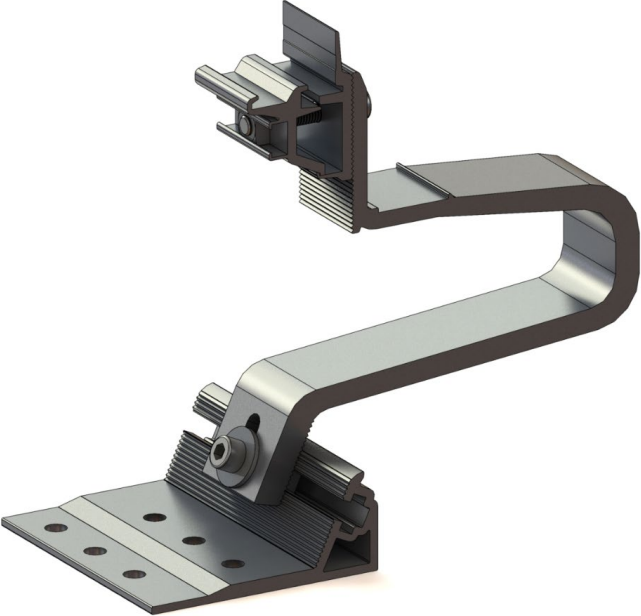


# Q.MOUNT INSTALLATION INSTRUCTIONS TILED ROOFS



Please carefully read the safety information contained in these installation instructions before starting the installation. Ensure that you are using the current installation instructions before starting the installation.

The design and planning of the mounting system should be carried out using the Q CELLS ROOFTOP PLANNER software. Please refer to the project report you receive from Q CELLS ROOFTOP PLANNER or from your Q CELLS Q.PARTNER for details of the required materials, positions and the arrangement of the individual components. This data is statically calculated and is of great importance for the safe and proper functioning of the system.

Before installation, the manufacturer of the photovoltaic system must ensure that the given roof substructure is designed for the additional loads that will occur. To check this, contact structural engineers directly on site. Each photovoltaic system must be installed in accordance with the structural requirements of the location and the installation situation, taking into account the specifications of the existing installation recommendation.

These installation instructions explain the installation procedures for the Q.MOUNT corrugated sheet metal bridges, their attachment to the roof substructure and the installation of the girder profiles and modules.

The corrugated sheet metal bridges must always be fixed to the stable roof substructure.

Normally, the PV modules are mounted in portrait format so that the mounting profiles are parallel to the ridge. Two mounting profiles per module row are used as standard. In strong wind and/or snow loads, a third mounting profile may have to be used.

The Q.MOUNT corrugated sheet metal bridge system is exclusively designed for PV modules. Any other use is considered improper.

The installation may only be carried out by trained specialists. In particular, work on the roofing should be carried out by a roofer.

If you have any further questions, take advantage of the professional and comprehensive consulting service offered by Q CELLS. Our expert civil engineers and construction technicians will be pleased to help you.

You should follow these instructions exactly for all work on the PV system. Installation, commissioning, maintenance and repair may only be carried out by appropriately qualified and authorised personnel.

Please observe the valid regulations and safety instructions.

## You must comply with these accident prevention regulations:

- BGV A 1 – General regulations
- BGV A 3 – Electrical installations and equipment
- BGV C 22 – Construction work (personal protective equipment against falls from a height)
- BGV D 36 – Ladders and steps
- Employer's liability insurance association rules for safety and health at work BGR 203 (roof work) and DIN EN 516 Equipment for walking on roofs
- Work clothing and work safety regulations in accordance with the regulations of the professional association

## You must comply with the following DIN standards:

- DIN 18299 – General regulations for construction works of any kind
- DIN 18338 – Roofing and roof sealing works
- DIN 18360 – Metal construction work, locksmith work
- DIN 4102 – Fire behaviour of building materials and components



Work on the systems may only be carried out by authorised personnel. The operator of the system has the following safety-related obligations:

We assume that at least once a year an inspection and maintenance of the installed pitched roof system components and the roof cladding is carried out. At least the following points should be checked:

- all mechanical connections for correct fit and strength
- the position of the system on the roof and the system itself with regard to deformations
- the cabling must be checked for integrity
- the PV modules must be checked for damage
- The assembly of the frame may only be carried out by personnel with appropriate qualifications, manual skills and basic knowledge of mechanics.
- It must be ensured that the assigned personnel are able to assess the work assigned to them and identify possible hazards.
- The installation instructions are part of the product and must be available during assembly.
- It must be ensured that the installation instructions – and in particular the safety instructions – are read and understood by the assigned personnel prior to assembly.
- The regulations of the employer's liability insurance association, the local industrial safety regulations and the rules of technology must be observed.
- Suitable lifting equipment and ladders must be used for the installation. No lean-to ladders may be used.
- It is necessary to have the existing building statics checked by a competent civil engineer with regard to the additional loads from a PV system.
- Possible general load limitations imposed by Hanwha Q CELLS GmbH (e.g. the necessity of snow removal to limit the snow load) must be taken into account.



## WARRANTY/PRODUCT LIABILITY (EXCLUSION)

The dimensioning notes contained in this manual are merely practical tips. Binding assembly rack statics can be created using the program **Q CELLS ROOFTOP PLANNER**.

As an installation company, you are responsible for the correct execution of the installation. **Hanwha Q CELLS GmbH** is not liable for the dimensioning information contained in commercial plant quotations.



As an installation company, you are responsible for the mechanical durability of the mounted interface connections on the building envelope, and especially for their tightness.

The components supplied by **Hanwha Q CELLS GmbH** are designed for this purpose in accordance with the expected loads and the current state of the art. In this context, you must specify all general technical conditions in writing in the project registration form (details of the supporting structure, snow load zone, building heights, wind loads, etc.) within the framework of the inquiry/order sent to **Hanwha Q CELLS GmbH**.

**Hanwha Q CELLS GmbH** is not liable for improper handling of the installed parts.

Use of the components near the sea is not permitted due to the risk of corrosion.

If handled properly and dimensioned in accordance with the static framework conditions and normal environmental and ambient conditions, **Hanwha Q CELLS GmbH** provides a 2-year product warranty for the service life and durability of its mounting systems. This applies in the context of the generally prevailing weather and environmental conditions.

Material and processing warranty: **Hanwha Q CELLS GmbH** provides a material and processing warranty of 10 years for the materials used. For more detailed information, please refer to the separate warranty conditions.



## NOTES ON ELECTRICAL INSTALLATION

You may only carry out electrical work if you are a qualified electrician. The applicable DIN standards, VDE regulations, VDEW guidelines, VDN guidelines, accident prevention regulations and the regulations of the local electricity supply companies (EVU) are decisive in this context.

- DIN VDE 0100 (Erection of power installations with nominal voltages up to 1000 V)
- VDEW guideline for the parallel operation of in-house generation plants on the low-voltage grid of the power supply company
- VDI 6012 Guideline for decentralised energy systems in buildings: Photovoltaics
- Leaflet on the VDEW Guideline "Distributed power generating plants connected to the low-voltage grid"
- VDN guideline "Distributed power generating plants connected to the low-voltage grid"
- DIN/VDE regulations, DIN/VDE 0100 "Erection of power installations with rated voltages up to 1000 V", in particular VDE 0100 Part 410 "Protection against direct and indirect contact" (DC voltages > 120 V, < 1000 V DC) and the "Accident prevention regulations of the industrial employers' liability insurance associations" VBG4 "Electrical installations and operating equipment"
- DIN VDE 0100-540 Selection and installation – Earthing, protective conductors and equipotential bonding conductors
- VDE 0185 Establishment of a lightning protection system and VDS 2010



Solar modules generate electricity as soon as they are exposed to light, so they are always live. Although the fully insulated plug contacts provide protection against accidental contact, you must pay attention to the following when handling the solar modules:

- Do not insert electrically conductive parts into the plugs and sockets.
- Do not mount solar modules and cables with wet plugs and sockets.
- Perform all work on the lines with extreme caution.
- Do not carry out any electrical installation work in damp conditions.
- Even with low illumination, very high direct voltages are generated at the series connection of solar modules, which are life-threatening if touched. Pay particular attention to the possibility of secondary damage from electric shock. DIN VDE 0100-540 Selection and erection of electrical equipment - Earthing arrangements and protective conductors.



High contact voltages can occur in the inverter even when it is disconnected:

- Be especially careful when working on the inverter and the cables.
- After switching off the inverter and carrying out other work, it is essential to observe the time intervals specified by the manufacturer to allow the high-voltage components to discharge.
- Please also observe the installation instructions provided by the inverter manufacturer.



Opening a closed string (e.g. when disconnecting the DC line from the inverter under load) can cause a lethal electric arc:

- Never disconnect the solar generator from the inverter while it is connected to the grid.

## NOTES ON RACK INSTALLATION



For installation in the roof area, you must observe the currently valid rules of construction engineering, in particular the requirements formulated in the DIN standards and in the regulations of the German roofing trade ("Regelwerk des Deutschen Dachdeckerhandwerks").

- Check that all screw connections are tight.
- Observe the specified torques.
- Irrespective of verifiable statics, you must ensure in advance of each installation that the product meets the static requirements on site in accordance with DIN EN 1991.
- DIN standard EN 1991 "Actions on structures" – and all related national application documents  
Part 1-1: Weights, dead weight and payloads in building construction  
Part 1-3: Snow loads  
Part 1-4: Wind loads
- DIN standard EN 1990: "Basis of structural design" – and all related national application documents.
- The design of the assembly rack is carried out in accordance with DIN EN 1993 "Design of steel structures" and DIN EN 1999 "Design of aluminium structures".
- Ensure that the substructure is suitable in terms of load-bearing capacity (dimensioning, state of preservation, suitable material characteristics), load-bearing structure and other layers affected by this (e.g. insulation layer).
- Make sure that the drainage of rainwater is not hindered.
- Take into account aspects of building physics (e.g. possible condensation when penetrating insulation layers).



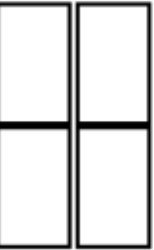
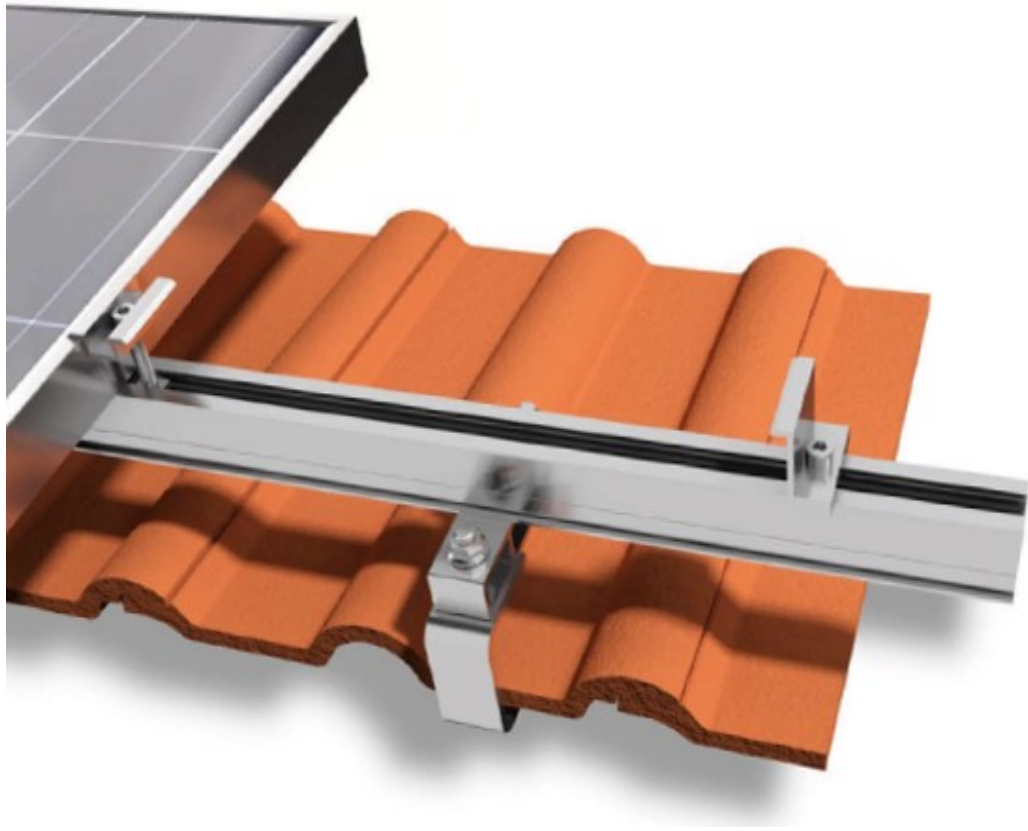
## STANDARDS AND GUIDELINES

All listed standards and guidelines have been issued and are applicable in Germany. They must be taken into account by referring to the latest valid version as amended. Outside Germany, please also observe the relevant national standards and guidelines.

## PRODUCT LIABILITY

The technical documentation is part of the product. Hanwha Q CELLS GmbH is not liable for damages resulting from non-observance of the installation instructions, in particular the safety information, and/or from misuse of the products.

# ROOF HOOK INSTALLATION - TILE, PLAIN TILE, SLATE



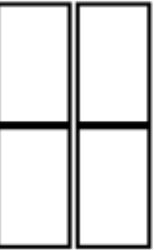
**Note:**

The clamping ranges and the resulting loads are specified in the installation instructions for the modules used.

Do not use the roof hooks and girder profiles as climbing aids or ladders!



# REQUIRED TOOLS



Cordless screwdriver with bits, WS8, hexagon 6



Torque wrench



Measuring tape



Chalk line

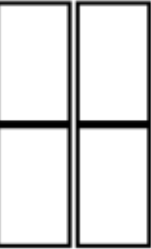


Spirit level



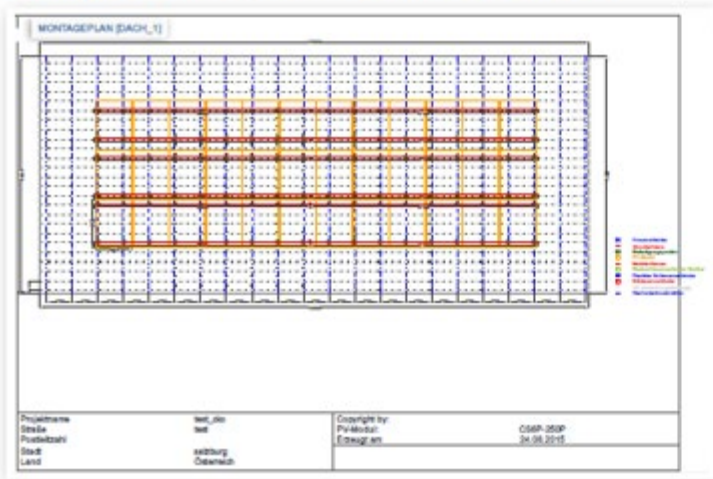
Allen key WS6

- **Use:** Tile; plain tile, slate
- **Module type:** framed modules
- **Module orientation:** vertical/horizontal
- **Max. module field length:** 12 m
- **Roof pitch:** 10°-65 °
- **Connection:** Plate-head screws
- **Material:** Aluminium EN AW-6063/stainless steel
- **Surface:** plate-finished
  
- **Torque:** 15 Nm (M8)  
30 Nm (M10)

