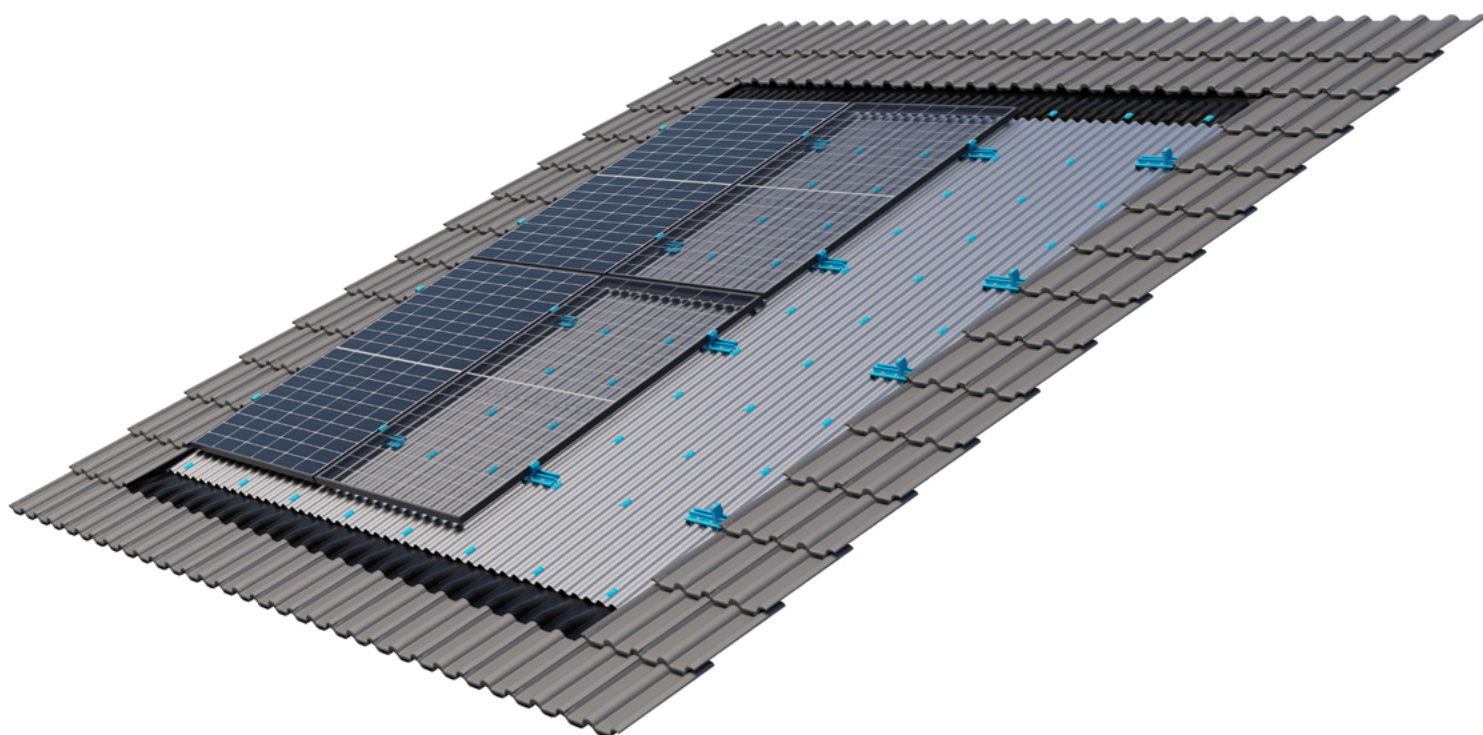




**Assembly instructions**

**S:FLEX INmount**

In-roof system



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Read these installation instructions carefully before installing the S:FLEX mounting system and retain them for future reference!

These installation instructions are only complete with the project-specific implementation plans (project report)!

The S:FLEX INmount is an in-roof system for PV modules. It enables direct integration of PV modules (framed/frameless with landscape mounting on request) into the roof cladding. All components are prefabricated according to your order and replace the existing roof covering. The S:FLEX INmount is either mounted on the existing roof structure or on new battens, if required. This means that the roof can be completely or partially covered with PV modules in the area around the PV generator.

## 1.1 Intended use

The S:FLEX INmount is a frame system for mounting PV modules. It is designed exclusively for the installation of PV modules.

Any other use in this regard is considered misuse of the product. In particular, intended use requires compliance with these installation instructions.

S:FLEX GmbH is not liable for damages that result from not observing the installation instructions or from the improper and not intended use of the product.

## 1.2 About this document

These instructions describe the installation of the S:FLEX INmount system as an in-roof system.

It must be ensured that a full version of the latest installation instructions is used for the installation.

### 1.3 Warnings

The warning texts provided in these installation instructions relay safety-related information. These consist of the following:



**Unless adhered to, there is a major risk of injury as well as a risk of death.**



**Non-compliance may lead to property damage.**

### 1.4 General information – standards and guidelines

Every photovoltaic system must be installed in accordance with the specifications in the respective installation instructions and project report.

These installation instructions are based on state-of-the-art technology and many years of experience of installing our systems on site. It must be ensured that only the current and complete installation instructions are used for the installation, and that a print-out of the installation instructions is stored in the immediate vicinity of the system. The system and these guidelines are subject to technical changes.

The project report is part of the installation instructions and is created on a project-specific basis. All of the information contained in the project report must be strictly adhered to. The project report contains the location-specific structural calculations. The S:FLEX mounting system must be designed and planned using the S:FLEX planning tool.

Since individual project-specific features must be considered with every roof, expert advice must always be sought prior to installation. Before installation, the PV system creator must ensure that the existing roofing and roof substructure are suitable for the additional loads. The condition of the roof substructure, the quality of the roof covering and the maximum load-bearing capacity of the roof construction must be checked by the system creator. Contact a local specialist installer or structural engineer for this purpose.

When installing the PV system, always comply with the module manufacturer's installation instructions. In particular, it is necessary to check that the module manufacturer's instructions regarding the module clamping guidelines (number of clamping points, module clamping area and clamping range) are complied with. If this is not the case, the customer must obtain a declaration of consent from the module manufacturer before installation; alternatively, the mounting system must be adapted in accordance with the module manufacturer's specifications.

The requirements for the protection of PV mounting systems against lightning and surges must be met in accordance with the DIN and VDE regulations. The specifications of the relevant power supply company must be adhered to.

Care must be taken that the PV system to be installed does not impair the functioning of the existing lightning protection system. It is also important to ensure that the PV system is designed so that it can be included in the protection zone of the building's lightning protection system. The separation distances between the PV system and the lightning protection system specified in the relevant regulations must be adhered to.

The applicable fire protection regulations must be adhered to during installation. Fire protection walls may not be built over, fire protection compartments must be preserved and the corresponding spacing regulations must be adhered to.

If the roofing is altered, the manufacturer's guidelines must be adhered to. During and after installation, the frame components may not be stepped on or used as a climbing aid. There is a risk of falling and the roofing underneath could be damaged.

Prior to installation, the creator of the photovoltaic system must ensure that the installation is carried out while strictly adhering to national and local building regulations, safety and accident prevention regulations, standards and environmental protection regulations.

Every person who installs S:FLEX PV mounting systems is obligated to independently inform himself/herself about all rules and regulations for professionally correct planning and installation, and to comply with said rules and regulations, including during the installation process. This also includes compliance with the latest versions of the respective rules and regulations. Installation of the PV system may only be carried out by trained specialists.



**All system components must be checked for damage before installation. Damaged components must not be used!**



**Installation of the S:FLEX substructure and the PV system may only be carried out by trained specialists. System components must not be used as step ladders. The modules must not be stepped on. When working on roofs, there is a risk of falling off and falling through roofs. A fall can result in injury or death. Ensure that appropriate climbing aids and fall-protection equipment (e.g. scaffolding) are provided as well as protection from falling parts.**



**Check the building statics and construction/condition of the roof substructure before starting the installation. During installation, the specifications in the installation instructions and project report must be strictly adhered to. Failure to observe the installation instructions and the project report can result in damage to the PV system and to the building.**

## 1.5 Description of the system

### System features S:FLEX INmount

Application:	Pitched roof, tile or concrete roof cover
Roof inclination:	22° – 75°*
Roof construction:	Battens analogue to tile roofing
Module type:	framed modules (frameless with landscape mounting on request)
Module size:	all standard sizes
Module orientation:	portrait/landscape
Module field length:	max. 12.60 m connected module field
Module layout:	Connected areas, covering of the entire roof surface and integration of skylights possible (prior inspection required)
Overall height of the PV system:	portrait mounting: 40 mm + module height Landscape mounting: 30 mm + module height
Materials:	Extruded aluminium (EN AW-6063 T66), aluminium (EN AW-3005/5005), Stainless steel (V2A), EPDM (calottes), foam, butyl
Colour:	Aluminium blank, cover & corner plates, adapters as well as mid clamps and end clamps optionally available in black
Warranty:	10 years for the durability of the materials



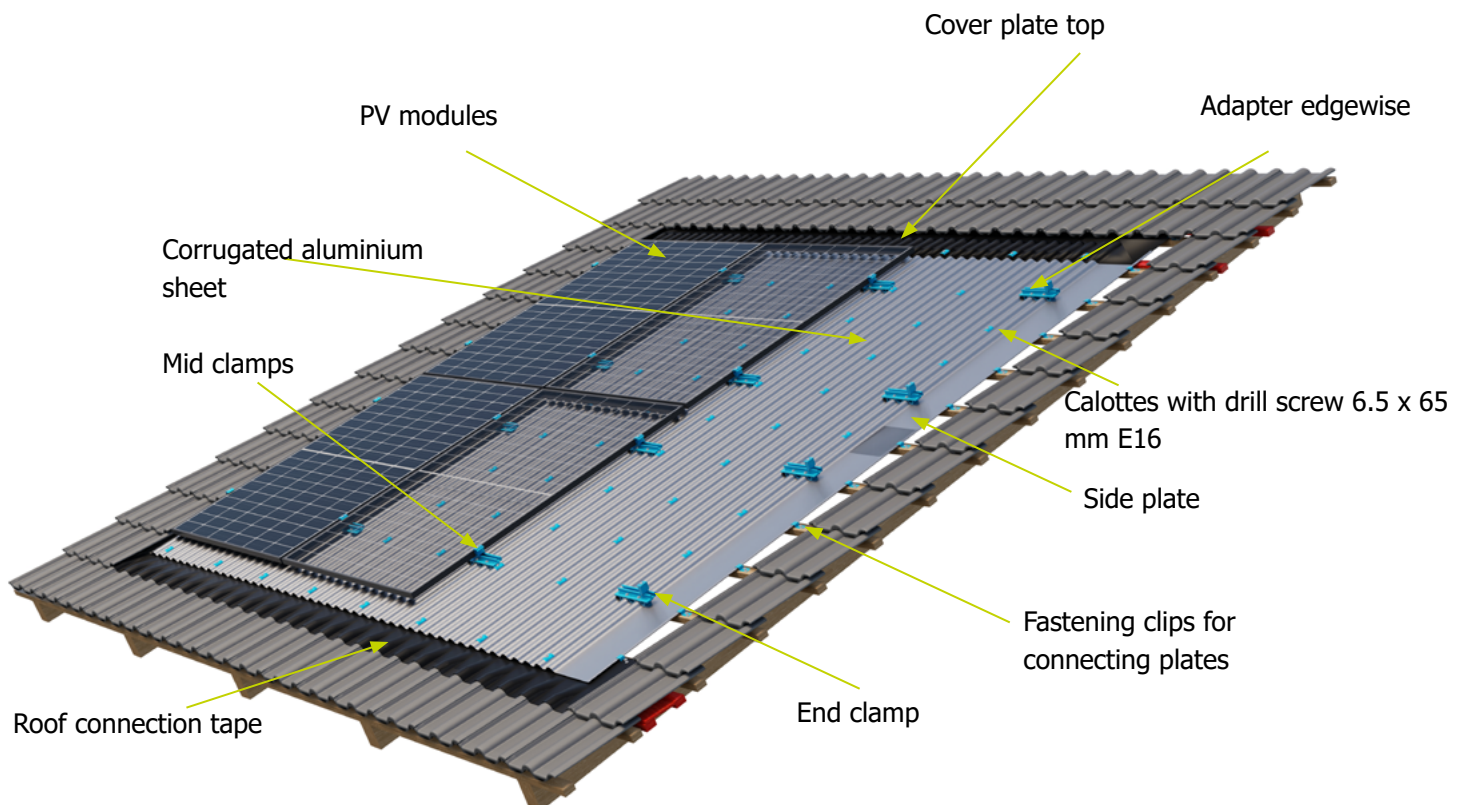
**The module manufacturer's installation instructions must always be adhered to.**

\*Other roof inclinations are possible on request. Please contact our support team via [support@sflex.de](mailto:support@sflex.de)

The most important system components are shown below.

