swissporton

APPLICATION GUIDE

Clay interlocking roof tiles

swisspor Hungary SEE Kft.

Technical department

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The informations provided in this documents, are textual guidelines, the datas in the form of technical drawnings correspond to the current technical knowledge at the time of publication and based to the experience of swisspor Hungary SEE Kft.. This application guide contains only a part of the product informations. The described applications, examples, do not take into account the special features that may arise in individual cases.

All datas and the suitability of the material for the intended use must always be checked on the construction site! swisspor Hungary SEE Kft. disclaims all warranties related the provided informations. This includes typographical errors and the subsequent changes to the specifications.

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PART I.
General rules and informations

More informations:: swissporTON.hu

I. Standards and regulations

General design and construction rules and regulations for the swissporTON interlocking clay tiles. Compliance with regulations and rules is important because warranty claims can only be enforced if the regulations are complied and the original accessories are installed.

EN 1304 Clay roofing tiles and fittings. Product definitions and specifications

ÉMSZ* Cserépfedések tervezési és kivitelezési szabályai.

ÉMSZ* Bádogos munkák tervezési és kivitelezési szabályai.

ÉMSZ* Alátéthéjazatok tervezési és kivitelezési szabályai.

ZVDH Zentralverband des Deutschen Dachdeckerhandwerks.

* *Épületszigetelők, Tetőfedők és Bádogosok Magyarországi Szövetsége (Hungarian Association of Building Insulators, Roofers and Tinsmiths)*

The most importants are:

- DIN 4108 Thermal insulation in buildings
- DIN 4109 Sound insulation in buildings
- DIN 18516 Cladding for external walls, ventilated at rear
- DIN 68800 Wood preservation
- VOB/C DIN 18338 General technical specifications in construction contracts (ATV) - Roofing work
- VOB/C DIN 18351 General technical specifications in construction contracts (ATV) - Work on back-ventilated curtain walling

II. From clay to tile

1. Main properties of clay:

The clay were formed by the wheathering of feldspar-rich magmatic rocks. It is a multi-component colloidal system, so:

- the particle sizes of the components are very small, less then 2mμ,
- does not crystallize,
- the proportion of each component varies depending on the place and circumstances of origin.

2. Components of clay mineral:

- clay minerals formed during rock erosion: kaolinites, illites, montmorillonites, (aluminosilicates)
- fragmented but not transformed weathering residue corresponding to the original rocks (mica, quartz)
- other minerals formed during rock deposition (gypsum, dolomite)
- impurities (organic matter, iron oxide)

Of the individual components, clay minerals are the predominant, usually more than 85%.

3. The clay tile:

Clay as a building material has had a very special relationship with humanity from the very beginning.

Tile, as the first building material shaped by human hands, dates back nearly 10,000 years. From quality clay, people created their first information-bearing objects that have survived to this day in the form of cuneiform pots.

Thanks to its excellent building physical and natural properties, it has been and still is one of the most popular building materials: its unique synthesis provides optimal protection against moisture and frost, while being diffusible and fireproof, UV-resistant and extremely durable. All of these are extras so that tile, as a popular building material, still retains its place today, precisely in terms of durability and is therefore so indispensable for swissporTON.

It is millions of years old and still relevant today

The unique raw material has always proved its worth since time immemorial. Using state-of-the-art technologies, swissporTON 's clay specialists have been working for decades to shape clay into a special brand product that plays a key role throughout Europe.

III. The interlocking tile:

1. Color and coating:

„Natural" original surface:

Natural ceramic roof tiles do not have any coating, their color is determined by the clay used for production and the production technology. Each roof tile can be considered unique and with this variety it impresses the viewer that with slight fluctuations it first boasts a natural hue and then forms the desired natural "tarnish". It is made from living, moisture-regulating, natural clay, without the addition of chemical additives, in the spirit of swissporTON 's ecological responsibility. In the case of natural tiles, it should be taken into account that there may be a difference in the color of tiles made of clay mined in the same mine but at a different place or time.

Engobe:

The main components of the clay are the silicate minerals and metal oxides. The engobe is a natural coloring material called clay sludge, which containing clay minerals and the main components are the same minerals and oxides like clay tiles have, so the two materials have the same properties. This procedure has been used by potters for thousands of years to make their pots more beautiful, colorful, finer looking, and last but not least, more durable. The surface treatment and engobing of the tiles is carried out in a similar way today, although we have already called on the help of science to determine exactly what engobic composition we need to achieve the desired effect. Therefore, it is possible that, after leaving the drying oven, the shaped and dried raw clay tiles may receive the engob, which is absorbed into the material through the surface poles of the tile. With the firing process, the engob

becomes chemically one with the tile, this relationship can be perfect and inseparable if the two materials are not unknown to each other, so they have the same chemical composition with the same properties. Thus, in this case, this means that the engob is not a coating that does form a separate layer of paint on the surface of the tile, but it is part of the ceramic tile. This creates a highly resistant surface.

The engobing creates the opportunity to enrich the various tiles in a very special way and at the same time do something for surface durability and lasting color retention. Natural earth paint from clay deposits specially selected for this purpose is applied to the unburned tiles and fused with it at a temperature above 1000ºC using a non-contact firing process. This demanding process gives swissporTON ceramic tiles a particularly aesthetic appearance and a wide range of colors.

2. Manufacturing Technology

Raw material mining

The first and most important step in tile production is to provide the right raw material. Based on preliminary raw material research, swissporTON found this near the town of Lenti in the western half of the country.

The raw material is extracted by opencast mining, during which the top soil layer (up to a depth of about 25 - 40 cm) is removed, followed by a barren layer unsuitable for product production (up to a further depth of about 40 - 120 cm). Both layer will be deposited separately in the area of the mining plot. After the removal of the top layers, the extraction of the utility material (clay suitable for tile production) can start. The pre-depot is built by mixing different amounts of materials from different parts of the mine. Upon completion of the mining process, recultivation is carried out using the previously extracted soil layers, and the mine is returned to the nature.

Extraction, depot built-up

As a first step, a pre-depot will be built on the mine site. The desired goal, to produce the best possible (homogenized) clay mixture, can be achieved by taking into account the preliminary test data of each layer. In the second phase of the extraction, a service depot (Halde) is built from the pre-depot material next to the preparation plant (thus the feedstock is further mixed and homogenized). These processes are repeated according to the raw material requirements of the manufacturing plants

Clay preparation

The depot described above will be dismantled by a front loader by dismantling in a vertical plane. The raw material thus obtained is stored in the box feeder of the preparation plant. From here it is passed on a conveyor belt to a pan mill, in which it is further mixed, and the appropriate plasticity is set by the controlled addition of water. In the next operation, the raw material is ground between 2 rows of rollers. For the first time, crushing of larger particles is ensured with cylinder distances of 1.2 and then 0.8 mm. The clay thus processed is conveyed by means of a conveyor belt to a round store where it is stored for approximately 2 weeks. In this way, the clay can be properly rested and homogenized before use. In addition to frequent sampling, the raw material used is subjected to laboratory tests, where it is examined for its color, shrinkage, water uptake and sedimentation. The latter operation is intended to determine the particle size distribution of the clay. With the help of a bucket-row excavator, we can extract the amount of raw material needed for production from the round storage. It is transported and distributed between the two factories on underground belts.

Forming the tile

Properly prepared and then rested raw material enters the plant from the cellar using a vertical strip. The raw material is transferred to a roller crusher, from which it is transferred to a double-shaft mixer by a collecting plate. Here we compact first with mixing paddles and then with an auger axle to achieve the most compressed material possible. From this it is then shredded into a vacuum chamber with a slicing knife. Vacuuming the chamber is necessary, because any air bubbles that may remain inside of the clay has to be removed from the it with absolute certainty. From here, the auger transports the raw material to the opening. The continuous clay is extruded and cutted to a suitable length with a thin steel wire. This cutted, homogeneous preform will form the basis of the pressed tiles, which are compressed between gypsum molds to obtain the final raw tile format.

Gypsum mold making

Unlike the shaping of the plain tiles, more complex shapes can be achieved with pressing technology. For this process, we need the negative of the tile, an important feature of which is its ability to absorb and drain the water displaced during pressing. It is a perfectly suitable form made of gypsum mixture that adapts to the quality factors of the clay.

The manufacturing process of the tiles

The preforms are transported to the “Rieter DR6” revolver press on conveyor belts and then automatically applied to the lower mold. Due to the design of the machine, it can form 4 tiles next to each other at the same time. The unit has 4 upper molds in operation, and 6x4 lower molds on a rotating 6-sided drum. The pressed tiles are picked up from the bottom with vacuum suction heads and placed on the drying trays. The trays are stacked on top of each other and then placed on drying cart.

Drying

Moving on rails, the cars enter a counter-current (the direction of air movement is opposite to the direction of product movement) tunnel dryer, where the tiles begin to dry. In the first step, they are placed in a medium with a relative humidity of 40°C, close to 100%, so that the drying starts gently. By continuously increasing the temperature and decreasing the humidity, we reach 90°C and 0% relative humidity in 1 day. At that time, there is an additional 2-3% moisture in the tile, which will only be lost during the firing process. There are 66,000 products in the dryer at the same time.

Engobing process

The final color of the tile is determined by the so-called engobe applied after drying. Its composition is made up of metal oxides varying in color and other natural materials. The aqueous mixture of these is applied evenly to the surface of the tile with the help of different spray equipment. The most important physical parameter of engobe paint is its coefficient of thermal expansion, which must be the same as that of its tile. The existence of this is constantly checked during production. In this way, we can guarantee that the engob and the tile will not live "separate lives" even after years.

Firing

After engobing, the tiles are placed in so-called “H-Cassettes” of their type, with millimeter-accurate Fanuc robots. The individual types of tiles (base, verge, ridge etc.) are supported in this case at several points, thus guaranteeing a perfect, deformation-free finished product. The accuracy of the combustion curve is guaranteed by PLC-controlled, automatic combustion zones. This guarantees that high-quality ceramic roof tiles can leave our factory any day of the year.

Finished goods classification and packaging

After firing in the tunnel kiln, each finished product is visually inspected and acoustically tested with the help of a hammer. The latter is needed to filter out hairline cracks that are not visible to the naked eye. After that, small bundles are formed from the product, then they are arranged on EUR pallets, strapped to each other and to the pallet. The resulting unit stack is stored in the warehouse area with six forklifts capable of moving three pallets at a time, from where it is transported to the customer by trucks.

IV. The roof:

The roof not only determines the aesthetic of our house, but also has many other functions, it has to perform many different tasks. It should provide the fullest possible protection against the various weather effects. It is exposed to high loads due to constantly changing weather conditions. A good roof should therefore be frost, storm, and rain resistant. The swissporTON 's roof system offers a timeless and aesthetic solution for every need.

1. Layers of the general roof structure:

- Rafter
- Underlayment
- Counter-batten
- Roof batten
- Interlocking tiles

2. Rafter:

The roofing plane and the slope of the roof structure is determined by the rafters. In addition to their own weight, the rafters and the supporting elements carry the weight of the roof and other elements of the roof, as well as the wind and snow load. The cross-section and distribution of the rafters in the roof structure must be designed for these loads.

3. Underlayment:

When higher than normal requirements are expected, additional protection must be provided during design and construction. The underlayment will be installed under the roof covering as an additional measure to increase the watertightness of the roof structure.

Functions of the underlayment:

- Protects against powder snow
- Protects against rainfall even with higher wind pressure
- Lead out the condensation water
- Helps to remove vapors from the thermal insulation
- Lead out the moisture from the melting of the accumulated snow
- Temporarily takes over the role of the tiles when the cover is damaged, until the roofing is repaired.

Underlayment groups and their characteristics:

Main group	Variations	Overlaps	Materials	Position	Support
1./ underlay insulation	**waterproof underlayment**	welded or glued joints and overlaps	bituminous or plastic sheets	above the counter-batten	complete formwork (decking or walkable thermal insulation)
	watertight underlayment			under the counter-batten	
2./ supported underlays	**windproof underlayment**	welded or glued joints and overlaps or sealed groove	insulating sheets, membranes or plates		
	free overlapping underlayment	without glued or sealed joints, boards with groove splicing or with overlaps			
3./ unsupported underlayment	**free laid underlayment**	without glued or sealed joints, boards with groove splicing or with overlaps	membranes, sheets		none

Standpoints for selecting the underlayment:

- The **standard roof pitch** of the roof tile model used
- **Designed pitch of the roof** (if there are several different pitch in one roof surface, then the lowest one must always be taken into account and the corresponding underlayment applied on the complete roof plane)
- When there is a **living space in the attic**, it is always necessary to install an underlayment.
- **Roof shape, complexity of roof structure**: Rafter length longer than average (more than 10 m), complex roof profile, snow-trap roof sections, etc.
- **Special weather conditions**: In areas with above-average rainfall, snow, and wind conditions, as well as in areas above 600 m above sea level, the cover is subject to increased requirement.
- **Other conditions**: Local building regulations, historical protection, or a higher level of requirements due to the special usage of the interiors

Several aspects need to be considered when determining the appropriate underlay for a given roof structure. These aspects called as "stress factors" during selection. All stress factors must be taken into account! For each type of tile, the underlayment specified in the table are the lightest additional measures required, for which a higher rated underlay can always be selected.

Choosing the underlayment for interlocking tiles:

The planned roof pitch "α"	-	One additional requirement	Two additional requirement	Tree additional requirement
$\alpha \geq \alpha_k$		**free laid underlayment**	**free laid underlayment**	**free laid underlayment**
$\alpha < \alpha_k$ $\alpha \geq \alpha_k - 6°$	**free laid underlayment**	**free laid underlayment**	**free overlapping underlayment**	**windproof underlayment**
$\alpha < \alpha_k - 6°$ $\alpha \geq \alpha_k - 10°$	**watertight underlayment**	**watertight underlayment**	**watertight underlayment**	**watertight underlayment**
$\alpha < \alpha_k - 10°$	**watertight underlayment**	**waterproof underlayment**	**waterproof underlayment**	**waterproof underlayment**
$\alpha < 10°$	**Interlocking roof tile cover can't be made!**			

α_k (standard roof pitch): is the angle where the specific roof tile model met the watertightness requirement without any additional measure.

When using the table, the following must be taken into account:

Among the criteria determining the selection, the standard roof pitch of the tile model and the utilization of the attic space are of the greatest importance. The other factors are given equal weight but somewhat lighter weight, so this is shown in the selection table not item by item but as the number of requirement factors.

Grouping the swissporTON roof tiles by roof pitch:

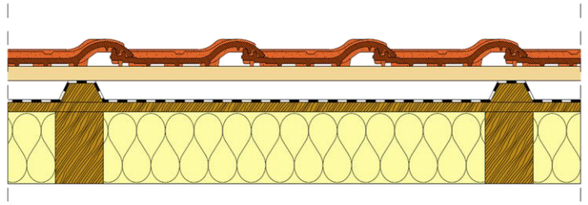
Model	DIN*	swissporTON **	Free laid underlayment	Windproof underlayment	Watertight underlayment	Waterproof underlayment
			"ECO"	"BASIC"	"PRO"	"ULTRA"
"MAGNUM"	22°		≥ 16°	≥ 14°	≥ 12°	≥ 10°
"BALANCE"	22°		≥ 16°	≥ 14°	≥ 12°	≥ 10°
"TITANIA"	22°		≥ 16°	≥ 14°	≥ 12°	≥ 10°
"FUTURA"	22°	18°	≥ 14°	≥ 12°	≥ 10°	≥ 7°
"PREMION"	22°	18°	≥ 14°	≥ 12°	≥ 10°	≥ 7°
"MZ3"	22°		≥ 16°	≥ 14°	≥ 12°	≥ 10°
"HARMONIE"	22°		≥ 16°	≥ 14°	≥ 12°	≥ 10°
"GENEVO"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"NOMINA"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"CANTUS"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"OPTIMA"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"SIMPLA"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"DOMINO"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"MIKADO"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"RAPIDO"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"RATIO"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"RUSTICO"	25°		≥ 18°	≥ 16°	≥ 14°	≥ 10°
"SINFONIE"	22°	18°	≥ 14°	≥ 12°	≥ 10°	≥ 7°
"MELODIE"	22°		≥ 16°	≥ 14°	≥ 12°	≥ 10°
Plain tiles	30°	30°	≥ 24°	≥ 22°	≥ 18°	≥ 10°
"PROFIL"	35°	30°	≥ 24°	≥ 22°	≥ 18°	≥ 10°
"RÓNA" segment cut	35°	30°	≥ 24°	≥ 22°	≥ 18°	≥ 10°
"RÓNA" straight cut	35°	30°	≥ 24°	≥ 22°	≥ 18°	≥ 10°
"KERKA" segment cut	35°	30°	≥ 24°	≥ 22°	≥ 18°	≥ 10°
"KERKA" straight cut	35°	30°	≥ 24°	≥ 22°	≥ 18°	≥ 10°

DIN: Standard roof pitch defined by DIN (the lowest roof pitch where the roof tile cover considered rainproof on its own)*

swissporTON**: *Standard roof pitch defined by the experience of swissporTON (the lowest roof pitch where the roof tile cover considered rainproof on its own)*

3.1. Supported underlays

3.1.1. Waterproof underlayment:

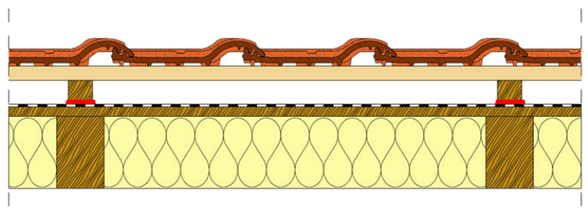


The waterproof underlayment is supported with a rigid formwork. The underlay covers the counter-battens, so the holes caused their nail fastenings are elevated from the level of the possible waterflow. Waterproof underlayment can only be made with qualified bituminous, plastic or synthetic rubber insulation plates. Overlaps and all breakthroughs on the roof shall be designed to be waterproof as well. An air layer below (double-ventilated roof) can only be made with roofs where there are no ridge ventilations, valleys and hips and also with roof structure where the breakthroughs are not exceeding the width of the rafter distances.

swissporTON "ULTRA, waterproof underlayment

Property	Test method	Datas			
Length	**EN 1848-2**	25 m			
Width	**EN 1848-2**	1,5 m			
Weight	**EN 1849-2**	360 g/m^2			
Fire resistance	**EN 13501-1**	E-d2			
Surface area		37,5 m^2			
Vapor permeability (sd)	**EN ISO 12572**	0,2 m			
Tensile strength	**EN 12311-1**	longitudinal:	420 N / 50 mm	cross direction:	490 N / 50 mm
Expansion	**EN 12311-1**	longitudinal:	50%	cross direction:	65%
Tearing resistance	**EN 12310-1**	longitudinal:	310 N	cross direction:	280 N
UV resistance		16 week			
Water proofness	**EN 1928**	W1			
Cold bending	**EN 1109**	-30 °C			

3.1.2. Watertight (rainproof) underlayment:

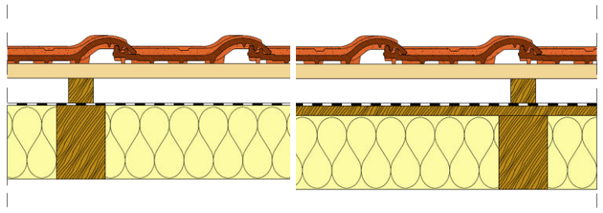


The watertight underlayment is supported with a rigid formwork., laid under the counter-battens and perforated by the fastenings of the counter-battens. These perforations has to be sealed under the counter battens. Watertight underlayment may only be made with certified bituminous, plastic or synthetic rubber insulation plates, or with a sheet or foil specially developed for this purpose and certified for this grade. Overlaps and all breakthroughs on the roof must be watertight.

swissporTON "PRO", watertight underlayment

Property	Test method	Datas			
Length	**EN 1848-2**	50 m			
Width	**EN 1848-2**	1,5 m			
Weight	**EN 1849-2**	210 g/m^2			
Fire resistance	**EN 13501-1**	E-d2			
Surface area		75,0 m^2			
Vapor permeability (sd)	**EN ISO 12572**	0,03 m			
Tensile strength	**EN 12311-1**	longitudinal:	490 N / 50 mm	cross direction:	460 N / 50 mm
Expansion	**EN 12311-1**	longitudinal:	45%	cross direction:	70%
Tearing resistance	**EN 12310-1**	longitudinal:	500 N	cross direction:	450 N
UV resistance		16 week			
Water proofness	**EN 1928**	W1			
Cold bending	**EN 1109**	-40 °C			

3.1.3. Windproof underlayment



The windproof underlayment is supported with a rigid formwork (eg. decking or walkable thermal insulation) and all of the joints and connections are welded, sealed or glued. The underlayment is laid under the counter-battens and perforated by the fastening of the counter-battens. It can be made with certified insulation plates, or with a sheet or foil developed for this purpose and certified for this grade. The overlaps and every breakthrough on the roof must be designed to be watertight!