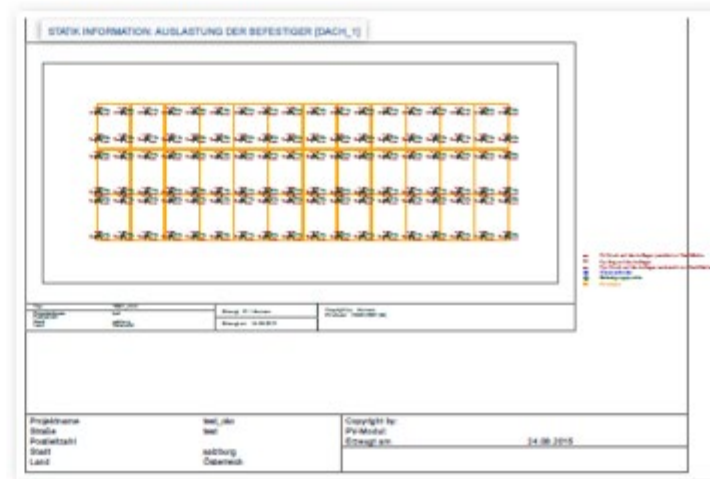


## Additional required documents

CAD-layout and statics-plan from Q CELLS ROOFTOP PLANNER



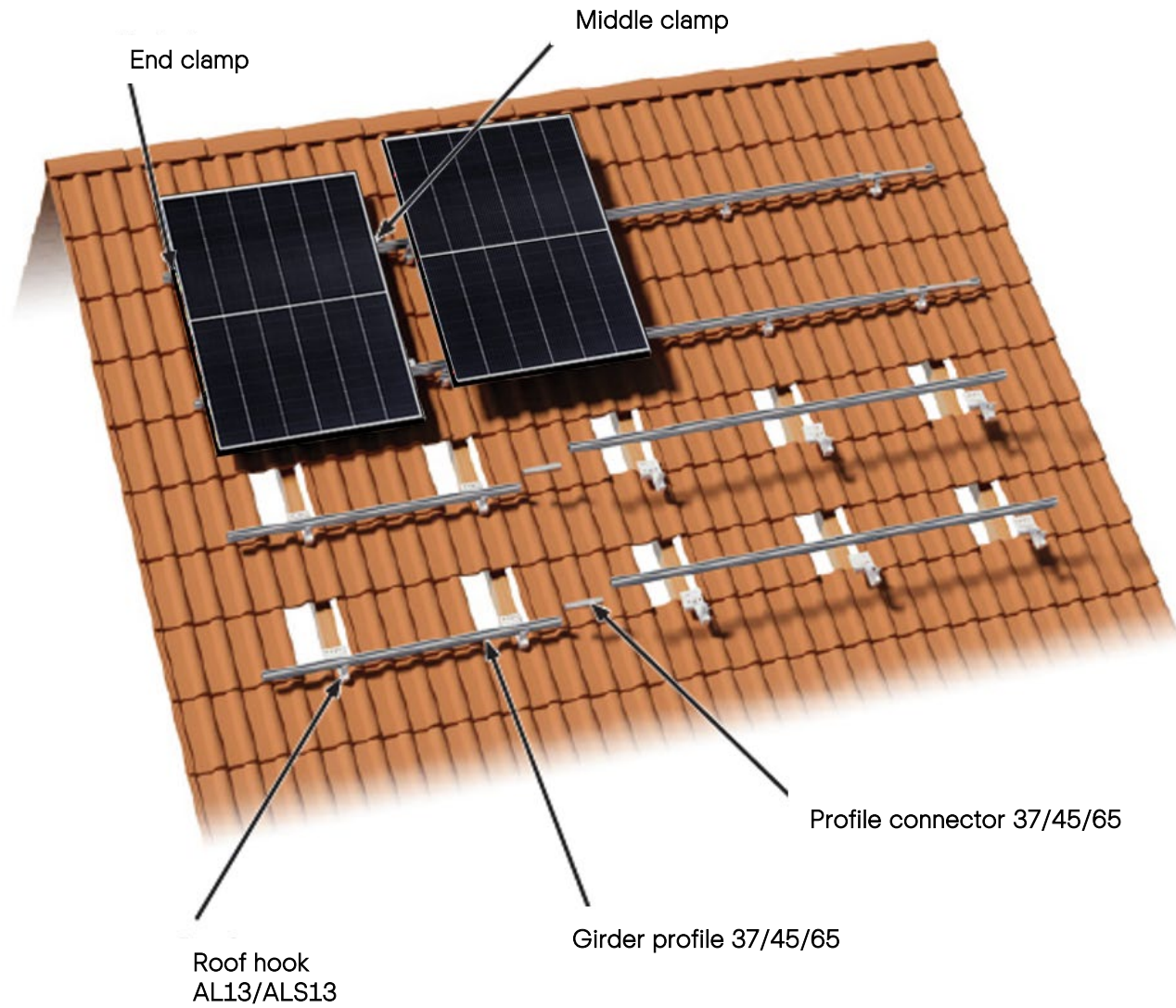
CAD-Plan



Statics



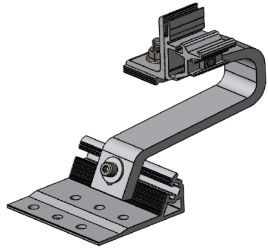
# VERTICAL MODULE MOUNTING - SINGLE LAYER



# TILED ROOF COMPONENTS



**Q.MOUNT**  
Roof hook  
AL 13/ALS13/ AL12



**Q.MOUNT**  
Roof hook  
AL13 X



**Q.MOUNT**  
Girder profile  
37/45/65



**Q.MOUNT**  
Click middle clamp



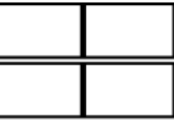
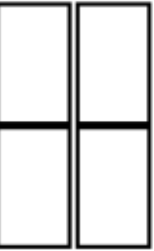
**Q.MOUNT**  
Click end clamp



**Q.MOUNT**  
Click middle clamp  
with PIN



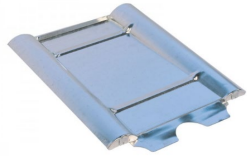
**Q.MOUNT**  
Click end clamp  
with PIN



**Q.MOUNT**  
profile connector  
37/45/65



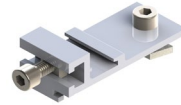
**Q.MOUNT**  
shim



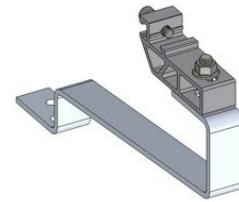
**Q.MOUNT**  
Sheet metal tile



**Q.MOUNT**  
Plate-head screw



**Q.MOUNT**  
Cross connector



**Q.MOUNT**  
roof hook for plain tile  
with quick assembly



**Q.MOUNT**  
Sheet metal plain tile



**Q.MOUNT**  
Roof hook for slate



**Q.MOUNT**  
Edge clip KC1 incl.  
cable clip



**Q.MOUNT**  
wire clamp 8-10



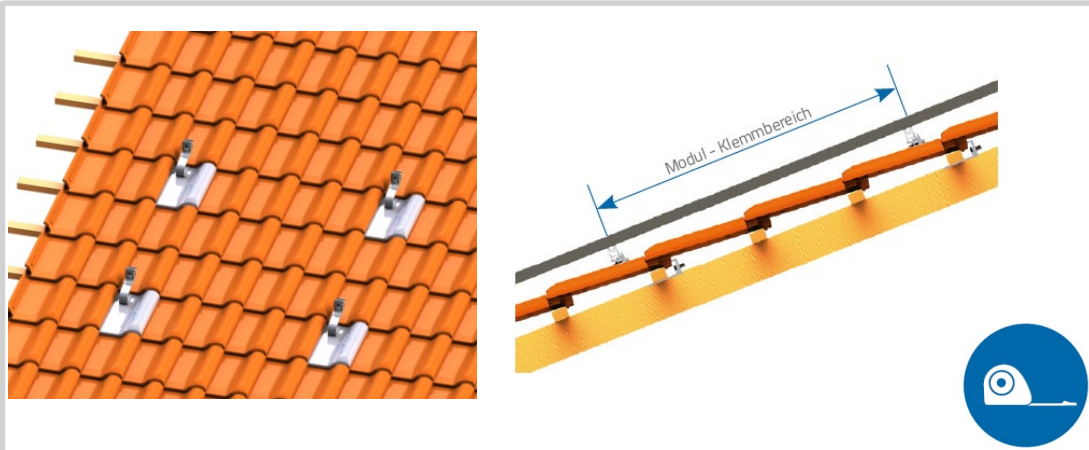
**Q.MOUNT**  
Round wire (8 mm)



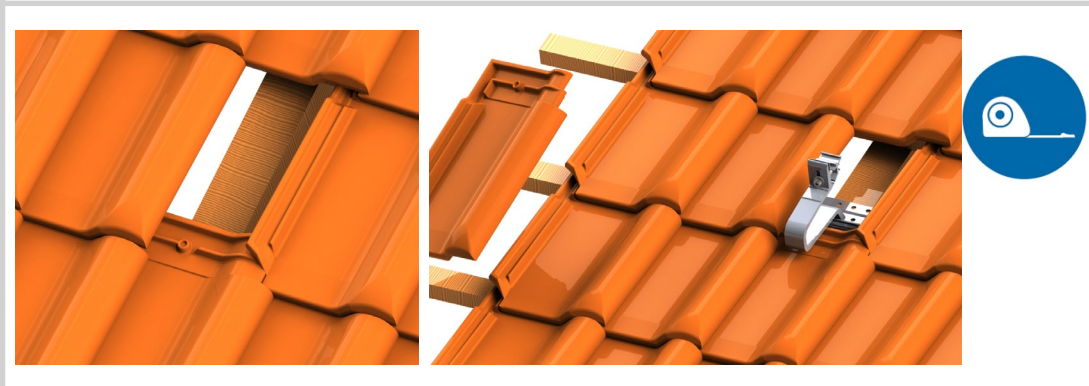
**Q.MOUNT**  
End cap QC



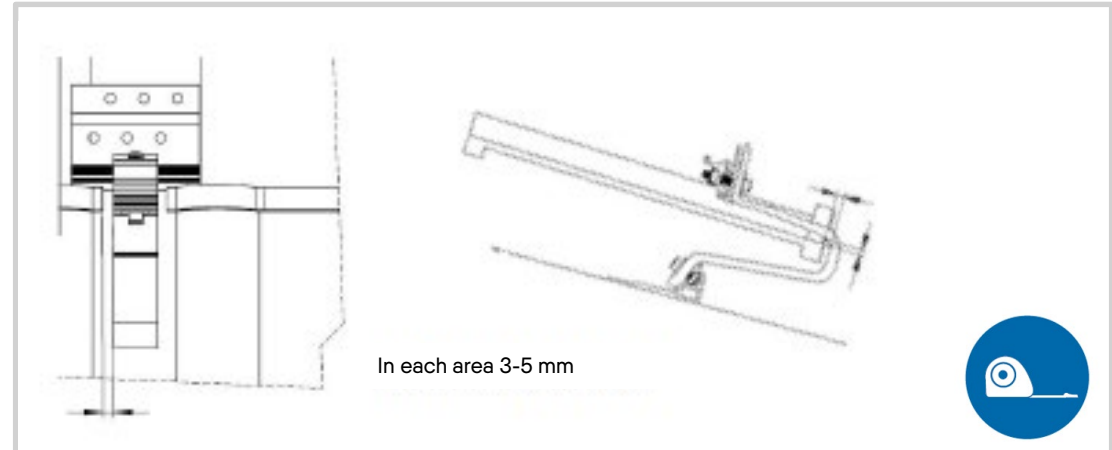
# REMOVE ROOF TILES AND FIX ROOF HOOKS



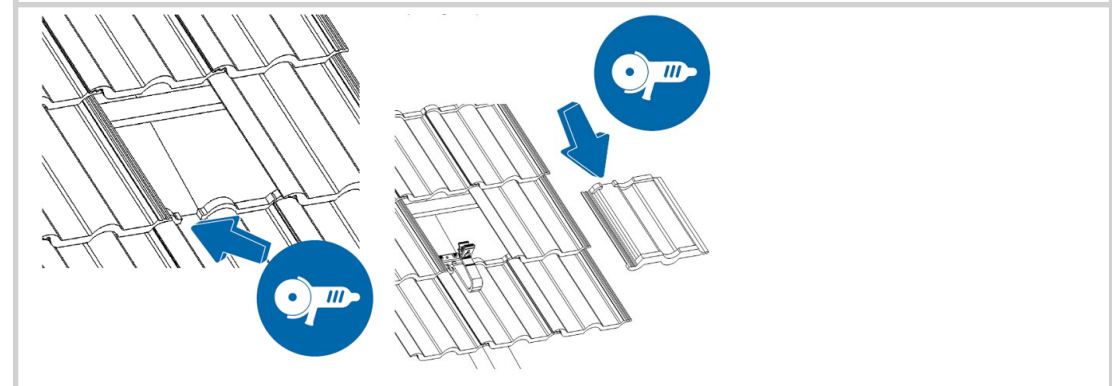
- Measure and mark the roof tiles to be removed according to the ROOFTOP PLANNER and the corresponding module clamping areas
- Enlist the help of a roofer for roof work.



- Remove the corresponding roof tiles above the rafter.
- Place the roof hook on the rafter so that the roof hook is in the valley of the corrugation of the tile underneath with the appropriate spacing.
- The roof hook must never rest directly on the tile surface (3-5 mm distance).



- Keep a distance in horizontal and vertical direction to the roof tile of 3-5 mm each.
- The roof hook must never rest directly on the tile surface (3-5 mm distance).
- To maintain the correct distance, use the adjustment possibilities of the bracket. To do this, loosen the screw between the bracket and the base plate, position it correctly and tighten the screw again accordingly (15 Nm).



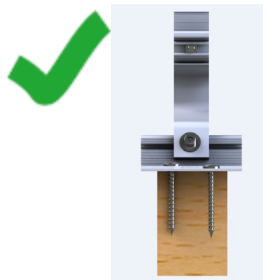
- If necessary, parts of the lip of the roof tile underneath or above must be removed with an angle grinder (diamond blade).
- Always ensure that the roof is watertight.
- Never grind into the tile itself, this will invalidate the roof tile manufacturer's warranty and increase the risk of roof leaks.
- Always check an alternative use of metal roof tiles in our portfolio.



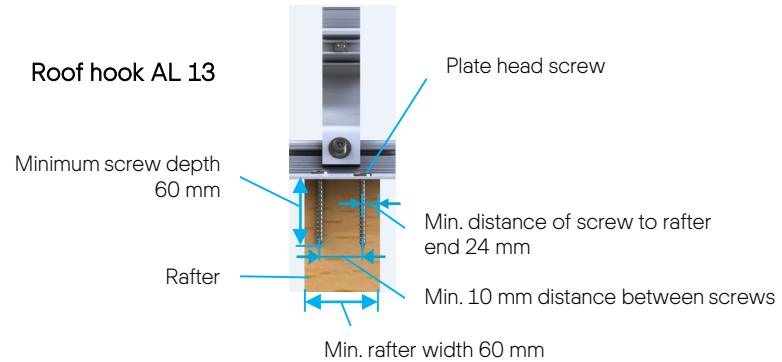
# FASTEN ROOF HOOKS TO RAFTERS



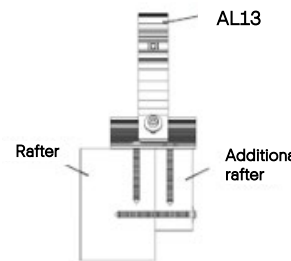
- Screw the roof hook into the rafter according to the following requirements with 2 plate-head screws.
- If necessary, use the shim to ensure full contact with the rafter.
- Align the roof hooks and the quick-mounting adapter with the help of a cord.



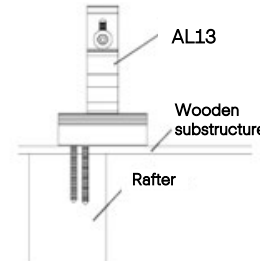
- Ensure that the base plate of the roof hook is fully supported.
- Level out any unevenness with the spacer plate.
- Use additional rafters or counter battens or wooden boards to ensure a full surface of the base plate (option 1, 2, 3).



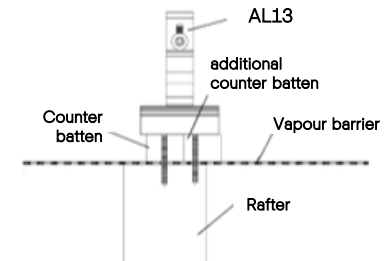
- Minimum rafter width: 60 mm
- Min. distance of the screws to the rafter end: 24 mm
- Minimum distance between the screws: 10 mm
- Minimum screw-in depth into the rafters: 60 mm



Option 1

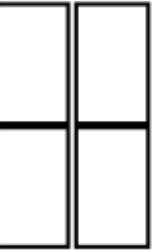


Option 2



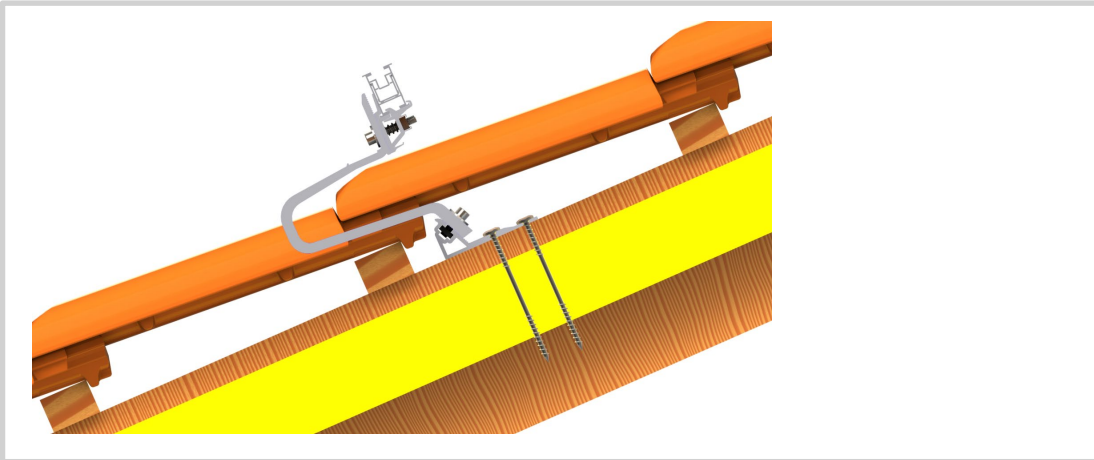
Option 3

- Ensure that the base plate of the roof hook is fully supported.
- Level out any unevenness with the spacer plate.
- Use additional rafters or counter battens or wooden boards to ensure a full surface of the base plate (option 1, 2, 3).

