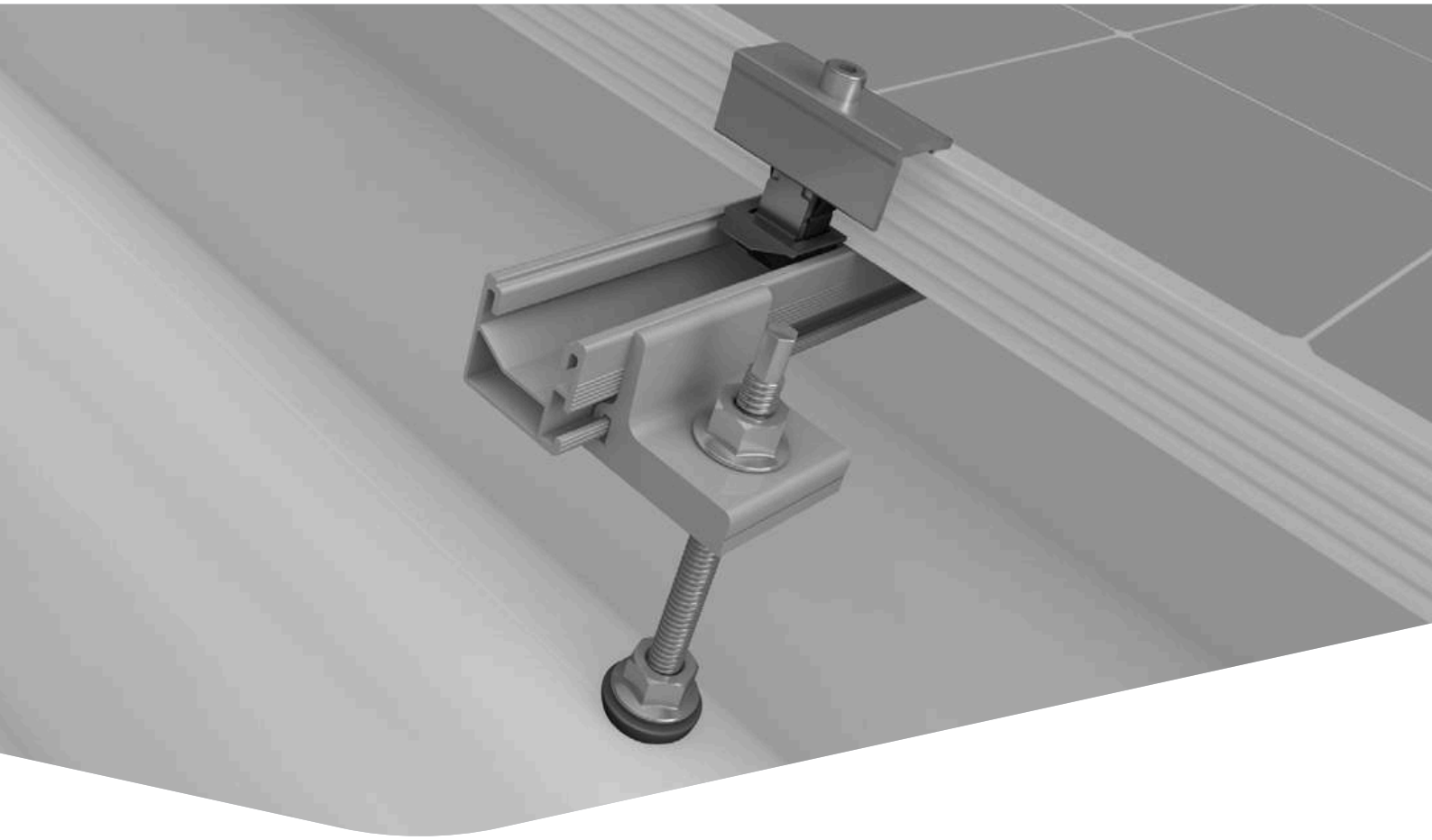
Connecting Strength



Assembly instructions

# Hanger bolts / solar fasteners

# Content

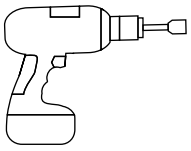

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## Tested quality - multiple certifications

K2 Systems stands for secure connections, top quality and maximum precision. Our customers and business partners have known this for a long time. Independent bodies have tested, verified and certified our competencies and components.

You can find our quality and product certificates at
k2-systems.com/en/technical-information

# Tools overview

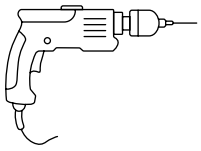




5/6 mm



7/9 mm





5.5 - 15 mm



6 - 35 Nm
(4.5 - 22.2 lb-ft)

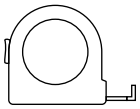


4/6 mm



13/15/16/17 mm





≥ 3.0 m



≥ 6.0 m

# General safety information

Please note that our general mounting instructions must be followed at all times and can be viewed online at k2-systems.com

- The equipment may only be installed and operated by qualified and adequately trained installers.
- Prior to installation, ensure that the product complies with on-site static loading requirements. For roof-mounted systems, the roof load-bearing capacity must always be checked.
- National and local building regulations and environmental requirements must be adhered to.
- Compliance with health and safety regulations, accident prevention guidelines and applicable standards is required.
  - Protective equipment such as safety helmet, boots and gloves must be worn.
  - Roofing works must be in accordance with roofing regulations utilising fall protection safeguards when eaves height exceeds 3 m.
  - At least two people must be present for the duration of the installation work in order to provide rapid assistance in the event of an emergency.
- K2 mounting systems are continuously developed and improved and the installation process may thereby change at any time. Prior to installation consult our website at www.k2-systems.com/en/technical-information for up-to-date instructions. We can send you the latest version on request.
- The assembly instructions of the module manufacturer must be adhered to.
- Equipotential bonding/grounding/earthing between individual parts is to be performed according to country specific standards, as well as national laws and regulations.
- At least one copy of the assembly instructions should be available on site throughout the duration of the installation.
- Failure to adhere to our general safety and assembly instructions and not using all system components, K2 is not liable for any resulting defects or damages. We do not accept liability for any damage resulting in the use of competitor's parts. Warranty is excluded in such cases.
- K2 Systems GmbH reserves the right to exclude liability in case of disregard of our General Safety Instructions as well as in case of installation or mounting of components of a competitor.
- If all safety instructions are adhered to and the system is correctly installed, there is a product warranty entitlement of 12 years! We strongly recommend reviewing our terms of guarantee, which can be viewed at k2-systems.com/en/warranty- terms-and-conditions
  We will also send this information on request.
- Dismantling of the system is performed in reverse order to the assembly.
- K2 stainless steel components are available in different corrosion resistance classes. Each structure or component must be carefully checked for possible corrosion exposure.

