



Rev. 25.04.2024

ASSEMBLY INSTRUCTIONS

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A ROOF FOR THE FUTURE

A Solartag yields a return on your investment - as opposed to a conventional roof, which amortizes over time. The return of investment time on a Solartag roof depends on electricity prices, which no one can predict. But a calculation for this investment should also include an assessment of the property's energy label, mortgage credit assessment, property assessment and the aesthetic expression. When the property's value increases, the loan-to-value ratio also increases.

If you have any questions, you are welcome
to contact technical support
on telephone +45 71 99 11 00
or Support@solartag.eu

YOUR WARRANTY

Our guarantee is your security for a roof, that excels on all parameters:

- | | |
|--|------------|
| - Lifetime as climate screen | + 80 years |
| - Warranty as climate screen | 40 years |
| - Yield performance warranty on solar cells of minimum 80% | 25 years |

Solartag products have been tested by the Danish Technological Institute and the Danish Fire Institute.

Please observe the following:

- Storage and handling
- Ventilation at the eaves footing and kip
- Minimum 15% roof pitch or else fixed underlay
- Caution when applying pressure during assembling.

Please note that using this manual is at your own risk. This assembly instruction is regularly updated, and we urge you to ensure, that you have downloaded the latest version from our homepage at all times. We recommend that you always seek professional advise and adhere to Danish building code.

PRODUCTS



ACTIVE SHEET

Colour	Matte satinised black
Size	1160 x 435 x 5,5 mm
Junction box classification	IP67
Sheets per. m ²	2,25 sheets
Yield	71 Watt per sheet p.a.
Cables	700 mm, 4 mm ²
Bypass diode	1 per sheet
Weight per M ²	14 kg
Cover measure	37 - 39 cm
Shine	under 10



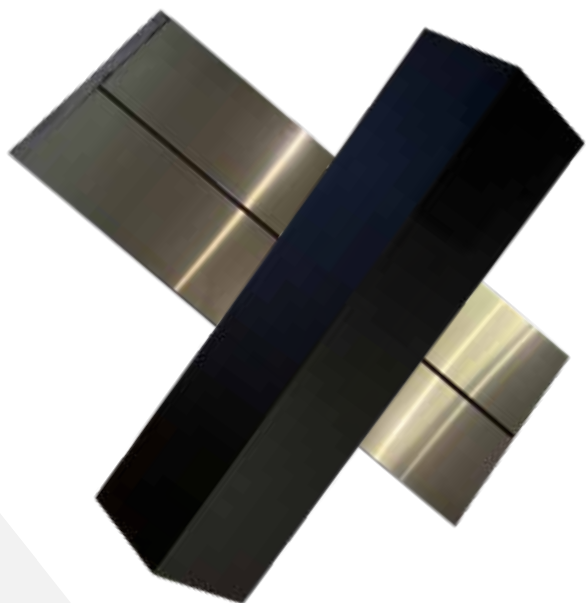
1/1 INACTIVE SHEET

Colour	Matte satinised black
Size	1160 x 435 x 5,5 mm
Cover measure	37 - 39 cm
Sheets per. m ²	2,25 sheets
Weight per M ²	14 kg
Shine	under 10



1/2 INACTIVE SHEET

Colour	Matte satinised black
Size	576 x 435 x 5,5 mm
Cover measure	37 - 39 cm



ROOF RIDGE SHEET

Colour	Black Matte RAL 9004
Size	1500 x 435 x 5,5 mm
Material	ALU Sandwich sheet
Weight per plade	4,9 kg
Roof pitch	from 0 to 60 degrees



CUTTING SHEET

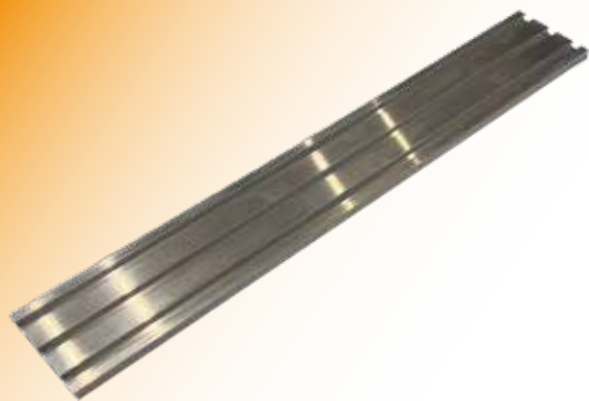
Colour	Black matte RAL 9004
Size	1500 x 435 x 5,5 mm
Cover measure	37 - 39 cm
Material	ALU Sandwich sheet
Weight per sheet	4,8 kg



T-HOOK

Colour	Black
Size on lath	T1
Material	ALU

PRODUCTS INCLUDED



BRACKET RAIL

Material	ALU
Size	410 x 65 x 6,5 mm



RAIL RUBBER

Colour	Black
Size	410 x 65 mm



SOLAR CELL CABLE

Colour	Black
Size	6 mm ²
Length per Roll	100 m - 500 m

MC4 STICK - MALE AND FEMALE

Colour
Approved for 1000 Volt

Sort
IP65

MC4 VÆRKTØJ

Quick Connector release
MC4 og MC4-Evo2 connectors

This tool is used for loosening MC4 connectors.