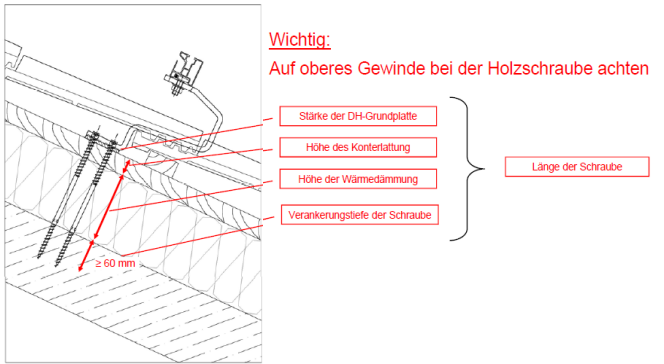




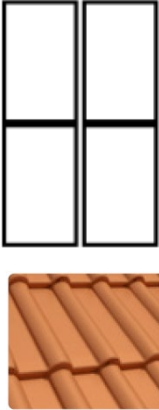
# FASTENING ROOF HOOKS TO RAFTERS



In the case of above-rafter insulation, wood screws with upper thread must be provided and used on site. The length of the wood screw is calculated by the sum of the thickness of the roof hook green plate of the roof hook, the thickness of the counter-battening, the height of the thermal insulation and the 60 mm anchoring depth in the rafter.



Length of the wood screw (incl. upper thread):  
 Thickness of DH base batten  
 +Height of the counter-battening  
 +Height of the thermal insulation  
 +60 mm anchorage depth in the rafters

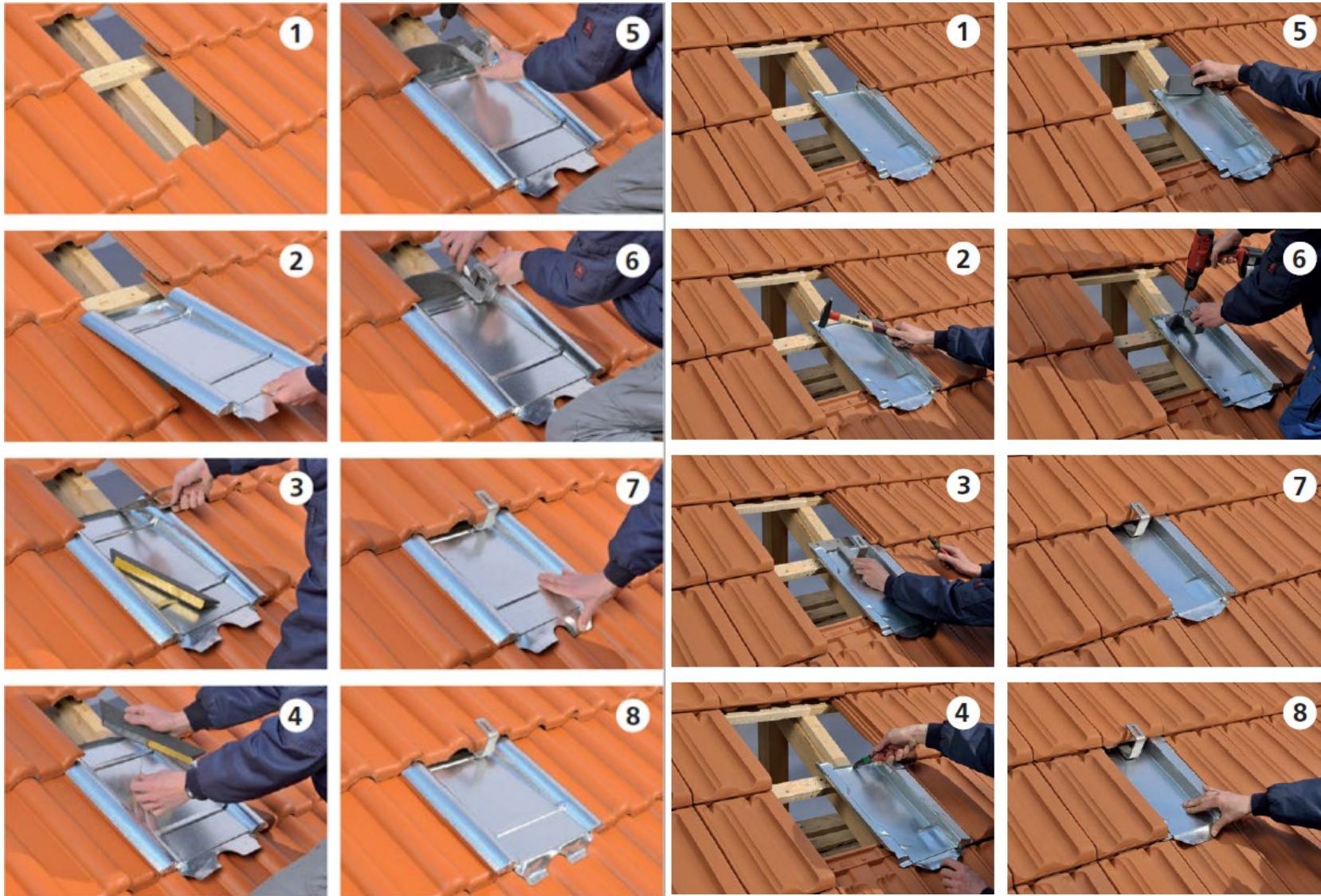


- Reposition the removed and processed roof tiles or used sheet metal tiles.
- Properly again.
- Make sure that the roof is watertight.





# METAL ROOF TILE TYPE CLAY AND CONCRETE



## Original underlay plates Marzari – type clay / type concrete

1. a) Provide support, if necessary insert roof batten  
b) Insert metal roof plate
2. Secure with nail if necessary
3. Determine and position for roof hooks
4. If necessary, flatten the edge slightly towards the bottom
5. Glue the foam wedge and cut it as described in the separate instructions

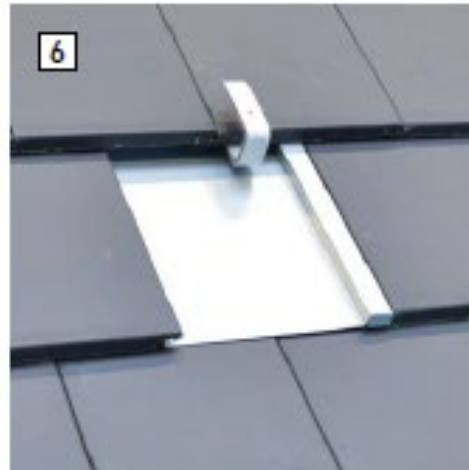
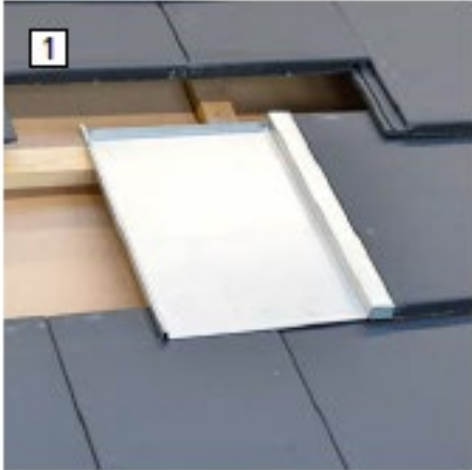


6. Fit the roof hooks
7. Cover with tiles
8. Mould in lead apron

\* Special note: Make sure that the metal roof plate fits exactly to the respective building project. Particularly in the case of clay roofs, the enormous variety and variable installation options of these tiles make careful suitability testing and processing urgently necessary.



# METAL ROOF TILES TEGALIT AND PLAIN TILE

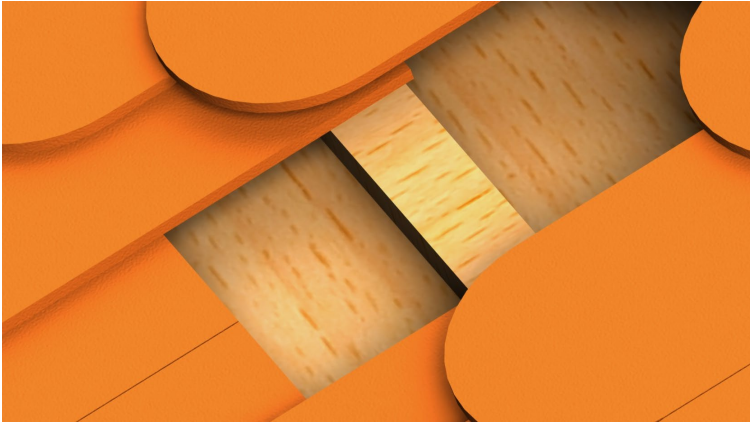


1. Insert metal roof plate
2. Secure with a nail or screw
3. Bend upstand forward if necessary (water lifting edge must remain functional)
4. Glue on foam wedge and cut as per separate instructions
5. Mount roof hooks
6. Cover the roof with tiles

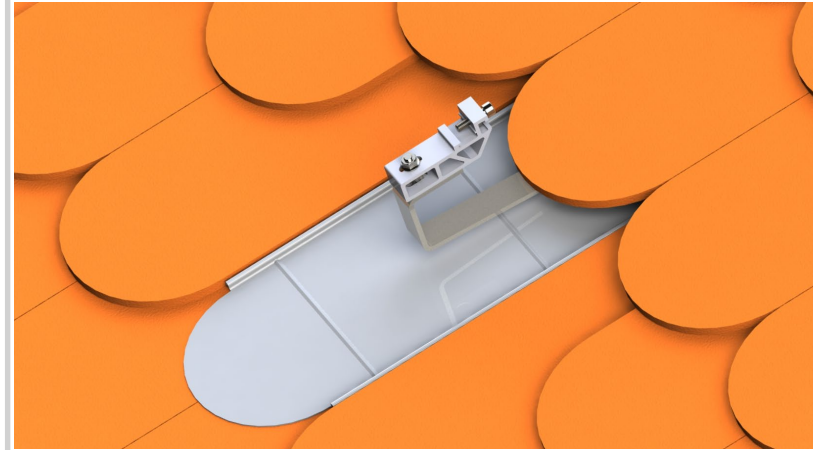
Important note!

Already when taking up the roof, pay attention to the thickness of the battens and the corresponding selection of the roof hooks with regard to the leg height.

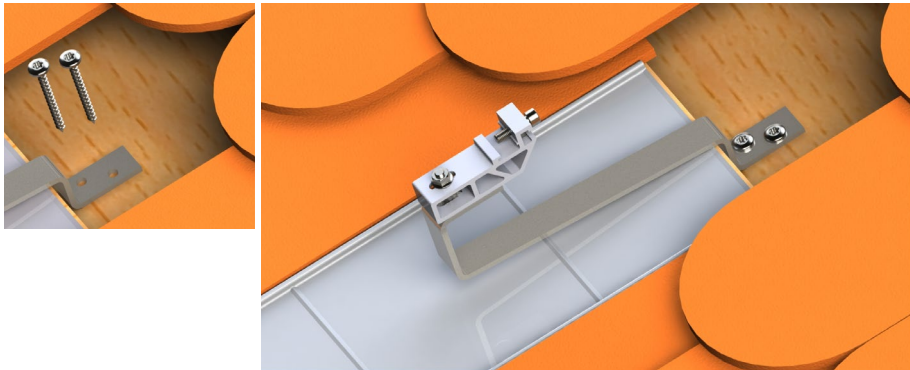
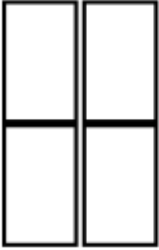
# FASTENING THE ROOF HOOKS - PLAIN TILE



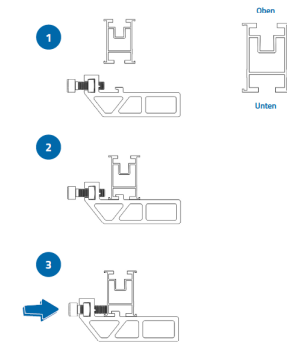
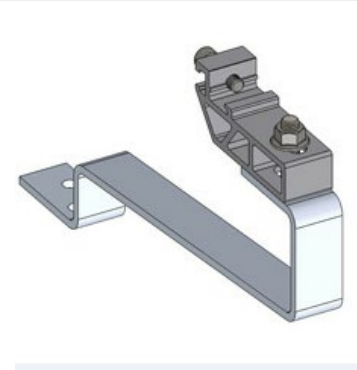
- Measure the positions of the roof hooks according to the ROOFTOP PLANNER on the roof and remove the roof tiles above the rafters.
- Also pay attention to the corresponding module clamping area.



- Replace the roof tile located above the roof hook.
- Make sure that the roof is watertight.



- Remove the roof tile under the roof hook and replace it with a sheet metal plain tile as shown on the following page.
- Screw the roof hook into the rafter with 2 wood screws according to the following instructions.



- Fix the girder profiles on the mounting plate with the right side up.
- Screw the support profile tight with the Allen screw to a torque of 15 Nm.

# METAL ROOFING TILES - PLAIN TILE



1. Insert metal roof plate
2. Secure with a nail or screw
3. Bend upstand forward if necessary (water lifting edge must remain functional)
4. Glue on foam wedge and cut as per separate instructions
5. Mount roof hooks
6. Cover the roof with tiles

Important note!

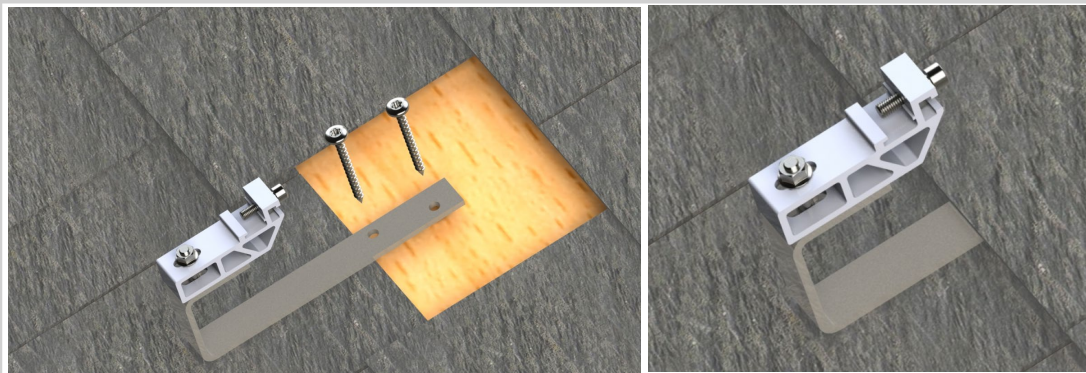
Already when taking up the roof, pay attention to the thickness of the battens and the corresponding selection of the roof hooks with regard to the leg height.



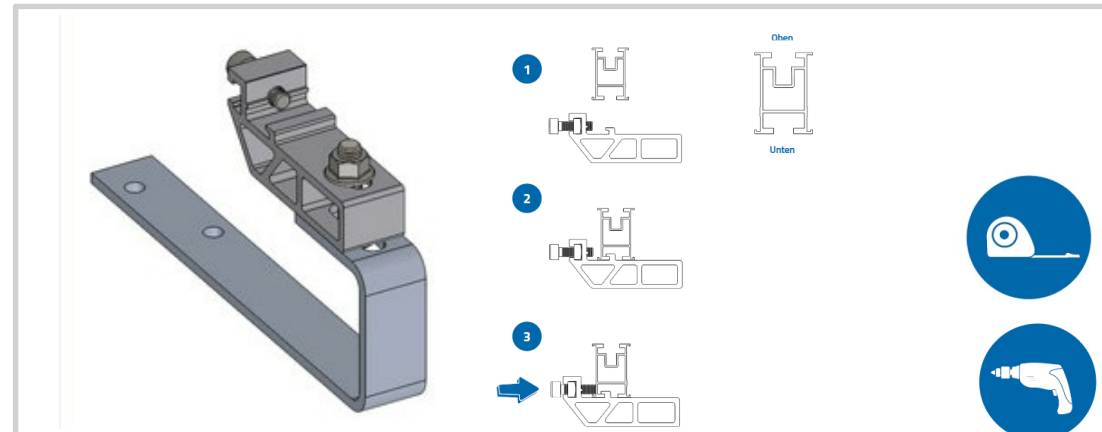
# FASTENING THE ROOF HOOKS - SLATE



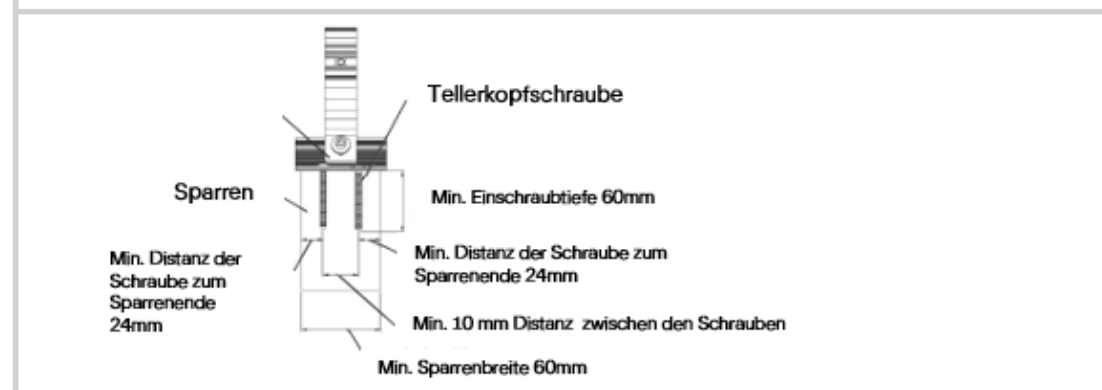
- Position the roof hooks according to the static requirements of the ROOFTOP PLANNER.
- Align and position slate roof hooks on rafters and fasten to rafter with 2 wood screws Fastening.
- The tightness of the roof must be ensured. Comply with the regulations and rules of the German roofing trade.



