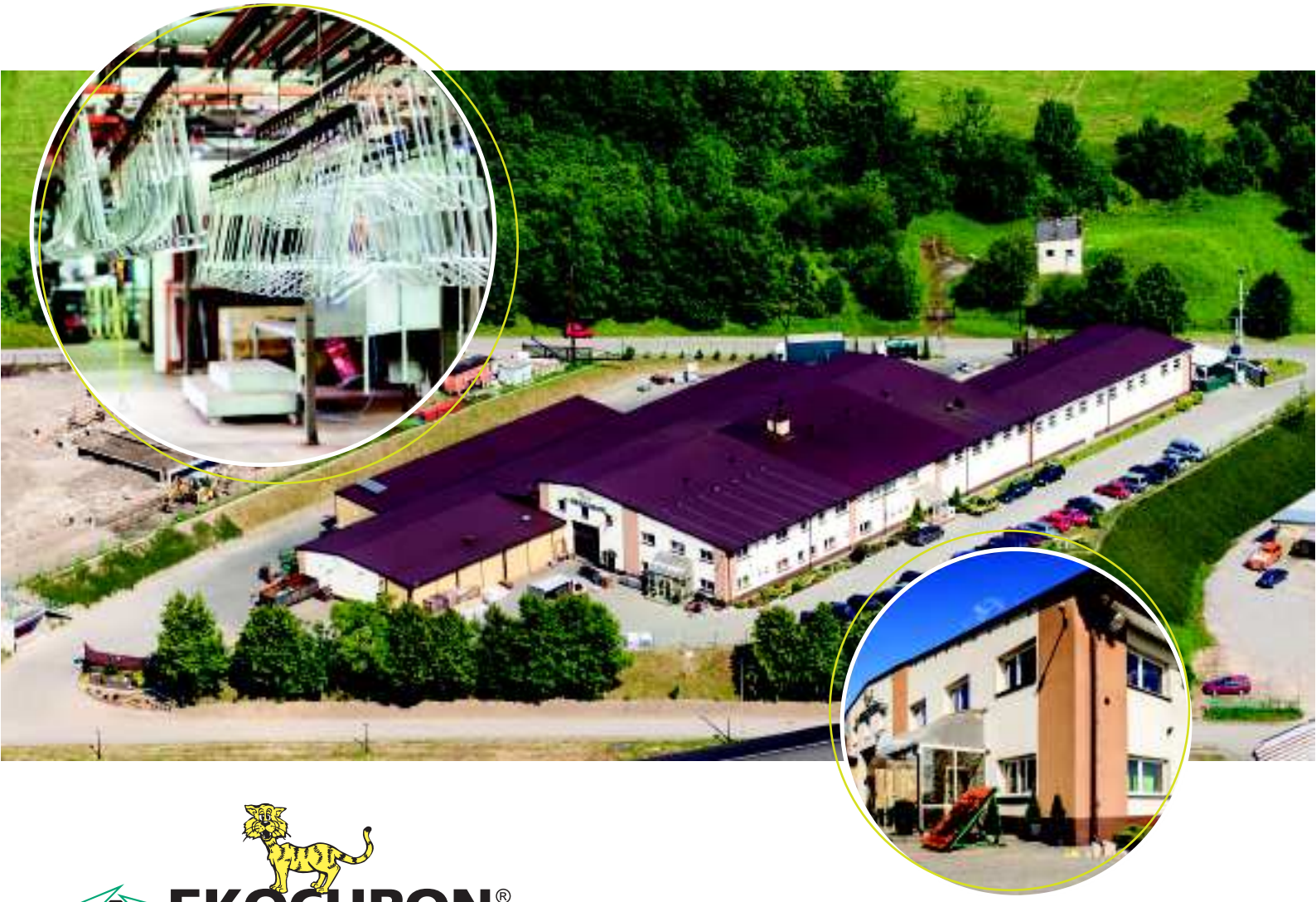
EKOCHRON®

PRODUCT CATALOGUE



EKOCHRON®

The Ekochron company was founded in the early 1990's. Thanks to the continuous committed work of its founders it has become one of the leading manufacturers of roof hardware.
Currently, the company is recognized in Poland and abroad as a manufacturer of high quality roof accessories, such as roof walkways, snow retention systems and fall protection equipment.
Ekochron supplies the market with products for all types of roof surfaces.
The experience of our employees and our own laboratory enable us to make products that meet the highest European standards and guarantee excellent rooftop performance confirmed by hundreds of satisfied customers.
Ekochron collaborates with research centres inside the country and abroad.

For your convenience, we have created a catalogue listing all our products and installation guidelines in order to familiarize you with their specifications and applications and thus increase the safety of all rooftop work. The catalogue is divided into four main categories:
1. Roof walkways,
2. Snow retention systems,
3. Roof safety hooks,
4. Other products.

Each section contains information about the products themselves, our tips regarding selected installation issues and general installation guidelines for the most popular support brackets in our range. We hope this will make your work easier and guarantee the correct installation of our products.
View all our products with our new updated catalogue.

The Ekochron management and staff.

Table of contents

WHY EKOCHRON?

Ekochron is a manufacturer of high quality elements for the construction industry, specializing in roof accessories such as roof walkways, snow retention systems, fall protection equipment, etc.
The beginnings of the company date back to 1991 when a small locksmith workshop started making their first snow guard elements. Continuous development, investing in people and machinery and, last but not least, trying hard to make sense of the market and clients' needs, were the driving forces behind the company's growth. Today, Ekochron has more than 60 employees and supplies around 500 customers in Poland. Co-operation with foreign partners has been very important to us from the very beginning. The high quality of our products found recognition abroad and they are now available in a number of European countries.
The Quality Management system ISO-9001 implemented in 2000 – which is constantly supervised by RW TÜV Nord – enabled continuous and systematic improvement of product quality, opening the door to the European market.
Since 2004 we have worked closely with the Czech Technical and Test Institute for Construction TZUS in Prague, branch in Ostrava. It was then that we introduced, as the first manufacturer in our country, high quality roof safety hooks preventing falls from height. Since that time all our products covered by the harmonised standards of the EU are introduced in co-operation with TZUS as it guarantees effective design and high quality.
Investments in infrastructure and machinery have resulted in our own powder paint shop and enabled further process automation, which in turn, directly improved efficiency and the reaction time to clients' requirements.
By working closely with our clients and monitoring the market, we keep introducing innovative products, setting new trends and becoming a good example for our competitors in the roofing industry.
The main material used for production is steel, which after treatment and hot-dip galvanization provides the finished products with corrosion resistance of minimum 15 years.

EKOCHRON®

The main EKOCHRON products are:

• **elements of roof walkways** (in compliance with EN 516) that is: roof platforms of 250mm in width which together with other elements allow for levelling platforms in the range of approx. 15-55 degrees.
A wide variety of brackets enables installation of platforms/steps on almost all types of roofing available on the market. The platforms can be arranged in long walkways by using platform connectors while the safety of rooftop work will be significantly improved by the use of our platform guardrails.

• **elements of snow retention** (1TB AT-15-3360) including snow fences, pipes, wooden logs, snow catchers and snow breakers.

• **roof safety hooks type A** (in compliance with EN 517) used for anchoring personal fall protection equipment; indispensable for any rooftop work. In addition, the safety hooks may be used for temporary suspension of roof ladders.

• **bird stops** in the form of chimney inserts, which prevent birds from building nests in chimneys and anti-bird spikes, which stop birds from fouling cornices and windowsills.

• **roof batten connector** allow for connecting and extending roof battens, which is especially helpful during thermal insulation work as it permits extension of the roof.

Bracket design allows for installation without interfering with the structure of the roof or interfering with it to a minimum. Following the installation principles developed by EKOCHRON guarantees a secure and watertight roof.

1. ROOF WALKWAYS

Technický a zkušební ústav stavební Praha pobočka Ostrava
(Construction Research and Development Institute in Ostrava)

EN 516

1.1. ROOF PLATFORM

An element of roof walkways with an anti-slip ribbed surface for roof construction.

- material – quality steel, thickness 2 mm
- platform width 250 mm (compl. with EN 516 - platform class: A)
- lengths: 420, 600, 800, 1000, 1200, 1500, 2000, 2500 and 3000 mm with the option of joining into longer walkways depending on the requirements
- rust protection – hot-dip galvanizing

At client's request the platforms are powder coated in compliance with RAL colour standard.

TIP
Platforms which are 420 mm long together with grip supports and brackets according to the norm may be used as a wide step.
Permissible distance between platform brackets, where the platform's load capacity complies with EN 516, is max. 90 cm, recommended distance is 80 cm.

1.2. ROOF PLATFORM CONNECTOR

Roof platform connectors are intended for connecting roof platforms into longer walkways of various lengths. In order to connect two platforms two connectors are necessary. They come in a set with fixing screws.

- material – quality steel, sheet metal ≠2 mm thick
- rust protection – hot-dip galvanizing

At client's request the platform connectors are powder coated in compliance with RAL colour standard.

TIP
Ensure the screws are firmly tightened.

1.3.
NARROW ROOF STEP

An element of roof walkways with anti-slip ribbed surface for roof access work. It has a handgrip which facilitates stepping down the roof.

- material – quality steel, 2 mm and 4 mm.
- size of footstep appr. 250 mm x 160 mm (in compliance with EN 516 – narrow step)
- rust protection – hot-dip galvanizing

At client's request the steps are powder coated in compliance with RAL colour standard.

TIP
The step construction allows for levelling it in the range 15°-55° relative to the roof surface ±3°.

1.4.
ROOF PLATFORM GRIP

A roof platform grip is an intermediate element between a roof platform and a platform bracket. It facilitates levelling the platform relative to the roof surface in the range 15°-55°±3°. Beside roof platforms it is an essential element of roof walkways. It comes with a set of screws for assem bling with a roof platform.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the grips are powder coated in compliance with RAL colour standard.

1.5.
WALL PLATFORM BRACKET

A wall platform bracket is an intermediate element for fixing a roof platform to a vertical side of a chimney. It comes with a set of screws for assembling with a roof platform.

- material – quality steel, sheet metal 3 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
Fix with anchor bolts.

1.6.
BENT STEP/PLATFORM BRACKET

Bent step/platform brackets are intended for fixing steps and platforms to roof surfaces covered with clay or concrete tiles. They come with a set of screws for assembly with a platform grip or a narrow step. Correct assembly requires the use of an auxiliary batten and grinding the locks of the tiles where the bracket passes through. Brackets used together with a narrow step should be fixed with the use of a bracket stabilizer.

- material – quality steel, flat bar 40 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

1.6.1.
BENT STEP/PLATFORM BRACKET WITH A PROTECTIVE STRIP

This bracket has a protective strip intended to protect tiles or other roofing against point pressure which can lead to tiles cracking.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP

The recommended distance between brackets should not exceed 80 cm. This bracket is recommended for use with tiles which have a flat surface in the area where the bracket is fixed.

1.6.2.
BENT STEP/PLATFORM BRACKET WITH EPDM RUBBER

This bracket has a foot made of EDPM rubber resistant to UV and atmospheric conditions, which is intended to protect tiles against point pressure, increasing the distance between the bracket and the tile.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP

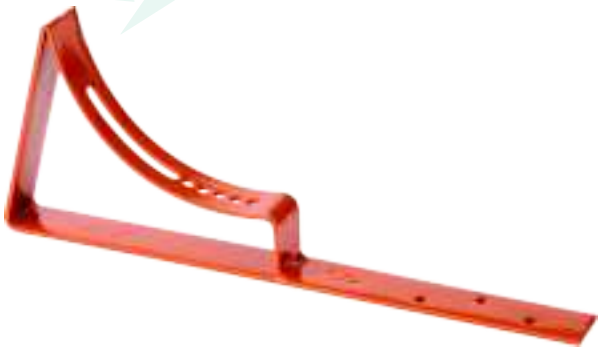
Recommended for use with tiles which do not have a flat surface in the area where the bracket is fixed.

1.6.3.
PLAIN TILE STEP/PLATFORM BRACKET (SINGLE PIECE)

Step/platform bracket for plain tiles (single piece) are intended for fixing platforms and steps to roof surfaces covered with plain tiles. They come with a set of screws for assembly with a platform grip or a roof step. Correct assembly requires the use of an auxiliary batten and grinding the locks of the tiles in the place where the bracket passes through. Brackets used together with a narrow step should be fixed using an additional bracket stabilizer.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.



1.6.4.
SLATE STEP/PLATFORM BRACKET

Slate step/platform bracket are intended for fixing platforms and steps to roof surfaces covered with slate. The brackets are fixed to the roof sheathing and then covered with slate. They come with a set of screws for assembling with a platform grip.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
The use of this kind of bracket with a narrow step is not recommended.