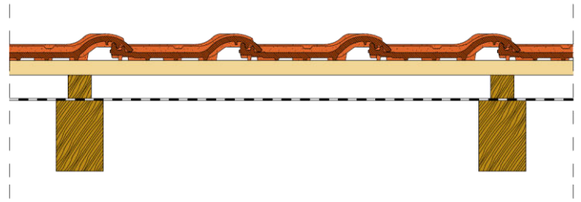
3.1.4. Free overlapping underlayment:

Overlapping sheets, foils, and / or grooved boards which are laid on a full surface, rigid formwork. The underlayment laid below the counter-battens, and perforated by the fastening of the counter-batttens.

swissporTON „BASIC", windproof underlayment**:**

Property	Test method	Datas			
Length	**EN 1848-2**	50 m			
Width	**EN 1848-2**	1,5 m			
Weight	**EN 1849-2**	150 g/m^2			
Fire resistance	**EN 13501-1**	E-d2			
Surface area		75,0 m^2			
Vapor permeability (sd)	**EN ISO 12572**	0,02 m			
Tensile strength	**EN 12311-1**	longitudinal:	310 N / 50 mm	cross direction:	240 N / 50 mm
Expansion	**EN 12311-1**	longitudinal:	70%	cross direction:	80%
Tearing resistance	**EN 12310-1**	longitudinal:	180 N	cross direction:	210 N
UV resistance		12 week			
Water proofness	**EN 1928**	W1			
Cold bending	**EN 1109**	-20 °C			

3.2. Free laid underlayment:



Made without any support, laid above the rafter with loose overlaps or made with unsealed grooved boards. The underlayment laid below the counter-battens, and perforated by the fastening of the counter-batttens. In the case of a thermally insulated structure, a free laid underlayment can only be made as a double-ventilated roof. The required thickness of the air layer formed above the thermal insulation must be ensured regardless of the degree of overhang! Free-laid underlayment must not be used below a roof pitch of 20°!

swissporTON „ECO", free laid underlayment:

Property	Test method	Datas			
Length	**EN 1848-2**	50 m			
Width	**EN 1848-2**	1,5 m			
Weight	**EN 1849-2**	120 g/m^2			
Fire resistance	**EN 13501-1**	E-d2			
Surface area		75,0 m^2			
Vapor permeability (sd)	**EN ISO 12572**	0,02 m			
Tensile strength	**EN 12311-1**	longitudinal:	260 N / 50 mm	cross direction:	180 N / 50 mm
Expansion	**EN 12311-1**	longitudinal:	50%	cross direction:	80%
Tearing resistance	**EN 12310-1**	longitudinal:	120 N	cross direction:	140 N
UV resistance		12 week			
Water proofness	**EN 1928**	W1			
Cold bending	**EN 1109**	-20 °C			

Underlay accessories:

"SKL" adhesive
For foil seams and for other connections
- cc. 19 lm adhesion

"NKS" seam adhesive tape
To seal longitudinal and transverse seams.
- 50 mm width
- 25 m / roll

"NDS" nail sealing tape
To seal nail holes below the counter battens.
- Butyl raw material
- 50 mm width
- 10 m / roll

"NDB" nail sealing tape
To seal nail holes below the counter battens.
- PE raw material
- 60 mm width
- 30 m / roll

"NDM" nail sealing mastic
To seal nail holes below the counter battens.
- 1 000 ml / tube
- cc. 50 lm counter-battens

"UAB" connection tape
For sealing connections (e.g. wall edges).
- 25 cm width
- 5 m / roll

"QSM" welding liquid & bottle
For welding the longitudinal and transverse joints of ULTRA
- 1 000 ml / canister
- 1 liter per cc. 200 m^2 roof surface

Hot air gun
For welding the longitudinal and transverse joints of ULTRA.

"KKS" counter-batten tape
To cover the counter batten for welded waterproof underlays
- 30 cm width
- 20 m / roll

"ULTRA" external corner
For waterproof wall corner joint.

Accessory	„ECO"	„BASIC"	„PRO"	„ULTRA"
"SKL" adhesive	✓	✓	✓	✓
"NKS" seam adhesive tape	✓	✓	✘	✘
"NDS" nail sealing tape	✓	✓	✓	✓
"NDB" nail sealing tape	✓	✓	✓	✘
"NDM" nail sealing mastic	✓	✓	✓	✘
"UAB" connection tape	✓	✓	✓	✘
"QSM" welding liquid & bottle	✘	✘	✘	✓
Hot air gun	✘	✘	✘	✓
"KKS" counter-batten tape	✘	✘	✘	✓
"ULTRA" external corner	✘	✘	✘	✓

4. Counter-batten:

The counter-battens must have a nominal thickness of at least 30 mm. Depending on the roof pitch, the length of the rafters and the location of the building, the size (height) of the counter-batten may should be increased. The tile covers belong to the group of the watertight coverings, so small amounts of moisture are allowed to enter below them. However, this moisture must be able to escape from the attic or the roof structure, so ventilation must be provided in all such cases!

Role of the air-gap:

One of the functions of the air-gap is to vent-out the moisture that has entered through the gaps in the roofing and the moisture that condenses on the bottom surface of the roof tiles, but this air layer also allows the moisture that drips from the tiles to escape from the roof. Another function of the air layer is to cool the back of the tile covering. Reducing the surface temperature of the roofing significantly relieves the thermal insulation and reduces its summer heat load. In the case of a single ventilated roof, the function of both air layers is performed by the outer air layer. In order to safely drain the steam built into the layers of the structure and escaping from the interior, the underlayment must have a vapor permeability (Sd < 0.3 m). In winter conditions, the cold air flowing in the air layer delays the melting of the snow, thus reducing the formation of ice rinks and the possibility of the gutter freezing. The counter-batten must comply at least with the requirement of the S 10 class according to the DIN 4074-1 (Strength grading of wood - Part 1: Coniferous sawn timber) standard.

Recommended counter-batten heights:

Rafter length	Roof pitch:				
	10° - 15°	15° - 20°	20° - 25°	25° - 30°	30° felett
up to 10 m	7,5 cm	5 cm	5 cm	5 cm	5 cm
10-15 m	10 cm	7,5 cm	5 cm	5 cm	5 cm
15-20 m	10 cm	10 cm	7,5 cm	5 cm	5 cm

Based on the Hungarian experience, in all cases the min. 5 cm counter-batten height is recommended!

In order to allocate the roof battens, we need to know the actual covering length. The length increase caused by the counter batten can be determined using the table below:

Height of the counter-batten	The increment of the counter-batten length (mm) if the roof pitch is:									
	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
30 mm	8,0	10,9	14,0	17,3	21,0	25,2	30,0	35,8	42,9	52,0
50 mm	13,4	18,2	23,3	28,9	35,0	41,9	50,0	59,6	71,4	86,7
65 mm	17,4	23,7	30,3	37,5	45,5	54,5	65,0	77,5	92,9	112,7
100 mm	26,8	36,4	46,6	57,7	70,0	83,9	100,0	119,2	142,9	173,3

5. Roof batten:

The supporting structure of the roof tile is the batten. The design and the quality of the roof battens greatly influence the plane of the roof and, consequently, the appearance of the roof covering, so it is especially important to pay attention to the flatness of all of the roof surfaces.

The roof battens must be fastened to the counter batten! Their distance from each other depends on the selected roofing material and the type of covering.

The recommended cross-sectional dimensions of the batten, depending on the rafter distance (distance between the counter-battens), can be found in the attached table. The cross section of the roof battens must comply with the static requirements! Increased load due to self-weight, wind and snow, and local roofing habits may require larger batten dimensions.

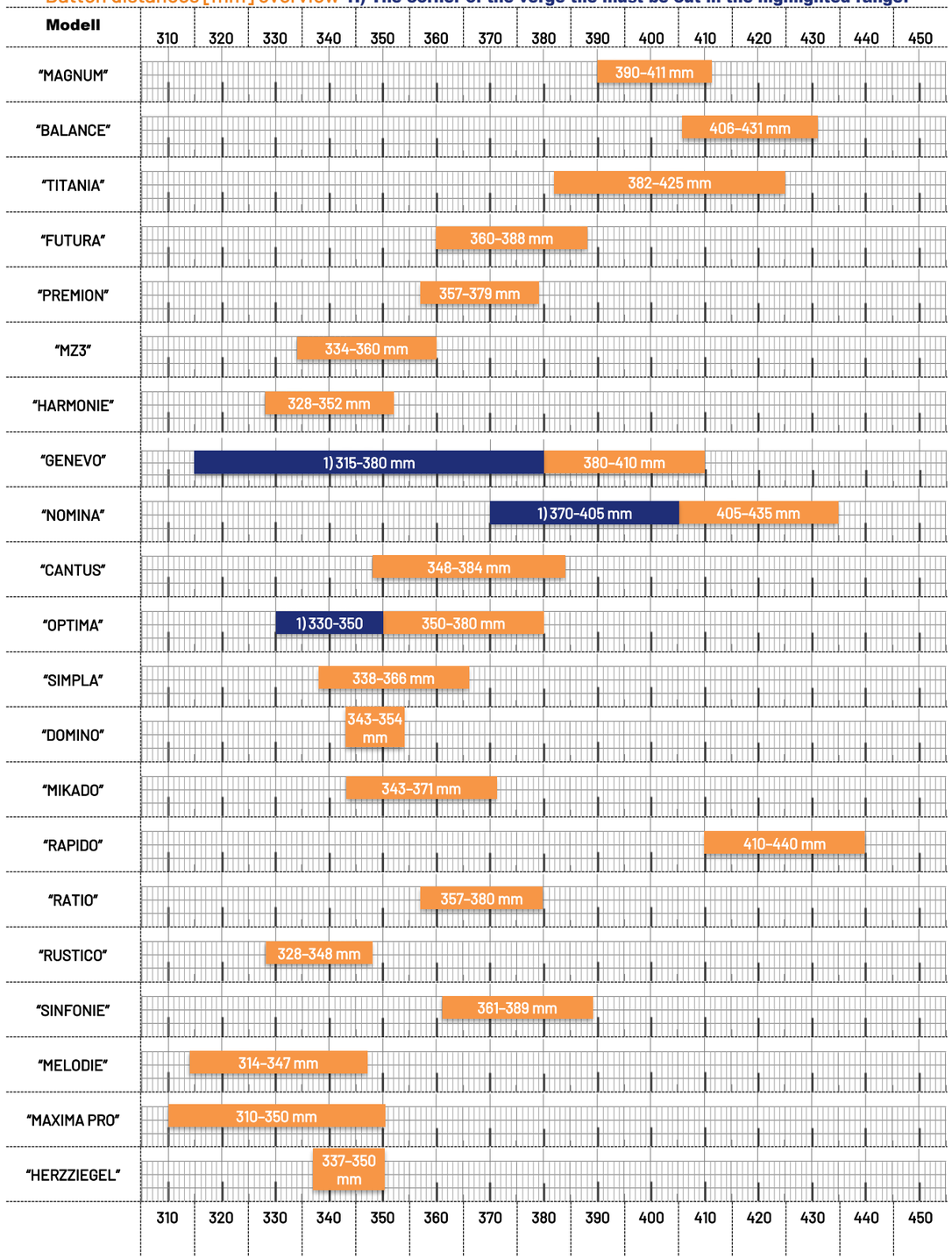
The counter-batten must comply at least with the requirement of the S 10 class according to the DIN 4074-1 (Strength grading of wood - Part 1: Coniferous sawn timber) standard.

Recommended sizes of roof battens:

Rafter distance*	Batten dimensions
up to 70 cm	30 x 50 mm
70 – 80 cm	30 x 50 mm
80 – 90 cm	30 x 50 mm
90 - 100 cm	40 x 60 mm

** Distance between adjacent rafters (not the axis distance). The location of the counter-battens must also be taken into account!*

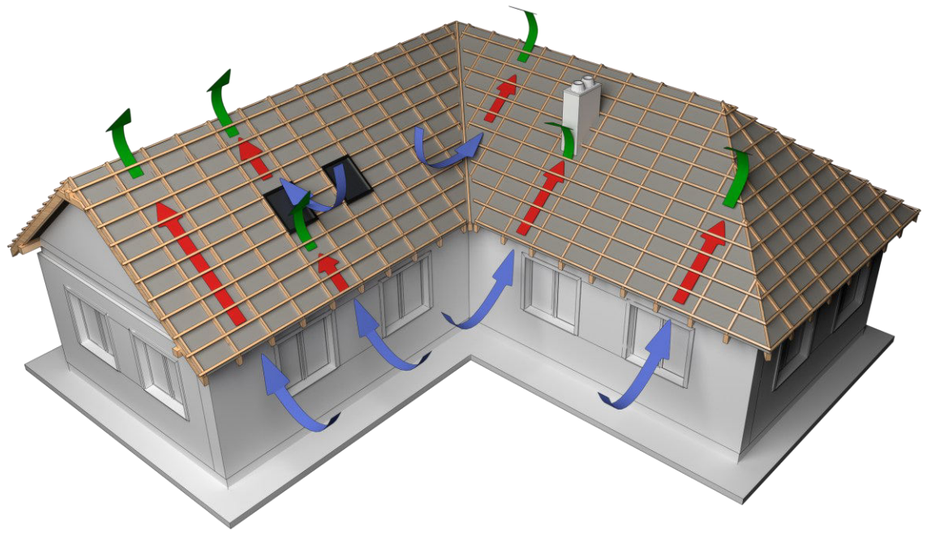
Batten distances [mm] overview **1.) The corner of the verge tile must be cut in the highlighted range!**



V. Ventillation:

1. Main principles:

The air layer under the tile covering must be ventilated according to the building's physical aspects! Ventilation occurs when an upward flow begins in an air layer or air space of appropriate cross-section (due to a difference in temperature or pressure). In a ventilated roof structure, the air movement depends on the roof pitch, the cross section of the air layer, the size and design of the air space, the free air permeability of the ventilation and ventilation openings and their placement on the roof. The greater the roof pitch and, consequently, the height difference between the in-ventilation and out-ventilation openings, the greater the driving force and thus the flow rate and the amount of air flushing the air layer / air space.



2. The size of the in and out-ventilation air gap:

There are no national regulations for the appropriate cross-section of the above-mentioned air layer and the size of the in-ventilation and out-ventilation openings, therefore we use the requirements of the proven DIN 4108-3 standard. According to the requirements of the standard, for roofs with a pitch angle of more than 10 °, the detailed vapor diffusion calculation can be dispensed with if the following minimum requirements are met:

- The free ventilation cross-section at the eaves must be at least 0.2% of the ventilated roof area, but at least 200 cm^2 / eaves meter!
- The minimum free ventilation cross-section to be formed on the general parts of the roof must be at least 200 cm^2 / meter!
- The free cross-section of the ventilation openings along the ridges and the hips must be at least 0.05% of the associated roof area!

- The following chart shows the necessary combined vapor diffusion equivalent air layer thickness (sd) of the building layers below the ventilation cross-section, depending on the length of the rafter:

Rafter length*	Required vapor diffusion equivalent air layer thickness (Sd)
0-10 m	≥ 2 m
10 – 15 m	≥ 5 m
>15 m	≥ 10 m

Along the eaves and ridges, the narrowing effect of the installed ventilation meshes, ventilation strips and other profiles has to be considered. The size of the required ventilation openings must be increased accordingly!

In the case of warm, humid spaces, individual sizing is required!

The vapor diffusion calculation can be performed according to DIN 4108-5.

The calculation is not necessary, if the following conditions are met:

In the case of ventilated and insulated roofs, if

- the above minimum ventilation cross-sections are provided,
- thickness of the diffusion-equivalent air layer of the structure under the ventilation air gap: Sdi> 2m

In the case of thermal-insulated roofs without ventilation, if ventilation of the roof covering is ensured (eg small roofing elements)

- Sde ≤ 0,1 m and Sdi ≥ 10 m, or
- Sde ≤ 0,3 m and Sdi ≥ 20 m, or
- Sde ≥ 0,3 m and Sdi ≥ 6*Sde

In the case of thermal-insulated roofs without ventilation, if ventilation of the roof covering is not ensured (eg large roofing elements)

- Sdi ≥ 100,0 m

swissporTON ventilation system elements

Ventilation element	Ventilation cross-section	Application field
Aluminium ventilation mesh	540 cm²/lm for 10 cm width	eave, shed roof ridge
Ventilation batten with comb	200 cm²/m	eave
Aluminium eave comb	Depends on the height of the tile profile	eave, valley
Ventilation tile	See in the charts later	ridge, hip, valley, eave
Ridge connection ventilation tile	230 cm²/lm 115 cm²/lm per ridge side	ridge
Aluminium ridge and hip roll	150 cm²/lm for 300 mm width	ridge, hip
Ridge and hip roll, PP	165 cm²/lm for 310 mm widthl	ridge, hip

In the event of the combined appearance of several weather factors (eg strong winds and long rain), the entry of powder snow and rainfall into the roof structure, cannot be avoided.

VI. Snow guard:

1. Concept, purpose, and task of snow guards:

The purpose of using snow guards is to prevent the snow mass from slipping on the roof surface and falling off the roof surface. According to § 60 (2) of the OTÉK in Hungary, all roofs between 25° and 75° must be covered with snow if the eave edge bordered with the area of traffic. Based on experience, it may also be necessary to create a snow guard at a roof pitch less than 25°, and the purpose of the snow guard is not only to avoid personal injury, but also to protect the connecting building structures. For this purpose, linear and / or point-like snow stopper which built into the roof surface can be used.

The two systems (linear and surface) can be used together for greater efficiency. When designing and constructing complex roof forms, the formation of snow traps between the roof profiles must be avoided, and care must be taken to prevent the formation of snow barriers between some roof profiles.

2. Surface snow guard

The point-like snow stop noses should be evenly distributed over the entire surface to prevent the snow on the roof from slipping. The base value of the snow load (which can be used to determine the required quantity of the snow stop noses) can be calculated by the *"EN 1991-1-3 Actions on structures, Part 1-3: General actions, Snow loads"* standard. During the calculation, the National Annex of the specific country has to be taken into account.

$$s_d = \gamma_s * \mu * C_e * C_t * s_k$$

- *"γ_s"*: safety coeffficient (equals to 1,5)
- *"μ"*: snow load shape coefficient, the value is at least 0,8 but for complex roofs it is equal to 1,6
- *"C_e"*: Exposure coefficient (equal to 1)
- *"C_t"*: Thermal coefficient (for safety, equal to 1)
- *"s_k"*: Characteristic value of snow on the ground at the relevant site (can be found in the National Anex)

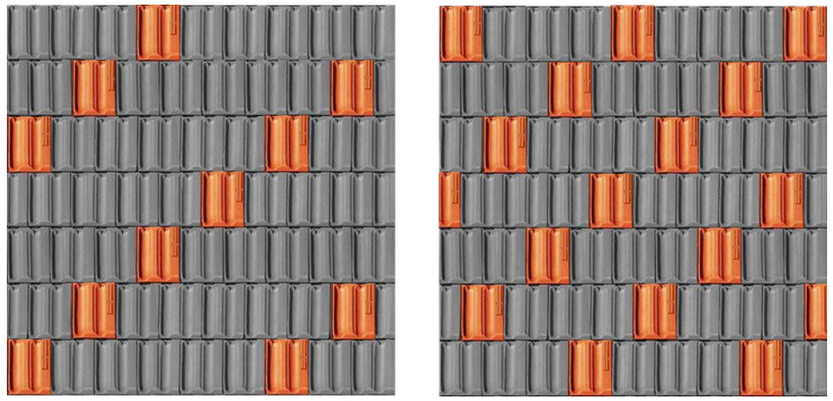
The amount of snow noses can be determined from the following tables.

Base value of the snow load (kN/m²)

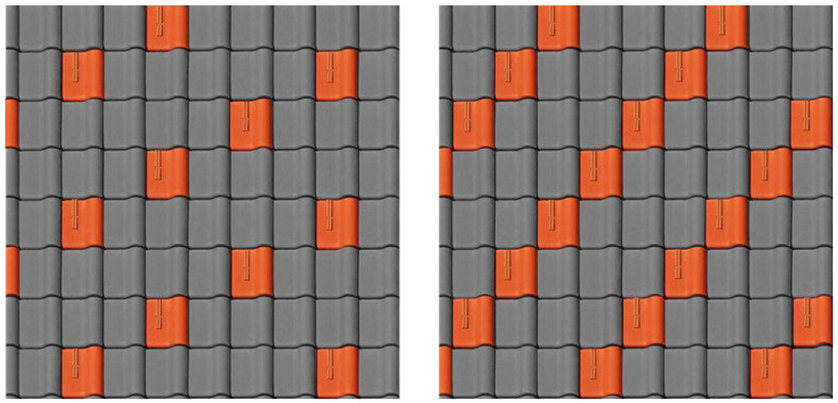
α*	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	12,00
20°	3,0	3,0	3,0	3,0	3,0	3,1	3,4	4,0	4,2	4,6	5,6
25°	3,0	3,0	3,0	3,0	3,2	3,3	3,8	4,2	4,8	5,3	6,3
30°	3,0	3,0	3,0	3,0	3,4	3,9	4,6	5,1	5,6	5,9	6,6
35°	3,0	3,0	3,1	3,1	3,5	4,	4,7	5,3	5,6	6,3	7,5
40°	3,1	3,1	3,2	3,2	3,6	4,1	5,1	5,4	6,0	6,4	8,2
45°	3,2	3,2	3,3	3,4	3,8	4,4	5,3	5,9	6,3	6,6	8,4
50°	4,0	4,0	4,4	4,8	5,2	5,7	6,3	6,8	7,1	7,4	8,6
55°	4,1	4,1	4,5	5,0	5,3	5,8	6,5	7,0	7,2	7,6	8,7
60°	4,6	4,6	5,1	5,3	5,7	6,2	6,5	7,2	7,7	8,2	8,9

α: roof pitch*

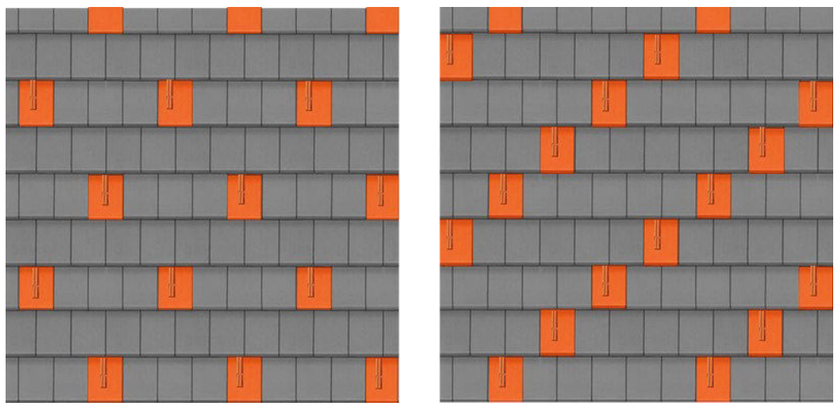
Placement of the snow stop noses for different tile models in quantities of 3,0 pcs/m² and 4,0 pcs/m²



swissporTON Rapido, with 8,5 pcs/m² covering capacity



swissporTON Balance, with 8,7 pcs/m² covering capacity

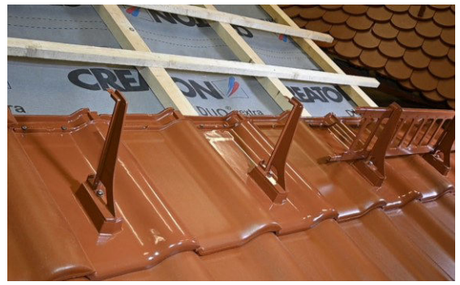


CREATON Domino, with 12,7 pcs/m² covering capacity

3. Linear snow guard

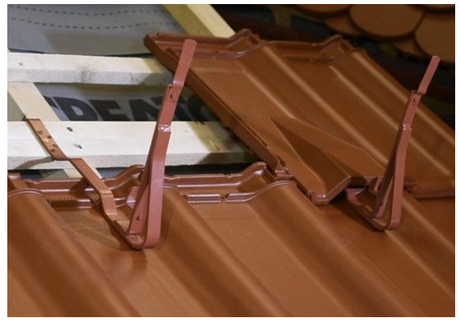
The purpose of using linear snow guard is to prevent the snow mass from slipping on the roof surface and to tear off the gutter. In the swissporTON product range, there are two kind of linear snow guard system:

Aluminium snow guard system



- Available in snow guard grid, tube and log support variants
- The supports are installed into the aluminium base tiles
- The distance between the supports can't exceed 80 cm
- There is no need for additional support below the aluminium base tiles

Universal snow guard grid



- Only in snow guard grid vartiant
- The supports are covered with ventilation tiles
- The distance between the supports can't exceed 90 cm
- Additional support battens required for the grid supporting brackets

The most suitable place for the linear snow guard is the 2nd row of tiles from the eave in case of single covering and the 3rd row in case of double covering.