Included with the solarcells.

INVERTER, 3 FASED

All inverters are dimensioned to fit the installation.

We only use 3 phased inverters to optimize utilisation of the installation.



NECESSARY ADDITIONAL PURCHASES

Crimping pliers MC4



If the customer installs the roof by himself, we recommend purchasing a professional crimping tool for use on cable lugs. This is because this type of pliers does two important things in one work flow; One is the electrical connection between the conductor and terminal. The other is the insulation crimp, which provides strain relief against vibrations and stresses.

It is important that the electrical connection is gas-tight with no gaps between the wires and the terminal. If there is even the slightest gap, corrosion can occur, which can cause resistance and excessive heat, which will in time damage the electrical connection.

Using a good quality crimping tool ensures that a full, gas-tight crimp is formed, preventing future deterioration of the electrical connection and insulation breakdown.

This can be bought in any professional hardware store.



Voltagemeter

You will need a voltmeter to measure voltage and connection. This can be bought in any professional hardware store.

It must be able to measure 1000 Volt DC

Use this setting on the devise:





Assembly glue, black

We recommend using a professional assembly glue for roof ridge sheets, hips, slopes etc.

We use Fix All Turbo due to tolerance of temperature shifts, durability etc.

This can be bought in most hardware stores.



Summation meter

We always recommend installment of a summation meter to ensure full benefit of the facility.

Contact your local energy supplier for installation of summation meter, unless you already have it integrated in your electrical panel.



SUCTION CUPS

Suction cups are not necessary, when you assemble the T-roof. But they are valuable tools, if you need to lift a sheet, that is already installed between neighboring sheets.

We recommend 2 suction cups, when replacing an installed sheet, due to the length of the sheet.

STORAGE AND HANDLING

Solartag sheets must be kept under cover in a dry place - preferably under roof - until use.

Solartag sheets - active and inactive - should always be handled with care. Tempered glass is a durable material, but with careless handling, fractures particularly around the corners can cause cracks and thus render the solar cells/the whole sheet useless.

Note: Surplus materials can be returned - provided in original packaging, unaffected by rain or moisture. Please see contract.



Electrical components should always be stored according to general guidelines.

The products are tolerant of general moisture, but must be protected against continuously dampness.

During assembly it is imperative to guard the plugs not yet connected against moisture such as rain etc.



Solartag sheets must always be lifted free from the stack. They must not be pulled off.

Damage to the sheets caused by the above will cause permanent scratches on the surface, which are visible, when the roof is laid.

Set up your cutting station away from the assembly area to avoid metal shavings under footsoles, as they can also cause visible scratches.



