sustainable Development by reducing environmental impact through the use of renewable resources in production and within its plants, as well as through innovations focused on health and safety.

Founded in 2008, **SOPRASOLAR®** has become the leading company in France for solar waterproofing. With its technical and commercial expertise, **SOPRASOLAR®** supports contractors and businesses looking to integrate energy-generating capabilities into their flat roofs.

Both in France and internationally, **SOPRASOLAR®**'s achievements include:

over 900 MWp
installed

over 5,000
references

over 15 millions m²
of flat roofs equipped on ribbed steel decking, wood, and concrete substrates, both in new construction and renovation.

Introduction

Note

The recommended systems shown here are examples. Each case is unique, so it is essential to consult **SOPRASOLAR®** for every project to validate the solution that best meets the building's needs.

The installation of waterproofing membranes must be carried out according to industry best practices and, where applicable, in accordance with our technical requirements.

Specifications

Load-bearing element	Ribbed steel decking (T.A.N.) and plywood panels[1]		Concrete	
Bituminous waterproofing membrane	Single-layer	Two-layer	Single-layer	Two-layer
Minimum roof slope	**3%**		**1%**	
Maximum roof slope	**10%**		**10%**	

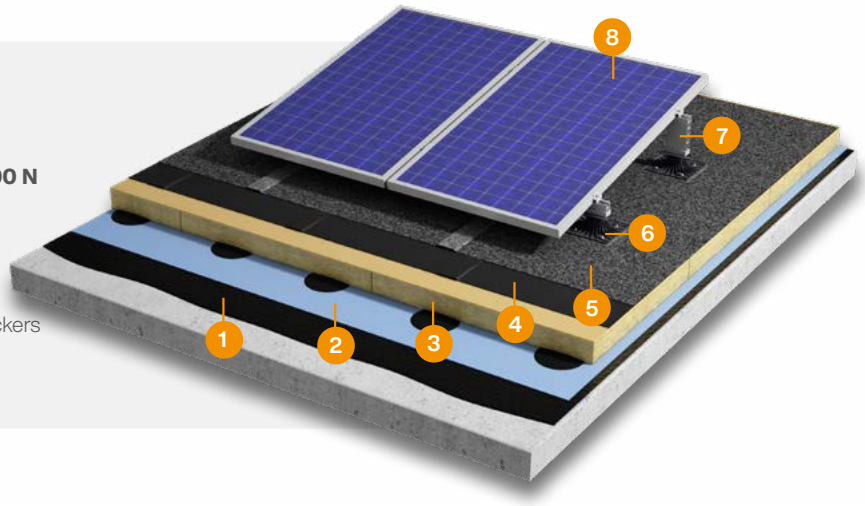
[1] Reminder:
- Ribbed steel decking, and plywood load-bearing elements must undergo specific sizing studies conducted by the supplier.

The **SOPRASOLAR® FIX EVO TILT** system allows for the installation of modules in either portrait or landscape orientation.

SOPRASOLAR® FIX EVO TILT Systems

Example: On concrete deck

1. **SOPRADÈRE®** or **AQUADÈRE®**
2. **ÉLASTOVAP**
3. PIR Insulation adhered with **SOPRACOLLE® 300 N**
4. **SOPRASTICK® SI**
5. **SOPRALÈNE® FLAM 180 AR** or **ALU**
6. **SOPRASOLAR® FIX EVO** Pedestals
7. **SOPRASOLAR® FIX EVO TILT** raisers and blockers
8. Crystalline photovoltaic module

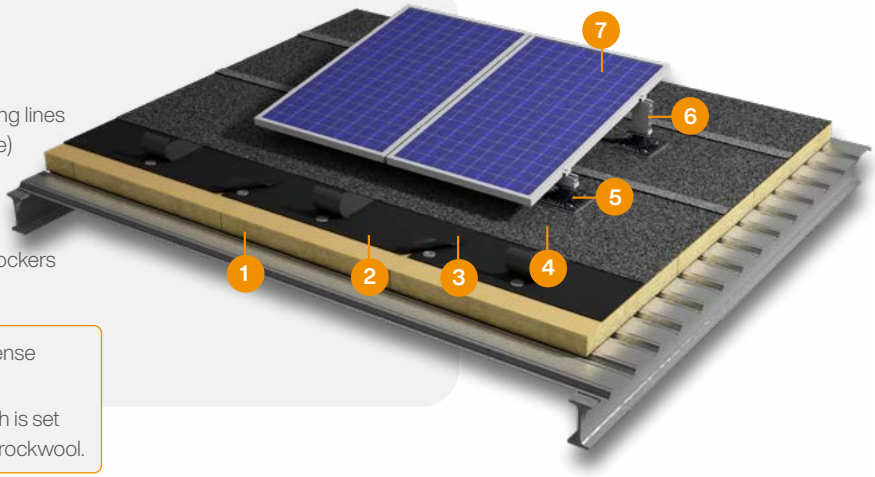


Example: On a ribbed steel deck

1. Class C bare insulation
2. **SOPRAFIX HP**
3. **SOPRAFIX HP** Bridging Tape on additional fixing lines (according to **SOPRASOLAR®** calculation Note)
4. **SOPRALÈNE® FLAM 180 AR** or **ALU**
5. **SOPRASOLAR® FIX EVO** Pedestals
6. **SOPRASOLAR® FIX EVO TILT** raisers and blockers
7. Crystalline photovoltaic module

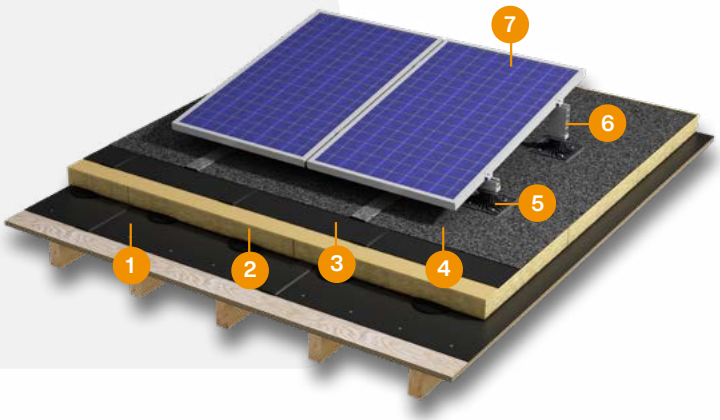
Compressibility class C: this term only makes sense to the French or anyone familiar with our DTU.

A parallel with the insulation density exists, which is set at 30 kg/m3 for EPS and PU and 130 kg/m3 for rockwool.



