STEEL GEAR

SOLAR

MOUNTING WORKSHEET

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MOUNTING INSTRUCTIONS - PITCHED ROOF

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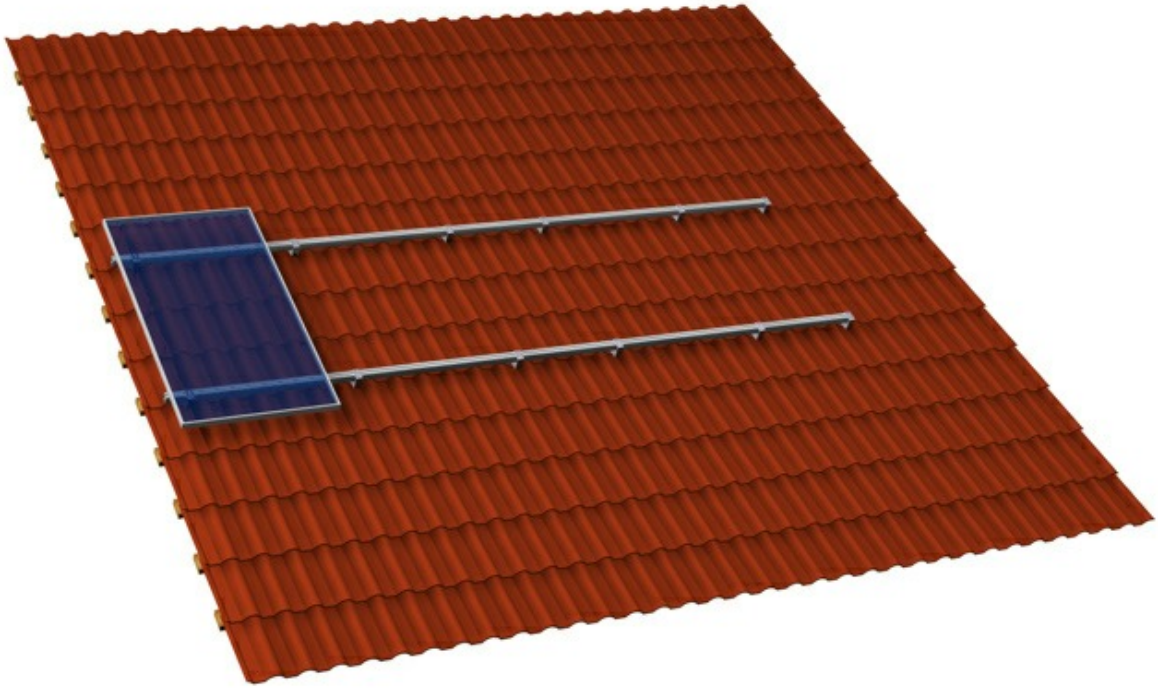
MOUNTING INSTRUCTIONS - PITCHED ROOF

GENERAL INFORMATION

Two things were absolutely decisive for our construction and development of the STEELGEAR SOLAR mounting systems:

simple installation and durability that guarantees safety.

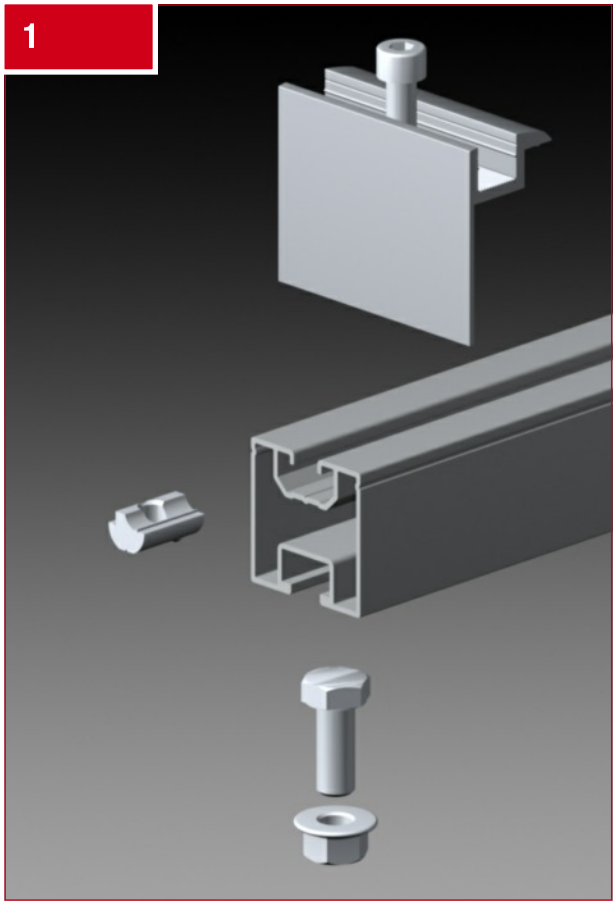


Since individual characteristics are to be taken into consideration for each and every roof, we suggest that have a professional specification of the roof before the installation. You need to take particular note of the static requirements. When mounting the system, it is very important to observe and uphold the corresponding norms and accident prevention regulations.

MOUNTING INSTRUCTIONS - PITCHED ROOF

SYSTEM OVERVIEW

1



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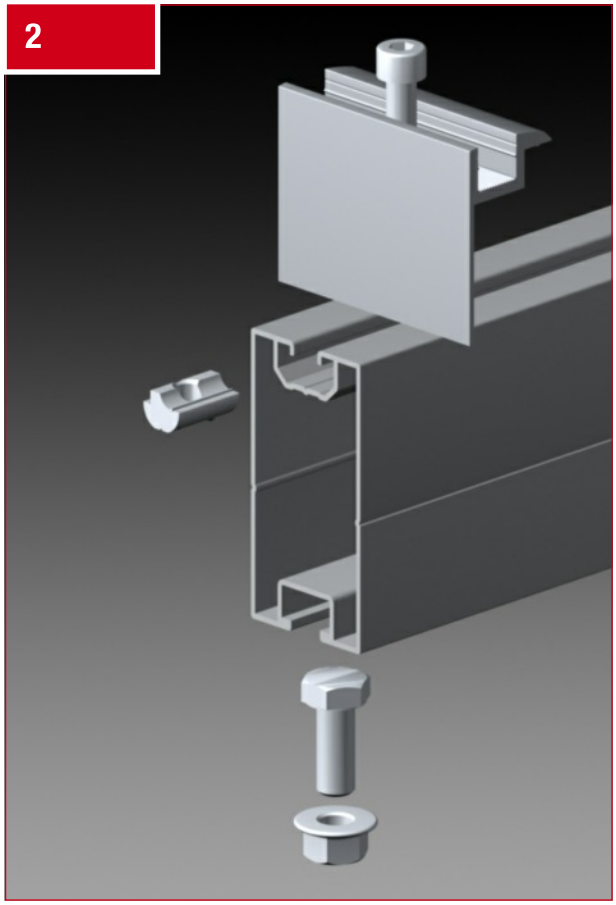