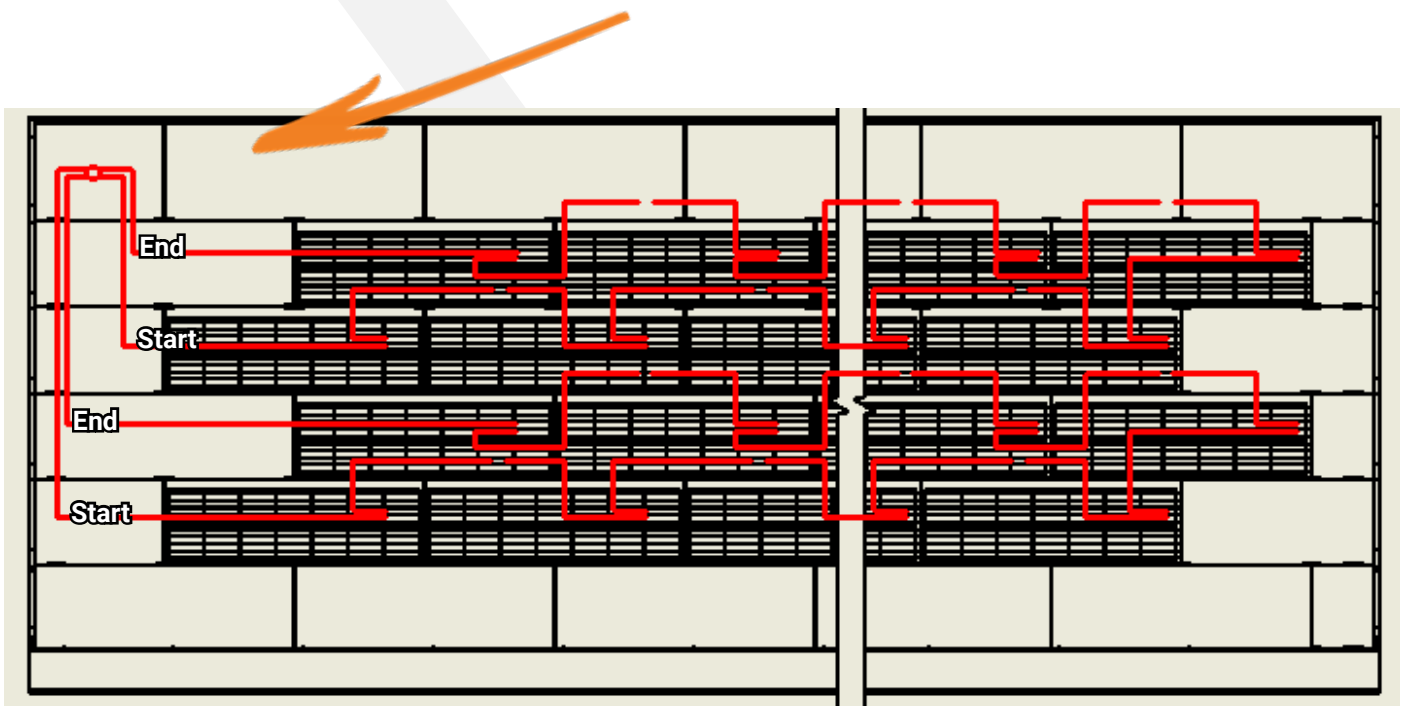
CABLING OF ACTIVE SHEETS

The active sheets are gathered in circuits of minimum 30 and maximum 95 sheets per circuit.

It is important to check the number of accesses (MPP trackere) as well as DC voltage of the inverter - does the number of ports match the number of circuits?

The inverter is 3-phased, corresponding with the 3 phased electrical panel, which means that the inverter covers the different phases of the household, i.e. the kitchen appliances, livingroom/other rooms with TV/PC, bathroom with laundry and floor heating a.s.f. Thus all the areas of electrical consumption is fully covered.

This simplified example shows two circuits going to the inverter.



When the first active sheet is laid, you also place a cord from the sheet to the location, where you intend to place the inverter (stater cord). This cord must be taped at the end - because solar cells always produce electricity - and you risk jolts.

Each of the subsequent sheets are connected in series, right to the last sheet. Remember to comply with minimum/maximum number of sheets in each circuit.

When the last active sheet is placed in the circuit, lead the last connecting cord to the location of the inverter (end-cord). Remember to tape this end too.

If the cabling is done correctly, there is a constant voltage in the circuit. This is verified by use of Voltmeter - See page 3.

Installation of inverter and registration must be done by authorized electrician.

PROCESSING

Cutting of Solartag's cutting sheets

For smaller cutting tasks, e.g. circular saws, jigsaws or angle grinders are used.

We recommend fine-toothed blade for wood or ALU blade.



Processing of hook and rail

We recommend an angle grinder for the small adjustments on the hook and rail.



Cutting several sheets at once

When cutting several sheets at once, plunge saw is used. We recommend ALU blade.



PROTECTIVE EQUIPMENT

When processing Solartag's cut-to-size sheets, there is no cutting dust, as with traditional tile sheets. But there are metal shavings, that require less protective equipment. However, we recommend as a minimum, that you use protective glasses for safety reasons, gloves and hearing protection. Cut away from place of assembly, to avoid metal shavings or small pebles under your shoes, as they can scratch the glass sheets.