# The following guidelines apply

This System can be used without further testing by K2 systems in the following standard conditions. It is also suitable for higher requirements. However, if a value exceeds the standard conditions, please contact K2 Systems.

## Planning with K2 Base

We recommend our free online software K2 Base for the planning. In five steps you can plan the right assembly system and get an installation recommendation, a bill of materials and the structural analysis report. Simply register and start planning: base.k2-systems.com

## Roof requirements

- It is essential to check that the roof structure has sufficient residual load capacity and that the pressure capacity of the roof insulation (where present) is not exceeded.
- Roof pitch of: 5 - 75°

## Important mounting instructions

- On-site general standards and regulations for lightning protection must be observed and consultation with a specialist to create a lightning protection concept is recommended (use lightning protection clamp if necessary).
- The earthing must be undertaken by the customer and must be carried out according to the respective country-specific regulations.
- We recommend a thermal separation after maximum of 17.60 m.
- A minimum mounting distance of 50 mm from the end of the rail / rail joint to the module frame.
- Rail cut SingleRail/SolidRail ≥ 700 mm
- The SingleRail 36/50 RailConnector must always be positioned between two hanger bolts / solar fasteners; meaning, a cantilever extension at the rail edge outside the last hanger bolt / solar fastener is not permitted.
- Observe the manufacturer's instructions for installing the modules.

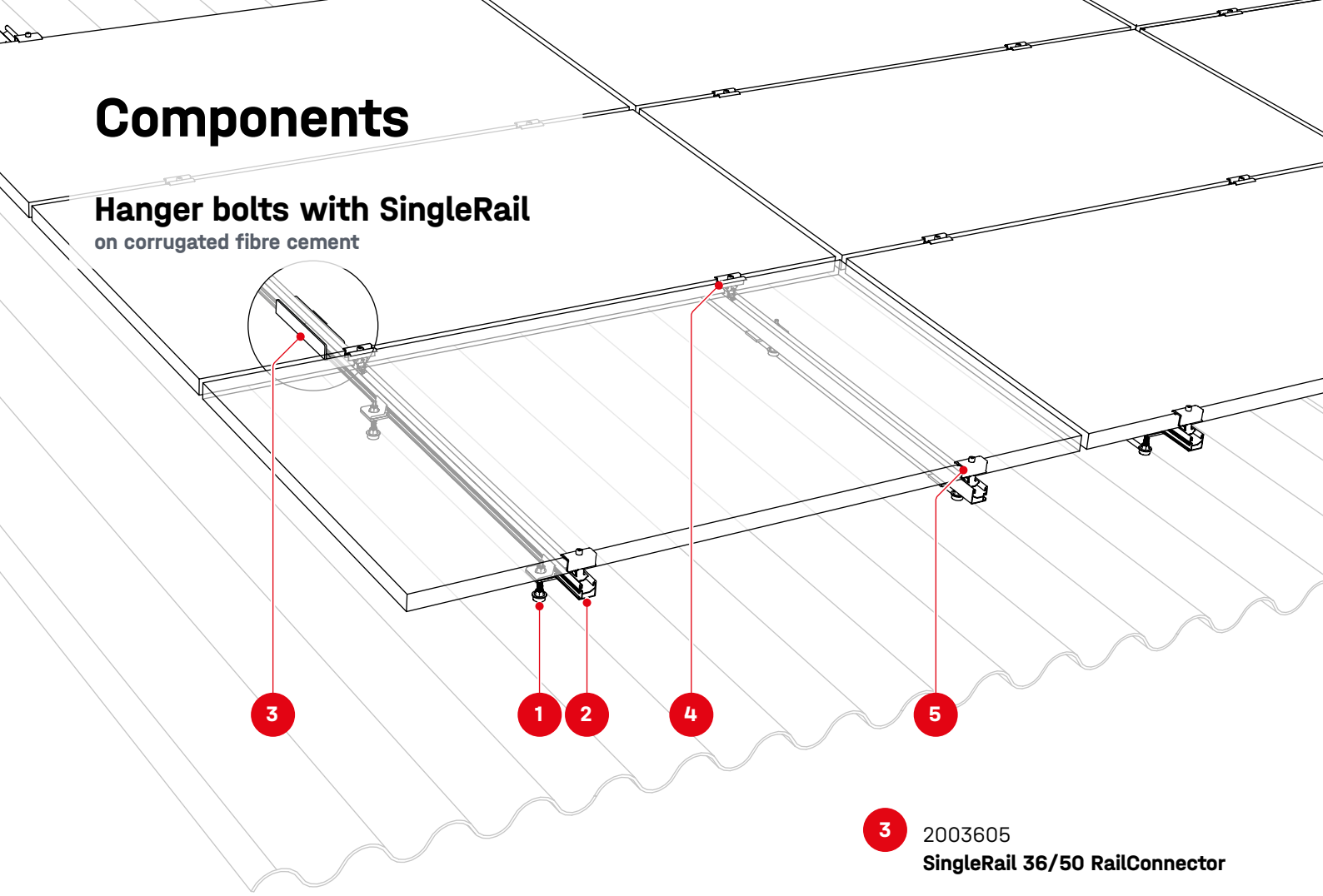
### Hanger bolts/solar fasteners

- The hanger bolts are suitable for fastening to fibre cement profiles.
- The solar fasteners are suitable for fastening to steel/aluminium roof sheeting profiles and fibre cement profiles.
- It is also possible to install on slate roofing using metal roof plates.
- Please observe the specified screw-in depth of the solar fasteners for wooden substructures. You can find this in our Base Report under the heading Results. The specified load-bearing capacity values can only be achieved if the specified screw-in depth of the solar fasteners is observed.
- Do not step on hanger bolts or solar fasteners as these are not climbing assists.
- The handling instructions and the applicable European Technical Assessment (ETA) of the screw manufacturers must be observed.
- When using hanger bolts and solar fasteners, it is essential to ensure that they are installed correctly and professionally, particularly to guarantee the roof is watertight. Installation must only be carried out by qualified specialists. K2 Systems accepts no liability for damage resulting from improper installation.