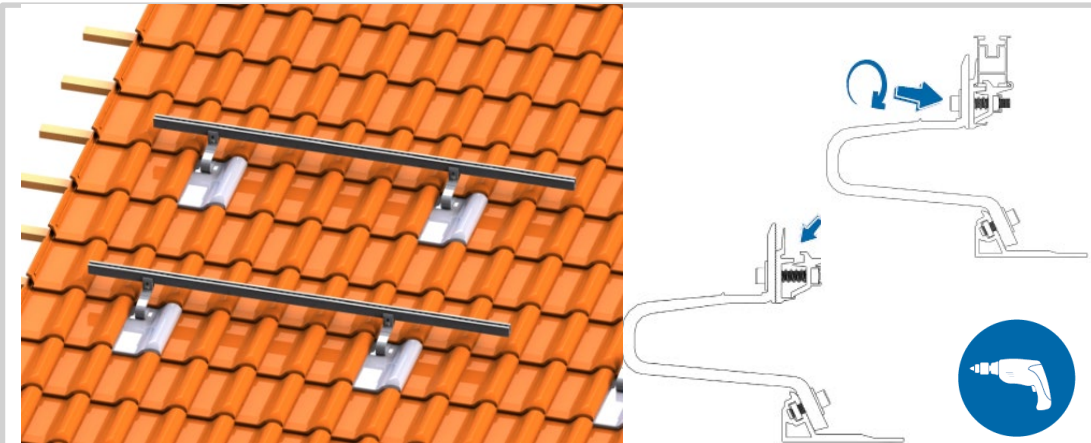
- If necessary, leave out the slate roof tiles and use a titanium zinc sheet to seal the adjacent slate roof tiles and seal it with a sealing tape to be provided by the customer.
- Fix the adjacent roof tiles and the titanium zinc sheet in accordance with the rules and regulations of the German roofing trade.



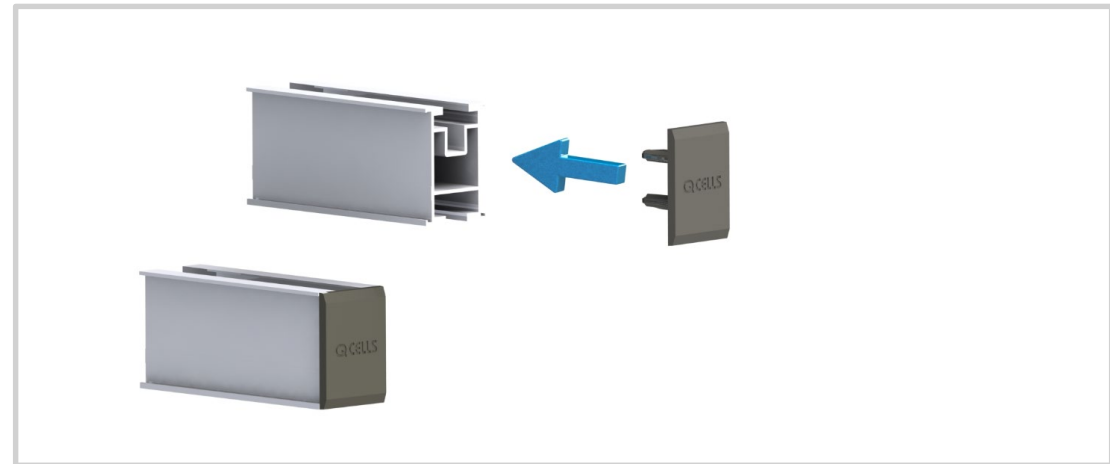
- Fix the girder profiles on the mounting plate with the right side up.
- Screw the support profile tight with the Allen screw to a torque of 15 Nm.



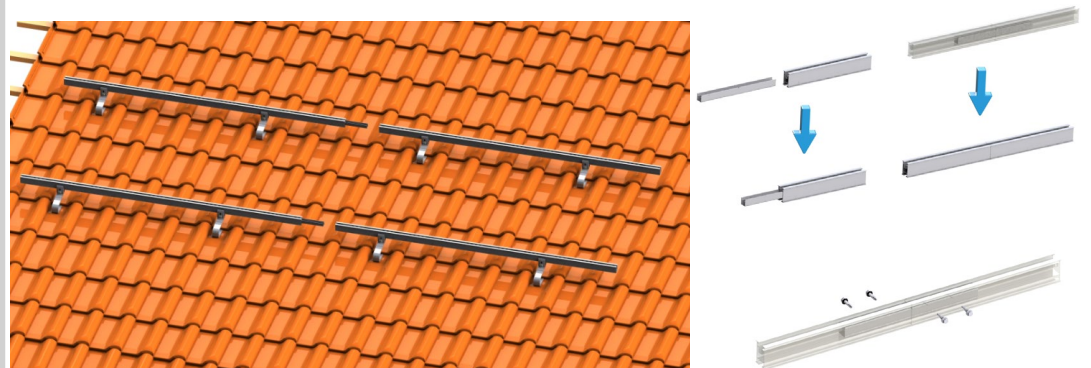
# FASTENING THE GIRDER PROFILES TO THE ROOF HOOK



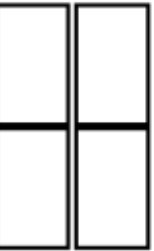
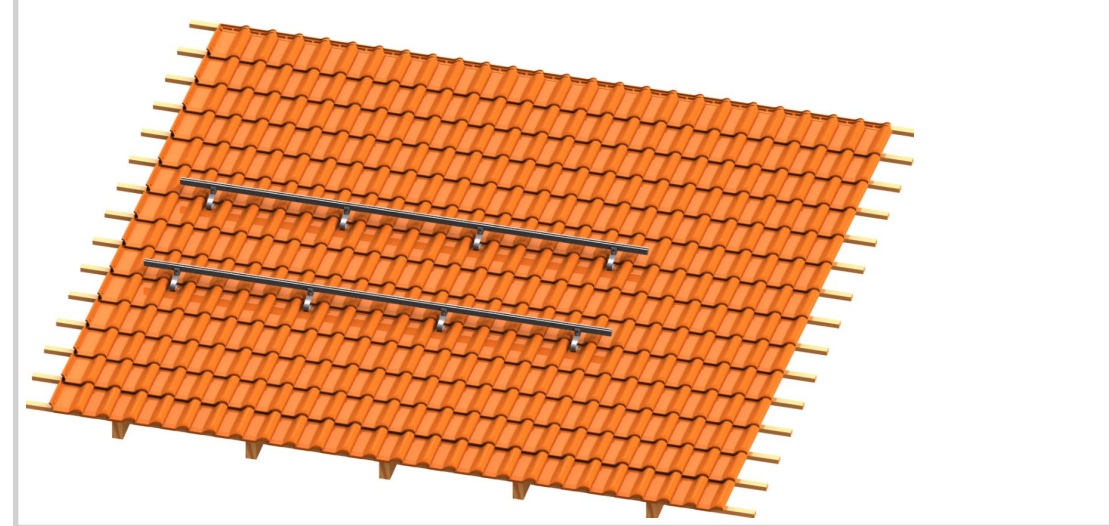
- Place the girder profile with the correct side on the quick-mounting adapter of the roof hook.
- And fasten the carrier profile with the Allen screw with a torque of 15 Nm.



- Press the end caps into the ends of the girder profiles.

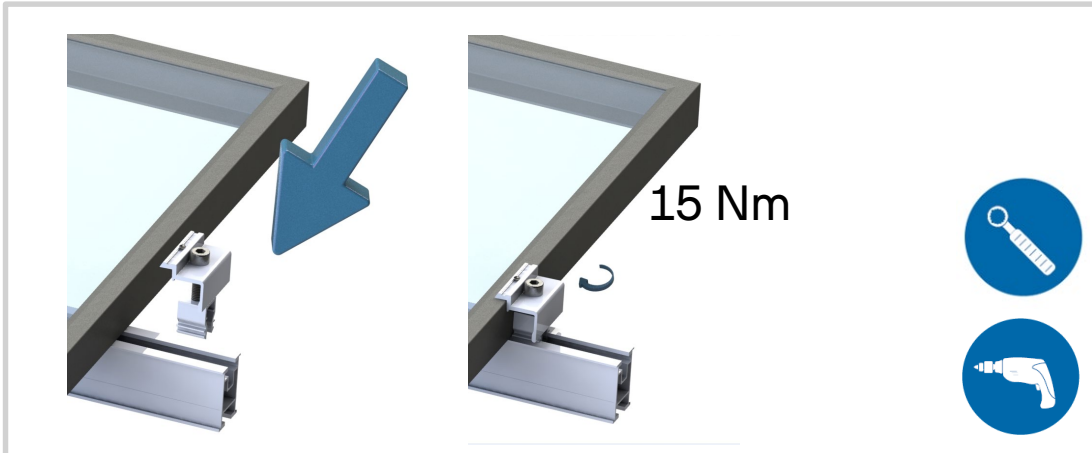


Connect girder profiles: necessary if the width of the module field is greater than the length of the girder profile. Insert the profile connector halfway into the first girder profile and insert the second girder profile onto the profile connector. If necessary, screw the profiles to the profile connector. Press the end caps into the end of the girder profile by hand.

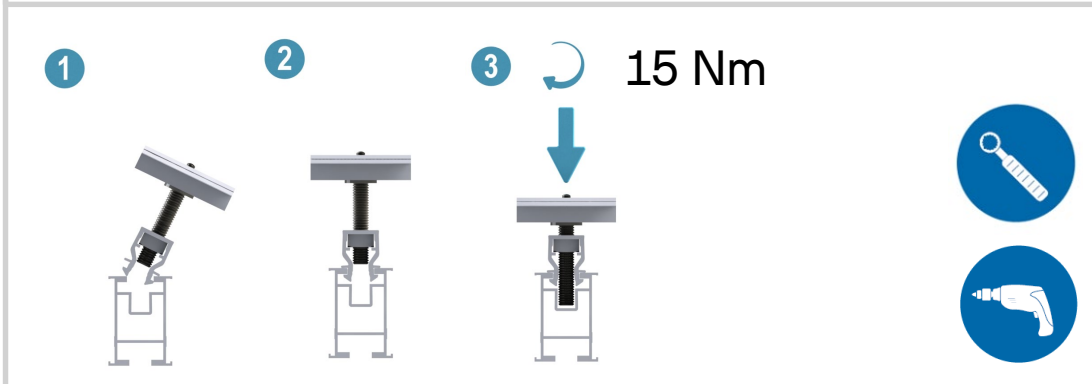




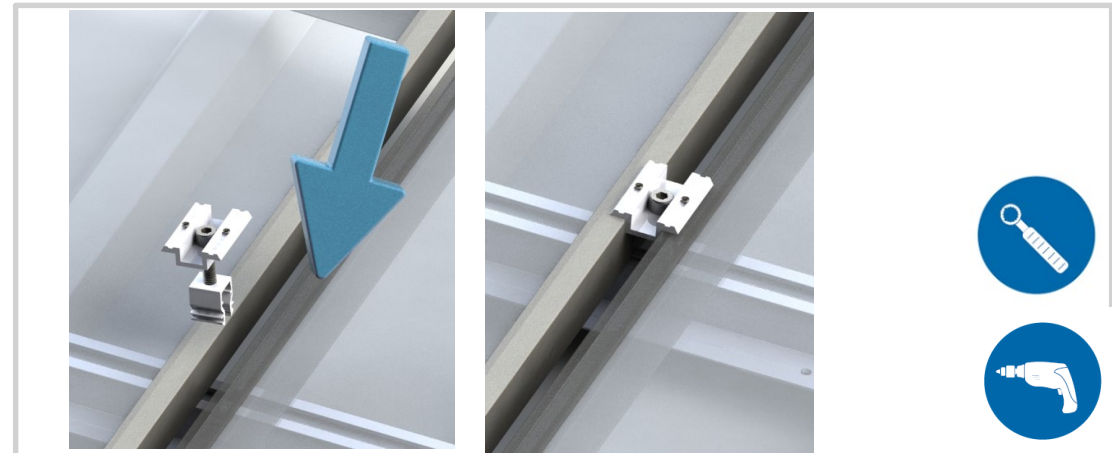
# MOUNTING SOLAR MODULES



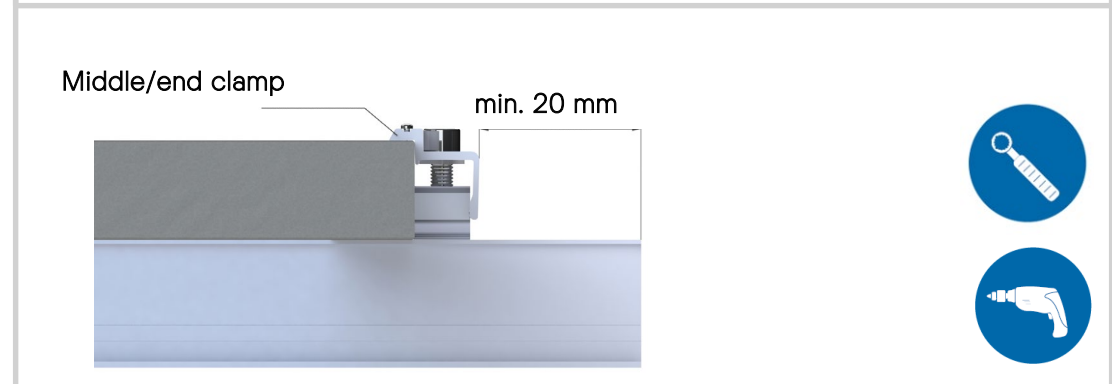
Start in the lowest module row by placing the first solar module on the girder profiles and aligning it. Place the end clamp on the module frame and click it into the girder profile. When the clamp is in the correct position, tighten the clamp.



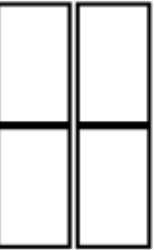
Click the clamps into the girder profile at a slight angle as shown and push the clamp up to the module frame. When the clamp and the second module are in the correct position, tighten the clamp. Tighten the screw on the middle clamp with a torque of **15 Nm**.



Click the centre clamps into the girder profile at a slight angle as shown and slide the end clamp to the module frame. When the clamp is in the correct position, tighten the clamp. Tighten the screw on the middle clamp with a torque of 15 Nm . Slide the next modules back to the middle clamp.