Example: On plywood deck

1. **ÉLASTOPHÈNE 25** nailed
2. **EFIGREEN ALU+** adhered with **SOPRACOLLE® 300 N** (according to **SOPRALÈNE® STICK** technical approval)
3. **SOPRASTICK® SI**
4. **SOPRALÈNE FLAM 180 AR** or **ALU**
5. **SOPRASOLAR® FIX EVO** Pedestal
6. **SOPRASOLAR® FIX EVO TILT** raisers and blockers
7. Crystalline photovoltaic module



You are at stage 1 — 2 — 3 — 4 — 5

1 Preparation

List of recommended **documents**

- This installation manual for **SOPRASOLAR® FIX EVO TILT**
- The Execution Drawing (EXE) issued by **SOPRASOLAR®**

List of **tools** required for implementation

- Standard roofer's tools (gas, torch, gloves, etc.)
- Knee pads (for welding pedestals while kneeling on the waterproofing)
- Measuring tape and long tape measure
- Chalk line
- Spatula
- Damp sponge
- Torque wrench for M8 hex socket screws or screwdriver with torque adjustment
- Optional: glass suction cup for handling modules
- Standard electrician's tools
- Lifting equipment for hoisting pallets of modules, cartons of pedestals, and small tools

Note

In hot weather, it is recommended to start work early for welding the pedestals onto the waterproofing.

Description of the various components

FIX EVO 250 Pedestal

Adjustable polyamide pedestal reinforced with fiberglass, featuring a bituminous plate. Dimensions: 250 x 250 mm.

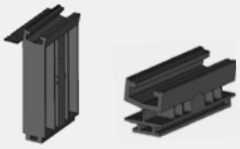
FIX EVO 300 Pedestal

Adjustable polyamide pedestal reinforced with fiberglass, featuring a bituminous plate. Dimensions: 300 x 300 mm.

Aluminum Raiser Kit

These raisers ensure the connection between **SOPRASOLAR® FIX EVO TILT** pedestals and the photovoltaic modules while creating a 10° inclination.

They must be used in combination with raiser blockers.



Polyamide Raiser Kit

These raisers ensure the connection between **SOPRASOLAR® FIX EVO TILT** pedestals and the photovoltaic modules while creating a 10° inclination.

They are self-locking and do not require blockers.

Universal clamp

Components for securing photovoltaic modules to the raisers of the **SOPRASOLAR® FIX EVO TILT** system. This reference is called "universal" because it adapts to photovoltaic module frames ranging from 30 mm to 42 mm.

Photovoltaic Module

Rigid module with an Aluminum frame.

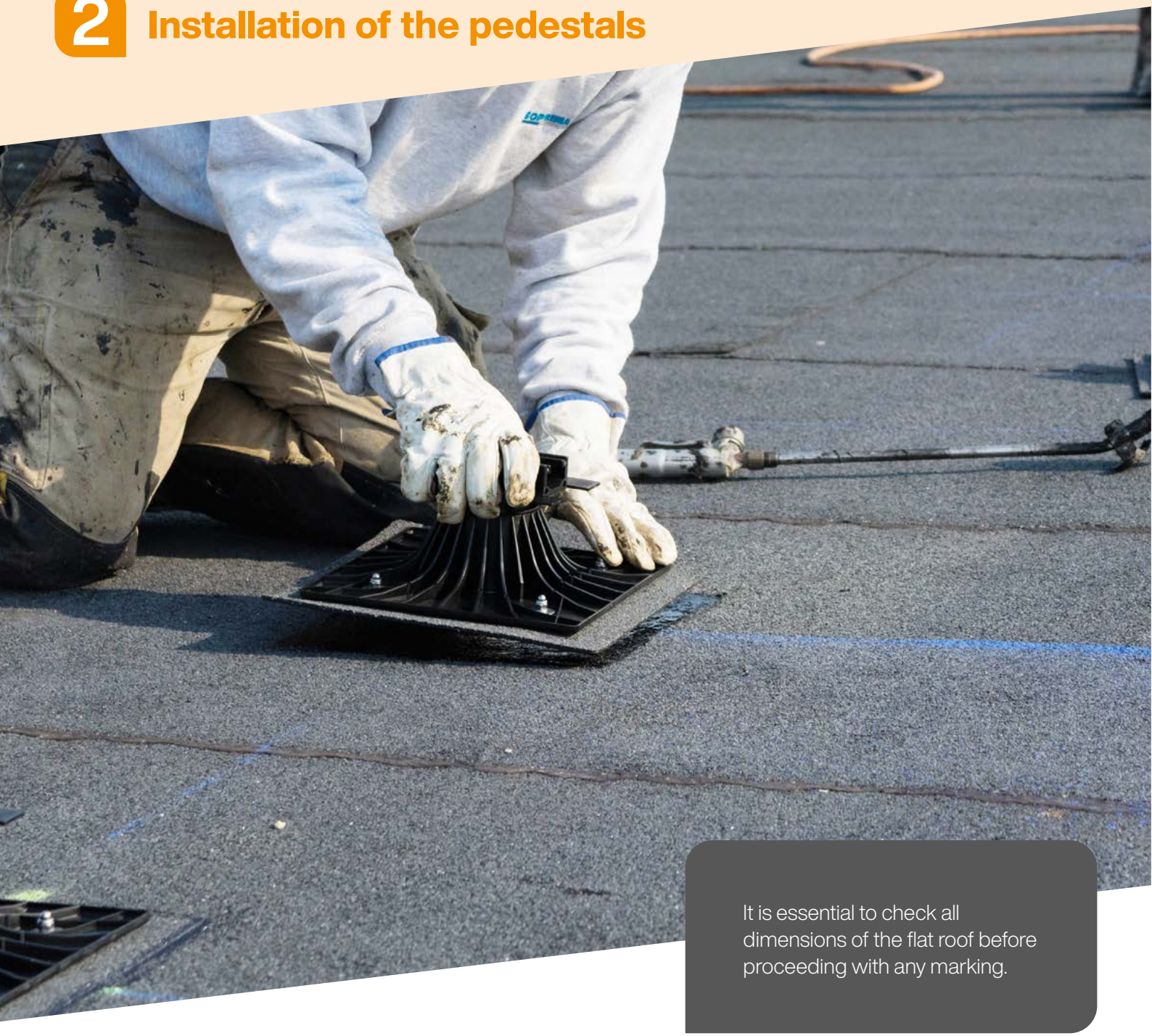
The benefits

- No waterproofing penetration
- No thermal bridge
- Easy installation
- Height-adjustable pedestals
- Associated to built-up roof systems subjected to successful wind uplift tests
- Ballast-free
- Broof t3 certified *

* Reach out to your SOPRASOLAR contact to learn more about the conditions.

You are at stage 1 2 3 4 5

2 Installation of the pedestals



It is essential to check all dimensions of the flat roof before proceeding with any marking.

