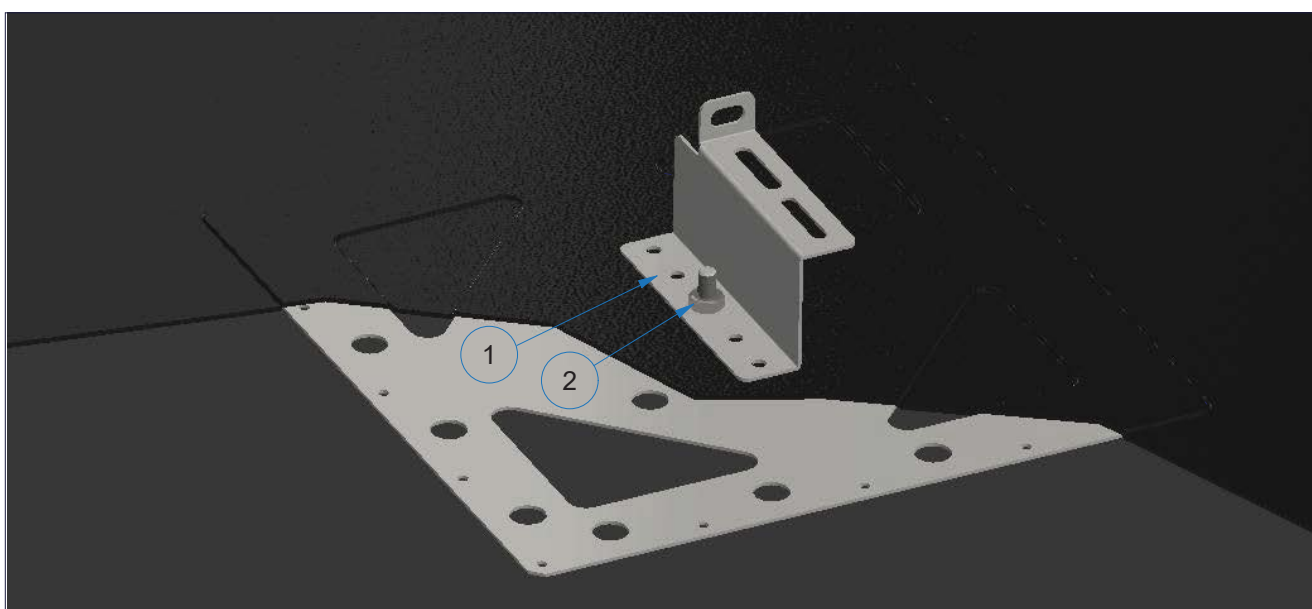


PISKO SOLAR FASTENERS

This instruction includes Pisko fasteners that are designed to be used for fixing various solar panel, and other rail systems, to different roof surfaces. The rails may be fixed to the fasteners either from the side of the rail, or from the bottom of the rail – multifunctional Pisko solar fasteners enable both options. This instruction is solely aimed at fixing the fasteners. Regarding the panel and rail fixing, follow the instructions provided by the manufacturer of those devices. The designer shall specify the needed amount of fasteners per project.