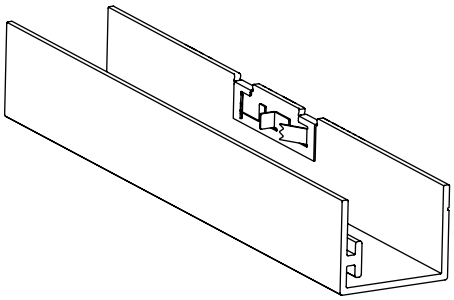
# Components

## Hanger bolts with SingleRail

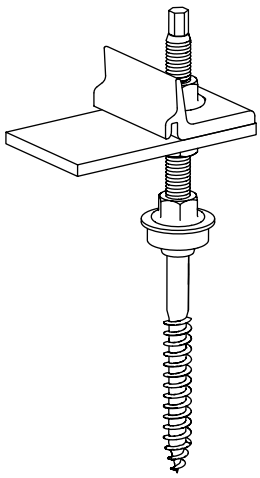
on corrugated fibre cement



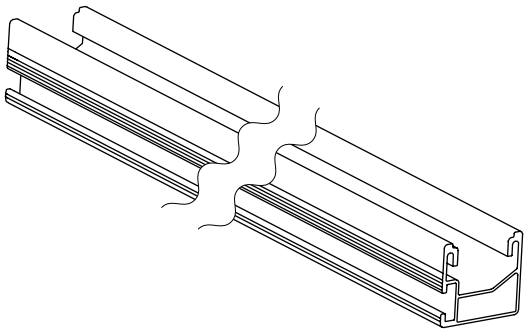

**3** 2003605
**SingleRail 36/50 RailConnector**



**1** Item number system-specific
**Hanger bolt M10/M12 for SingleRail**

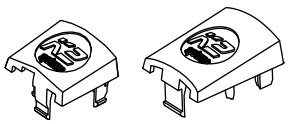


**2** Item number system-specific
**SingleRail 36, 50 or 36 Light**

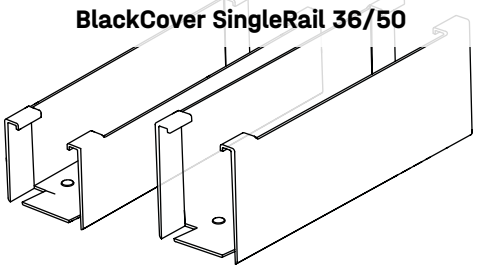


## Optional

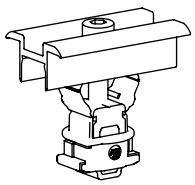
1004767/2004911
**EndCap SingleRail 36/50**



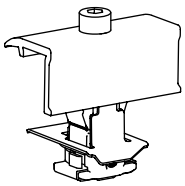
2003523/2002907
**BlackCover SingleRail 36/50**



**4** Item number system-specific
**Module middle clamp**



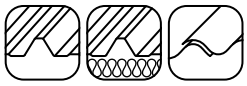
**5** Item number system-specific
**Module end clamp**



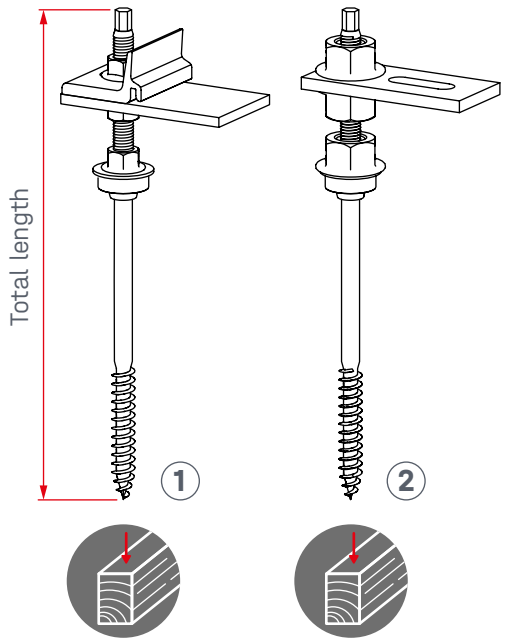
# Fastener

## Overview

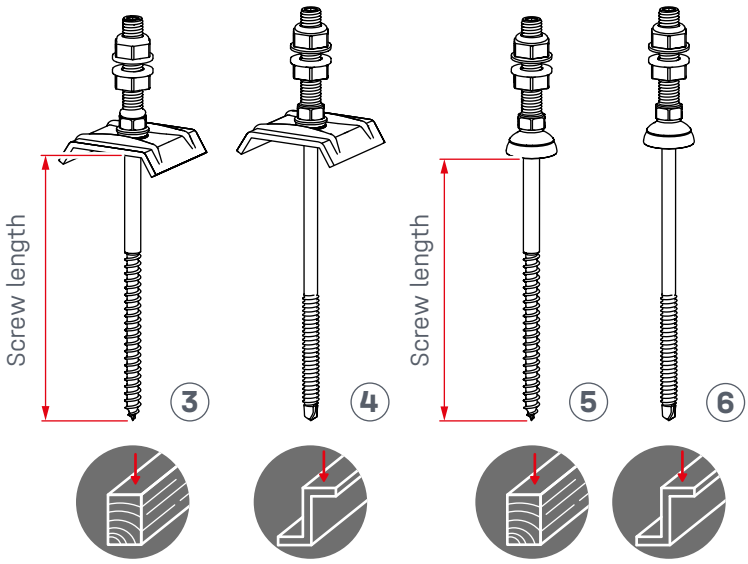
| Fastener | Roof covering | Illustration | Substructure | | |
|---|---|---|---|---|---|
| | | | Timber | | |
| | | | Total length [mm] / Product number | | |
| | | | M10 | M12 | |
| **Hanger bolt SingleRail** with fibre cement seal | Corrugated fibre cement  | ① | **180 /** 2003272 | **200 /** 2003275 | |
| | | | **200 /** 2003273 | **250 /** 2003276 | |
| | | | **250 /** 2003274 | **300 /** 2003277 | |
| **Hanger bolt SolidRail** with fibre cement seal | Corrugated fibre cement  | ② | **180 /** 2000120 | **200 /** 2000123 | |
| | | | **200 /** 2000121 | **250 /** 2000124 | |
| | | | **250 /** 2000122 | **300 /** 2000125 | |