Marking the location of the pedestals

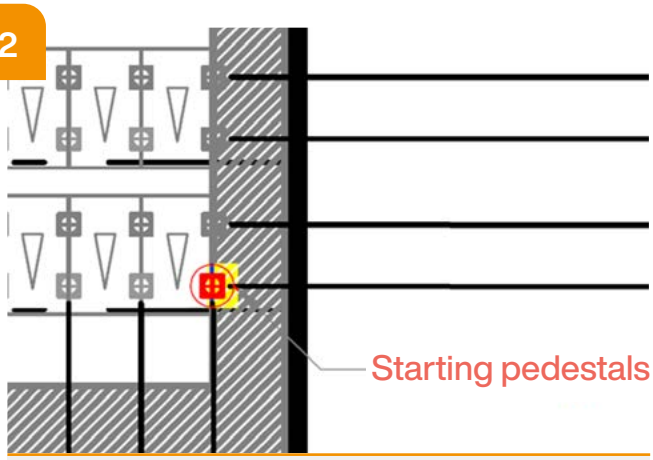
Before proceeding further on worksite, it is important to print the execution drawing (EXE) in the appropriate format (as indicated on the plan; A3 to A0) for better readability.

For roofs with a surface area greater than 3000 m^2, it is recommended to consult a surveyor for marking the pedestal locations. **SOPRASOLAR®** is available for any technical inquiries.

1

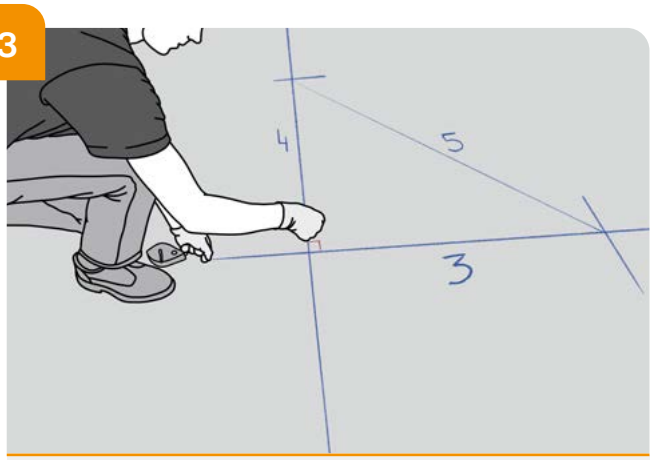
→ Verify the roof dimensions and the location of hindrances in relation to the EXECUTION DRAWING before any marking.

2



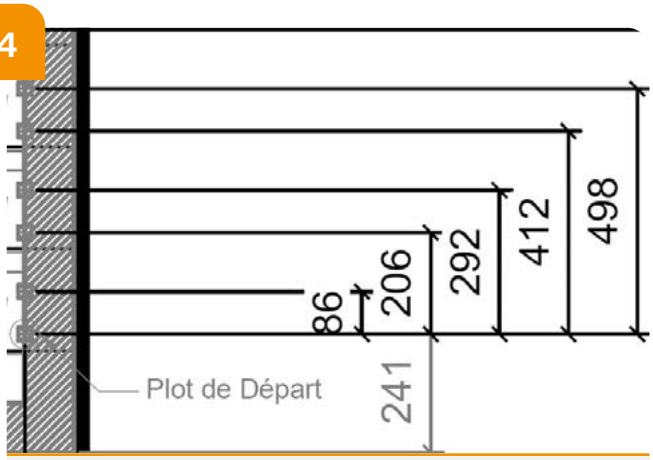
→ Check the positioning of the pedestal of reference using the EXECUTION DRAWING.

3



→ Position the SOPRASOLAR® FIX EVO pedestals. The center of each pedestal is marked by the intersection of the drawn lines.

4



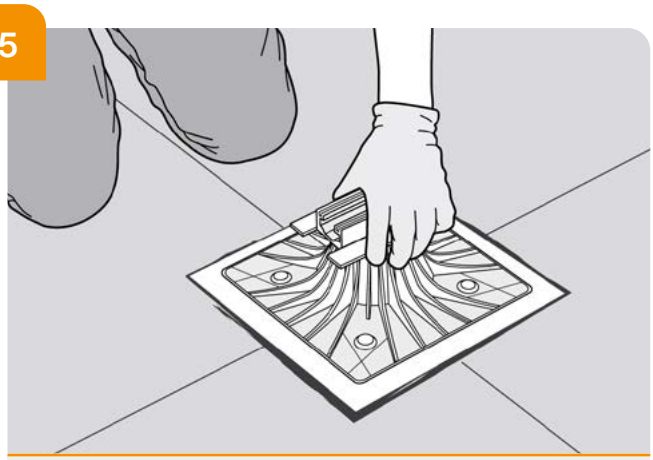
→ Mark the reference points using a chalk line, following the dimensions from the EXECUTION DRAWING. Check the squareness of the installation every 8 meters (using the 3-4-5 method).

Videos about marking

You are at stage 1 2 3 4 5

Welding of the **SOPRASOLAR® FIX EVO** flange

5

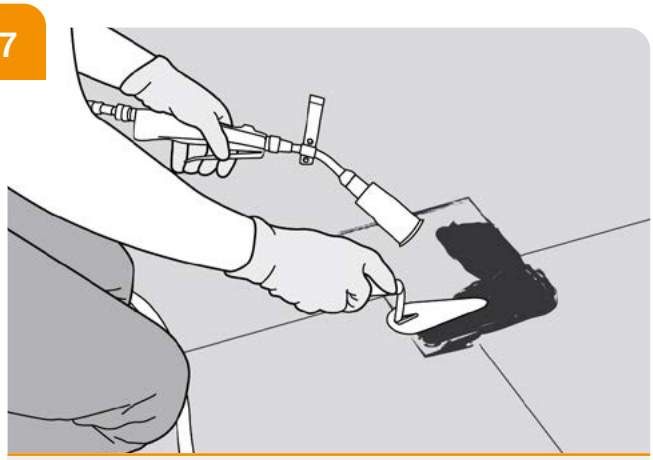


→ Ensure the positioning of the **SOPRASOLAR® FIX EVO** pedestals. The center of each pedestal is marked by the intersection of the drawn lines.

6

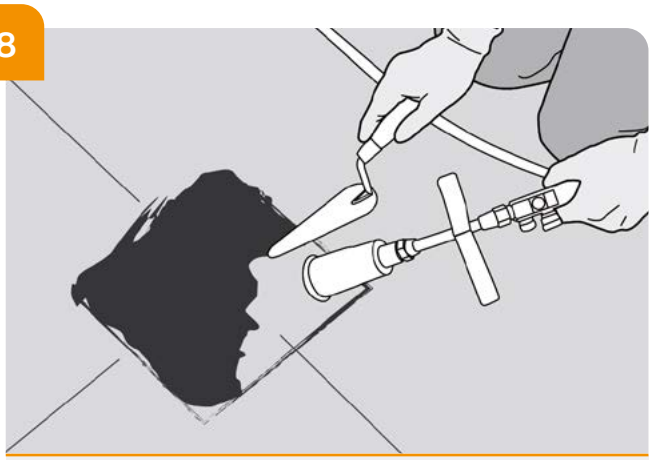
→ Mark the outline of the pedestal using a trowel to indicate its position on the roof.