PISKO SOLAR FASTENER, universal flat roof solution



INSTALLATION

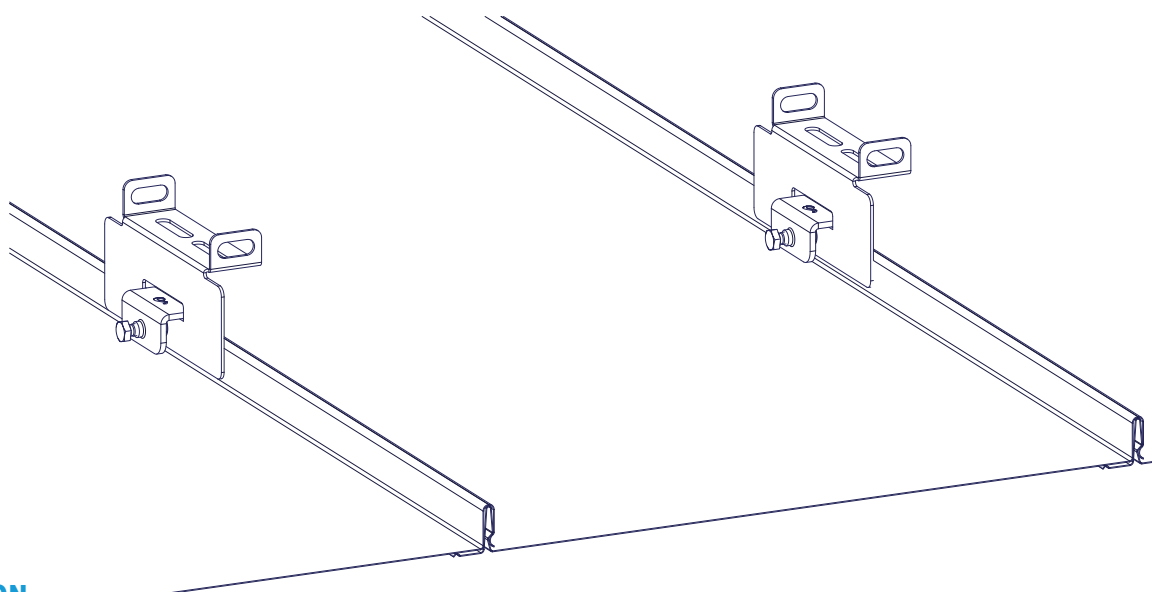
Install the mounting plate for waterproofing membrane roofs according to the product specific instructions.

Attach the PISKO SOLAR FASTENER for flat roofs to the M10 bolt with stainless steel M10 nut. Use suitable sealant between the fastener and the roof surface. The sealant is needed to avoid excess strain to the roof (heat, mechanical, etc.).

Solar panels, fixing rails and other similar devices shall be fixed to the fastener with bolted joint. The fastener enables the use of M8 or M10 fastening bolts. It is recommended to use washers (DIN 440 R) when fixing the rails, in order to improve the strength of the connection. Informative values regarding the strength of the fasteners/connection have been published in a separate technical declaration document.

Part	Description
1	Pisko Solar fastener, flat roofs
2	Hexagon nut M10, stainless steel

PISKO SOLAR FASTENER, UNISEAM, standing seam metal roofs



INSTALLATION

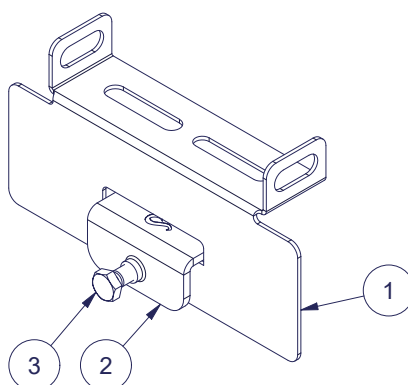
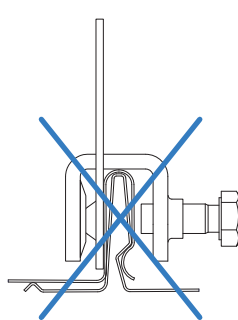
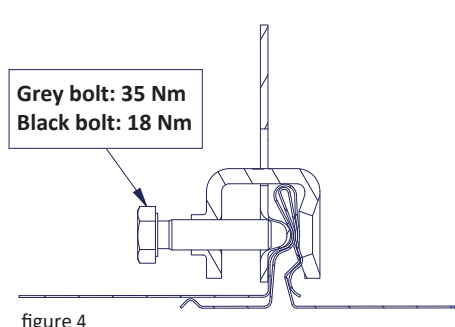
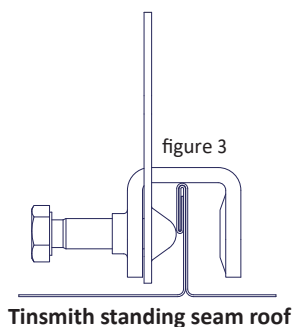
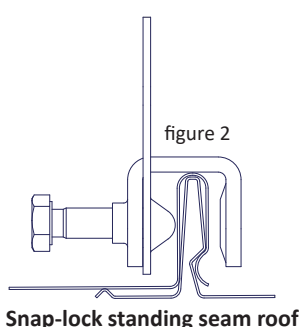
Pisko UniSeam solar fasteners shall be mounted on the standing seam with tightening clamps. The tightening clamp shall be inserted into the rectangular opening in the fastener.

