



Self-supporting Roofing Installation Guide for PERGOLA /CARPORT

NOVATOIT ranges

FOAM panel - OUTDOOR - 2% installation

X63 R16

X82 R16

X102 R16

X164 R16

FLAT TECH panel - OUTDOOR - Integrated 2% slope

Thermal :

X122 FT2 R16

X151 FT2 R16

X176 FT2 R16 (ISIWATT® compatible)

X203 FT2 R16

X208 FT2 R16 (ISIWATT® compatible)

Acoustics :

X126 FT2S R16

X156 FT2S R16

X181 FT2S R16 (ISIWATT® compatible)

X207 FT2S R16

X212 FT2S R16 (ISIWATT® compatible)

November 2024 edition

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

INSTALLATION GUIDE FOR SANDWICH PANELS FOR PERGOLA & CARPORT ROOFS

Summary

General Rules for panel Handling
 General Rules for panel Installation
 General Rules for design and bimetal effect

- 1 Data Sheets
- 2 Roof layout
 - 2.1 Roof dimensions
 - 2.2 Panel length
 - 2.2.1 Determining the roof pitch
 - 2.2.2 Panel length
 - 2.3 Number of self-supporting panels
- 3 Cutting panels, aluminum profiles and accessories
 - 3.1 Bottom Wall Hanger
 - 3.2 Connecting keys
 - 3.3 Rive
 - 3.4 Insulating panels
- 4 Mounting the bottom aluminum wall-hanging profile
- 5 Start-up of self-supporting panel roofing
 - 5.1 Installing the first self-supporting panel
 - 5.2 Fixing the first self-supporting panel
 - 5.3 Fitting the junction key
 - 5.3.1 Aluminum connecting key
- 6 Installation of the following self-supporting panels
- 7 Fastening the connecting keys
- 8 Installing the edge profile on the gutter side
- 9 Waterproofing under key junction
- 10 Finishing on the gables
- 11 Installation of flashing (upper wall-hanging profile)
 - 11.1 Drilling and gasketing
 - 11.2 Installing flashing on the wall
- 12 Special finish for membrane panels (Silence range)

Document Identification	GDP AVC 2024-11	Hint: A
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ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

General rules for panel handling

- Open pallets (without protective covers) must not be stored outdoors;
- Shrink-wrapped pallets stored outdoors should be placed on a sloping surface to avoid water retention on top;
- When stacking one pallet on top of the other, ensure that pallets are correctly aligned to distribute the load evenly;
- Do not stack more than 2 pallets on top of each other;
- Do not step on the signs;
- Always handle panels with 2 people, taking care to avoid shocks;
- Never slide the panels one on top of the other, but lift them by lifting the ends directly;
- Never transport panels directly on the forks of a forklift truck;
- When preparing an order, take care to :
 - Protect the pallet with cardboard and foam film;
 - Deburr any saw cuts;
 - Check that there are no particles between panels;
 - Loosely strap the panels together with plastic ties resting on angle irons, so as not to crush the panels;

General rules for panel installation

- Always handle panels with 2 people, taking care to avoid shocks;
- Do not leave panels with protective film outside for more than 45 days;
- Do not use blunt objects or indelible markers for tracing operations;
- Use suitable cutting tools, such as a circular saw with alternating teeth for aluminum, but not a jigsaw or disk saw;
- To avoid scratching, do not slide the panels over each other or over structures, but lift them by the ends;
- Do not drive directly on the panels without using a polystyrene sheet as protection;
- Do not jump on signs;
- Do not clean the panels with solvents;
- Limit fastener torque to avoid distorting the panels.

General rules for design and bimetal effect

- Always lay the panels in the direction of the slope;

Document Identification	GDP AVC 2024-11	Hint: A
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ITEM	Product PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION
	CRF / DEF : GDP 2023-09

- Design the roof taking into account expansion and the bimetal effect, appropriate configuration and sizing of panels;
- Comply with snow and wind regulations for the dimensioning of the structure and the span of the panels;
- All materials or products in contact with or in the vicinity of the panels must be compatible with each other, so as not to risk provoking (with or without external agents) a particular corrosion or ageing reaction (see Veranda Professional Rules 2011 page 44 §4).

The bimetal effect:

- Expansion applies to all materials, and results from an increase in temperature that causes the material to stretch.
 On sandwich panels, the aluminum facings are separated by different thicknesses of insulating material, resulting in a significant temperature difference between the face exposed to the weather on the outside and the face exposed to the weather on the inside. This temperature delta will result in panel deflection. This deflection will be positive, depending on whether the temperature is higher on the outside of the roof than on the inside (hot period), or negative, when the temperature is higher on the inside than on the outside (cold period).
 This phenomenon is not set in stone: the panel's posture will change as a function of temperature variations.
 This can generate crackling noises during temperature changes.

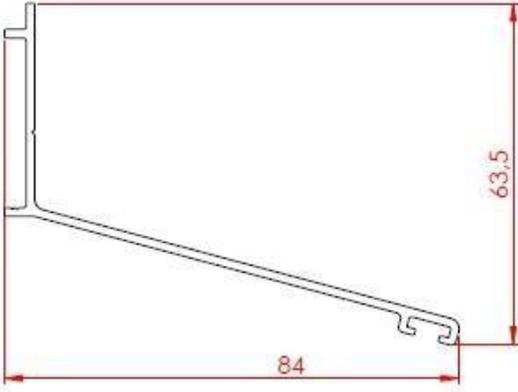
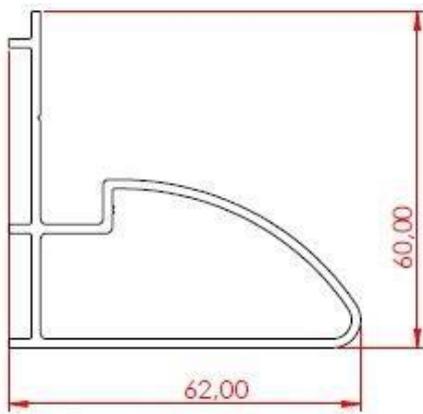
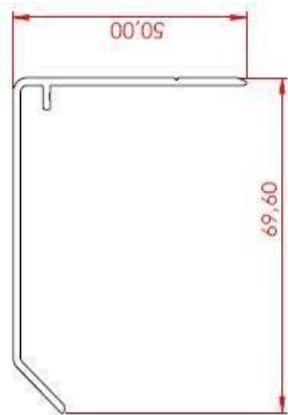
It is important to anticipate and integrate this phenomenon into the design and installation of panels, by incorporating expansion gaps (see installation section).