7



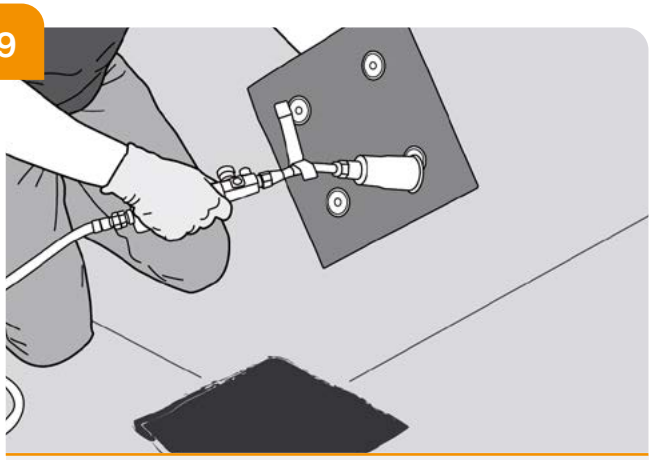
→ Blacken the location of the pedestal using a torch and a spatula.

8



→ Degrease the visible Slate chippings on the waterproofing sheet.

9

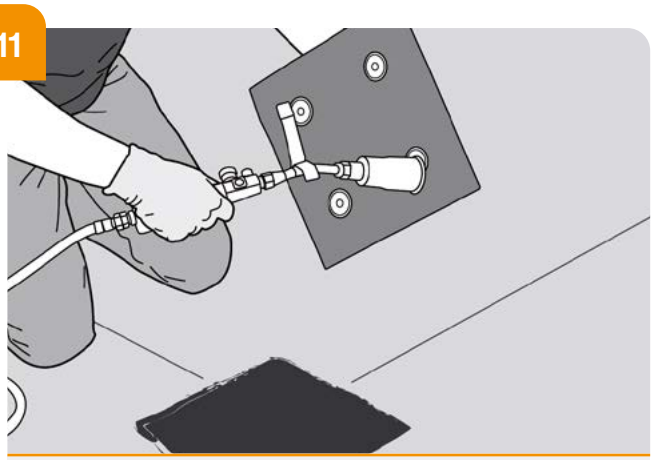


→ Melt the thermofusible film with the torch, then heat the underside of the base.

10

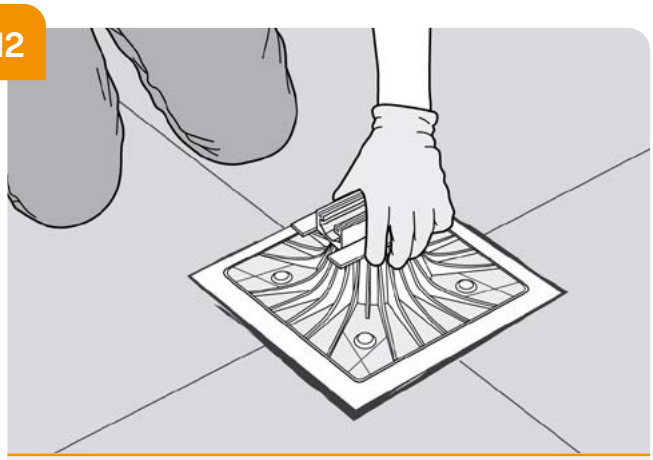
→ Heat the blackened surface of the membrane.

11



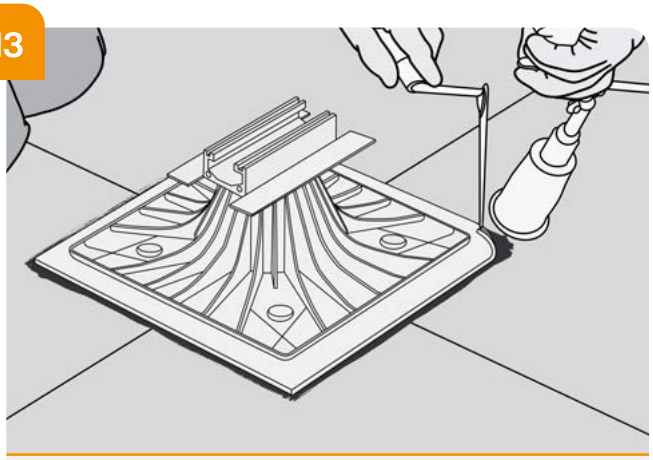
→ Heat the underside of the flange once again.

12



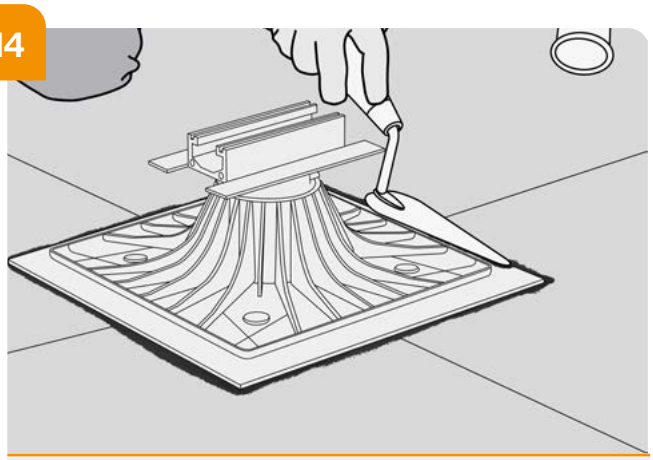
→ Apply the pedestal to the membrane and press down to confirm the weld.