The fastener is mounted to the snap-lock standing seam roofs on the full side of the seam (Figure 2) and to the tinsmith standing seam roofs on the folded side of the seam (figure 3). **NB! The bolt of tightening clamp must always be against the fastener, NOT against the seam (figure 5).**

The M8 bolt in the tightening clamp shall be tightened to a torque, mentioned in the figure 4. Correct tightening torque will spread out the tightening clamp a bit, in order to create a strong and long-lasting connection (figure 4).

The minimum number of fasteners per panel installation is four (4) pieces.

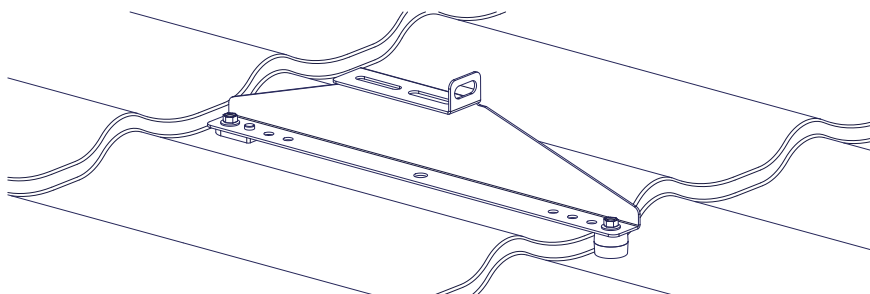
Solar panels, fixing rails and other similar devices shall be fixed to the fastener with bolted joint. The fastener enables the use of M8 or M10 fastening bolts. It is recommended to use washers (DIN 440 R) when fixing the rails, in order to improve the strength of the connection. Informative values regarding the strength of the fasteners/connection have been published in a separate technical declaration document



Part	Description
1	Pisko Solar fastener, UniSeam
2	SG tightening clamp, UniSeam
3	Hexagon bolt M8

PISKO SOLAR FASTENER 425, for trapezoidal sheets, waterproofing membranes and tile sheets

Tile sheets

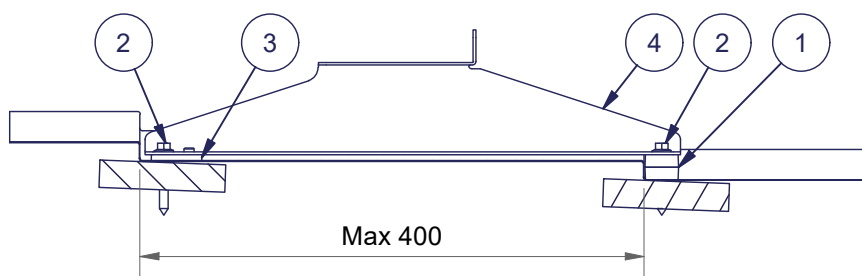


INSTALLATION

Solar fastener shall be mounted directly to the load bearing battens by suitable screws. Suitable sealants, chosen based on the height of the step, shall be used in the location of the fixing screws. The amount of sealants and the length of the fixing screws shall be chosen according to the roof profile and the thickness of the underlying battens. Pisko 2+1 sealant includes the sealant to the top part of the solar fastener. If necessary, the round part of the Pisko 2+1 sealant may be used in the bottom part of the solar fastener, in addition to the 10 mm high sealant nuggets. The height of the sealant stack should be slightly higher than the free space between the solar fastener and the roof surface, in order to create tight sealing.