- Supporting profiles with joints or glazing beads must not restrict the panels and must allow them to move slightly;
- Profiles must have joints to prevent metal-to-metal friction;
- For self-supporting panels, fasten panels at top and bottom only;
- No structural element should restrict or interfere with the natural movement of the panels, especially in the gable ends.

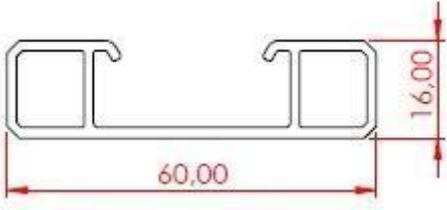
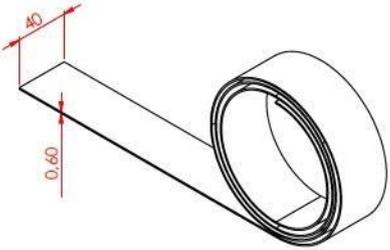
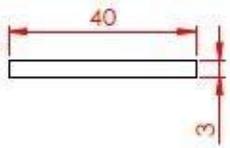
If the panel is fastened in the middle, in the event of positive deflection, it can lift the structure. Conversely, in the event of negative deflection, if there is no clearance between the inner face of the panel and the structural elements, it is the ends of the panel that will lift, which can cause the fastening points to pull out or the panel to be punched by the screw heads.

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

ACCESSORIES

	<p>Ref. 004 - Top wall hook White Ral 9010. Length 7000 mm.</p> <p>Ref. 825 - Top wall hook Brown Ral 8004. Length 7000 mm.</p> <p>Ref. 006 - Superior Roussillon wall hook. Length 7000 mm.</p> <p>Ref. 826 - Top wall hook Gris Ral 7024. Length 7000 mm.</p>
	<p>Ref. 003 - Bottom Wall Hanger White Ral 9010. Length 7000 mm.</p>
	<p>Ref. 093 - Rive 60 mm Blanc Ral 9010. Length 7000 mm.</p> <p>Ref. 099 - Rive 60 mm Roussillon. Length 7000 mm.</p> <p>Rf. 828 - Rive 60 mm Brun Ral 8004. Length 7000 mm.</p> <p>Ref. 827 - Rive 60 mm Gris Ral 7024. Length 7000 mm.</p>

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

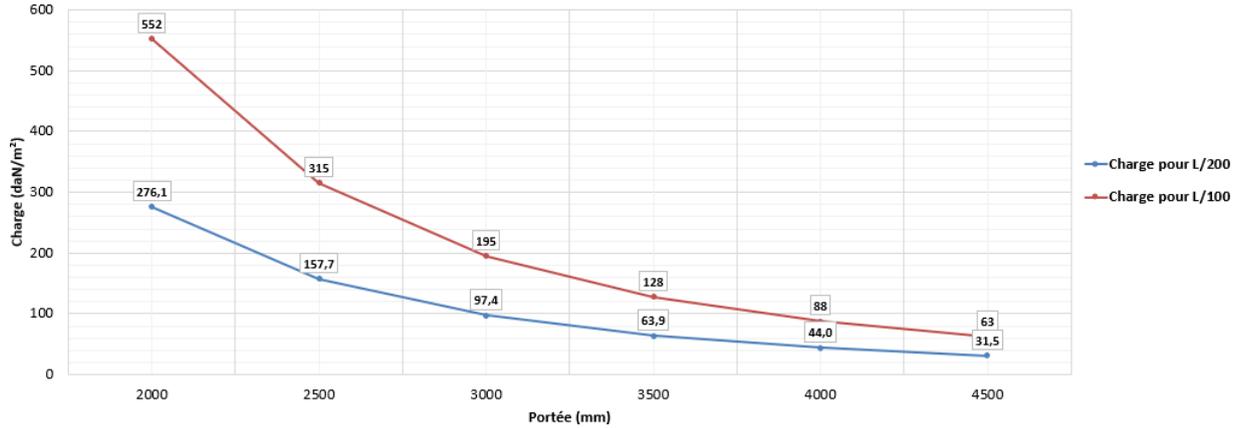
	<p>Ref. 136 - Aluminum 16x60 wrench. Length 7500mm.</p> <p>- Aluminum 16x60 wrench. Length 4550 mm.</p>
	<p>Ref. 095 - Rubber gasket for top wall attachment. Length 150 ml.</p>
	<p>Ref. 1180 -Double-sided adhesive tape 40 x0.6mm. Length 33 ml .</p>
	<p>Ref. 0369 - Aluminum dish 40 x 3mm. RAL White 9016. Length 7 ml.</p> <p>Ref. 0370 - Aluminum dish 40 x 3mm. RAL Brown 8004. Length 7 ml.</p> <p>Ref. 0855 - Aluminum dish 40 x 3mm. RAL Grey 7024. Length 7 ml.</p> <p>Ref. 1205 - Aluminum dish 40 x 3mm. RAL Grey 7040. Length 7 ml.</p>

1. Load charts

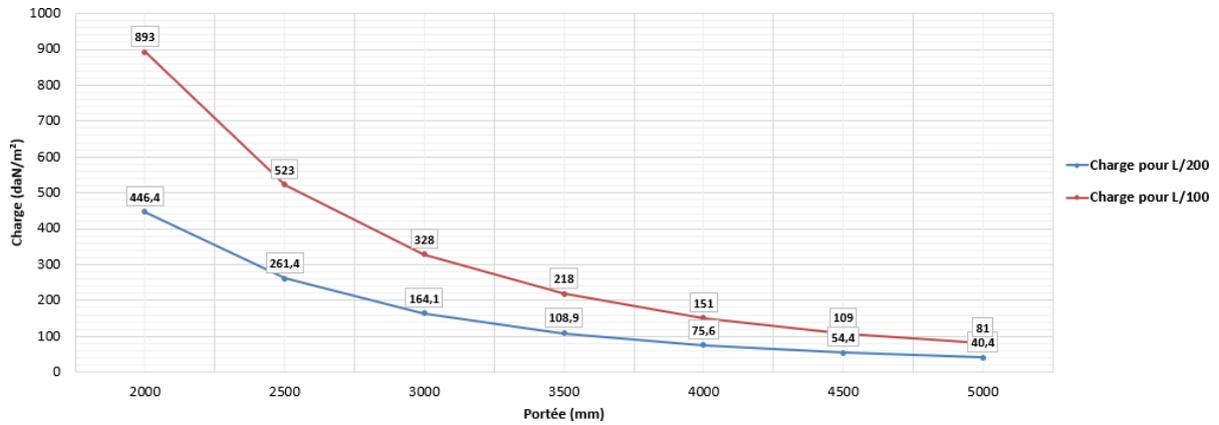
Depending on the snow and wind regulations in force in the area of installation, refer to the charts below to define the maximum span of the panels. Data valid only for altitudes below 900 m.