For rafter lengths higher than 10 m, they must be placed in at least two rows.

In the case of a large eave overhang, it must be pulled close to the plane of the wall to reduce the torque acting on the rafters.

VII. Walking on the roof:

The safety regulations must be compliance during the construction and maintenance of the roof which is covered with swissporTON tiles. It is not permitted to enter tile covered roofs without the necessary measures (eg. roof ladders or walkways). If a roof part requires maintenance (eg solar or ventilation equipment), it is essential to use a walking grid that complies with the safety regulations. In the swissporTON product range, there are two groups of the walking systems:

Aluminium walking grid system

- Available in 4 sizes (single step, 46, 80 and 150 cm), of which the 150 cm length is connectable
- The walking grid supports are installed into the aluminium base tiles
- There is no need for additional support below the aluminium base tiles

Universal walking grid system

- Available in 5 sizes (40, 60, 80, 100 and 250 cm), all of them are connectable
- The supports are covered with ventilation tiles
- •Additional support battens required for the grid supporting brackets

Walking grids, ladders and other accessories of the swissporTON system shall not be considered as an anchoring point for safety harnesses.

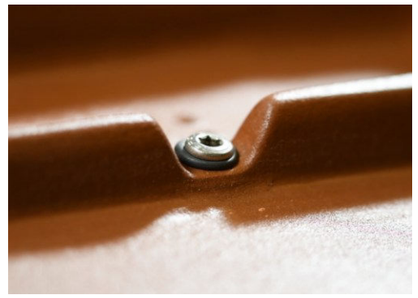
For this purpose, only the specificly designed safety hook should be used. The hook has to be installed into the steel beam which can be found in the package.

The distance between the safety hook can't exceed:

- 4 meter in the direction of the roof pitch
- 1,4 meter sidewise

VIII. Fixing the tiles:

1. Mechanical fastening along the edges of roof surfaces:



Irrespective of the angle of inclination of the roof, additional fastening shall be applied along the edges, eaves, valleys, hips and the ridge or shed roof ridge. In this case, the fastening is done by screwing with a self-tapping screw with a sealing ring. Traditional nailing is not recommended as it does not provide proper fastening in the long run! These screws must be used through the pre-formed nail hole (in the case of cutted tiles, a new hole must be made) using a hand drill. When the screw is in place, the sealing ring fills the gap between the hole and the screw, thus sealing the drilled tile against any moisture.

This additional fastening must be carried out for each tile along the listed edges (edge zones) as well as for the fastening of each ridge tile (eg. ridge clip)!

Along the hips and valleys, the cutted tiles can be fixed with a wire. A specially developed product for this purpose is the "Stainless steel clip with wire for cutted tiles", which can be found in the system accessories (see product data sheets) group. In this case, there is no need for a new hole in the tile (so no screw with a sealing head is needed).

2. Mechanical fastening against the falling of the tile

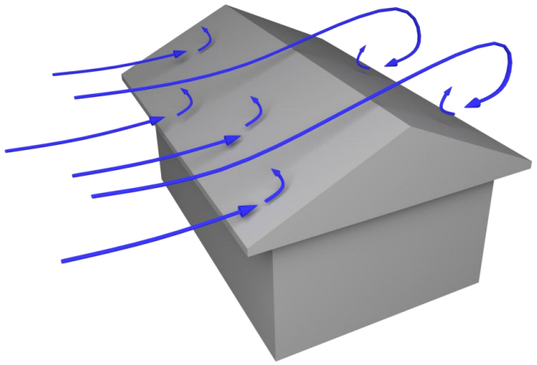
The protection against the falling tile is crucial, because any falling tiles present a significant risk to human life and our valuables (eg. parked cars). This risk should be considered to determine how many tiles will be fixed in certain cases. The main factors which should be considered are: the height of the building, the angle of the roof and the function / location of the building.

The table below is a guideline for the amount of additional fixings to be used depending on the roof pitch angle. The values in the table must be increased when the earlier mentioned reasons require it!

Roof pitch	Amount of the fastened tiles in the general roof surface
up to 45°	no need for additional fixing
45°- 60°	every third and every second tile
above 60°	every one of the tiles

3. Mechanical fastening against wind loads

An additional fastening shall be applied if the amount of wind suction due to wind load exceeds the self-weight of the tiles which act as a resisting force (or torque). The wind pressure on one side of the roof always causes wind suction on the opposite side of the roof! In addition, the effect of turbulent wind flow due to the geometric design of the roof must be taken into account.



The determination of the wind load must be determined based on the Eurocode standard (EN 1991-1-4) and calculated by a structural engineer. The standard is valid for all European Member States, and the geographical and meteorological differences (and the resulting data) for each country are included in the national annexes.

This standard provides a so-called simplified procedure, which can be used when the following conditions are met:

- • The height of the building does not exceed 200 m
- • On the windward side of the building, the average slope of the terrain is less than 3 °
- • There is no building or other object in the vicinity of the building that has at least twice its average height
- • If the air space under the tile roof is not closed, the building must not have two or more sides with a ratio of opening surfaces of more than 30%

The simplified procedure takes into account the reference pressure depending on the height above ground level and the installation category, as well as the shape factors depending on the geometric design of the roof.

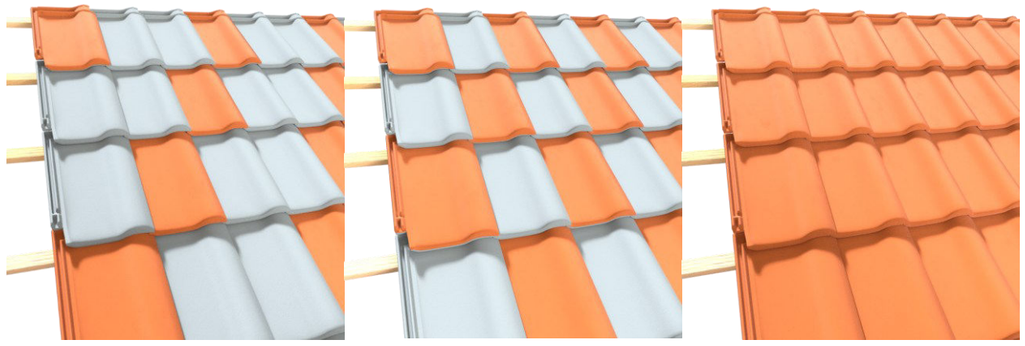
$$w_d = \gamma_w * q_p(z) * c_{pe} * c_{eq}$$

- *"γ_s"*: safety coefficient (equals to 1,5)
- *"$q_p(z)$"*: peak velocity pressure
- *"c_{pe}"*: external pressure coefficient (see later)
- *"c_{eq}"*: pressure equalizing factor (depend on the roof layers)

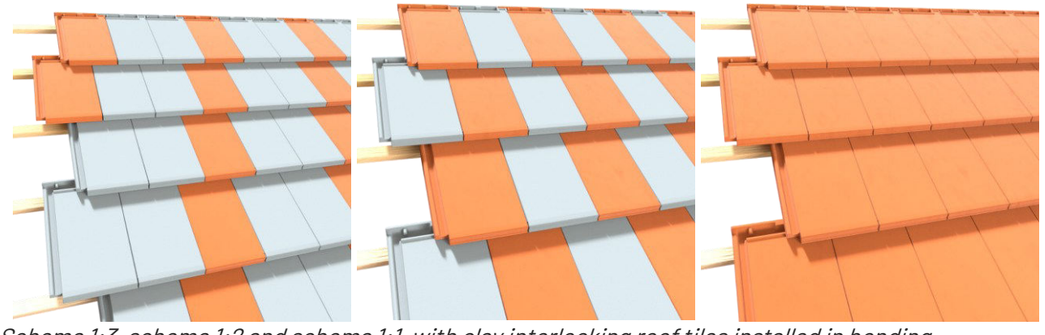
The value of the external pressure coefficient is determined by the simplified procedure for three roof forms: shed roof, gabble roof and hip roof.

In each case, the roof surfaces are divided into zones, so different values are determined for the eaves, edges, hips, ridges and the remaining roof surfaces.

Stormclips must be used on surfaces where the wind load exceeds the resisting weight load! The density of stormclips is determined from the ratio of these two effects, so it may be necessary to fix each tile (1: 1), every second tile (1: 2), or every third tile (1: 3).



Schema 1:3, schema 1:2 and schema 1:1, with clay interlocking roof tiles installed in mesh



Schema 1:3, schema 1:2 and schema 1:1, with clay interlocking roof tiles installed in bonding

Turbulent air flow is a major risk in the vicinity of roof breakthroughs (dormers, chimneys etc.). The use of stormclips around them is recommended for all tiles (in the previously determined width)!

The amount of stormclips calculated using the simplified procedure must always be checked and, if it is neccessary by the local conditions (eg prevailing wind direction or the highest wind pressure that has occurred in the past), it must be adjusted! The exact windload values must be determined by the roofer or the structural engineer!

In the design and use of stormclips, we consider that they are placed as far away from the turning axel as possible (usually in the lower half of the sidelock of the tile), so that we can increase the resisting "moment arm" (thus obtaining a higher counterbalancing torque).

We use stormclips of different sizes for different products, and you can also choose between nail-in and mount-on stormclips.

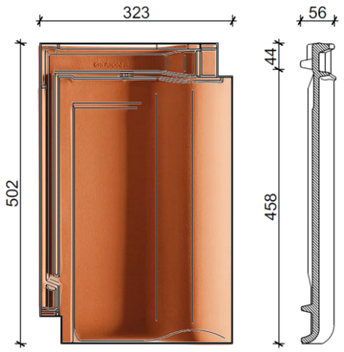
Nail-in, mount-on and the universal stormclip installation, and the grooves in the side lock where the mount-on stormclip can be hooked

More informations:: swissporTON.hu

PART II.
Technical specifications

More informations:: swissporTON.hu

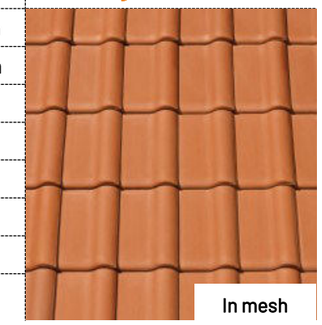
BALANCE®



Product datas

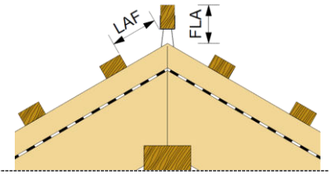
Size	width:	323 mm
	length:	502 mm
	height:	55 mm
	thickness:	10 mm
Weight:		4,9 kg
Packaging	bundle:	4 pcs
	pallet:	192 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	406 mm	419 mm	431 mm
Covering width	274 mm	275 mm	277 mm
Consumption	9,0 pcs/m²	8,7 pcs/m²	8,4 pcs/m²
Covering type		single cover	
Covering width		42,63 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

LB ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	95	90	90	80	80	80	75	75	75	75	75
FLA [mm]	100	95	90	80	70	60	50	45	30	25	20

LB ridge tile and 40x60 batten

LAF [mm]	95	90	90	75	75	75	70	65	60	60	60
FLA [mm]	105	105	100	90	80	70	60	55	40	35	30

LR ridge tile and 30x50 batten

LAF [mm]	95	90	90	80	80	80	75	75	75	75	75
FLA [mm]	100	95	90	80	70	60	50	45	30	25	20

LR ridge tile and 40x60 batten

LAF [mm]	95	90	90	75	75	75	70	65	60	60	60
FLA [mm]	105	105	100	90	80	70	60	55	40	35	30

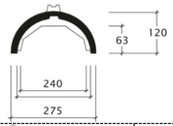
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 16°
Windproof underlayment	"BASIC"	≥ 14°
Watertight underlayment	"PRO"	≥ 12°
Waterproof underlayment	"ULTRA"	≥ 10°

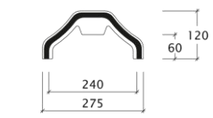
Required batten dimensions

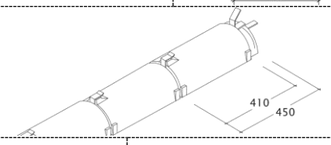
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"LB" ridge tile 2,5 pcs/m



"LR" ridge tile 2,5 pcs/m





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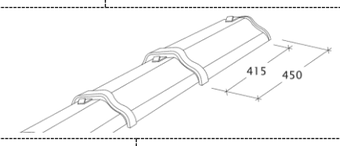
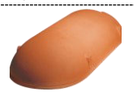


"LB" hip starter	"LB" hip starter, shell shape	3 axis hip cap	"LR" hip starter	"LR" hip starter, shell shape
				
„LB" hip starter, rounded	„LB" closing plate	4 axis hip cap	"LR" closing plate	
				

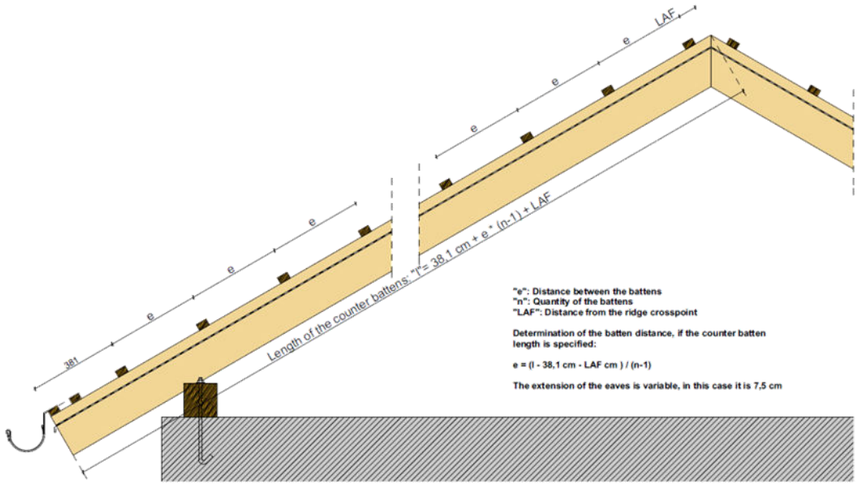
Clay accessories	Size	Quantity
Half tile	253x502	as needed
Verge tile - left	382x502	2,4 pcs/m
Verge tile - right	323x502	2,4 pcs/m
Double wave tile	382x502	2,4 pcs/m
Ventilation tile LQ 37,5	323x502	as required
Ridge connection ventilation tile	323x502	3,6 pcs/m
Ridge connection vent. half tile	253x502	as needed
Ridge conn. vent. verge tl. left	382x502	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	323x502	as needed
Double wave ridge connection tile	382x502	as needed
Shed roof tile	-	3,6 pcs/m
Shed roof half tile	-	as needed
Shed roof verge tile – left	-	as needed
Shed roof verge tile – right	-	as needed
Mansard tile	-	3,6 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

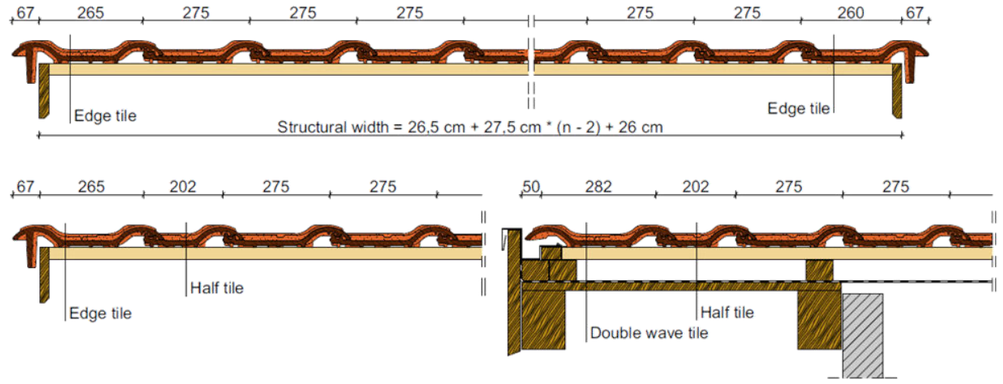
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "BALANCE" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "LB" ridge tile and 30x50 mm roof battens, LAF = 80 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	406 mm	419 mm	431 mm
10	4 115	4 232	4 340
11	4 521	4 651	4 771
12	4 927	5 070	5 202
13	5 333	5 489	5 633
14	5 739	5 908	6 064
15	6 145	6 327	6 495
16	6 551	6 746	6 926
17	6 957	7 165	7 357
18	7 363	7 584	7 788
19	7 769	8 003	8 219
20	8 175	8 422	8 650
21	8 581	8 841	9 081
22	8 987	9 260	9 512
23	9 393	9 679	9 943
24	9 799	10 098	10 374
25	10 205	10 517	10 805
26	10 611	10 936	11 236
27	11 017	11 355	11 667
28	11 423	11 774	12 098
29	11 829	12 193	12 529
30	12 235	12 612	12 960
31	12 641	13 031	13 391
32	13 047	13 450	13 822
33	13 453	13 869	14 253
34	13 859	14 288	14 684
35	14 265	14 707	15 115
36	14 671	15 126	15 546
37	15 077	15 545	15 977
38	15 483	15 964	16 408
39	15 889	16 383	16 839
40	16 295	16 802	17 270



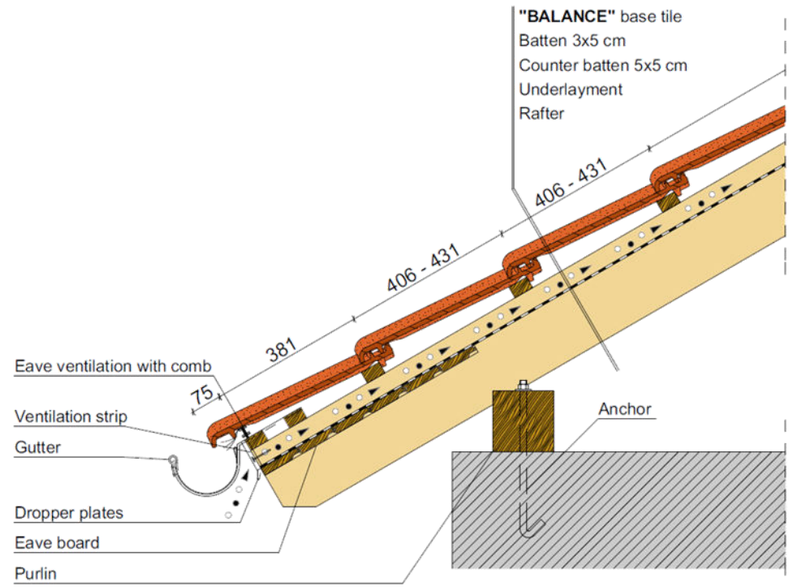
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	202	275	477	525	727	800	1 002	1 075	1 277
10	2 725	2 927	3 000	3 202	3 275	3 477	3 550	3 752	3 825	4 027
20	5 475	5 677	5 750	5 952	6 025	6 227	6 300	6 502	6 575	6 777
30	8 225	8 427	8 500	8 702	8 775	8 977	9 050	9 252	9 325	9 527
40	10 975	11 177	11 250	11 452	11 525	11 727	11 800	12 002	12 075	12 277
50	13 725	13 927	14 000	14 202	14 275	14 477	14 550	14 752	14 825	15 027
60	16 475	16 677	16 750	16 952	17 025	17 227	17 300	17 502	17 575	17 777
70	19 225	19 427	19 500	19 702	19 775	19 977	20 050	20 252	20 325	20 527
80	21 975	22 177	22 250	22 452	22 525	22 727	22 800	23 002	23 075	23 277
90	24 725	24 927	25 000	25 202	25 275	25 477	25 550	25 752	25 825	26 027
100	27 475	27 677	27 750	27 952	28 025	28 227	28 300	28 502	28 575	28 777

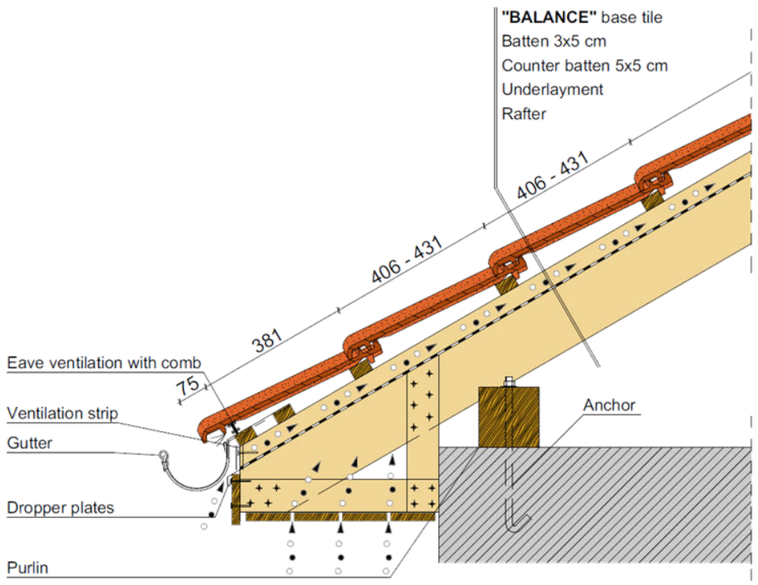
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 350	1 552	1 625	1 827	1 900	2 102	2 175	2 377	2 450	2 652
10	4 100	4 302	4 375	4 577	4 650	4 852	4 925	5 127	5 200	5 402
20	6 850	7 052	7 125	7 327	7 400	7 602	7 675	7 877	7 950	8 152
30	9 600	9 802	9 875	10 077	10 150	10 352	10 425	10 627	10 700	10 902
40	12 350	12 552	12 625	12 827	12 900	13 102	13 175	13 377	13 450	13 652
50	15 100	15 302	15 375	15 577	15 650	15 852	15 925	16 127	16 200	16 402
60	17 850	18 052	18 125	18 327	18 400	18 602	18 675	18 877	18 950	19 152
70	20 600	20 802	20 875	21 077	21 150	21 352	21 425	21 627	21 700	21 902
80	23 350	23 552	23 625	23 827	23 900	24 102	24 175	24 377	24 450	24 652
90	26 100	26 302	26 375	26 577	26 650	26 852	26 925	27 127	27 200	27 402
100	28 850	29 052	29 125	29 327	29 400	29 602	29 675	29 877	29 950	30 152