| | | | Timber | | Steel | |
|---|---|---|---|---|---|---|
| | | | Screw length [mm] / Product no. | | Screw length [mm] / Product no. | |
| | | | M10 × 50 | M10 × 70 | M10 × 50 | M10 × 70 |
| **Solar fastener** with calotte (trapezoidal/ corrugated) | Trapezoidal sheet metal, sandwich panels, corrugated sheet metal  | ③ ④ | **80 /** 1002228 | **80 /** 1004286 | **85 /** 2003018 | **85 /** 2003032 |
| | | | **100 /** 1001770 | **100 /** 1006125 | **115 /** 2003019 | **115 /** 2003033 |
| | | | **130 /** 1001511 | **200 /** 1005906 | **155 /** 2003020 | **155 /** 2003034 |
| | | | **150 /** 1000807 | | **195 /** 2003021 | **195 /** 2003035 |
| | | | **180 /** 1001627 | | | |
| | | | **200 /** 1002749 | | | |
| **Solar fastener** with fibre-cement seal | Corrugated fibre cement  | ⑤ ⑥ | **80 /** 1002130 | **130 /** 1006058 | **85 /** 2003013 | **85 /** 2003028 |
| | | | **100 /** 1003029 | **150 /** 1005263 | **115 /** 2003012 | **115 /** 2003029 |
| | | | **130 /** 1001759 | **200 /** 1001420 | **155 /** 2003016 | **155 /** 2003030 |
| | | | **150 /** 1002001 | | **195 /** 2003017 | **195 /** 2003031 |
| | | | **180 /** 1002533 | | | |