13



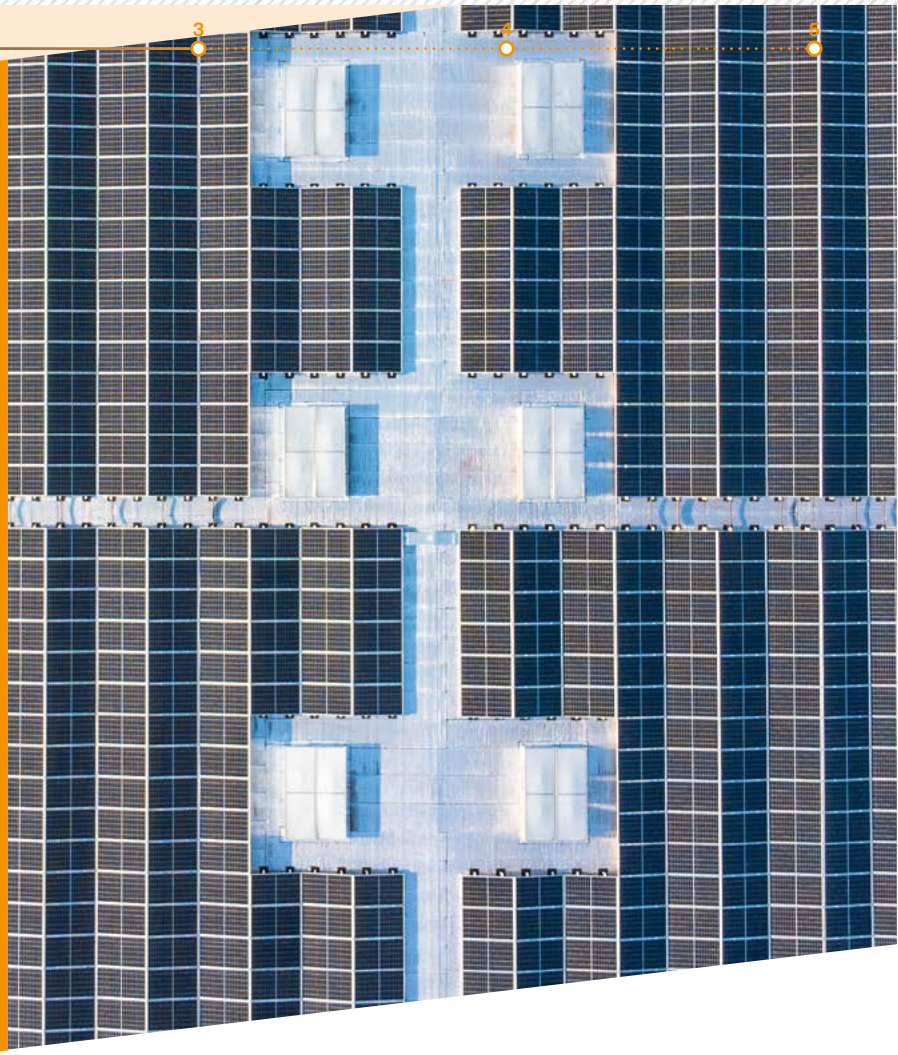
→ If necessary, confirm the weld at the corners of the flange.

14



→ Confirm the welding of the flange edges using a spatula.

You are at stage 1 2 3 4 5



Waterproofing membrane protection **ALUMINIZED MEMBRANES**

The occurrence of damage due to foot traffic and equipment movement is a concern for all types of membranes. Membranes with aliminum facing are finish are particularly sensitive, and aesthetic damage is exacerbated in high temperatures.

Protection on work site

→ Unloading material

To reduce the risk of damage to waterproofing membranes and insulation (due to repetitive traffic) and to ensure efficient execution on the roof, we recommend using a mobile tower crane (such as an MK88) to evenly distribute pallets (**SOPRASOLAR®** pedestals, accessories, photovoltaic modules) across the roof.

Pallets should be unloaded:

- After the location has been validated by the roofer;
- With a protective layer placed between the waterproofing (e.g., pieces of insulation or equivalent **SOPRATEC TOP**).

→ Roaming pathways

Workloads done by other experts following the completion of the waterproofing (installation of the mounting system, connection of the modules, etc.) should be carried out with temporary waterproofing protection and designated roaming pathways in place.

It is recommended to use a temporary protection coating (equivalent to **SOPRATEC TOP**), which allows for the creation of a temporary circulation path to protect the **SOPRALENE Flam 180 ALU** from repeated traffic.

The roofer will install the product according to the planned circulation areas for the project (material storage, pedestal welding zone, personnel movement paths to reach different points on the roof, etc.).

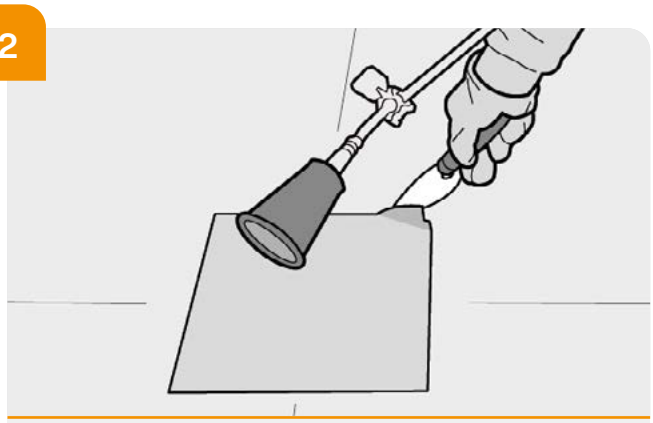
Ballast adding on the created pathway is necessary (e.g., concrete slabs placed at regular intervals) immediately after the product is installed.

Welding the flange of the pedestals onto **SOPRALÈNE FLAM 180 ALU** (Aluminum facing)

1

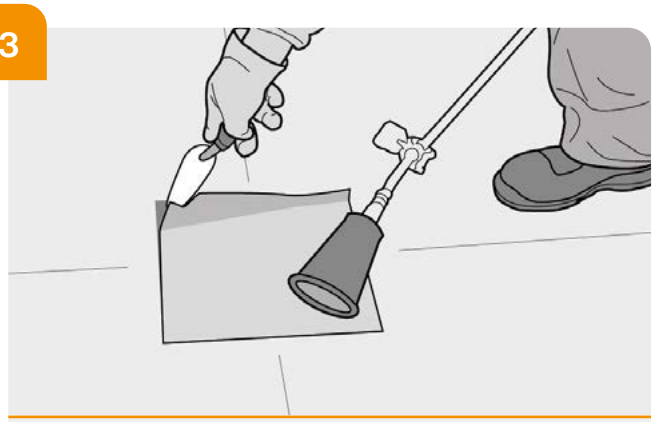
→ Cut the foil sheet using a box cutter, considering a 1-cm-wide setback from the markings you had cautiously drawn beforehand.

2



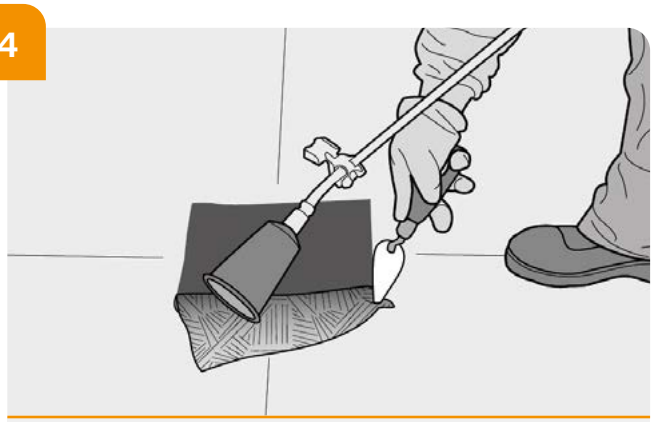
→ Heat up and remove the cutout section of the Aluminum finish sheet using the torch.

3



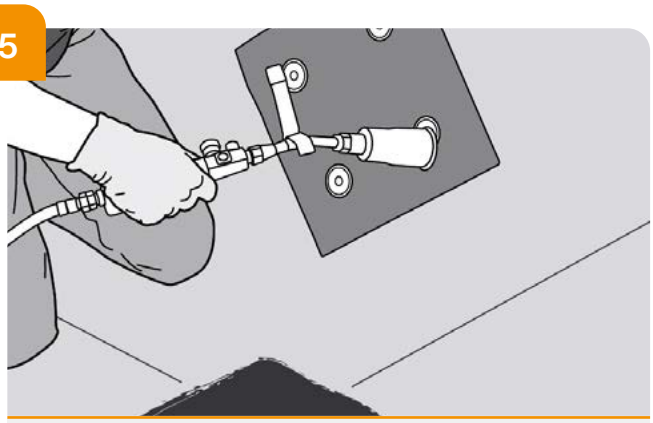
→ Use a spatula to lift the cutout.