1.7. TILE EFFECT STEEL SHEET STEP/PLATFORM BRACKET

Tile effect step/platform brackets are intended for fixing platforms and steps to roof surfaces covered with tile effect steel sheets. Due to the diversity of steel sheet profiles we offer a number of bracket types. The brackets come with a set of screws for assembling with a roof platform grip or with a narrow roof step. Installation requires making two holes in the roofing and using silicone sealant for ensuring water-tightness.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
Due to the diversity of profiled steel sheet types available on the market we offer a range of bracket types. On request we offer profiled sheet metal brackets module 30 (1.7.1a) and 46 (1.7.2a).

BRACKET NAME	SYMBOL	STEEL SHEET MODULE „m" [mm]	HEIGHT OF SHEET PROFILE „h" [mm]
Tile effect steel sheet platform bracket module 35	1.7.1	350	20
Tile effect steel sheet platform bracket module 40	1.7.2	400	20
Tile effect steel sheet platform bracket Finnera	1.7.3	330	30
Tile effect steel sheet platform bracket Venezia	1.7.4	350	35
Tile effect steel sheet platform bracket Decra	1.7.5	350	20

1.8.
UNIVERSAL STEP/PLATFORM BRACKET

Universal step/platform brackets are intended for fixing platforms and steps to roof surfaces covered with troughed steel sheets, bitumen (tar paper, shingles) and other sheet metal roofing. It comes with a set with screws for assembly with a platform grip or a narrow roof step.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
Due to the wide and diverse use of metal sheet roofing, the bracket may be used with additional elements made by EKOCHRON for a variety of roofing surfaces such as a standing seam roofing.

- FOR A LOW STANDING SEAM – DOUBLE LOCK

A universal step/platform bracket used on steel sheets seamed by folding with the seam up to 26 mm is mounted with the use of an additional grip for a standing seam (product 4.1.1.).

- FOR A HIGH STANDING SEAM

A universal step/platform bracket used on steel sheets seamed by folding with the seam up to 36 mm is mounted with the use of an additional grip for a high standing seam (product 4.1.2.).

1.9.
TILED ROOF STEP/PLATFORM BRACKET WITH A SUPPORT (TWO-PIECE)

Tiled roof step/platform bracket with a support are intended for mounting platforms and steps on roof surfaces covered with tiles with the length up to 420mm (they are typically cement tiles). An additional support of the bracket allows for partial relief of the main tile and the distribution of the load onto two tiles. The installation of the bracket together with the support requires additional grinding of the upper lock of the tile and an auxiliary counter batten in the roof construction. It comes with a set of screws for assembling with a roof platform grip or a narrow roof step.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

1.10.
PLAIN TILE STEP/PLATFORM BRACKET WITH A SUPPORT (TWO-PIECE)

Plain tile step/platform brackets with a support are intended for mounting platforms and steps on roof surfaces covered with plain clay tiles arranged as fish scale or lace. An additional wide support of the bracket allows for partial relief of the main tile and the distribution of the load onto two tiles as well as additional stabilization of the construction. The installation of the bracket together with the support requires additional grinding of the tiles and the use of auxiliary battens in the roof construction. It comes with a set of screws for assembly with a platform grip or a narrow roof step.

- material – quality steel, flat bar 4 mm thick, sheet metal ≠3
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

1.11.
TILED ROOF STEP/PLATFORM BRACKET TYPE C AND C1

Tiled roof step/platform brackets C and C1 are intended for fixing platforms and wide steps to roof surfaces already in use, covered with clay or concrete tiles. Depending on the length of the tiles, the C bracket is used for tiles 420 mm long (especially cement tiles), while C1 is used up to approx. 480 mm (clay tiles – large sizes). The bracket is hooked on a tile and the batten on which the tile rests. Correct installation requires grinding of the locks of the tiles where the bracket passes through. They come with a set of screws for assembly with a platform grip.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
The use of this kind of bracket with a narrow step is not recommended.

1.12.
DECRA PROFILE STEEL SHEET STEP/PLATFORM BRACKET

Decra profile steel sheet step/platform brackets are intended for fixing platforms and wide steps type 420 mm. They come with a set of screws for assembly with a platform grip. The installation requires drilling a hole in the roofing surface and using a silicone sealant to ensure water-tightness.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This type of bracket is not recommended for use with narrow steps. At client's request the brackets can be taped with a special protective strip to avoid damage to the roof sheathing.

1.13.
STEP/PLATFORM BRACKET STABILIZER

A stabilizer assembled with step/platform brackets increases their stability.

TIP
It is indispensable in the case of roof walkways made of narrow steps.

1.14.
ROOF PLATFORM GUARDRAILS

Roof platform guardrails are used to protect operatives from falling from the roof whilst repairing or maintaining the chimney. They can be mounted along roof walkways. However, they cannot be used as anchor points for self-belay systems used for rope access works. There are two types of guardrails available: closed (as protection against falling off the end of a roof platform) and simple ones (allowing free passage along a chimney and/or joining platforms).

- material – quality steel
- rust protection – hot-dip galvanizing

At client's request the guardrails are powder coated in compliance with RAL colour standard.

TIP

Guardrail posts are mounted on roof platforms with the use of attached fasteners. Please note that handrails must be fixed to the posts by tightening screws present in the seats of the handrail. All fasteners needed for installation and other PVC elements come in a set which includes: a roof platform 1 m, platform grips - 2 pcs, platform brackets - 2 pcs, two posts, two handrails.

1.15.
ROOF LADDER

A roof ladder is intended for climbing the roof along its slope as an alternative to roof steps. Ladders may be used on a variety of roofing surfaces such as clay and concrete tiles, plain steel sheets profiled sheets, shingles and tar paper. Ladders are hung on previously installed roof safety hooks. After finishing maintenance work, ladders should be removed from the roof as they are not permanently fixed to it. Ladders must not be used as anchor points for self-belay systems. Only correctly installed safety hooks may be used for this purpose. Ladders are available in the following lengths: 2 m. They are equipped with protective caps made of EPDM rubber which is resistant to UV and atmospheric conditions. The caps protect the roofing against point pressure.

- material - quality steel, sheet metal ≠1.5 mm thick
- rust protection – hot-dip galvanizing

At client's request the ladders are powder coated in compliance with RAL colour standard.

2. SNOW GUARDS

EKOCHRON snow guard products:
- snow fences, 20 cm and 15 cm height (2.1.),
- snowstop pipes (2.2.),
- wooden logs (2.3.),
- single elements such as snow breakers and snow catchers (2.4.).

The durability and efficiency of snow guard systems is determined by the distribution of their brackets. The number of brackets required depends on: the length and type of the snow guard system applied, the climate zone, the roof construction, the terrain, and the geographical orientation of the building, and must be determined individually for each roof. Tips which will help to initially determine the number of brackets can be found in the installation instructions section.

ATTENTION! On high/long roof surfaces (long rafters) two rows of snow guards must be used.

2.1. SNOW FENCES, 20 CM AND 15 CM HEIGHT

Snow fences are installed to prevent snow/ice packs from avalanching from a roof surface. The use of snow fences improves safety around the building. Each snow guard system is dedicated for a particular type of roofing. Snow fences are available in the following lengths: 1.0 m; 1.2 m; 2.0 m; 3.0 m.

- material - quality steel, sheet metal ≠1 mm and ≠2 mm thick
- rust protection – hot-dip galvanizing

At client's request the fences are powder coated in compliance with RAL colour standard.

TIP
Fences can be joined together with the use of purpose designed connectors to achieve required lengths. One joint requires the use of 2 pcs of fence connectors.

2.1.1. SNOW FENCE CONNECTOR

Snow fence connectors are used to join snow fences into snow guard systems of required length. Two connectors are necessary to connect two fences.

2.1.2.
TILED ROOF FENCE BRACKET TYPE A

A tiled roof fence bracket type A is dedicated for the installation of snow fences on tiled roof surfaces. The construction facilitates fixing it to rafters. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available in two variants: 20 cm and 15 cm.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roofs which have already been tiled.

2.1.3.
PLAIN TILE FENCE BRACKET

A plain tile fence bracket is used for the installation of snow fences on roof surfaces covered with plain tiles. The bracket can be used for both fish scale and lace arrangement. The density of distribution of the brackets and the method of installation should follow EKOCHRON recommendations. The bracket is available in two variants: 20 cm and 15 cm.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.1.4.
TILED ROOF FENCE BRACKET TYPE B

A tiled roof fence bracket type B is used for the installation of snow fences on roof surfaces covered with tiles. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available in variants: 20 cm and 15 cm.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roof surfaces which have not yet been tiled as it requires fitting an auxiliary batten.

2.1.5.
TILED ROOF FENCE BRACKET TYPE B2

A version of the tiled roof fence bracket type B, with a shorter length (325 mm), dedicated for concrete tiles. Other features are identical with the tiled roof fence bracket type B.

2.1.6.
TILED ROOF FENCE BRACKET TYPE BN

A version of the tiled roof fence bracket type B, with a lower fence support and a smaller hook for hanging on a roof batten. It works with most clay tile types. Other features are identical with the tiled roof fence bracket type B.

2.1.7.
TILE EFFECT STEEL SHEET FENCE BRACKET

A tile effect steel sheet fence bracket is used for the installation of snow fences on roof surfaces covered with profiled steel sheets. The bracket construction facilitates fixing the bracket to the roof supporting structure and requires drilling holes in the roofing (except Decra). The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available in two variants: 20 cm and 15 cm.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
Due to a diversity of profiled m roofing types available on the market we offer a range of bracket types. At request we offer tile effect steel sheet brackets module 30 (2.1.7.1a) and 46 (2.1.7.2a).

BRACKET NAME	SYMBOL	STEEL SHEET MODULE „m" [mm]	HEIGHT OF SHEET PROFILE „h" [mm]
Tile effect steel sheet platform bracket module 35	2.1.7.1	350	20
Tile effect steel sheet platform bracket module 40	2.1.7.2	400	20
Tile effect steel sheet platform bracket Finnera	2.1.7.3	330	30
Tile effect steel sheet platform bracket Venezia	2.1.7.4	350	35
Tile effect steel sheet platform bracket Decra	2.1.7.5	350	20

2.1.8.
DECRA TYPE STEEL SHEET FENCE BRACKET

Decra type steel sheet fence brackets are used for the installation of snow fences on this type of roofing. The installation requires drilling a hole in the roofing and using a silicone sealant to ensure watertightness.

TIP
At client's request the brackets can be taped with a special protective strip to avoid damage to the roof sheathing.

2.1.9.
UNIVERSAL FENCE BRACKET TYPE A

A universal fence bracket type A is used for the installation of snow fences on roof surfaces covered with plain metal sheets or low-profiled sheets. Due to the wide range of metal sheet roofing available on the market this type of bracket is used on troughed sheets with the profile height of max. 50mm, as well as with a seam grip for metal sheets seamed by folding. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available in two variants: 20 cm and 15 cm.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

- FOR A LOW STANDING SEAM – DOUBLE LOCK

A universal snow fence bracket is used on metal sheet roofing seamed by folding (lock) with the seam height up to 26 mm. It is fixed with the use of an additional grip for a standing seam (product 4.1.1.).

- FOR A HIGH STANDING SEAM

A universal snow fence bracket is used on metal sheets seamed by folding with the seam up to 36 mm. It is fixed with the use of an additional grip for a high standing seam (product 4.1.2.).

2.1.10.
UNIVERSAL FENCE BRACKET TYPE B

A universal fence bracket type B is used for the installation of snow fences on roof surfaces covered with high-profile metal sheets with profile height above 50 mm. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available only in one variant: 20 cm

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.1.11.
SLATE ROOF FENCE BRACKET

A slate roof snow fence bracket is used for fixing snow fences on roof surfaces covered with slate. The bracket is fixed to the roof sheathing - and then covered with slate. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available in two variants: 20 cm and 15 cm.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.1.12.
TILED ROOF FENCE BRACKET TYPE C AND C1

Fence bracket types C and C1 are used for fixing snow fences on roof surfaces covered with tiles. The C type bracket is used for tiles 420 mm long (especially concrete tiles), while C1 is used for tiles up to 480 mm (clay tiles – large size). The bracket is hooked on a tile and the batten on which the tile rests. Correct installation requires grinding of the locks of the tiles where the bracket passes through. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations. The bracket is available in variants: 20 cm and 15 cm.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roofs which have already been covered with tiles.

2.2.
SNOWSTOP PIPES

Snowstop pipes are installed to prevent snow/ice packs from avalanching and damaging people and property below. They offer an alternative to snow fences and wooden logs. The snow guard system consists of two pipes ø32 mm.

- material – quality steel, pipe ø32 mm x 1.5 mm,
- rust protection – hot-dip galvanizing

At client's request the pipes are powder coated in compliance with RAL colour standard.

TIP
Pipes may be joined into longer stretches by means of dedicated connectors.

In special cases 3-pipe brackets are used, which finds application with low profiled (up to 20 mm) roofing, where the snow guard system must be particularly effective.

PIPE CONNECTOR – PRODUCT CATALOGUE NUMBER - 2.2.8.