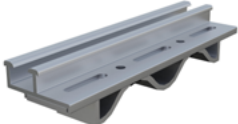

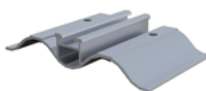

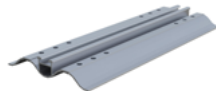

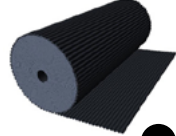

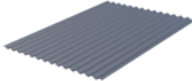
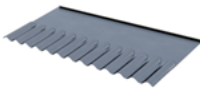

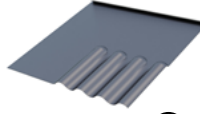

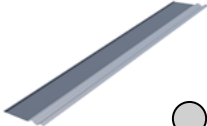










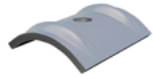





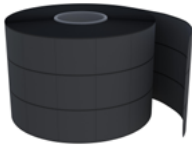
The design of the individual system parts may vary or additional components may be required, depending on:

- Roof type (substructure and roof cladding)
- Module type
- Number of modules and configuration
- The local conditions



**This drawing shows the portrait mounting of the PV modules. For landscape mounting, short and long crosswise adapters are used.**

2.1 System components

<p>Adapter edgewise, 210 mm</p>  	<p>Adapter crosswise, 100 mm</p>  	<p>Adapter crosswise, 380 mm</p>  	<p>Roof connection tape</p>  	
<p>Corrugated aluminium sheet</p> 	<p>Cover plate top</p>  	<p>Edge plate</p>  	<p>Side plate</p>  	
<p>End clamp AK II Klick 30-50</p>  	<p>Mid clamp AK II Klick 30-50</p>  	<p>Mid clamp AK II Klick 30-50 grounding plate</p>  		
<p>Tinsmith screw 4.5 x 45 mm E16 (for mounting fastening clip)</p> 	<p>Drill screw 6.5 x 65 mm E16 (for fastening adapters &amp; calottes)</p> 	<p>Fastening clips for side plates</p> 	<p>Calotte for S:FLEX INmount corrugated sheet</p> 	<p>Foam profile filler corrugated aluminium sheet</p> 
<p>Roof valley sealing strip</p> 	<p>Double-sided adhesive tape (optional for attaching foam filler tree cut)</p> 	<p>Foam filler tree cut (optional as insect protection)</p> 	<p>Mounting aid corrugated aluminium sheet (10 pcs., optional)</p> 	<p>Butyl tape (optional for additional fastening of the side plates)</p> 



## 2.2 Important installation instructions

### 2.2.1 Assembly preparation

Before ordering the S:FLEX INmount, S:FLEX recommends that you inform yourself about the conditions on site. In particular familiarise yourself with:

- Roof condition
- Thickness of the roof battens
- Quality of the roof battens
- Spacing of the roof battens

### 2.2.2 Mounting aids and tools required

You will need the following tools to assemble the frame system:

- Roof ladder
- Folding rule
- Chalk line for aligning the frame parts
- Aluminium alignment battens (to check the evenness of the battens and the module field)
- Angle grinder with stone disc (for adjusting the tiles)
- Metal shears (for cutting sheet metal, sealing tape, etc.)
- Specialist roofing tools, e.g. pulling pliers or folding pliers (for working on the cover plates if necessary)
- Rubber mallet
- Allen key, 6 mm
- Cordless drill driver with 8 mm hexagonal attachment (for the drill screws) and Torx attachment
- Nibbler (e.g. Makita nibbler DJN161Z, battery, 18V)

### 2.2.3 Additional materials required (not included in the scope of delivery)

You will need the following additional materials to install the S:FLEX INmount:

- Roof battens
- Suitable fastening material for fixing the roof battens (e.g. wood screws, ring shank nails, etc.)
- If necessary, suitable material for sealing and additional fastening of the neighbouring tiles



**Excessive loads can severely damage the roof!**  
**Before assembly and installation, make sure that the building and in particular the roof cladding fulfil the additional structural requirements imposed by the PV system and the installation operation.**



**Parts falling from the roof can cause serious injury or death!**  
**Before each assembly and installation, make sure that the material used fulfils the structural requirements on site.**

## 2.3 Planning the module area & the additional roof battens

### 2.3.1 Operating conditions

Please take the dimensions of the module area from the project report or calculate them using the method described in points 2.4.2 & 2.4.3. You need to know the module field width and height in order to work out the other dimensions (e.g. distances between the adapters).

The planning of the module field depends on:

- Module size (L x W x H)
- Module orientation (landscape, portrait)
- Number of modules
- Spacing of the roof battens

### 2.3.2 Additional roof battens

Before the roof connection tape is installed, an additional plank must always be installed to support the roof connection tape. This is essential to ensure that the roof is watertight (see point 2.5). If the existing roof battens are not in the positions required by the module field, additional roof battens may also be required in the following locations:

- Fastening the upper adapters
- Fastening the top cover plate

The additional roof battens and their fasteners are not included in the scope of delivery.



**The standard S:FLEX INmount components are designed for connecting the module field to a tiled roof. Connections to other roof coverings must always be carried out by a specialised roofing company.**

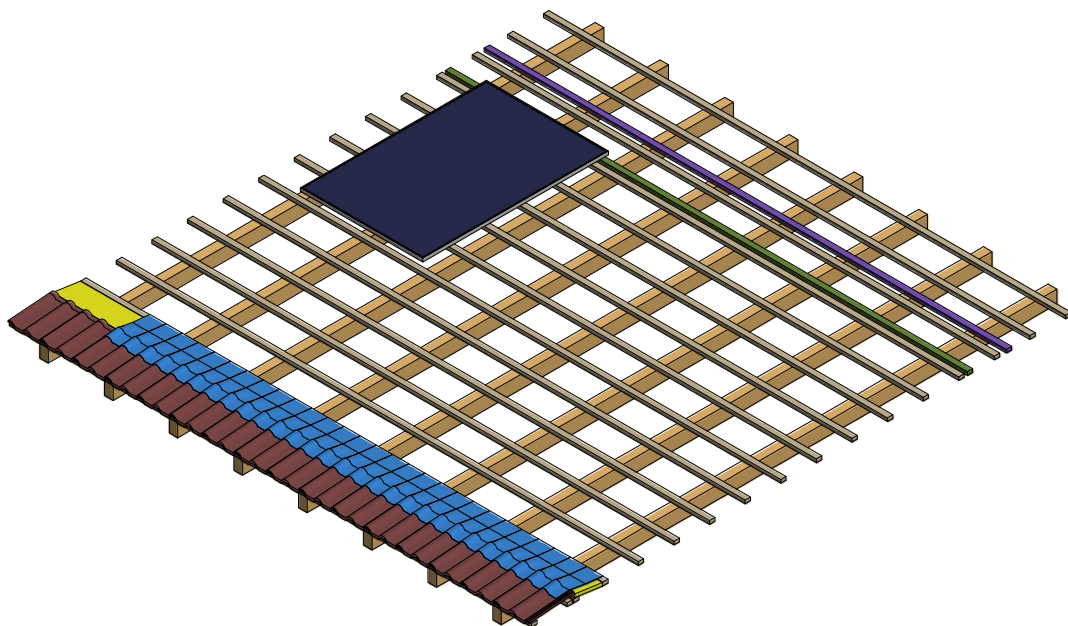
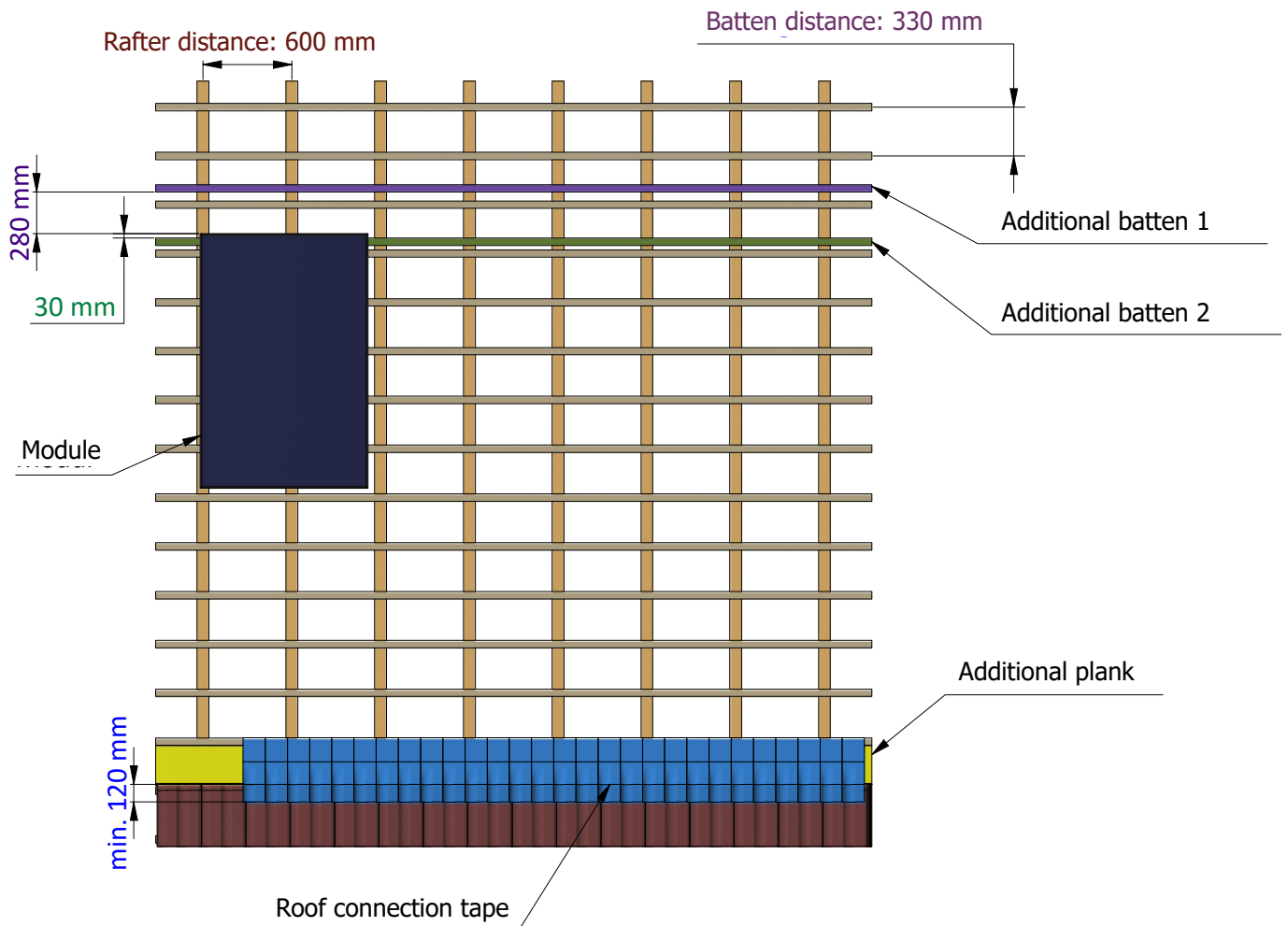