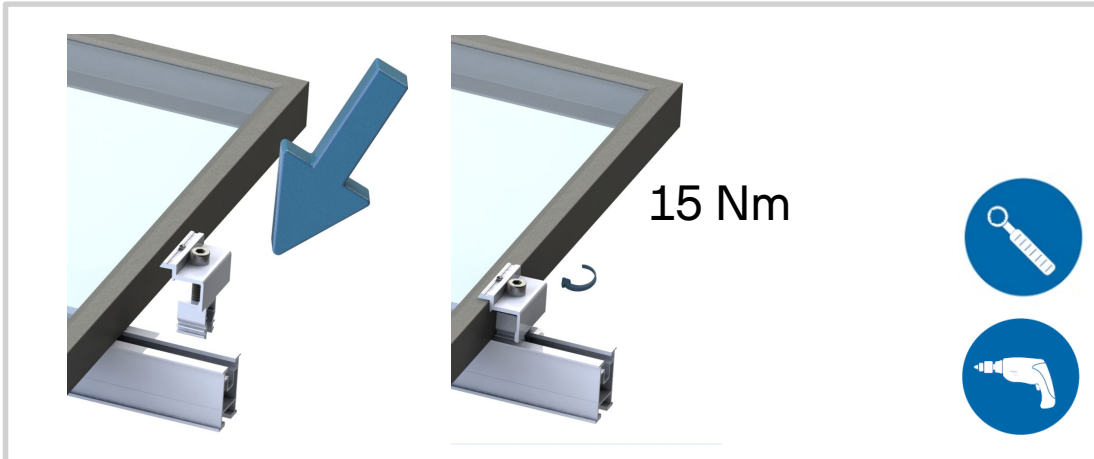


**Note:** The middle/end clamps must be installed at least 20 mm from the end of the corresponding girder profiles.

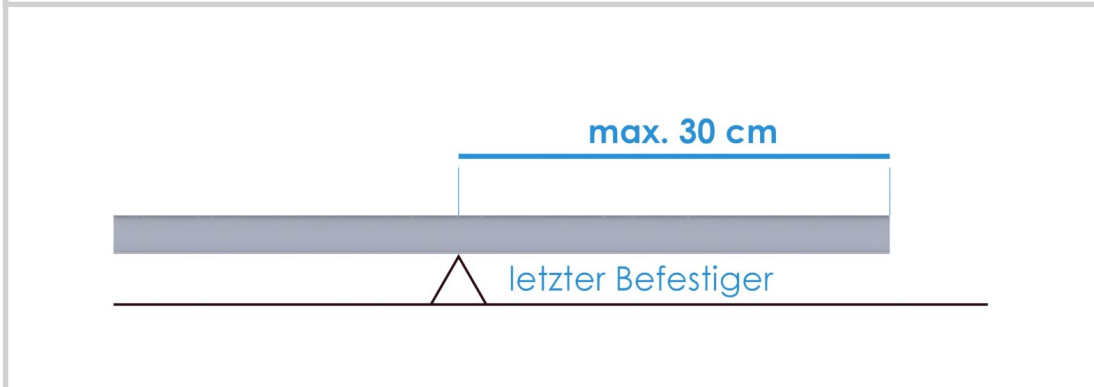




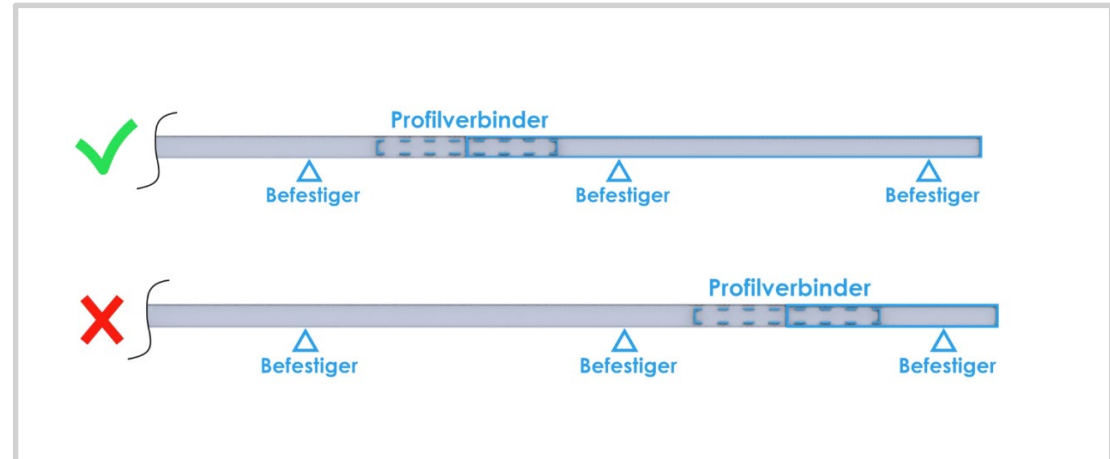
# MOUNTING SOLAR MODULES



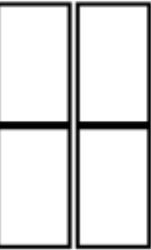
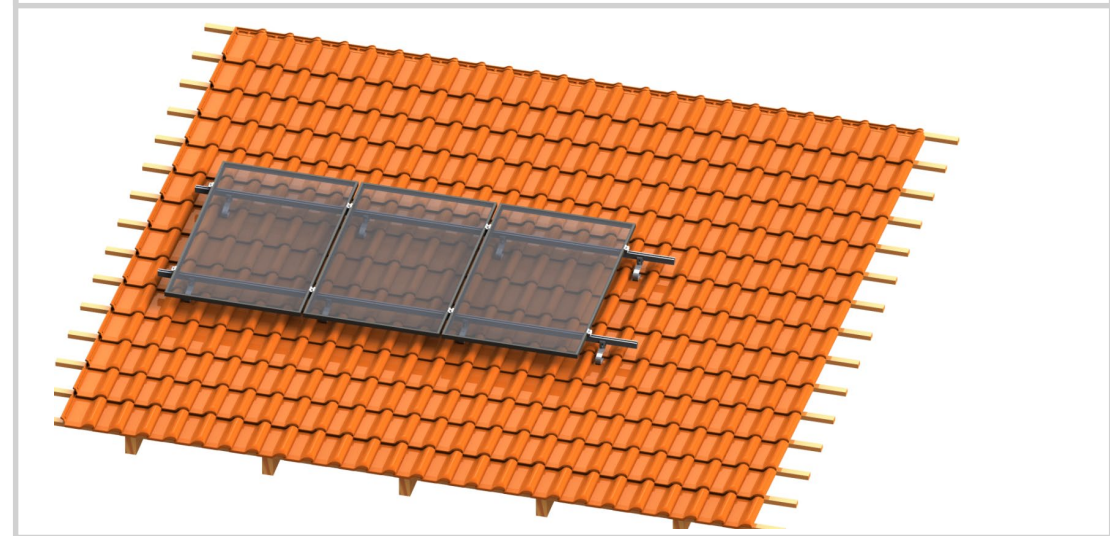
Use end clamps again on the last module of the module row. Place the end clamp on the module frame and click it into the girder profile. When the clamp is in the correct position, tighten the clamp.



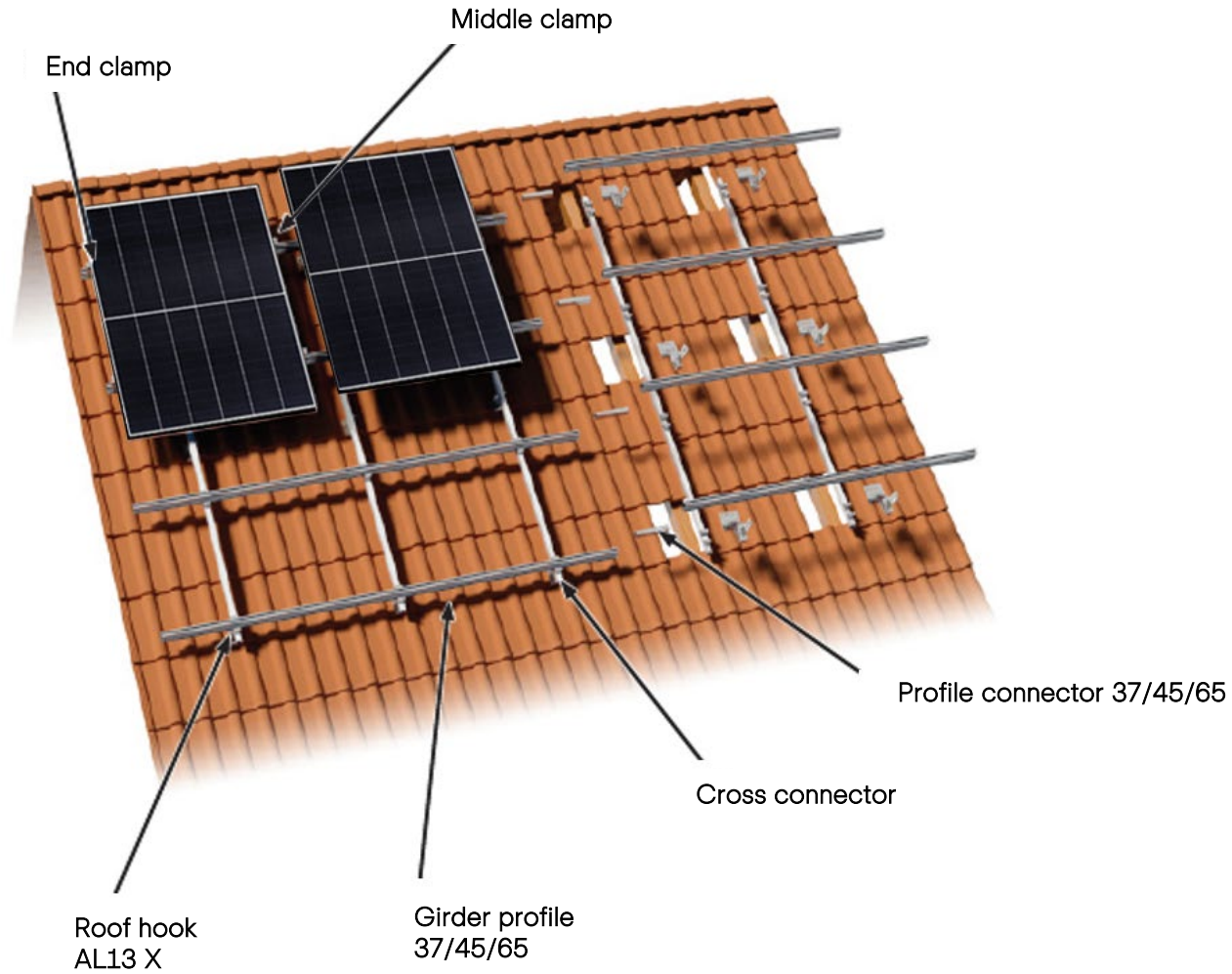
- Note:
- Girder profile length: max.12 m!
  - After max. 12 m, form an expansion joint of at least 5 cm.
  - Projection of the girder profiles over the last fastening: max. 30 cm! The projection should be the same on both sides.



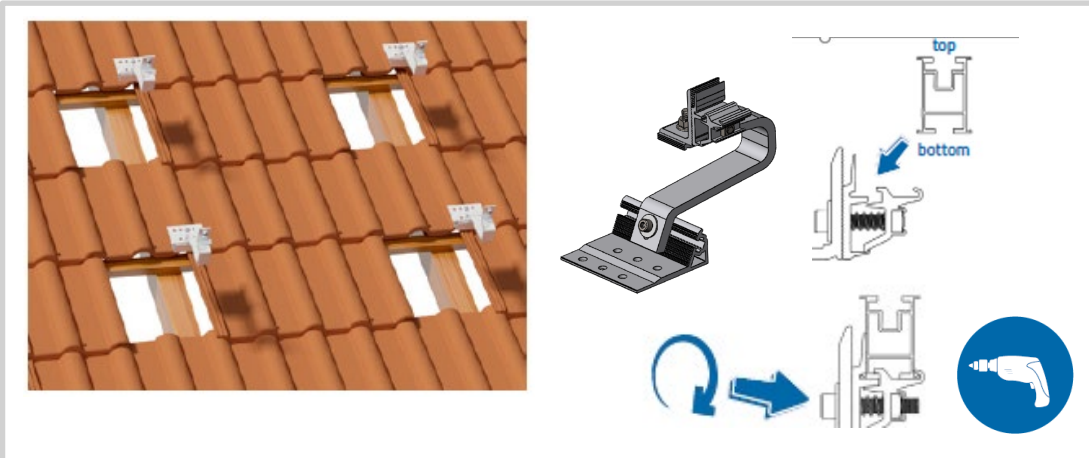
- Note:
- Fix each girder profile on at least two fixing points (roof hooks).
  - Do not assemble the girder profiles until you are at the assembly site (e.g. on the roof)!
  - Do not transport assembled girder profiles vertically!
  - The joints of the girder profiles must not be in the area of the module clamps and roof hooks!



# VERTICAL MODULE MOUNTING - CROSS CONNECTION



# FASTENING THE GIRDER PROFILES TO THE ROOF HOOK AND CROSS CONNECTION



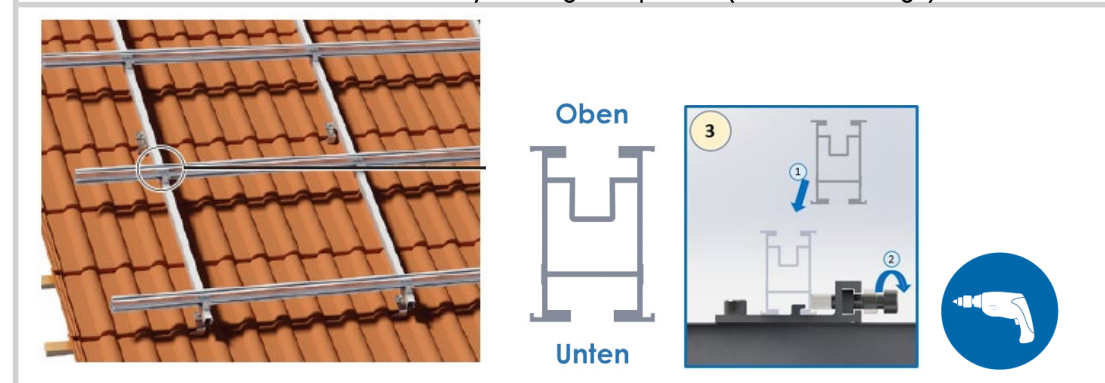
- Place the girder profile with the correct side on the quick-mounting adapter of the roof hook.
- And fasten the girder profile with the Allen screw (perpendicular to the eaves) with a torque of 15 Nm.



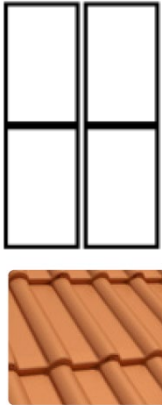
- Make sure that the girder profiles are mounted tension-free.
- For this purpose, use the adjustability of the roof hook (ribbing and slotted hole on the quick-assembly adapter).
- Make sure that a force-fit and form-fit connection is achieved by the interlocking of the corrugations.



- Screw the cross connector into the upper profile channel of the base girder profile and insert the Allen screw with the threaded plate into the upper channel as well.
  - Align the cross connector and tighten the Allen screw with a torque of 15 Nm.
- NOTE: If the base girder profiles are mounted perpendicular to the ridge, the girder profile screw of the cross connector must always be aligned upwards (towards the ridge).



- Place the girder profile on the cross connector with the correct side facing upwards and align. Tighten the Allen screw with a torque of 15 Nm.
- When loosening and tightening the screw several times, make sure that the threaded plate is correctly aligned (across the profile channel).





# CONNECTING THE GIRDER PROFILES TO THE ROOF HOOK



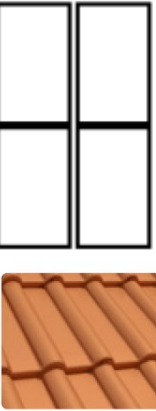
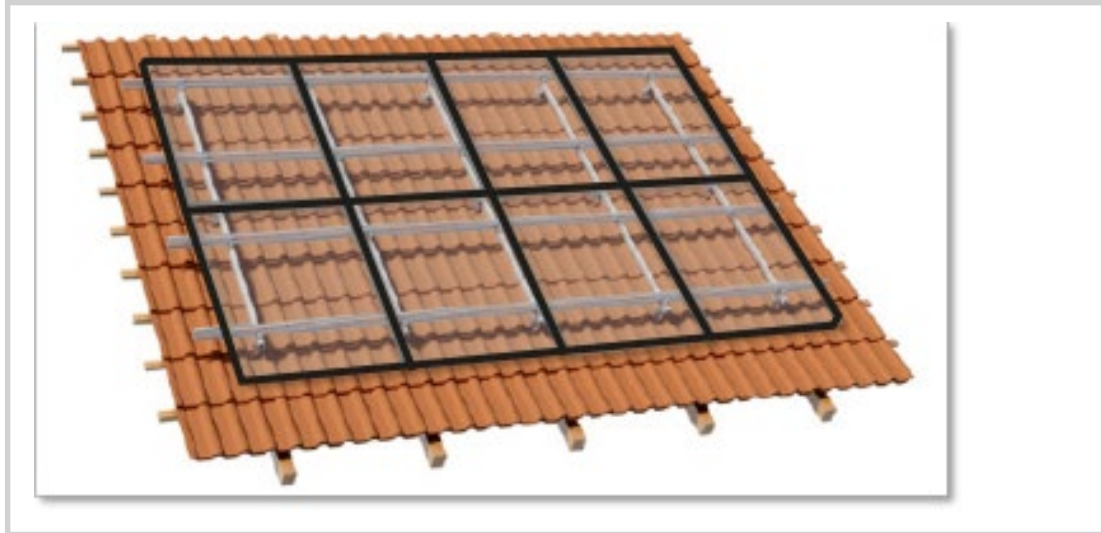
Connect girder profiles: necessary if the width of the module field is greater than the length of the girder profile. Insert the profile connector halfway into the first girder profile and insert the second girder profile onto the profile connector. If necessary, screw the profiles to the profile connector. Press the end caps into the end of the girder profile by hand.