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

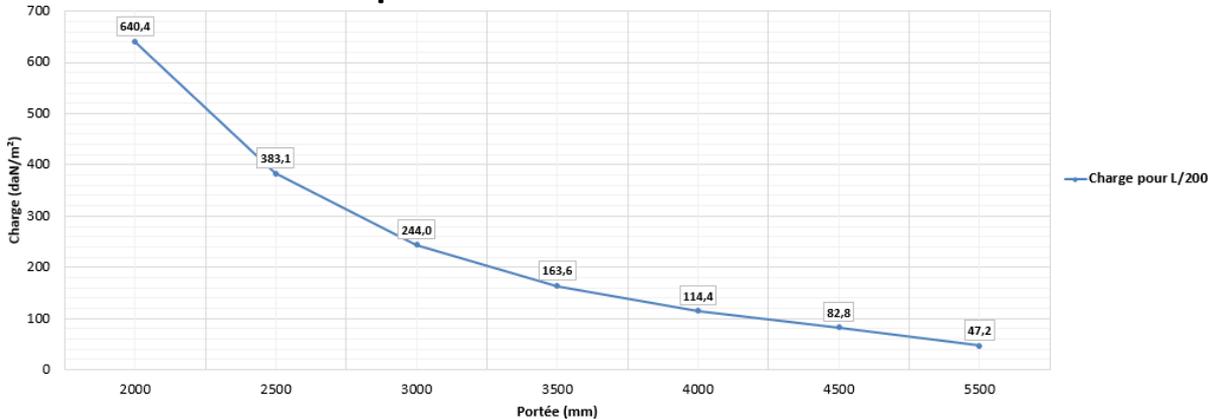
Foam Panel X63R16 - OUTDOOR - 2% installation



Foam X82R16 panels - OUTDOOR - 2% installation

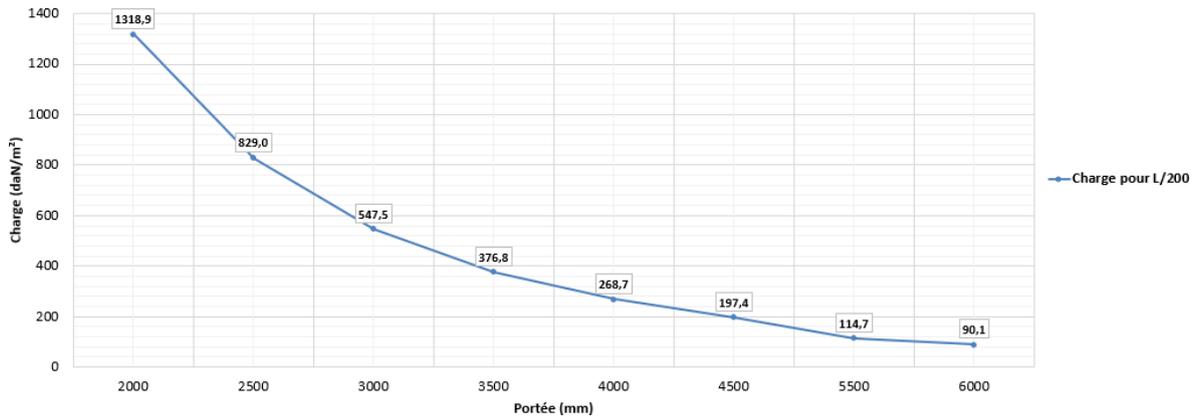


Foam X102R16 panels - OUTDOOR - 2% installation

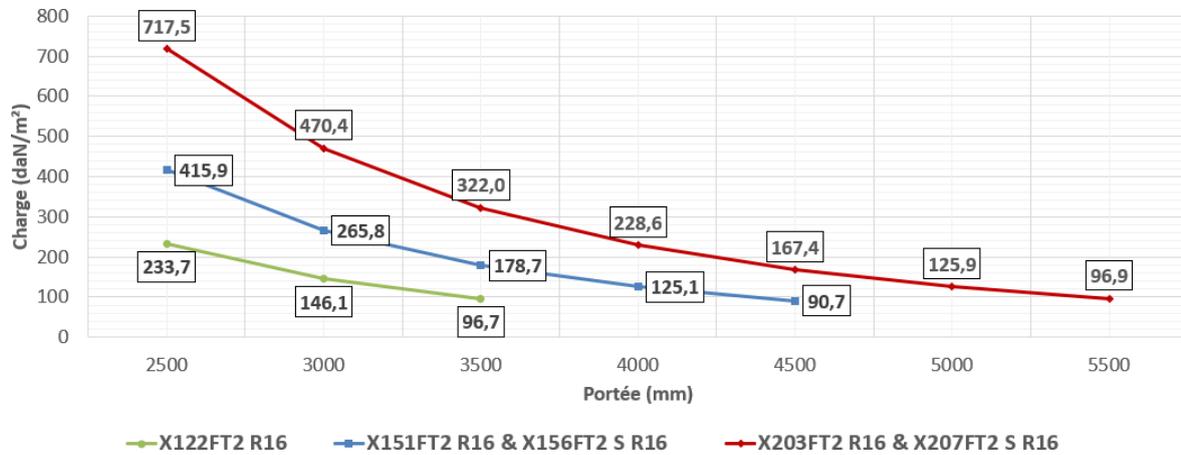


ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

Foam Panels X164R16 - OUTDOOR - 2% installation



Flat Tech panels - OUTDOOR - integrated 2% slope

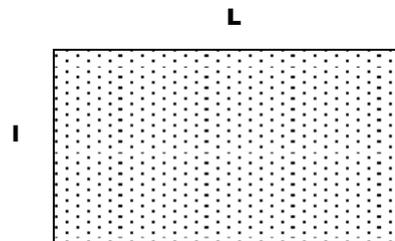


ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

2. Roof layout :

2.1. Roof dimensions :

To set up a site, please determine the desired roof width (I) and roof length (L).



Note: Self-supporting panels are designed for simple square or rectangular roofs.