4



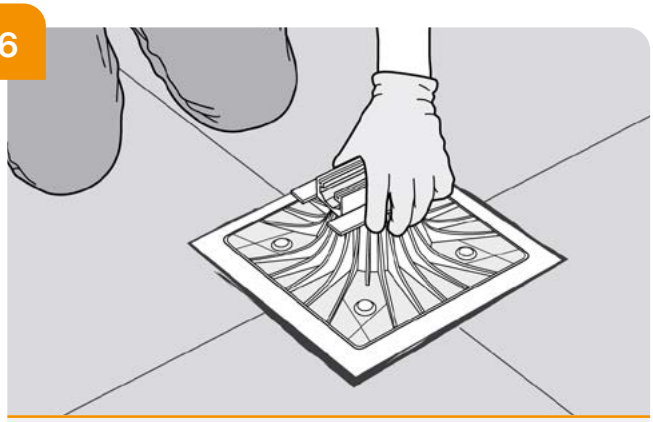
→ Finish removing the cutout. The bitumen should be exposed.

5



→ Heat up the flange using a propane torch.

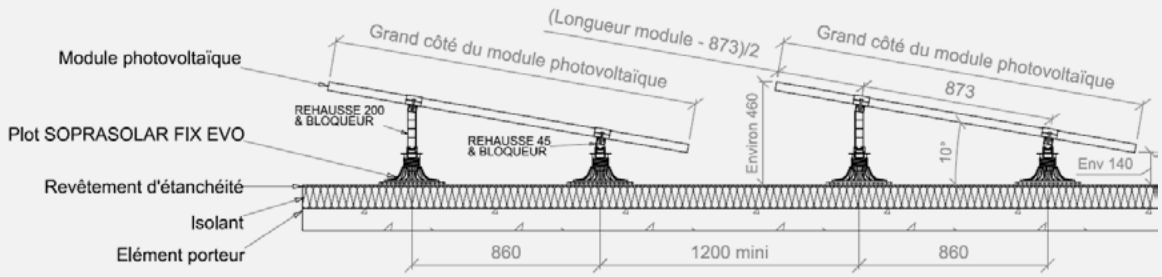
6



→ Put the pedestral down respecting the marks and apply pressure.

3 Raisers ALUMINUM version

The raisers connect the pedestals to the photovoltaic modules, creating a 10° inclination relative to the roof.
The ALUMINUM raiser version must adhere to specific configurations (see diagram below).



Installation of **upper and lower raisers** and the **blocker**

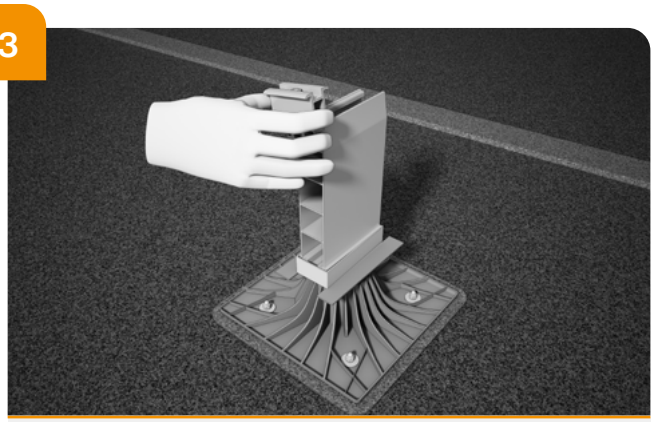
1

→ Slide the raiser into the head of the pedestal.

2

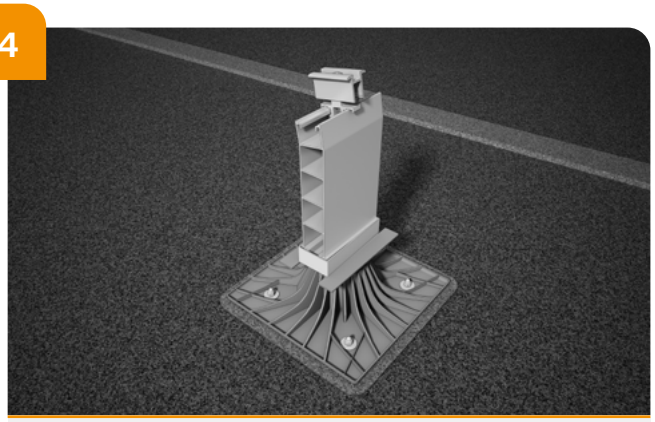
→ Slide the raiser blocker into place.

3



→ Slide the clamp into the raiser rail.

4

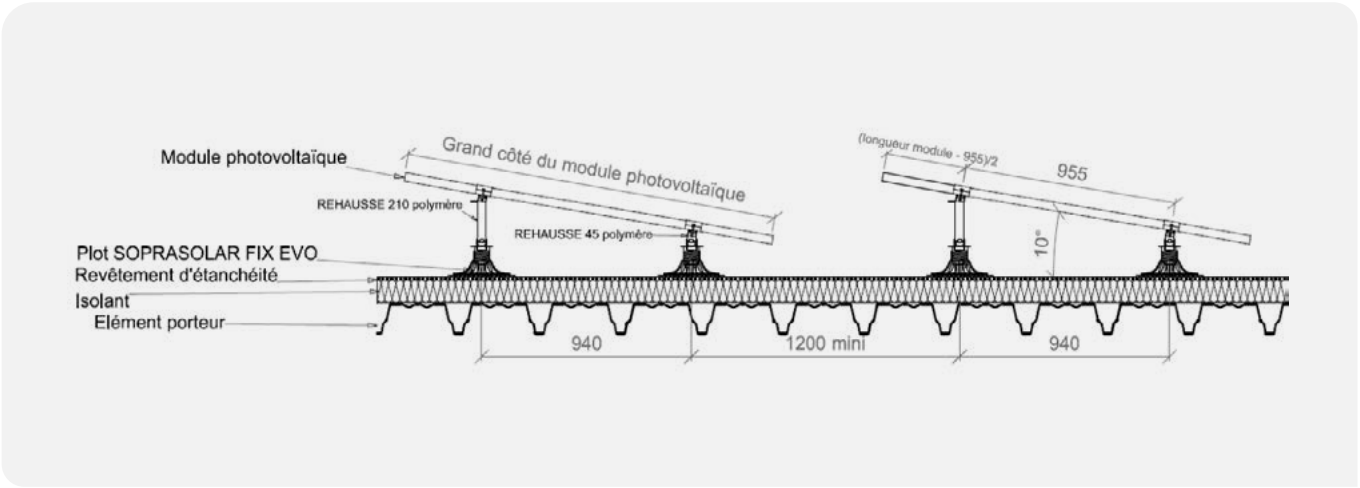


→ Overall view once the components are assembled.