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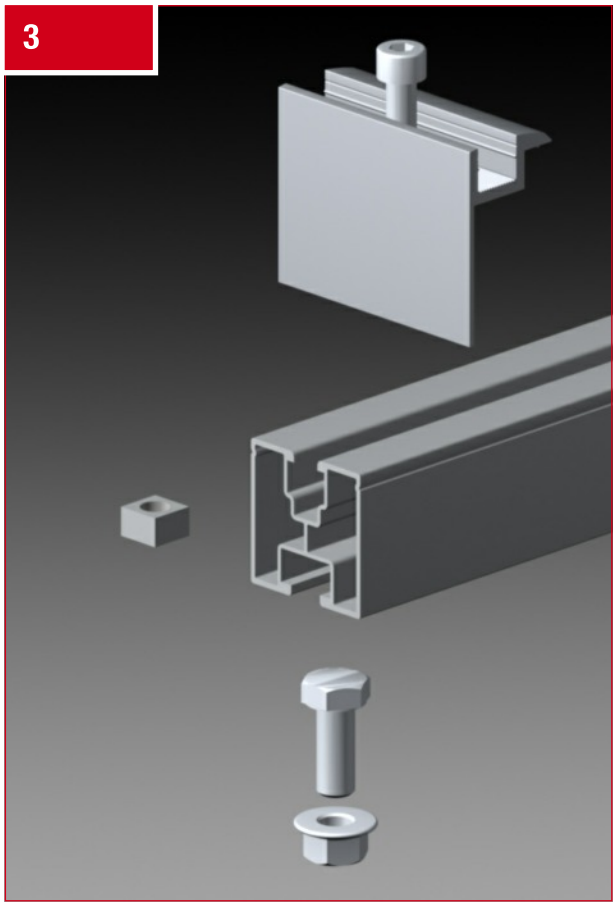
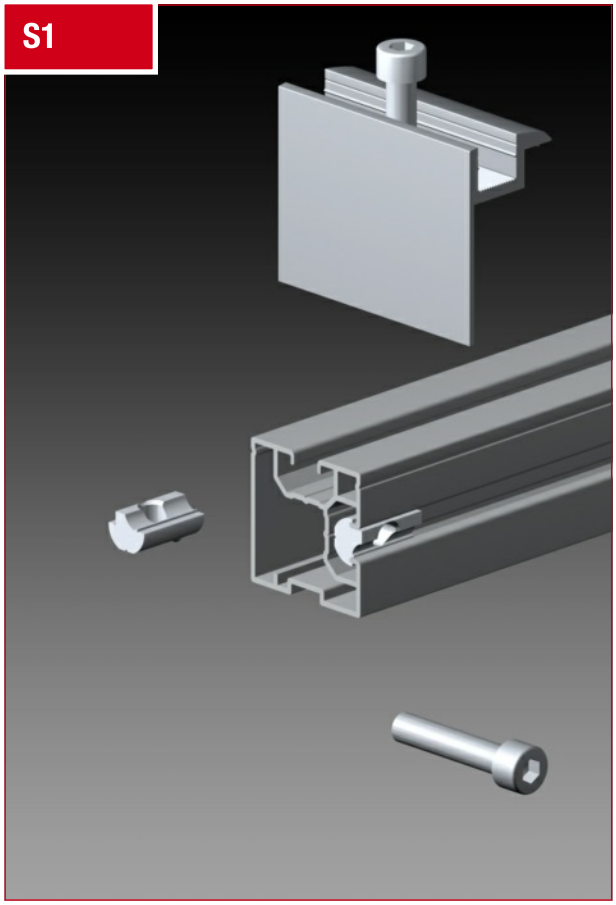