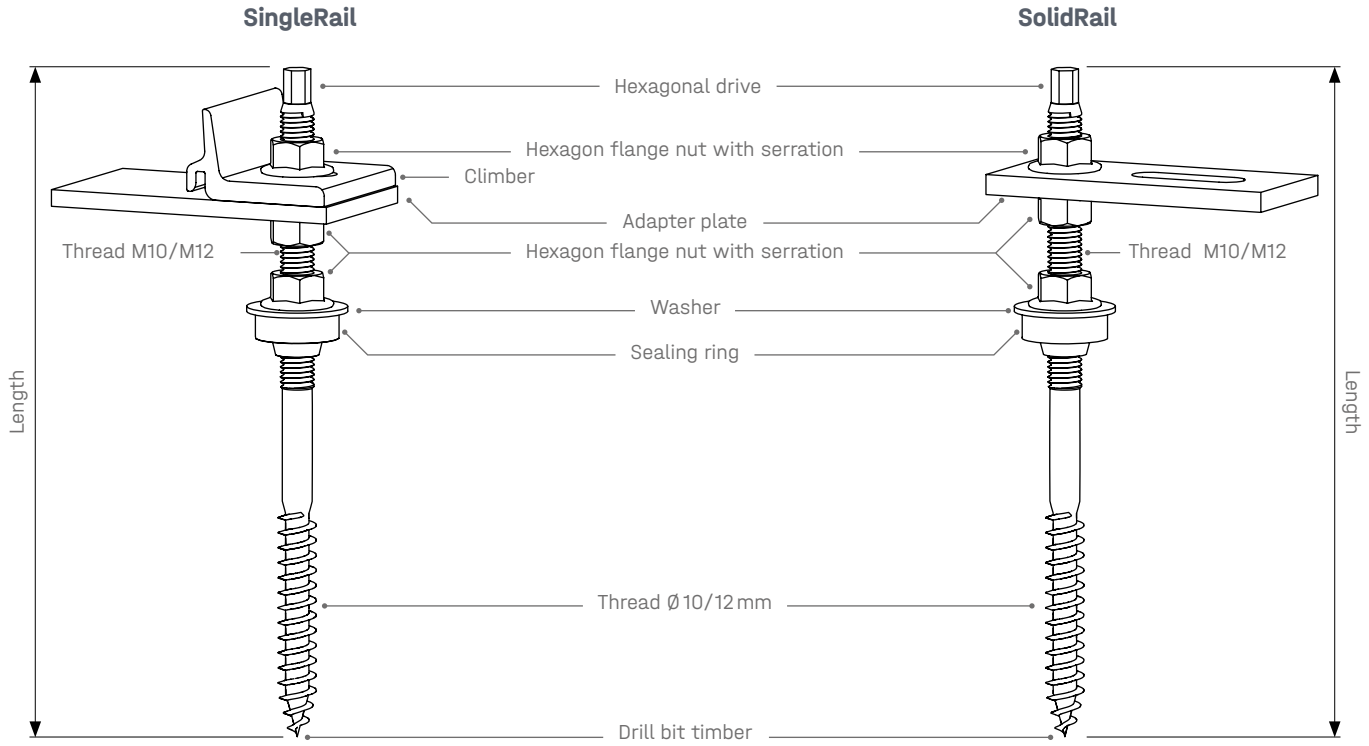
### Hanger bolts




### Solar fasteners



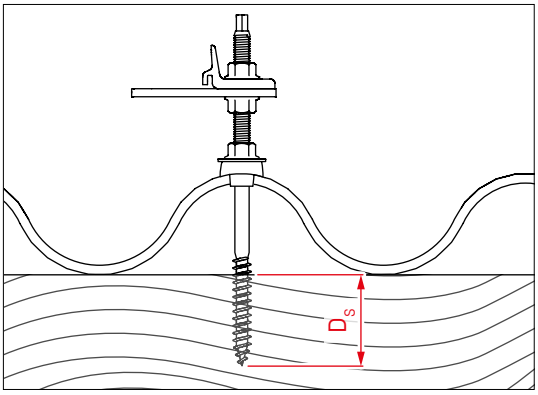
# Hanger bolts




### Roof covering, fastener types and pre-drilling diameters

| Pre-drill level | | Material | Pre-drilling diameters [mm] | |
|---|---|---|---|---|
| 1 | Substructure | **Timber** | **M10** | 7.0 |
| | | | **M12** | 8.5 |
| 2 | Roof covering | **Corrugated fibre cement** | **M10** | 14.0 |
| | | | **M12** | 15.0 |

1 2 = Sequence of pre-drilling, see step 1b on page 17

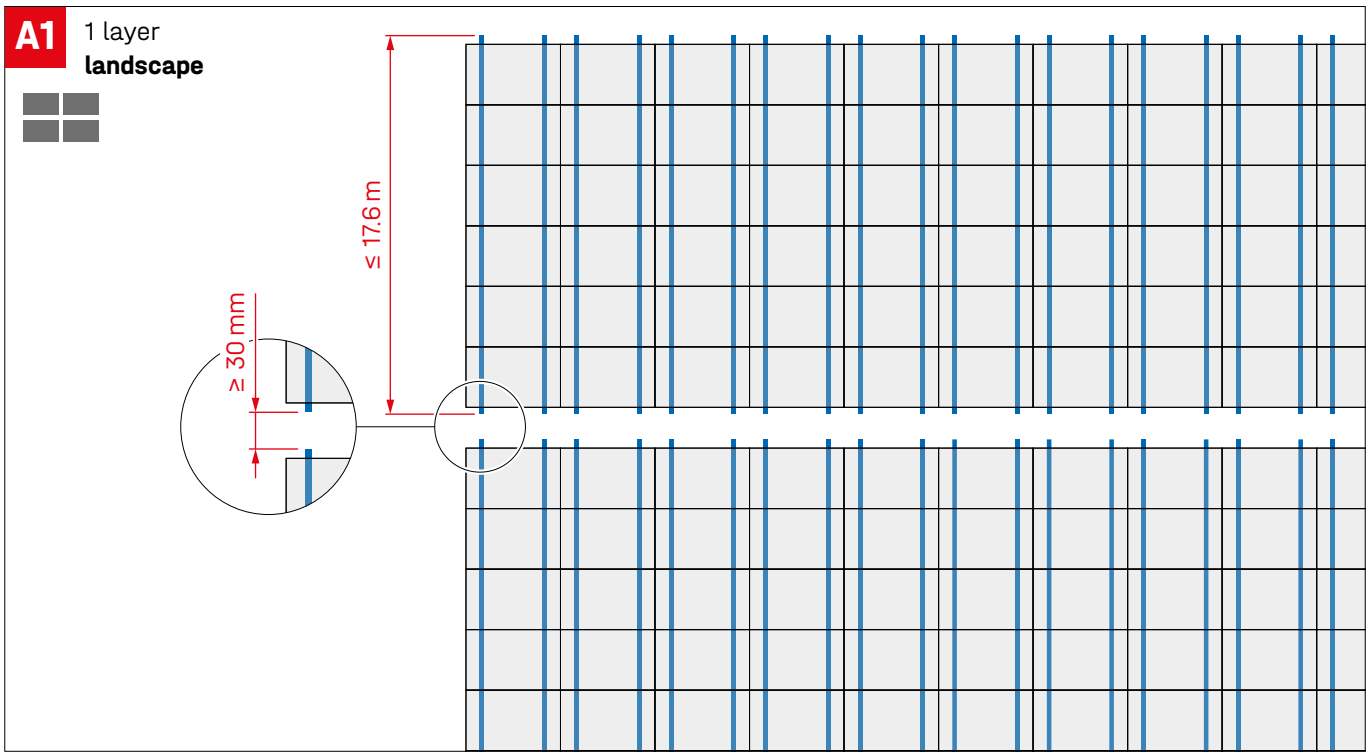



Observe minimum screw-in depth $D_S$
M10 = ≥ 40 mm / M12 = ≥ 48 mm, see also "Calculation hanger bolt and solar fastener length" document.