2.2.1.
TILED ROOF PIPE BRACKET TYPE A

A tiled roof pipe bracket type A is used for the installation of snowstop pipes on roof surfaces covered with tiles. The construction facilitates fixing it to rafters. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm sheet metal ≠3 mm,
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snowstop pipes on roofs which have already been tiled.

2.2.2.
TILED ROOF PIPE BRACKET TYPE B

A tiled roof pipe bracket type B is used for the installation of snowstop pipes on roof surfaces covered with tiles. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm sheet metal ≠3 mm,
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roof surfaces which have not yet been covered with tiles as it requires the use of an auxiliary batten.

2.2.3.
TILED ROOF PIPE BRACKET TYPE C AND C1

Tiled roof pipe bracket types C and C1 are used for the installation of snowstop pipes on roof surfaces covered with tiles. The C bracket is used for tiles 420 mm long (especially cement tiles), while C1 is used up to approx. 480 mm (clay tiles - large sizes). The bracket is hooked on a tile and the batten on which the tile rests. Correct installation requires grinding of the tile locks in the area where the bracket passes through. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 4 mm thick
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roofs which have already been tiled.

2.2.4.
PLAIN TILE PIPE BRACKET

A plain tile pipe bracket is used for the installation of snowstop pipes on roof surfaces covered with plain tiles. Brackets can be used in case of both fish scale and lace arrangement. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm sheet metal ≠3 mm,
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.2.5.
TILE EFFECT STEEL SHEET PIPE BRACKET

Tile effect steel sheet pipe brackets are used for the installation of snowstop pipes on roof surfaces covered with profiled metal sheets. The bracket construction facilitates fixing the bracket to the roofing support structure and requires drilling holes in the roofing (except Decra). The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm sheet metal ≠3 mm,
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

Due to a diversity of profiled sheet metal roofing types available on the market we offer a range of bracket types. At client's request, we offer tile effect steel sheet brackets module 30 (2.2.5.1a) and 46 (2.2.5.2a).

BRACKET NAME	SYMBOL	STEEL SHEET MODULE „m" [mm]	HEIGHT OF SHEET PROFILE „h" [mm]
Tile effect steel sheet platform bracket module 35	2.2.5.1	350	20
Tile effect steel sheet platform bracket module 40	2.2.5.2	400	20
Tile effect steel sheet platform bracket Finnera	2.2.5.3	330	30
Tile effect steel sheet platform bracket Venezia	2.2.5.4	350	35
Tile effect steel sheet platform bracket Decra	2.2.5.5	350	20

2.2.6.
SLATE ROOF PIPE BRACKET

Slate roof pipe brackets are used for fixing snow-stop pipes on roof surfaces covered with slate. The bracket is fixed to the roof sheathing and then covered with slate. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm sheet metal ≠3 mm,
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.2.7.
UNIVERSAL PIPE BRACKET

A universal pipe bracket type A is used for the installation of snowstop pipes on roof surfaces covered with plain metal sheets or low-profiled sheets. Due to a wide range of metal sheet roofing types available on the market this type of bracket is used on troughed sheets with the profile height of max. 50 mm, as well as with a seam grip for metal sheets seamed by folding. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm, sheet metal ≠3 mm,
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
The assembly of a snowstop pipe bracket with a seam grip is identical as in the case of a fence bracket.

2.2.8.
PIPE CONNECTOR

Snowstop pipe connectors facilitate the installation of snow guard systems of any length.

Material: The connectors are made from high quality plastic which ensures durability of the joints. They are available only in black.

TIP
The joints may be additionally stabilized by the use of self tapping screws.

2.2.9.
PIPE PLUG

Material: The plugs are made from high quality plastic which ensures durability of the joints. They are available only in black.

2.3.
WOODEN LOGS Ø120

Snowstop systems in the form of wooden logs are installed on dedicated log brackets. The brackets facilitate the installation of logs on a variety of roofing surfaces such as metal sheets, tiles, shingles, etc. Wooden logs offer an alternative to metal snowstop systems and are often used on wooden structures and in highland areas.

TIP
The max. log diameter is 720 mm. The logs are fixed to the bracket with screws.
EKOCHRON does not offer wooden logs for sale.

2.3.1.
TILED ROOF LOG BRACKET TYPE A

Tiled roof log brackets type A are used for the installation of log-based snow guard systems on roof surfaces covered with tiles. The construction facilitates fixing the bracket to a rafter. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roofs which have already been tiled.

2.3.2.
TILED ROOF LOG BRACKET TYPE B

Tiled roof log brackets type B are used for the installation of log-based snow guard systems on roof surfaces covered with tiles. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
This bracket is recommended for fixing snow guard systems on roofs which have not yet been covered as it requires the use of an auxiliary batten.

2.3.3.
PLAIN TILE LOG BRACKET

A plain tile log bracket is used for the installation of log-based snow guards on roof surfaces covered with plain tiles arranged as fish scale or lace. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.3.4.
TILE EFFECT STEEL SHEET LOG BRACKET

Tile effect steel sheet log brackets are used for the installation of log-based snow guards on roof surfaces covered with profiled metal sheets. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
The bracket construction facilitates fixing it to the roof supporting structure and typically requires drilling holes in the roofing.

Due to a diversity of profiled sheet metal roofing types available on the market we offer a range of bracket types. At client's request, we offer log brackets for tile effect steel sheet module 30 (2.3.4.1a) and 46 (2.3.4.2a).

BRACKET NAME	SYMBOL	STEEL SHEET MODULE „m" [mm]	HEIGHT OF SHEET PROFILE „h" [mm]
Tile effect steel sheet platform bracket module 35	2.3.4.1	350	20
Tile effect steel sheet platform bracket module 40	2.3.4.2	400	20
Tile effect steel sheet platform bracket Finnera	2.3.4.3	330	30
Tile effect steel sheet platform bracket Venezia	2.3.4.4	350	35
Tile effect steel sheet platform bracket Decra	2.3.4.5	350	20

2.3.5.
UNIVERSAL LOG BRACKET

A universal log bracket is used for the installation of log-based snow guards on roofs covered with a variety of flat, low-profiled or troughed roofing up to 50 mm. The density of bracket distribution and the method of installation should follow EKOCHRON recommendations.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP
Due to a wide range of metal sheet roofing types available on the market, the bracket may be used with additional elements made by EKOCHRON such as standing seam grip, etc.

2.4.
SNOW BREAKERS AND SNOW CATCHERS

Snow breakers protect against avalanching snow and are designed to break clumps of snow into smaller pieces.
Snow catchers are designed to increase snow retention on the roof, until the snow and ice melts away.
Snow breakers and snow catchers are installed on roofs in alternating rows by hanging on tiles or fixing to the wooden sheathing on flat roofing surfaces. These elements fixed across the entire roof surface may replace snow fences or complement them.

TIP
The application of breakers at the very bottom of a roof surface arranged in one row is regarded to be an installation error and any claims from resulting damage shall not be considered.

2.4.1.
TILED ROOF SNOW BREAKERS

A snow breaker designed for use on all types of clay and concrete tiles regardless of size. The installation of the breakers on interlocking tiles requires grinding of the locks.

• material – quality steel, flat bar 25 mm x 3 mm, sheet metal ≠2 mm,

• rust protection – hot-dip galvanizing

At client's request the breakers are powder coated in compliance with RAL colour standard.

2.4.2.
PLAIN TILE SNOW BREAKERS

A snow breaker designed mostly for use on roofs covered with plain tiles regardless arranged as fish scale or lace). The installation of breakers on tiles requires grinding of tile sides adjacent to the breakers.

• material – quality steel, flat bar 30 mm x 4 mm, sheet metal ≠2 mm,

• rust protection – hot-dip galvanizing

At client's request the breakers are powder coated in compliance with RAL colour standard.

2.4.3.
TILE EFFECT STEEL SHEET ROOF SNOW BREAKER

A snow breaker designed for use on roofs covered with profiled metal sheets. Depending on the requirements, there are breakers module 35 cm (2.4.3.a) and 40 cm (2.4.3.b). They should be fixed at two points to the steel sheet bearing battens.

• material – quality steel, flat bar 25 mm x 3 mm, sheet metal ≠2 mm,

• rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP

Use a roofing sealant in the area of fixing the snow breaker to ensure watertightness.

2.4.4.
SIMPLE SNOW BREAKERS

A snow breaker designed for use on roofs covered with flat metal sheets and other flat roofing materials such as shingles or tar paper.

• material – quality steel, flat bar 30 mm x 4 mm, sheet metal ≠2 mm,

• rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP

Use a roofing sealant in the area of fixing the snow breaker to the metal sheet to ensure watertightness. Allow an extra length of self-vulcanizing shingles/tar paper to seal and protect the area around the snow breaker joint.

2.4.5.
TILED ROOF SNOW BREAKER

A snow breaker designed for use on clay and concrete tiles. The installation of snow breakers on concrete tiles consists in hanging the breakers on a tile and fixing it to the batten with a nail while the installation of breakers on clay tiles requires grinding the (upper and lower) locks.

• material – quality steel, flat bar 35 mm x 1.2 mm or 1.0 mm.

• rust protection – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

TIP

Snow breakers must be installed in rows all across the roof surface on every second tile. It is also recommended for plain clay tiles (it does not require grinding of the tiles), slate and Struktonit tiles.

2.4.6.
SHINGLE ROOF SNOW BREAKER

A snow breaker designed for use on roofs covered with shingles, tar paper and other flat roofing materials, e.g. sheet metal seamed by folding. The installation requires making holes in the roofing, which must be sealed with a roofing sealant.

• material – quality steel, flat bar 35 mm x 1.2 mm or 1.0 mm.

• rust protection – hot-dip galvanizing

At client's request the breakers are powder coated in compliance with RAL colour standard.

TIP

The breakers must be installed in alternating rows all across the surface of a roof.

2.4.7.
BLADE SNOW CATCHER

The product is made on request to customers specifications. The intended use and the installation procedure as for the other snow breakers in the EKOCHRON product range. The product is designed to match a particular geographical region.

- Flat blade snow catcher
- Tiled roof snow catcher

At client's request the brackets are powder coated in compliance with RAL colour standard.

2.4.8.
SLOVAKIAN CROSS SNOW CATCHER

The product is made on request to customers specifications. The intended use and the installation procedure as for the other snow breakers in the EKOCHRON product range. The product is designed to match a particular geographical region.

- Flat roof Slovakian cross snow catcher
- Tiled roof Slovakian cross snow catcher

At client's request the snow catchers are powder coated in compliance with RAL colour standard.

3. ROOF SAFETY HOOKS TYPE A

Technický a zkušební ústav stavební Praha pobočka Ostrava
(Construction Research and Development Institute in Ostrava)

EN 516

A device for dynamic tests of hook capacity in compliance with EN 517.

3. ROOF SAFETY HOOKS TYPE A

Roof safety hooks type A are dedicated for steep roof surfaces. They are used as anchors for personal fall protection equipment and to carry loads. Safety hooks require a strong supporting structure which enables firm installation of the hooks on the roof.

Roof safety hooks are designed to provide anchoring points for personal fall protection equipment during work at heights. Only certified fall protection equipment such as carabiners, lifelines and harnesses may be used.

EKOCHRON roof safety hooks may also provide anchoring for roof ladders during maintenance work. A ladder step must rest on the inner side of a hook's arch.

EKOCHRON roof safety hooks are manufactured in compliance with the European standard EN 517. This is attested by relevant documents issued by TZUS Prague, Ostrava branch.

3.1.
TILED ROOF SAFETY HOOK TYPE A

A tiled roof safety hook type A is fixed directly to a rafter with the use of three M8 bolts. The rafters must be drilled through and the bolts must be tightly secured from the bottom with nuts.

- material – quality steel
- rust protection – hot-dip galvanizing

At client's request the hooks are powder coated in compliance with RAL colour standard.

TIP
Roof safety hooks must not be loaded with wooden logs or other objects which might hinder access to them.

3.2.
TILED ROOF SAFETY HOOK TYPE B.

A tiled roof safety hook type B is fixed to a platform built for this purpose hidden under the roofing. The hook is anchored on a board – the platform – and fixed with three M8 bolts tightly secured from the bottom with nuts.

- material – quality steel
- rust protection – hot-dip galvanizing

At client's request the hooks are powder coated in compliance with RAL colour standard.

TIP
Roof safety hooks must not be loaded with wooden logs or other objects which might hinder access to them. The roof safety hook type B may be installed on plain tiles.

3.3.
TILE EFFECT STEEL SHEET SAFETY HOOKS MODULE 35

Tile effect steel sheet safety hooks are fixed to a platform built for this purpose, hidden under the roofing. The hook is placed on the roofing and fixed with three M8 bolts tightly secured from the bottom with nuts.

- material – quality steel
- rust protection – hot-dip galvanizing

At client's request the hooks are powder coated in compliance with RAL colour standard.

TIP
The bolts must be sealed from the top with a roofing sealant.
Roof safety hooks must not be loaded with wooden logs or other objects which might hinder access to them.