**If the roof ridge is not sealed, there must be at least one row of tiles between the upper edge of the module field and the roof ridge.**



**A direct connection of the module field to the roof ridge, verge or eaves must always be carried out by a specialised roofing company.**

Example illustration of additional roof battens with dimensions

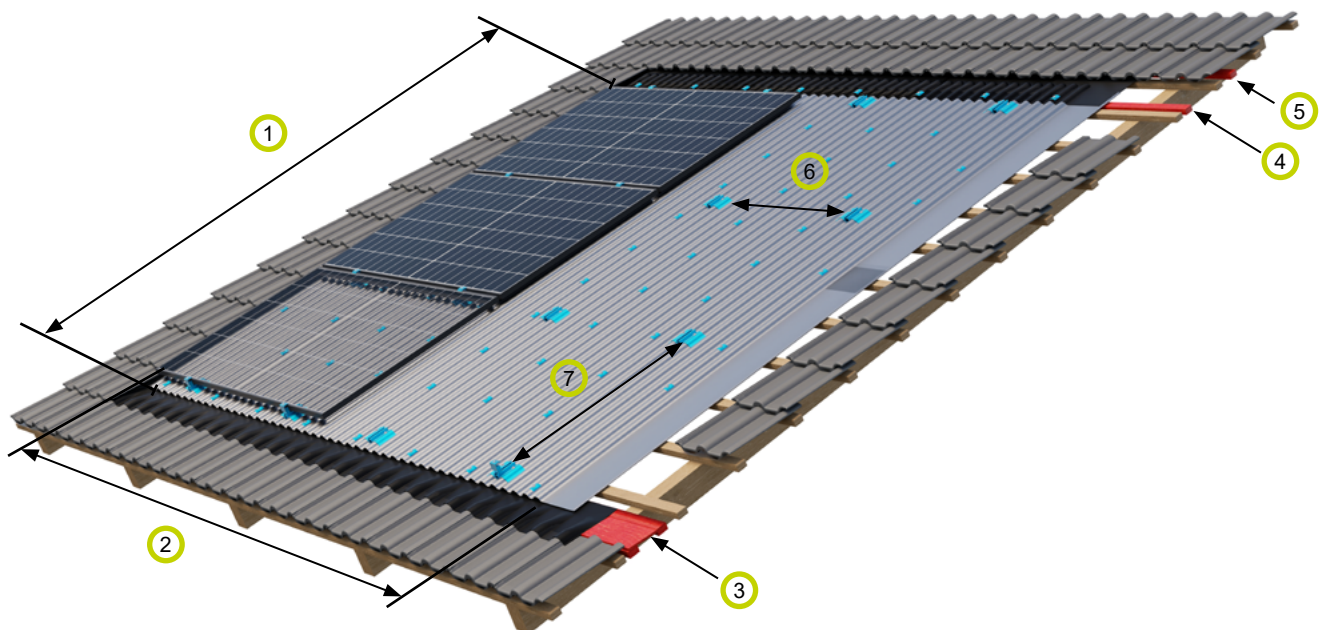


## 2.4 Illustrative system structure with dimensions, adapter distances

### 2.4.1 Selection of short and long crosswise adapters for landscape mounting

If the existing battens are replaced or supplemented by new battens, short adapters **can** be used inside and at the top row of the module field. The long adapters allow greater vertical flexibility when fixing the PV modules, so that additional roof battens do not need to be installed to the roof truss to install the mounting system. To install the bottom edge of the module field, short adapters must always be used.

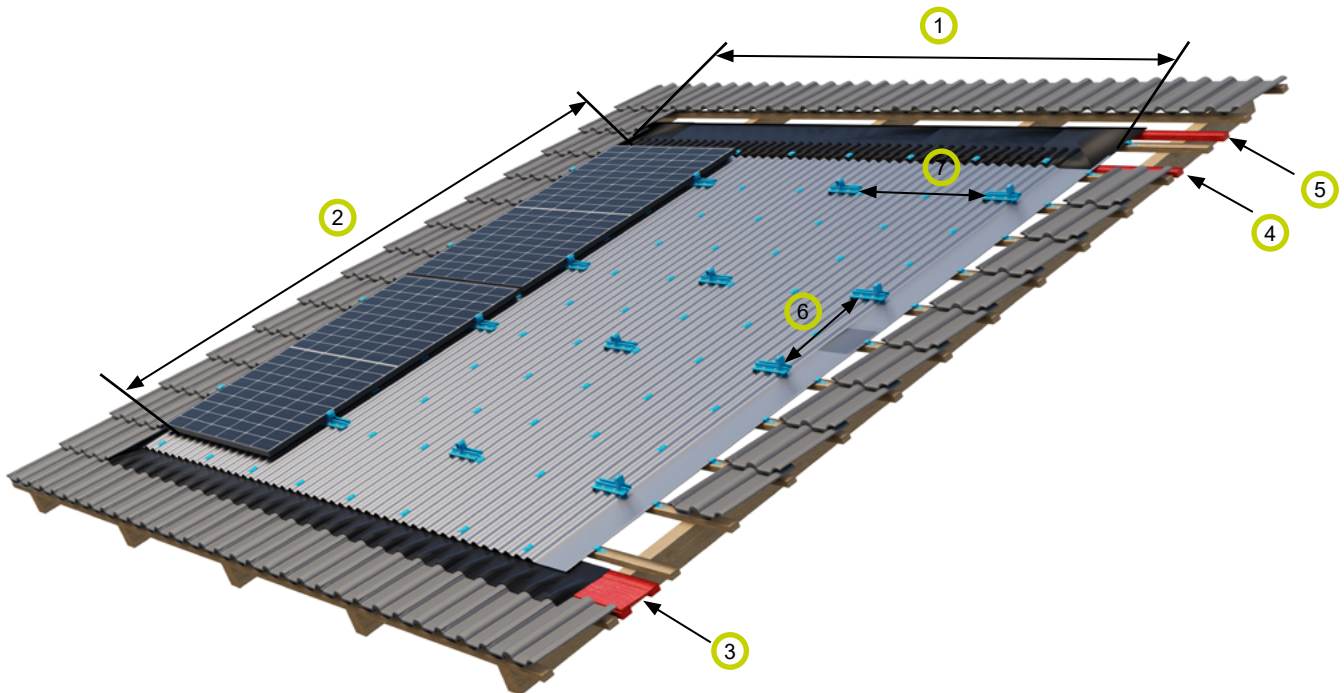
### 2.4.2 Illustrative system structure for landscape mounting



Please refer to the project report for the dimensions of the module field. The following calculation can be performed as a **plausibility check**:

1. **Height of module field:** Module width x number of modules vertical + (number of modules vertical - 1) x 20 mm + 50 mm. Example: 1,134 mm x 3 modules + (3 modules - 1) x 20 mm + 50 mm = 3,492 mm
2. **Width of module field:** Module length x number of modules horizontal + (number of modules horizontal - 1) x 20 mm. Example: 1,722 mm x 3 modules + (3 modules - 1) x 20 mm = 5,206 mm
3. Additional plank required to **support the roof connection tape** (see point 2.5)
4. Additional **roof batten for fastening the upper adapter** (see point 2.3.2)
5. Additional **roof batten for fastening the top cover plate** (see point 2.3.2)
6. The **horizontal spacing between the adapters** is determined by the clamping areas, which are described in the installation instructions.
7. **Vertical adapter spacing:** Derived from the module dimensions. Position the adapter in the inner area of the module field so that its centre is located in the 20 mm wide free space (= width of the mid clamp) between the modules. For the outer upper and lower adapters, maintain a minimum distance of 25 mm between the edge of the adapter and the edge of the module field.

**2.4.3 Illustrative system structure for portrait mounting**



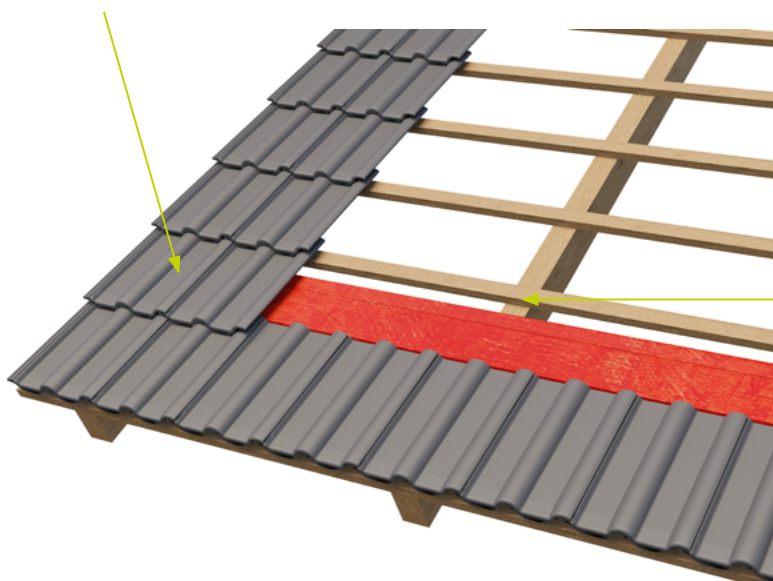
Please refer to the project report for the dimensions of the module field. The following calculation can be performed as a plausibility check:

1. **Width of module field:** Module width x number of modules horizontal + (number of modules horizontal - 1) x 20 mm + 50 mm. Example: 1,134 mm x 3 modules + (3 modules -1) x 20 mm + 50 mm = 3,492 mm
2. **Height of module field:** Module length x number of modules vertical + (number of modules horizontal - 1) x 20 mm. Example: 1,722 mm x 3 modules + (3 modules - 1) x 20 mm = 5,206 mm
3. Additional plank required to **support the roof connection tape** (see point 2.5)
4. Additional **roof batten for fastening the upper edge of the module field** (see point 2.3.2)
5. Additional **roof batten for fastening the top cover plate** (see point 2.3.2)
6. The **vertical spacing between the adapters** is determined by the clamping areas, which are described in the installation instructions.
7. Spacing depends on the roof batten grid. If the batten grid is very unfavourable, additional battens may have to be inserted.
8. **Horizontal adapter spacing:** Derived from the module dimensions. Position the adapter in the inner area of the module field so that its centre is located in the 20 mm wide free space (= width of the mid clamp) between the modules. For the adapters on the right and left edges, maintain a minimum distance of 25 mm between the edge of the adapter and the edge of the module field.