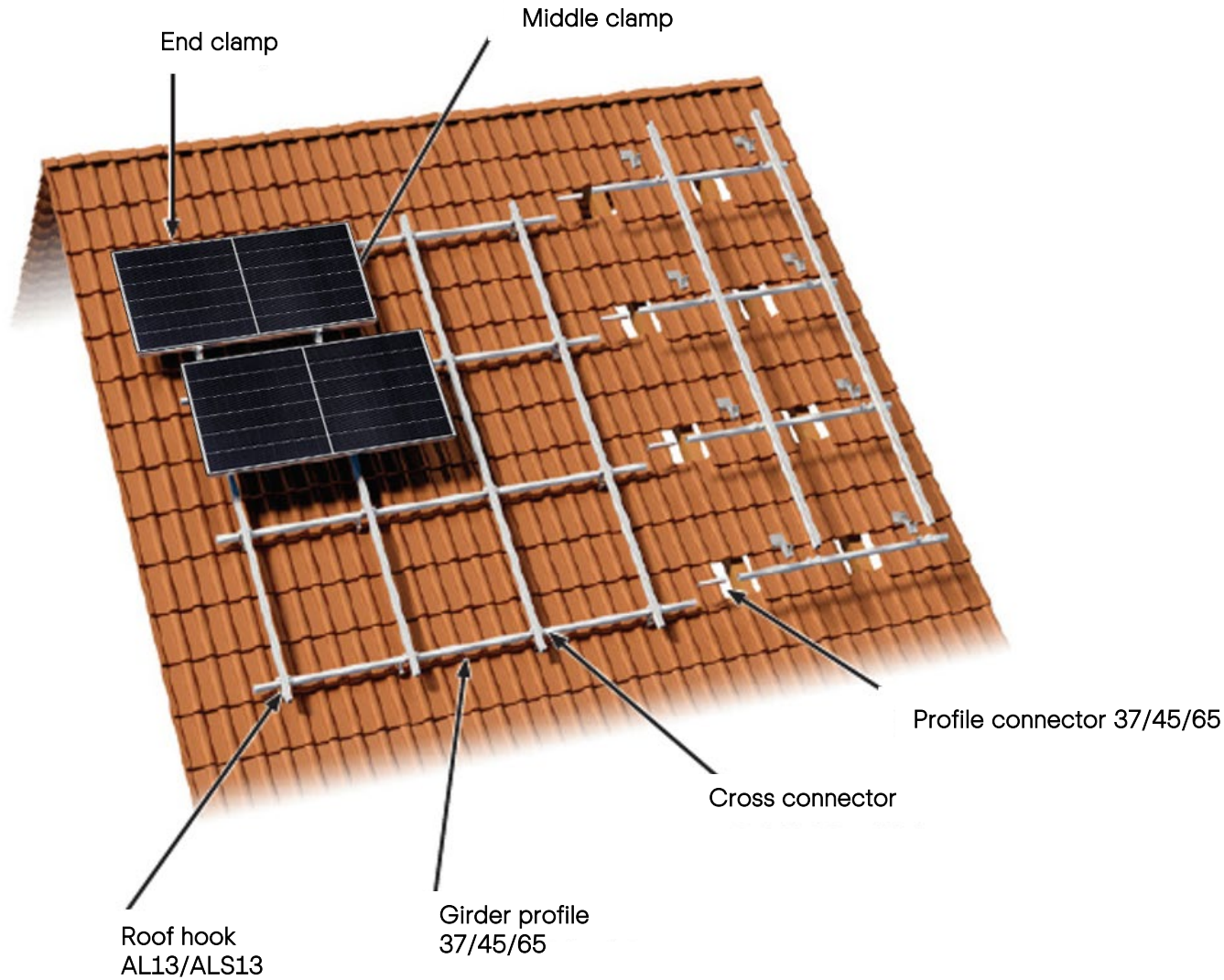
**Note:** Please refer to the relevant module clamping areas and the associated static loads in the corresponding installation instructions for the solar modules being installed.



- Press the end caps into the ends of the girder profiles.

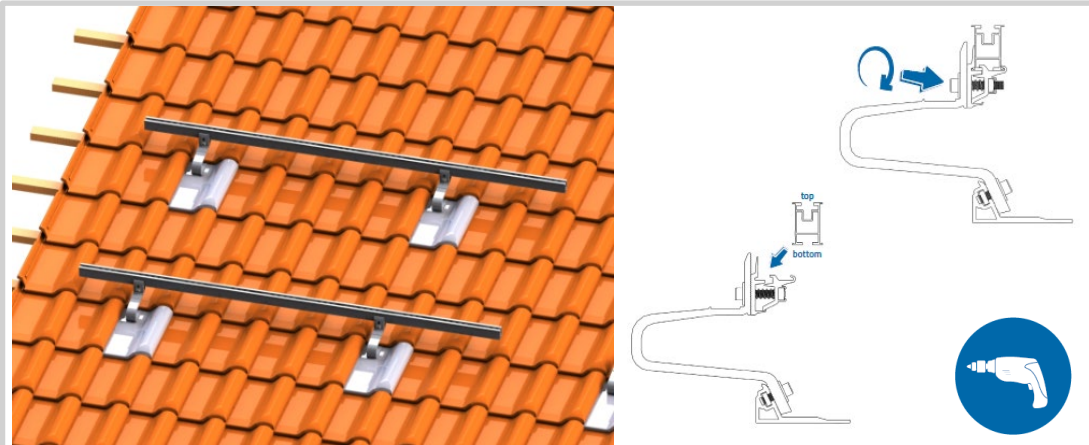


# HORIZONTAL MODULE MOUNTING - CROSS CONNECTION

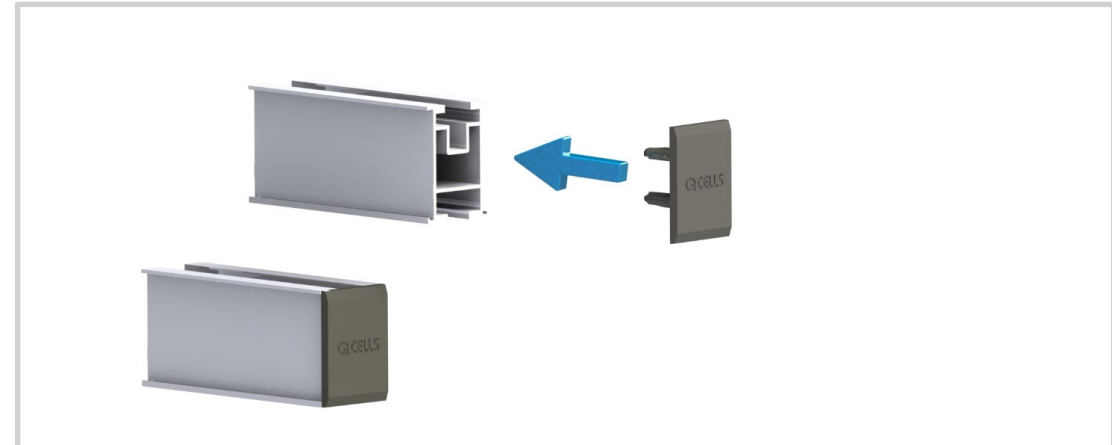




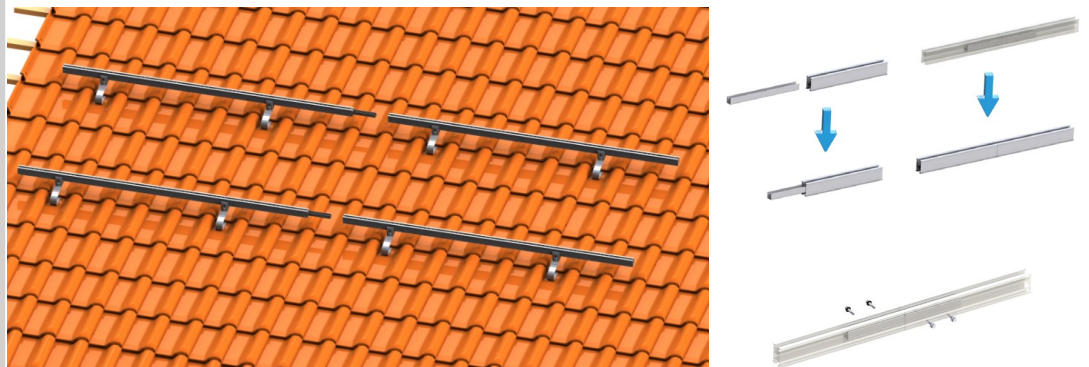
# FASTENING THE GIRDER PROFILES TO THE ROOF HOOK



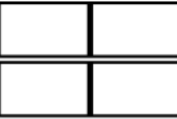
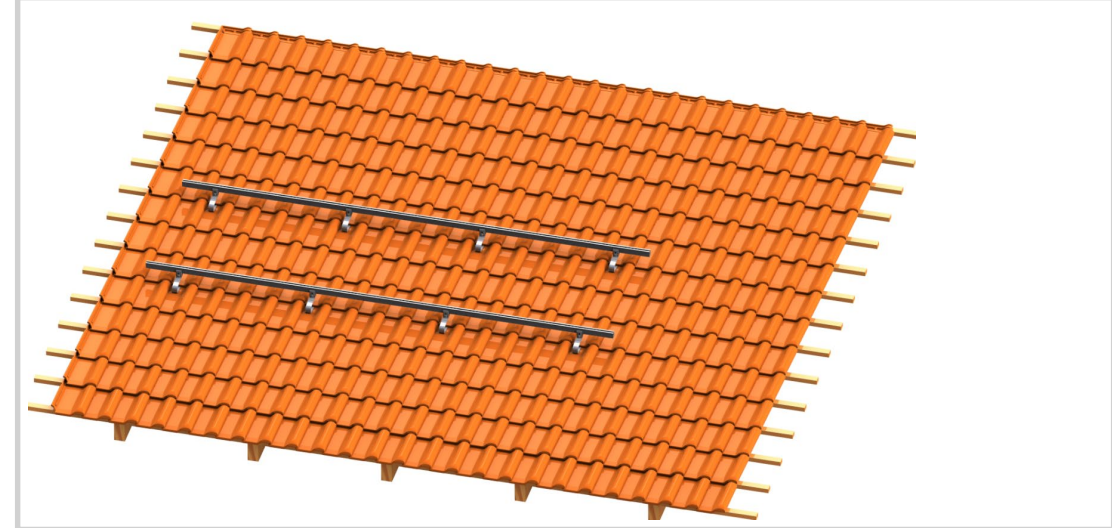
- Place the girder profile with the correct side on the quick-mounting adapter of the roof hook.
- And fasten the carrier profile with the Allen screw with a torque of 15 Nm.



- Press the end caps into the ends of the girder profiles.

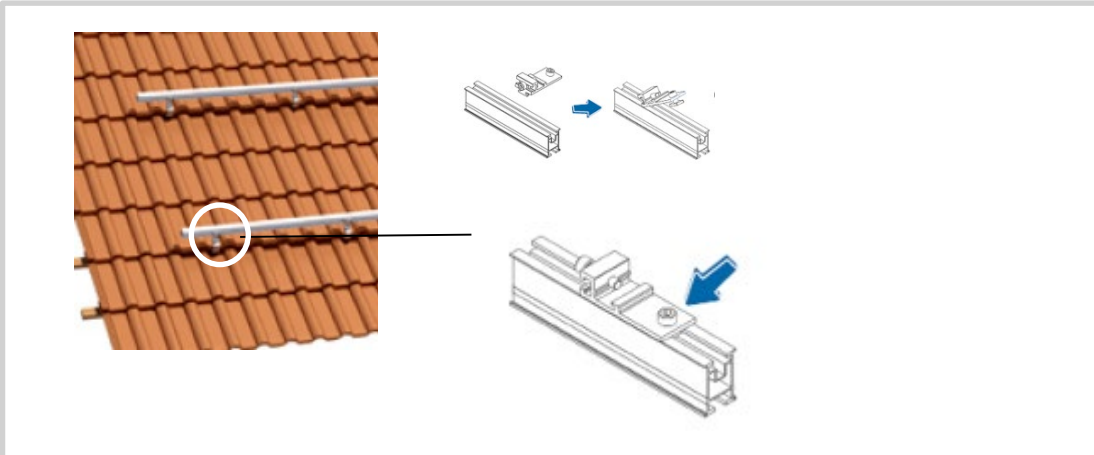


Connect girder profiles: necessary if the width of the module field is greater than the length of the girder profile. Insert the profile connector halfway into the first girder profile and insert the second girder profile onto the profile connector. If necessary, screw the profiles to the profile connector. Press the end caps into the end of the girder profile by hand.

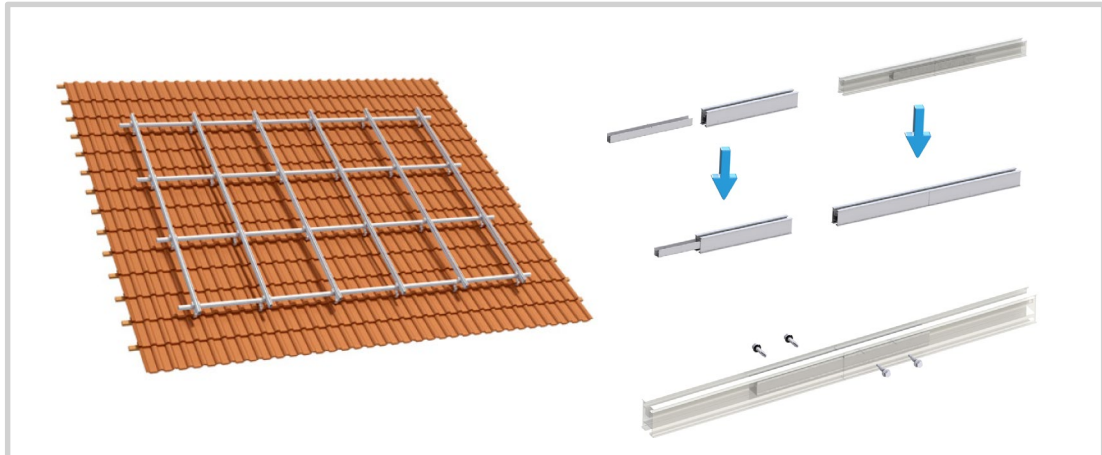




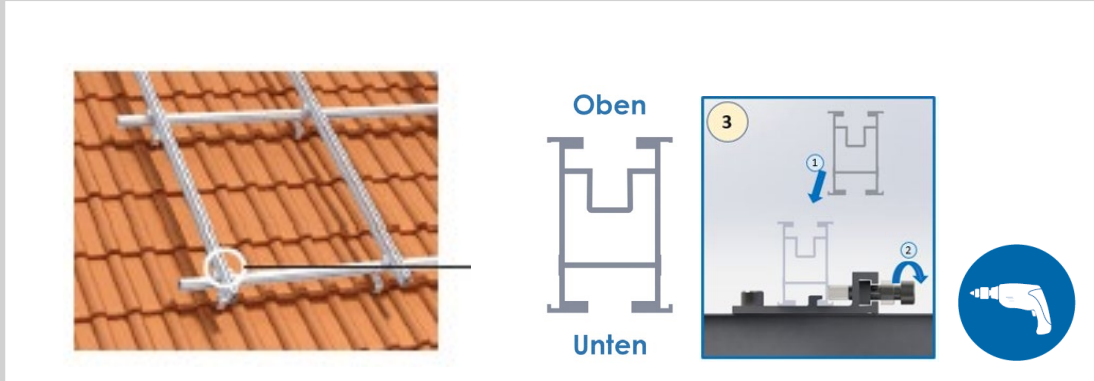
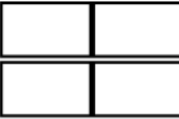
# FASTENING THE GIRDER PROFILES TO THE ROOF HOOK AND CROSS CONNECTION



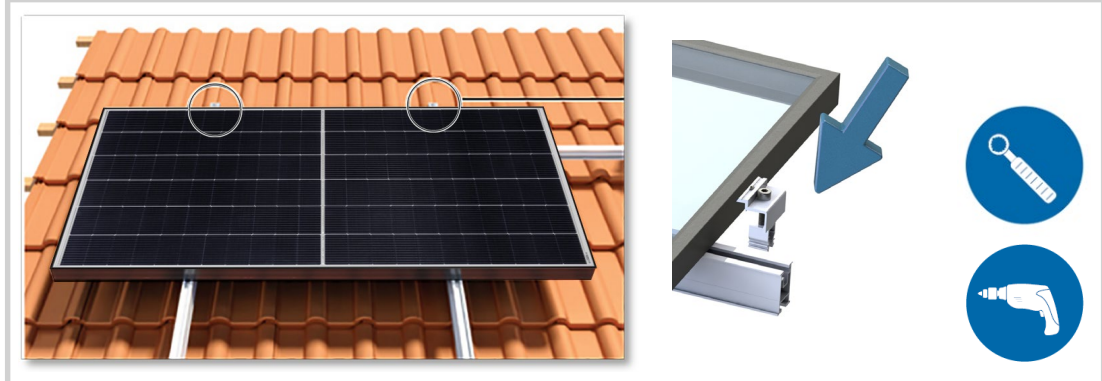
- Screw the cross connector into the upper profile channel of the base girder profile and insert the Allen screw with the threaded plate into the upper channel as well.
  - Align the cross connector and tighten the Allen screw with a torque of 15 Nm.
- NOTE: If the base girder profiles are mounted parallel to the ridge, the girder profile screw of the cross connector must always be aligned upwards (towards the ridge).



**Note:** Please refer to the relevant module clamping areas and the associated static loads in the corresponding installation instructions for the solar modules being installed.