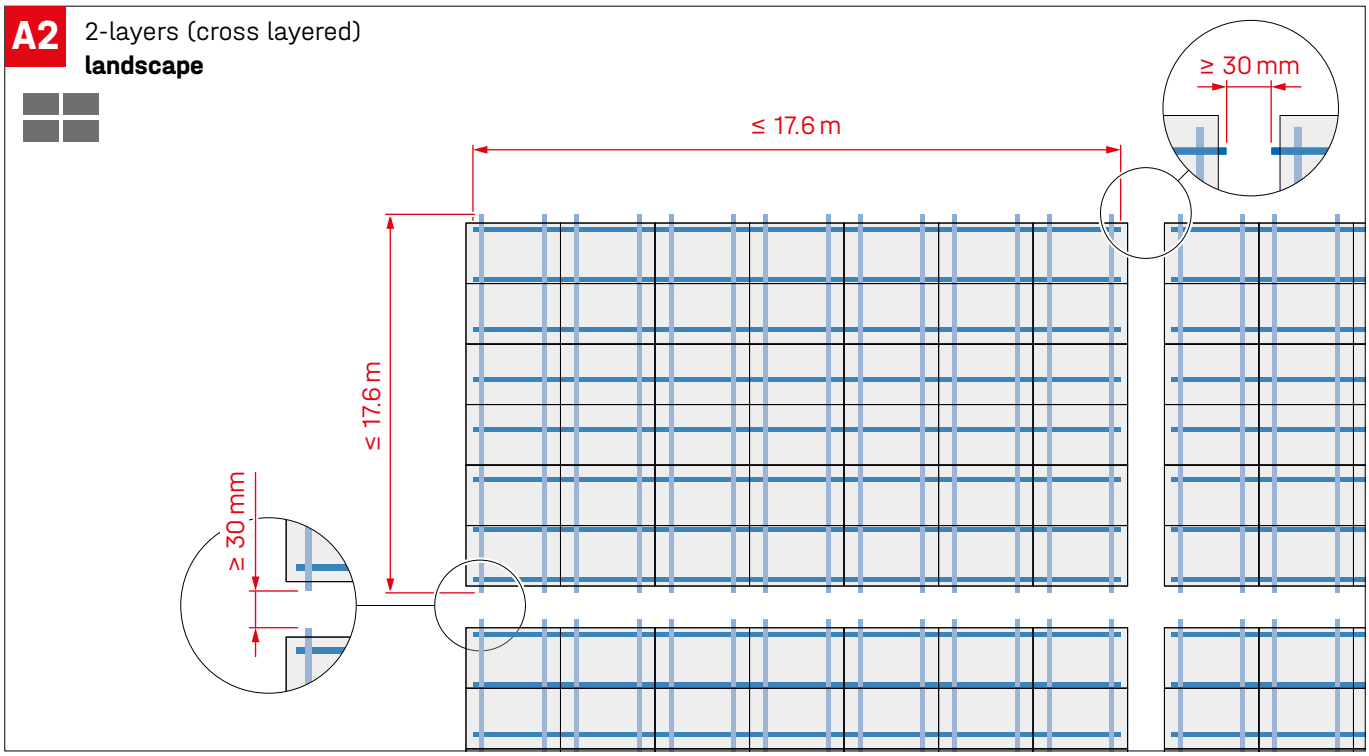
# Assembly

## Module blocks and thermal separations

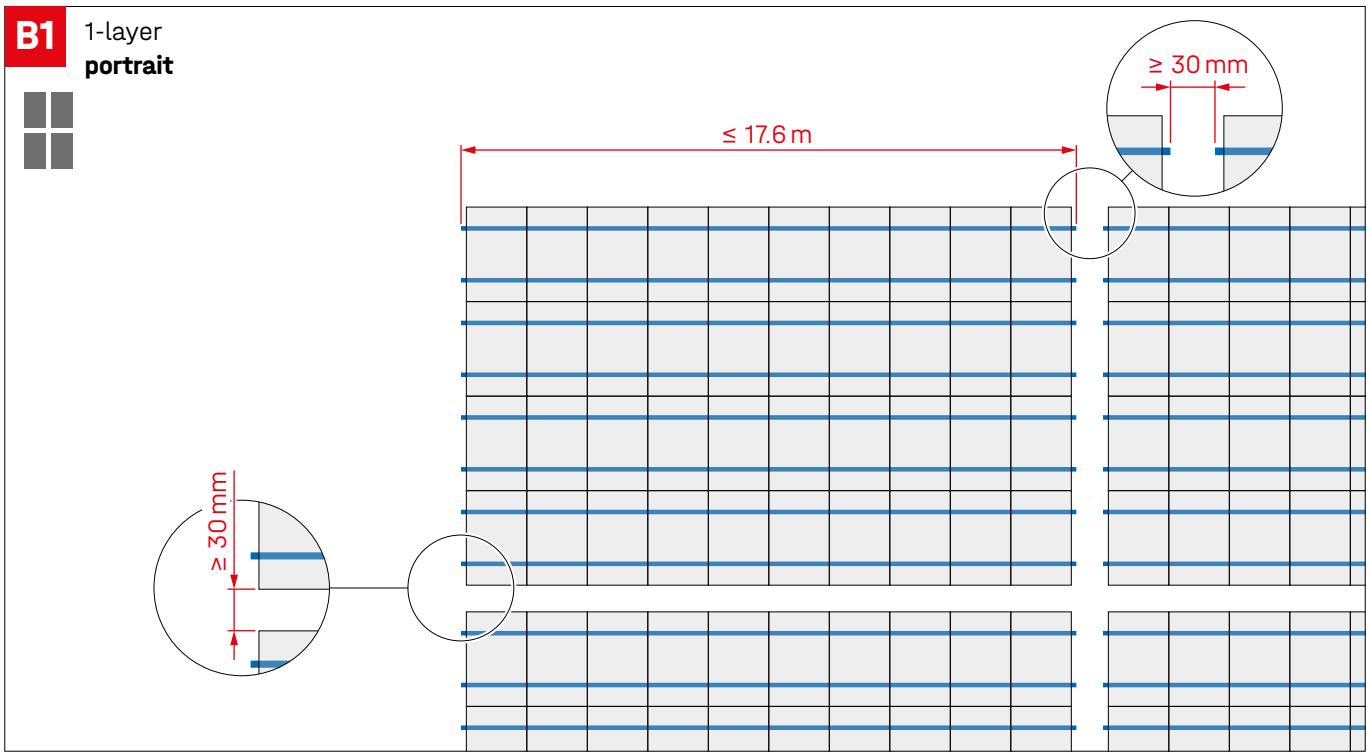
**A1** 1 layer
**landscape**



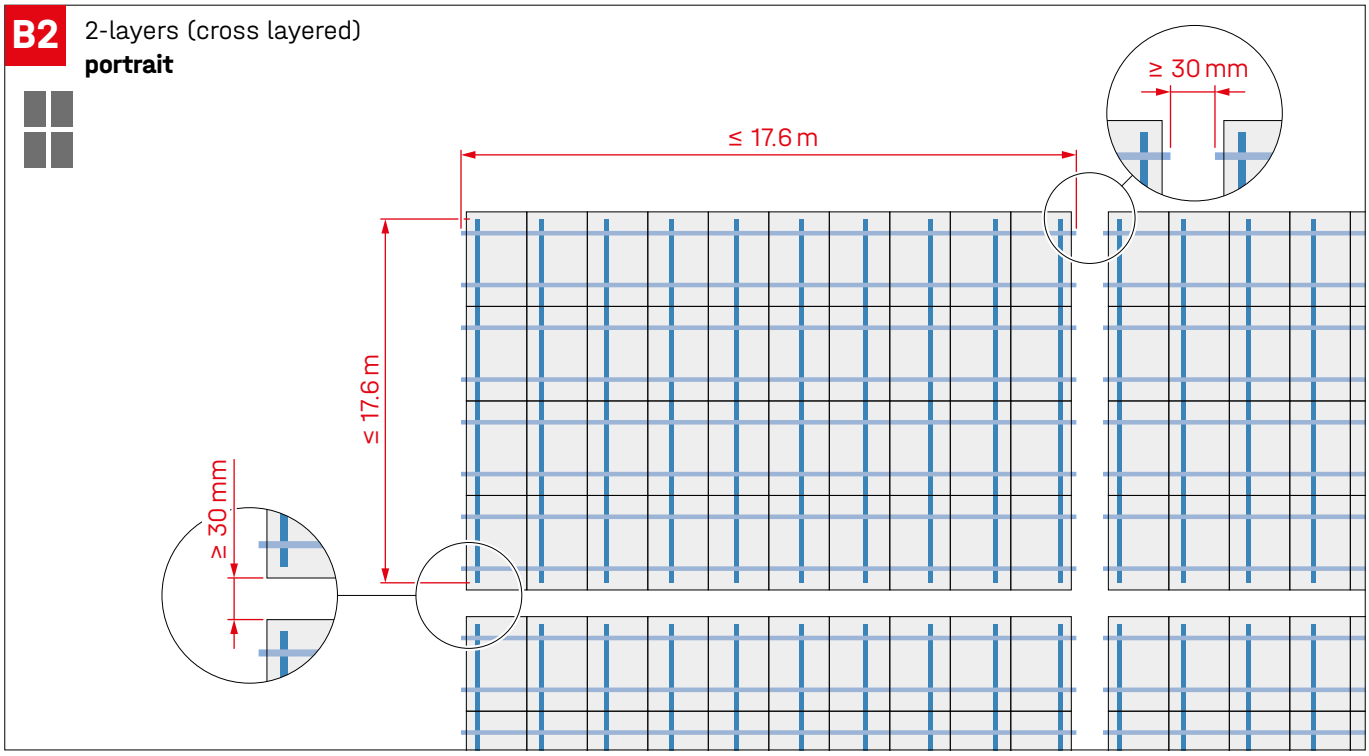