### 2.5 Preparation of the roof & installation of additional plank

- Remove the roof covering in the module area. Remove an additional row of roof tiles on the sides and top than the actual module area requires. Please refer to the project report for the specific dimensions.
- The roof surface must be level: if necessary, use additional roof battens on site to achieve a level surface.
- It is essential to check whether an underlay is required. If necessary, place an underlay membrane beneath the intended module field. The underlay membrane must be selected depending on the roof pitch and the tiles used.
- In the event of direct contact between the underlay and the insulation, it must be ensured that the underlay is water vapour permeable.
- To ensure that the roof remains watertight even when the system is exposed to snow and dew, the lower end of the system must be underlaid with an additional plank. The width of the plank must be selected and installed in such a way that the roof connection tape lies flat on the plank. An even transition of the gradient between roof tiles and corrugated sheet metal must be ensured and, as a minimum, the requirements for the standard gradient of the roof tiles used must be met. Overlap length of the roof connection tape to the neighbouring row of tiles min. 120 mm
- If necessary, professionally fasten additional roof battens to the rafters at the required points (see point 2.3.2)

Roof covering (e.g. roof tiles)



Roof substructure (e.g. wooden battens)



**Material damage: If the additional roof battens are not adequately fastened, they will not be able to withstand increased wind forces. Ensure adequate fastening of the roof battens to the rafters.**

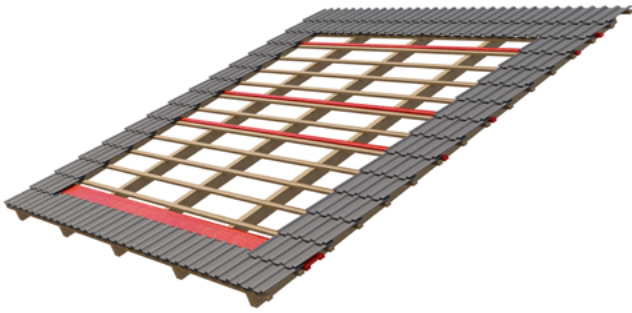


**Danger of death when falling from the roof. When working on the roof, parts may fall or people may fall.**

#### 2.5.1 Design of expansion joints for portrait mounting

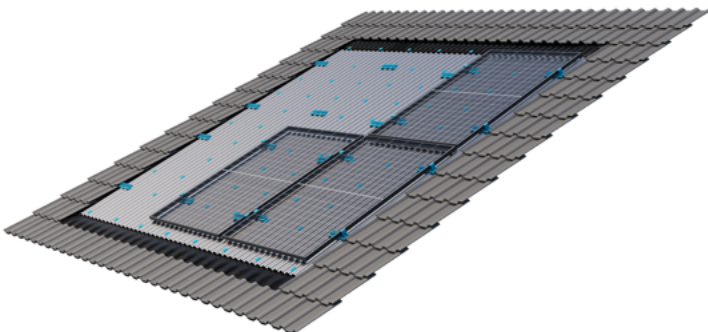
##### Optional installation step for module field lengths > 13m with portrait mounting

Before laying the metal sheet, additional load-bearing battens must be installed between the rafters with the expansion joint. Positioning is based on the module manufacturer's clamping point specifications.



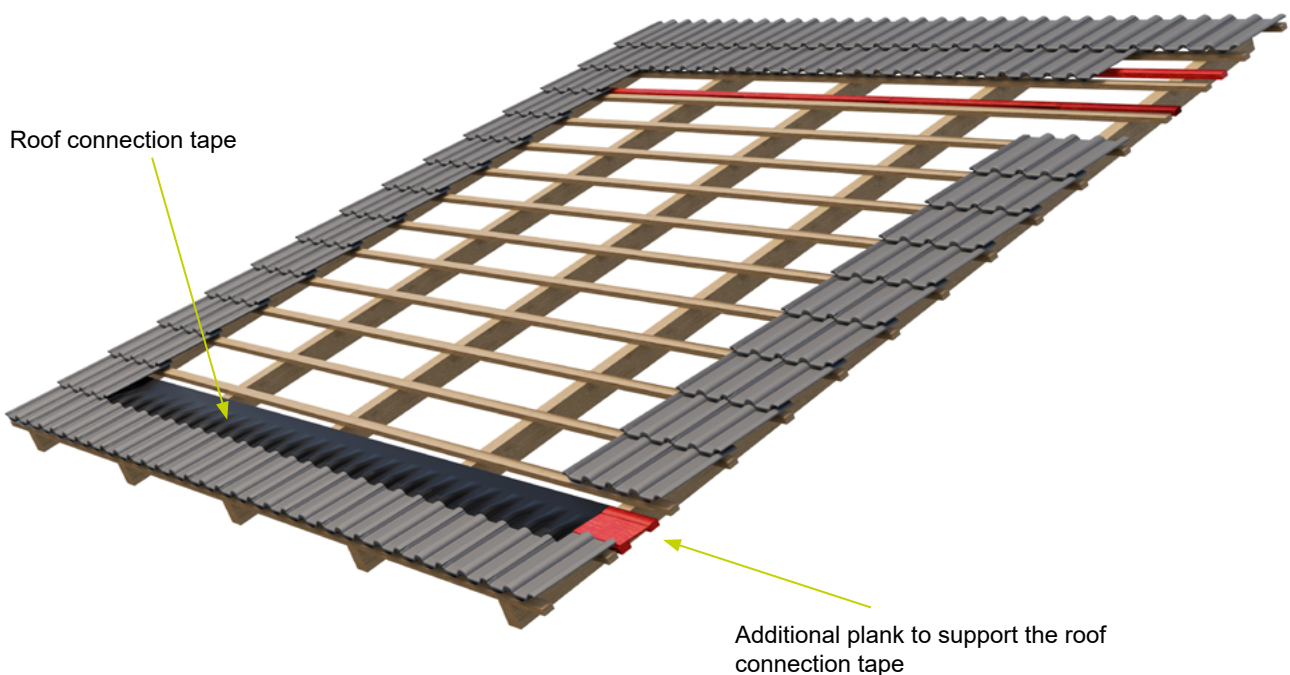
After covering with the metal sheet, the fastening rails can be mounted on both battens so that they do not overlap. Please adhere to the clamping range of the module.

Fasten both modules with end clamps so that there is a gap of at least 40 mm between the modules.



## 2.6 Installing the roof connection tape

- Before installing the roof connection tape, the underlying surface must first be prepared with the additional plank
- Roll out the roof connection tape along the lower edge of the covered roof surface
- Cut the roof connection tape to the length of the field + one tile width each on the left and right
- Provide a sufficient gap (50 mm) between the upper edge of the roof tiles and the lower edge of the corrugated sheets to prevent the edge from being too thick. The roof connection tape must be in full contact with the newly installed plank.
- Fasten the roof connection tape to the plank with screws.
- After installing the roof connection tape, adjust the tape to the shape of the tile, avoiding the formation of sharp edges.

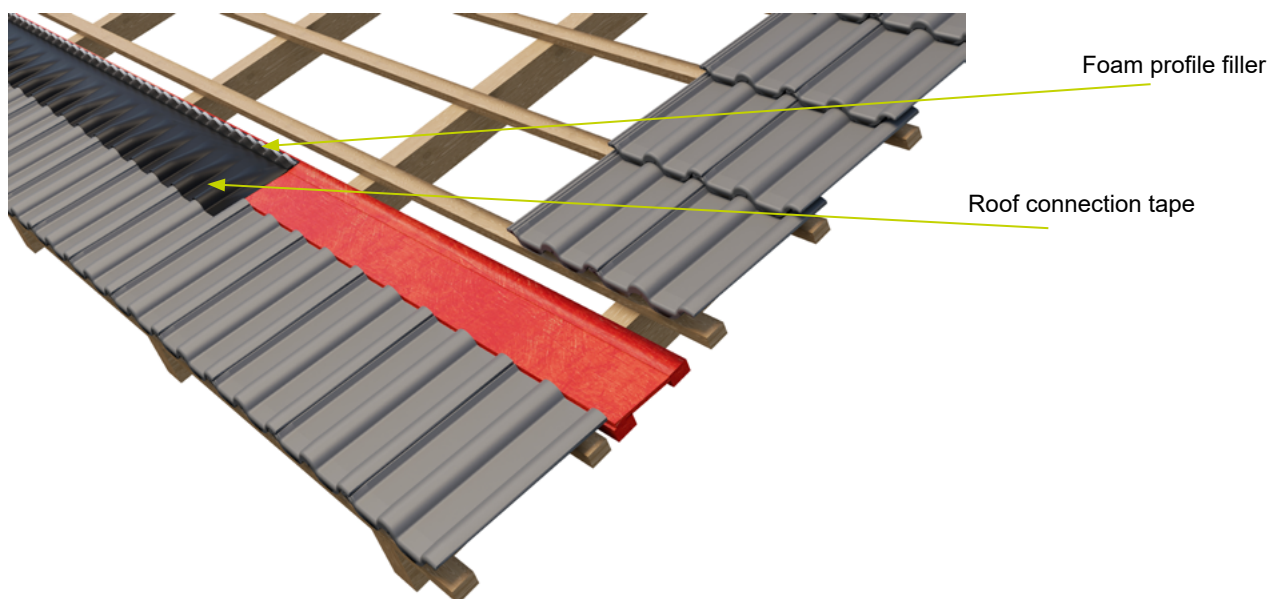


**Leaky construction:** If the roof connection tape does not extend sufficiently over the roof tiles, the roof may leak. Lay the roof connection tape vertically over the tiles with an overlap that is at least as big as the overlap between the tiles themselves. With very high roof tiles, it may be advisable to flatten the top edge of the underlying tiles before laying the roof connection tape in order to avoid a sharp edge and the potential build-up of water.



### 2.7 Attaching the foam profile filler

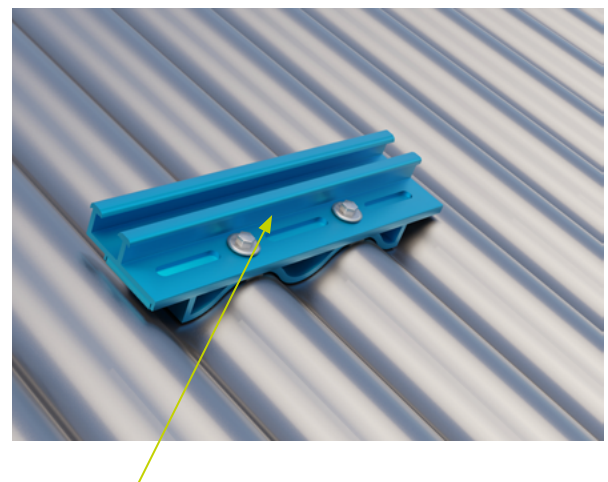
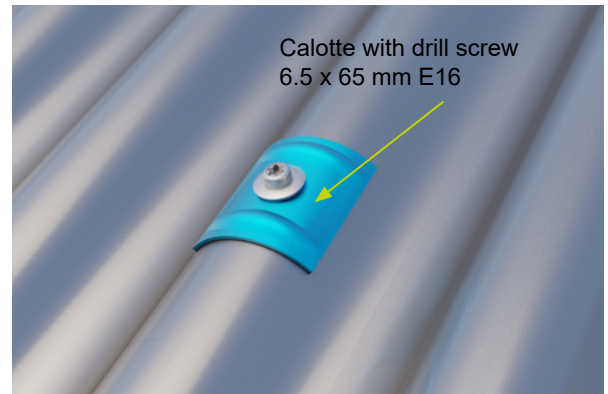
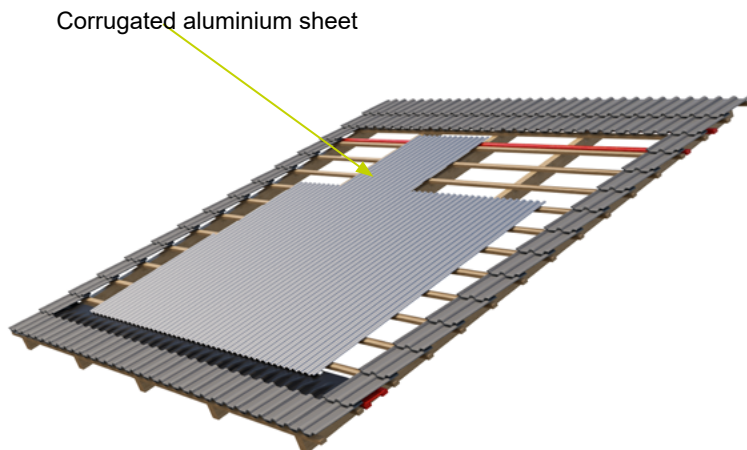
- Lay out the foam profile filler across the entire width of the roof connection tape
- If the product "Metall Roll" is used as roof connection tape, the 20 mm upper adhesive surface can be completely folded over so that the adhesive surface is facing upwards and the profile filler can be glued to the folded-over section



