SOPRASOLAR

MANAGEMENT
OF SOLAR ENERGY

SOPRASOLAR® FIX EVO TILT PVC/TPO INSTALLATION

SOPREMA GROUPE

SOPRASOLAR®

CONTENTS

As a group that has been independent since it was founded in 1908, Soprema has become a leading global company in the areas of waterproofing, insulation and building protection.

Soprema has installed millions of square metres of waterproofing, roofing, insulation and protection systems across the world, contributing to a variety of large projects such as the European Parliament building in Strasbourg, the national stadium in Beijing, Roland Garros stadium and the museum of the city of Antwerp.

With a workforce of 8008 and €2.75 billion turnover in 2018, Soprema is a global manufacturer and vendor
with 67 factories, of which 14 in France, more than 90 operating subsidiaries and over 4000 distributors.
Operations in 90 countries, 15 R&D centres with a strong focus on sustainable development and 22 training centres in five countries.

The product range of Soprema is the result of close collaboration between the marketing department and its research and development centres, and is innovative and perfectly in line with market requirements and current standards.
With Soprema, you have the assurance of finding a solution suited to every type of project.

For over 20 years, Soprema has been taking measures to limit the impact of its products and business on people and the environment over the entire life of structures, from the time when they are built up to their demolition.

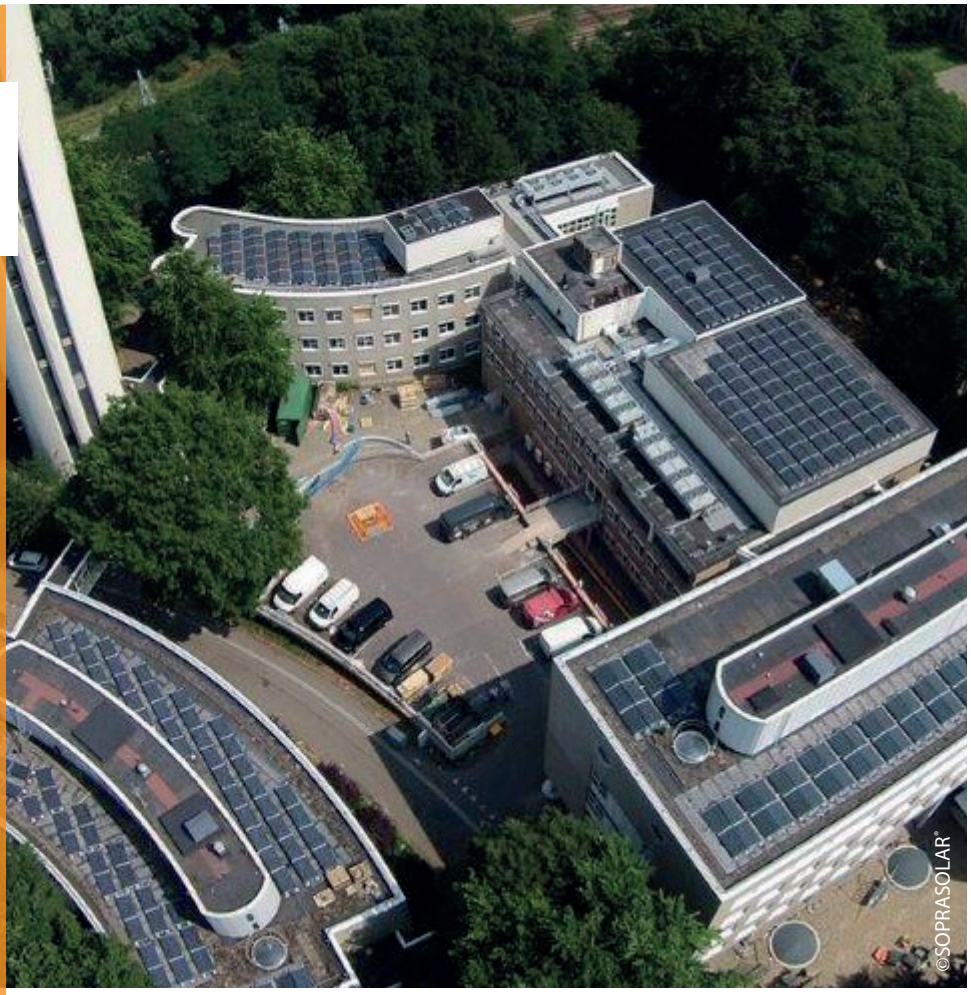
The R&D policy of Soprema is strongly driven by sustainable development, as is reflected by the limitation of its environmental impact through the use of renewable resources in its products and factories, and by innovation geared to protect health and safety.

Since its inception in 2008, SOPRASOLAR® has become the leading French supplier of solar waterproofing products. Its technical and commercial expertise enables it to support project owners and contractors who are looking to add an energy generation function to their terrace roofs.