3.4.
FLAT ROOF UNIVERSAL SAFETY HOOK

A flat roof universal safety hook is installed on flat roofing surfaces such as shingles, tar paper and other flat or low-profiled steel sheets which do not hinder anchoring lifeline carabiners. It is fixed to a platform built for this purpose hidden under the roofing. It requires making 3 holes for the bolts. The hook is fixed to the roof supporting structure with M8 bolts tightly secured from the bottom with nuts.

- material – quality steel
- rust protection – hot-dip galvanizing

At client's request the hooks are powder coated in compliance with RAL colour standard.

TIP
The holes must be sealed with a roofing sealant.
The hooks should not be installed on standing seam metal roofing.
Roof safety hooks must not be loaded with wooden logs or other objects which might hinder access to them.

4. OTHER PRODUCTS

Due to the continuous evolution of roofing materials and changing requirements, Ekochron manufactures a number of supplementary elements which enable the installation of standard products on a variety of roofing types. Apart from roof walkways and snow guard systems Ekochron offers bird control accessories as well as straight drainage covers.

4.1. GRIP FOR A STANDING SEAM

It is used for the installation of universal brackets on metal roofing joint by folding. It is applicable for both roof walkways as well as snow guard systems.

- material-quality steel, sheet metal ≠2 mm.
- rust protection – hot-dip galvanizing

At client's request the grips are powder coated in compliance with RAL colour standard.

TIP
Depending on the type of seam the following two types of grips are available:
- for a low standing seam – double lock
- for a high standing seam - snap lock metal sheets

4.1.1. LOW STANDING SEAM (DOUBLE LOCK) GRIP

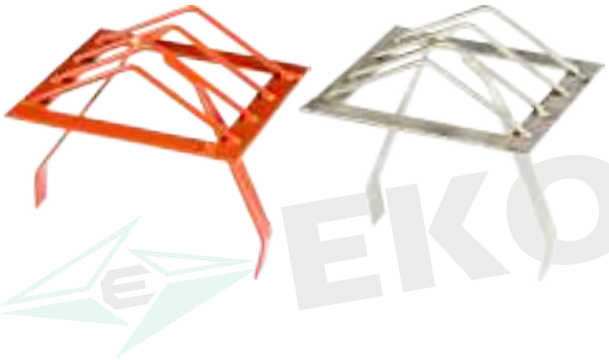
4.1.2. HIGH STANDING SEAM (SNAP LOCK) GRIP

4.2.
CHIMNEY BIRD STOP

Chimney protection grills are designed to protect chimney vents against birds and foliage. Their structure does not restrict chimney draft and is resistant to smoke gases activity.
Depending on the size of the chimney shaft we offer rectangular and square bird stops.
The installation does not require any additional elements.
We also have stainless steel and galvanized chimney bird stops.

- material – quality steel or stainless steel; sheet metal 25 x 4 mm, rods ø6.
- rust protection – stainless steel or galvanized steel.

At client's request the platforms are powder coated in compliance with RAL colour standard.



4.2.1.
SQUARE CHIMNEY BIRD STOP

Available sizes: 15 cm x 15 cm, 20 cm x 20 cm, 25 cm x 25 cm, 30 cm x 30 cm.

4.2.2.
RECTANGULAR CHIMNEY BIRD STOP

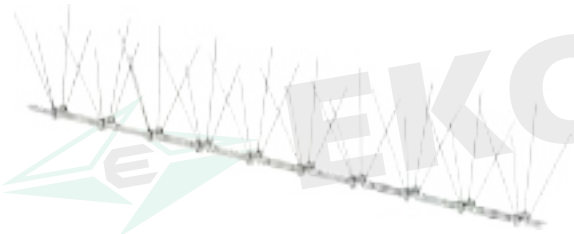
Available sizes: 15 cm x 20 cm, 20 cm x 25 cm, 25 cm x 25 cm, 25 cm x 30 cm.

4.3.
ANTI-BIRD SPIKES

Spikes are commonly used to scare birds away. They offer effective protection against birds fouling parapets, cornices and facades.
We offer 3 types of anti-bird spikes which differ in the density of spike distribution on the supporting base. The spikes are made of stainless steel and the base is made of polycarbonate. This prevents smudges which could otherwise form on facade plasters.

4.3.1.
ANTI-BIRD SPIKES TYPE A

A section of 50 cm includes 30 spikes.
Bird stops may be joined together for more effective protection.



4.3.2.
ANTI-BIRD SPIKES TYPE B

A section of 50 cm includes 40 spikes.
Bird stops may be joined together for more effective protection.

4.3.3.
ANTI-BIRD SPIKES TYPE C

A section of 50 cm includes 50 spikes.
Bird stops may be joined together for more effective protection.

4.4.
SOLAR BRACKET

Solar brackets are used to enable solar panel installation and related solutions. Depending on the roofing type we offer tiled roof brackets, metal roof brackets and flat roof brackets for such roofing surfaces as tar paper or shingles.

- material – quality steel; sheet metal 30 x4 mm.
- rust protection of all the parts – hot-dip galvanizing

At client's request the brackets are powder coated in compliance with RAL colour standard.

4.4.1.
TILED ROOF SOLAR BRACKET TYPE B

Tiled roof solar bracket type B is used for the installation of solar panels and photovoltaic cells on roof surfaces covered with tiles. The density of bracket distribution depends on the panel size or other-reqirements.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection of all the parts – hot-dip galvanizing

TIP
An auxiliary batten must be used for the installation to ensure secure fitting.

4.4.2.
FLAT ROOF SOLAR BRACKET

Universal solar brackets are used for the installation of solar panels and photovoltaic cells on roofs covered with a variety of flat or low-profiled roofing surfaces and troughed metal sheets up to 50 mm high. The density of bracket distribution depends on the panel size or other requirements.

- material – quality steel, flat bar 30 mm x 4 mm
- rust protection of all the parts – hot-dip galvanizing

TIP
The bracket must be fixed to battens or wooden sheathing. Flat solar brackets may be used together with a grip for a standing seam.

4.5.
DRAINAGE GUTTER COVER

Drainage gutter covers are intended to cover up drainage ducts.
EKOCHRON offers two types of covers: light – A15 and heavy B125 in compliance with PN-EN1433. They are made from sheet metal through cold forging. The covers are made from galvanized sheet metal DX51 + Z275 in compliance with EN10142 and EN10143.
EKOCHRON does not offer concrete gutters.

4.5.1.
DRAINAGE GUTTER COVER TYPE MEDIUM B125

The width and height of the cover is 120 x 20 mm. Standard cover lengths: 1.0 m, 0. 5m and 0.33 m. The covers are assembled with concrete gutters by means of a gutter bracket and ø8 screws.

4.5.2.
GUTTER EDGE METAL AND COVER BRACKET

A gutter edge metal piece is placed on concrete gutter edges to provide support for the installation of guuter covers type medium.

4.5.3.
DRAINAGE GUTTER COVER TYPE LIGHT A15

The width and height of the cover is 130 (95) x 20 mm. Standard cover lengths: 1.0 m, 0.5 m and 0.33 m. The covers are assembled with concrete gutters by means of a “snap” joint.

4.6.
STORING PLATFORM

A storing platform provides a flooring surface for store facilities. It also facilitate the construction of walkways and stairways inside storehouse halls.

• material – galvanized steel.

Cross section measurements: width 250 mm, height 60 mm.

4.7.
ROOF BATTEN CONNECTOR

A roof batten connector is used to extend battens which prove too short as a result of added wall thermal insulation. They may also be used as a rafter connector, e.g. for roof repairing work. Possible applications are demonstrated in the diagrams below.

• material – galvanized sheet metal, thickness 1.5 mm,

Measurements: for battens 50 x 50 and 60 x 40 mm we offer connectors in the following lengths: 500, 750, 1000 and 1500 mm.

TIP

Battens should be connected by means of ø3.5 mm screws. The edge slot facilitates fixing the edge tile to the extended wooden batten. The size of the slot permits application with a variety of tile types.

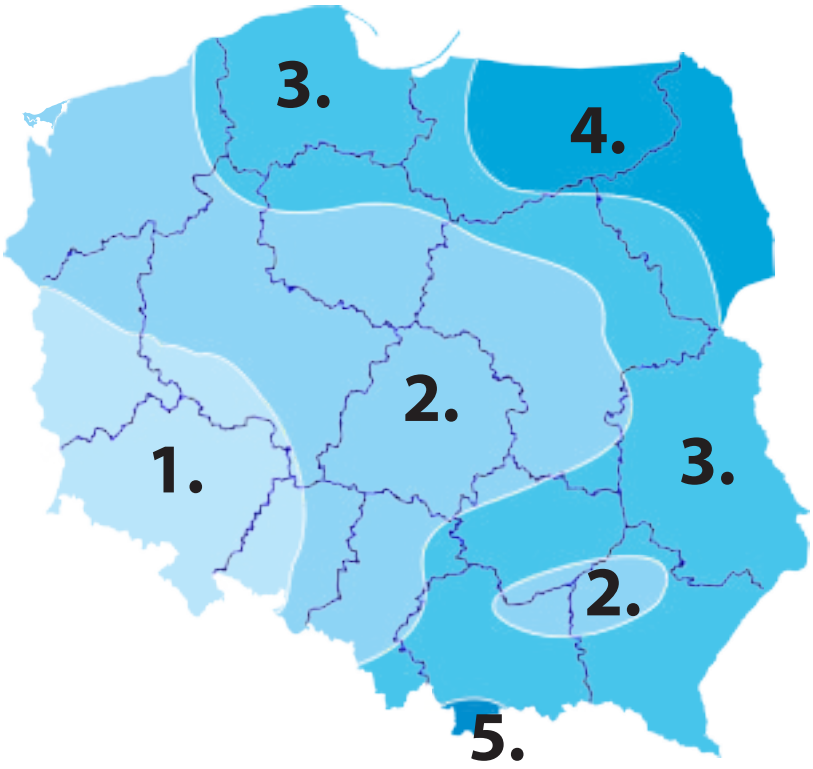
5.
SNOW ZONES IN POLAND

PN-EN 1991-1-3 construction standard permits the determination of how much snow lingers on a roof, taking into consideration the shape of the roof, its slope angle, location in Poland and climate zone. This standard divides Poland into five climate zones which are determined by the amount of snow lingering on roof surfaces.
The assumed weight of 1m3 of snow is about 250 kg (snow density ç=2,45 kN/m3).
The diagram below shows that most of the country is in the second climate zone. However, to the east of the Vistula river, it becomes the third zone, and in the Białystok region – the fourth zone. The first climate zone is in the south-west of the country, while the fifth zone covers a small area consisting of Podhale (Poland's southernmost region).

Snow load on the ground depending on the climate zone:

ZONE	S_k, kN/m²
1	0,007A-1,4; $s_k \geq 0,70$
2	0,9
3	0,006A-0,6; $s_k \geq 1,2$
4	1,6
5	0,93exp(0,00134A); $s_k \geq 2,0$

A - height above sea level



As these figures represent the amount of snow lingering on the ground, a coefficient needs to be applied which will translate these values into the amount of snow lingering on roofs. The coefficient will have to account for the slope angle and the shape of the rooftop. The standard specifies the coefficient and its range

$\mu_1 = 0 \div 1{,}6$.

For single-family detached houses for every roof slope up to 30° $\mu_1 = 0.8$ and for 45° $\mu_1 = 0.4$. For a roof slope ≥60° $\mu_1 = 0$, which reflects the fact that snow does not linger on such a steep roof.

RULES FOR DETERMINING THE SNOW LOAD (EN 1991-1-3)

The specific roof load S related to the roof projection on a horizontal surface should be calculated according to the formula:

$S = \mu_1 C_e C_t S_k$ [kN/ m²]

where: C_e – the exposure factor taking account of the intensity of the wind (0.8÷1.2)
C_t – the thermal factor taking account of the roof insulation (usually 1.0)

For umbrella roofs and flat roofs in unheated and uninsulated buildings, the roof load S should be increased by 20%.

• EXAMPLE 1

Let's take a hip roof (with 4 slopes) of 11 m x 11 m (L) with a slope of 30° and let's assume this house is located near Wrocław.
According to this data and according to the snow zones standard we can determine that this house is located in the first climate zone with a snow load Sk = 0.7 [kN/m²], roof shape factor (according to the chart 5.2 of the standard) we assume $\mu_1 = 0.8$. The horizontal projection of the roof covers 121 m². The roof (attic) insulated ($C_t = 1.0$). Normal terrain where snow is not moved by the wind in significant amounts ($C_e = 1.0$). Relating this data to the surface of the roof we get:

S_I = (0.8 x 1.0 x 1.0 x 0.7) x 121 = 67,76 [kN], which equals 6 900 kg.

to calculate the snow load on the snow fences on each side of the roof, the result is divided by 4. The snow load pressing on the snow guard railing Fs depends on the roof pitch and its length:

$Fs_I = (S_I / 4 / L) \times \sin 30° \approx 160 \times 0{,}5 = 80$ kg/mb

In this case every slope is a triangle, so the number of brackets must be higher in the centre than on the sides where the snow pressure is smaller.