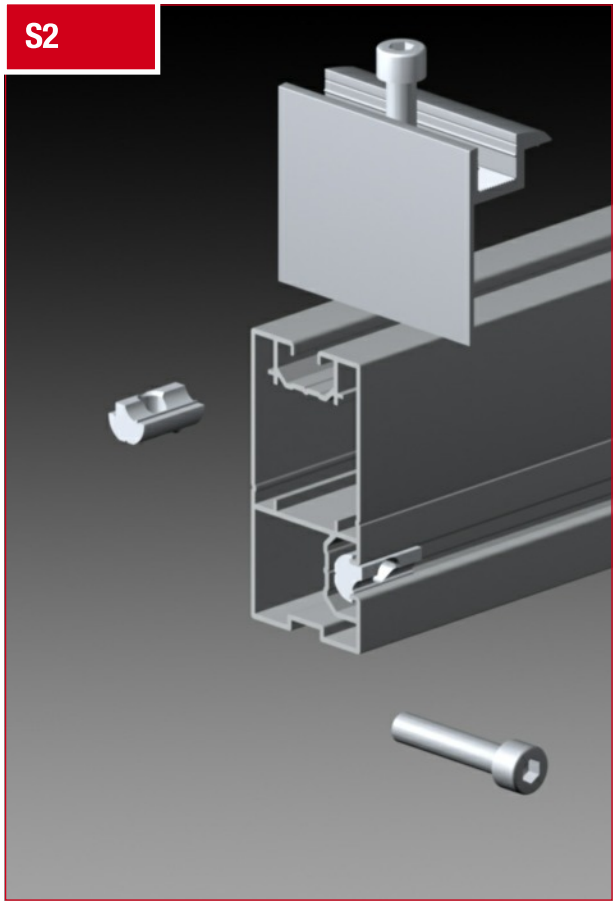
MOUNTING INSTRUCTIONS - PITCHED ROOF

SYSTEM OVERVIEW

S1



S2



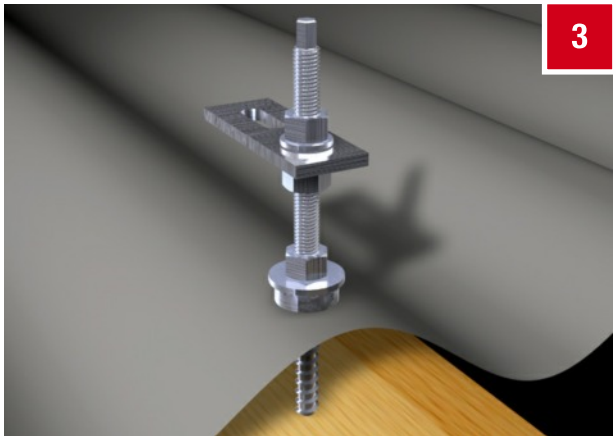
MOUNTING INSTRUCTIONS - PITCHED ROOF

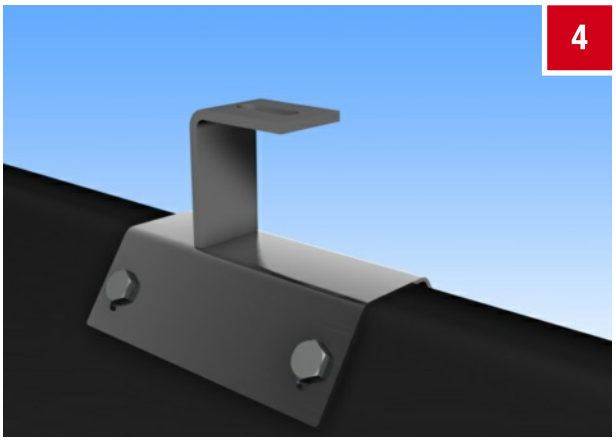
POSSIBILITIES FOR ATTACHING SYSTEMS TO A ROOF

A majority of roof coverings are established with roof tiles or roofing shingles. For these types of roofs, you can use, for example, Vario roof hooks (for heavy loads, **PICTURE 1)**, adjustable roof hooks and standard roof hooks **(PICTURE 2)**.
The assembly is described in the following.

These roof hooks are generally mounted to wooden beams as per current wood norms. You can use the following screws for this:

- DIN 571 A2 8*80/100/120 mm wooden screws





When covering with corrugated sheets **(PICTURE 3)** or trapezoidal metal sheets, you can use stock screws and special consoles/blocks **(PICTURE 4, 5 and 6)**. You select the corresponding stock screws based on the respective sub-construction (for example, whether it's wood or steel).
We offer the following possibilities here:

For wooden sub-constructions:

- See delivery programs 9215 + 9216 + 9217 + 9219

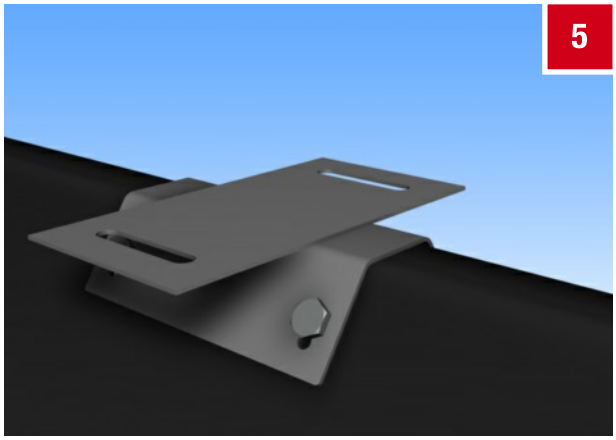
For steel sub-constructions:

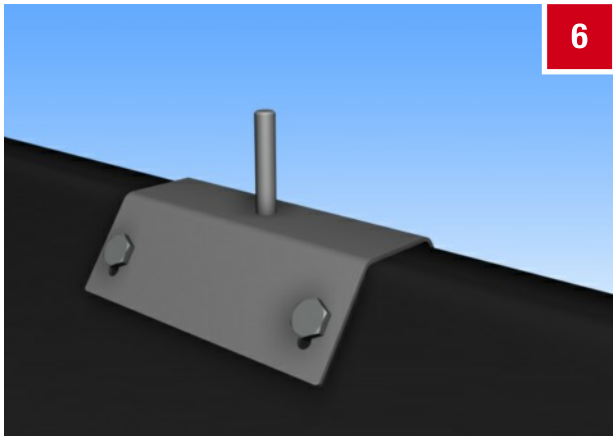
- See delivery program 9222
- Approved solar panel fasteners!

You select the proper console based on the respective roof cover.

MOUNTING INSTRUCTIONS - PITCHED ROOF

POSSIBILITIES FOR ATTACHING SYSTEMS TO A ROOF





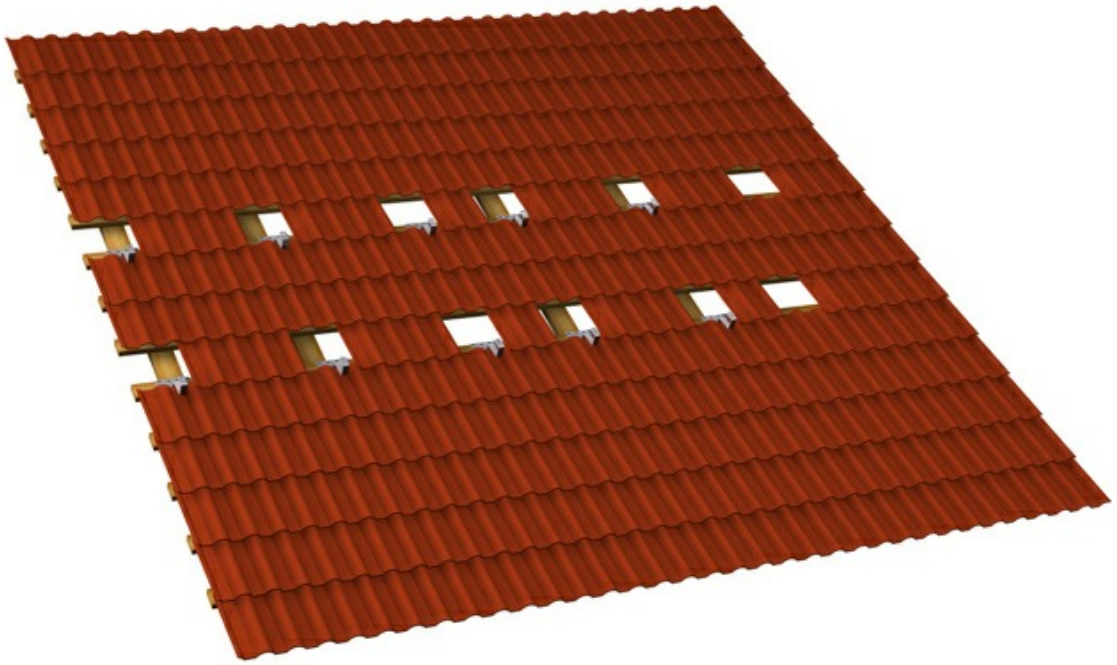
If a roof penetration is not possible, you can conduct a direct attachment to the provided trapezoidal or corrugated sheet covers with a console/block (see below) for a sheet mounting.