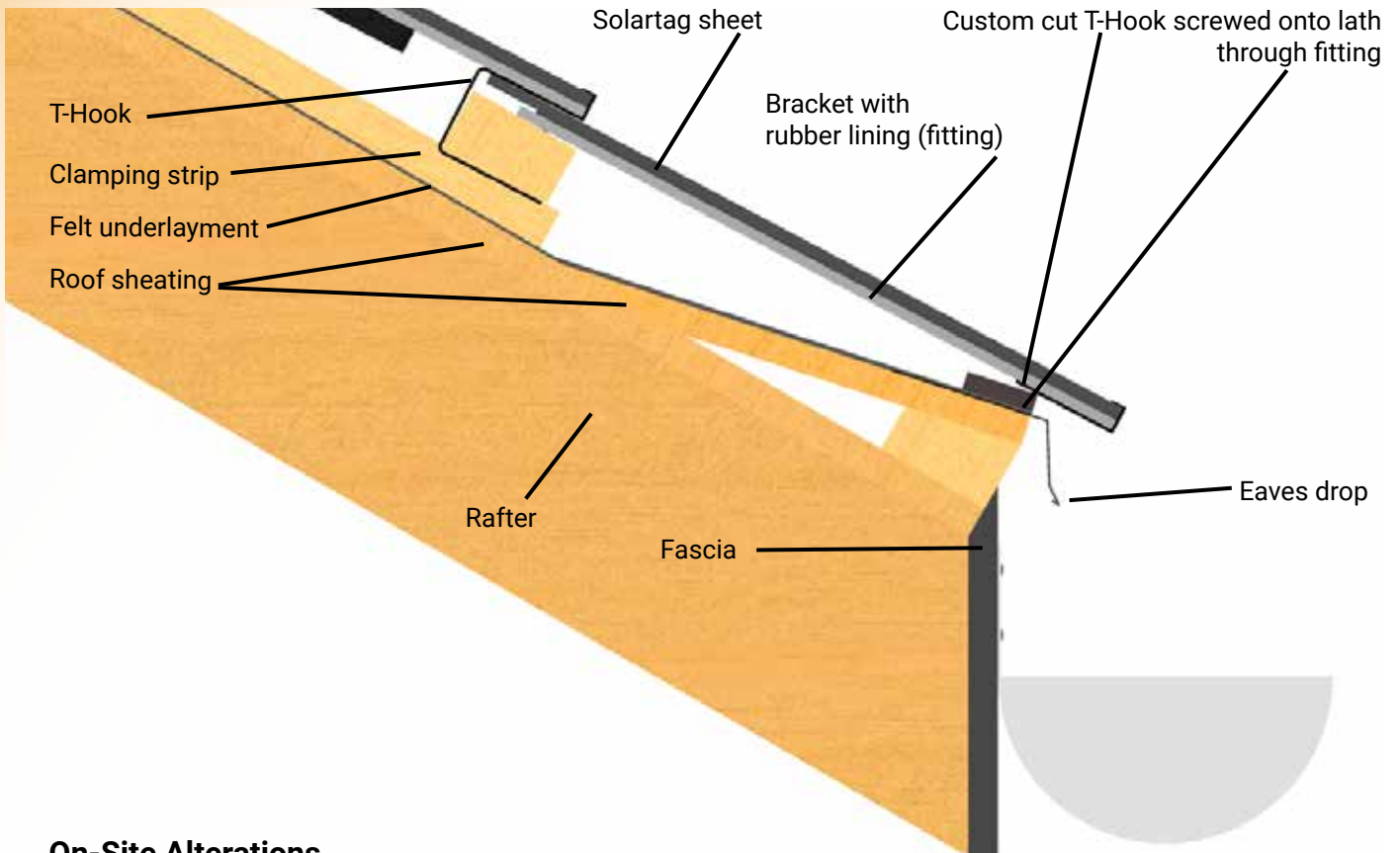
When using handtools, we refer to the manufacturer's safety instructions.



ROOF CONSTRUCTION

Cross section of a typical roof foot, with a Solartag built on laths. Roof feet can be built in many ways, depending on the construction of the roof. Solartag can be adapted to any type. In this example, we use a ventilation list - all though not obligatory - it depends on the need to secure correct angling of the lower row of sheets.

The first (lower) T-Hook is cut to size, removing the back part and the T-Hook is secured by screwing on to the lath. The following T-Hooks are carried by the lath, on which they are mounted. The last T-Hook is turned upside down, in order face the hook downwards, to lock the top sheet with the ALU railing and rubber lining.

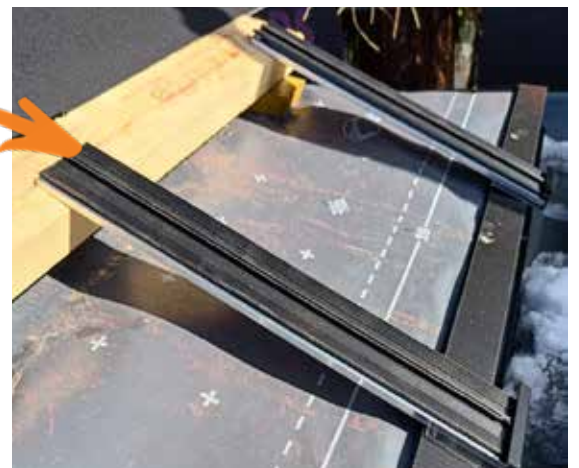


On-Site Alterations

The first T-Hooks (entire row by the gutter) is adapted with an angle grinder, by taking off the back part of the clamp. This allows the T-Hook to be screwed to the lath. Note that the first row of brackets are screwed onto the first lath by drilling through the aluminium railing under the rubber.