The maximum c/c distance between the battens is 400 mm

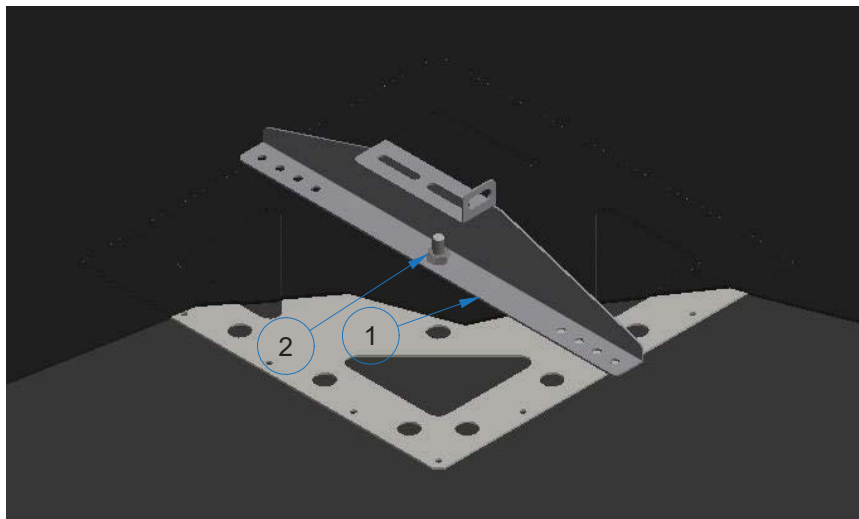
Solar panels, fixing rails and other similar devices shall be fixed to the fastener with bolted joint. The fastener enables the use of M8 or M10 fastening bolts. It is recommended to use washers (DIN 440 R) when fixing the rails, in order to improve the strength of the connection. Informative values regarding the strength of the fasteners/connection have been published in a separate technical declaration document.



Part	Description
1	Rubber sealant pair
2	HVAC-screw 7x50 mm or 7x70 mm
3	Pisko 2+1 sealant
4	Pisko Solar fastener 425

PISKO SOLAR FASTENER 425, for trapezoidal sheets, waterproofing membranes and tile sheets

Waterproofing membrane



Part	Description
1	Pisko Solar fastener 425
2	Hexagon nut M10, stainless steel

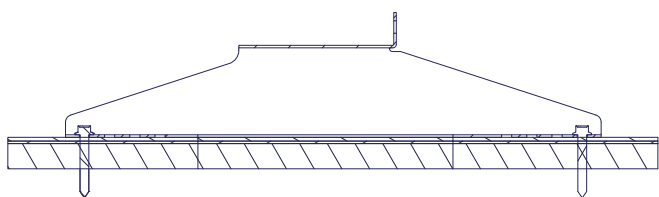
INSTALLATION

Install the mounting plate to the waterproofing membrane according to separate product specific installation instructions.

Attach the PISKO SOLAR FASTENER 425 to the M10 bolt with stainless steel M10 nut. Use suitable sealant between the fastener and the roof surface. The sealant is needed to avoid excess strain to the roof (heat, mechanical, etc.).

Solar panels, fixing rails and other similar devices shall be fixed to the fastener with bolted joint. The fastener enables the use of M8 or M10 fastening bolts. It is recommended to use washers (DIN 440 R) when fixing the rails, in order to improve the strength of the connection. Informative values regarding the strength of the fasteners/connection have been published in a separate technical declaration document.