• EXAMPLE 2

With the same roof structure as in the first example, but with a location in Suwałki (zone IV) at circa 177 metres above sea level the load is:

S_{IV} = (0.8 x 1.0 x 1.0 x 1.6) x 121 = 157 [kN], which equals 15 985 kg

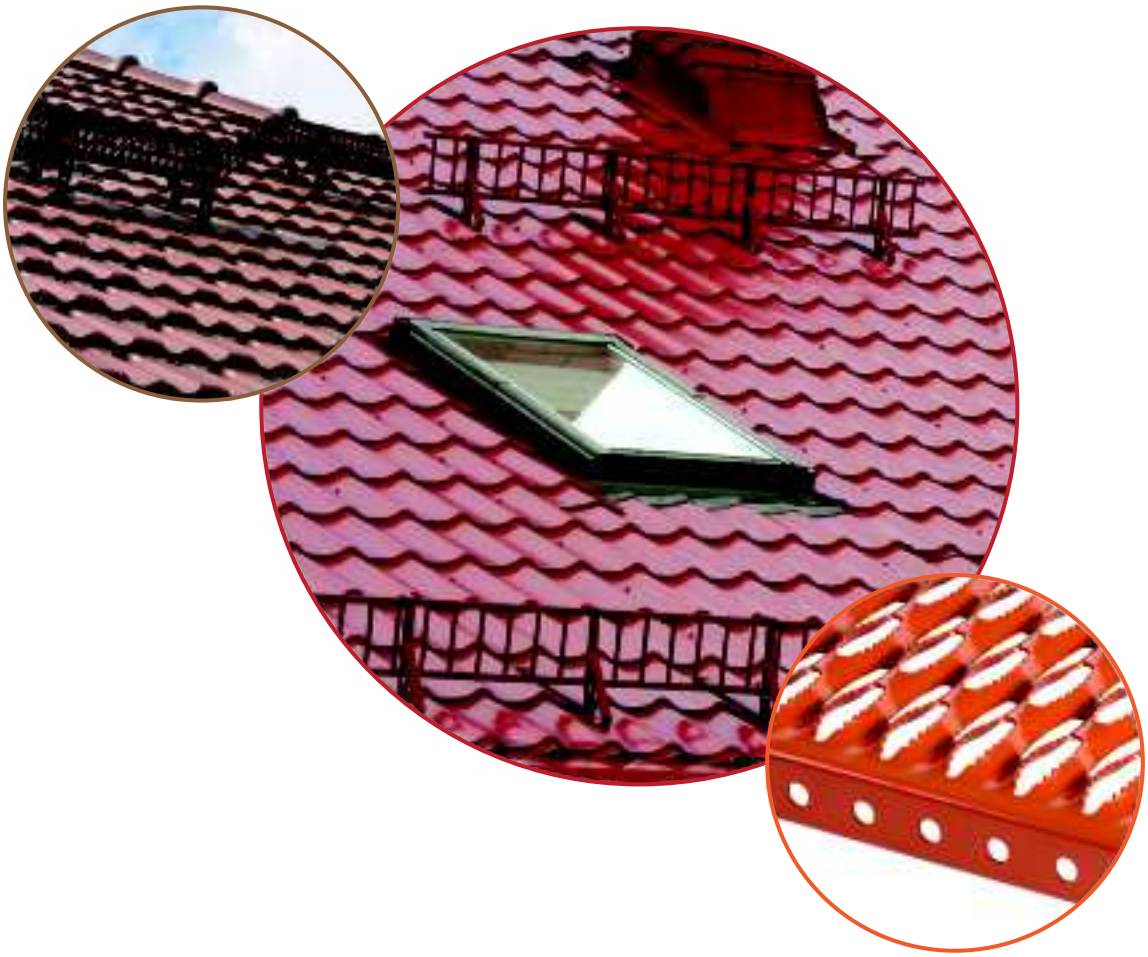
By applying similar calculations as in the first example, the result is: $F_{SIV} \approx$ 182kg/mb

• CONCLUSIONS:

When analyzing the results of calculations in the examples, one can see the force the snow fences must withstand at the moment of avalanche depending on the snow zone.

In the snow zone I the average pressure on the snow fence is at the level of about 80kg/rm (running metre), but in zone IV it is already around 180kg/mb, therefore snow retention should be taken seriously, otherwise the damage might be severe.

It is obvious that forces acting on snow fences are enormous and therefore two lines of fences should be installed. Alternatively, one row of fences may be supported with snow breakers or snow stop systems. It helps take some pressure off of the bottom line of the snow guards. There have been cases of broken tiles due to massive amounts of snow pressing on the roof, despite the fact that the brackets had been installed correctly, causing damage to the roofing at the moment when its tightness was most desired and the repair was really burdensome and expensive.



6.
NOMOGRAM

The nomogram table helps estimating the number of brackets needed for a snow fence. It takes into account the roof slope angle and the length of the rafters. Using this data, the number of the brackets and fences needed can be pre-determined.

brackets for tiles

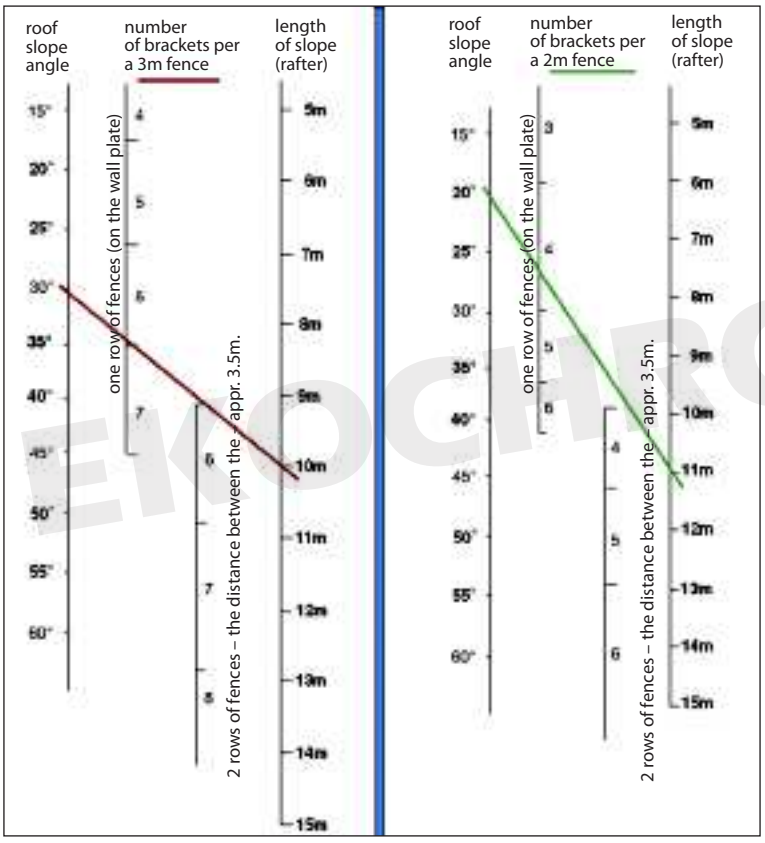
angle ↓ / length of rafter →	estimating the no. of tiled roof snow fence brackets type B depending on the angle and length of the rafters (no. of pieces per 3m fence)									
	5	6	7	8	9	10	11	12	13	14
15	3	3	3	3	3	3	3	4	4	4
20	3	3	3	3	4	4	4	6	6	6
25	3	3	4	4	4	6	6	6	6	6
30	3	4	4	4	6	6	6	2 rows/4	2 rows /6	2 rows /6
35	4	4	6	6	6	6	2 rows/4	2 rows /6	2 rows /6	2 rows /6
40	4	4	6	6	6	2 rows/4	2 rows /6	2 rows /6	3 rows /6	3 rows /6
45	4	6	6	6	2 rows/4	2 rows /6	2 rows /6	3 rows /6	3 rows /6	3 rows /6
50	4	6	6	2 rows/4	2 rows /6	2 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6
55	6	6	6	2 rows /6	2 rows /6	2 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6
60	6	6	2 rows/4	2 rows /6	2 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6

brackets for metal tiles

angle ↓ / length of rafter →	estimating the no. of tile effect steel sheet and universal snow fence brackets depending on the angle and length of rafters (no. of pieces per 3m fence)									
	5	6	7	8	9	10	11	12	13	14
15	3	3	3	3	3	4	4	4	5	5
20	3	3	3	4	4	5	5	5	6	6
25	3	4	4	5	5	5	6	6	2 rows/4	2 rows/4
30	4	4	5	5	6	6	2 rows/4	2 rows/4	2 rows /5	2 rows /5
35	4	5	5	6	6	2 rows/4	2 rows /5	2 rows /5	2 rows /6	2 rows /6
40	5	5	6	6	2 rows/4	2 rows /5	2 rows /5	2 rows /6	2 rows /6	3 rows /6
45	5	5	6	2 rows/4	2 rows /5	2 rows /5	2 rows /6	3 rows /6	3 rows /6	3 rows /6
50	5	6	6	2 rows/4	2 rows /5	2 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6
55	5	6	2 rows/4	2 rows /5	2 rows /6	2 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6
60	6	6	2 rows/4	2 rows /5	2 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6	3 rows /6

Apart from nomograms, other tables have been developed which make the data easier to understand. These tables differentiate between tiled and metal roofs and assume the use of the most popular brackets in a given segment of roofing materials.

The tables were developed for snow zones 2 and 3. Correct selection of snow protection for buildings under construction always requires considering their location as well as their orientation. The final decision about the scope of snow protection should be made by the site manager with reference to the architectural design.
It is important to plan the installation of roof accessories at the design stage, as changes at later stages may require partial removal of the roofing, which may prove time-consuming and expensive.

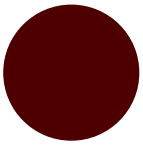


7.
LIST OF BRACKETS AND TILES

Below is a list of the most popular models of ceramic tiles offered by the leading roofing manufacturers. A detailed description of recommended brackets for a given tile model can be found in chapter 1.2. Roof walkways on pages 7-8. If you do not find the model you need, contact our sales department.

BRACKET	PHOTO	MANUFACTURER	TILE MODEL
bent step/platform bracket with a protective strip used interchangeably with step/platform bracket with EPDM pads	 	Braas	Rubin Granat Topas Turmalin Romańska Celtycka Teviva
		Roben	Piemont MonzaPlus
		Koramic	Reńska Renesansowa Płaska Marsylka
		Nelskamp	Nibra F10 Nibra F7 Nibra G10 Nibra R10
		Tondach	Holenderka 11 Stodo Figaro
step/platform bracket with protective strip		Braas	Opal
		Koramic	Karpiówka
plain tile step/platform bracket (two-piece)		Nelskamp	Karpiówka
		Tondach	Karpiówka

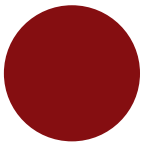

RAL 7016 - anthracite

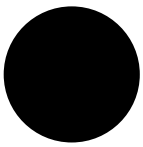

RAL 8012 - chestnut


RAL 7015 - anthracite


RAL 6020 - olive

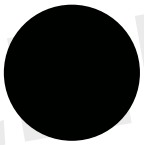

RAL 8004 - brick

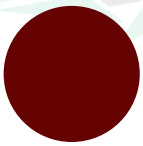

RAL 3011

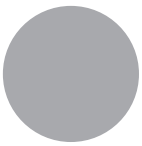

RAL 9005 - black


RAL 7024

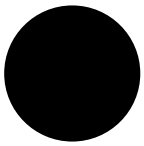

RAL 8017 - brown

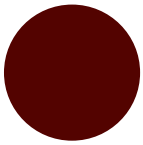

RAL 9004

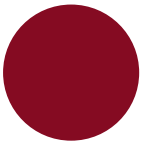

RAL 3004 - cherry


RAL 9006


RAL 8019 - brown gray


RAL 9011


RAL 8015 - chestnut brown


RAL 3005

For an additional fee, products can be painted with custom colours using the RAL colour palette. Delivery date: up to 7 working days.

RAL colours presented in the catalogue are only illustrative and may differ from the real ones due to differences resulting from printer settings and the photographic process.

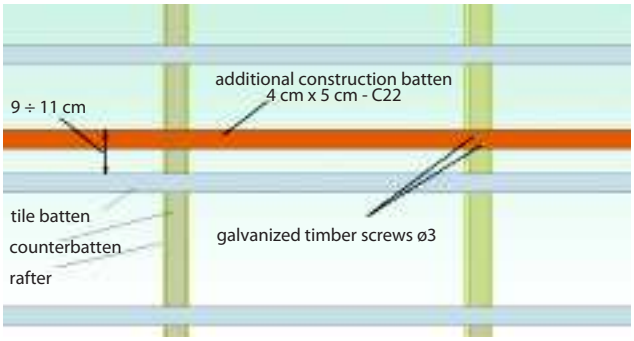
9.