SOPRASOLAR® is credited with the following, in France (including the overseas territories), Spain, Great Britain, Italy, Switzerland and North America:

over 150 MWp installed
over 900 references
over 3,500,000 m^2
of terrace roofs fitted with load-bearing units in
ribbed steel, timber and concrete, in new build and refurbishment projects alike.

INTRODUCTION



NB

The complexes recommended opposite are examples. As each case has its particular features, advice must be sought from SOPRASOLAR® for each project in order to ensure that the solution is suited to the needs of the building.

Waterproofing will have to be applied in accordance with the recommendations in technical approvals and installation

CHARACTERISTICS

	Ribbed steel & wood and wood-based panels[2]	Masonry		Cellular concrete
PVC/TPO	Single layer	Single layer	Double layer	Single layer
Minimum roof slope	3	1	0	1
Maximum roof slope	10	10		10

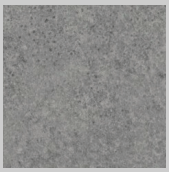
[1] In accordance with the installation requirements for the process.
[2] Reminder:
- Ribbed steel, wood and wood-based load-bearing units must undergo a specific sizing study carried out by the supplier.

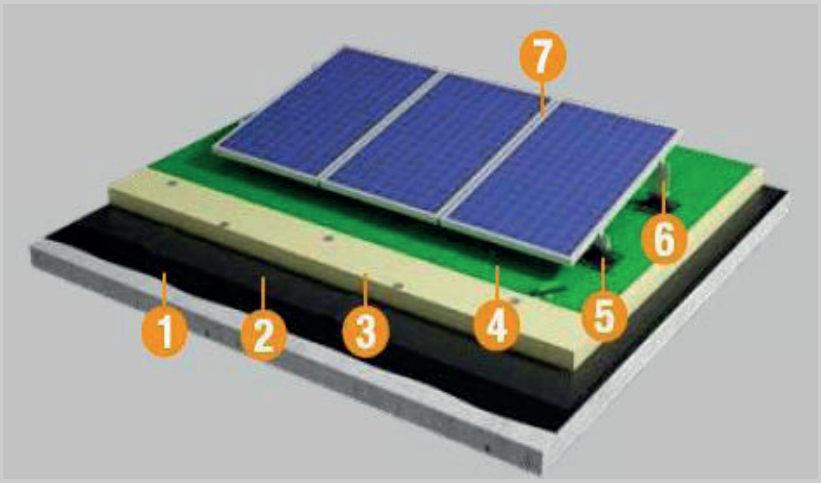
The Soprasolar® Fix Evo Tilt PVC/TPO process allows the use of modules in portrait or landscape orientation.
The usage area may differ depending on the installation instructions of module suppliers.
For all projects, please contact our staff for an appropriate study.

SOPRASOLAR® FIX EVO TILT PROCESSES

Example: On load-bearing unit in masonry or

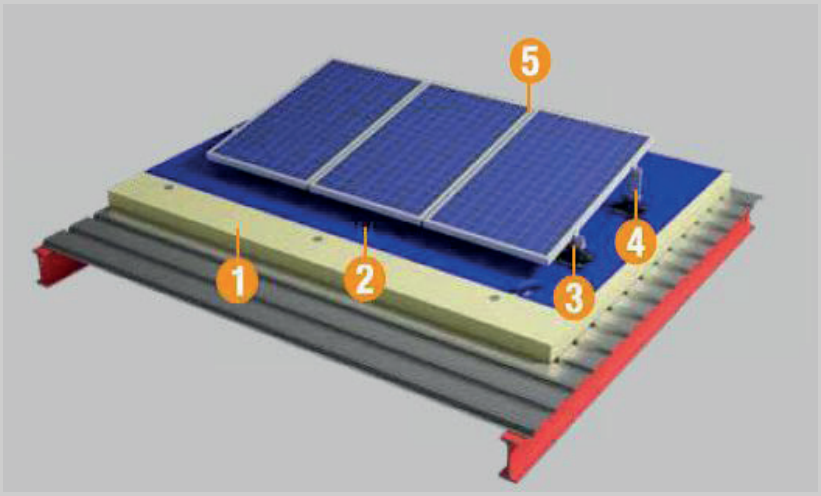
1. Cold-applied primer
2. Fully torched vapour barrier
3. Class C insulation
4. Synthetic single layer waterproofing Flagon® EP/PR or Flagon® SR
5. Soprasolar® Fix Evo PVC/TPO pedestals
6. Soprasolar® Fix Evo Tilt booster and locking frame
7. Crystalline photovoltaic module