**A2** 2-layers (cross layered)
**landscape**



**B1** 1-layer
**portrait**

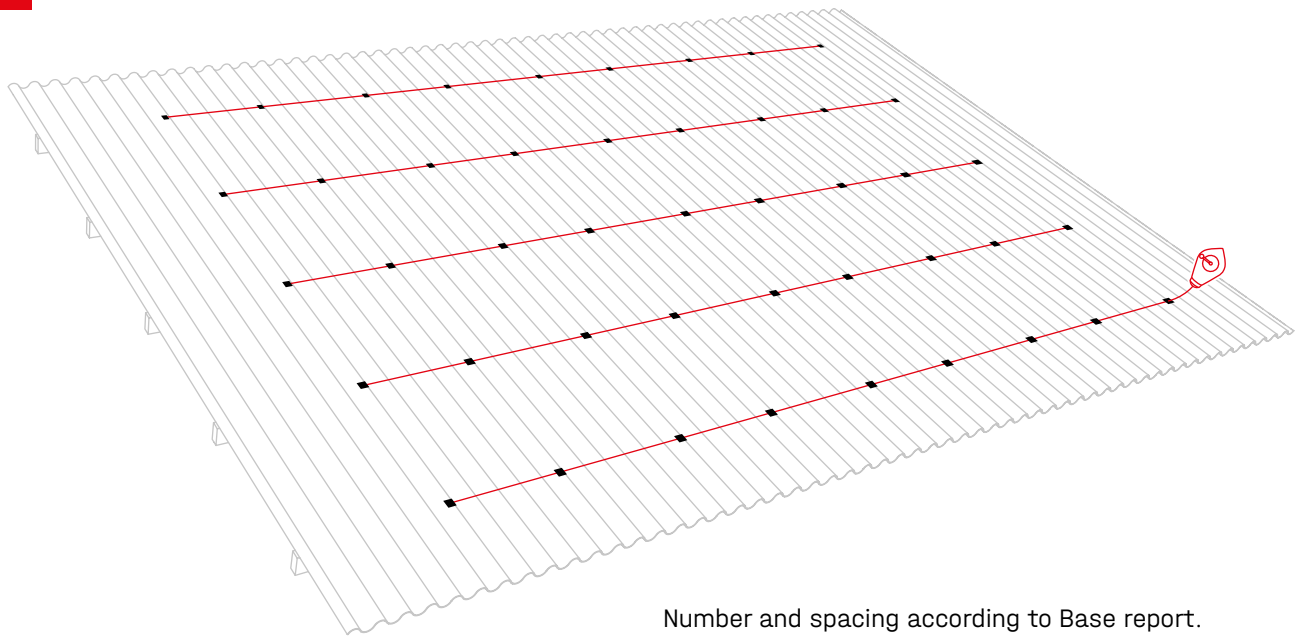



**B2** 2-layers (cross layered)
**portrait**



# Pre-drilling

**1a**

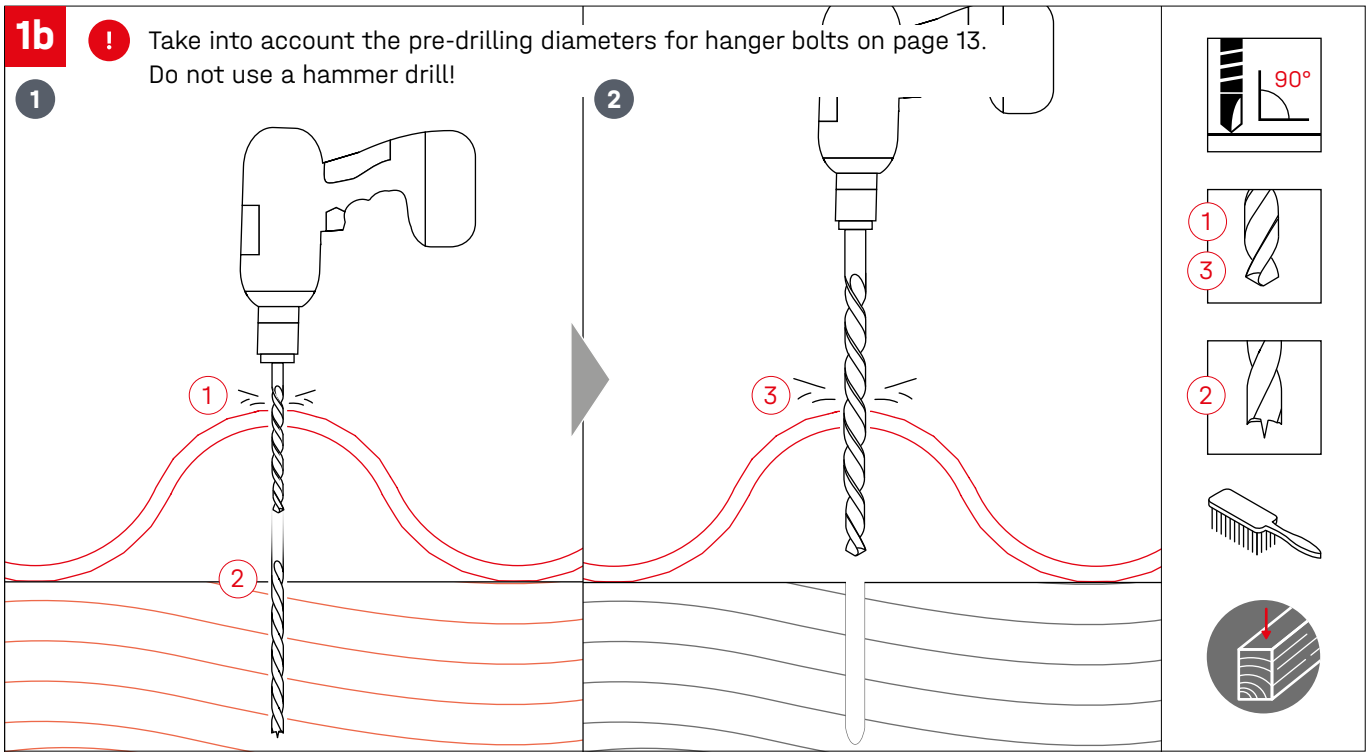