This will determine the projected roof surface: **$S = I \times L$**

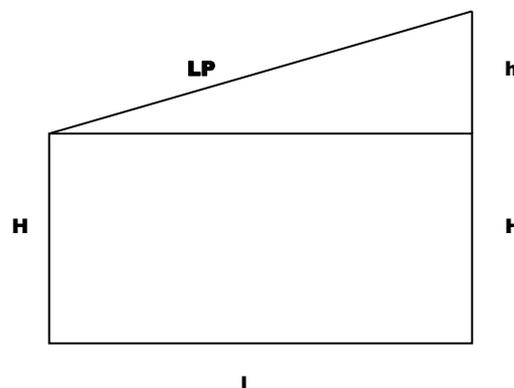
2.2. Panel length :

2.2.1. Determining the roof pitch

FOAM panels - OUTDOOR: Minimum slope : 2%

To do this, it will be necessary to determine the overall dimensions:

- the height **H** of the roof projected on the lower part (at the level of the eave)
- the height **h** possible on the upper part of the proposed roof, taking into account the existing parts of the dwelling (e.g. spandrels, windows, etc.).



ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

The total height of the roof at the highest point will be H+h.

The slope will thus be: **h/l** (in %).

FLAT TECH - OUTDOOR panels: Minimum installation slope : 0%.

Flat Tech panels are laid flat, since they have an integrated 2% slope.

2.2.2. Panel length :

There are several ways of calculating panel length:

*** Pythagoras:

$$LP = \sqrt{l \times l + h \times h}$$

*** Tangent :

Calculation of angle in radians: **$a = \arctang (h / l)$**

$$LP = l / (\cosine a)$$

*** Or measure on the spot!

2.3. Number of self-supporting panels :

The number of panels N will be :

$$N = L \text{ (in m)} / 1.2 \text{ (round up)}$$

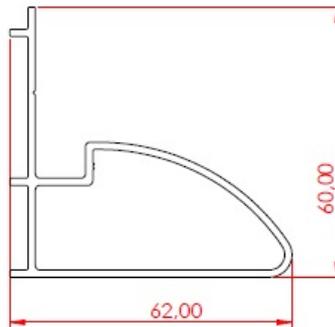
Note: For a more pleasing appearance, you can cut the last non-whole panel in 2 to position the 2 pieces on the 2 sides for better symmetry.

3. Cutting of insulation panels, aluminum sections and accessories:

3.1. Bottom Wall Hanger :

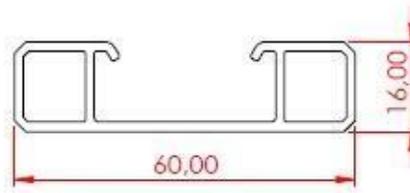
The lower aluminum wall hook will be cut to the width of the roof L minus the thickness of the aluminum posts against the façade:

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09



3.2. Connecting key :

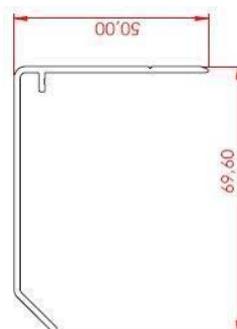
Cut the joining keys to the length of the LP panels plus approx. 10mm for self-supporting aluminum panels.



3.3. Rive 60* :

The length of the verges corresponds to the periphery of the roof. For a rectangular roof, the length is : $L(+s) + 2 \times (l + s)$

It will be necessary to take into account the off-cut due to mitering and therefore to have an extra length s :



*Only for FOAM X63 R16 panel. For other panels, bend aluminum sheet.

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

3.4. Insulating panels :

Insulating panels (self-supporting) should be cut to length **LP+10 cm minimum**, with a minimum extra length of 10 cm to ensure that the panels overhang the eaves in relation to the top plate.

Note :

For a pleasing appearance, we suggest that for roof widths that are not multiples of 1200 mm, the 2 self-supporting end panels are cut to the same width. In this case, installation will start on the middle part of the roof, so that the 2 panels on the sides of the roof are installed last (the cut can be made at this point to ensure that the width of the cut is correct).

4. Installation of the bottom wall-hanging profile and the top plate on the top plate:

4.1. Lower Wall Hanger :

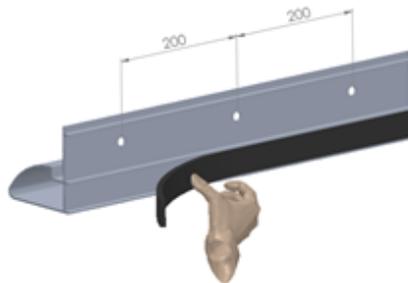
The various operations to be carried out :

- Mark the height of the roof (H+h) at both ends;
- Mark out the position of the Bottom Wall hook with a chalk line, taking into account the **over-height** in relation to the gable or gutter framework (see bimetal effect table below).

- Make sure the supporting wall is not too uneven. If this is the case, it will be necessary to straighten the wall with mortar in order to obtain a flat surface on which to fix the lower wall bracket;

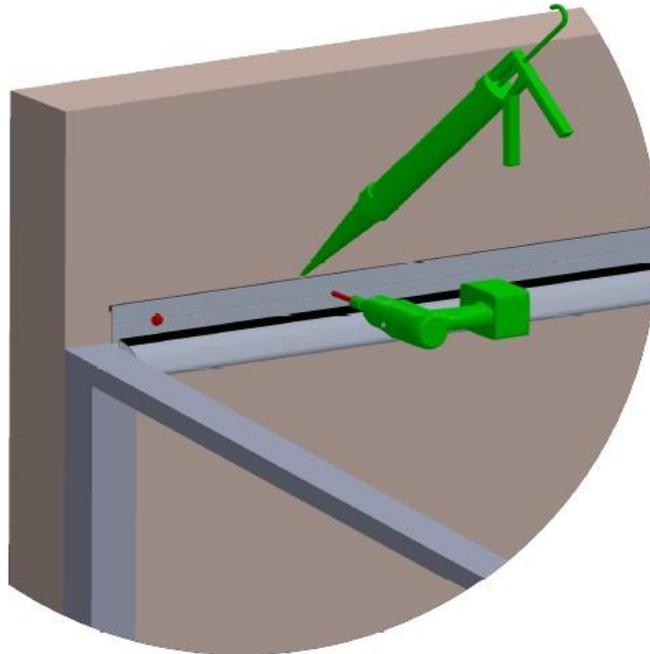
- Drill the holes on the bottom wall bracket, spacing them 200 mm apart;

Install a 15x20 mm self-adhesive "compriband" gasket on the back of the bottom wall-hanging profile to ensure a watertight seal;



- Mark the fixing holes on the wall and drill using the lower wall hook;
- Fix the lower wall bracket to the supporting wall using aluminum plugs and screws, or epoxy chemical sealants;

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09



5. Self-supporting panel installation :

When starting up the roof, it will be necessary to remove the protective film by about 5 cm, around the entire perimeter of the panels (on all 4 sides) and on both sides, so that the protective film can be removed when the entire roof is erected.