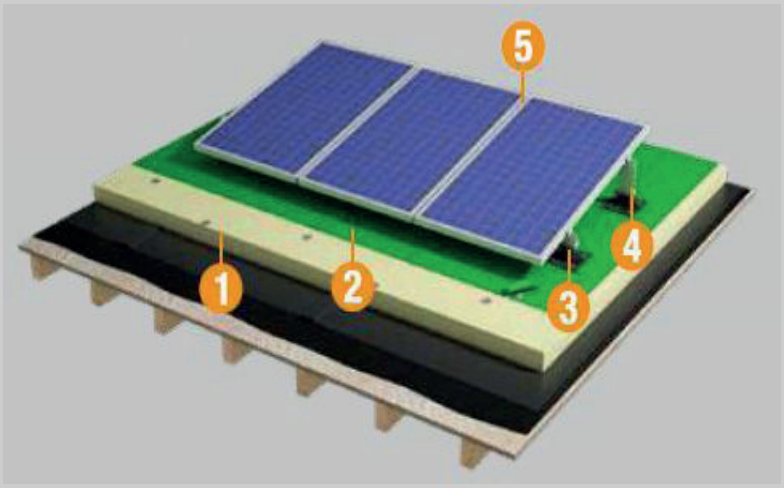
Example: On ribbed steel load-bearing unit

1. Class C insulation, mechanically fixed
2. Synthetic single layer waterproofing Flagon® EP/PR or Flagon® SR
3. Soprasolar® Fix Evo PVC/TPO pedestals
4. Soprasolar® Fix Evo Tilt booster and lockinf frame
5. Crystalline photovoltaic module



Example: On load-bearing units in wood or wood-

1. Class C insulation, mechanically fixed
2. Synthetic single layer waterproofing Flagon® EPPR or Flagon® SR
3. Soprasolar® Fix Evo PVC/TPO pedestals
4. Soprasolar® Fix Evo Tilt booster and locking frame
5. Crystalline photovoltaic module



STEP 1: PREPARATION

LIST OF DOCUMENTS NECESSARY FOR INSTALLATION

- These installation instructions of Soprasolar® Fix Evo Tilt PVC/TPO;
- Drawing of pedestals and boosters provided by SOPRASOLAR®;
- Drawing of modules provided by SOPRASOLAR®.

LIST OF TOOLS NECESSARY FOR INSTALLATION

- Standard waterproofing tools Hot air gun (Leister) ;
- 40 mm and/or 20 mm nozzle;
- Metal brush; the nozzles must absolutely be kept clean and correctly open (not squeezed);
- (Soft) silicone pressure roll for PVC and (hard) Teflon roll for TPO;
- Tester for mechanically testing the welds. It is systematically applied to each weld made;
- Knee pads (pedestals welded kneeling on the waterproofing);
- Rule and measuring tape;
- Chalk line;
- Torque wrench for M8 6 hex screws or torque adjustment screwdriver;
- Optional: glazer's suction cups for handling the modules;
- Standard electrician's tools;
- Lifting equipment to lift the pallets with modules, pallets with pedestal boxes and small equipment.

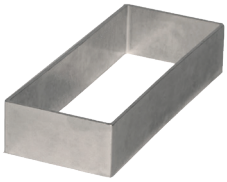
DESCRIPTION OF THE DIFFERENT COMPONENTS

Soprasolar® Fix Evo Tilt PVC/TPO

Adjustable glass fibre reinforced polyamide pedestal with Flagon® PVC or Flagon® TPO base panel

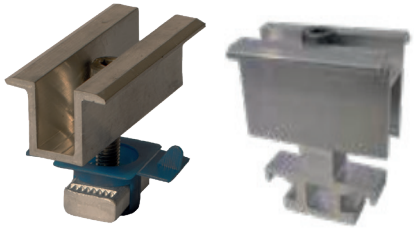
Low and high raisers

For connecting Soprasolar® Fix Evo Tilt pedestals to photovoltaic modules while creating a 10° tilt angle. They must be used in combination with booster locking frames.



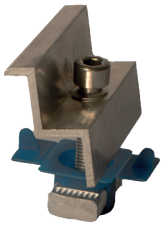
Blockers

Used for locking the booster on the top of the pedestal.



Intermediate Clamp (or universal support bracket kit)

Set of parts including a captive nut, intermediate support clamp, M8 hex socket screws, head notched on the underside.



Final Clamp

Set of parts including a captive nut, end support clamp, M8 hex socket screws, head notched on the underside.