Number and spacing according to Base report.

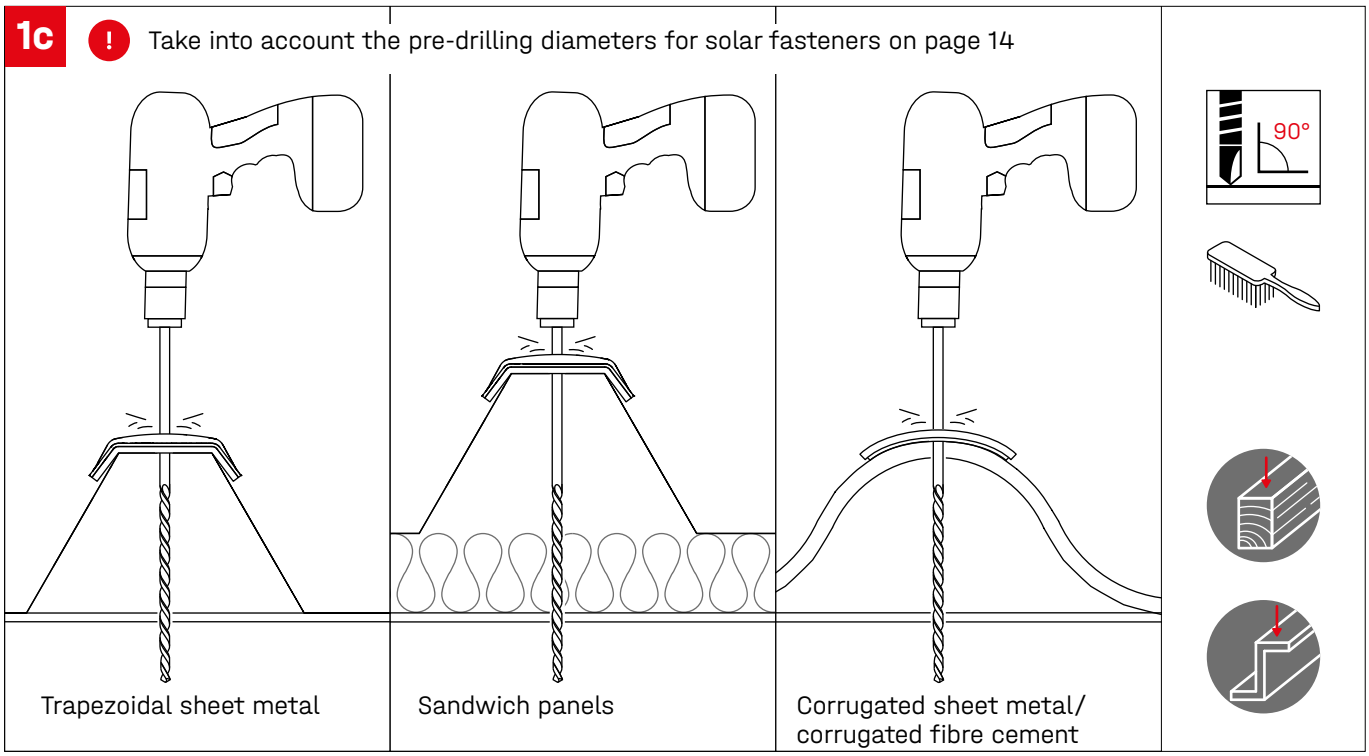
## Hanger bolt

**1b**

! Take into account the pre-drilling diameters for hanger bolts on page 13.
Do not use a hammer drill!



## Solar fastener




## Fasten screws