You are at stage 1 2 3 4 5

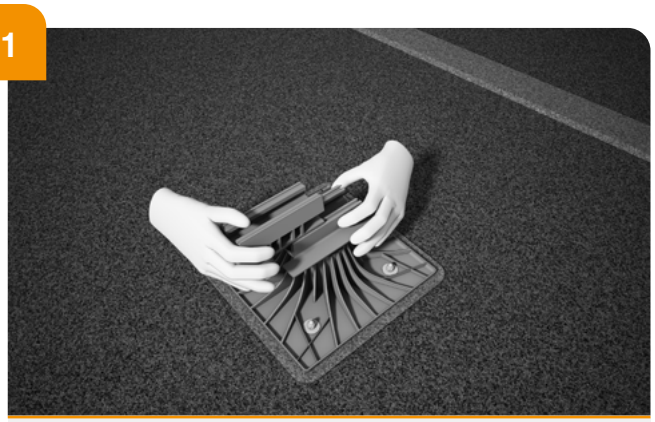
3 Raisers **POLYAMIDE** version

The raisers connect the pedestals to the photovoltaic modules, creating a 10° inclination relative to the roof.
The POLYAMIDE raiser version must adhere to specific layout plans (see diagram below).



Installation of **upper and lower raisers** and **blockers**

1

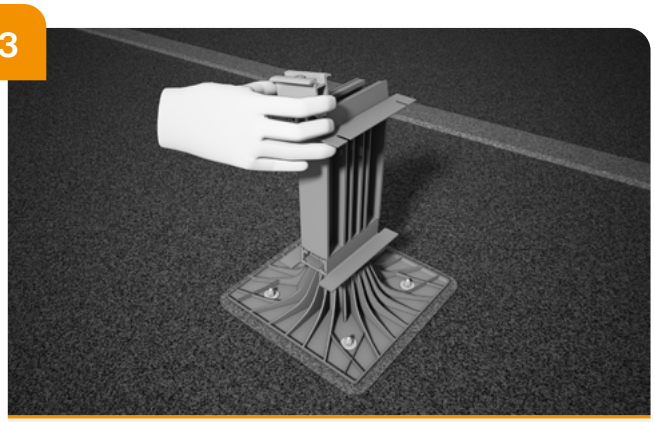


→ Slide the lower raiser along the pedestal rail.

2

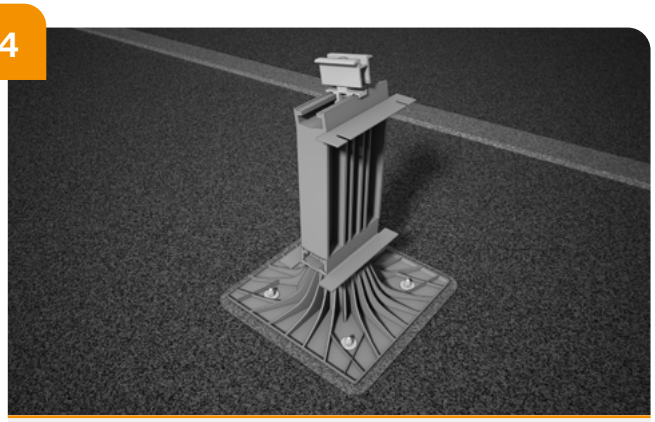
→ Slide the upper raiser along the pedestal rail.

3



→ Slide the clamp into the raiser rail.

4



→ Overall view of all the components.

You are at stage 1 2 3 4 5

4 Installation of photovoltaic modules

Important

- Two individuals are required to handle a module
- The presence of an electrician on worksite is essential for the electrical connection of the modules
- Electrical cables and cable ties for holding the cables in place are not provided by **SOPRASOLAR®**
- Pallets of photovoltaic modules must be stored on the roof in the designated areas defined by the roofer.

1

Connection Loop

(To be performed by a qualified person)

- The cable extensions for connection to the inverter must be secured with cable ties on the return edge of the panel frame to minimize the effects of induced loops. The fins of the pedestal can be drilled to allow a Colson-type cable tie to pass through, securing the cable as it is positioned on the fin.

⚠ **Important: No cable or connector should rest directly on the waterproofing membrane.**

2

Handling of PV Modules

⚠ **Important: Modules should only be secured and connected in the presence of a qualified electrician.**

The modules must be handled with great care according to the following recommendations:

- Handle the modules with both hands and do not use the junction box as a handle.
- Do not subject the modules to loads or stress. Walking on the modules is strictly prohibited.
- Ensure that the electrical connectors do not come into contact with dirt and/or moisture.

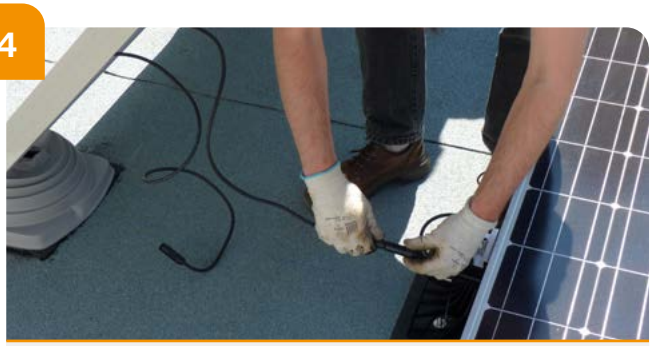
3

Positioning of the modules

⚠ **Important: Do not secure the modules to the pedestals until the electrician has completed the connections with the adjacent modules. Modules must only be secured and connected by a qualified electrician.**

- Place the modules on the pedestals. Adjust the position according to the execution drawing requirements.

4



Connection and grounding

(To be performed by a qualified electrician)

- Pre-position the subsequent modules on the pedestals;
- Connect the connectors of the adjacent modules;
- Ground the modules.

5

Tighten the clamps

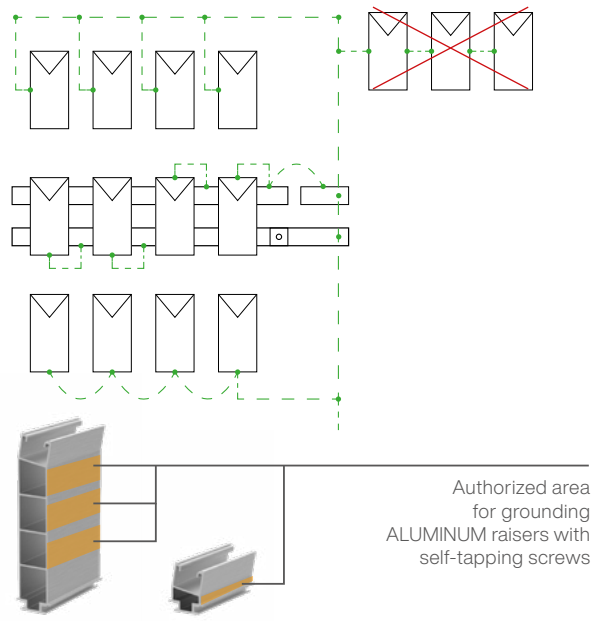
- Lock the position of the modules by tightening the brackets on the raisers with a torque of **14 ± 2 N.m**

5 Connection and grounding

Connection and grounding

Principle of grounding photovoltaic modules, raisers (ALUMINUM version only), and cable trays

→ To be performed by a qualified person.
→ Grounding of polymer raisers is not required.