Photovoltaic module

Rigid module with aluminium

+

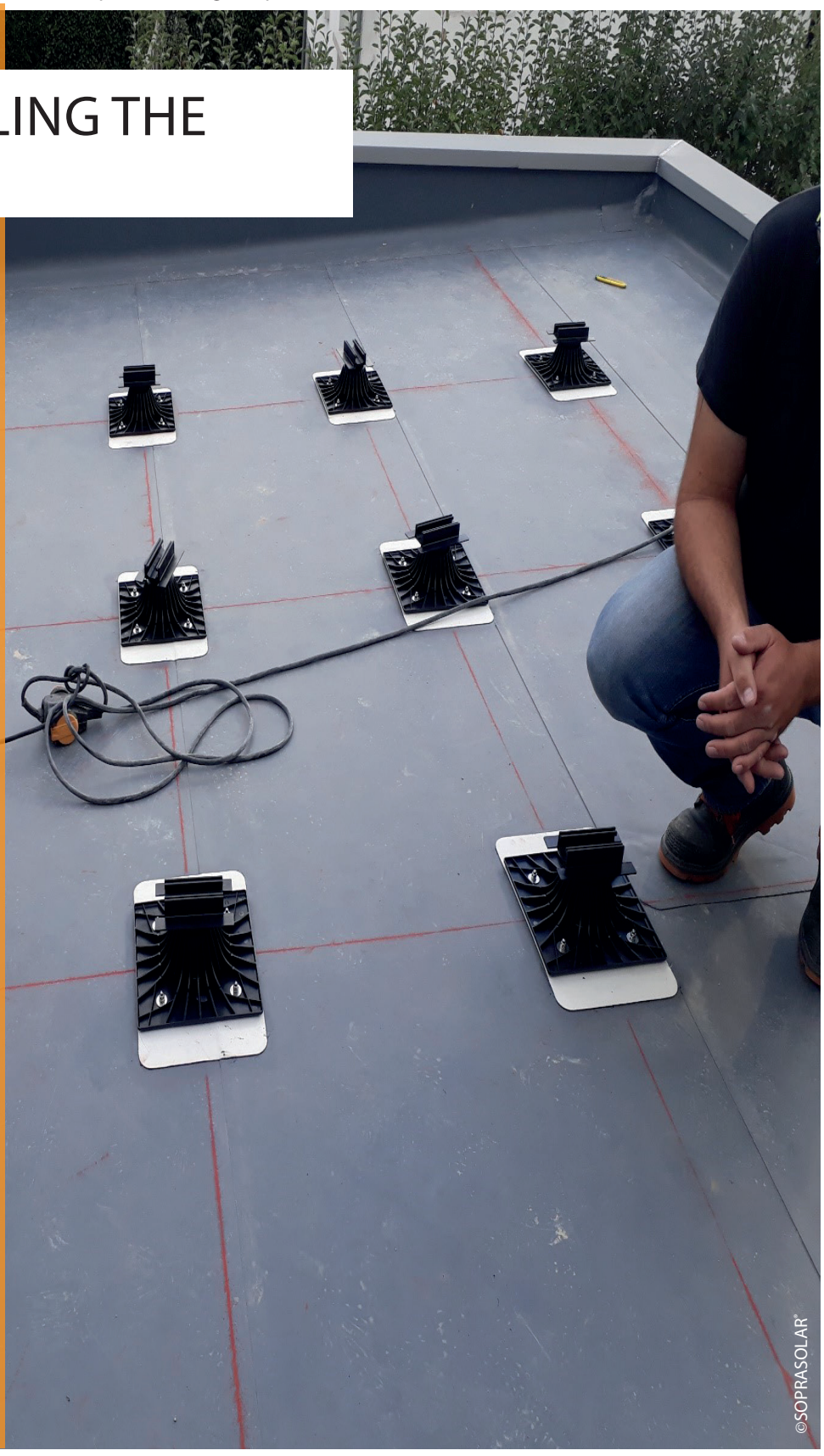
- Single layer waterproofing Flagon® EP/PR; EP/PR SC or Flagon® SR; SR FR M2; SR SC
- Without piercing the waterproofing under the pedestals;
- Easy maintenance;
- Easy to put in place and maintain;
- Height-adjustable pedestals;
- Many tests carried out by outside laboratories;
- 20-year system guarantee (if complete pack as recommended by SOPRASOLAR® and compliance with maintenance required);
- In installation requirements;
- No heat bridge.

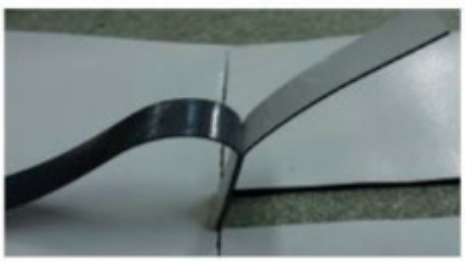
STEP 2: INSTALLING THE PEDESTALS

ALL THE DIMENSIONS OF THE ROOF TERRACE MUST BE CHECKED BEFORE STARTING TRACING.