In addition, on the inside face of the panels, on the side resting on the eave (at the sealing joint, before resting on the eave side), use a circular saw to cut the inner aluminum cladding across the entire width of the panel. This 3 mm wide saw cut will ensure the thermal break.

5.1. Installing the first self-supporting panel :

- *Multiple roof widths of 1200 mm :*

The first panel can be installed from either gable end. The choice will depend on the ease of installation and the external environment (wall, tree, etc.).

- *Non-multiple roof width of 1200 mm :*

Installation of the first panel begins in the middle of the roof.

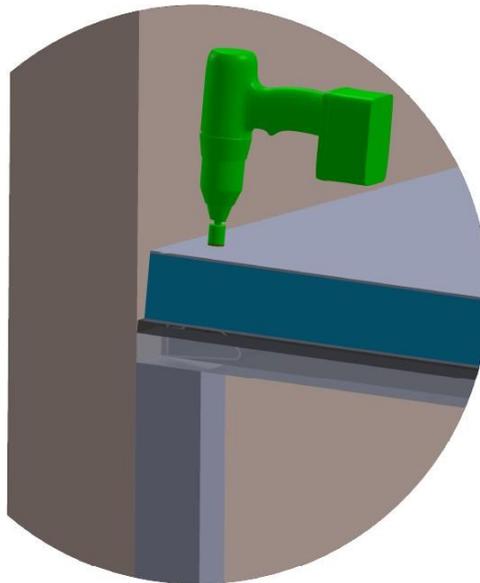
ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

The first panel is placed on the lower wall hook and on the roof runner, with the panel at right angles to the lower wall profile and/or the runner.

5.2. Fixing the first self-supporting panel :

Once the first panel has been correctly positioned on the lower wall bracket, it must be secured in order to position the other side panels in the best possible conditions. The panel is then fastened to the bottom wall hook using four SFS self-drilling screws (Ref.: SXC5-S19-5.5 length to be defined according to panel thickness).

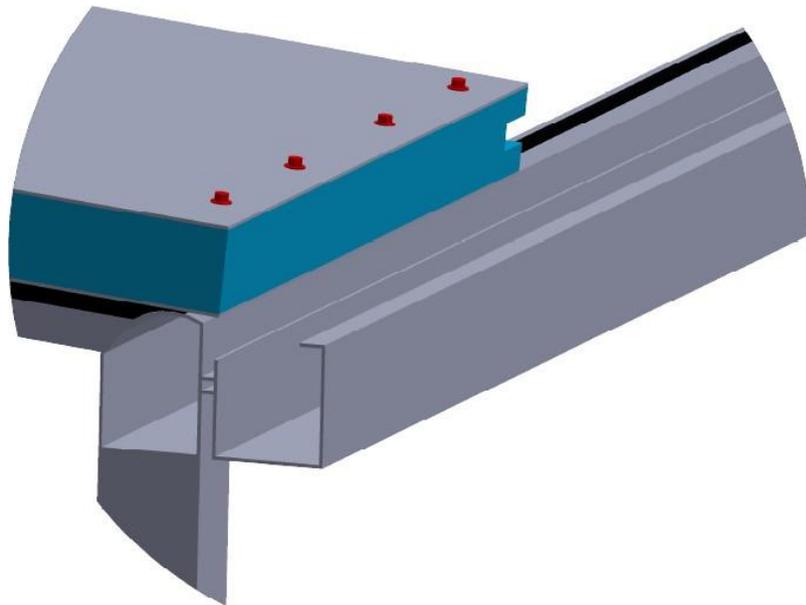
>> On the upper part of the roof on the lower wall hook profile :



>> In the lower part of the roof on the eave :

The panel is fastened to the top plate with four SFS self-drilling screws (Ref.: SXC5-S19-5.5x87 for thicknesses of 52 and 55 mm, for example).

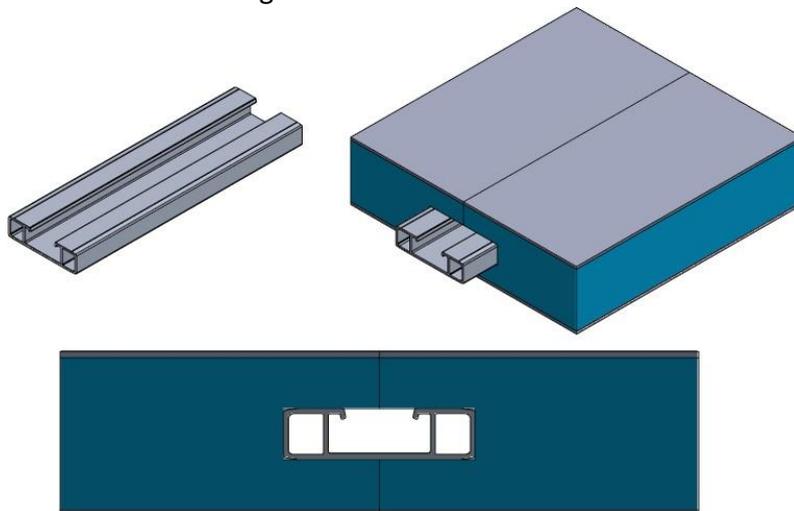
ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09



5.3. Fitting the junction key

5.3.1. Connecting key Aluminum

The cut-to-length joining key is fitted into the panel groove, leaving the excess length of 10 to 15 mm protruding from the lower part of the roof to allow run-off water to drain into the drainage channel.