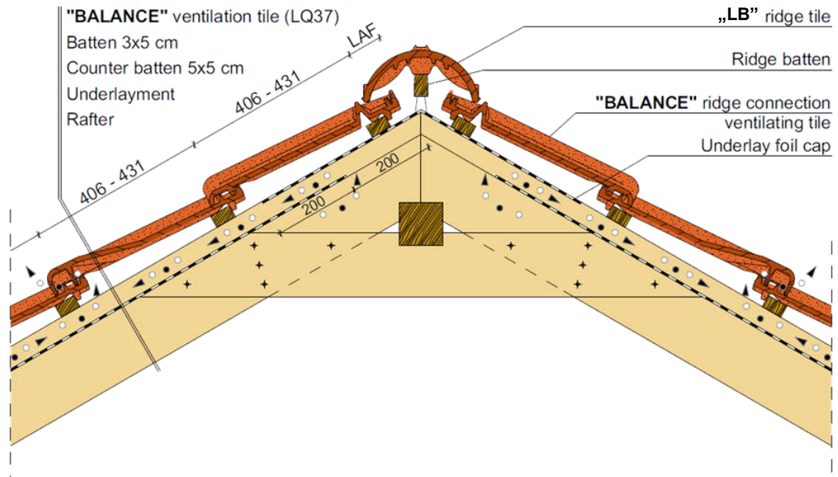
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



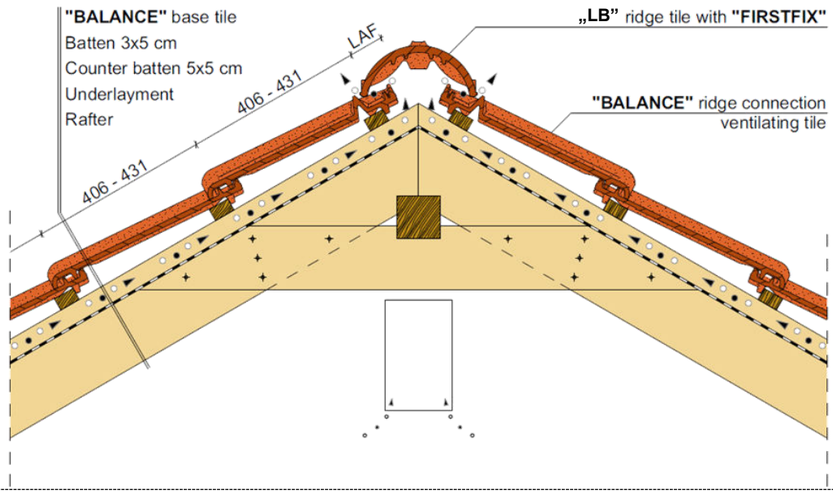
Eave detail



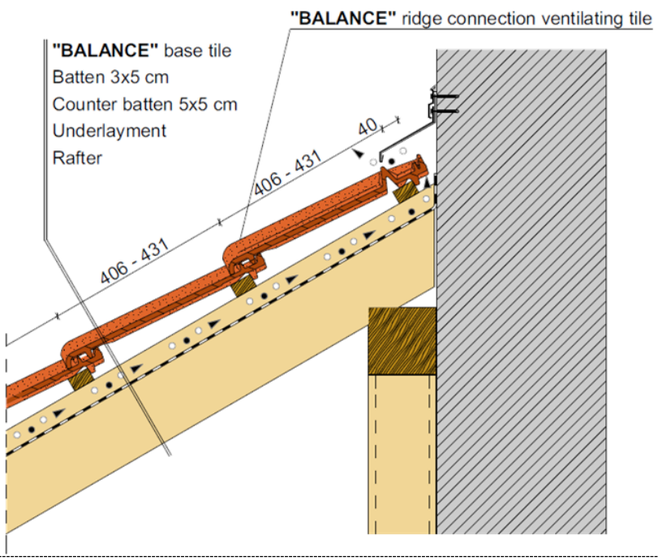
Closed eave detail



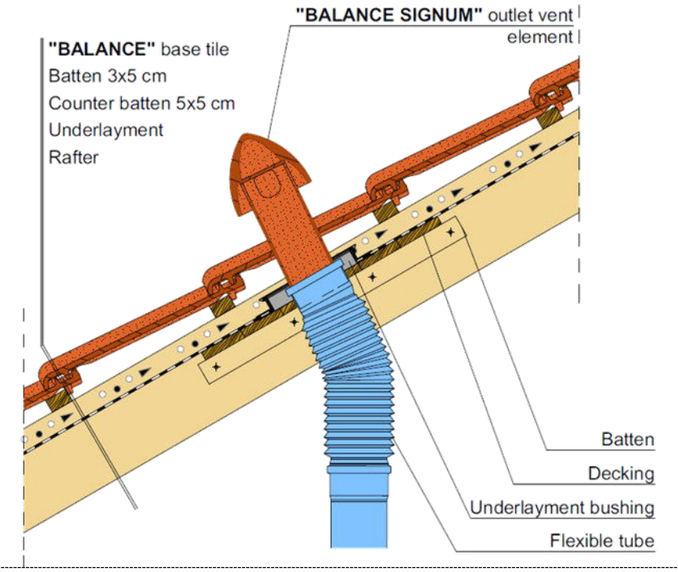
Ridge detail, with ventilation tile



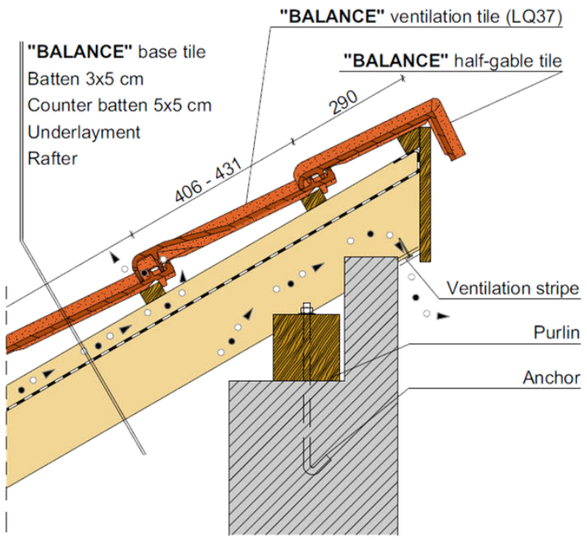
Ridge detail, with ridge connection ventilation tile



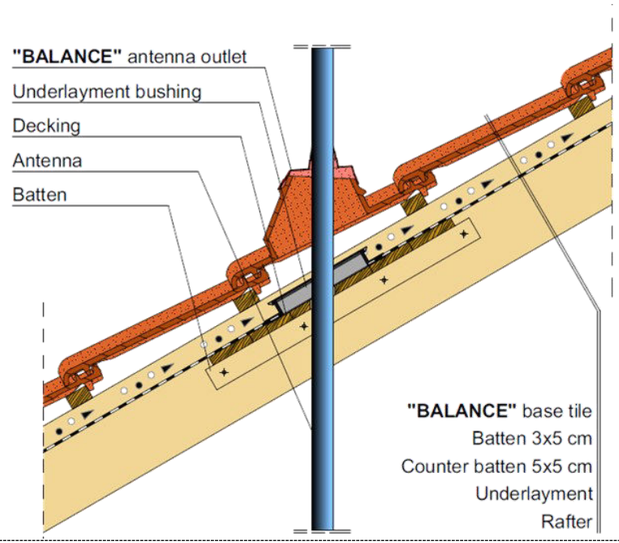
Wall connection detail



Clay ventilation outlet tile

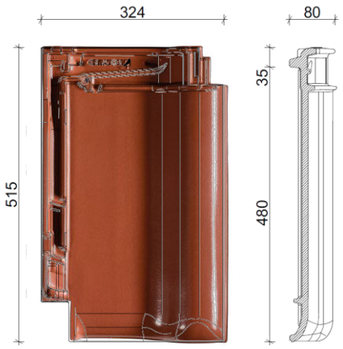


Shed ridge detail, with shad roof tile



Clay antenna outlet tile

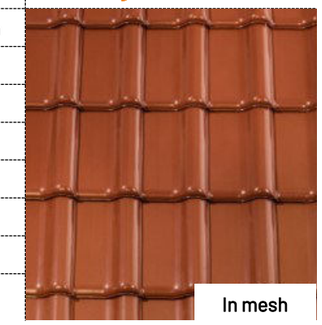
TITANIA®



Product datas

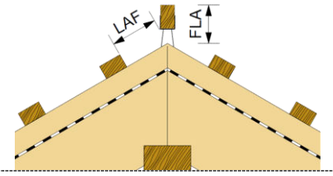
Size	width:	325 mm
	length:	515 mm
	height:	80 mm
	thickness:	11 mm
Weight:		5,2 kg
Packaging	bundle:	4 pcs
	pallet:	168 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	382 mm	403 mm	425 mm
Covering width	260 mm	262 mm	264 mm
Consumption	10,1 pcs/m²	9,5 pcs/m²	9,0 pcs/m²
Covering type		single cover	
Covering width		46,80 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PT ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	90	90	90	90	90	85	80	80	80	75	75
FLA [mm]	110	110	100	80	70	70	65	55	45	35	30

PT ridge tile and 40x60 batten

LAF [mm]	90	90	90	85	85	80	75	70	65	60	60
FLA [mm]	120	120	110	90	80	80	75	65	55	45	40

PT ridge tile and 50x50 batten

LAF [mm]	85	85	85	80	80	70	65	60	55	50	45
FLA [mm]	130	130	120	100	90	95	90	80	75	65	70

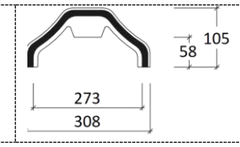
Underlayment requirement

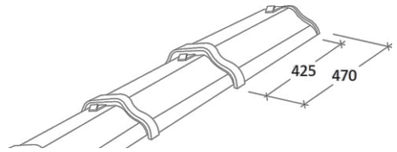
Unsupported underlayment	"ECO"	≥ 16°
Windproof underlayment	"BASIC"	≥ 14°
Watertight underlayment	"PRO"	≥ 12°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PT" ridge tile 2,5 pcs/m





Rounded hip starter	Closing plate	Funct.c.p.	3 axis hip cap
			

Hip starter	Shell shapedhip starter	4 axis hip cap
		

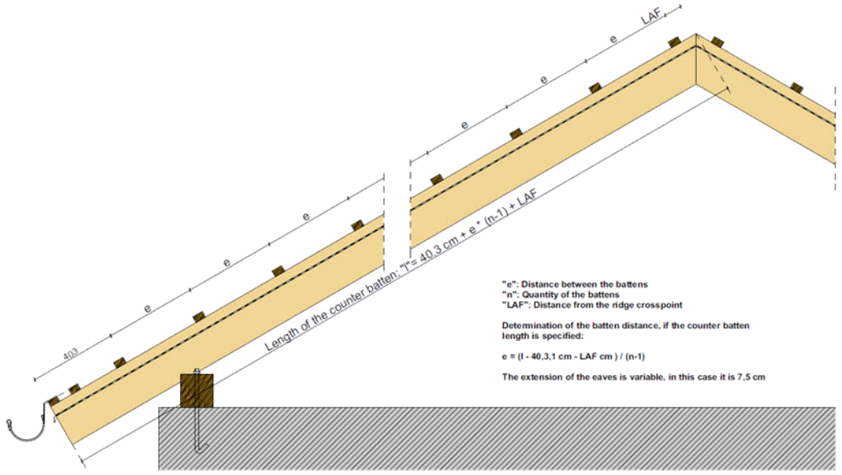
Clay accessories	Size	Quantity
Verge tile - left	366x515	2,5 pcs/m
Verge tile - right	324x515	2,5 pcs/m
Double wave tile	366x515	2,5 pcs/m
Ventilation tile LQ 32	324x515	as required
Ridge connection ventilation tile	324x515	3,8 pcs/m
Ridge conn. vent. verge tl. left	366x515	as needed
Ridge conn. vent. verge tl. right	324x515	as needed
Double wave ridge connection tile	366x515	as needed

Clay accessories	Size	Quantity
Shed roof tile	324x400	3,8 pcs/m
Shed roof verge tile – left	366x400	as needed
Shed roof verge tile – right	324x400	as needed
Mansard tile	-	3,8 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

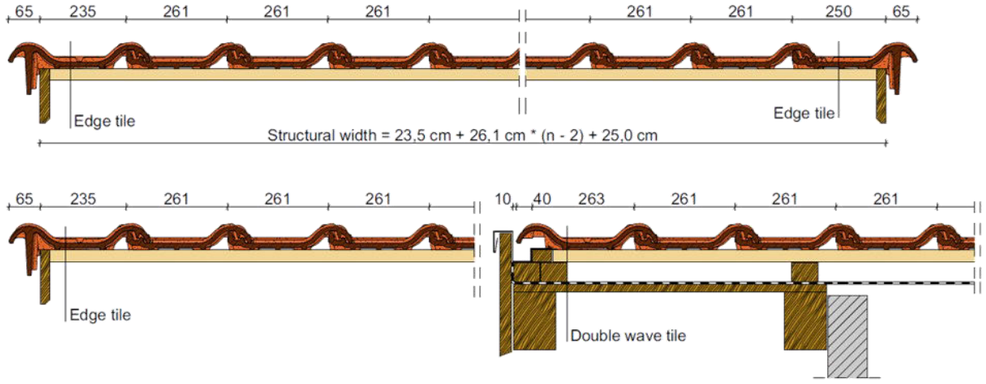
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "TITANIA" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PT" ridge tile and 30x50 mm roof battens, LAF = 90 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	382 mm	403 mm	425 mm
10	3 931	4 120	4 318
11	4 313	4 523	4 743
12	4 695	4 926	5 168
13	5 077	5 329	5 593
14	5 459	5 732	6 018
15	5 841	6 135	6 443
16	6 223	6 538	6 868
17	6 605	6 941	7 293
18	6 987	7 344	7 718
19	7 369	7 747	8 143
20	7 751	8 150	8 568
21	8 133	8 553	8 993
22	8 515	8 956	9 418
23	8 897	9 359	9 843
24	9 279	9 762	10 268
25	9 661	10 165	10 693
26	10 043	10 568	11 118
27	10 425	10 971	11 543
28	10 807	11 374	11 968
29	11 189	11 777	12 393
30	11 571	12 180	12 818
31	11 953	12 583	13 243
32	12 335	12 986	13 668
33	12 717	13 389	14 093
34	13 099	13 792	14 518
35	13 481	14 195	14 943
36	13 863	14 598	15 368
37	14 245	15 001	15 793
38	14 627	15 404	16 218
39	15 009	15 807	16 643
40	15 391	16 210	17 068



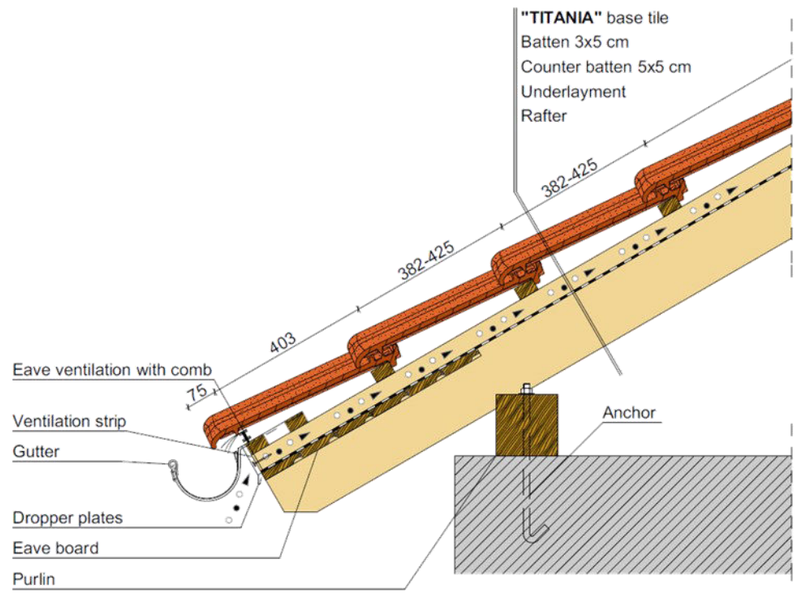
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	-	261	-	485	-	746	-	1 007	-
10	2 573	-	2 834	-	3 095	-	3 356	-	3 617	-
20	5 183	-	5 444	-	5 705	-	5 966	-	6 227	-
30	7 793	-	8 054	-	8 315	-	8 576	-	8 837	-
40	10 403	-	10 664	-	10 925	-	11 186	-	11 447	-
50	13 013	-	13 274	-	13 535	-	13 796	-	14 057	-
60	15 623	-	15 884	-	16 145	-	16 406	-	16 667	-
70	18 233	-	18 494	-	18 755	-	19 016	-	19 277	-
80	20 843	-	21 104	-	21 365	-	21 626	-	21 887	-
90	23 453	-	23 714	-	23 975	-	24 236	-	24 497	-
100	26 063	-	26 324	-	26 585	-	26 846	-	27 107	-

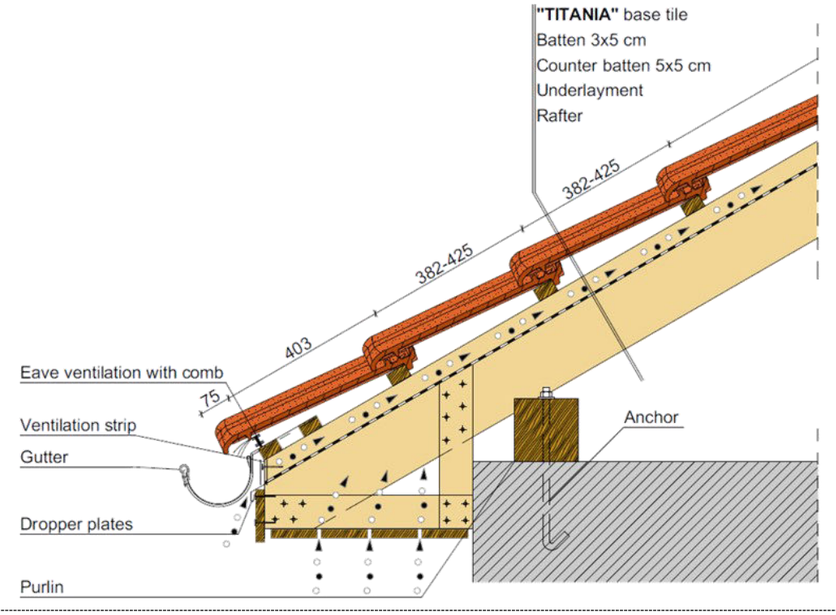
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 268	-	1 529	-	1 790	-	2 051	-	2 312	-
10	3 878	-	4 139	-	4 400	-	4 661	-	4 922	-
20	6 488	-	6 749	-	7 010	-	7 271	-	7 532	-
30	9 098	-	9 359	-	9 620	-	9 881	-	10 142	-
40	11 708	-	11 969	-	12 230	-	12 491	-	12 752	-
50	14 318	-	14 579	-	14 840	-	15 101	-	15 362	-
60	16 928	-	17 189	-	17 450	-	17 711	-	17 972	-
70	19 538	-	19 799	-	20 060	-	20 321	-	20 582	-
80	22 148	-	22 409	-	22 670	-	22 931	-	23 192	-
90	24 758	-	25 019	-	25 280	-	25 541	-	25 802	-
100	27 368	-	27 629	-	27 890	-	28 151	-	28 412	-

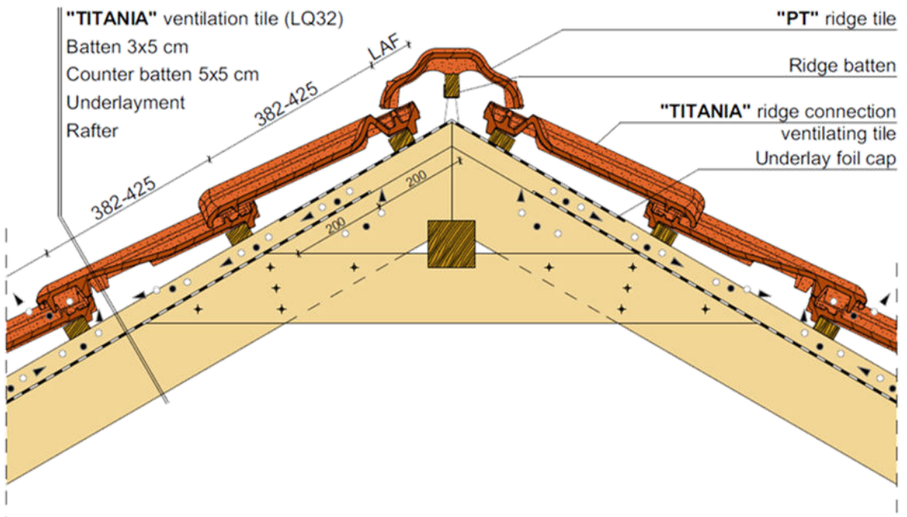
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