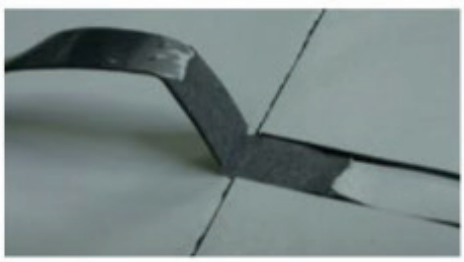
DAILY PEEL TEST OPERATING PROCEDURE:

After making the weld with a manual gun or a robot on a sample of membrane

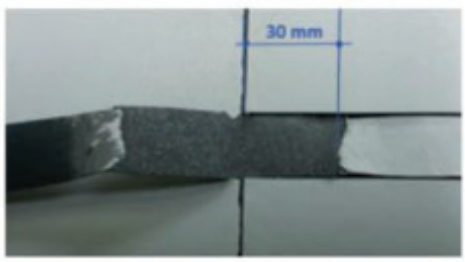




Cut three seperate 15mm strips

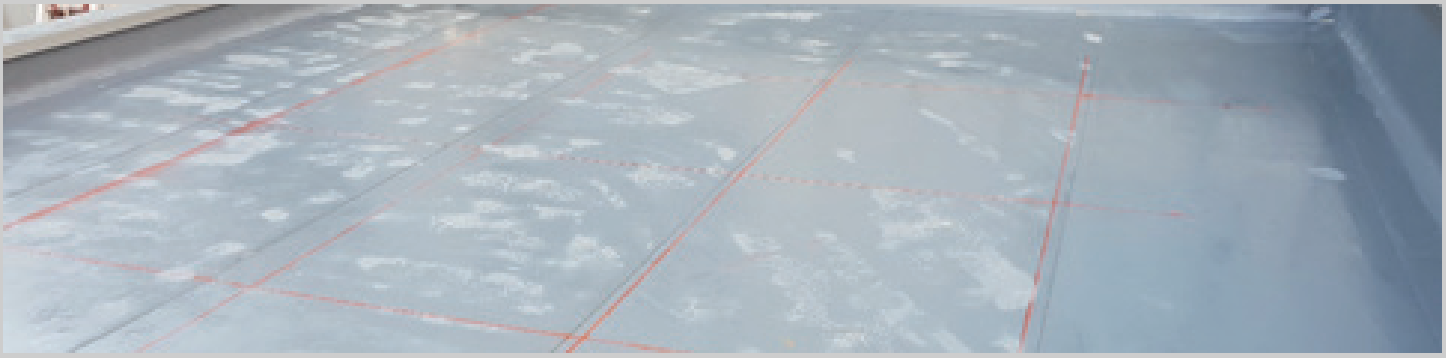


Pull from each side of the weld



The frame appears

PEDESTAL LOCATION PLOTTING



WELDING THE SOPRASOLAR® FIX EVO TILT

Synthetic membrane	TEMPERATURE
PVC	350 °C to 550 °C
TPO	250 °C to 450 °C

Clean the pedestal welding area using FLAG PVC CLEANER or FLAG TPO CLEANER depending on the type of membrane

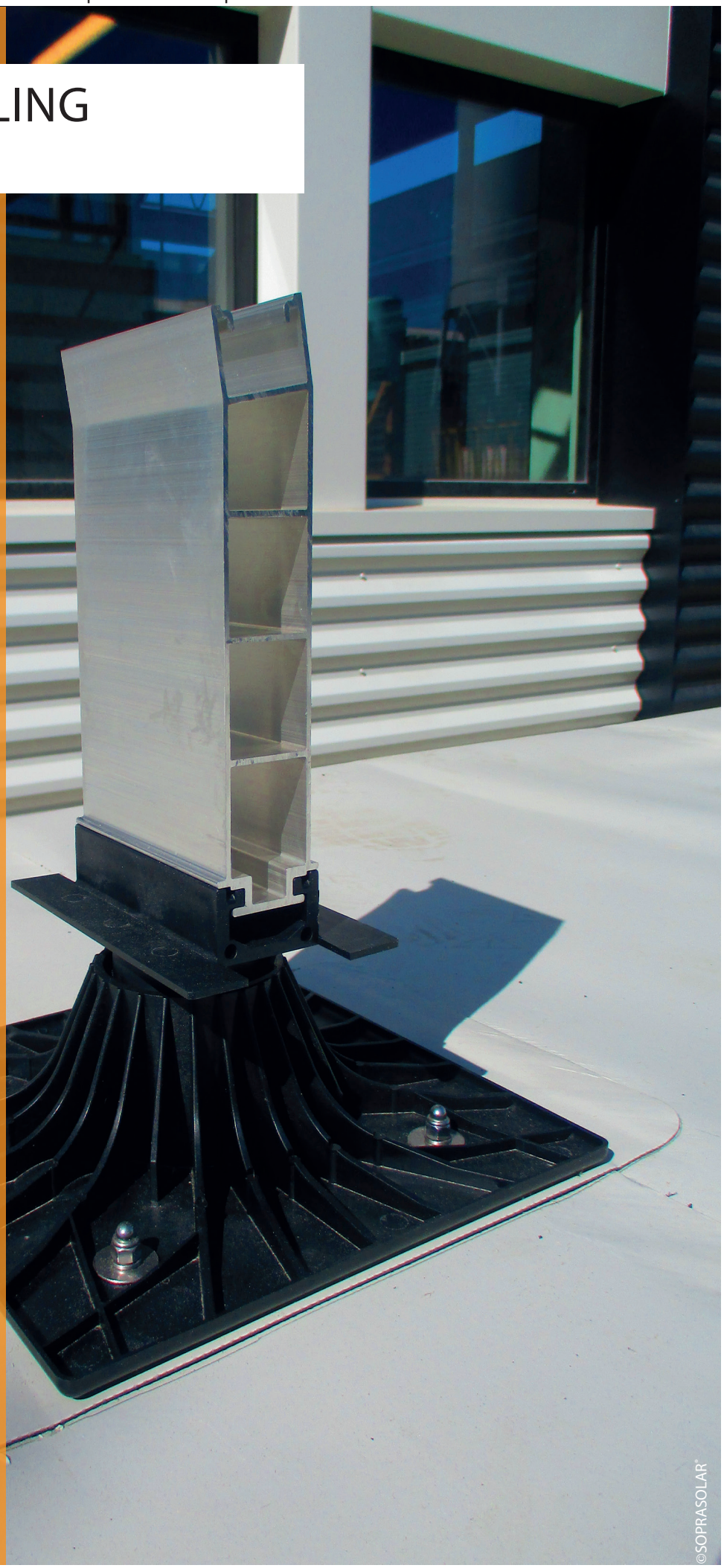
1. Weld one side of the base panel over a minimum width of 3 cm