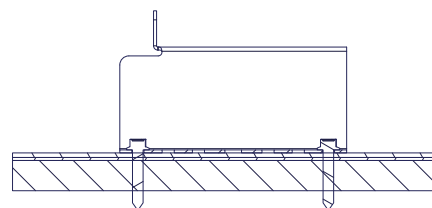
OSB, plywood, full boarding and similar flat roof structures



INSTALLATION

PISKO SOLAR FASTENER 425 is suitable to be fixed to various types of flat surfaces. The decision of the suitable fastener is to be decided according to the surface/structure specific characteristics – load bearing capacity (yield strength of the structure, against point loads), the risk of wood splitting, etc. Pisko solar fastener 425 spreads the loads and fixing points on a wider area, compared to the shorter Pisko universal flat roof solution.

The length of the screw shall be decided according to the thickness of the roof structure. Pisko 2+1 sealant shall be used between the roof surface and the solar fastener.



INSTALLATION

PISKO SOLAR FASTENER, universal flat roof solution is usually very suitable and compact solution to be used for solar system installations on flat roofs, if the roof structure is not limiting the capacity.

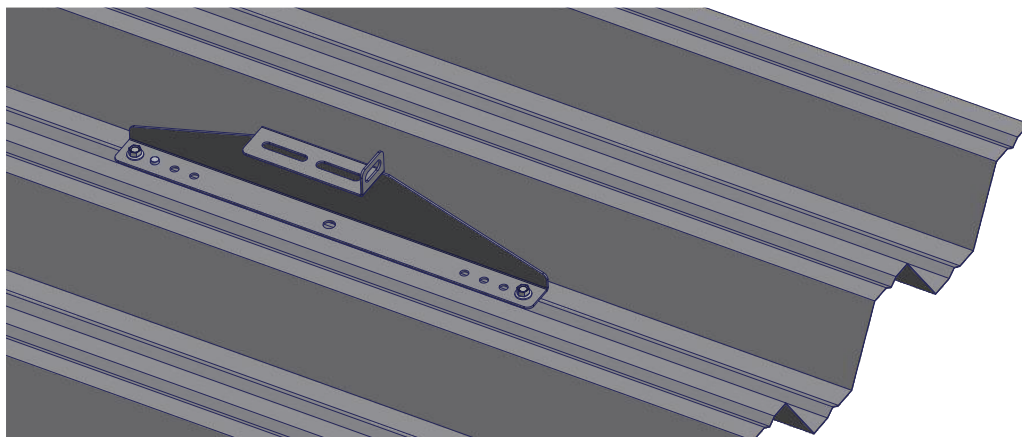
The length of the screw shall be decided according to the thickness of the roof structure. Pisko 2+1 sealant shall be used between the roof surface and the solar fastener.

PISKO SOLAR FASTENER 425, for trapezoidal sheets, waterproofing membranes and tile sheets