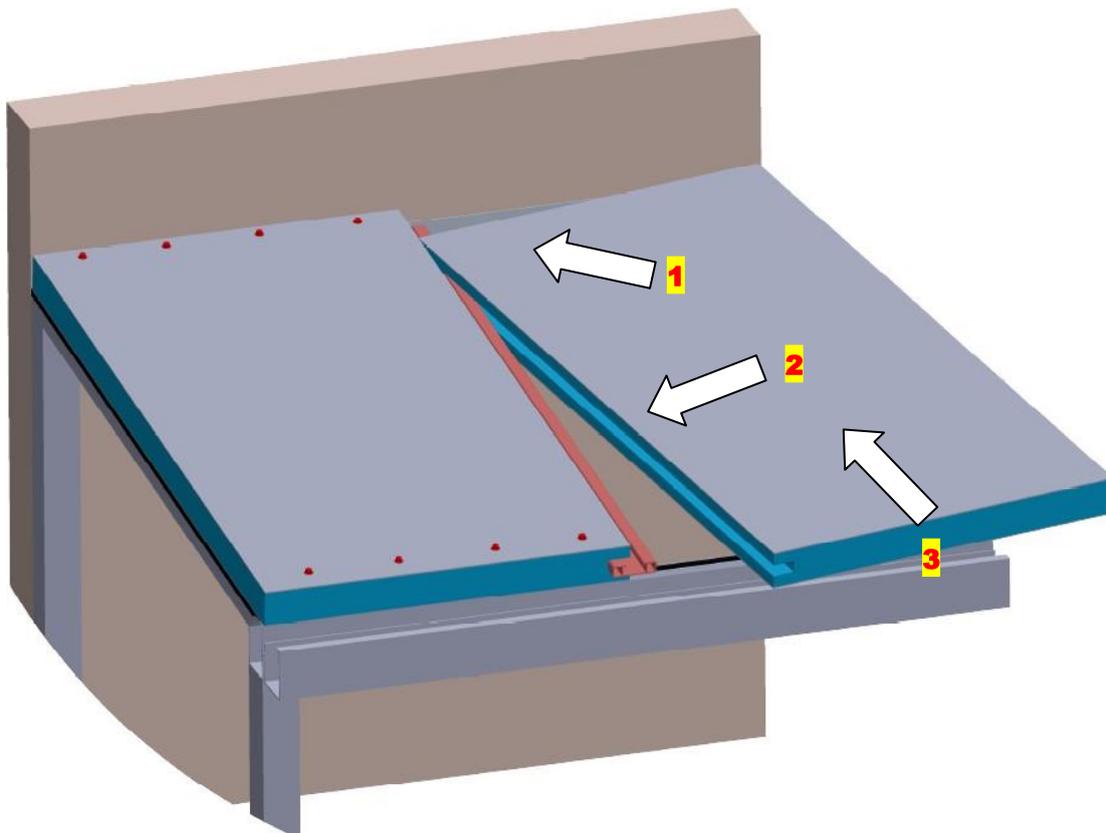
ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

After having cut the appropriate length of the aluminum joining key (7.5 ml and 4.55 ml bars), including a minimum excess length of 10 mm, the various operations to be carried out are :

- Lubricate junction key with liquid soap + water or silicone spray;
- Insert the key into the panel edge groove, starting from one side of the panel (usually the top)
- Leave a **minimum** overhang of **10 mm** on the key junction at the bottom of the roof to allow rainwater to run off;
- Continue to fit the joining key along the entire length of the panel by hand.

6. Installation of the following self-supporting panels:

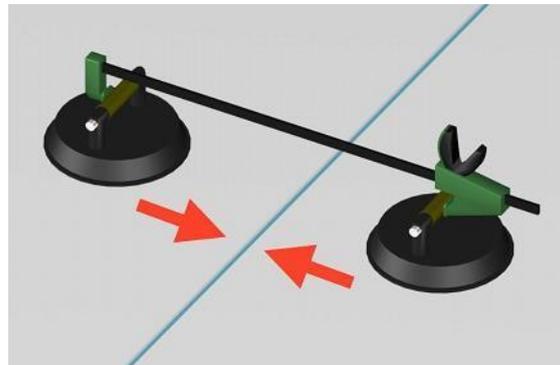
The other panels will be installed as described below (scissor movement):



- Installing the first panel on the top wall profile;
- Fix the panel to the upper wall bracket (see § 4.2.) using four SFS self-drilling screws (Ref.: type SXC5-S19 5.5, length to be defined according to panel thickness);

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

- Fix the panel to the end of the top plate (see § 4.2.) using four SFS self-drilling screws (Ref.: type SXC5-S19 5.5, length to be defined according to panel thickness);
- Continue to fit the joining key along the entire length of the panel by hand;
- Position the next panel in contact with the previous one and bring it closer together in a scissor movement from top to bottom (see previous drawing);
- Use suction pads on adjacent panels to adjust the edge-to-edge junction between each panel;
 - Installation of "1-hand" clamps;
 - Operate the clamps so that the panels make contact as shown in the drawing below:



After fitting, push the panel against the top of the upper aluminum profile.

When the second panel is correctly positioned and assembled with the previous one, fasten it to the top and bottom of the roof (see § 4.2.) using three SFS self-drilling screws (Ref.: type SXC5-S19 5.5, length to be defined according to panel thickness).

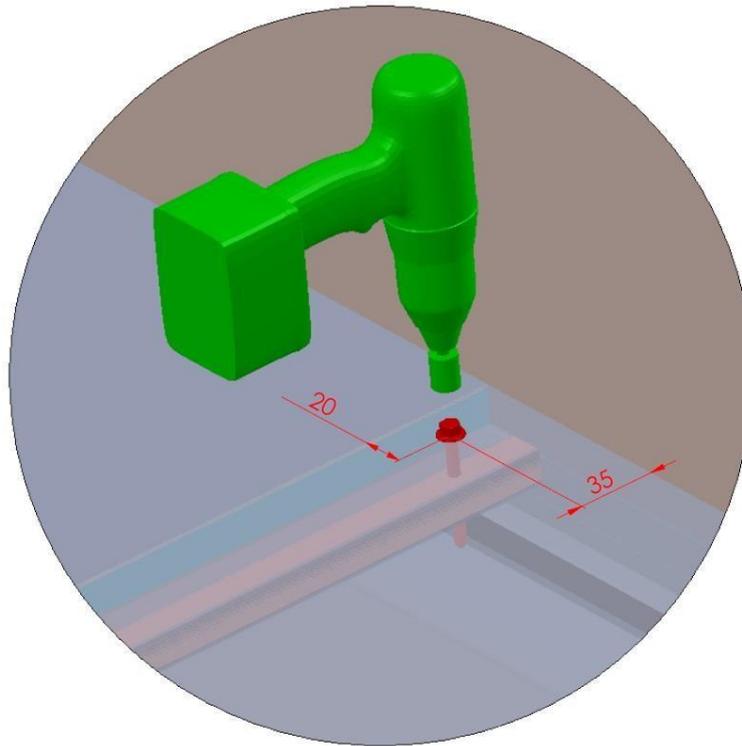
Repeat these operations until the last panel is installed.