2. Weld the other side of the base panel over a minimum width of 3 cm

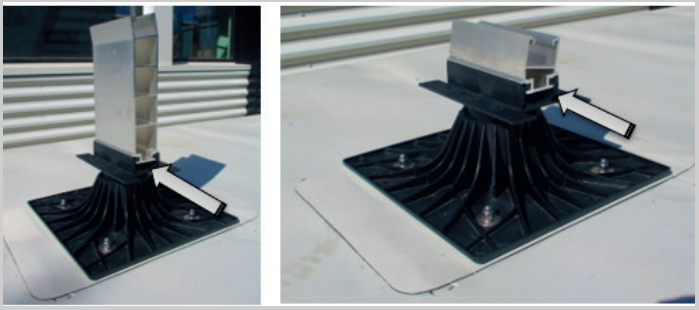
3. Verify the quality of the welds using the tester after cooling

STEP 3: INSTALLING THE BOOSTERS

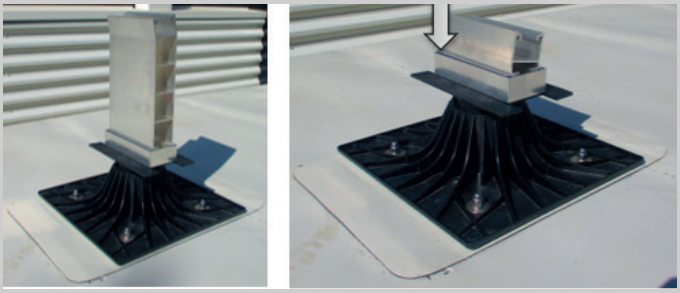
IT IS INDISPENSABLE TO LOCATE THE TILT DIRECTION OF THE MODULES IN THE SOPRASOLAR® EXECUTION DRAWINGS IN ORDER TO CORRECTLY POSITION THE HIGH AND LOW BOOSTERS.



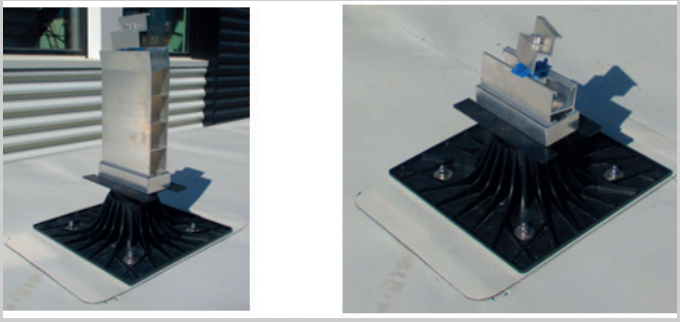
INSTALLING THE LOW AND HIGH BOOSTERS, THE LOCKING FRAME AND THE PEDESTAL COVER



a. Installing the raisers according to the layout.