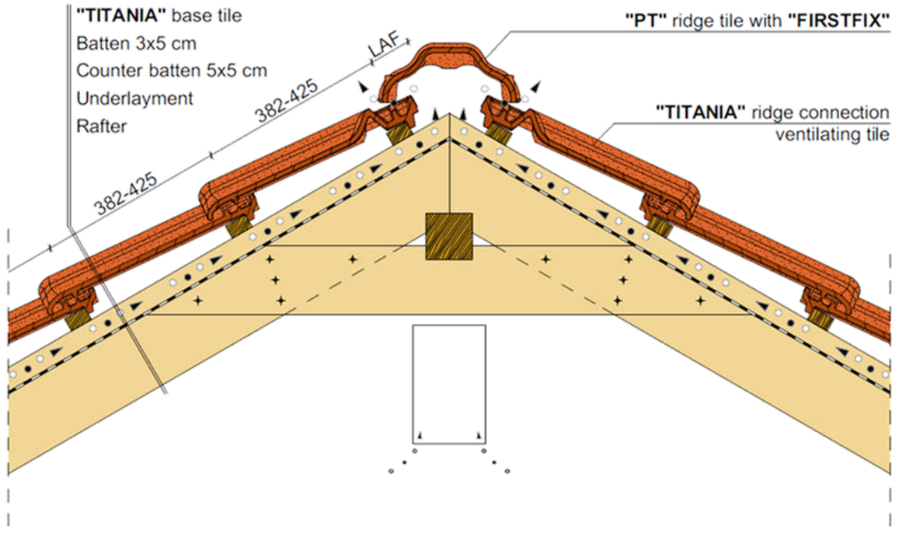
Eave detail



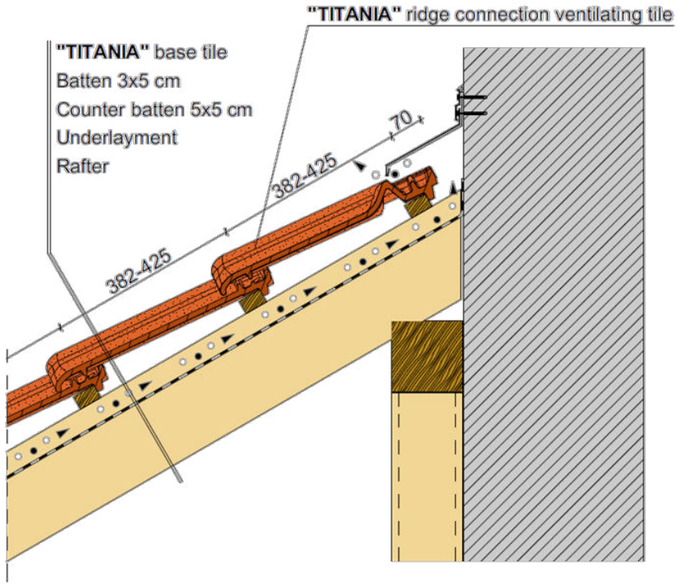
Closed eave detail



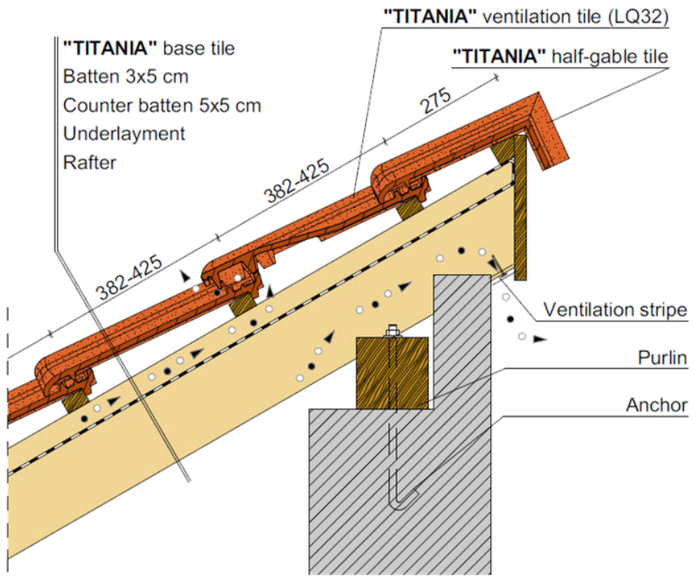
Ridge detail, with ventilation tile



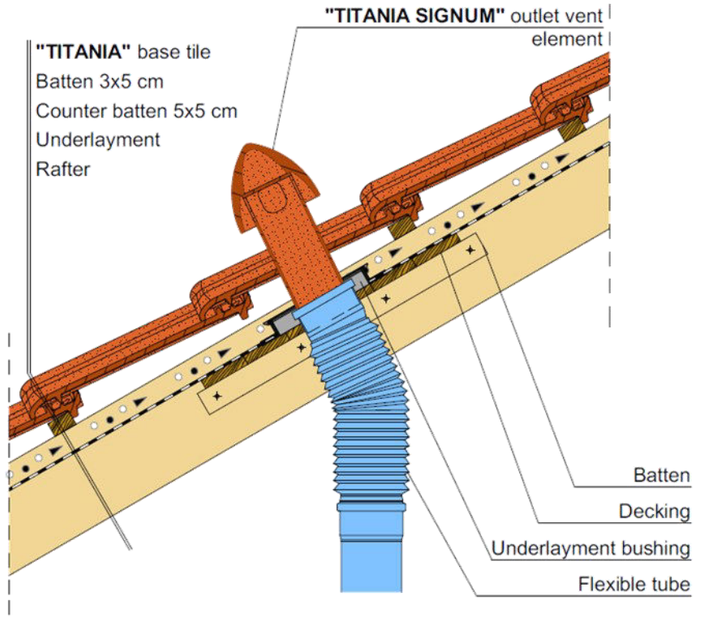
Ridge detail, with ridge connection ventilation tile



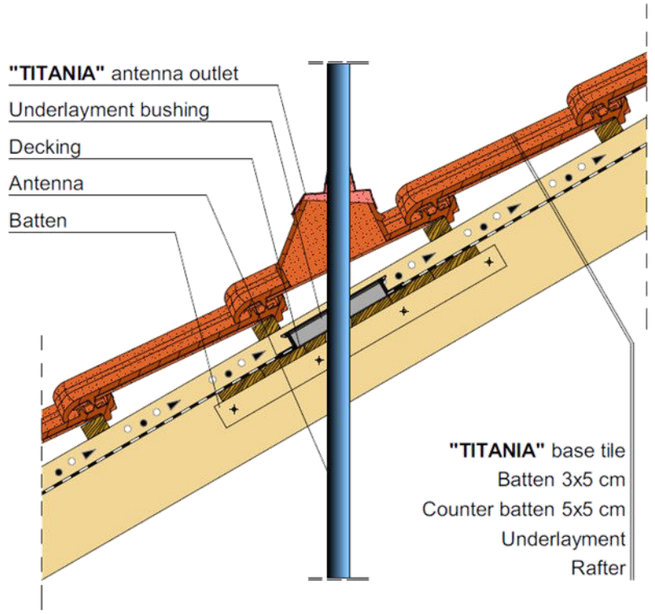
Wall connection detail



Shed ridge detail, with shad roof tile

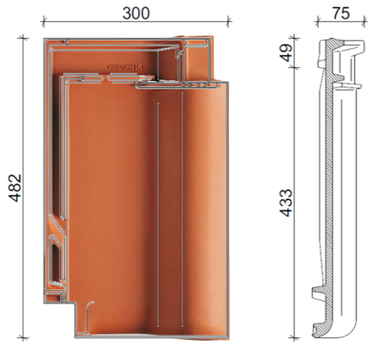


Clay ventilation outlet tile



Clay antenna outlet tile

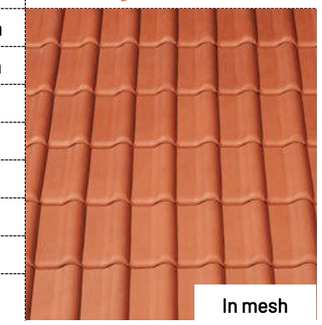
FUTURA®



Product datas

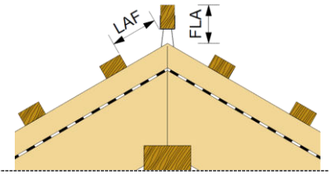
Size	width:	300 mm
	length:	482 mm
	height:	75 mm
	thickness:	11 mm
Weight:		4,3 kg
Packaging	bundle:	4 pcs
	pallet:	192 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	360 mm	374 mm	388 mm
Covering width	235 mm	238 mm	240 mm
Consumption	11,9 pcs/m²	11,3 pcs/m²	10,8 pcs/m²
Covering type		single cover	
Covering width		48,6 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PF ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	80	80	75	70	65	65	60	50	45	45	45
FLA [mm]	100	95	90	80	70	60	55	55	50	50	40

PF ridge tile and 40x60 batten

LAF [mm]	80	80	75	65	60	60	55	40	30	30	30
FLA [mm]	110	105	100	90	80	70	65	65	60	60	50

PR ridge tile and 30x50 batten

LAF [mm]	80	80	75	70	65	65	60	50	45	45	45
FLA [mm]	100	95	90	80	70	60	55	55	50	50	40

PR ridge tile and 40x60 batten

LAF [mm]	80	80	75	65	60	60	55	40	30	30	30
FLA [mm]	110	105	100	90	80	70	65	65	60	60	50

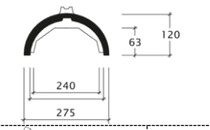
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 14°
Windproof underlayment	"BASIC"	≥ 12°
Watertight underlayment	"PRO"	≥ 10°
Waterproof underlayment	"ULTRA"	≥ 7°

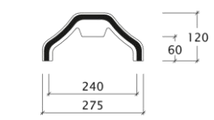
Required batten dimensions

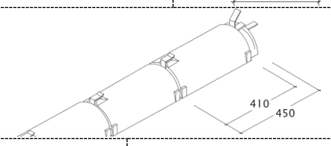
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PF" ridge tile 2,5 pcs/m



"PR" ridge tile 2,5 pcs/m





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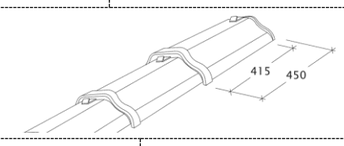


"PF" hip starter	"PF" hip starter, shell shape	3 axis hip cap	"PR" hip starter	"PR" hip starter, shell shape
				
„PF" hip starter, rounded	**„PF" closing plate**	**4 axis hip cap**	**"PR" closing plate**	
				

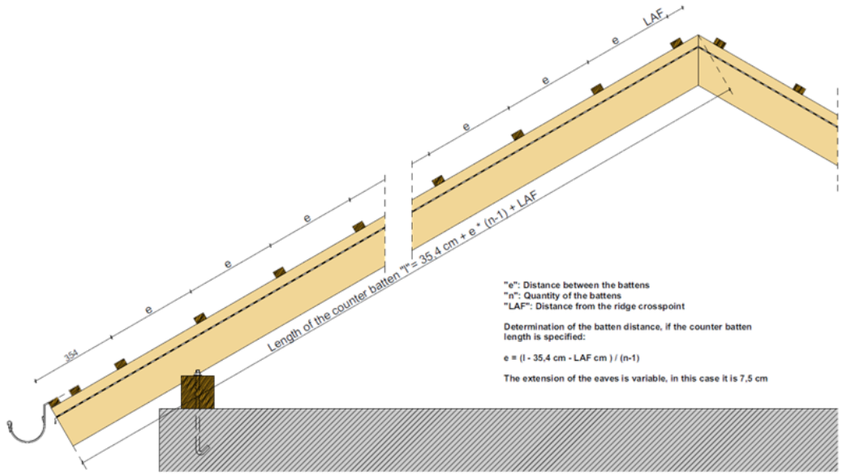
Clay accessories	Size	Quantity
Half tile	234x482	as needed
Verge tile - left	338x482	2,7 pcs/m
Verge tile - right	300x482	2,7 pcs/m
Double wave tile	338x482	2,7 pcs/m
Ventilation tile LQ 32,5	300x482	as required
Ridge connection ventilation tile	300x482	4,2 pcs/m
Ridge connection vent. half tile	234x482	as needed
Ridge conn. vent. verge tl. left	338x482	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	300x482	as needed
Double wave ridge connection tile	338x482	as needed
Shed roof tile	300x390	4,2 pcs/m
Shed roof half tile	234x390	as needed
Shed roof verge tile – left	338x390	as needed
Shed roof verge tile – right	295x390-	as needed
Mansard tile	-	4,2 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

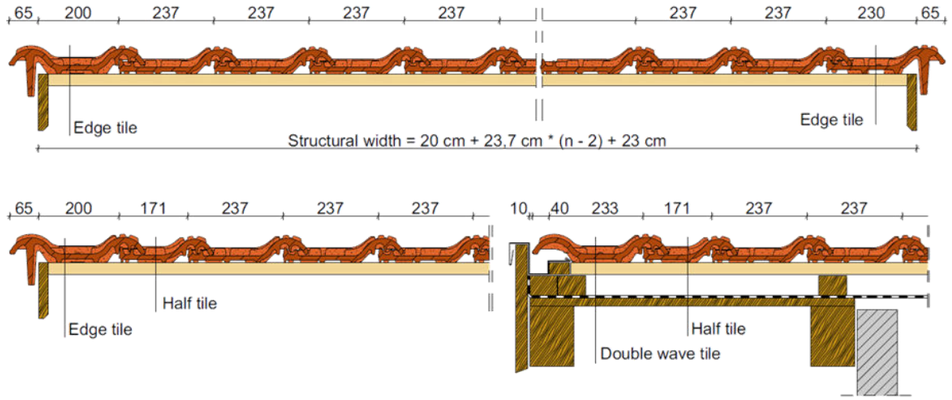
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "FUTURA" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PF" ridge tile and 30x50 mm roof battens, LAF = 65 mm		
Number of battens (n)	**min. batten dist.(e)** 360 mm	**avg. batten dist.(e)** 374 mm	**max. batten dist.(e)** 388 mm
10	3 659	3 785	3 911
11	4 019	4 159	4 299
12	4 379	4 533	4 687
13	4 739	4 907	5 075
14	5 099	5 281	5 463
15	5 459	5 655	5 851
16	5 819	6 029	6 239
17	6 179	6 403	6 627
18	6 539	6 777	7 015
19	6 899	7 151	7 403
20	7 259	7 525	7 791
21	7 619	7 899	8 179
22	7 979	8 273	8 567
23	8 339	8 647	8 955
24	8 699	9 021	9 343
25	9 059	9 395	9 731
26	9 419	9 769	10 119
27	9 779	10 143	10 507
28	10 139	10 517	10 895
29	10 499	10 891	11 283
30	10 859	11 265	11 671
31	11 219	11 639	12 059
32	11 579	12 013	12 447
33	11 939	12 387	12 835
34	12 299	12 761	13 223
35	12 659	13 135	13 611
36	13 019	13 509	13 999
37	13 379	13 883	14 387
38	13 739	14 257	14 775
39	14 099	14 631	15 163
40	14 459	15 005	15 551



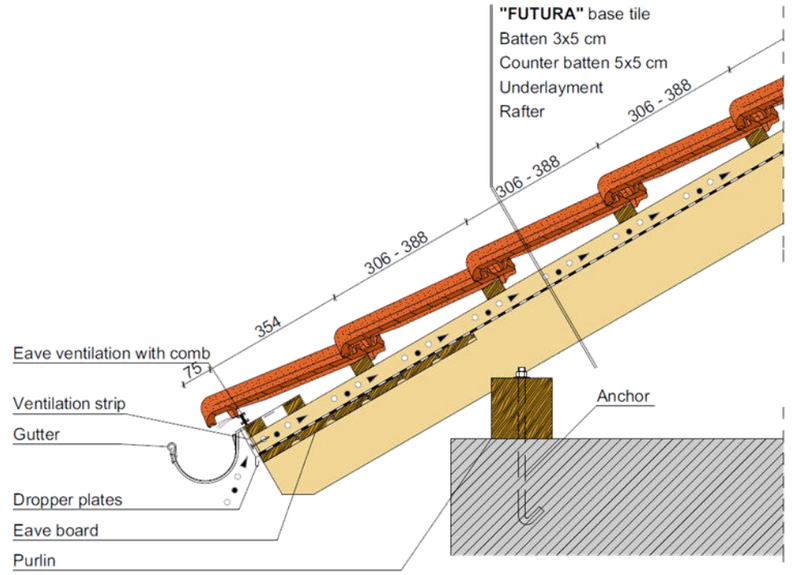
Structural width between the verge boards

	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2
0	-	171	237	408	430	601	667	838	904	1 075
10	2 326	2 497	2 563	2 734	2 800	2 971	3 037	3 208	3 274	3 445
20	4 696	4 867	4 933	5 104	5 170	5 341	5 407	5 578	5 644	5 815
30	7 066	7 237	7 303	7 474	7 540	7 711	7 777	7 948	8 014	8 185
40	9 436	9 607	9 673	9 844	9 910	10 081	10 147	10 318	10 384	10 555
50	11 806	11 977	12 043	12 214	12 280	12 451	12 517	12 688	12 754	12 925
60	14 176	14 347	14 413	14 584	14 650	14 821	14 887	15 058	15 124	15 295
70	16 546	16 717	16 783	16 954	17 020	17 191	17 257	17 428	17 494	17 665
80	18 916	19 087	19 153	19 324	19 390	19 561	19 627	19 798	19 864	20 035
90	21 286	21 457	21 523	21 694	21 760	21 931	21 997	22 168	22 234	22 405
100	23 656	23 827	23 893	24 064	24 130	24 301	24 367	24 538	24 604	24 775

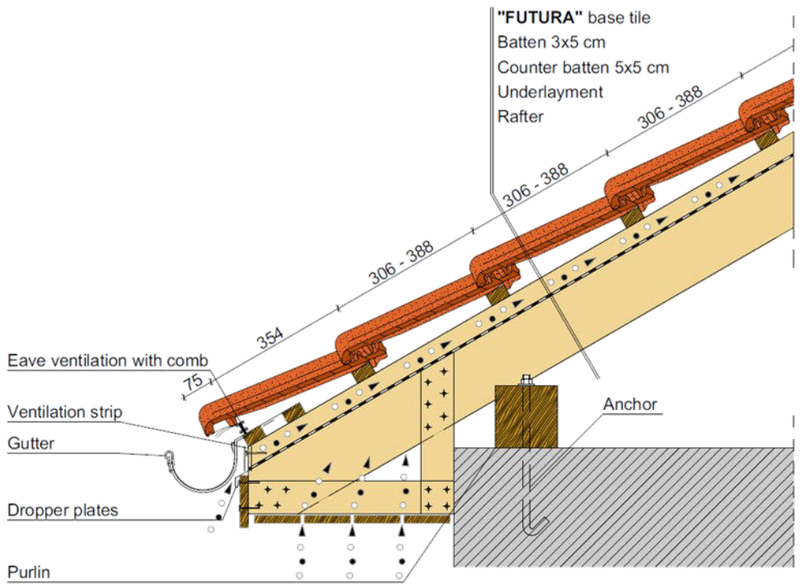
Structural width between the verge boards

	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2
0	1 141	1 312	1 378	1 549	1 615	1 786	1 852	2 023	2 089	2 260
10	3 511	3 682	3 748	3 919	3 985	4 156	4 222	4 393	4 459	4 630
20	5 881	6 052	6 118	6 289	6 355	6 526	6 592	6 763	6 829	7 000
30	8 251	8 422	8 488	8 659	8 725	8 896	8 962	9 133	9 199	9 370
40	10 621	10 792	10 858	11 029	11 095	11 266	11 332	11 503	11 569	11 740
50	12 991	13 162	13 228	13 399	13 465	13 636	13 702	13 873	13 939	14 110
60	15 361	15 532	15 598	15 769	15 835	16 006	16 072	16 243	16 309	16 480
70	17 731	17 902	17 968	18 139	18 205	18 376	18 442	18 613	18 679	18 850
80	20 101	20 272	20 338	20 509	20 575	20 746	20 812	20 983	21 049	21 220
90	22 471	22 642	22 708	22 879	22 945	23 116	23 182	23 353	23 419	23 590
100	24 841	25 012	25 078	25 249	25 315	25 486	25 552	25 723	25 789	25 960

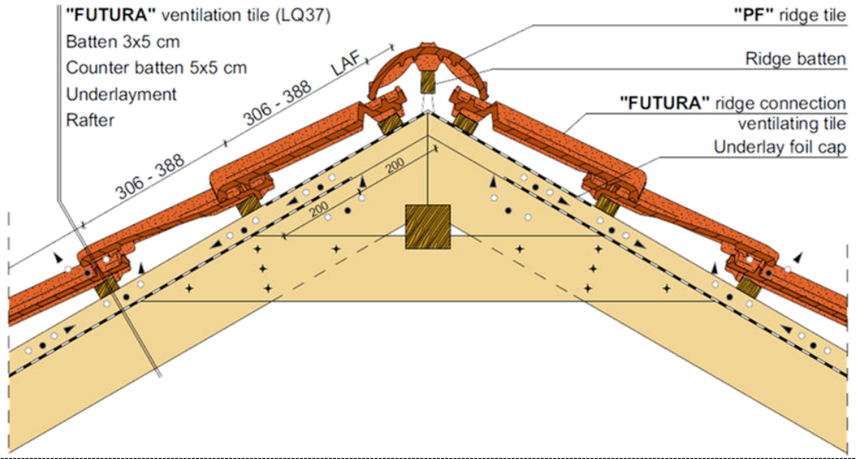
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