Trapezoidal sheets

INSTALLATION ON A PROFILE WITH MAX. 70 MM OF HEIGHT

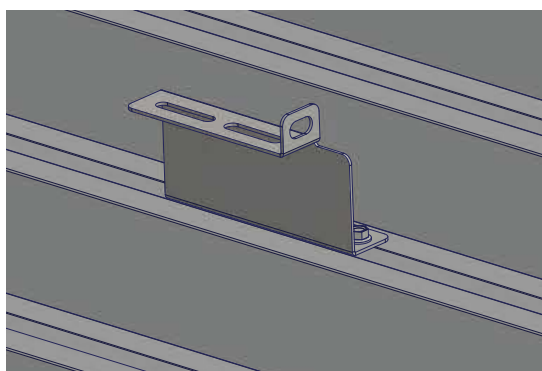
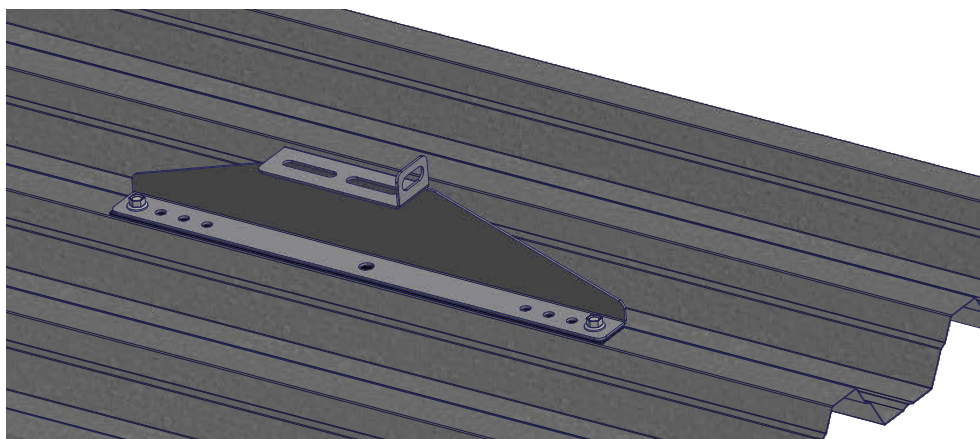
Solar fastener shall be installed on the valley (bottom) of the profile, by fixing the fastener directly to the load bearing battens. This is always the recommended solution in order to avoid excess strain to the roof surface, and to ensure proper strength of the fixing. Pisko 2+1 sealants shall be used in the location of the fixing screws.



INSTALLATION ON A PROFILE WITH MORE THAN 70 MM OF HEIGHT

Solar fasteners shall be installed only on the surface of the trapezoidal sheet. Pisko 2+1 sealants shall be used in the location of the fixing screws.

When utilizing this installation option, the thickness of the trapezoidal sheet is recommended to be 0.70 mm or more.



PISKO SOLAR FASTENER, UNIVERSAL FLAT ROOF SOLUTION

The installation on the surface of a trapezoidal sheet may be, alternatively, done by utilizing the shorter, universal flat roof fastener. When utilizing this installation option, the thickness of the trapezoidal sheet is recommended to be 0.70 mm or more and min. 2 screws must be used in each fastener.

The height of the PISKO SOLAR FASTENER, universal flat roof solution is 70 mm. Considering this, the universal fastener may be installed either on the valley or crown of the profile. When the height is enough, the fastener should be fixed on the valley of the profile and place the fastener in a way, that one fixing screw per fastener would hit a load bearing batten.

PISKO SOLAR FASTENER, tile roofs

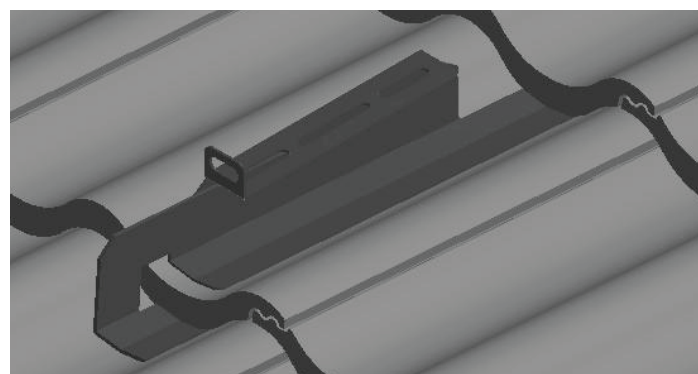
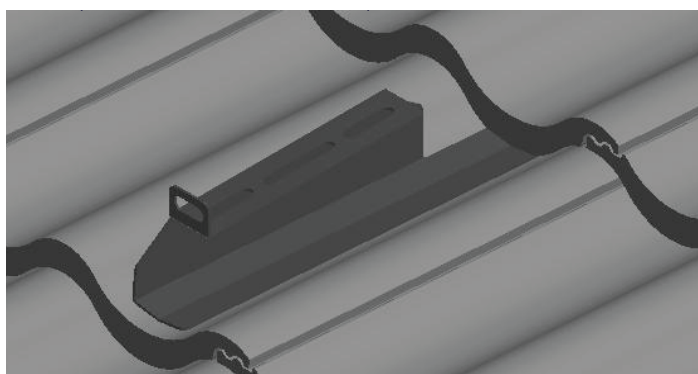


figure 1

figure 4

INSTALLATION

Solar fastener shall be installed on the groove of the tile and fixed to the batten with a screw (fig. 1 and 2)

An additional locking unit for tile roofs must be used on the lowest row of the fasteners.