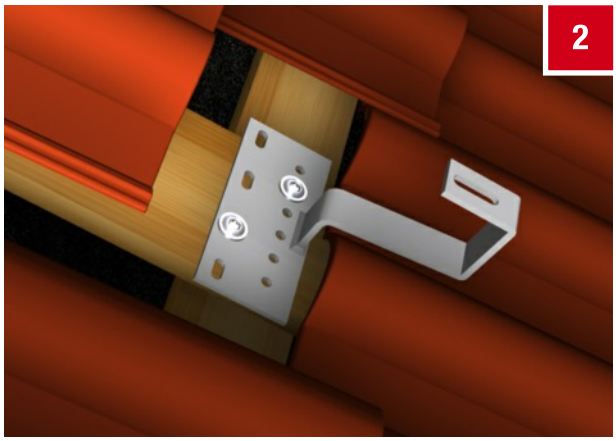
The consoles can be used up to a pitch of 30° depending on the construction type. Before starting, you must observe that the attachment of the sheet to the sub-construction is sufficient and observe the maximum load capacity of the sheet.

MOUNTING INSTRUCTIONS - PITCHED ROOF

MOUNTING STEP: PITCHED ROOF FRAMEWORK

Determine the position of the roof hooks according to the plan, which is provided in the project-related assembly draft drawings.





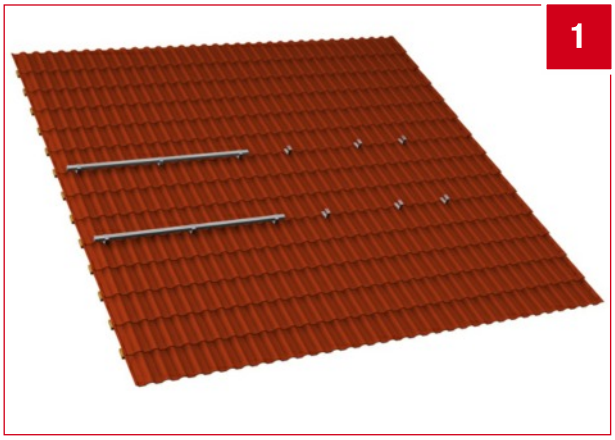
Remove the roofing tiles at the respective positions or, if possible, push them upwards. Position the respective roof hooks; the hook must not push against the roofing tile.

Depending on the roof hook model, you can adjust the roof hooks at the height and in the sides, such that it is located in the wave trough of the roofing tile. Mount each roof hook with two wood screws (for example, wooden screws DIN 571 to the rafters.

If necessary, leave out the roofing tile above the roof hooks at the spot where the roof hooks are led through with hand-held cutters. The roof hooks should not push up the roofing tile located above it. In the case of mixed roofing tiles, we recommend that you also leave out the lower tile.

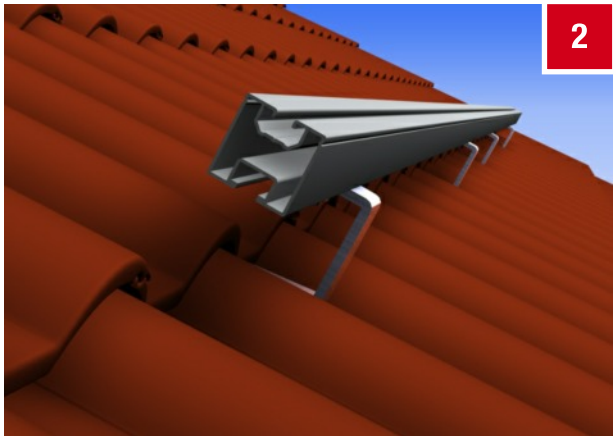
MOUNTING INSTRUCTIONS - PITCHED ROOF

MOUNTING STEP: PITCHED ROOF FRAMEWORK



You mount the mounting rails for every module row using various screws and bolts. (For **PICTURE 2** and **PICTURE 3**, you can also feel free to use self-locking DIN 985 bolts with ring washers; tightening torque max. 18 Nm.)

Make sure you check the required rail connectors in advance (see page 10.)



2:

DIN 933 A2 M10*25 (hexagon bolt) plus 9345 A2 M10 (locking nut)

oder

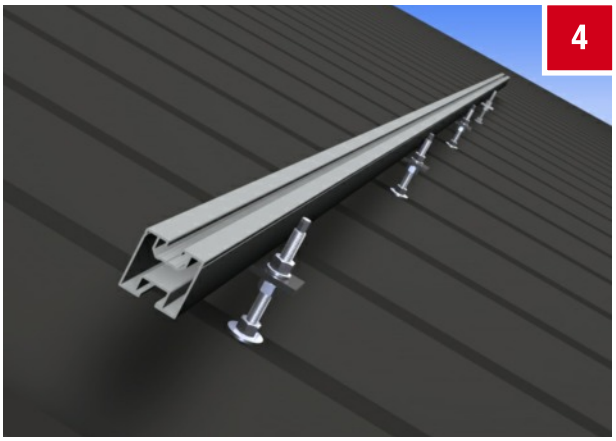
M10*25 (hammerhead bolt) plus 9345 A2 M10 (locking nut)

3:

Roll in T slot nut plus DIN 912 A2 M8*16 (cylinder head screw)

oder

DIN 603 A2 M8*25 (round-head screw) plus 9345 A2 M8 (locking nut)



BUILD 4:

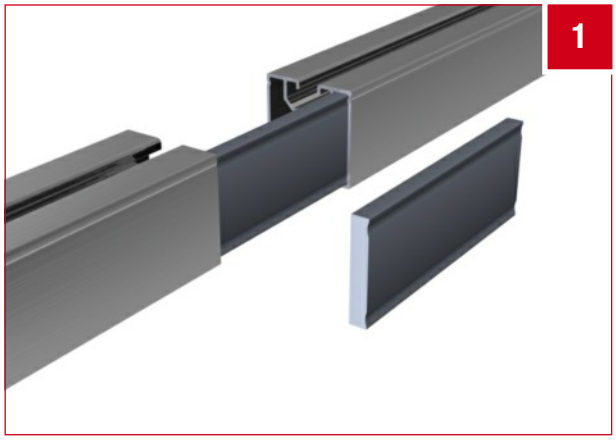
DIN 933 A2 M10*25 (hexagon bolt) plus 9345 A2 M10 (locking nut)

oder

M10*25 (hammerhead bolt) plus 9345 A2 M10 (locking nut)

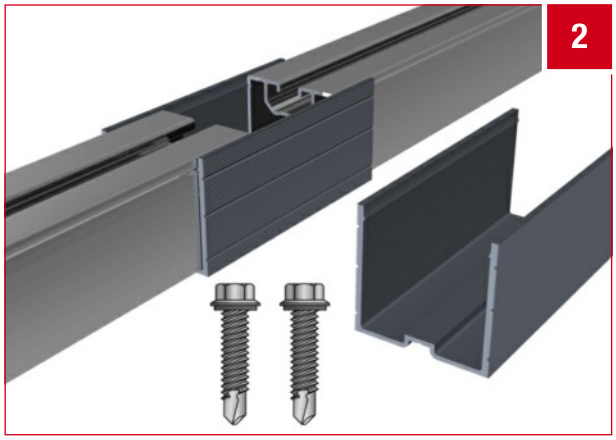
MOUNTING INSTRUCTIONS - PITCHED ROOF

MOUNTING THE RAIL CONNECTORS

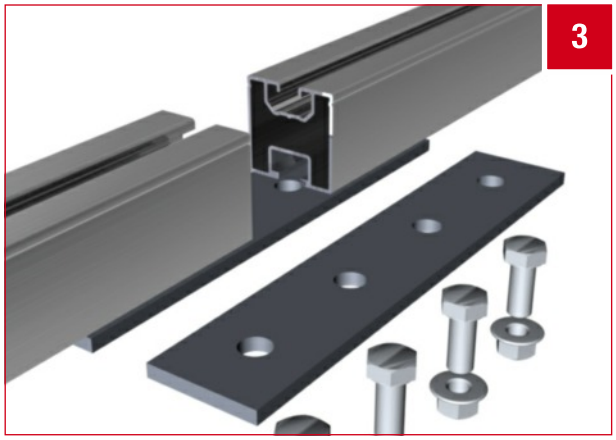


To line up several system units next to each other, you can use various connectors:

PICTURE 1: Half of the connector is pushed into the mounting rail. Then push the other mounting rail onto the connector. Afterwards, you push together the mounting rails with pressures.



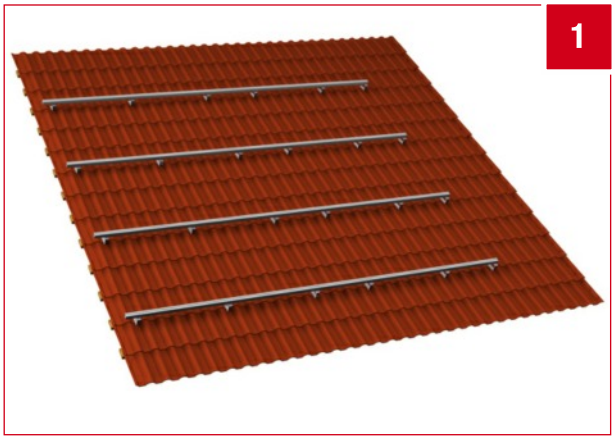
PICTURE 2: Place the connector above the first mounting rail and click it into the existing groove. Then click in the second mounting rail and press them together. You then screw the connection together with two drilling screws (tightening torque 8-10 Nm).



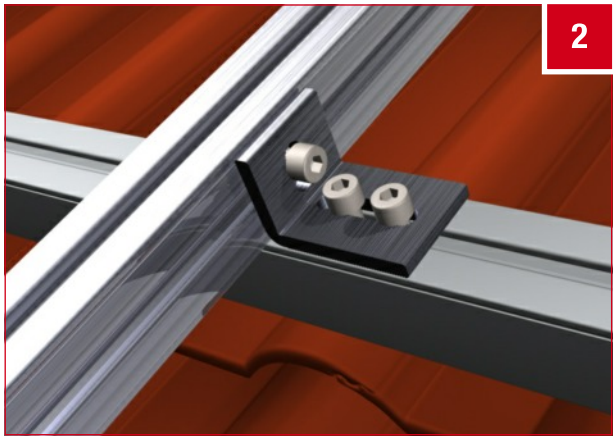
PICTURE 3: Make sure you have four hexagon bolts for the connectors (featuring 4 holes) and then push the first two screw heads into the lower channel of the first mounting rail. Then push the last two screws into the other rails. You then attach all four screws with (in each case) 4 bolts (tightening torque 10-12 Nm).

MOUNTING INSTRUCTIONS - PITCHED ROOF

MOUNTING STEP: IN CROSSBAR COMBINATION

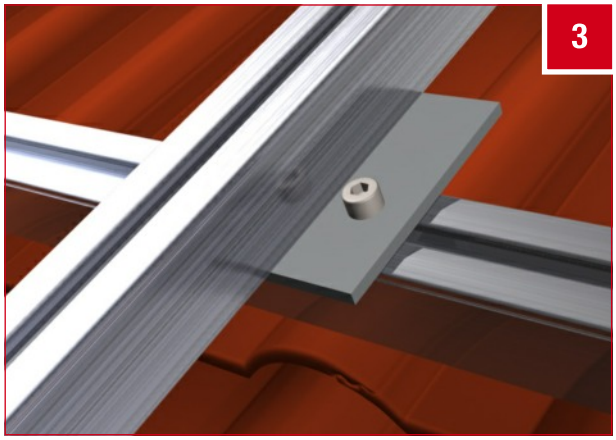


When you attach non-framed PV modules, you may have to conduct an assembly in the cross brace. This is a particularly stabile construction. You must always observe the module manufacturer instructions!