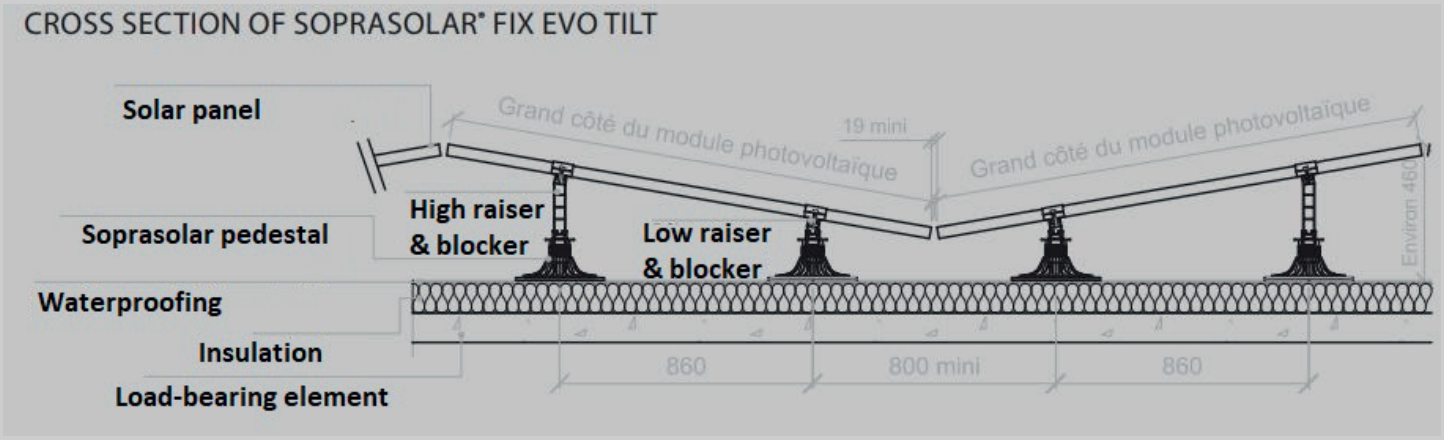


b. Putting in place the blocker to keep the raisers from being dislodged from the top of the pedestal.



c. Insert the cage nut of the support clamp kit in the raiser through the opening provided.

CROSS SECTION OF SOPRASOLAR® FIX EVO TILT



STEP 4: INSTALLING THE FIRST MODULE

IMPORTANT

- Two people are required for handling each module;
- The attendance of an electrician on the worksite is indispensable for the electrical connections of modules.

The electrical cables and the cable ties for holding them are not supplied by SOPRASOLAR®.

SOPRASOLAR® can provide a list of components if necessary.

CONNECTION LOOP
(TO BE SET UP BY A QUALIFIED WORKER)

The cable extensions for connecting the UPS must be fixed using cable ties on the return of the panel frame in order to reduce the inductive loop effect.
The wings of the pedestal may be pierced by a tapered bit to insert a Colson type cable tie, to tie the cable so that it rests on the wing.
That avoids contact with the waterproofing membrane and the risk of water puddles forming around cables and connectors.

IMPORTANT: No cable or connector may rest directly on the waterproofing.

FIXING THE MODULES TO SOPRASOLAR® FIX EVO PEDESTALS WITH THE SUPPORT CLAMPS

1. Take the modules out of their packaging

IMPORTANT: The modules must be installed in the fitting direction recommended by the project electrician.
The modules may only be fixed and connected with a qualified electrician in attendance.

Modules must be handled with the utmost care. The following points must be observed while unpacking, transporting and storing the modules:
- Modules must be carried with both hands, the junction box must not be used as a handle;
- Modules may not be subjected to loads or stresses and you must not step on the modules or drop them;
- Electrical connectors must be placed in

POSITIONING THE FIRST MODULES IN A ROW

1. Putting in place the first module

a. Adjust the position of the support clamps and module (see SOPRASOLAR® execution drawing);
b. Also adjust the position of the module in relation to the edge of the module.

IMPORTANT: Do not fix the modules to the pedestals till the electrician has connected them to adjacent modules. The modules must be fixed and connected by a qualified electrician only.

2. Centring

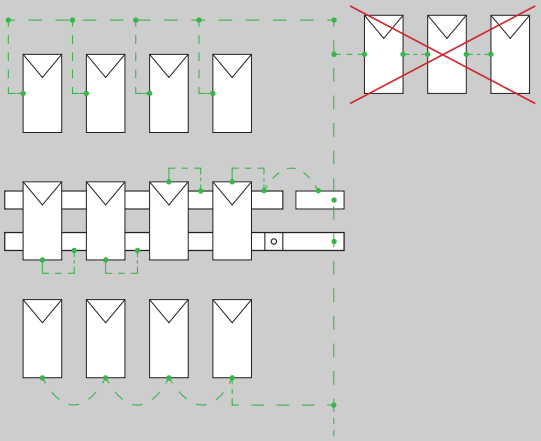
a. Centre the modules on the tops of the pedestals according to the panels execution drawing provided by the SOPRASOLAR® design department.

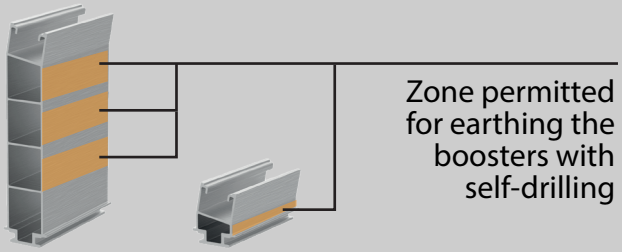
CONNECTION AND EARTHING AS THE WORK PROGRESSES
Only a qualified electrician may carry out this stage.