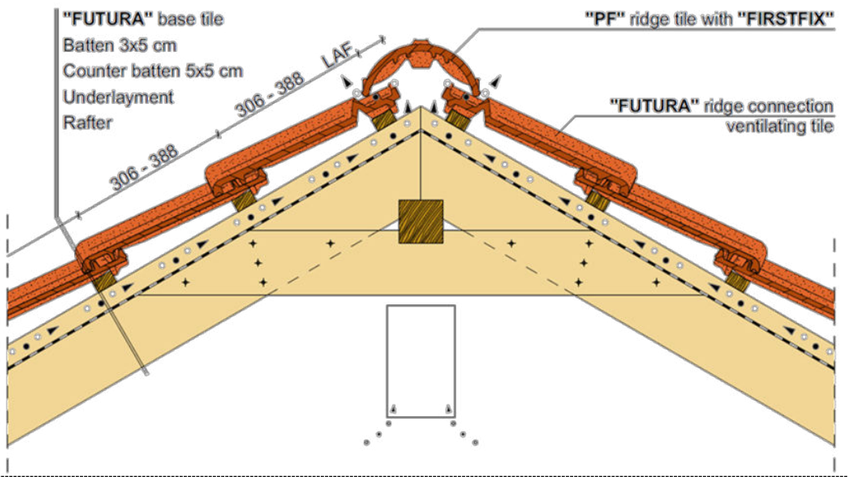
Eave detail



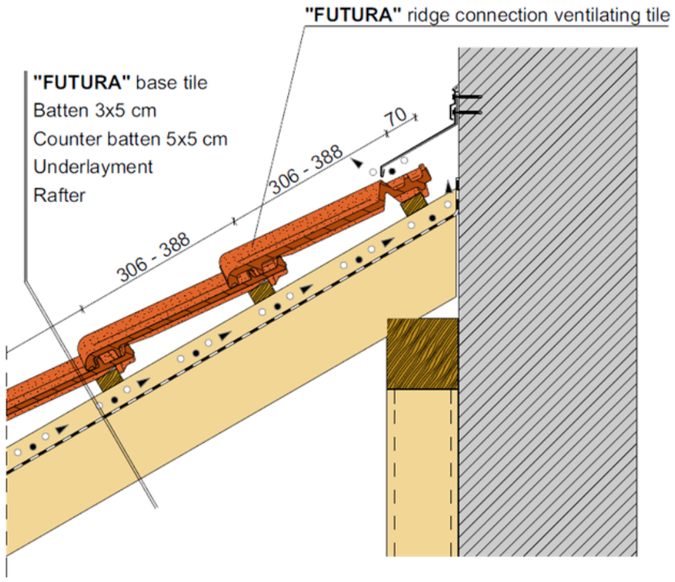
Closed eave detail



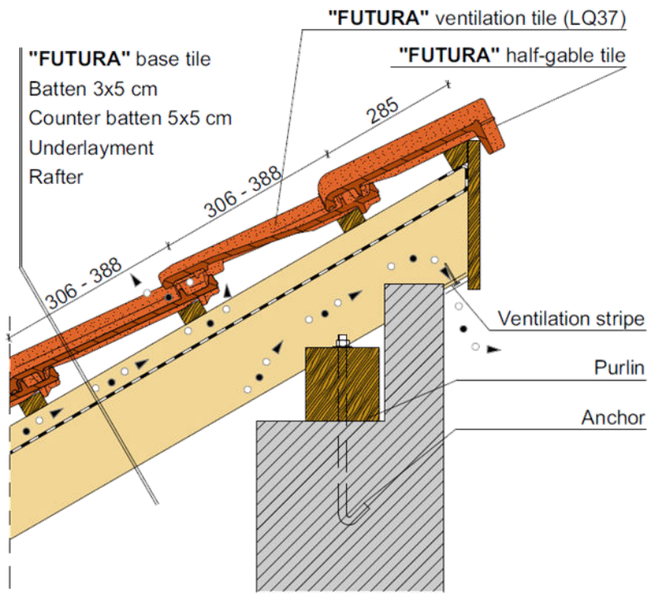
Ridge detail, with ventilation tile



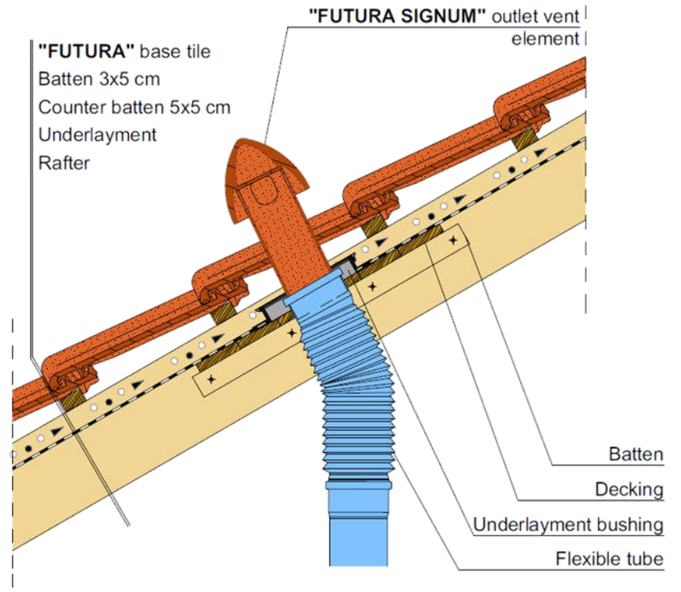
Ridge detail, with ridge connection ventilation tile



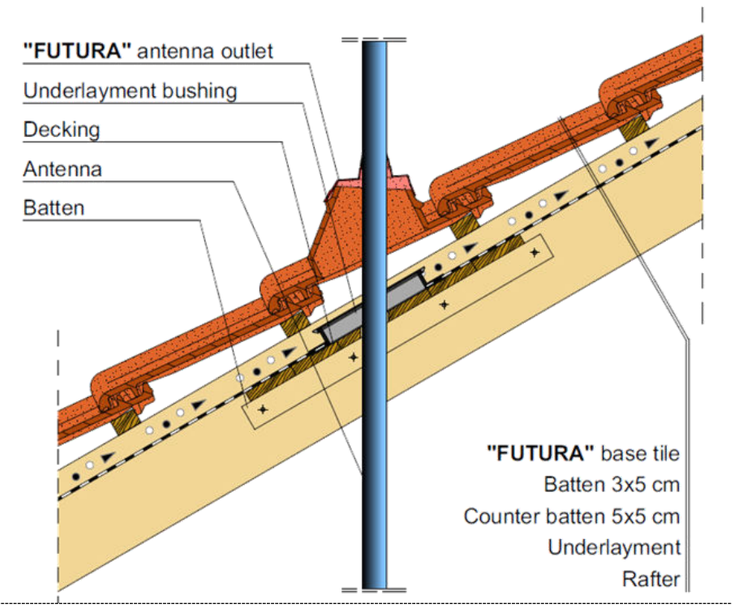
Wall connection detail



Shed ridge detail, with shad roof tile

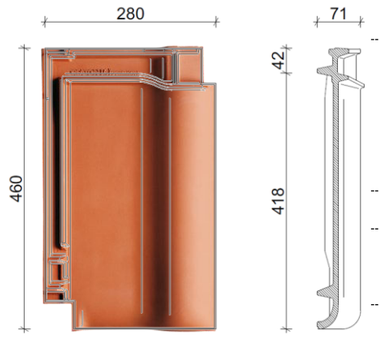


Clay ventilation outlet tile



Clay antenna outlet tile

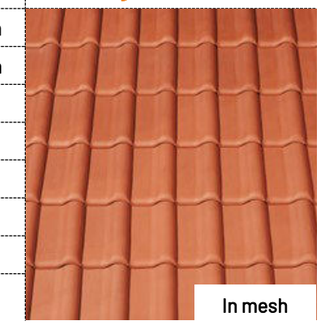
PREMION®



Product datas

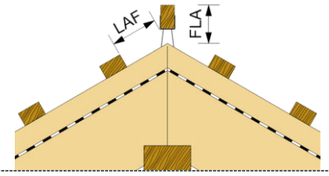
Size	width:	280 mm
	length:	460 mm
	height:	71 mm
	thickness:	10 mm
Weight:		3,5 kg
Packaging	bundle:	4 pcs
	pallet:	192 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	357 mm	368 mm	379 mm
Covering width	222 mm	225 mm	228 mm
Consumption	12,6 pcs/m²	12,1 pcs/m²	11,6 pcs/m²
Covering type		single cover	
Covering width		42,4 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PP ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	80	70	65	60	55	50	45	45	40	35	30
FLA [mm]	100	100	90	80	80	75	70	60	60	45	40

PP ridge tile and 40x60 batten

LAF [mm]	80	70	65	55	50	45	40	35	25	20	15
FLA [mm]	110	110	100	90	90	85	80	70	70	55	50

PHP ridge tile and 30x50 batten

LAF [mm]	70	70	65	60	60	55	50	40	30	20	✘
FLA [mm]	125	125	125	120	110	105	100	95	90	90	✘

PHP ridge tile and 40x60 batten

LAF [mm]	70	70	65	55	55	50	45	30	15	5	✘
FLA [mm]	135	135	135	130	120	115	110	105	100	100	✘

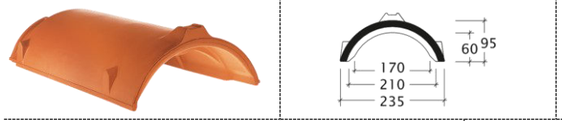
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 14°
Windproof underlayment	"BASIC"	≥ 12°
Watertight underlayment	"PRO"	≥ 10°
Waterproof underlayment	"ULTRA"	≥ 7°

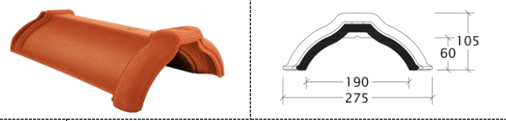
Required batten dimensions

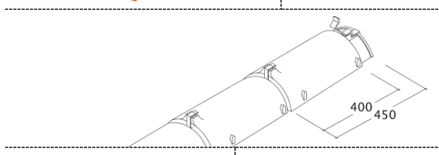
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

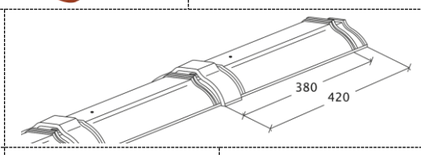
"PP" ridge tile 2,5 pcs/m



"PHP" ridge tile 2,6 pcs/m







"PP" hip starter	"PP" hip starter, shell shape	3 axis hip cap	"PHP" hip starter	"PHP" hip starter, shell shape
				
„PP" funct. closing plate	**„PP" closing plate**	**4 axis hip cap**	**"PHP" funct. closing plate**	
				

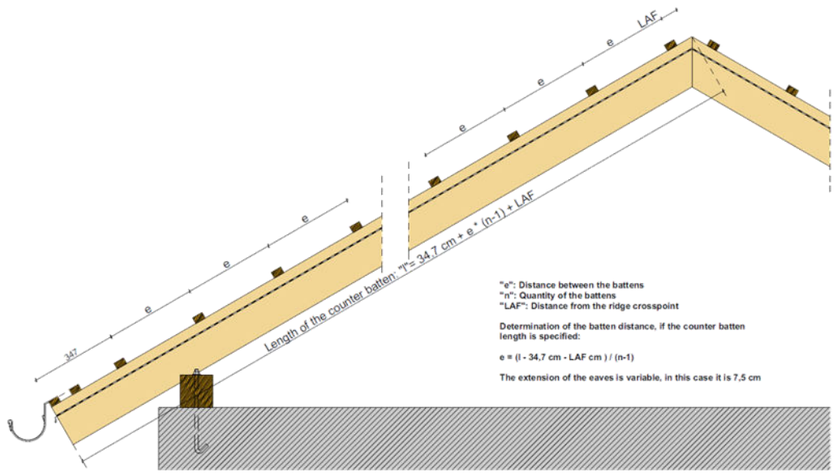
Clay accessories	Size	Quantity
Half tile	220x460	as needed
Verge tile - left	318x460	2,7 pcs/m
Verge tile - right	280x460	2,7 pcs/m
Double wave tile	318x460	2,7 pcs/m
Ventilation tile LQ 32,5	280x460	as required
Ridge connection ventilation tile	280x460	4,5 pcs/m
Ridge connection vent. half tile	220x460	as needed
Ridge conn. vent. verge tl. left	318x460	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	280x460	as needed
Double wave ridge connection tile	318x460	as needed
Shed roof tile	280x375	4,5 pcs/m
Shed roof half tile	220x375	as needed
Shed roof verge tile – left	318x375	as needed
Shed roof verge tile – right	280x375	as needed
Mansard tile	-	4,5 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

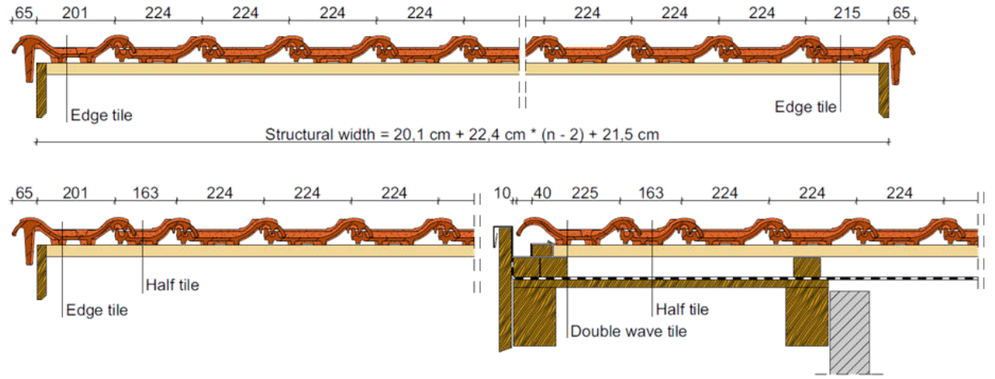
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 60 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "PREMION" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PP" ridge tile and 30x50 mm roof battens, LAF = 55 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	357 mm	368 mm	379 mm
10	3 615	3 714	3 813
11	3 972	4 082	4 192
12	4 329	4 450	4 571
13	4 686	4 818	4 950
14	5 043	5 186	5 329
15	5 400	5 554	5 708
16	5 757	5 922	6 087
17	6 114	6 290	6 466
18	6 471	6 658	6 845
19	6 828	7 026	7 224
20	7 185	7 394	7 603
21	7 542	7 762	7 982
22	7 899	8 130	8 361
23	8 256	8 498	8 740
24	8 613	8 866	9 119
25	8 970	9 234	9 498
26	9 327	9 602	9 877
27	9 684	9 970	10 256
28	10 041	10 338	10 635
29	10 398	10 706	11 014
30	10 755	11 074	11 393
31	11 112	11 442	11 772
32	11 469	11 810	12 151
33	11 826	12 178	12 530
34	12 183	12 546	12 909
35	12 540	12 914	13 288
36	12 897	13 282	13 667
37	13 254	13 650	14 046
38	13 611	14 018	14 425
39	13 968	14 386	14 804
40	14 325	14 754	15 183



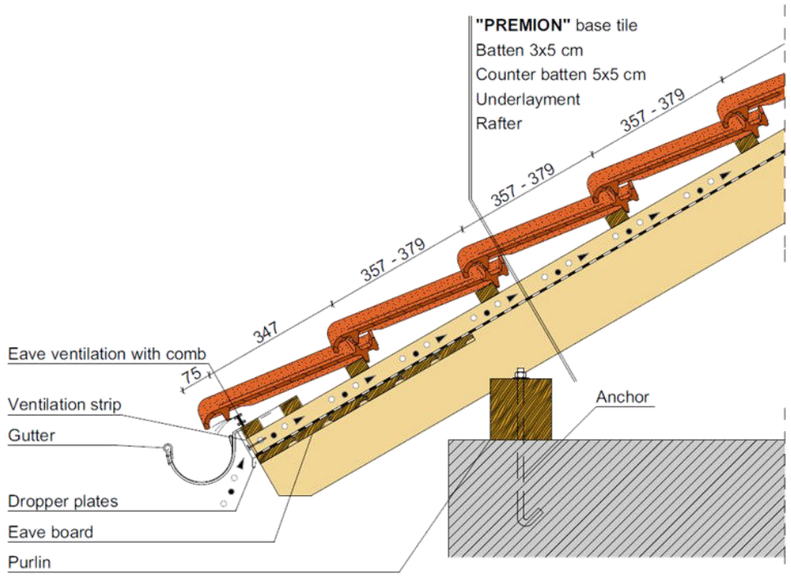
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	163	224	387	416	579	640	803	864	1 027
10	2 208	2 371	2 432	2 595	2 656	2 819	2 880	3 043	3 104	3 267
20	4 448	4 611	4 672	4 835	4 896	5 059	5 120	5 283	5 344	5 507
30	6 688	6 851	6 912	7 075	7 136	7 299	7 360	7 523	7 584	7 747
40	8 928	9 091	9 152	9 315	9 376	9 539	9 600	9 763	9 824	9 987
50	11 168	11 331	11 392	11 555	11 616	11 779	11 840	12 003	12 064	12 227
60	13 408	13 571	13 632	13 795	13 856	14 019	14 080	14 243	14 304	14 467
70	15 648	15 811	15 872	16 035	16 096	16 259	16 320	16 483	16 544	16 707
80	17 888	18 051	18 112	18 275	18 336	18 499	18 560	18 723	18 784	18 947
90	20 128	20 291	20 352	20 515	20 576	20 739	20 800	20 963	21 024	21 187
100	22 368	22 531	22 592	22 755	22 816	22 979	23 040	23 203	23 264	23 427

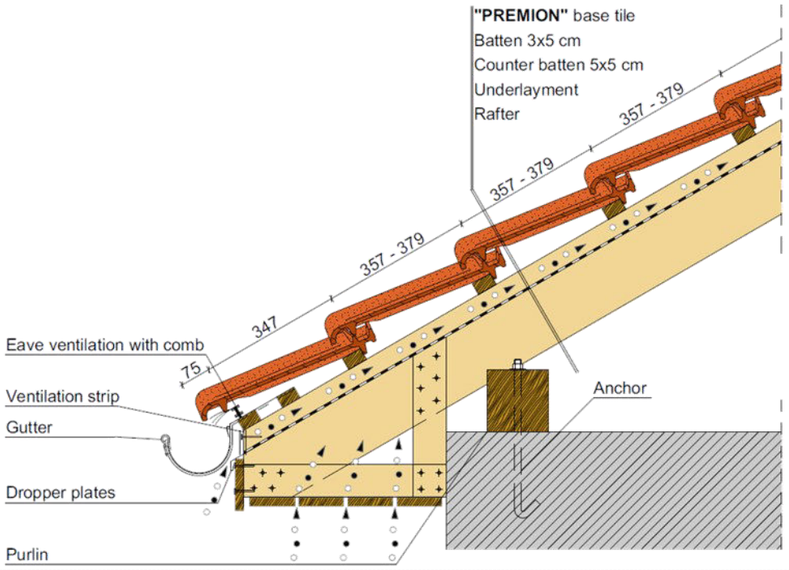
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 088	1 251	1 312	1 475	1 536	1 699	1 760	1 923	1 984	2 147
10	3 328	3 491	3 552	3 715	3 776	3 939	4 000	4 163	4 224	4 387
20	5 568	5 731	5 792	5 955	6 016	6 179	6 240	6 403	6 464	6 627
30	7 808	7 971	8 032	8 195	8 256	8 419	8 480	8 643	8 704	8 867
40	10 048	10 211	10 272	10 435	10 496	10 659	10 720	10 883	10 944	11 107
50	12 288	12 451	12 512	12 675	12 736	12 899	12 960	13 123	13 184	13 347
60	14 528	14 691	14 752	14 915	14 976	15 139	15 200	15 363	15 424	15 587
70	16 768	16 931	16 992	17 155	17 216	17 379	17 440	17 603	17 664	17 827
80	19 008	19 171	19 232	19 395	19 456	19 619	19 680	19 843	19 904	20 067
90	21 248	21 411	21 472	21 635	21 696	21 859	21 920	22 083	22 144	22 307
100	23 488	23 651	23 712	23 875	23 936	24 099	24 160	24 323	24 384	24 547

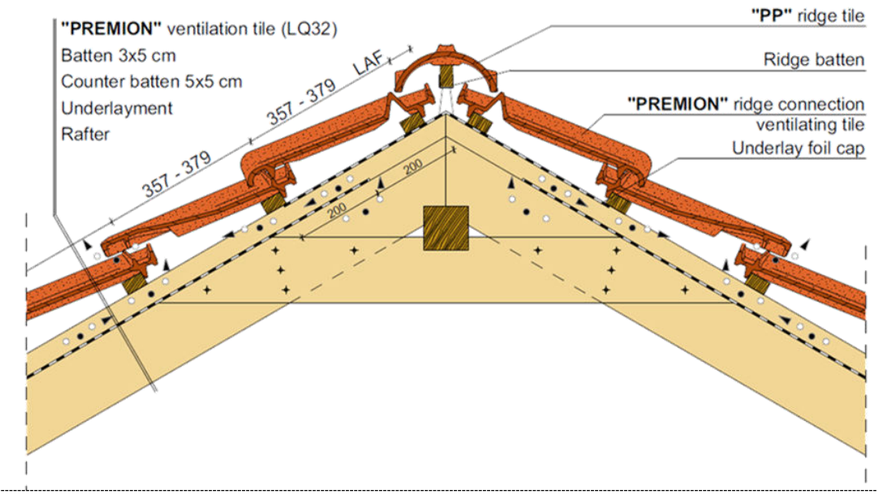
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



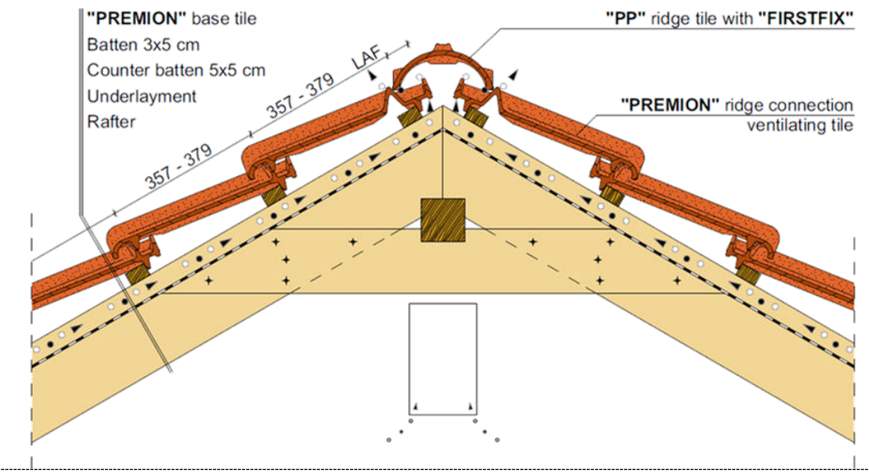
Eave detail



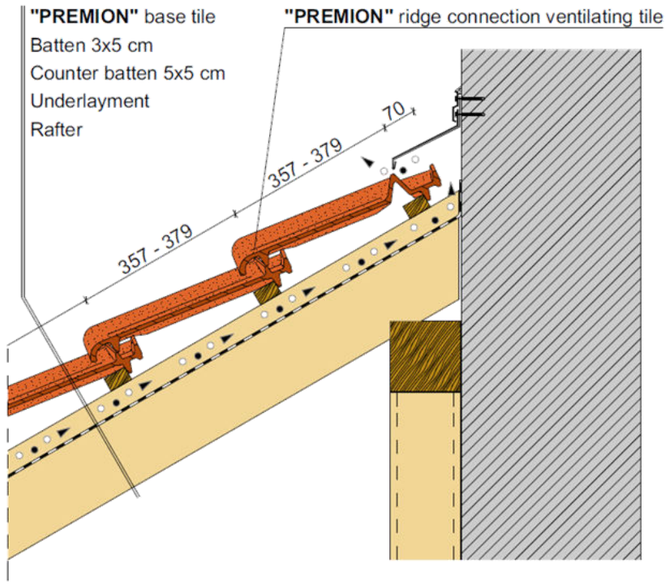
Closed eave detail



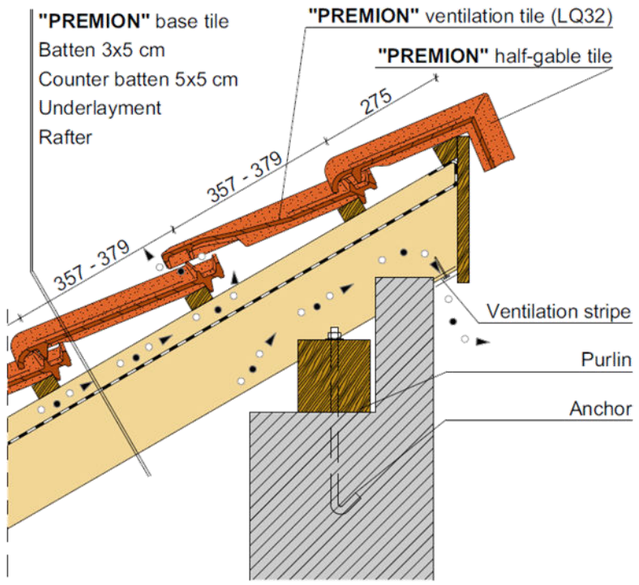
Ridge detail, with ventilation tile



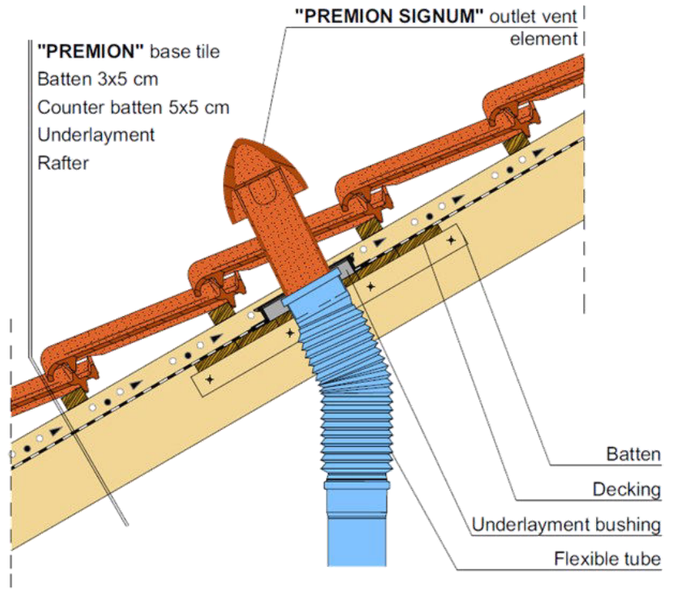
Ridge detail, with ridge connection ventilation tile