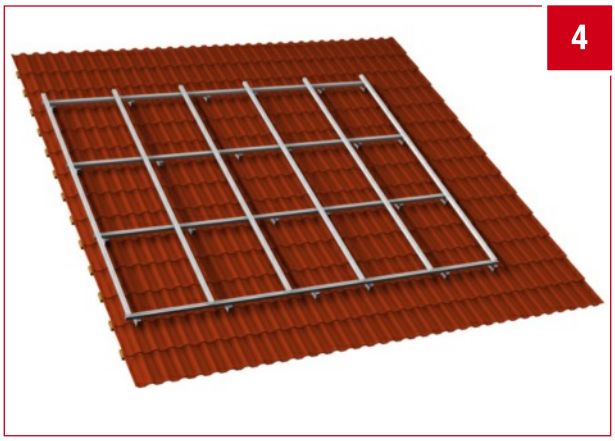
PICTURE 2: Connection of the two rails via a cross brace bracket

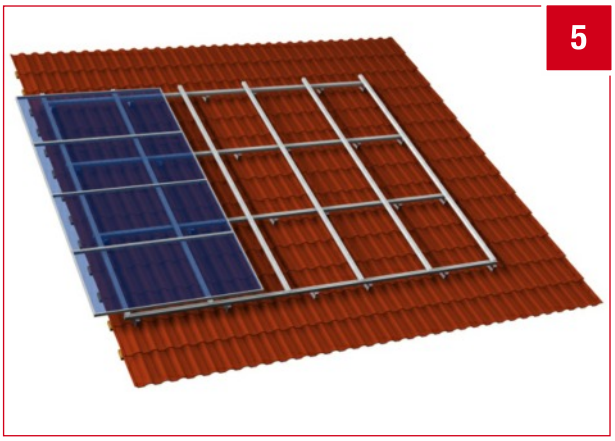
- 912 A2/A4 8*16 (3x) cylinder head screw
- Roll in (3x) t-nut
- Angle bracket cross brace



PICTURE 3: Connection of the two rails via a connector plate

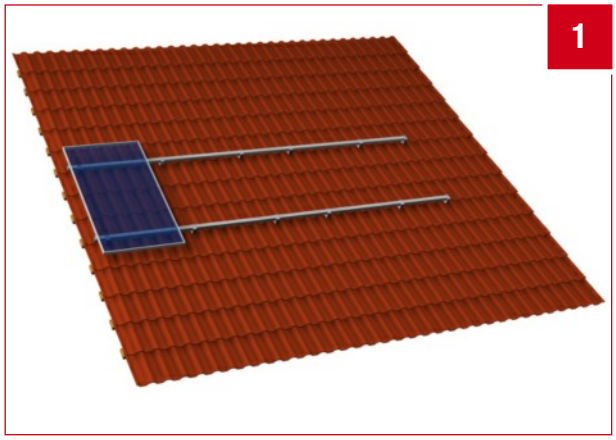
- 912 A2/A4 8*16 (2x) cylinder head screw
- Roll in (2x) t-nut
- Cross connector plate
- 933-2 10x25 hexagon bolt
- M10 self-locking nut



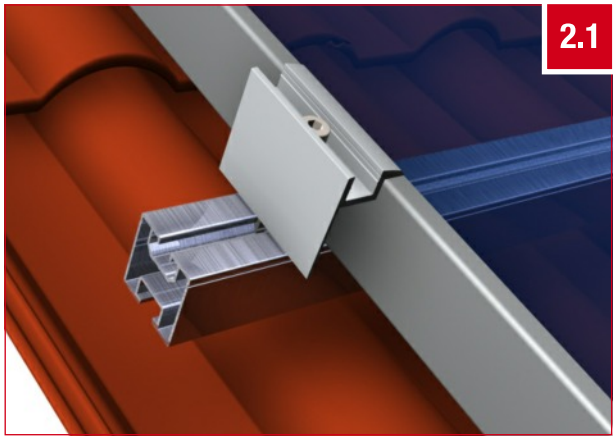


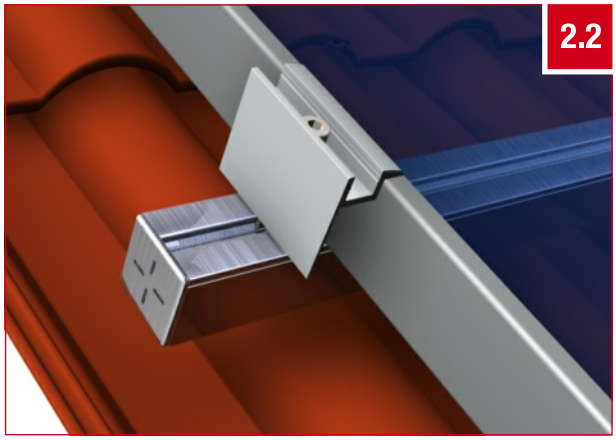
MOUNTING INSTRUCTIONS - PITCHED ROOF

MOUNTING STEP: PITCHED ROOF FRAMEWORK WITH FRAMELESS PV MODULES

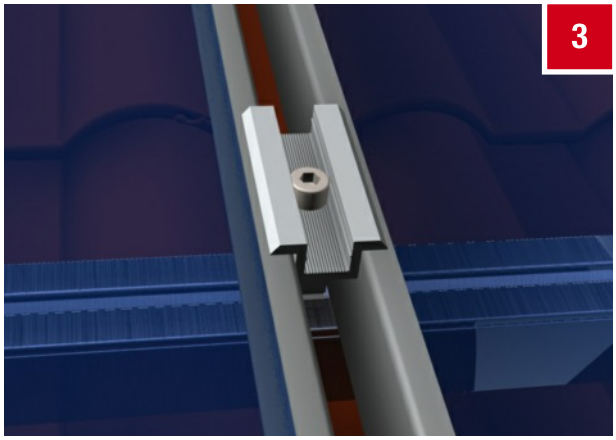


Attachment examples for middle and end clamps:

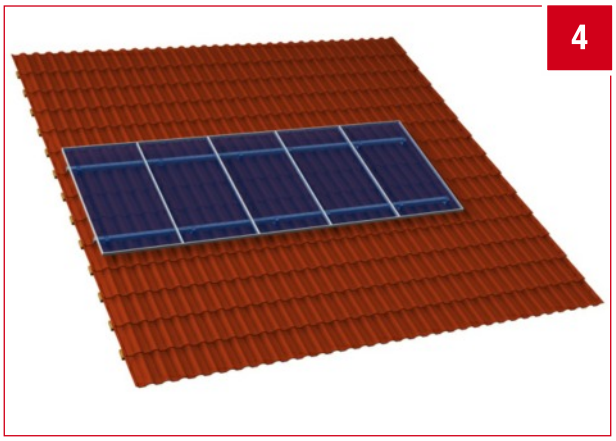




PICTURE 2.1 : Swivel the t-nut into the upper rail and click it in. Twist the end clamp with the respective screw (depending on module height) into the t-nut. Alternatively, you can attach the click-in kit in the upper channel of the rail and tighten it (tightening torque up to a maximum of 18 Nm depending on module manufacturer.) You can add a cover to the rails for personal or appearance reasons (PICTURE 2.2).

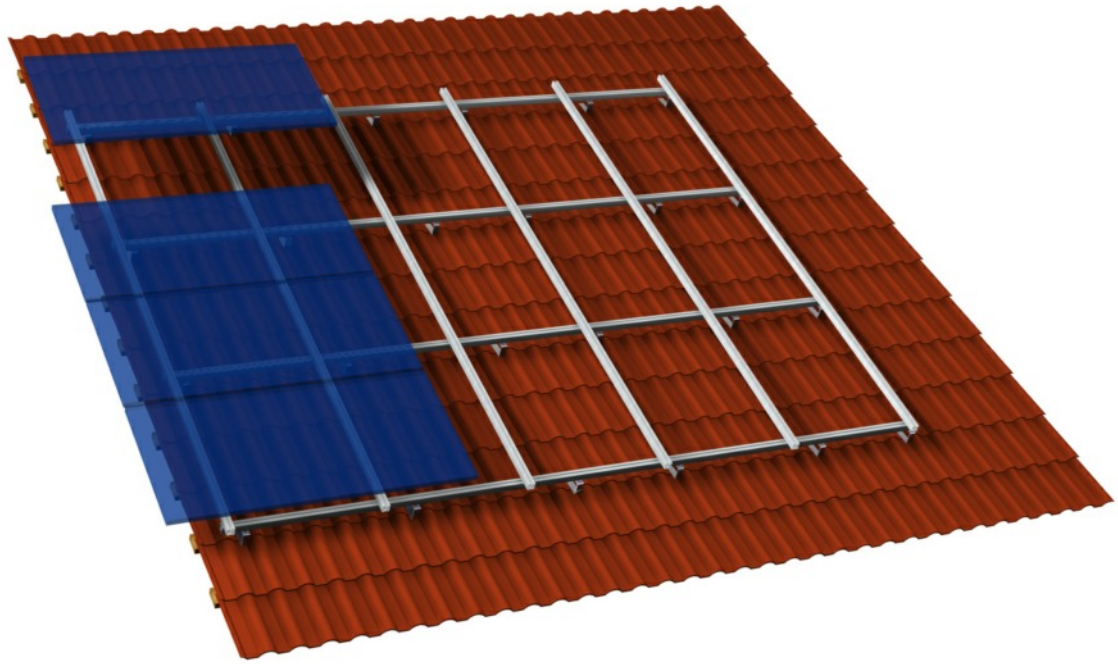


PICTURE 3: Swivel the t-nut into the upper rail and click it in. Twist the middle clamp with the respective screw (depending on module height) into the t-nut. Alternatively, you can attach the click-in kit in the upper channel of the rail and tighten it (tightening torque up to a maximum of 18 Nm depending on module manufacturer.)