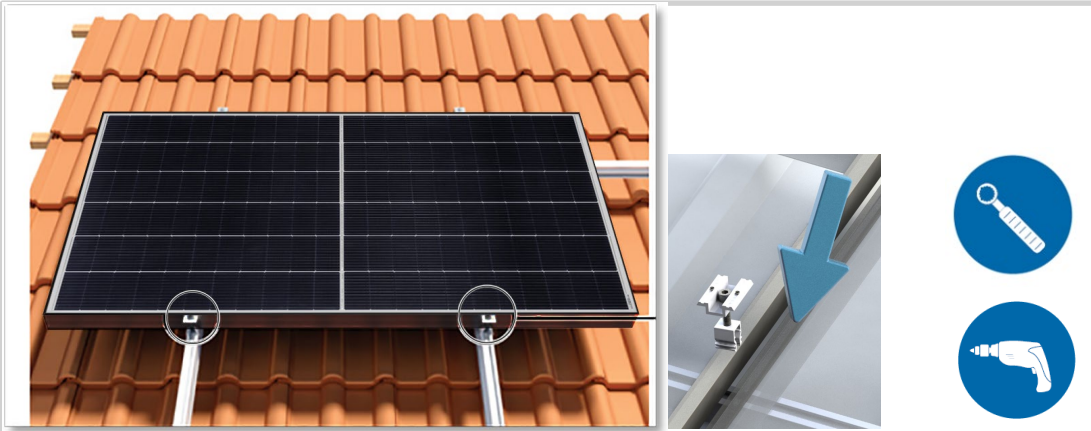


- Place the girder profile on the cross connector with the correct side facing upwards and align. Tighten the Allen screw with a torque of 15 Nm.
- When loosening and tightening the screw several times, make sure that the threaded plate is correctly aligned (across the profile channel).

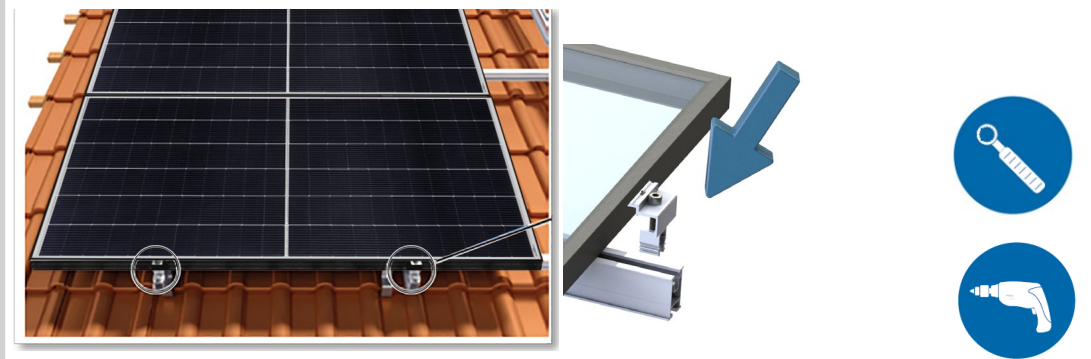


Start by placing the first solar module on the girder profile and aligning it. Place the end clamp on the module frame and click it into the girder profile. When the clamp is in the correct position, tighten the clamp.

# MOUNTING SOLAR MODULES



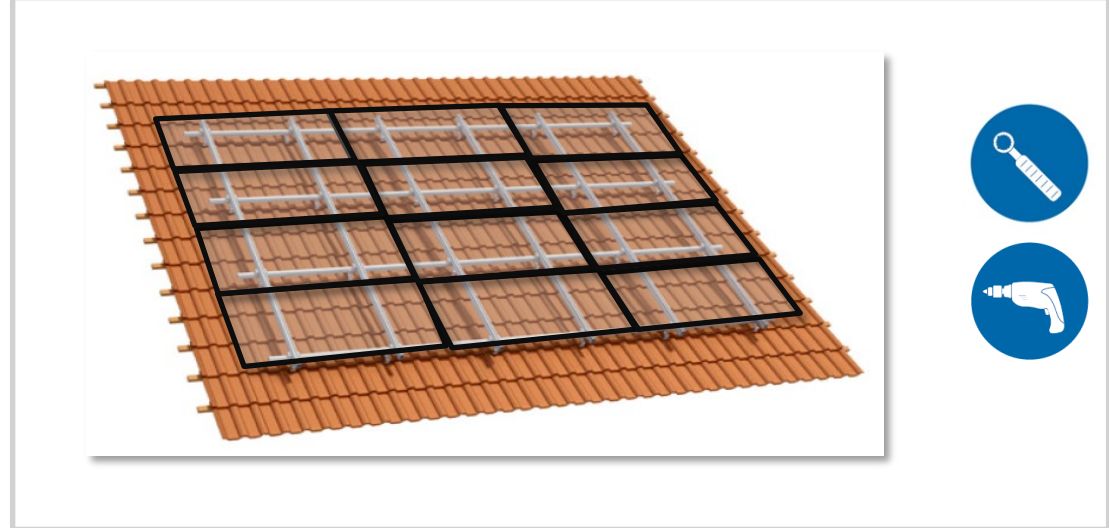
**Note:** The middle/end clamps must be installed at least 20 mm from the end of the corresponding girder profiles.



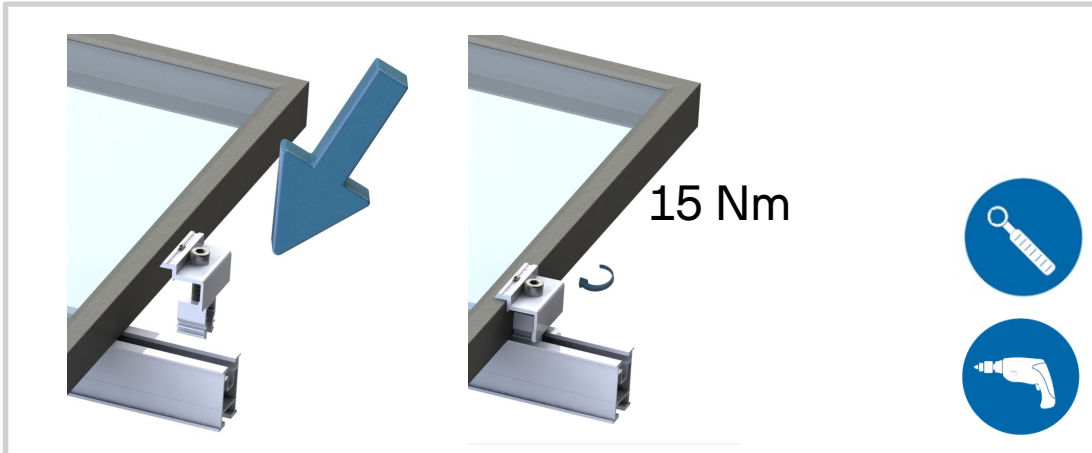
Place the lowest module on the girder profiles and align. Place the end clamp on the module frame and click it into the girder profile. When the clamp is in the correct position, tighten the clamp.



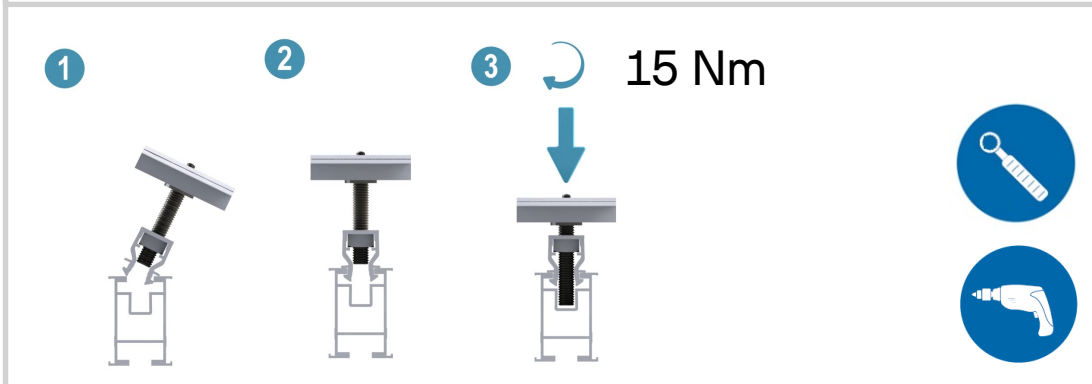
**Note:** Please refer to the relevant module clamping areas and the associated static loads in the corresponding installation instructions for the solar modules being installed.



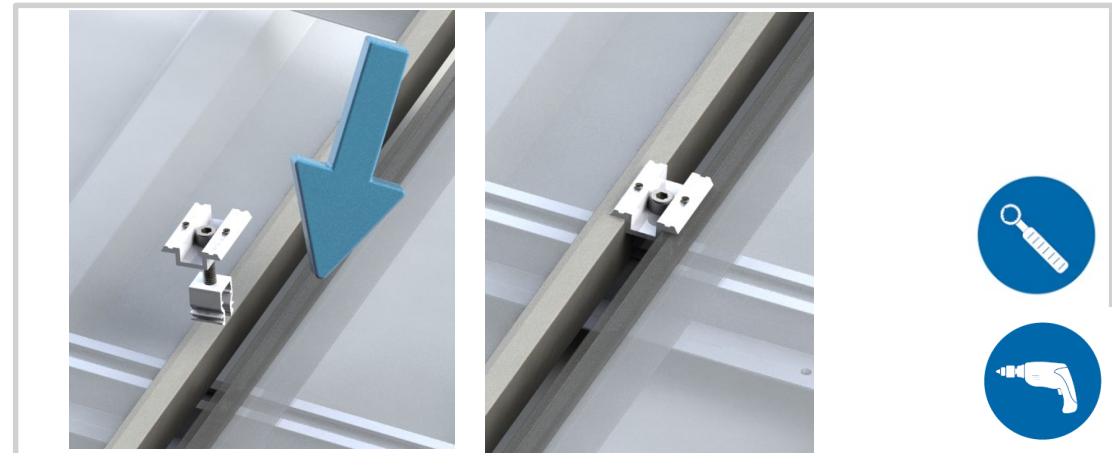
# MOUNTING SOLAR MODULES



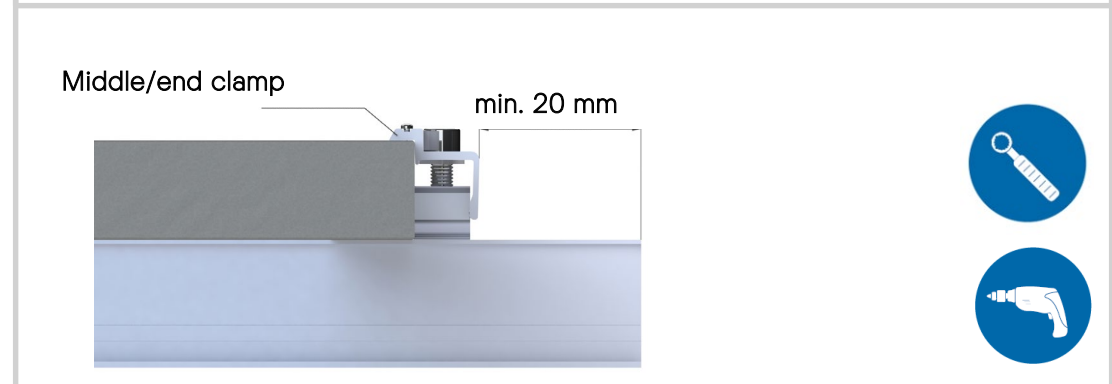
Start in the lowest module row by placing the first solar module on the girder profiles and aligning it. Place the end clamp on the module frame and click it into the girder profile. When the clamp is in the correct position, tighten the clamp.



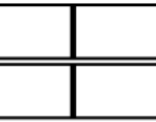
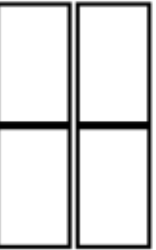
Click the clamps into the girder profile at a slight angle as shown and push the clamp up to the module frame. When the clamp and the second module are in the correct position, tighten the clamp. Tighten the screw on the middle clamp with a torque of **15 Nm**.



Click the centre clamps into the girder profile at a slight angle as shown and slide the end clamp to the module frame. When the clamp is in the correct position, tighten the clamp. Tighten the screw on the middle clamp with a torque of 15 Nm . Slide the next modules back to the middle clamp.

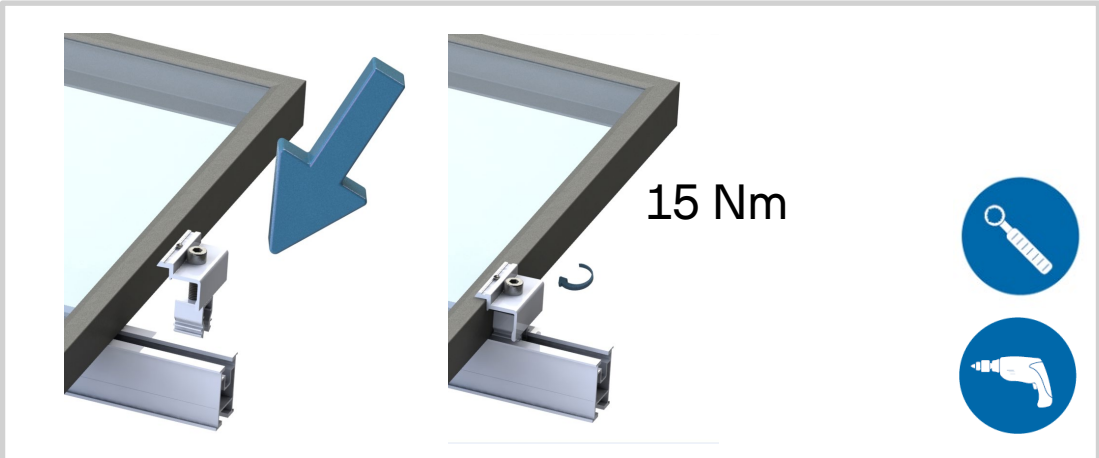


**Note:** The middle/end clamps must be installed at least 20 mm from the end of the corresponding girder profiles.

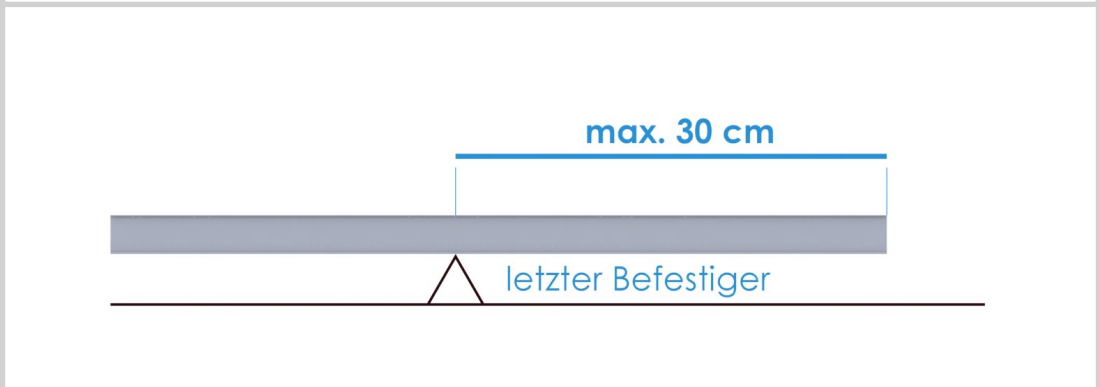




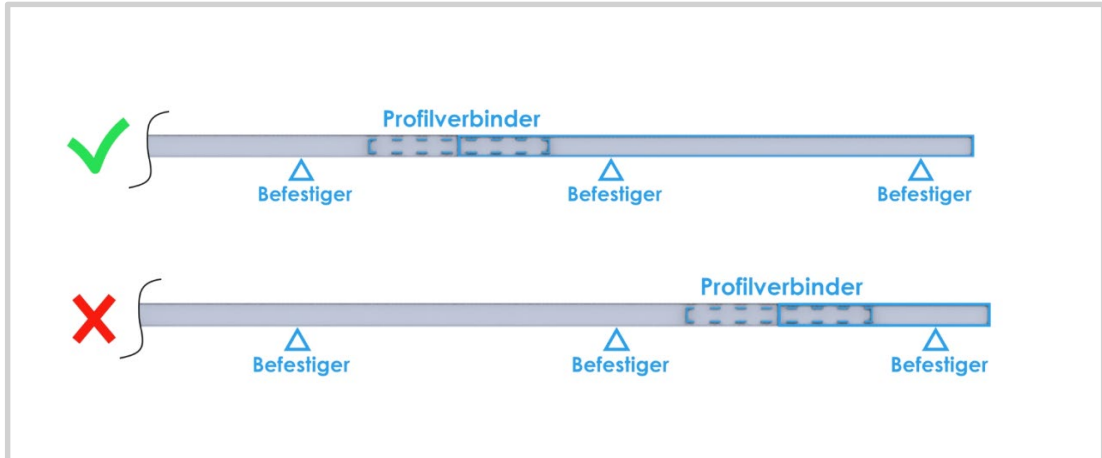
# MOUNTING SOLAR MODULES



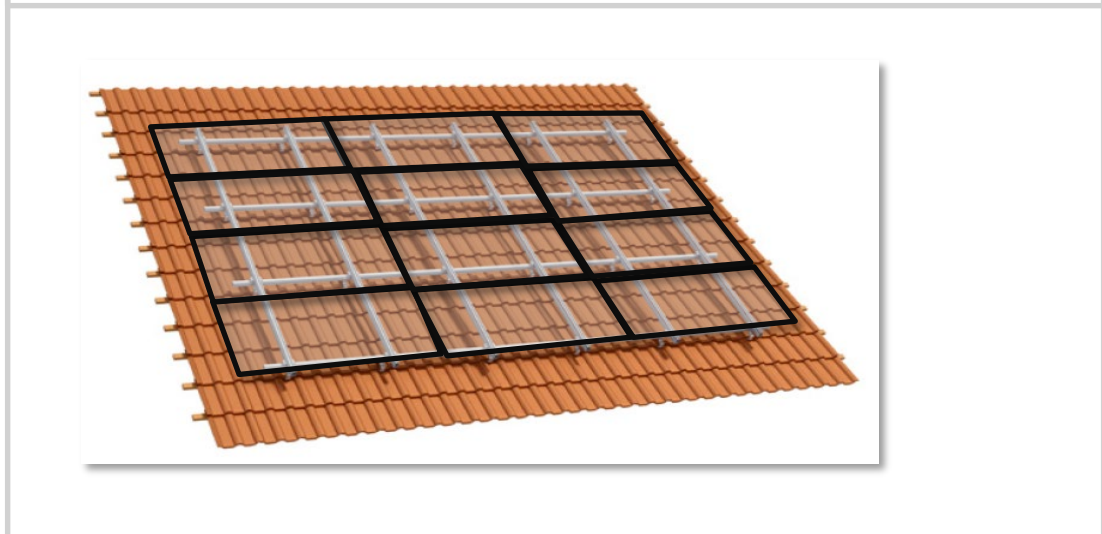
Use end clamps again on the last module of the module row. Place the end clamp on the module frame and click it into the girder profile. When the clamp is in the correct position, tighten the clamp.