ADDITIONAL INFORMATION
INSTRUCTIONS
INSTALLATION GUIDELINES

INSTALLATION REQUIREMENTS:

• Fit an auxiliary batten to provide support for fence / pipe / log brackets.

• Grind partly the tile locks – both the lower and the upper (covering) tile – in the contact area with the bracket to a width of 40 mm as shown in the picture below.



INSTALLATION:

• Hook the bracket on the auxiliary batten. After putting the bracket in place and making all the necessary adjustments, fix the bracket the batten with a galvanized screw min. ø5 (PN (Polish Standard) 82503/DIN 97)

• A correctly installed bracket does not cause the tile to stand out ensuring watertightness of the roof and permitting further installation of snow guards.

• As a final stage of installation, insert the fence / pipe / log into the bracket.

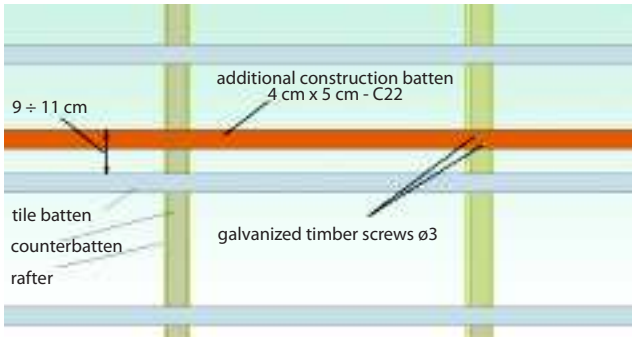
- In case of snow fences, you should hear a 'snap' sound as the fence snaps securely into the bracket.
- Pipes, after inserting into the bracket eyes, do not require any additional securing measures or devices.
- Snow logs must be fixed to the brackets from the top with galvanized screws through the dedicated holes.

ATTENTION!
If you build snow barriers longer than standard module lengths use dedicated connectors.

INSTALLATION REQUIREMENTS:

• Fit an auxiliary batten to serve as a base for the installation of roof walkways.

• Grind partly the tile locks – both the lower and the upper (covering) tile – in the contact area with the bracket to a width of 40 mm as shown in the picture below.



INSTALLATION:

• Hook the step/platform bracket on the auxiliary batten. After putting the bracket in place and making all the necessary adjustments, fix the bracket to the batten with galvanized screws min. ø5 (PN 82503 / DIN 97).

• A roof platform is fixed to the grip (use galvanized screws M8x50). After levelling, fix the platform to the already fixed bracket (use galvanized screws M8x20). Grips and brackets come with a set of dedicated screws.

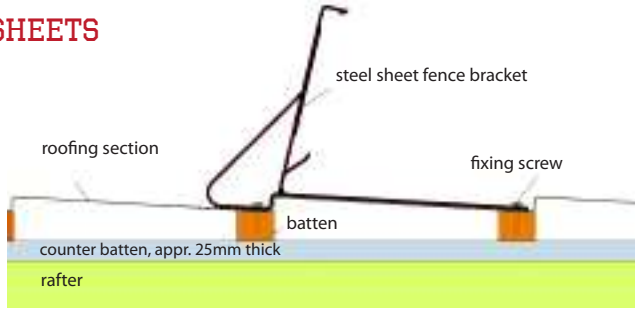
• A safety step is fixed directly to the bracket after levelling it. The installation of narrow steps requires the use of an additional element – a stabilizer, which is fixed together with the bracket to the batten with additional screws min. ø5 (PN 82503 / DIN 97).

PROFILE METAL SHEETS – TILE EFFECT METAL SHEETS

INSTALLATION REQUIREMENTS:

The requirements for the installation of snow guards are the same as for roof walkways.

The installation requires fitting construction battens as in the diagram to serve as a base for the installation of brackets. Depending on the steel sheet module the distance between the battens is usually between 35cm and 40cm.



INSTALLATION:

1. SNOW GUARD BRACKETS

- Decide where to place the bracket and make two holes ø8.
  - Due to the large size of the screws, pre-drill a hole in the batten (a bit smaller than the screw size), to avoid splitting the batten during the installation (Picture 1).
  - Prior to the installation, line the area around the holes with silicone sealant (Picture 2).
  - We recommend galvanized fixing screws with hexagonal heads ø8 (DIN571; PN-82501); optionally you can use galvanized wood screws min. ø6 x 40.
- After placing the bracket on the designated place (Picture 3) tighten the screws pressing the sealant out to waterproof the holes (Picture 4); remove excess sealant.
- As a final stage of installation, insert the fence/pipe/log into the brackets (Picture 5).
  - In case of snow fences, you should hear a 'snap' sound as the fence snaps into the bracket.
  - Pipes, after inserting into the bracket eyes, do not require any additional securing measures or devices.
  - Fix snow logs to the brackets from the top with galvanized screws using the dedicated holes.


Picture 1


Picture 2


Picture 3


Picture 4


Picture 5

2. ROOF WALKWAYS BRACKETS

- Fix the brackets to the roofing following the same principles as for snow guard brackets. (Pictures 6, 7, 8).
- Fix the roof platform to the grip (use galvanized screws M8 x 50) and, after levelling, fix the platform to the already fixed bracket (use galvanized screws M8 x 20). Grips and brackets come with a set of screws.

EKOCHRON does not recommend the installation of narrow safety steps on tile effect metal sheets; As an alternative we recommend the use of wide steps – width 40 cm.


Picture 6


Picture 7

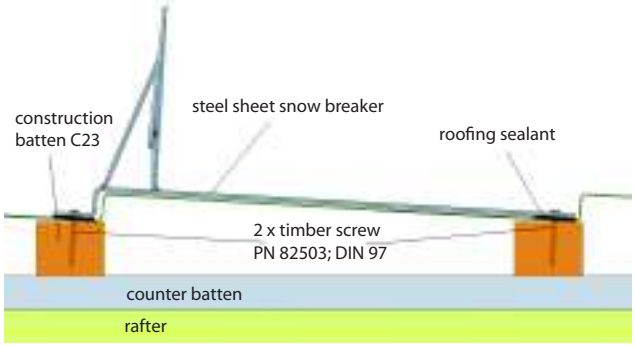

Picture 8


Picture 9

ATTENTION! Screws designed for fastening steel sheets must not be used for the installation of roof safety accessories.

INSTALLATION REQUIREMENTS:

The installation requires fitting construction battens in all the places where snow breakers are to be fixed. Depending on the steel sheet module the distance between the battens is usually between 35cm and 40 cm.



INSTALLATION:

- Plan the distribution of snow breakers on the roof and prepare the roofing as in the case of snow retention systems. For 5 mm fixing screws, metal sheets have to be drilled through with a drill bit min. ø5 mm in the places where the brackets are to be fixed. The battens need to be pre-drilled with a drill bit ø4 mm.
- Line the area around the holes with silicone sealant.
- Fix the snow breaker with screws and remove the excess sealant.

ATTENTION!

- Use ample amount of the sealant so it comes out from under the bracket after tightening the screws. Remove the excess afterwards.
- Failing to fit a batten where a bracket is fixed or using the same type of screws as for fixing metal roofing is impermissible.
- Use galvanized screws min. ø5 mm x 35 mm (PN 82503 / DIN 97) to fix snow breakers.
- The application of snow breakers in one row at the bottom of a roof surface is regarded to be an installation error and any claims from resulting damage will not be considered.

INSTALLATION REQUIREMENTS:

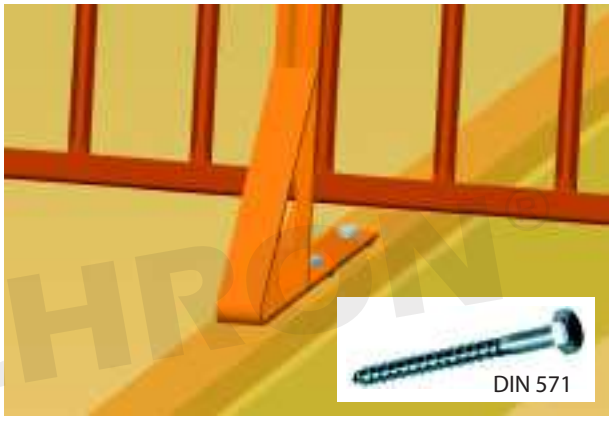
The installation of roof accessories requires fitting extra battens in all the places where they are to be fixed.

INSTALLATION OF BRACKETS:

The principles of installation of all brackets are the same for roof walkways and snow retention systems.

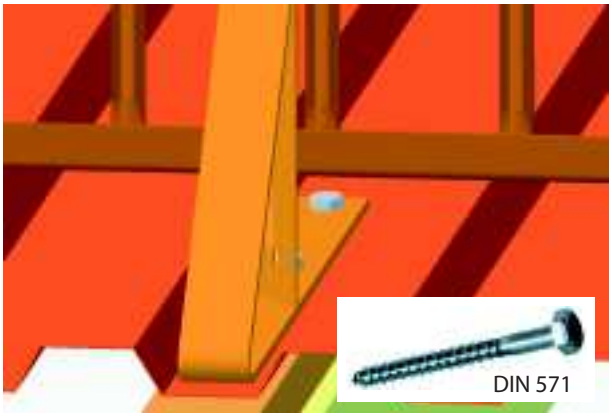
1. FLAT ROOFING (FLAT METAL SHEETS, SHINGLES, TAR PAPER)

- Decide where to place the brackets and make holes ø8 in the roofing.
- Pre-drill the battens or sheathing with a drill bit smaller by 1 mm (diameter) than the fixing screws.
- Line the area around the holes with silicone sealant.
- Use galvanized timber fixing screws with a hexagonal head ø8 (PN 82501; DIN 571).
- Put the bracket in place and fix it tightly to the roof so that excess sealant comes out, waterproofing the roofing. Remove excess sealant.
- Depending on the bracket used, install its accessory elements.



2. TROUGHED METAL SHEETS

- The brackets are placed on the bottom part of a sheet profile.
- Decide where to place the brackets and make holes in the metal roofing for the fixing screws (ø8).
- Due to the large size of the screws, pre-drill holes in the battens (with a dill bit dia ø7), to avoid splitting battens during the installation.
- Prior to the installation, line the area around the holes with roofing sealant.
- Use galvanized timber fixing screws with a hexagonal head ø8 (PN 82501; DIN 571).
- Put the bracket in place and fix it tightly to the roof so that excess sealant comes out, waterproofing the roofing. Remove excess sealant.
- Depending on the bracket used, install its accessory elements.



ATTENTION!

EKOCHRON does not recommend the installation of narrow safety steps on flat and troughed metal sheets; As an alternative we recommend the use of wide steps – width 40 cm, 60 cm or 80 cm.

3. STANDING SEAM STEEL SHEETS

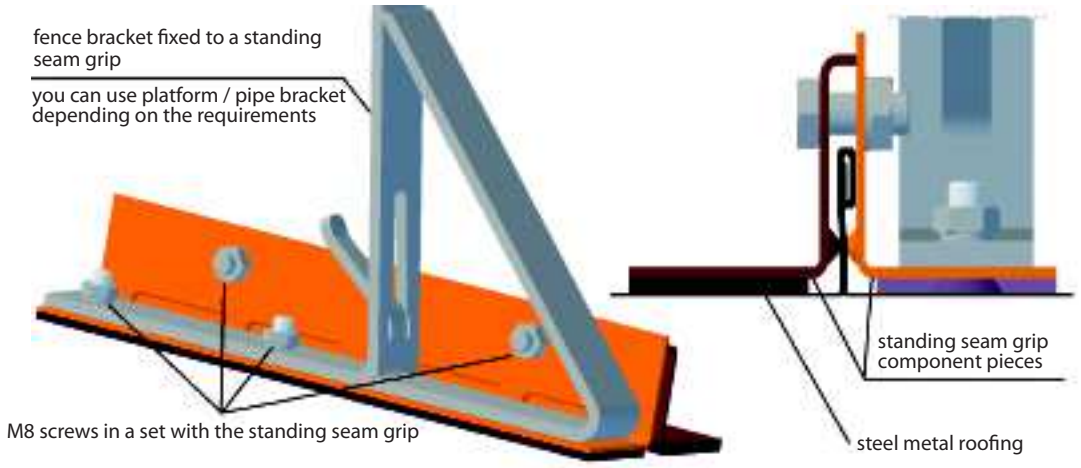


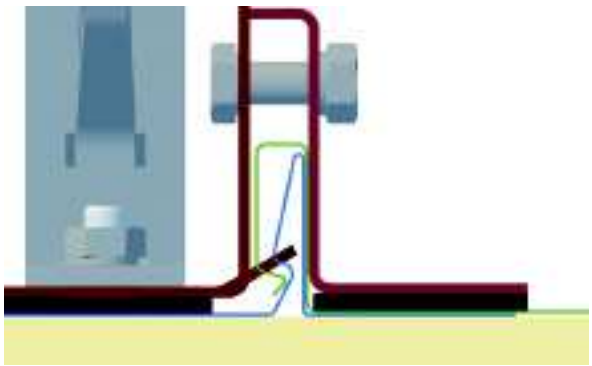
Illustration of the assembly of fence and platform bracket with the standing seam grip

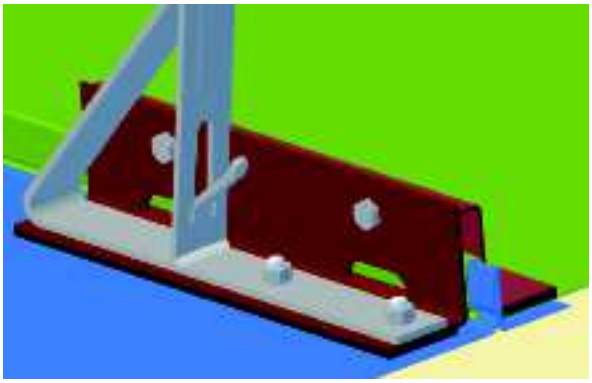
- Brackets are mounted on dedicated grips which eliminate the need to drill holes in the roofing (Product Catalogue p. 41).
- Put more clips fixing the seam to the sheathing in the area chosen for a bracket.
- The procedure is illustrated in the diagram below (the brackets come with a set of dedicated screws).