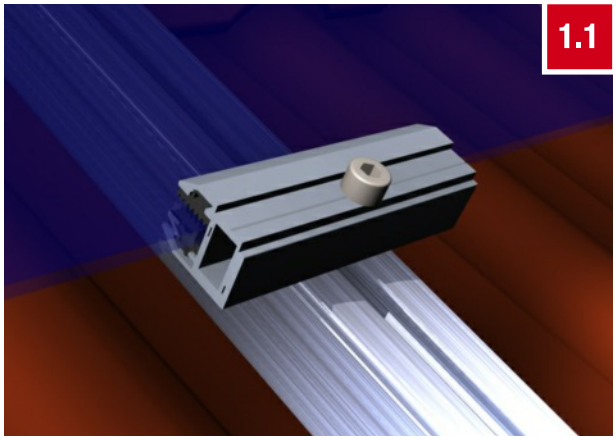


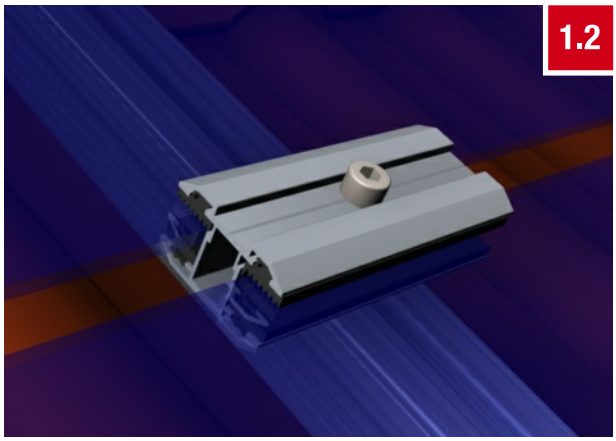
MOUNTING INSTRUCTIONS - PITCHED ROOF

MOUNTING STEP: PITCHED ROOF FRAMEWORK WITH FRAMELESS PV MODULES

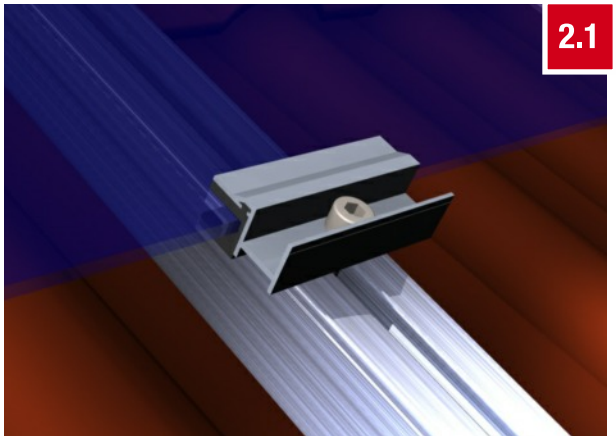


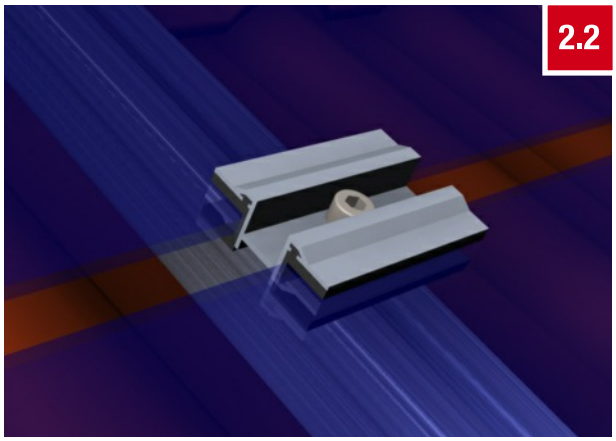
PICTURE 1: Swivel the t-nut into the upper rail and click it in. Twist the end clamp with a DIN 912 A2/A4 M8*35 mm screw into the t-nut and tighten it (tightening torque up to 15 Nm.)





PICTURE 2: Swivel the t-nut into the upper rail and click it in. Twist the end clamp with a DIN 912 A2/A4 M8*35 mm screw into the t-nut and tighten it (tightening torque up to 15 Nm.)





MOUNTING INSTRUCTIONS - PITCHED ROOF

SCREWS FOR FRAMED PV MODULES

Use DIN 912 M8 allen screws - see below for lengths applicable to Different module heights

Application of Allen screws for various module heights

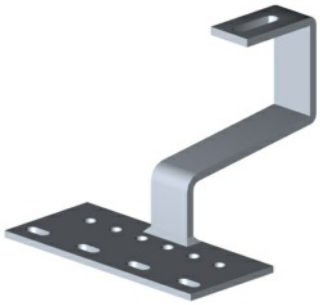
Module height	Screw for rail with t-nut	Locking washer (only for t-nut channel)	Screw for rail with square nut
32 mm	Allen, M8 * 35	-	Allen, M8 * 35 or *40
34 mm	Allen, M8 * 35	-	Allen, M8 * 35 or *40
35 mm	Allen, M8 * 40	X	Allen, M8 * 40 or *45
36 mm	Allen, M8 * 40	X	Allen, M8 * 40 or *45
38 mm	Allen, M8 * 40	-	Allen, M8 * 40 or *45
40 mm	Allen, M8 * 45	X	Allen, M8 * 45 or *50
41 mm	Allen, M8 * 45	X	Allen, M8 * 45 or *50
42 mm	Allen, MB * 45	-	Allen, M8 * 45 or *50
45 mm	Allen, M8 * 50	X	Allen, M8 * 50 or *55
46 mm	Allen, M8 * 50	X	Allen, M8 * 50 or *55
50 mm	Allen, M8 * 55	X	Allen, M8 * 55 or *60

[1] For this variant, you can use both of the stated screw lengths.

MOUNTING INSTRUCTIONS - PITCHED ROOF

ARTICLE LIST – ACCESSORIES

Standard roof hooks

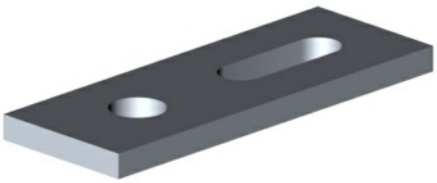


Vario roof hooks

Trapezoidal sheet block

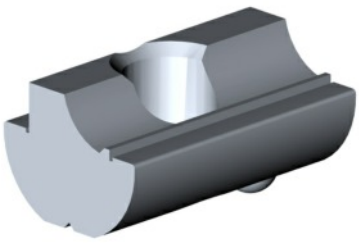
Hanger bolt

Adapter sheet



Mounting bracket

T-nut



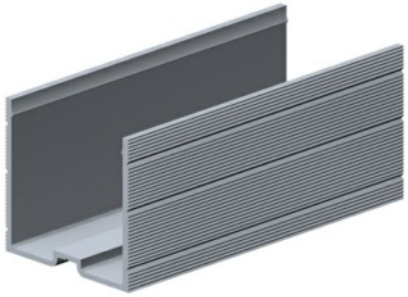
Section connector

MOUNTING INSTRUCTIONS - PITCHED ROOF

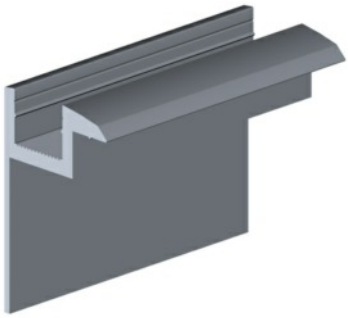
ARTICLE LIST – ACCESSORIES

Section connector - slot in

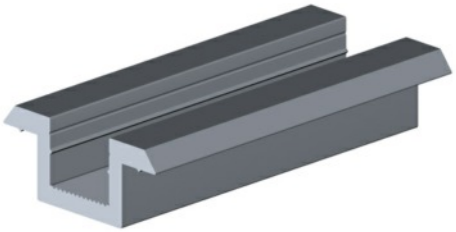
Section connector - Profile



End clamp



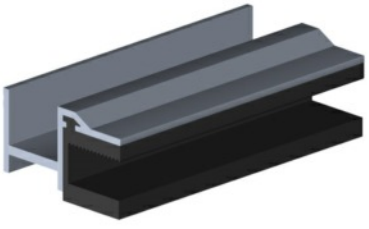
Middle clamp



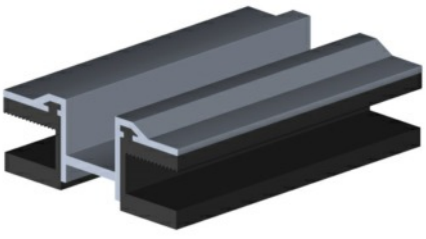
End clamp for LAMINAT L glass module

Middle clamp for LAMINAT L glass module

End clamp for LAMINAT JT glass module



Middle clamp for LAMINAT JT glass module



STEEL GEAR

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