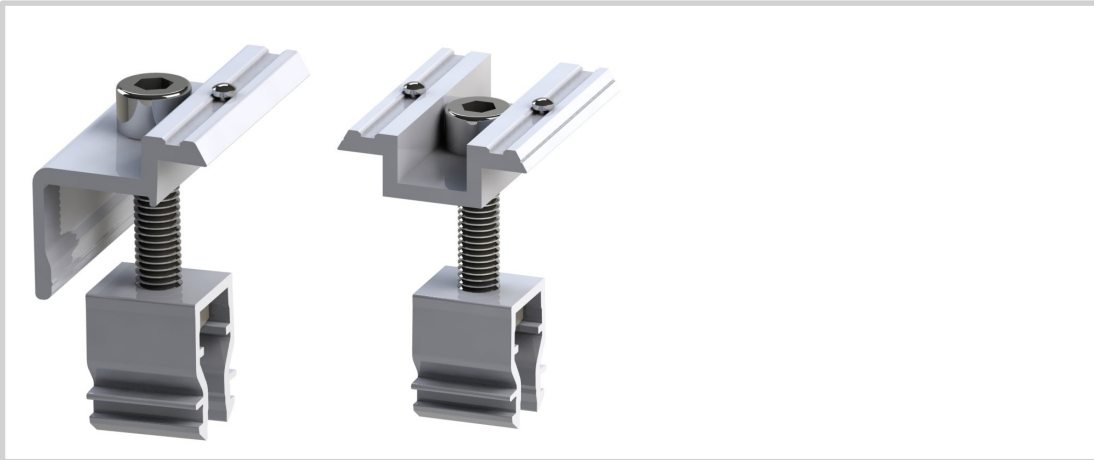
- Note:
- Girder profile length: max.12 m!
  - After max. 12 m, form an expansion joint of at least 5 cm.
  - Projection of the girder profiles over the last fastening: max. 30 cm! The projection should be the same on both sides.



- Note:
- Fix each girder profile on at least two fixing points (roof hooks).
  - Do not assemble the girder profiles until you are at the assembly site (e.g. on the roof)!
  - Do not transport assembled girder profiles vertically!
  - The joints of the girder profiles must not be in the area of the module clamps and girder profiles!



# POTENTIAL EQUALISATION AND CABLE MANAGEMENT



To integrate the modules into the potential equalisation, you can use the end and middle clamp with pin. The pins are located between the clamps and module frames and thus conductively interconnect all module rows in a module field.



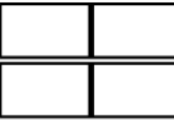
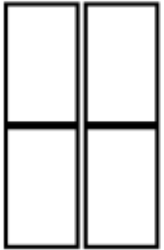
Insert a wire clamp into the profile channel of the girder profiles on the first or last girder profile of a module row. Insert the aluminium wire into the wire clamp and fix it by tightening the screw. In this way, all module rows of a module field are conductively interconnected.



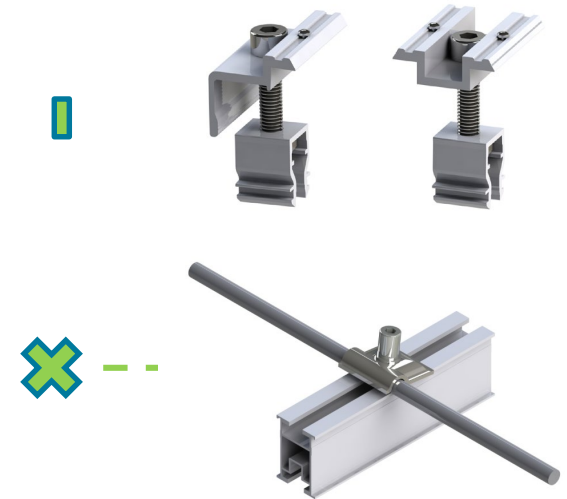
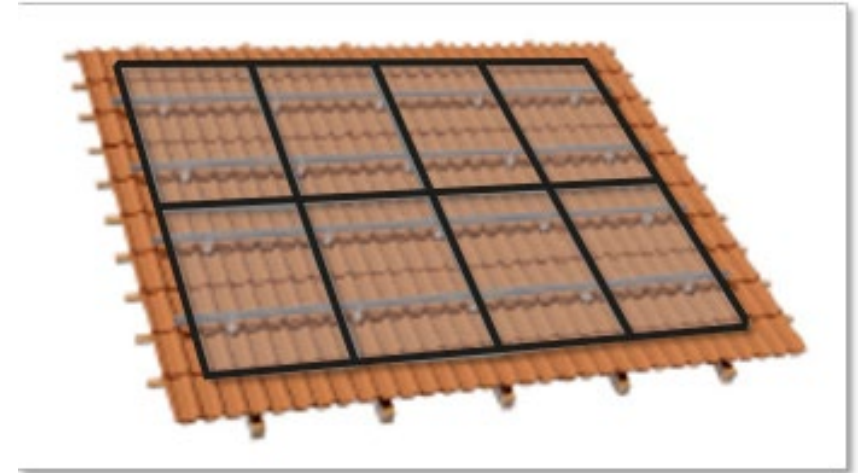
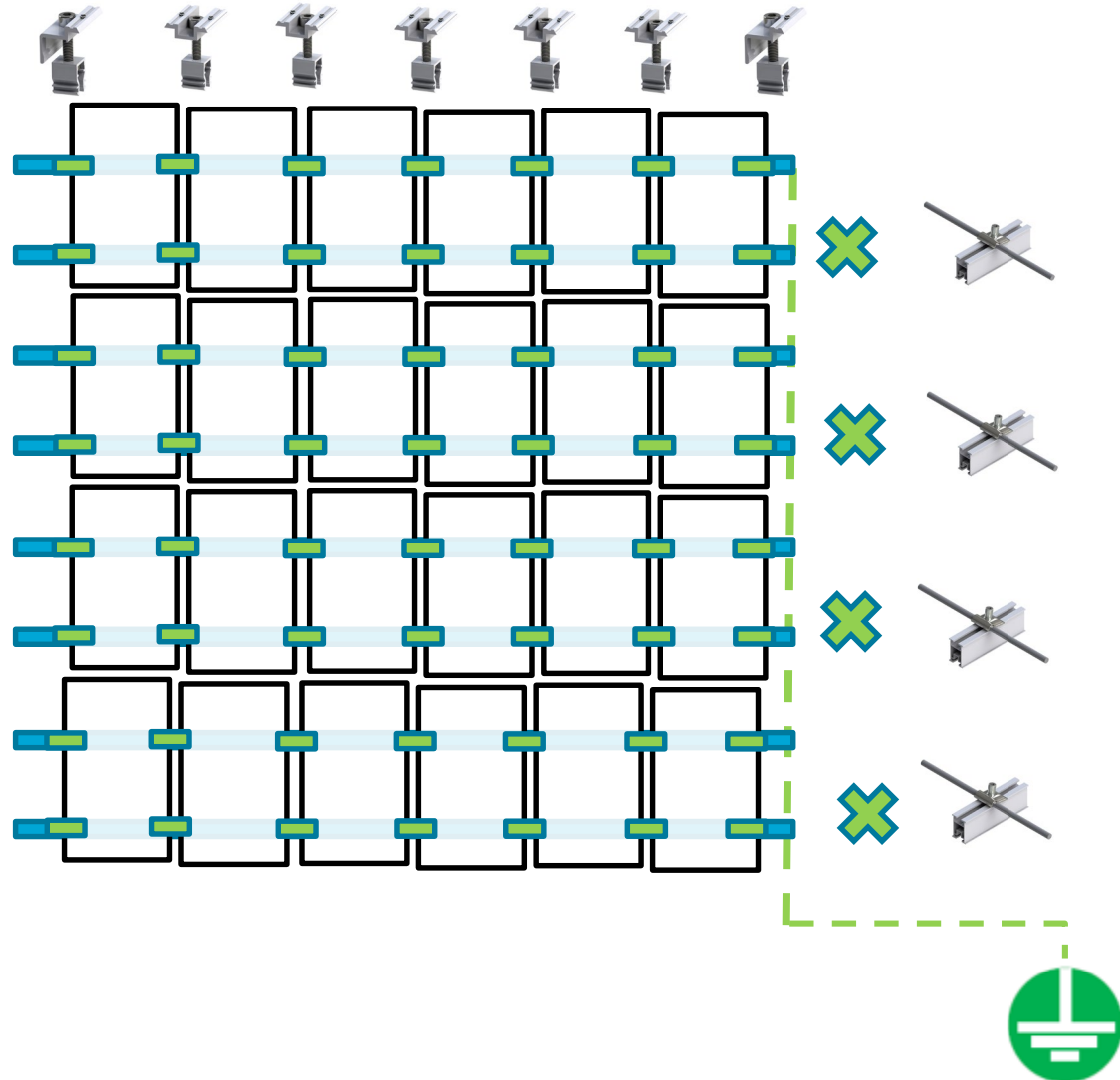
To properly secure the module cables either to the frame sides, you can use the available cable clips to ensure that the connectors do not touch the roof cladding. Select the position of the cable clips so that the cable plugs do not rest on the water-bearing layer.



To properly secure the module cables either to the frame sides, you can use the available cable clips to ensure that the connectors do not touch the roof cladding. Select the position of the cable clips so that the cable plugs do not rest on the water-bearing layer.

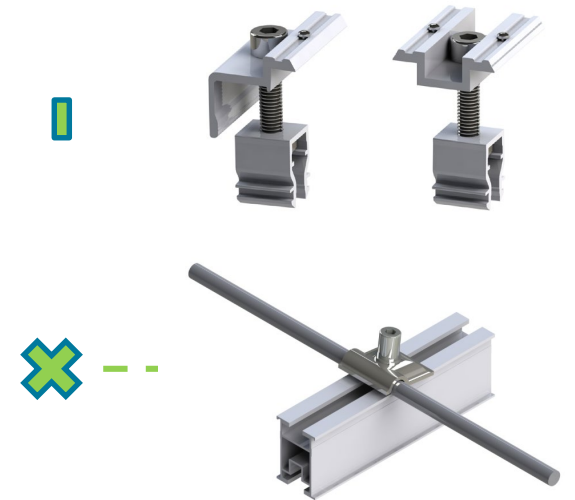
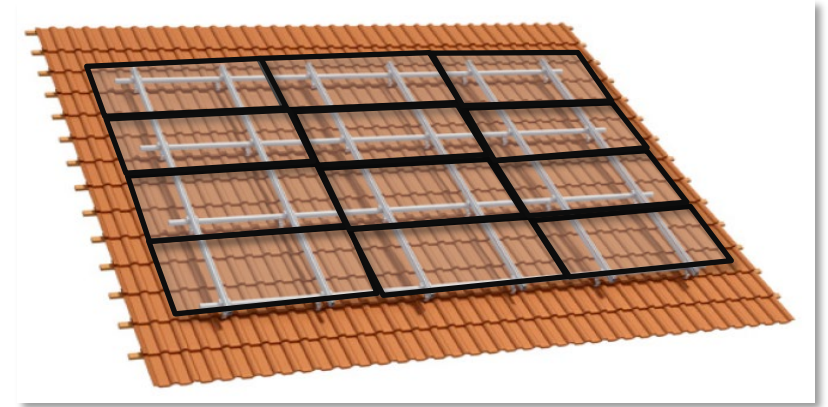
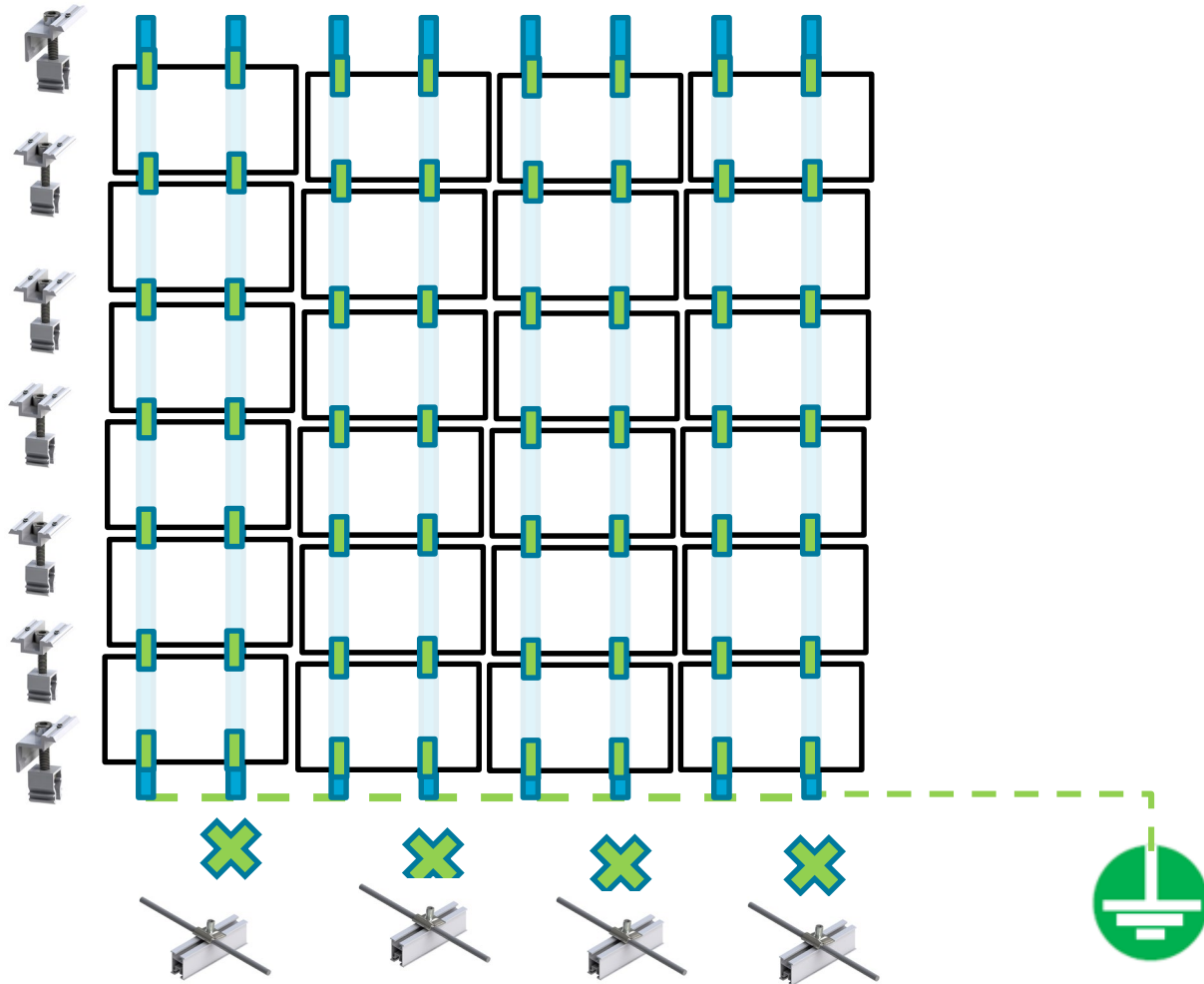


# POTENTIAL EQUALISATION OPTIONS FOR TILED ROOF





# POTENTIAL EQUALISATION OPTIONS FOR TILED ROOF



Specifications subject to technical changes © Q CELLS Q\_CELLS\_Installation\_manual\_Q.MOUNT\_Tiled\_Roofs\_2020-12\_Rev01\_EN