**Leaky construction: If the roof connection tape is not sufficiently covered by the corrugated metal sheet, the roof covering can develop leaks. Start the roof connection tape at least 100 mm above the planned lower edge of the corrugated sheet and provide a further 50 mm up to the edge of the roof tile.**

### 2.8 Laying out the corrugated sheet

- Arrange the corrugated sheets at the lower edge with sufficient overlap over the roof connection tape: provide 100 mm for the foam profile filler (see point 2.7)
- Lay out the corrugated sheets so that the sides end with a wave pointing downwards towards the roof truss

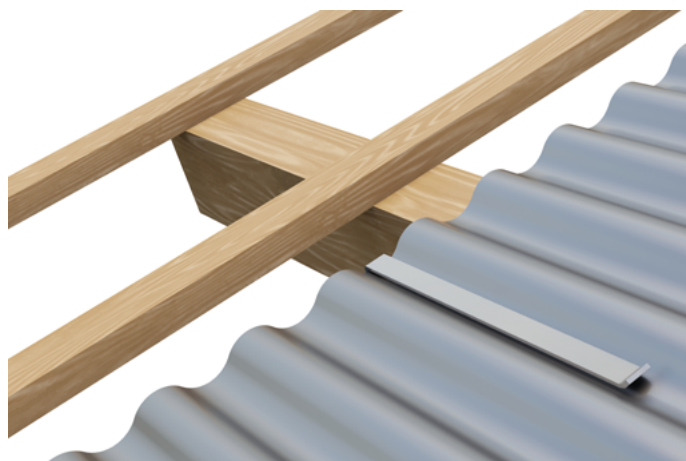
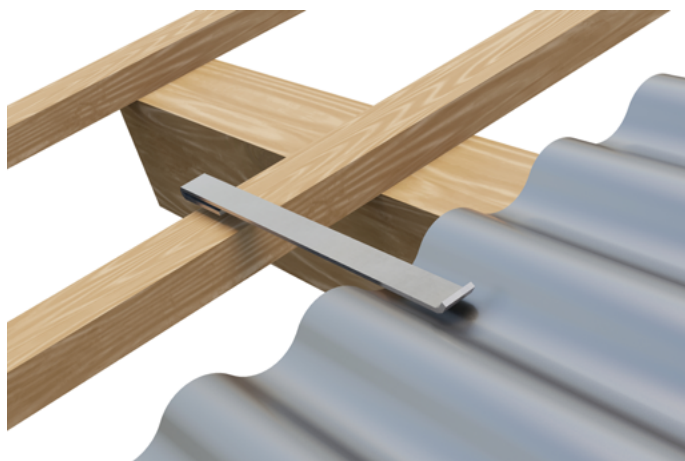


Adapter crosswise, 100 mm



**Leaky construction:** If the corrugated sheets do not have a sufficient overlap, the roof can leak. Overlap the corrugated sheets by at least 200 mm on top of each other and at least 80 mm (= two high beads) alongside each other. Lay the corrugated sheets one after the other from bottom to top and with an overlap at the side according to the main wind direction.

- For normal roof coverings, lay the bottom edge of the lowest row of corrugated sheets parallel to the eaves.
- Arrange the corrugated sheets over the roof connection tape and foam profile filler up to the intended overlap and align the sheets with each other
- At the bottom, install the corrugated sheet along with the adapters (see point 2.9), foam profile filler and side plates to the roof using drill screws 6.5 x 65 mm E16
- Screw the corrugated metal sheets to the roof battens using additional calottes and drill screws 6.5 x 65 mm E16 so that there are at least six fixing points per m<sup>2</sup>. Make sure that the calottes are not placed in the positions of the intended adapters
- Position the corrugated sheets so that the total area corresponds approximately to the module field. If necessary, put in place additional fixings at the overlapping points using calottes and drill screws 6.5 x 65 mm E16.
- In addition, secure the outer edges of the corrugated sheet at intervals of no more than 500 mm with calottes and drill screws 6.5 x 65 mm E16, **but only after the side and cover plates have been installed.**
- **Optional:** To make installation easier, the mounting aid can be used from the second row of sheets onwards. The mounting aid cannot be used for the bottom/upper row, as the height of the corrugated sheet must be adapted to the intended module field height and therefore the 200 mm overlap specified by the mounting aid is exceeded.



**Material damage: Stepping on the corrugated sheet can cause dents or tears. Do not walk or stand on the corrugated sheet. Use a roofing ladder to make installation easier and prevent damage to the corrugated sheet.**

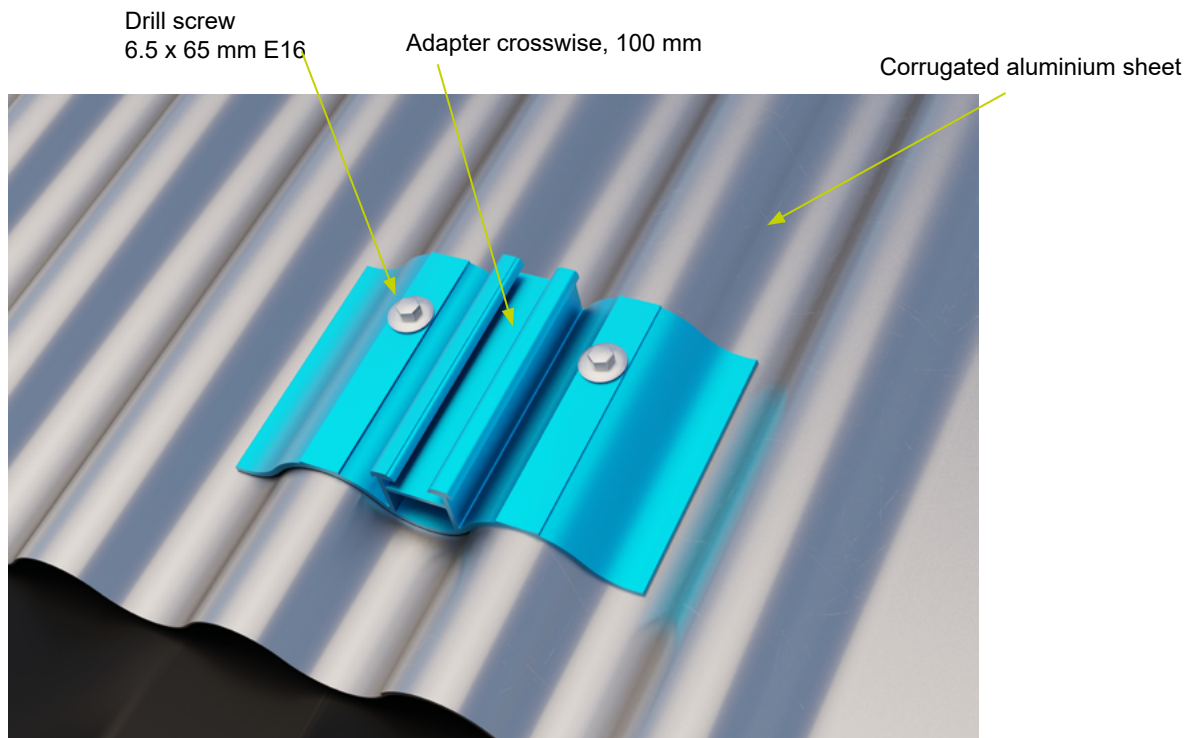
## 2.9 Mounting the adapters

### 2.9.1 Landscape mounting

Always install the adapters from bottom to top. When fitting the adapters, you should regularly ensure that the surface is flat, e.g. using an aluminium straightedge.

#### Mounting the adapters crosswise, 100 mm (at the lower edge of the module field)

- Position short crosswise adapters on the lower edge of the corrugated sheet according to the plans. The adapter holes should point upwards (see detailed image)
- Screw the adapter to the roof batten below using two drill screws 6.5 x 65 mm E16 at the planned positions (see point 2.4.2). Install the corrugated sheet, roof connection tape and foam profile filler at the same time



**Material damage: Stepping on the corrugated sheet can cause dents or tears. Do not walk or stand on the corrugated sheet. Use a roofing ladder to make installation easier and prevent damage to the corrugated sheet.**

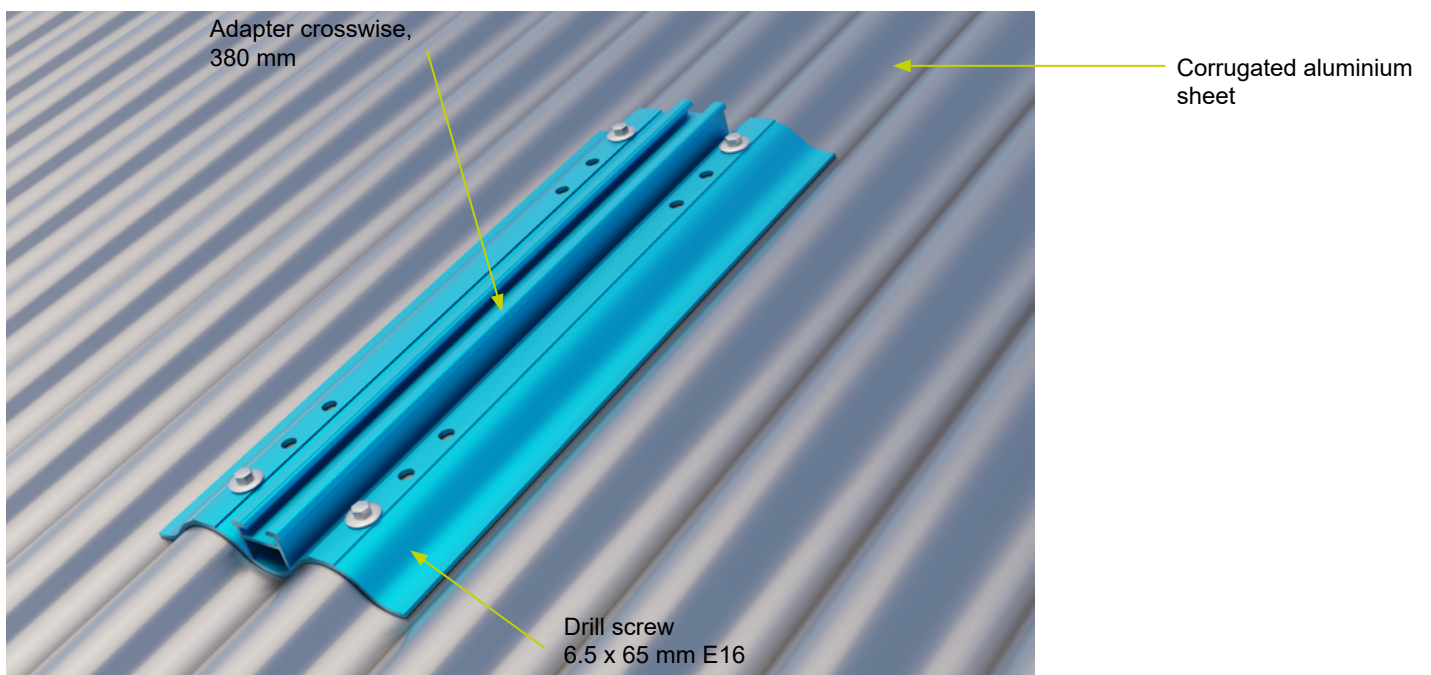


**Material damage: Screws that are not centred on the roof batten can be ripped out. Insert all screws in the centre of the batten.**

#### Mounting the short or long crosswise adapters (in the centre and upper area of the module field)

The long crosswise adapter is used if no new battens have been installed inside or at the top of the module field, otherwise the short adapter can be used. Short adapters must be used for the bottom row of adapters.