The additional locking unit shall be used on the lowest row of fasteners in each individual panel field. If every row of panels is a separate individual field (not mechanically connected to each other with rails etc.), the locking unit shall be installed in the lowest row of fasteners in each panel row. If the panel rows form a uniform larger field, the additional locking unit is only needed on the fasteners in the lowest row of the field.

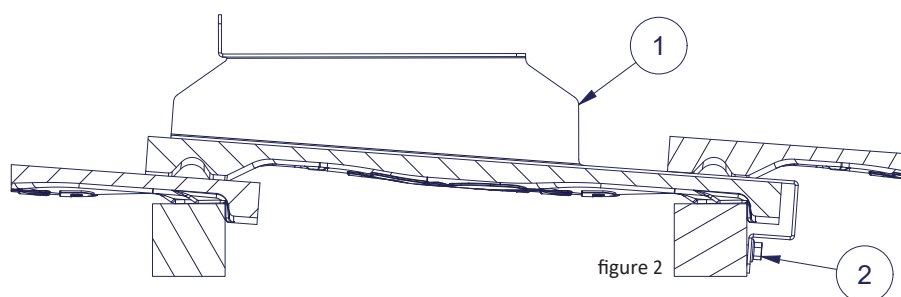
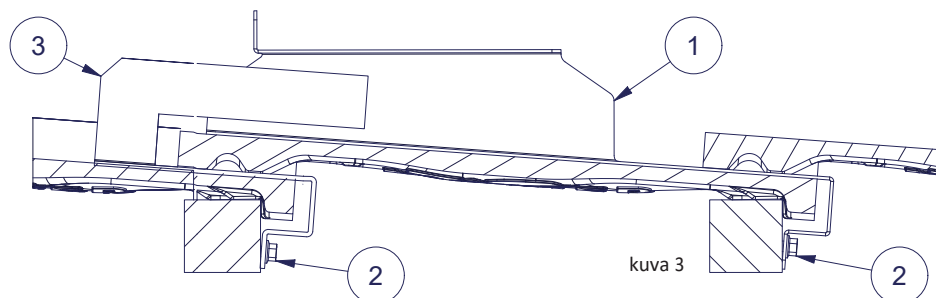


figure 2



kuva 3

Part	Description
1	Pisko Solar fastener, tile roofs
2	HVAC-screw 7X50 mm
3	Additional locking unit for tile roofs

MAINTENANCE

Pisko products are hard-wearing and safe to use, guaranteed by the ongoing quality control and development work by Piristeel Ltd, as well as correct installation of the products according to the manufacturer's instructions. To ensure the reliability and safety of the products, the property owner must carry out yearly inspection and maintenance procedures and monitor that the installed products and the substructure (roof surface) surrounding the products are in good condition.

Check the tightness of joints, connections, fixings and attached devices. Especially pay attention to the waterproofing membrane around the mounts and take necessary actions to repair the membrane according to manufacturer's instructions, if needed. Carefully inspect for a proper adhesion and/or condition of the waterproofing membrane's surface around the mounts.

Check the roof attachments (fixings). Ensure any excessive snow load is cleared to minimize the strain on structures, fixed devices and attachment points (as necessary; there might be a need to do this several times during the winter).

As necessary, clear the attached devices of snow and ice. Check the paintwork and metal coating of the Pisko-products; repair faults and touch up paintwork if necessary. Replace or repair any damaged or faulty parts as soon as possible to avoid any hazards.