- Tighten the screws which squeeze the seam.
- Depending on the bracket used, install its accessory elements.

INSTALLATION OF ACCESSORY ELEMENTS:

As the final stage of installation, insert a fence, pipe or fix a log onto the bracket, fix a step/platform to the bracket.





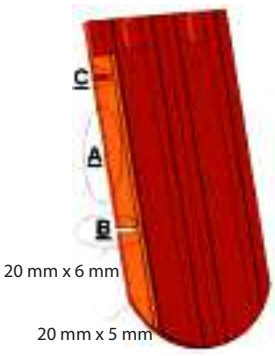
- In case of ***snow fences***, you should hear a 'snap' sound as the fence snaps into the bracket.
- ***Pipes***, after inserting into the bracket eyes, do not require any additional securing measures or devices.
- ***Snow logs*** must be fixed to the brackets from the top using galvanized screws driven through the dedicated holes.
- ***Narrow steps***, after levelling, must be fixed to the brackets with two screws (the screws come in a set with the bracket).
- ***Roof platforms*** are fixed to grips (use galvanized screws M8x50). After levelling, fix the platforms again to the already installed brackets (use galvanized screws M8x20). Grips and brackets come with a set of dedicated screws.

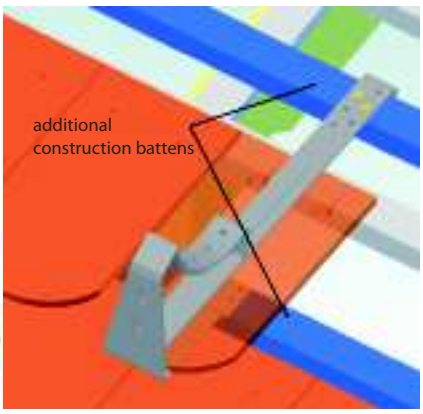
PLAIN CLAY TILES ARRANGED AS LACE ROOF WALKWAYS BRACKET INSTALLATION

INSTALLATION REQUIREMENTS:

• Fit two (for the bracket and the stabilizer) auxiliary standard construction battens (e.g. 40 mm x 50 mm), to be used exclusively as a base for plain tile roof walkway brackets with a stabilizer – arranged as lace.

• Prepare the tiles: grind the tile edges adjacent to the brackets in the places A, B, C as shown in the diagram.

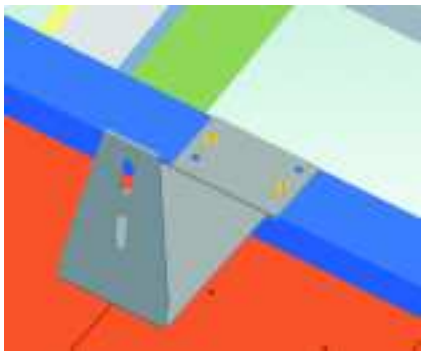




INSTALLATION:

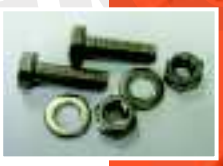
• Install the bracket support on the joint between two tiles, on which the support will rest.

• Fix the support to the batten with at least two galvanized timber screws min. ø5 (PN 82503 / DIN 97).

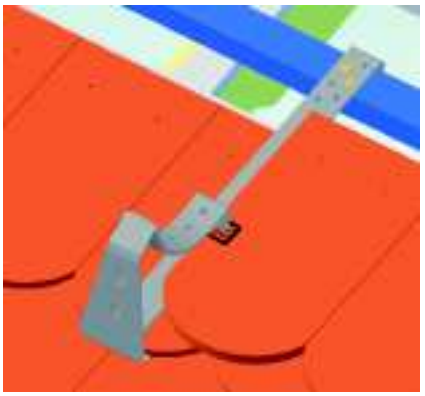


• Lay another row (only the first layer) of tiles, put the bracket in place and fix it to the other batten.

- Fix the bracket to the already installed support (brackets come in sets with M8 x 20 screws).
- Fix the bracket to the batten with at least two galvanized timber screws min. ø5 (PN 82503 / DIN 97).
- Correct placement of auxiliary battens permits a collision free installation of the support and the bracket.



• Lay another row of tiles. Cut groves in the edges adjacent to the bracket so the tiles remain all at one level. You can also buy purpose made profiled tiles.



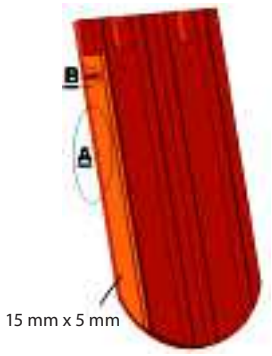
• **Fix the roof platform to the grip** (use galvanized screws M8 x 50) and, after levelling, fix it to the already installed bracket (use galvanized screws M8 x 20). Grips and brackets come with a set of dedicated screws.

• **Fix the safety step**, after levelling, directly to the bracket. The installation of narrow steps requires the use of an additional element – a stabilizer, which is fixed together with the bracket to the batten with additional screws min. ø5

INSTALLATION REQUIREMENTS:

• Fit auxiliary standard construction battens (e.g. 40 mm x 50 mm) to be used exclusively as a base fence/pipe/log brackets.

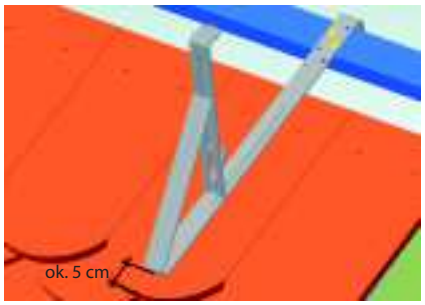
• Prepare the tiles: grind the tile edges adjacent to the brackets in the places A, B as shown in the diagram.



INSTALLATION:

• Fix the fence/pipe/log bracket to the auxiliary batten so that the bracket ends around 5cm above the underlying tile bottom edge.

- Fix the support to the batten with at least two galvanized timber screws min. ø5 (PN 82503 / DIN 97).



• Using the prepared (ground edges) tiles lay another row of tiles.

- A correctly installed bracket does not cause tiles to stand out, ensures watertightness of the roof and permits further installation of snow guards systems.

• As a final stage of installation, insert the fence/pipe/log into the brackets.

- In case of snow fences, you should hear a 'snap' sound as the fence snaps into the bracket.
- Pipes, after inserting into the bracket eyes, do not require any additional securing measures or devices.
- Snow logs must be fixed to the brackets from the top with galvanized screws using the dedicated holes.

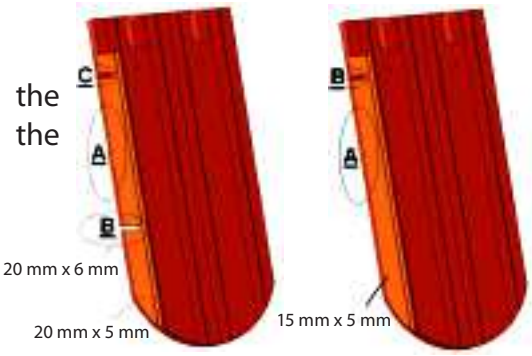
ATTENTION!
If you build snow barriers longer than standard module lengths, use dedicated connectors.

PLAIN CLAY TILES ARRANGED AS FISH SCALE
ROOF WALKWAYS BRACKET INSTALLATION

INSTALLATION REQUIREMENTS:

• Grind the tiles adjacent to the support and the bracket as in the diagram.

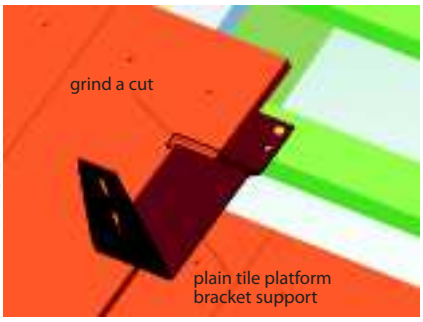
The first tile A, the second tile B.



INSTALLATION:

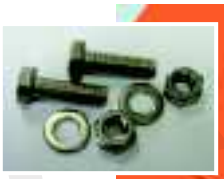
• Fix the bracket support placing it symmetrically in the middle of the bottom tile.

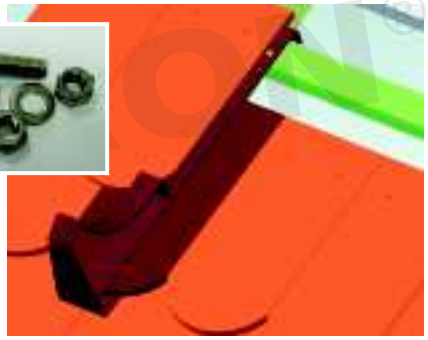
- Fix the support to the batten with at least two galvanized timber screws min. ø5 (PN 82503 / DIN 97).
- Prepare tile A (right and left).



• Lay another row of tiles and put a bracket on it fixing it to another row of battens.

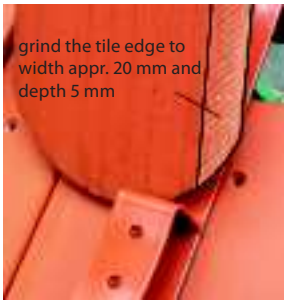
- Fix the bracket to an already installed support (brackets come in sets with M8 x 20 screws).
- Fix the support to the batten with at least two galvanized timber screws min. ø5 (PN 82503 / DIN 97).





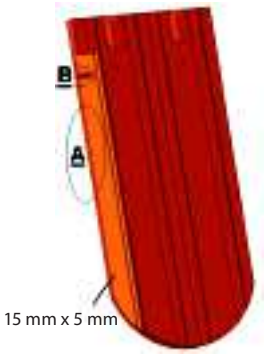
• Lay another row of tiles using the already prepared tiles, so that they form a level surface in the area around the bracket.

- Prepare tile B (right and left).



• **Fix the roof platform to the grip** (use galvanized screws M8 x 50) and, after levelling, fix it to the preinstalled bracket (use galvanized screws M8 x 20). Grips and brackets come with a set of dedicated screws.

• **Fix the safety step**, after levelling, directly to the bracket. The installation of narrow steps requires the use of an additional element – a stabilizer, which is fixed together with the bracket to the batten with additional screws min. ø5.



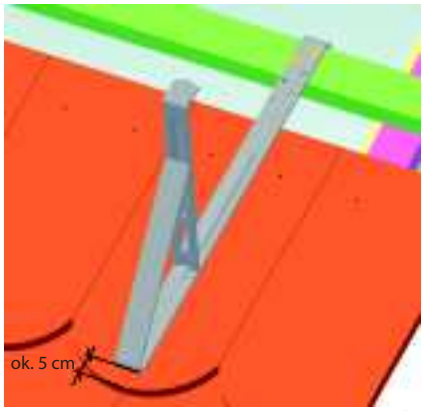
INSTALLATION REQUIREMENTS:

• Grind the tiles adjacent to the support and the bracket as in the picture.

INSTALLATION:

• Fix the fence/pipe/log bracket to the batten on which the tiles are placed so that the bracket ends around 5 cm above the bottom edge of the underlying tile.

- Fix the bracket to the batten with at least two galvanized timber screws min. ø5 (per PN 82503 / DIN 97).



• Using the prepared (ground edges) tiles lay another row of tiles.

- A correctly installed bracket does not cause tiles to stand out, ensures watertightness of the roof and permits further installation of snow guards systems.