7. Fastening the connecting keys :

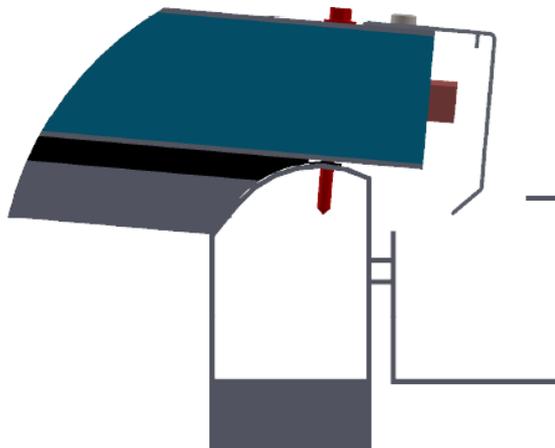
20mm from the inter-panel junction and 35mm from the top edge of the panel, at the top of the roof, place a screw to lock the junction key into the panel.

Do not go through the panel. Select the screw length so as to reach the junction key. The screw should end up below the upper wall fastener (flashing). Use screws with sealing washers.

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09



8. Installing the edge profile on the gutter side



The edge must never touch the key junction. A minimum gap of 10mm must be maintained to allow water to drain properly.

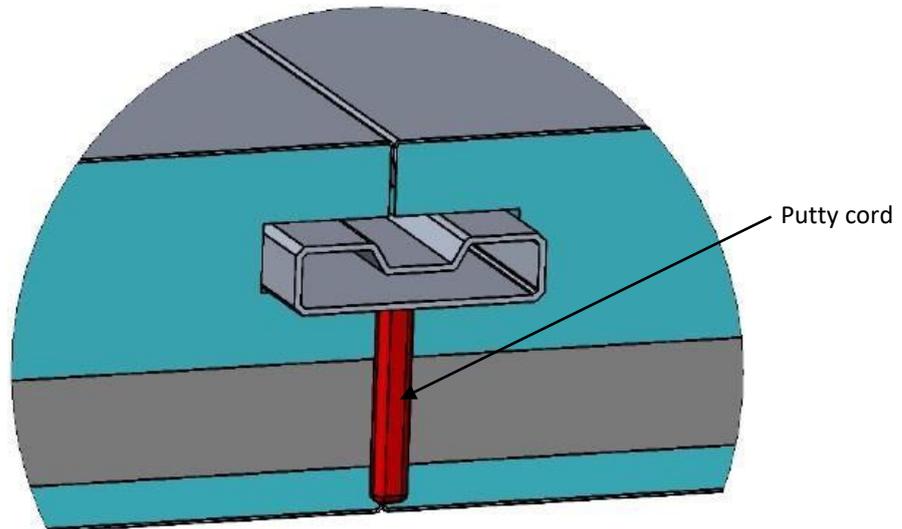
ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

Install an edge on a double bead of silicone mastic at the ends of the panels, then fasten with self-drilling stainless steel screws (e.g. SFS-SXC519 self-drilling screws);

It will be necessary to miter the aluminum edge between the eave and the gables.

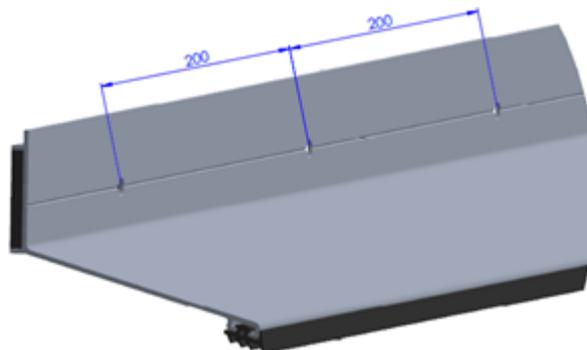
9. Waterproofing under key junction

When all the panels are installed on the roof, a bead of mastic (Ref. SikaFlex - 508) is applied to the lower part of the eave, in line with each overhang of the aluminum joint profiles.



10. Flashing installation:

10.1. Drilling and gasketing



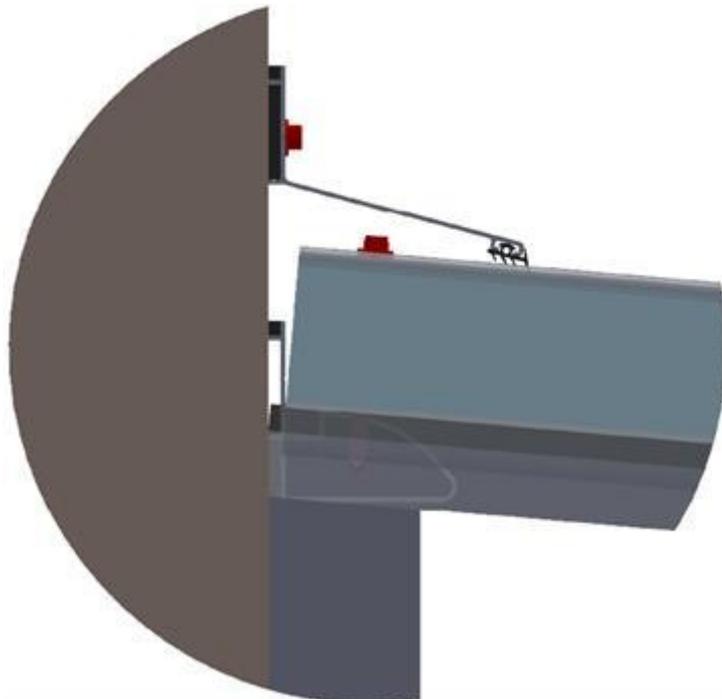
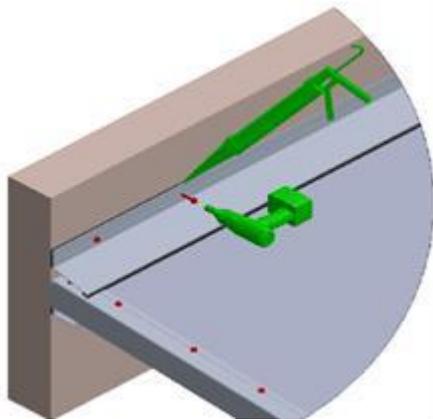
- Drill the holes on the bottom wall bracket, spacing each hole 200 mm apart;

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

- Position the gasket (JJ 407) in the groove of the upper wall profile;
- Install a 50x20 mm self-adhesive "compriband" gasket on the back of the bottom wall-hanging profile to ensure a watertight seal.

10.2. Installing flashing on the wall :

- The flashing joint should be flush with the outside of the panels.
- Fasten the lower wall bracket to the supporting wall using aluminum plugs and screws, or use epoxy chemical sealants (always ensuring that the joint is plated onto the panels).
-



Sheet metal folding is required to ensure watertightness and finish on the sides of the flashing.