- For orientation: Mark the position of the roof battens on the corrugated sheet using a chalk line
- Depending on the layout, screw long or short crosswise adapters onto the roof battens below at the planned locations (see point 2.4.2) using drill screws 6.5 x 65 mm E16. Use the matching holes in the adapter — two for the short and four for the long adapters

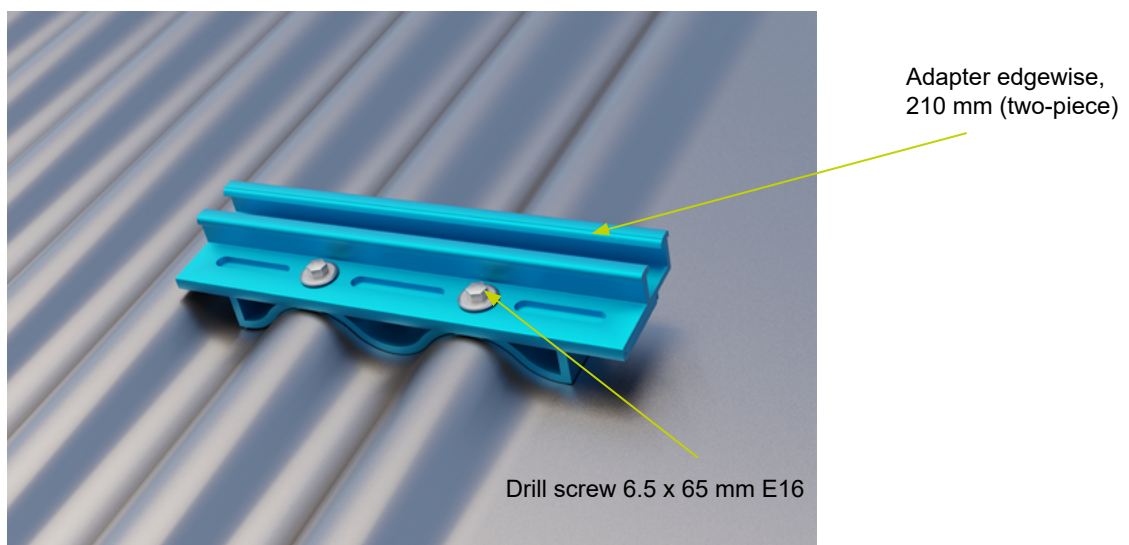


**For landscape mounting, the top cover plate must be installed before the upper adapter row is installed.**

## 2.9.2 Portrait mounting

### Mounting the adapters edgewise, 210mm (in the entire module field)

- For orientation: Mark the position of the roof battens on the corrugated sheet using a chalk line
- Depending on the plans, screw the edgewise adapters onto the roof battens below at the planned locations (see point 2.4.2) using two drill screws 6.5 x 65 mm E16. Use the appropriate holes in the adapter for this purpose. Mount the two parts of the edgewise adapter precisely on top of each other within the module field
- When mounting in the edge area, the perforated strip can be moved laterally by max. 50 mm beyond the base to ensure a clean transition between the roof and the module field



**Material damage: Screws that are not centred on the roof batten can be ripped out. Insert all screws in the centre of the batten.**



**Material damage: Stepping on the corrugated sheet can cause dents or tears. Do not walk or stand on the corrugated sheet. Use a roofing ladder to make installation easier and to avoid damage to the corrugated sheet.**



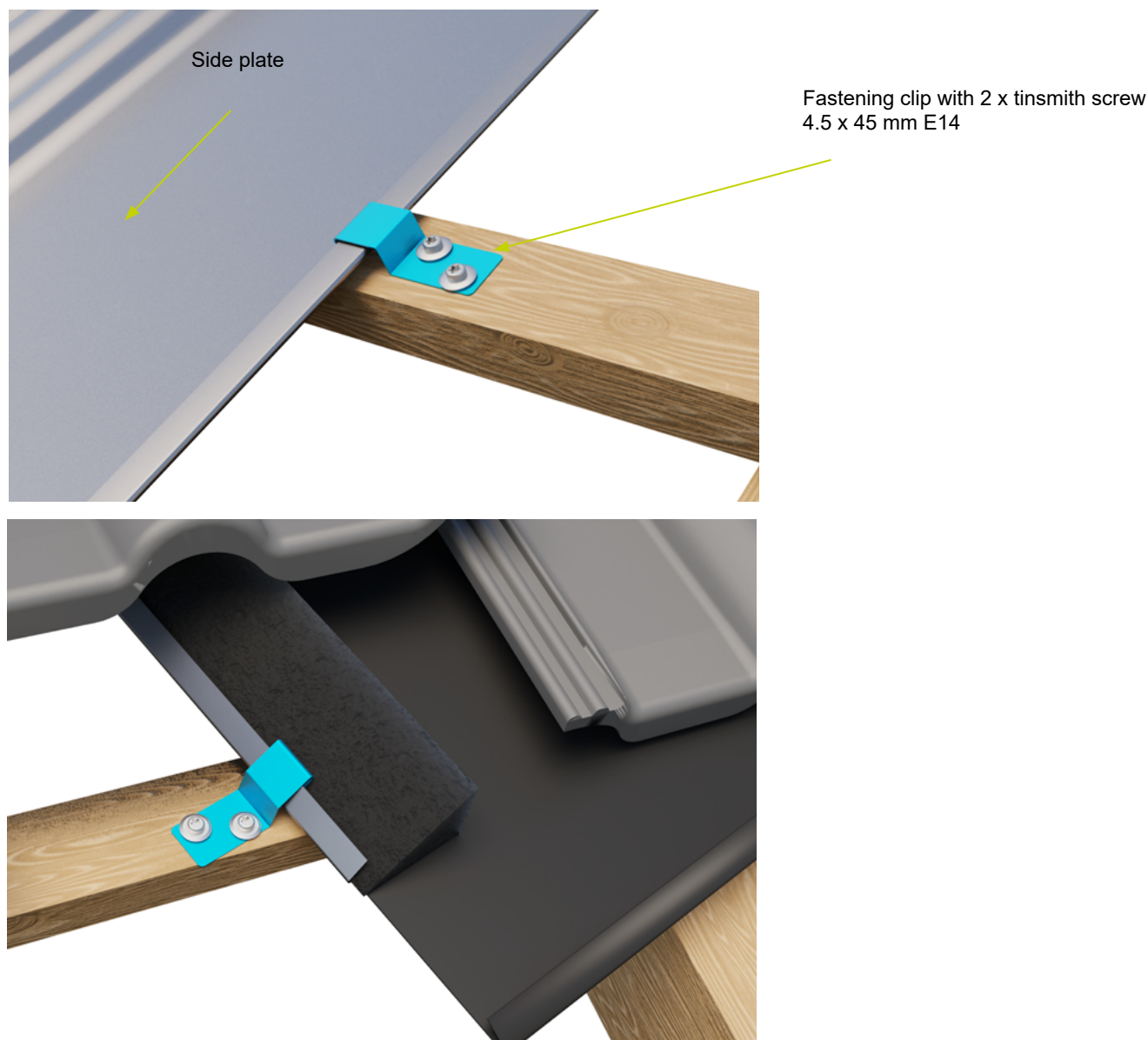
**For portrait mounting, the side plates must be installed before the outer adapters are mounted (see point 2.10).**



**Equipotential bonding of the metal surface must be carried out professionally and without impairing the waterproof properties.**

### 2.10 Installing the side plates

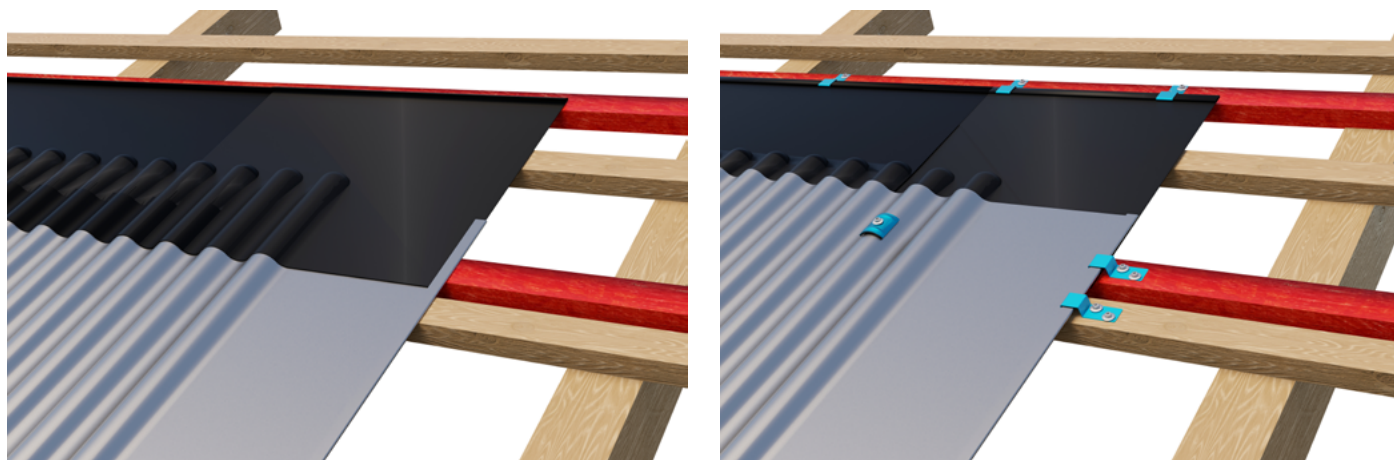
- Position the lowest side plates on the right and left edges of the module field so that the two waves of the plates overlap with the corrugated sheets
- Align the plates at the lower edge of the corrugated sheet
- If using several side plates, allow the top one to overlap by at least 200 mm — if corrugated sheet. The edge plate then covers the uppermost side plate\*
- Fasten the plates on the inside using calottes and drill screws 6.5 x 65 mm E16 or adapters (only for portrait mounting) at intervals of no more than 500 mm
- Fasten the plates on the outside using fastening clips and tinsmith screws 4.5 x 45 mm E14
- Use specialist roofing tools, e.g. folding pliers, to ensure professional overlapping of the corrugated sheets
- As an additional seal, apply the self-adhesive roof valley sealing strip between the side panels and the neighbouring row of tiles



\* When using black components, the coating may chip slightly during manual cutting. This has no effect on the tightness of the system. Ensure that the manually fitted side plate is always covered by the edge plate.