• As a final stage of installation, insert the fence/pipe/log into the brackets.

- In case of snow fences, you should hear a 'snap' sound as the fence snaps into the bracket.
- Pipes, after inserting into the bracket eyes, do not require any additional securing measures or devices.
- Snow logs must be fixed to the brackets from the top with galvanized screws using the dedicated holes.

ATTENTION!
If you build snow barriers longer than standard module lengths, use dedicated connectors.

INSTALLATION OF PLAIN TILE ROOF STEP/PLATFORM BRACKETS ARRANGED AS LACE – ONE-PIECE BRACKET

INSTALLATION:

• Fit an auxiliary 40 mm x 50 mm batten between the standard battens, rafter-to-rafter long, to provide basis for the bracket.

• Place the bracket on one of the tiles from the lower row and, after laying the neighbouring tiles, fix the bracket with galvanized timber screws min. ø5.
• Where a stabilizer 1.13. is applied, use 6 screws which come in a set with the stabilizer.

• Grind both tiles which are in direct contact with the bracket (covering it) symmetrically on the sides in order to achieve a flat, uniform surface of the roof.
• Grind the tiles all along the side edge to about 4 mm depth and 20 mm width.
• Cut a slot in the tiles for the flat bar (arch). **ATTENTION! The location of the slot varies depending on the arrangement of the tiles.**
• Grind the tile deeper in the bracket fixing spot (to allow space for the head of the fixing screw).

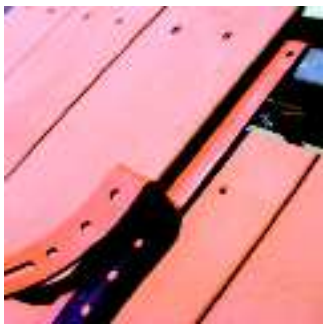
• Put the ground tiles on both sides of the bracket and continue to lay the roof.

• Fix the platform grip and a platform or a narrow step to the bracket.
• It is not recommended to mount narrow steps without the use of a bracket stabilizer fixed together with the bracket – hidden under the tiles.

INSTALLATION OF PLAIN TILED ROOF STEP/PLATFORM BRACKETS ARRANGED AS FISH SCALE – ONE-PIECE BRACKET

INSTALLATION:

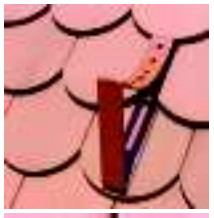
• The bracket is fixed to the roof on the same battens which support the tiles.



• Hook the bracket on the batten so that it is placed in the middle of the underlying tile and fix it with galvanized timber screws min. ø5.
• Where a stabilizer 1.13. is applied, use 6 screws which come in a set with the stabilizer.

• Grind both tiles which are in direct contact with the bracket (covering it) symmetrically on the sides in order to achieve a flat, uniform surface of the roof.
• Grind the tiles all along the side edge to about 4 mm depth and 20 mm width.
• Cut a slot in the tiles for the flat bar (arch). **ATTENTION! The location of the slot varies depending on the arrangement of the tiles.**
• Grind the tile deeper in the bracket fixing spot to allow space for the head of the fixing screw.

• Put the ground tiles on both sides of the bracket and continue to lay the roof.



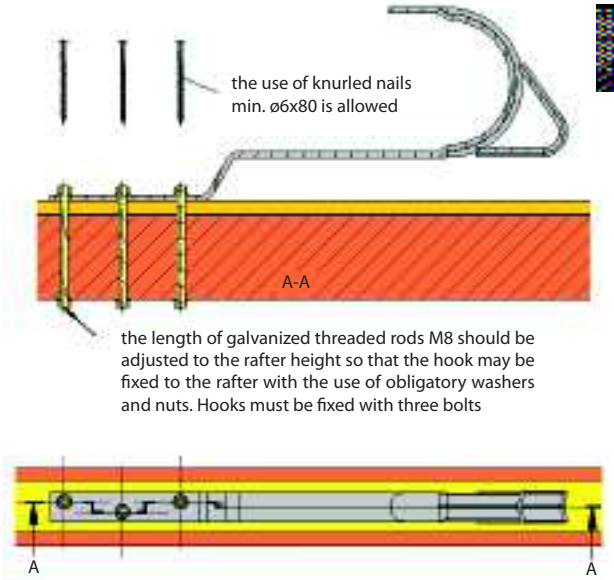
• Fix the platform grip and a platform or a narrow step to the bracket.
• It is not recommended to mount narrow steps without the use of a bracket stabilizer fixed together with the bracket - hidden under the tiles.

SAFETY HOOKS TYPE A INSTALLATION GUIDELINES IN COMPLIANCE WITH EN 517.

Roof safety hooks type A, manufactured in compliance with EN 517 are used as anchoring points for personal fall protection equipment during work at heights. As they are intended to ensure safety, they require particular installation conditions. Safety hooks should be fixed to rafters. Alternatively, build a supporting structure in between rafters.

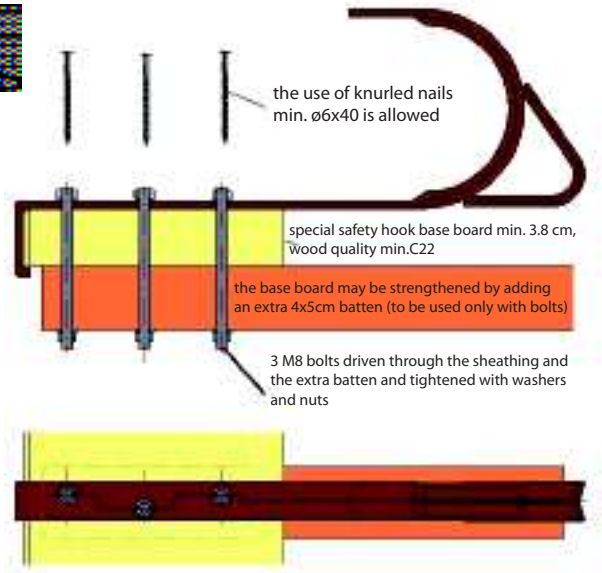
Despite the fact that standard EN 517 permits the use of nails, after consultation with the certifying body TZUS Ostrava, we recommend fastening the hooks with bolts (threaded rods) min. M8, securing them on both sides with washers and nuts.

FIXING SAFETY HOOKS TO RAFTERS

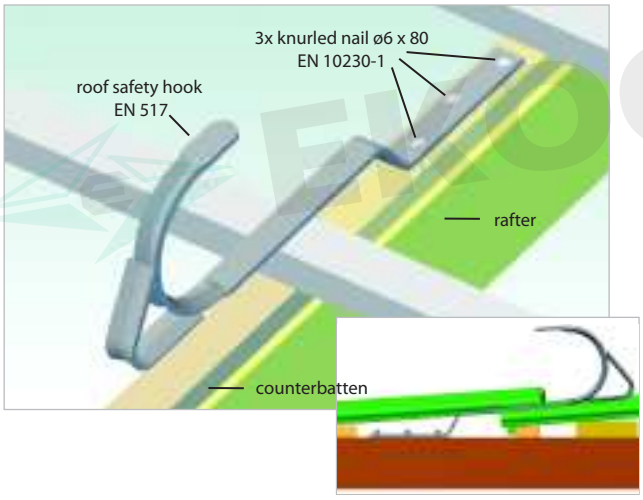


There is no need to build an additional supporting base.

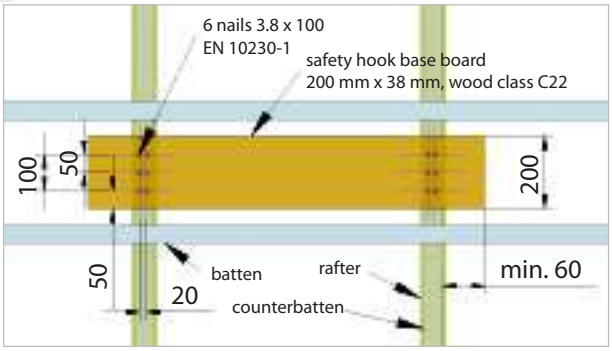
FIXING SAFETY HOOKS BETWEEN RAFTERS



FIXING A HOOK WITH NAILS



Build a special hook supporting base following these guidelines: The hooks are fixed to the roof bearing structure, which must have a dedicated base board, section min. 200 mm x 38 mm. The board must be min. wood class C22 (PN-EN 1912) and it has to be fastened onto rafters following the principles shown in the diagram.



NOTES!

1. After an emergency use of a hook it must be replaced with a new one together with all the fasteners. The supporting wooden structure must be carefully inspected.

2. Hooks should not be fastened to the ridge board.

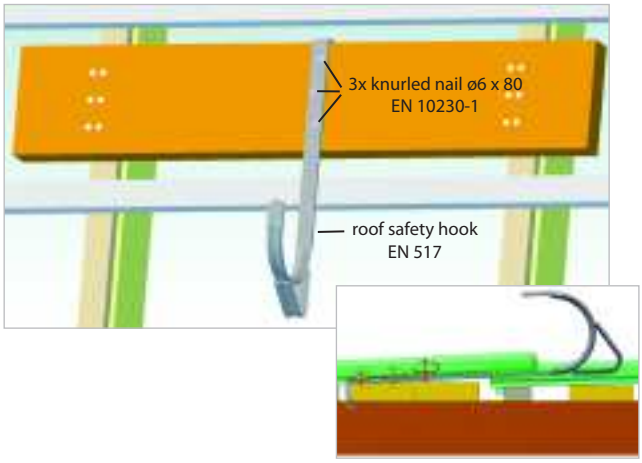
3. The hook may be placed anywhere on the platform base adjusting it to the roofing profile.

4. All hooks are tested on a dedicated dynamic test station in compliance with EN 517.

5. Safety hooks are also used for temporary hanging of roof ladders.

6. Nails or bolts are not provided by the hook manufacturer.

Fix the roof safety hook to the roof supporting structure with 3 M8 bolts or 3 galvanized knurled nails 6 x 40.
Prior to fastening the hooks, pre-drill holes for the nails to avoid splitting timber when the nails are driven through.



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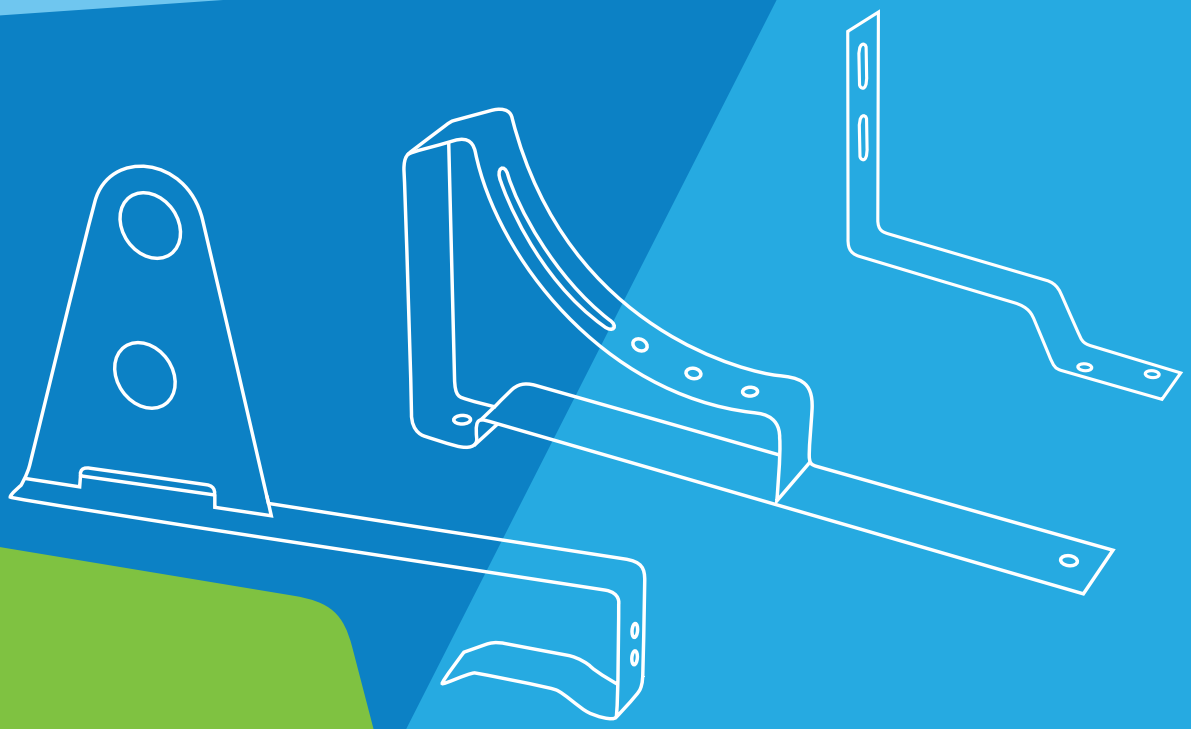

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