- Pre-position the following modules on the pedestals;
- Connect the connectors of adjacent modules;
- Connect the modules to the earth;
- Fasten the support bracket fastening screw to the tightening torque indicated in the technical documentation of SOPRASOLAR®.

STEP 5: CONNECTION

CONNECTING THE MODULES



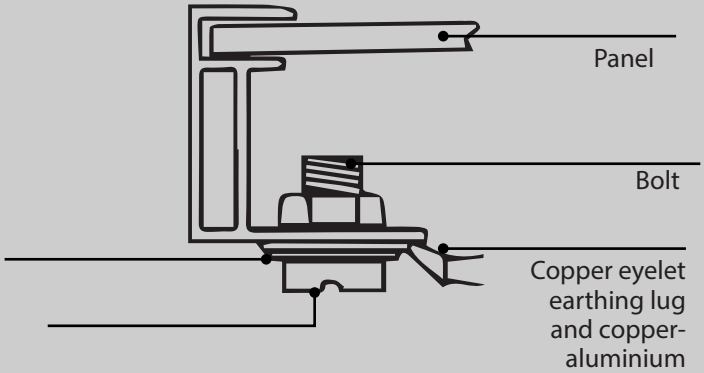


1. Principle for earthing photovoltaic modules and cable trays (to be carried out by a qualified worker)

While earthing the modules, it is essential to:
- Not pierce the modules;
- Always use the fastening holes on the frames of the module;
- Make the earth connection as described above.

a. Connect the cable tray to the earth if it is made of metal. Also, all the other metal items on the roof must be connected to one and only one ground potential;
b. Connect the frame of each module (while installing

Sectional view for earth connection



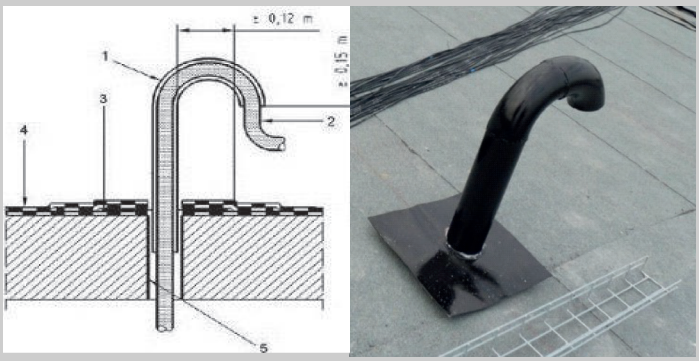
Other

You may also use other systems developed specifically to save installation time.
These methods are not explicitly approved in the standard. That is why such accessories may only be used subject to the consent of the site control staff.

2. Electrical and earth connections

a. Connect the modules to each other using the connectors;
b. Earth the frames of modules in accordance with the principles described in the previous paragraph;
c. Raise the connectors and cables by fixing them to the fames of the module so that they do not rest on the waterproofing or in water retention areas.

GOOSENECK FOR ROUTING CABLES THROUGH THE ROOF



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

STEP 6: SELF INSPECTION

SELF INSPECTION FORM

PROCESS
SOPRASOLAR FIX EVO TILT PVC-TPO

Name of worksite:	
Location:	
Date when process used:	
Work execution supervisor:	Signature:

POINTS TO VERIFY TO ENSURE PROPER INSTALLATION OF SOPRASOLAR FIX EVO PVC-TPO PEDESTALS

- Acceptance of pedestal substrate membrane:

  Age of substrate < 18 months ☐

  Cleaning of welding zone with FLAG TPO CLEANER or FLAG PVC CLEANER ☐

- Electricity supply

  Must comply with the requirements of welding equipment (output power adequate and constant) ☐

- Peel test

  To be carried out between the samples of base panels located in the pedestal boxes and remaining substrate membrane. Every morning and afternoon. ☐

- Layout plan

  Have the Soprasolar layout plan for the project ☐

  Make sure that the roof dimensions are in accordance with the layout plan ☐

- Installation of Soprasolar Fix Evo PVC-TPO pedestals

  The installation must comply with 7.3.2 of the Soprasolar Fix Evo Tilt PVC-TPO installation requirements:

  Minimum weld width 3 cm ☐

  Welding temperature within the following ranges: ☐

Synthetic membrane	TEMPERATURE
PVC	350 °C to 550 °C
TPO	250 °C to 450 °C

  Visual inspection of welds (back flow of material at the edge and no overheated zone, yellowing or incipient carbonisation) ☐

  Mechanical inspection with a point after cooling ☐

SOPRASOLAR

SOPRASOLAR® at your service

Are you interested in SOPRASOLAR® systems?

Our staff can help you in your project with studies, technical and commercial assistance and training. We are by your side to bring power to your roofs!

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Novembre 2020 - Communication department

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