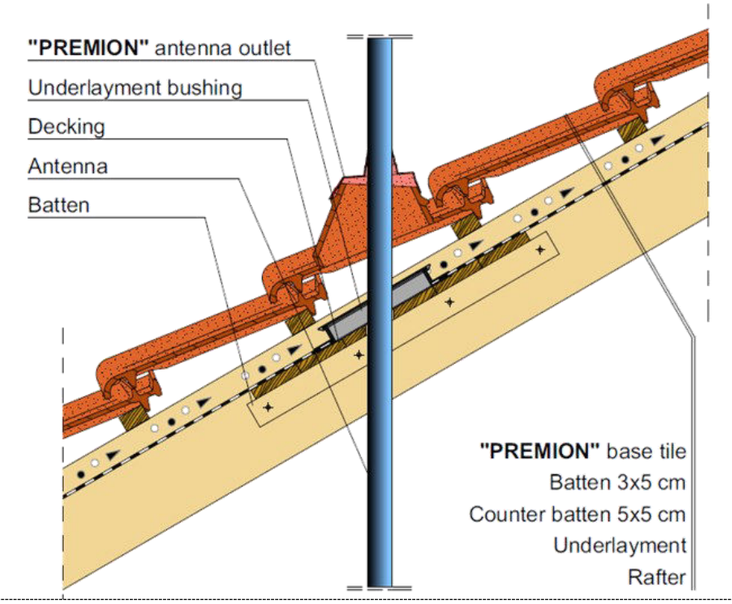
Wall connection detail



Shed ridge detail, with shad roof tile

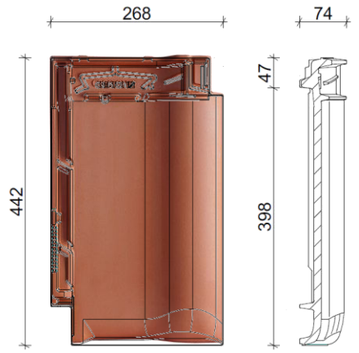


Clay ventilation outlet tile



Clay antenna outlet tile

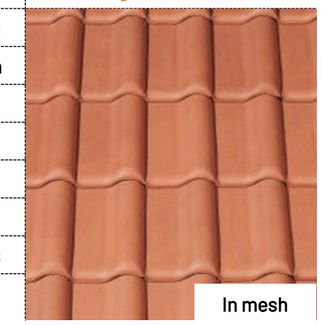
MZ3®



Product datas

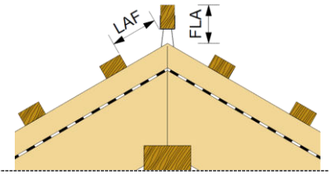
Size	width:	268 mm
	length:	442 mm
	height:	74 mm
	thickness:	11 mm
Weight:		3,6 kg
Packaging	bundle:	5 pcs
	pallet:	240 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	334 mm	345 mm	360 mm
Covering width	216 mm	218 mm	220 mm
Consumption	13,9 pcs/m²	13,3 pcs/m²	12,6 pcs/m²
Covering type		single cover	
Covering width		47,9 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PMZ ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	65	60	55	50	45	40	35	25	15	10	✖
FLA [mm]	125	120	115	105	100	95	95	90	90	85	✖

PMZ ridge tile and 40x60 batten

LAF [mm]	65	60	55	45	40	35	30	15	5	✖	✖
FLA [mm]	135	130	125	115	110	105	105	100	100	✖	✖

PMZ ridge tile and50x50 batten

LAF [mm]	60	55	50	40	35	25	20	5	✖	✖	✖
FLA [mm]	145	140	135	125	120	120	120	115	✖	✖	✖

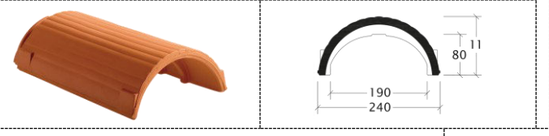
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 16°
Windproof underlayment	"BASIC"	≥ 14°
Watertight underlayment	"PRO"	≥ 12°
Waterproof underlayment	"ULTRA"	≥ 10°

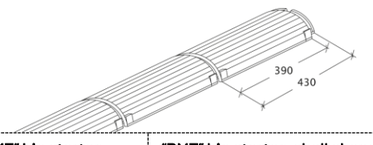
Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

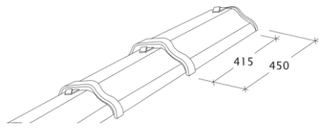
"PMZ" ridge tile 2,6 pcs/m



"PR" ridge tile 2,5 pcs/m



Funct.c.p.



"PMZ" hip starter	"PMZ" hip starter, shell shape	3 axis hip cap	"PR" hip starter	"PR" hip starter, shell shape
				

„PMZ" hip starter, rounded	„PMZ" closing plate	4 axis hip cap	"PR" closing plate
			

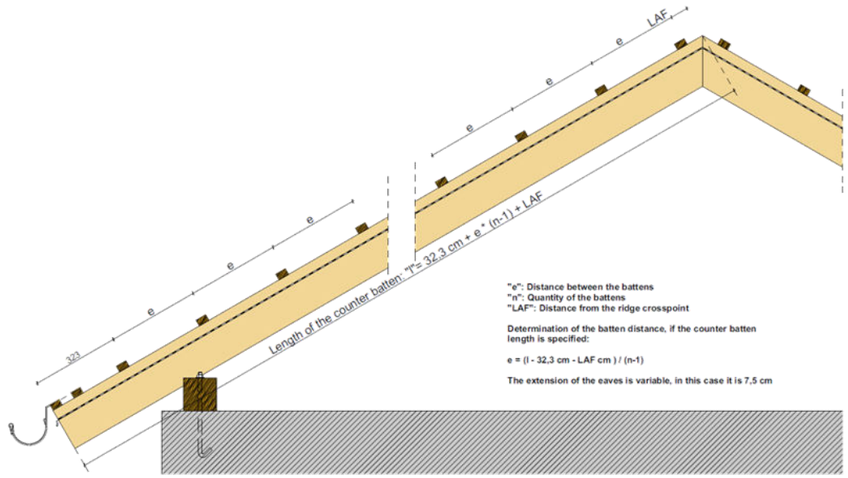
Clay accessories	Size	Quantity
Verge tile - left	315x442	2,9 pcs/m
Verge tile - right	268x442	2,9 pcs/m
Double wave tile	315x442	2,9 pcs/m
Ventilation tile LQ 22	268x442	as required
Ridge connection ventilation tile	268x442	4,6 pcs/m
Ridge conn. vent. verge tl. left	315x442	as needed
Ridge conn. vent. verge tl. right	323x442	as needed
Double wave ridge connection tile	315x442	as needed

Clay accessories	Size	Quantity
Shed roof tile	268x347-	4,6 pcs/m
Shed roof verge tile – left	315x347	as needed
Shed roof verge tile – right	268x347-	as needed
Mansard tile	-	4,6 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

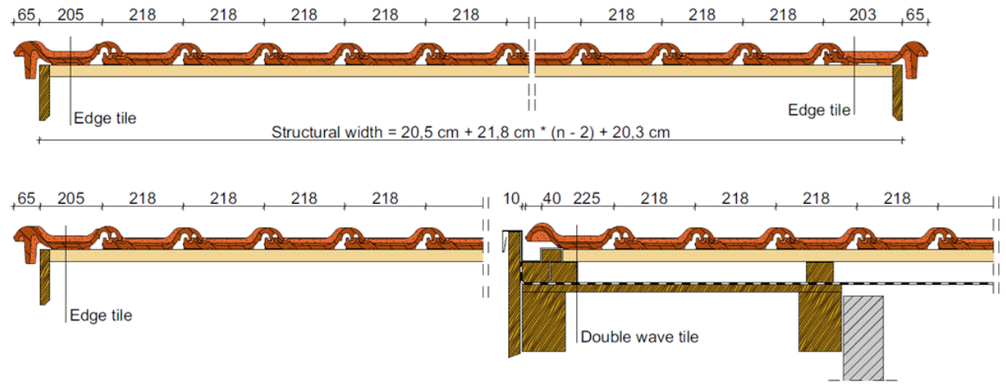
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "MZ3" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PMZ" ridge tile and 30x50 mm roof battens, LAF = 45 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	334 mm	345 mm	360 mm
10	3 374	3 473	3 608
11	3 708	3 818	3 968
12	4 042	4 163	4 328
13	4 376	4 508	4 688
14	4 710	4 853	5 048
15	5 044	5 198	5 408
16	5 378	5 543	5 768
17	5 712	5 888	6 128
18	6 046	6 233	6 488
19	6 380	6 578	6 848
20	6 714	6 923	7 208
21	7 048	7 268	7 568
22	7 382	7 613	7 928
23	7 716	7 958	8 288
24	8 050	8 303	8 648
25	8 384	8 648	9 008
26	8 718	8 993	9 368
27	9 052	9 338	9 728
28	9 386	9 683	10 088
29	9 720	10 028	10 448
30	10 054	10 373	10 808
31	10 388	10 718	11 168
32	10 722	11 063	11 528
33	11 056	11 408	11 888
34	11 390	11 753	12 248
35	11 724	12 098	12 608
36	12 058	12 443	12 968
37	12 392	12 788	13 328
38	12 726	13 133	13 688
39	13 060	13 478	14 048
40	13 394	13 823	14 408



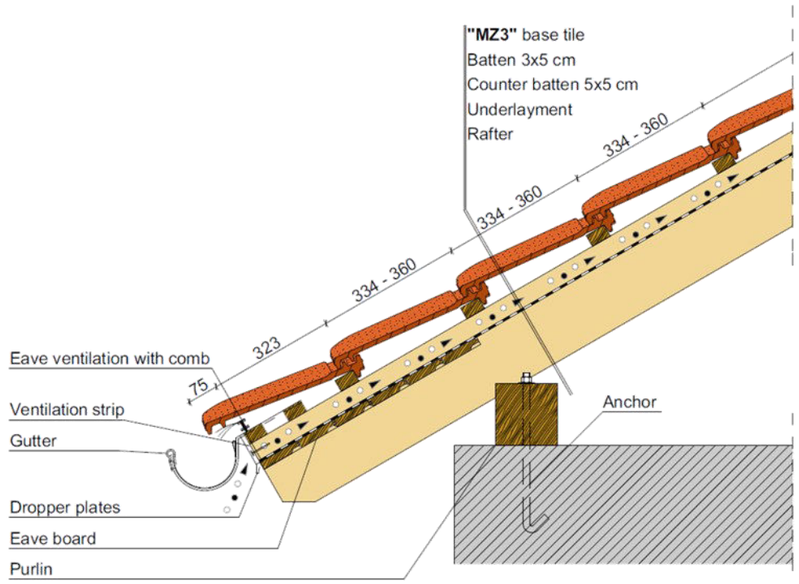
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	0	218	-	408	-	626	-	844	-
10	2 152	-	2 370	-	2 588	-	2 806	-	3 024	-
20	4 332	-	4 550	-	4 768	-	4 986	-	5 204	-
30	6 512	-	6 730	-	6 948	-	7 166	-	7 384	-
40	8 692	-	8 910	-	9 128	-	9 346	-	9 564	-
50	10 872	-	11 090	-	11 308	-	11 526	-	11 744	-
60	13 052	-	13 270	-	13 488	-	13 706	-	13 924	-
70	15 232	-	15 450	-	15 668	-	15 886	-	16 104	-
80	17 412	-	17 630	-	17 848	-	18 066	-	18 284	-
90	19 592	-	19 810	-	20 028	-	20 246	-	20 464	-
100	21 772	-	21 990	-	22 208	-	22 426	-	22 644	-

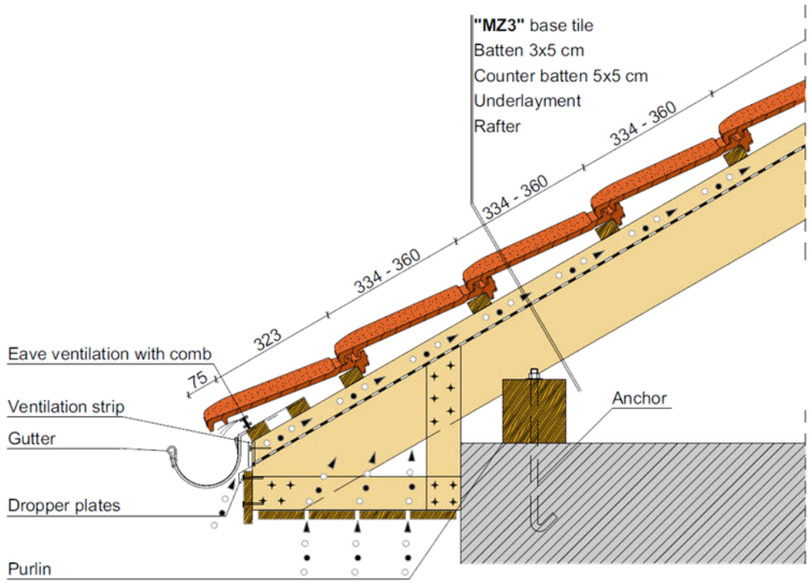
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 062	-	1 280	-	1 498	-	1 716	-	1 934	-
10	3 242	-	3 460	-	3 678	-	3 896	-	4 114	-
20	5 422	-	5 640	-	5 858	-	6 076	-	6 294	-
30	7 602	-	7 820	-	8 038	-	8 256	-	8 474	-
40	9 782	-	10 000	-	10 218	-	10 436	-	10 654	-
50	11 962	-	12 180	-	12 398	-	12 616	-	12 834	-
60	14 142	-	14 360	-	14 578	-	14 796	-	15 014	-
70	16 322	-	16 540	-	16 758	-	16 976	-	17 194	-
80	18 502	-	18 720	-	18 938	-	19 156	-	19 374	-
90	20 682	-	20 900	-	21 118	-	21 336	-	21 554	-
100	22 862	-	23 080	-	23 298	-	23 516	-	23 734	-

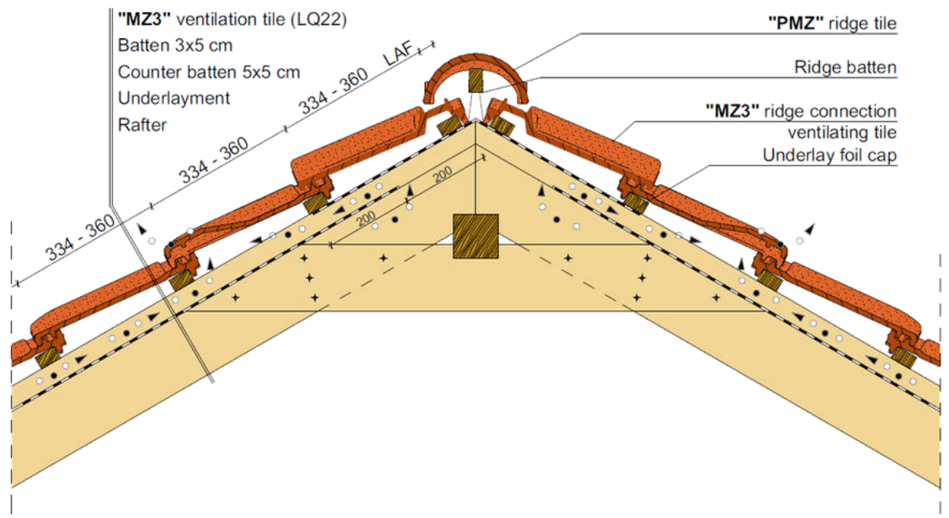
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



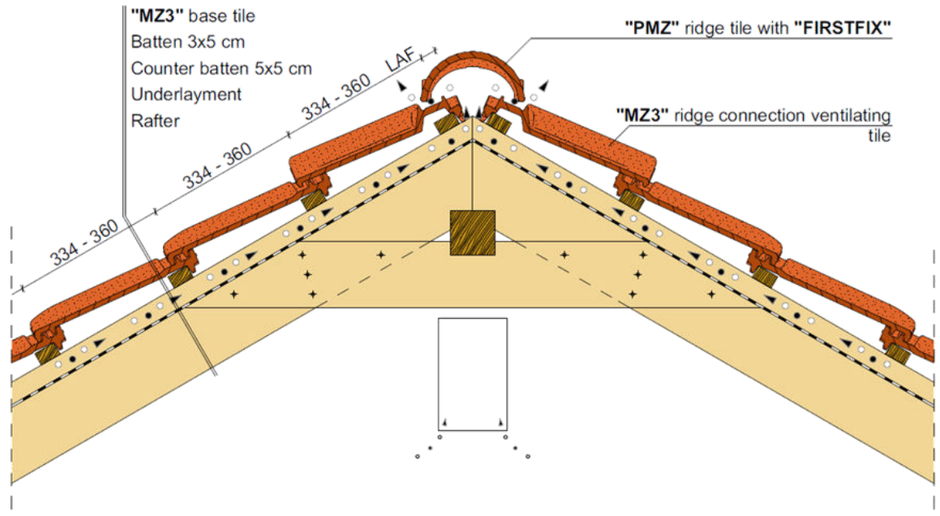
Eave detail



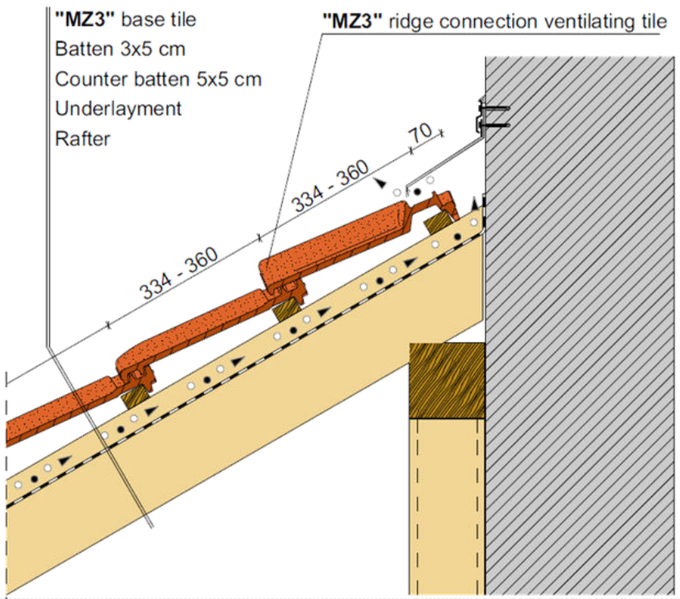
Closed eave detail



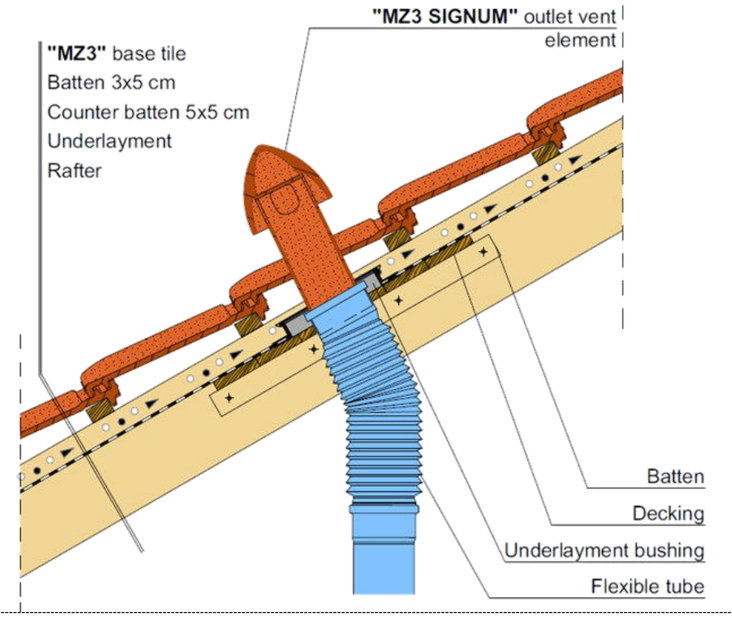
Ridge detail, with ventilation tile



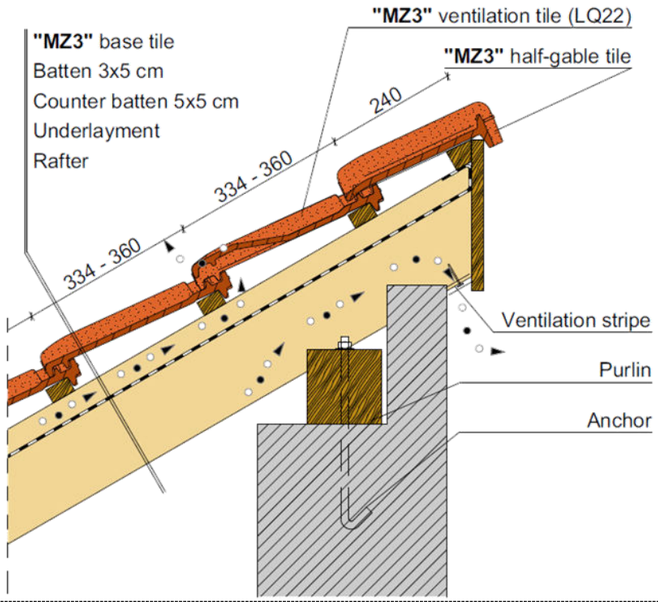
Ridge detail, with ridge connection ventilation tile