Make sure that the railings are placed parallel with the lath for a perfect line by the gutter

The following brackets need no screws.



SHEET ORIENTATION

Solar roof is also called a T-Roof, as it is usually stretcher bond connected and forms T's in a harmonious process.

A T-Roof can be installed from both sides, but should be installed from the bottom up for reasons of cable routing. This means that you start at the bottom by the gutter. Adaptation takes place at the top row, where cutting is done.

We recommend maximizing the number of active sheets, but avoiding roof foot and other border zones. This is because these areas may be subject to regular activities such as cleaning of gutter or painting of fascia.

Tolerances

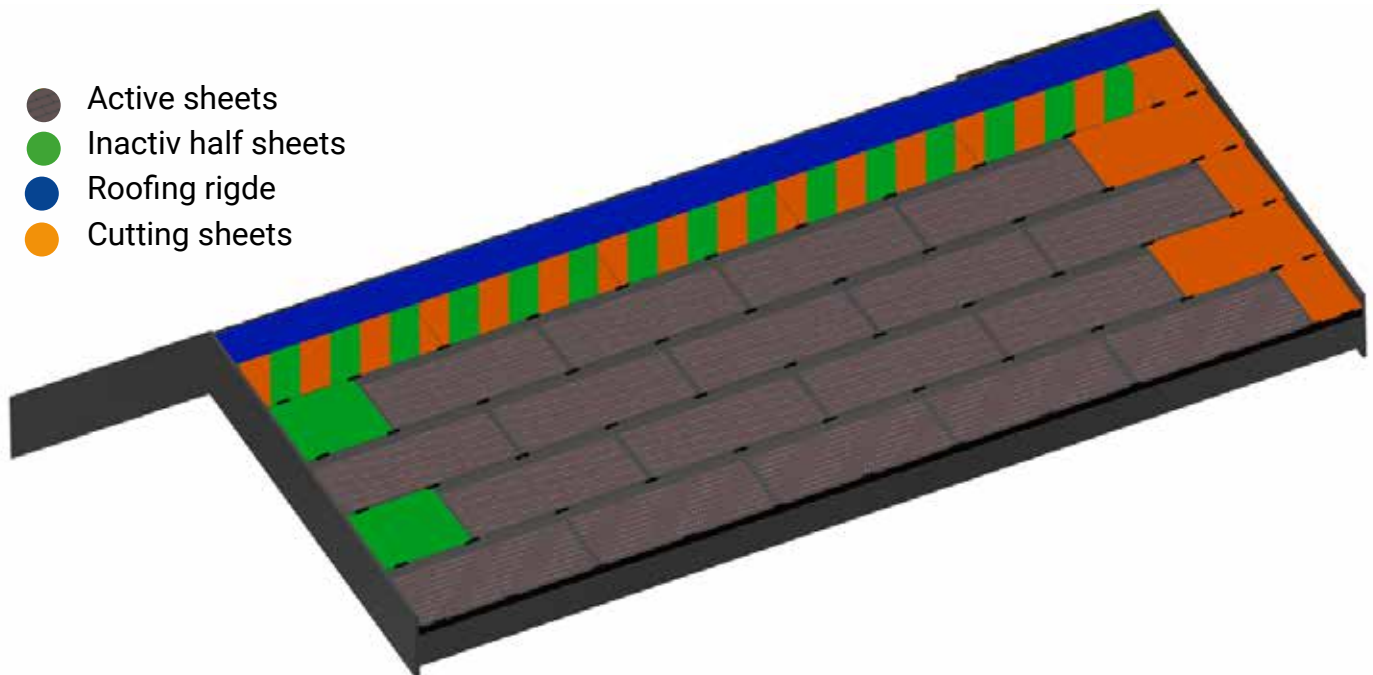
When installing a solar roof, it is important to check the correctness of the battens and rafters. Straightness is checked with a straightedge or string.

In the case of a pinch rod of 2 metres, fluctuations must not be greater than 3 - 5 mm evenly distributed. It is recommended that the installation is done with string, parallel to the roof base.