11. Special finish for membrane panels

Aluminum waterproofing plates are positioned on the overlap of each panel junction with the outer membrane to complete the waterproofing.

Optimum application range: [10°C to 38°C].

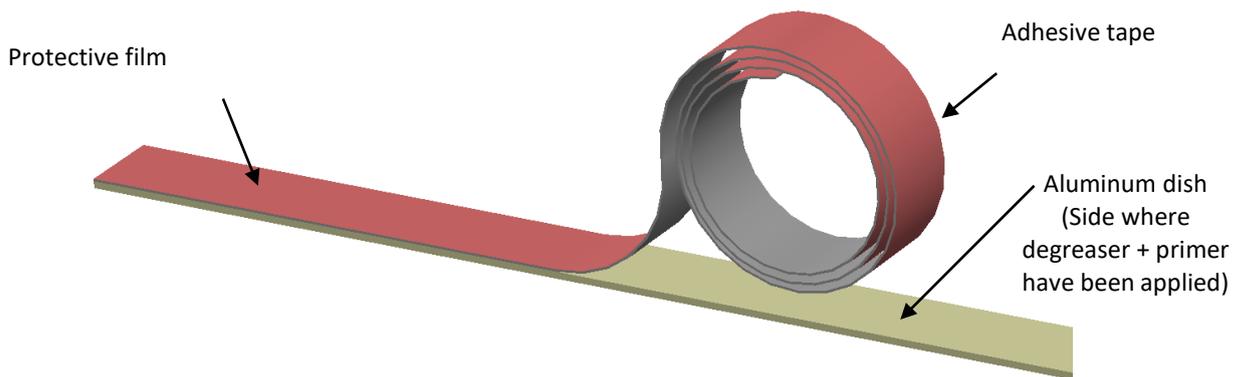
Unroll the membrane at the last moment on site, the panel must be clean and dry. To

ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

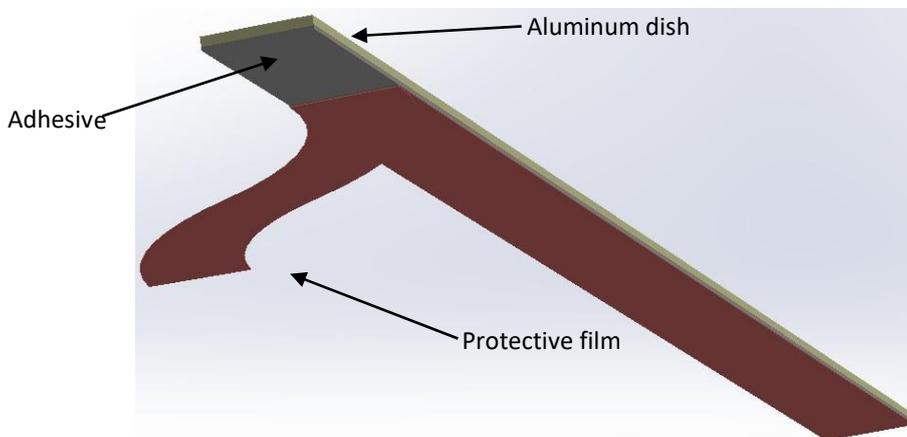
optimize adhesion, we recommend cleaning the surface to be coated and the panel itself with a degreaser and a clean cloth. Apply primer **only to the area covered by the aluminum plate where the panels meet.**

Then apply the primer to the side of the aluminum plate to be bonded.
Allow to dry.

Apply the adhesive tape to the aluminum plate (primer side) and exert UNIFORM, DYNAMIC PRESSURE of at least 1 kg / cm² on the plate using a marouflage squeegee with felt edges.



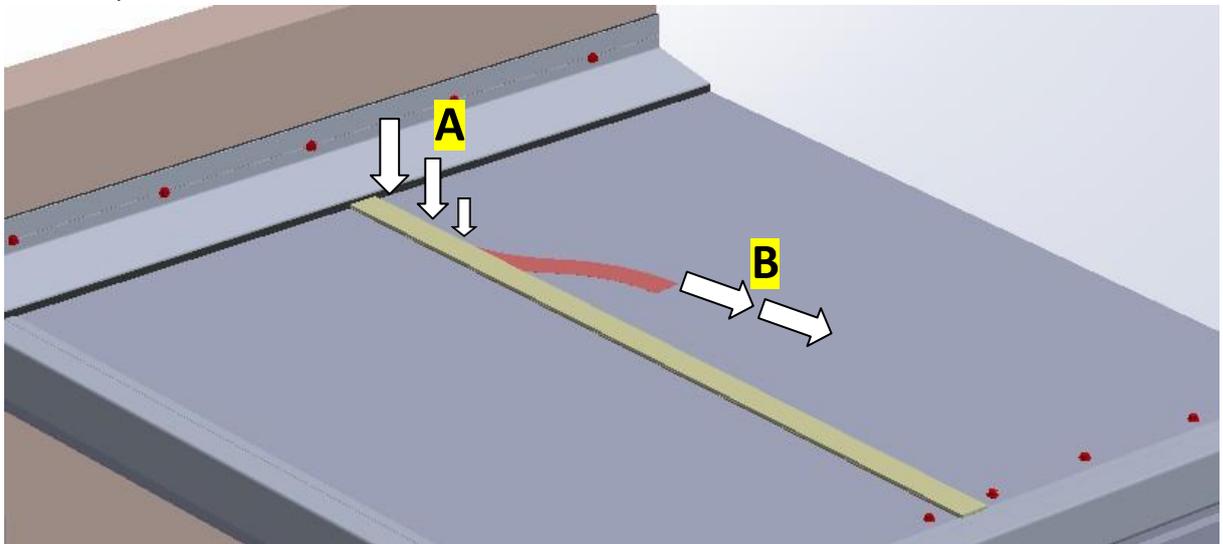
Remove the protective film from the adhesive tape on the aluminum plate that has just been coated:



ITEM	Product	PANEL INSTALLATION GUIDE PERGOLA / CARPORT ROOFING
	DESIGNATION	
	CRF / DEF :	GDP 2023-09

Apply the aluminum plate to the panel junction, starting at the top (step **A** below), and apply UNIFORM, DYNAMIC PRESSURE of at least 1 kg / cm² to the plate using a marouflage roller:

As you go along, remove the protective film (step **B** below) and press down. Proceed in small steps:



12. Installation of gutter extensions :