### 2.11 Installing the top cover plates & edge plates

- Allow the second roof batten to protrude slightly beyond the intended edge of the top cover plate to enable the use of fastening clips
- Position the left and right edge plates so that the flat part and the two outer corrugations overlap with the side plate. Push the edge plates down as far as possible
- Continue with the installation of the top cover plates. Ensure that the sheets are aligned and that there is a minimum overlap of at least 80 mm (= two raised beads). Fix the overlap using adapters and drill screws 6.5 x 65 mm E16 (if an adapter needs to be mounted at these points) or using calottes and drill screws 6.5 x 65 mm E16
- Use specialist roofing tools on the upstands of the metal sheets to ensure a clean overlap
- Fasten the upstand to the underlying roof batten at intervals of no more than 500 mm using fastening clips and 2 x tinsmith screws 4.5 x 45 mm E14
- Complete the installation of the top cover plate by securing the corrugated sheet metal section using adapters and/or calottes along with the corresponding drill screws 6.5 x 65 mm E16 at gaps of no more than 500 mm
- **Optionally**, a self-tapping screw with seal and separately available butyl tape can be attached as an additional fastening for the plates in the cover area
- **Optionally**, the separately available foam filler tree cut can be applied as insect protection at the transition between the top plates and the upper row of tiles using double-sided adhesive tape (available separately)



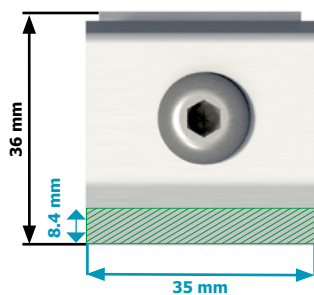
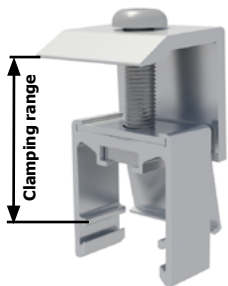


2.12 Instructions for mounting end clamp and mid clamp AK

Clamping range

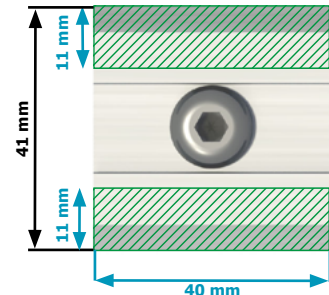
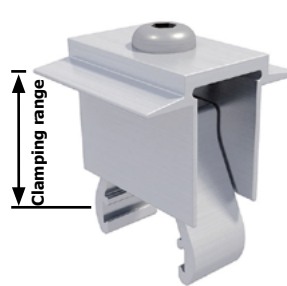
Height-adjustable mid clamps and end clamps with click technology allow for maximum flexibility in the installation of virtually all framed module types with a frame height of 30 – 50 mm. When installing the PV modules to the mounting rail (here adapters), always comply with the installation instructions issued by the module manufacturer.

When fastening using the mid clamp and end clamp, ensure that these clamp onto the module frame over the clamping area defined by the module manufacturer. Every person who installs S:FLEX PV fastening systems is obligated to ensure that the existing clamping areas correspond with the module manufacturer's installation instructions. If the maximum clamping areas of the mid clamps and end clamps are insufficient, it is also possible to obtain the components in different lengths.



Module end clamp (EC)

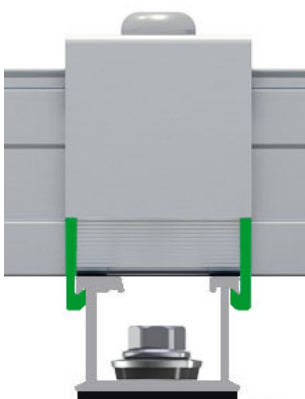
Maximum clamping area EC II:  
 $A = 8.4 \times 35 = 294 \text{mm}^2$



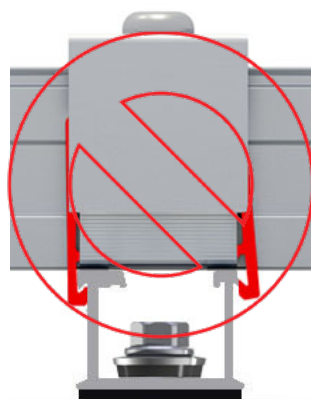
Module mid clamp (MC)

Maximum clamping area MC:  
 $A = 11 \times 40 = 440 \text{mm}^2$  (per side)


End clamp AK



Both sides clicked in



Incorrect

 **Observe the module manufacturer's instructions: Check the defined clamping area.**

 **Mid and end clamps are built for one-off installation. Ensure that mid and end clamps have been clicked in properly.**

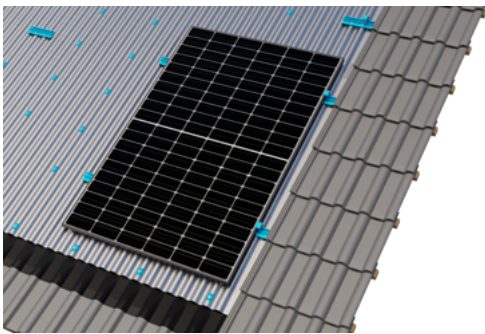


#### 2.13 Module installation

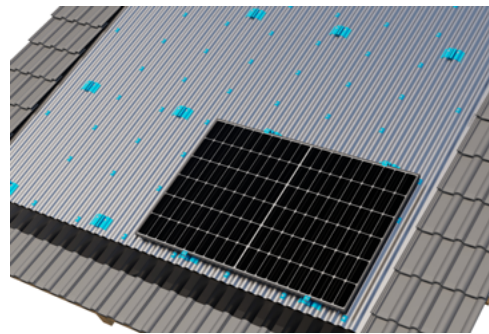
The modules are mounted on the adapters one after the other. The modules are mounted starting from one side. Mid clamps and end clamps are used to install the modules. The end clamps can hold one module each. The mid clamps are positioned between two modules.

The edge modules in the PV system are located on the left and right side for portrait mounting and along the bottom and top for landscape mounting. Each module is installed with two module end clamps.

##### 2.13.1 Module installation, end clamps



Portrait mounting



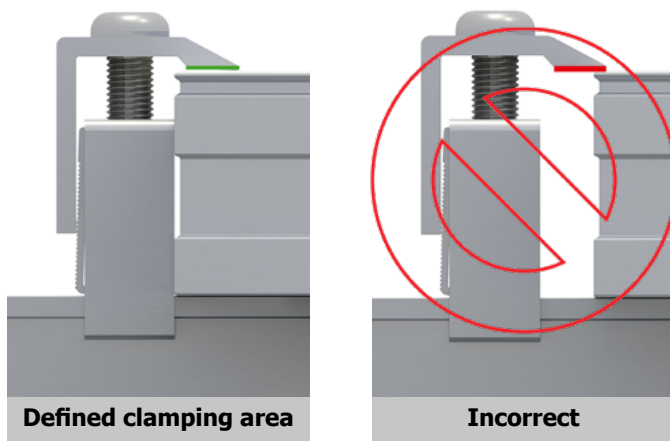
Landscape mounting

##### Installation steps – portrait mounting

- Place an outer module in the desired position and ensure it is aligned. Allow 30 mm of the edgewise adapter to protrude on the outside of the panel
- Click the end clamp onto the adapter and push it so it is flush with the module.
- Ensure that the end clamp is properly engaged on the adapter.
- Now adjust the end clamp to match the height of the module and tighten the screw (torque 8–10 Nm).
- Ensure that the end clamp is clamped around the module frame over the clamping area defined by the module manufacturer.

##### Installation steps – landscape mounting

- Place an outer module in the desired position and ensure it is aligned.
- Click the end clamp onto the adapter and push it so it is flush with the module.
- Ensure that the end clamp is properly engaged on the adapter.
- Now adjust the end clamp to match the height of the module and tighten the screw (torque 8–10 Nm).
- Ensure that the end clamp is clamped around the module frame over the clamping area defined by the module manufacturer.



**End clamps are built for one-off installation. Ensure that the end clamp has been clicked in properly.**

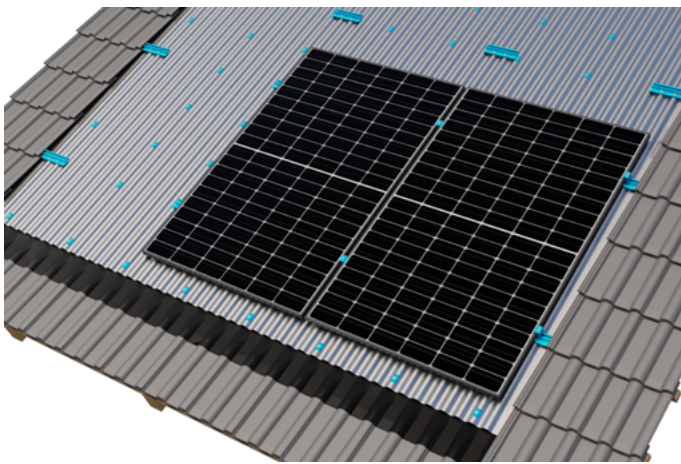


**Install the end clamp.**

#### 2.13.2 Module installation, mid clamp

Two mid clamps are installed between two modules.

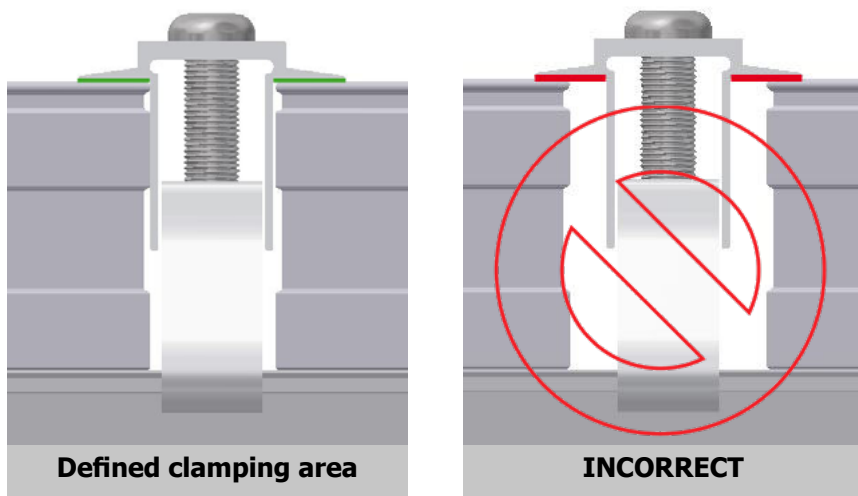
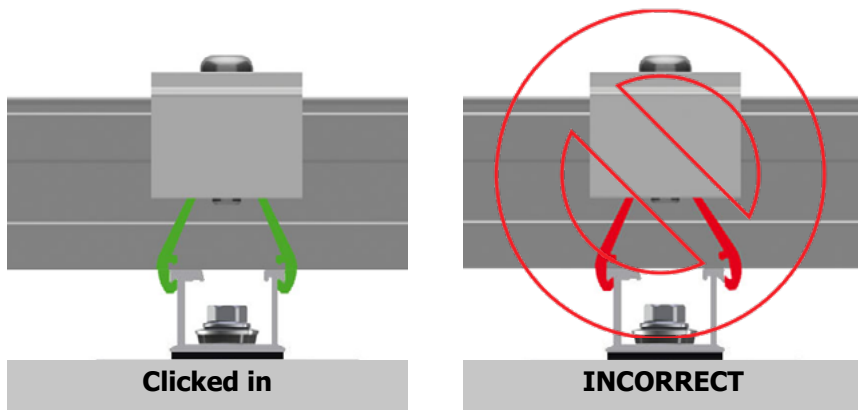
- To do this, click the mid clamp onto the adapter and push it so it is flush with the module.
- Ensure that the mid clamp is properly engaged on the adapter.
- Now slide the next module underneath the mid clamp, adjust the mid clamp to the height of the module's frame and tighten the screws (tightening torque 8–10 Nm).
- Maximum permissible gap between two modules: 20 mm





**Material damage due to incorrect assembly: Incorrectly installed modules may fall down and get damaged. Make sure it has correctly engaged. Slide the module all the way up to the mid clamp. Observe the specified tightening torque of at least 8 Nm when tightening the screw. After installation, check that both modules are securely in position.**

**Mid clamp AK**

Ensure that the mid clamp grips both of the module frames over the clamping area defined by the module manufacturer.