Trimming

Cutting sheets are used when cutting to size on the sides and when finishing up towards the roof ridge. The cutting sheet is made of aluminium and is cut to size with tools, described on pages 12 and 13. The cutting sheet is produced so that it resembles active and inactive sheets as closely as possible. Active or inactive sheets must not be used for cutting.

See distribution of sheet types on the roof surface:



NOTE: The model above is a simple roof solution. If the roof is adapted to Solartag's dimensions, active sheets can be used all the way up to roofing ridge as well on the closing side.

If your project includes skylights, dormers, angles, chimneys or other openings, of course more cutting sheets must be expected around these.

ASSEMBLY

Laths

Roof laths of type T1 is used.

Distance between laths must be 38,5 with a tolerance of plus/minus 1 cm.

Solartag weighs 14 kg per m², placing it among the lightest on the marked.



Roof sheathing

A Solartag is a ventilated roof. Thus a firm roof sheathing with moisture membrane is recommended to safeguard against blowing snow and driving rain.

Solartag has a long life expectancy (80 years) as a climate screen, and we recommend a high quality roof sheathing to optimize life expectancy.



Roof foot profile and ventilation list

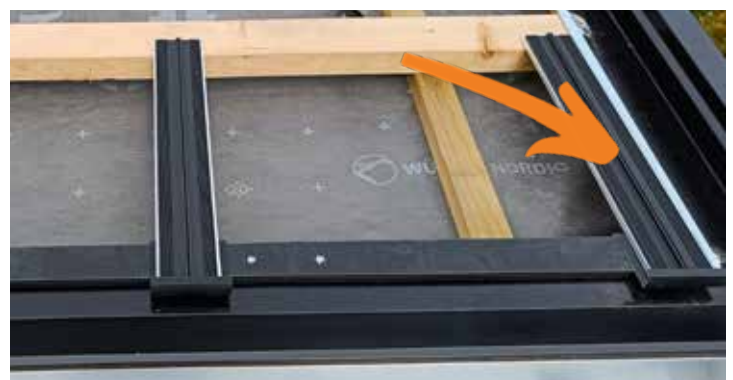
[Carl Ras](#) or BygTjek sells roof foot profiles and ventilation lists for assembly on the lower lath of the roof foot.

Ventilation lists secure ventilation to the Solartag as well as maintaining the correct pitch, as the bottom sheet is lifted to match the following sheets.



Start

The first T-Roof sheet is placed in T-Hooks and ALU bracket rails with rubber strip - 3 T-Hooks and 3 rails per whole sheet, 2 per half sheet (hereafter referred to as fittings). Solartag is laid in a strecher bond pattern, and so the second row starts with a half sheet. It is however not a requirement.



Continue along the roof foot

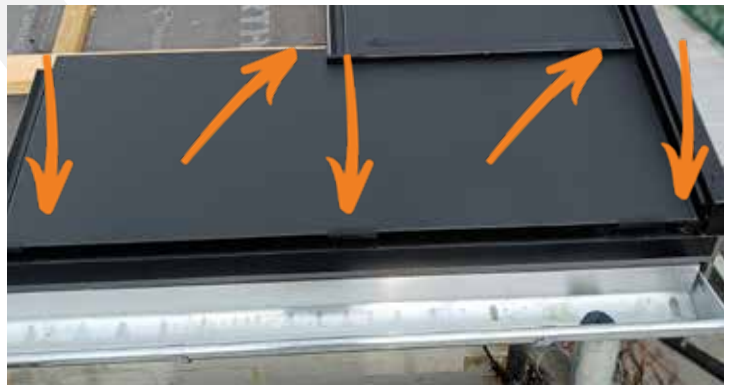
The next fittings is placed along the roof foot and assembly of 1/1 sheets is continued with fittings. Give the T-Hook a squeeze. The next row above is placed continuing from the half sheet, which begins the second row. This ensures the necessary stretcher bond effect. Every second row after starts with a half sheet.



Attachment - top and bottom

Every whole sheet is secured by 3 fittings, where the outermost is shared by the next sheet. The rubber profile separates the adjoining sheets with a tight seal.

A half sheet needs only 2 fittings. The outer sheets have a fitting at the side, that is adjacent to fascia/windshield or other type of closing.



Finishing a row

A row is completed with an adapted cutting sheet which is fastened in the same way as the other sheets.

If the roof is measured and adapted to Solartag product sizes, rows can be finished with whole or half active or inactive sheets for a harmonious look.



Locking a row

Lock the T-Roof sheets top edge with T-Hooks. This ensures the firm attachment and completion of the row and a new row can start.