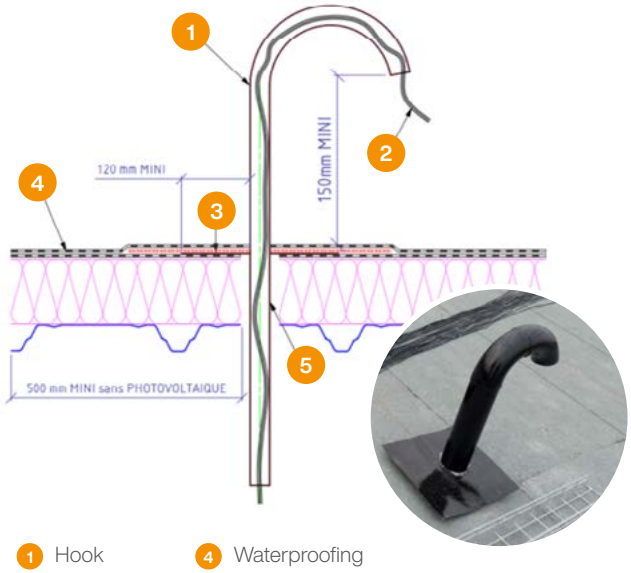
a. Connect the modules to each other using the connectors.

b. Ensure the grounding of the frame of the photovoltaic modules and the raisers (ALUMINUM version only):
- → Do not drill into the modules;
- → Always use the existing mounting holes on the module frames.

c. Elevate the connectors and cables by securing them to the module frames to prevent them from resting on the waterproofing or in areas where water might accumulate.

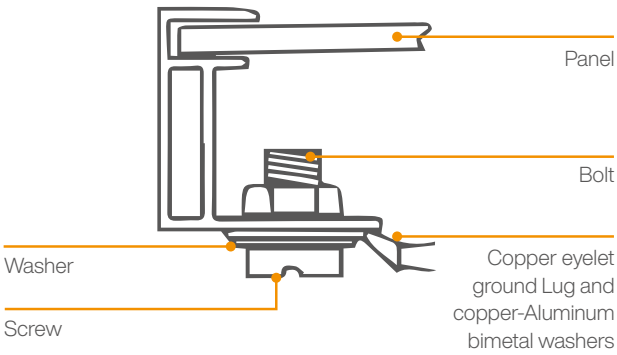
d. Ground the cable tray if it is metallic. It is also necessary to connect all other metallic components on the roof to the same grounding potential..

Hook for touting cables through the roof



1. Hook
2. Cable
3. Plate
4. Waterproofing
5. Sleeve

Cross-section view for grounding connection



Alternative solution

It is also possible to use other systems specifically developed to save time during installation.

These procedures are not explicitly validated by the standard. The use of these accessories must be approved by the site inspection office and the module manufacturer.

Self-Inspection

Self-Inspection checklist for **SOPRASOLAR® FIX EVO TILT** System

Project Name:

Location:

Company Responsible for Implementing **SOPRASOLAR® FIX EVO TILT** Pedestals:

Date of Process Implementation:

Air Temperature:

Name of the Work Supervisor:

Date of Self-Inspection:

Signature:

Self-inspection for installation of SOPRASOLAR® FIX EVO TILT pedestals on bituminous membrane

The following self-inspection procedure must be completed and submitted to the project management team at the end of each day of implementation. This form should be accompanied by an annotated plan showing the inspected areas, along with supporting photographs.

Assessment of the waterproofing system (supporting the pedestals)

- → Ensure the waterproofing system has been approved by the project management team. ☐
- → Verify that the membrane is suitable for welding (follow the implementation timeline according to ATEx case a or ETN). ☐
- → Confirm that the existing waterproofing type (BITUME) is compatible with the delivered pedestals. ☐
- → Check that the air temperature is above 10°C. ☐

Preparation Before Marking

- → Verify the SOPRASOLAR® execution drawing with the project management team. ☐
- → Print the latest version of the execution drawing in the largest format possible. ☐
- → Check the dimensions of the roof and the location of penetrations based off the execution drawing. ☐

Marking

- → Mark the positioning of the pedestals according to the instructions in the installation guide. ☐
- → Transfer the measurements from the execution drawing onto the roof accordingly. ☐
- → Check the squareness of the installation using the 3-4-5 rule. ☐

Electrical Supply

- → Ensure that the electrical supply meets the requirements of the welding equipment (sufficient and consistent power output). ☐

Peel test

- → Perform a peel test between the pedestal plate samples from the boxes and leftover membrane material. This test should be done after each restart of the hot air gun. ☐

Installation of SOPRASOLAR® FIX EVO TILT Pedestals

- → Weld the pedestals according to the instructions in this Installation Guide (welding temperature based on the membrane type, minimum weld width: 3 cm). ☐
- → Visual checking of the welds (look for material runoff at the edges and check for any signs of overheating, yellowing, or early signs of carbonization). ☐
- → Conduct a mechanical check using a tester. ☐

Installation of raisers (TILT version) and clamps

- → For the tilted version (SOPRASOLAR FIX EVO TILT), verify the installation of the raisers and the raiser blockers according to the execution drawing. ☐
- → Check the tightening of the clamps, securing the photovoltaic modules. ☐

SOPRASOLAR by SOPREMA

OUR EXPERTISE & PROJECTS
soprasolar.com

Installation of
SOPRASOLAR® FIX EVO TILT

SOPREMA Group, at your service

Are you interested in **Soprasolar®** systems?

Contact our
sales team

Do you have technical questions about the implementation of our systems?

Would you like to stay updated on our latest news and be the first to know about our newest products?

SOLAR
ENERGY
MANAGEMENT

SOPREMA GROUP

Communication Department - DC-17/045L_EN - August 2024

Take action for paper recycling with Soprasolar and Ecofolio
papiers

Soprasolar® - 202 Quai de Clichy - 92110 CLICHY - FRANCE - Tel.: +33 (0)1 46 88 01 80 - Fax: +33 (0)1 46 88 01 89 - Capital: €100,000.
Soprasolar® reserves the right to modify, without notice, the composition and usage conditions of its materials in line with advances in knowledge and technology, which may subsequently affect their pricing. Therefore, any order will only be accepted under the terms and technical specifications in effect on the date of receipt.