 **Mid clamps are built for one-off installation. Ensure that the mid clamp has been clicked in properly.**

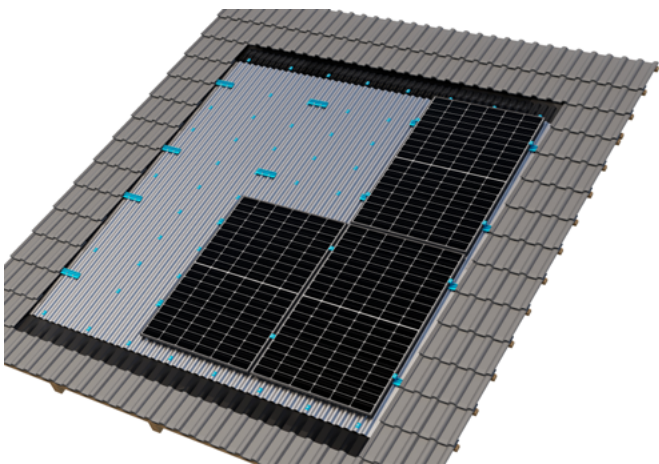
 **Observe the module manufacturer's instructions: Check the defined clamping area.**

 **Install mid clamp.**

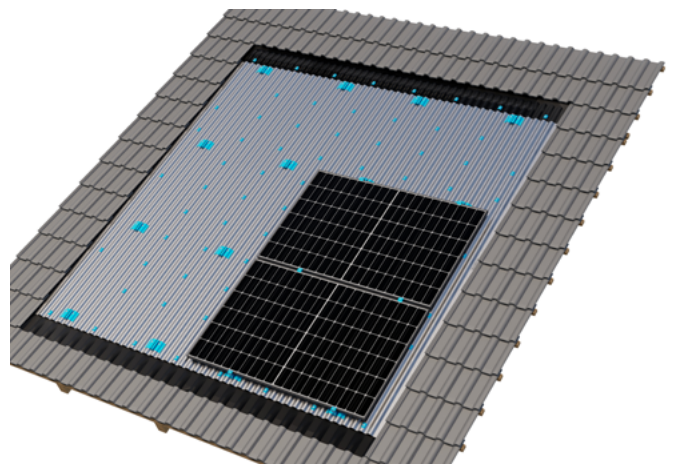


#### 2.13.3 Module installation, end clamp on row end

- End clamps must be installed on the final module in each row (if applicable, on expansion joints).
- To do this, click the end clamp onto the adapter and push it so it is flush with the module.
- Ensure that the end clamp is clicked onto both sides of the adapter.
- Now adjust the end clamp to match the height of the module and tighten the screw (torque 8–10 Nm).
- Ensure that the end clamp clamps the module frame over the the clamping area defined by the module manufacturer.
- Proceed as described for the following rows.



Portrait mounting



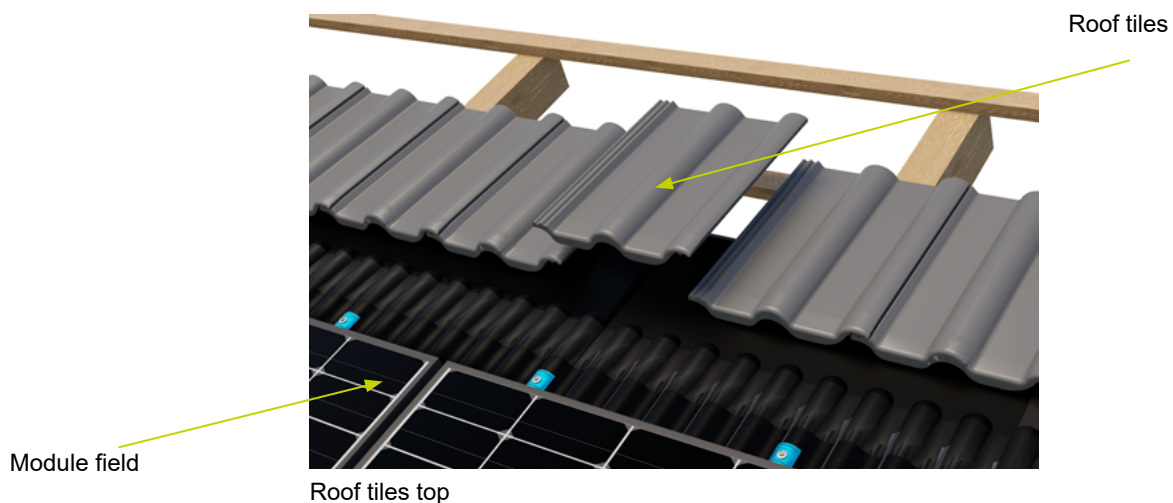
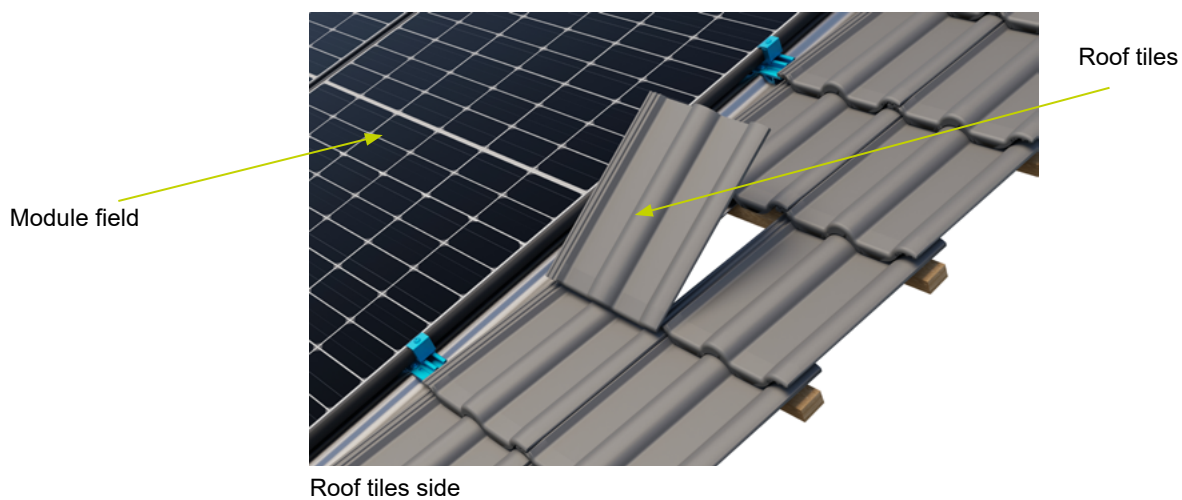
Landscape mounting



**Use e.g. a mid clamp as a spacing gauge. This will enable you to achieve identical horizontal and vertical spacing.**

### 2.14 Re-roofing

- Re-cover the roof tiles around the module field
- Depending on the module area and roof covering, it may be necessary to cut the neighbouring roof tiles to size
- If it is necessary to trim the roof tile mounts, an additional professional fastening must be put in place
- Depending on the roof covering, a gap may remain between the tile and the side plate or top cover plate. If this is the case, it must be professionally sealed to prevent the ingress of snow or insects (e.g. using the separately available foam filler tree cut)



**Leaky construction: If the roof tiles do not overlap sufficiently with the cover plates, the roof may develop leaks. Place the roof tiles over the top cover plates up to the edge of the module field.**

### 3.1 Disassembly

Disassembly of the S:FLEX mounting system may only be carried out by trained specialist personnel. Observe the same safety instructions, standards and guidelines as provided for the installation.

In general, disassembly is carried out in reverse order to the described installation.



**Before disassembly, disconnect the PV modules from the mains network. Disconnect all of the PV modules' electrical cables (string lines and plug connectors) and remove them from the frame system.**



**Improper disassembly can lead to damage to the modules.**

- Remove the modules and store them safely.
- Disassemble the frame system and safely store all of the parts.
- Check the roof surface and roof covering for damage. Any damage must be repaired professionally to prevent water ingress and consequential damage. Any damaged tiles must be replaced, any drill holes in the sheet metal sealed, and any openings in the roof cladding closed.



**Disassemble frame system and safely store all of the parts. Any holes in the roof must be sealed by a specialist.**

### 3.2 Disposal

The S:FLEX mounting system is made from aluminium, stainless steel and steel components. These materials can be recycled after disassembly.

The frame system must only be disposed of by a specialist waste management company. Observe the applicable national standards and guidelines.

### 4.1 Utilisation agreement

We expressly point out that the assembly system is sold under a purchase agreement. Its installation/processing or acquisition by a third party is not carried out in the name of, or on behalf of, S:FLEX GmbH. Installation/processing of the system must be carried out by appropriately qualified personnel and strictly in accordance with the installation instructions.

The design and planning of the system must be carried out using the S:FLEX planning tool. S:FLEX GmbH is neither responsible for the project-specific structural analysis of the roof structure, nor for obtaining and documenting the approval of the roof manufacturer for use of the respective fastening systems on the roof in question (in the terms of the warranty), nor for correct installation of the fastening system.

S:FLEX GmbH accepts no liability for faults and damage and/or a restricted or limited operational capability of the system which has resulted from incorrect installation and/or installation which was not carried out in accordance with the installation instructions and/or the project report. In the case of incorrect installation, the buyer's right to assert claims for material defects shall expire.

The system warranty is only valid if all system components were acquired from S:FLEX GmbH.

### 4.2 Warranty / disclaimer

The information regarding dimensioning provided in these instructions is merely suggested values based on prior experience. Binding structural analyses for installation frames can be created using the S:FLEX planning tool.

As an installation company, you are responsible for the correct execution of the installation. S:FLEX GmbH is not liable for the dimensional information contained in commercial system quotations.

As the installation company, you are responsible for the mechanical durability of the installed interface connections on the building envelope, in particular also for their watertightness. The components supplied by the company S:FLEX GmbH are designed for the expected loads and in accordance with the currently available technology.

In this context, you must provide the company S:FLEX GmbH with information about all general technical conditions in writing via the project data collection sheet (information about the supporting structure, snow load zone, building heights, wind loads, etc.).

S:FLEX GmbH is not liable if the installed components are not properly handled. Any use close to the sea needs to be clarified with S:FLEX GmbH directly on a case-by-case basis due to the increased risk of corrosion. Provided that the system is handled properly and dimensioned according to the structural conditions and normal environmental and ambient conditions, the company S:FLEX GmbH provides a warranty from transfer of risk to the warranty holder, which guarantees that the metallic components of the racks will remain free from defects with regard to material and workmanship for a period of 10 years. This warranty does not apply to wear parts. For additional information, please refer to the separate warranty provisions.

This applies within the context of the generally prevalent weather and environmental conditions.