Note that 2 sheets are securely locked by the bead on the rubber profile. Make sure that the sheets are closely fitted to the bead.



WIND SHEAR AND ROOF RIDGE

Standard stern ditch

Many solutions to the completion against the wind shear exists on the marked.

We recommend a combination of 2 ALU profiles; a stern ditch and a stern capsule - We refer to Carl Ras - please see Accessories Catalogue [here](#) or BygTjek.



Alternative stern ditch with wind shear

Custom bent ALU stern ditch as this example is another option.

For a maintenance free combination, the wind shear is integrated as part of the stern ditch.



Securing of Roof ridge

The last T-Hooks (on the top row) are turned upside down, placing the hook upwards, in conjunction with the fittings, to lock the top sheet, before the roof ridge is placed.

The roof ridge is laid on top of the top row of cutting sheets. Overlay must as a minimum cover the T-Hooks. (If the last row is active sheets, ensure that no solar cells are covered by the roof ridge sheet).

The roof ridge sheet can be attached with mounting glue and screwed on for extra fixation (provided that the last row are cutting sheets).



Tall slope

Safety must always be observed, when working in heights. With tall slopes, combined with rain or wet sheets, extra precaution is required.

We refer to safety rules for working on scaffolding from [Arbejdstilsynet](#)

All scaffoldings must have secure entry-ways, like stairs or ladders.

Scaffolding from 2 meters above ground level and more, must always have hand and knee railings and baseboard skirting.

Scaffolding must have solid support and bricking up may not exceed 20 cm.



Low slope

A Solartag tolerates walking during assembly, provided that you walk where the sheets are supported from below with brackets, avoiding the middle of the sheet.

Putting weight on unsupported areas can cause micro-cracks, which can affect yield or function.

Footprints and other dirt will disappear after the first rainshower.

Be careful of metal cuttings and similar, also see page 10.



HIP AND SLOPE

Roof ridge sheets

Use the same sheet on hips as on roof ridges.

The roof ridge sheets must be secured with screws, as the step-by-step slope is not suited for assembly glue alone. Ensure that only cutting sheets are used in connection with roof ridge sheets.

Ordinary stainless facade screws with rubber gaskets are used.

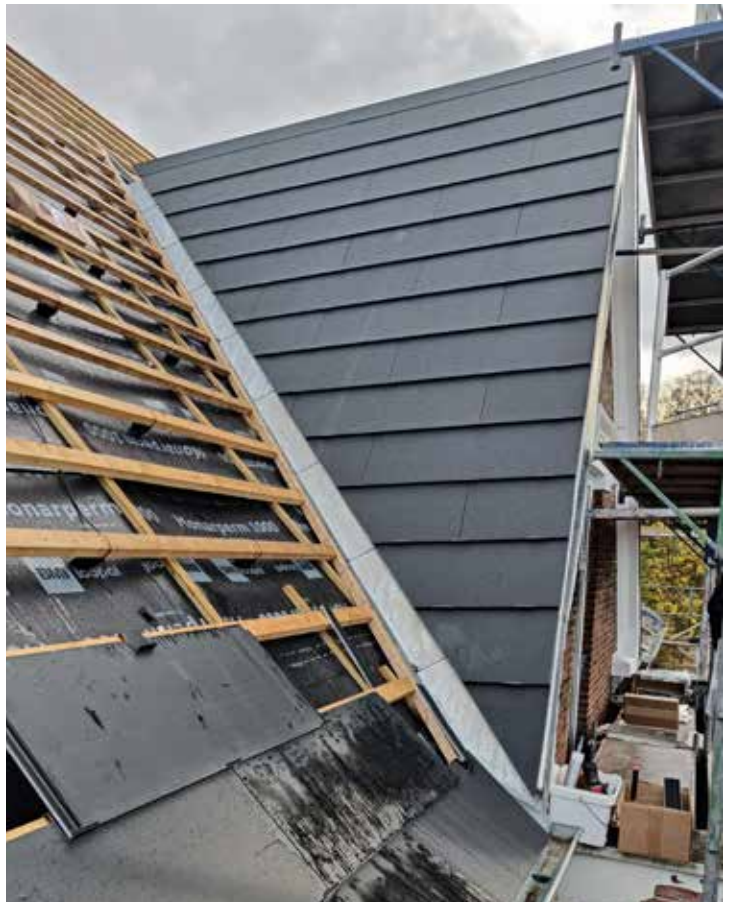
Remember only to use cutting sheets.



Slope

We refer to Carl Ras - please see Accessories Catalogue [here](#) or Bygtjek.

Black is also an option.



CABLE ROUTING

Attention by connections

During assembly of the active sheets it is of paramount importance to secure the connecting of all plates.

If a connection is forgotten somewhere along the assembly work, it will generate unnecessary extra work to debug, where cables are not properly connected.

When traversing i.e. windows or other breakthroughs, use an extension cable to reach the next active sheet. Extra male/female plugs depends on the project and can be added to the order.

Cables from the active sheets are placed under the laths and over the clamping strip. This is an easy and secure attachment method.



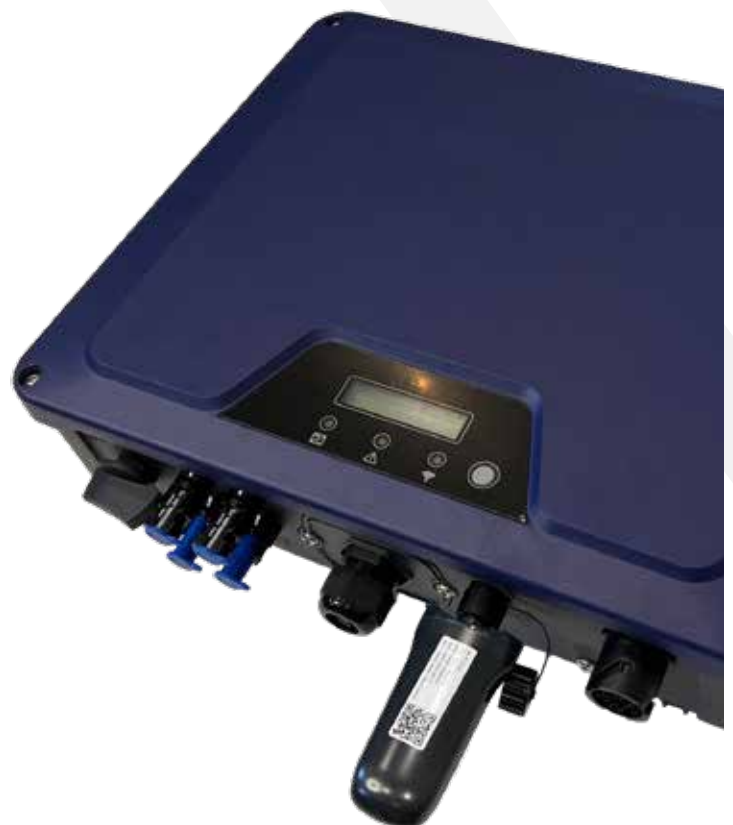
Connecting cables

The active sheets are collected in circuits of minimum 30 and maximum 95 sheets per circuit.

Please note that the numbers of entries in the inverter (MPP trackers) corresponds with the number of circuits.

This inverter has 2 MPP trackers,

Installation of inverter and subsequent registration must be carried out by an authorized electrician,



SKYLIGHTS

Velux standard covering for slate roof

A Solartag looks like a slate roof in many respects. This is why the same method of covering is used: EDL or EDN standard covering for Velux windows for slate roof.

See Velux' [Assembly instructions](#) and [Assembly drawings for flat roof windows](#).

We recommend replacing old coverings to match your new Solartag.

PLEASE NOTE: Never use heavy metals with aluminum, zinc or galvanized roofing materials. Heavy metals, can cause deposition corrosion of aluminium. Some important heavy metals are copper, mercury, tin, nickel, and lead. The corrosion caused by these are more pronounced in acidic solutions as compared to alkaline solutions.



Roof caps

We recommend Cembrit Roof caps for slate roof.

These roof caps are aesthetic compatible with Solartag.

We refer to Carl Ras - please see Accessories Catalogue [here](#)



Chimney

The consequence of a faulty covering of the chimney can and will cause water damage in your house. For this reason we recommend a professional for this type of work.

You can choose between visible and invisible covering. If invisible, the covering is placed under the sheets. This is the more elegant solution, but it must be ensured that the water can be directed correctly to the gutter and not end up under the roof.

For this reason most people chose the solution where the cover run along the chimney and is bent around the adjoining sheets. This ensures the flow above the roof to the gutter.



Roof steps

Particularly with tall slopes it is advisable to integrate steps for the chimney sweep.

You can choose from a variety of steps, according to personal taste and functionality.

PLEASE NOTE: Steps can not be placed on active sheets as they will create permanent shadow.

REMEMBER that disposal of construction waste must be done according to current official guidelines and local guidelines on your recycling site.

Intact Solartag materials, that has been stored according to Solartag guidelines can be credited upon return to Solartag. This way we can all contribute to the minimization of construction waste.





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