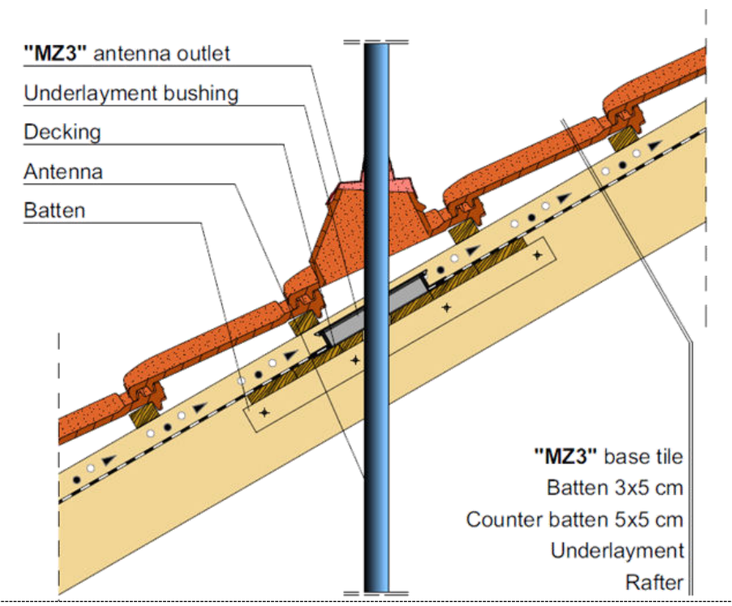
Wall connection detail



Clay ventilation outlet tile

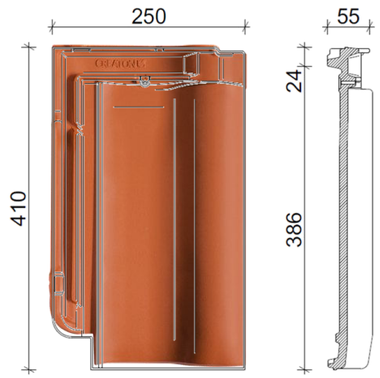


Shed ridge detail, with shad roof tile



Clay antenna outlet tile

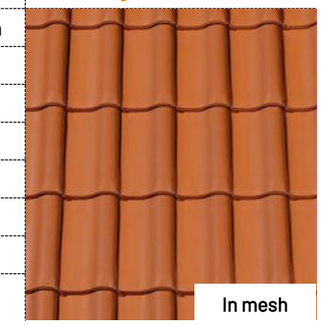
HARMONIE®



Product datas

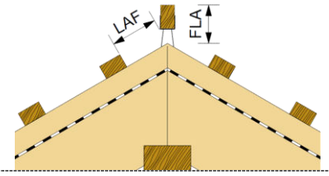
Size	width:	250 mm
	length:	410 mm
	height:	55 mm
	thickness:	10 mm
Weight:		3,1 kg
Packaging	bundle:	5 pcs
	pallet:	280 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	328 mm	340 mm	352 mm
Covering width	197 mm	199 mm	201 mm
Consumption	15,6 pcs/m²	14,9 pcs/m²	14,2 pcs/m²
Covering type		single cover	
Covering width		46,2 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PZ ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	60	60	55	50	45	40	35	30	30	25	25
FLA [mm]	100	100	95	90	85	80	70	70	60	55	50

PZ ridge tile and 40x60 batten

LAF [mm]	60	60	55	45	40	35	30	20	15	10	10
FLA [mm]	110	110	105	100	95	90	80	80	70	65	60

PZ ridge tile and50x50 batten

LAF [mm]	55	55	50	40	35	25	20	10	5	✖	✖
FLA [mm]	120	120	115	110	105	105	95	95	90	✖	✖

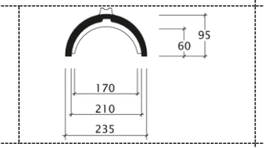
Underlayment requirement

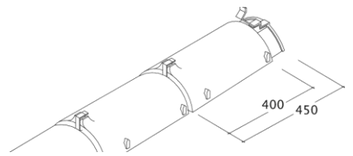
Unsupported underlayment	"ECO"	≥ 16°
Windproof underlayment	"BASIC"	≥ 14°
Watertight underlayment	"PRO"	≥ 12°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PZ" ridge tile 2,5 pcs/m





Rounded hip starter

Closing plate

Funct.c.p.

3 axis hip cap

Hip starter

Shell shapedhip starter

4 axis hip cap

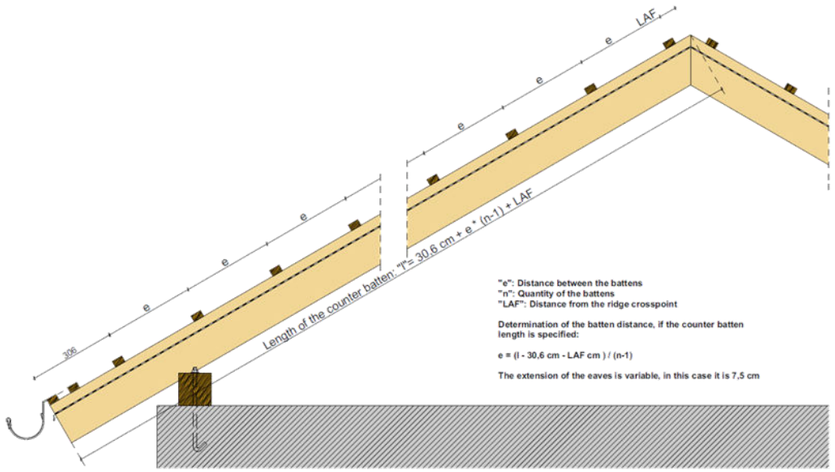
Clay accessories	Size	Quantity
Half tile	150x410	as needed
Verge tile - left	275x410	2,9 pcs/m
Verge tile - right	250x410	2,9 pcs/m
Double wave tile	275x410	2,9 pcs/m
Ventilation tile LQ 32,5	250x410	as required
Ridge connection ventilation tile	250x410	5,1 pcs/m
Ridge connection vent. half tile	150x410	as needed
Ridge conn. vent. verge tl. left	275x410	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	250x410	as needed
Double wave ridge connection tile	275x410	as needed
Shed roof tile	250x375	5,1 pcs/m
Shed roof half tile	150x375	as needed
Shed roof verge tile – left	275x375	as needed
Shed roof verge tile – right	250x375	as needed
Mansard tile	-	5,1 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

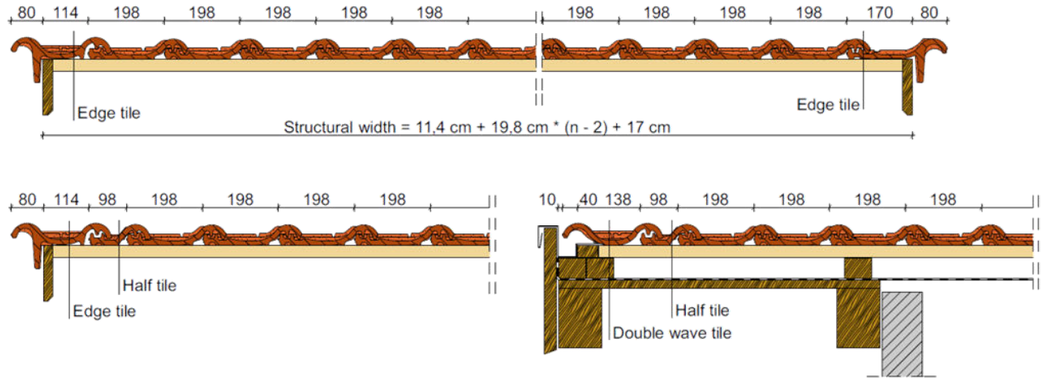
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "HARMONIE" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PZ" ridge tile and 30x50 mm roof battens, LAF = 45 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
10	328 mm	340 mm	352 mm
11	3 303	3 411	3 519
12	3 631	3 751	3 871
13	3 959	4 091	4 223
14	4 287	4 431	4 575
15	4 615	4 771	4 927
16	4 943	5 111	5 279
17	5 271	5 451	5 631
18	5 599	5 791	5 983
19	5 927	6 131	6 335
20	6 255	6 471	6 687
21	6 583	6 811	7 039
22	6 911	7 151	7 391
23	7 239	7 491	7 743
24	7 567	7 831	8 095
25	7 895	8 171	8 447
26	8 223	8 511	8 799
27	8 551	8 851	9 151
28	8 879	9 191	9 503
29	9 207	9 531	9 855
30	9 535	9 871	10 207
31	9 863	10 211	10 559
32	10 191	10 551	10 911
33	10 519	10 891	11 263
34	10 847	11 231	11 615
35	11 175	11 571	11 967
36	11 503	11 911	12 319
37	11 831	12 251	12 671
38	12 159	12 591	13 023
39	12 487	12 931	13 375
40	12 815	13 271	13 727



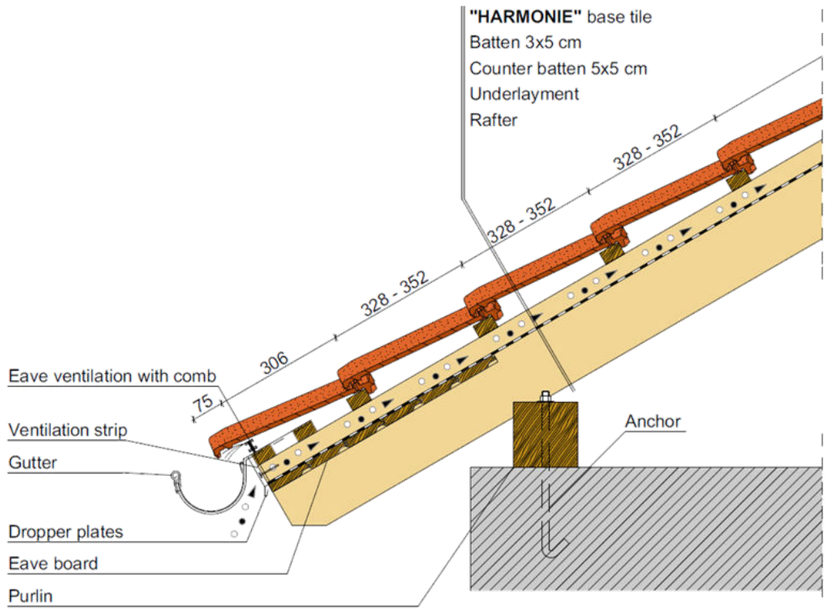
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	98	198	296	284	382	482	580	680	778
10	1 868	1 966	2 066	2 164	2 264	2 362	2 462	2 560	2 660	2 758
20	3 848	3 946	4 046	4 144	4 244	4 342	4 442	4 540	4 640	4 738
30	5 828	5 926	6 026	6 124	6 224	6 322	6 422	6 520	6 620	6 718
40	7 808	7 906	8 006	8 104	8 204	8 302	8 402	8 500	8 600	8 698
50	9 788	9 886	9 986	10 084	10 184	10 282	10 382	10 480	10 580	10 678
60	11 768	11 866	11 966	12 064	12 164	12 262	12 362	12 460	12 560	12 658
70	13 748	13 846	13 946	14 044	14 144	14 242	14 342	14 440	14 540	14 638
80	15 728	15 826	15 926	16 024	16 124	16 222	16 322	16 420	16 520	16 618
90	17 708	17 806	17 906	18 004	18 104	18 202	18 302	18 400	18 500	18 598
100	19 688	19 786	19 886	19 984	20 084	20 182	20 282	20 380	20 480	20 578

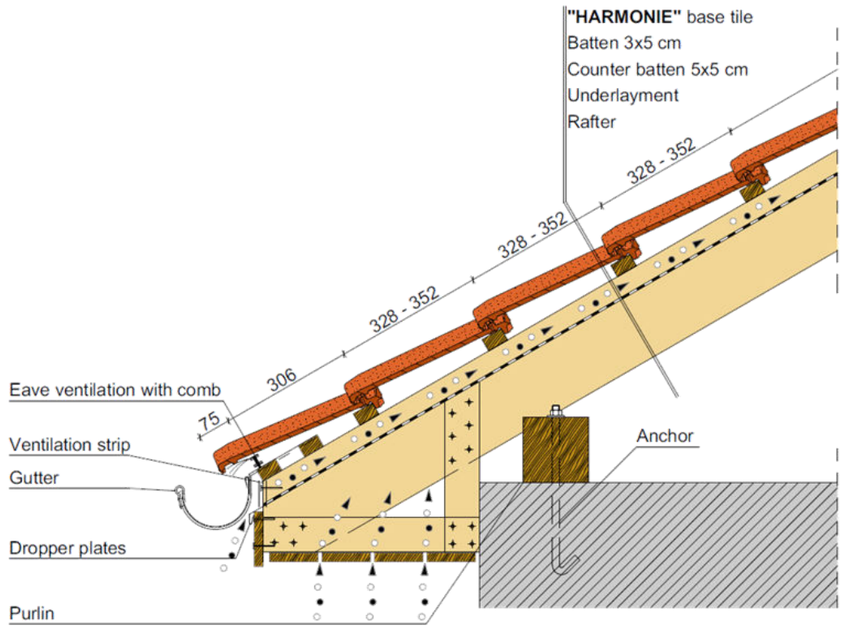
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	878	976	1 076	1 174	1 274	1 372	1 472	1 570	1 670	1 768
10	2 858	2 956	3 056	3 154	3 254	3 352	3 452	3 550	3 650	3 748
20	4 838	4 936	5 036	5 134	5 234	5 332	5 432	5 530	5 630	5 728
30	6 818	6 916	7 016	7 114	7 214	7 312	7 412	7 510	7 610	7 708
40	8 798	8 896	8 996	9 094	9 194	9 292	9 392	9 490	9 590	9 688
50	10 778	10 876	10 976	11 074	11 174	11 272	11 372	11 470	11 570	11 668
60	12 758	12 856	12 956	13 054	13 154	13 252	13 352	13 450	13 550	13 648
70	14 738	14 836	14 936	15 034	15 134	15 232	15 332	15 430	15 530	15 628
80	16 718	16 816	16 916	17 014	17 114	17 212	17 312	17 410	17 510	17 608
90	18 698	18 796	18 896	18 994	19 094	19 192	19 292	19 390	19 490	19 588
100	20 678	20 776	20 876	20 974	21 074	21 172	21 272	21 370	21 470	21 568

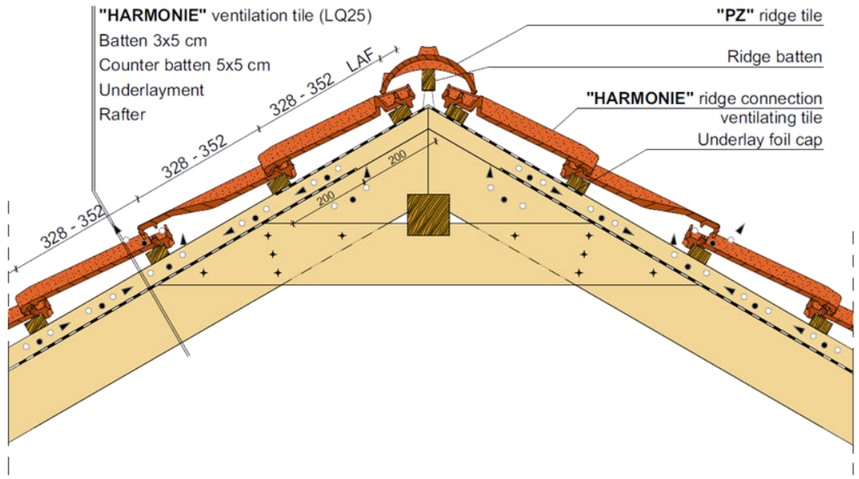
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



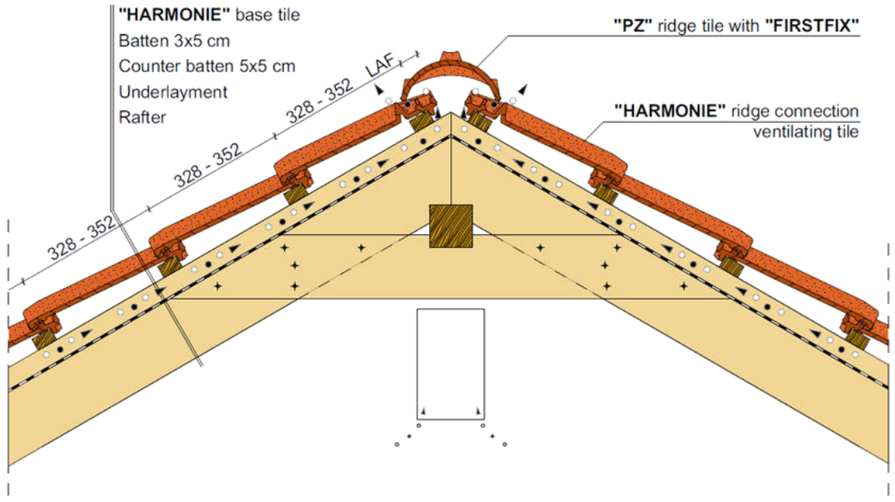
Eave detail



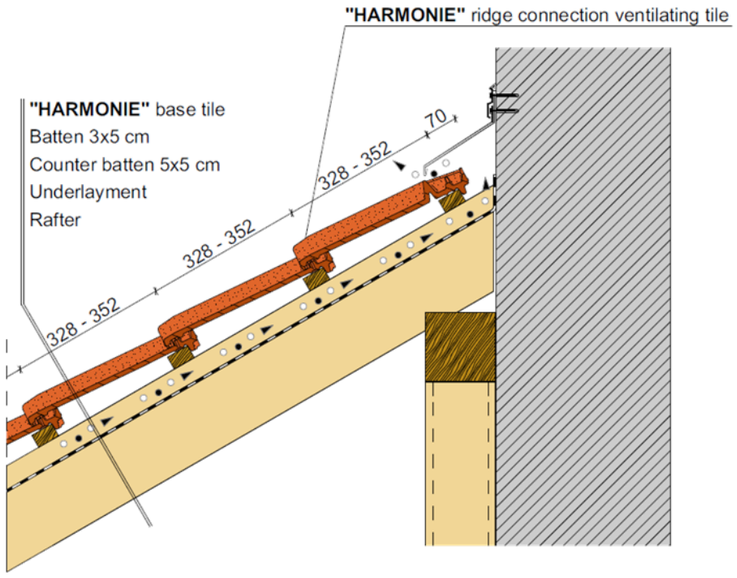
Closed eave detail



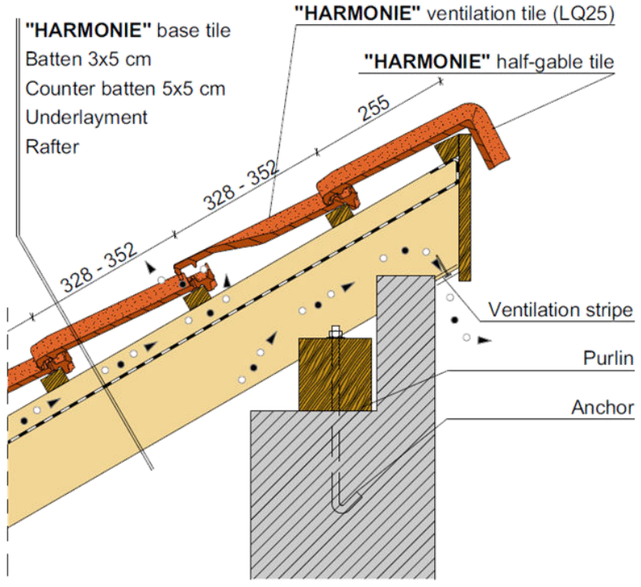
Ridge detail, with ventilation tile



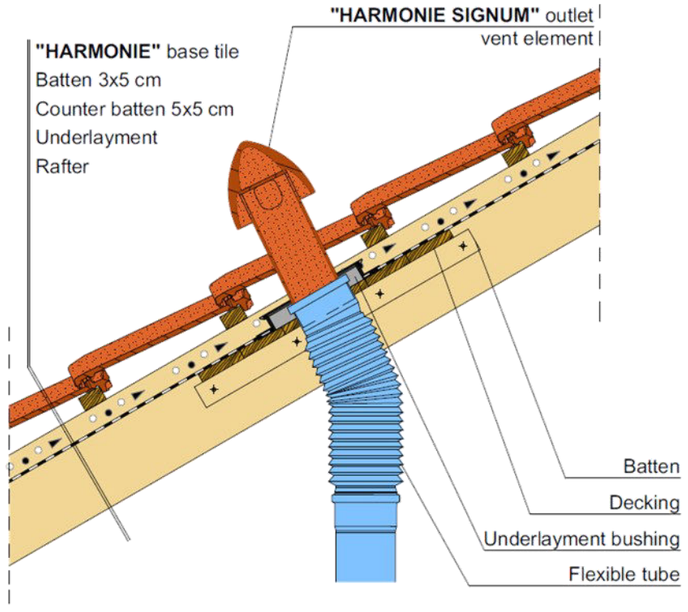
Ridge detail, with ridge connection ventilation tile



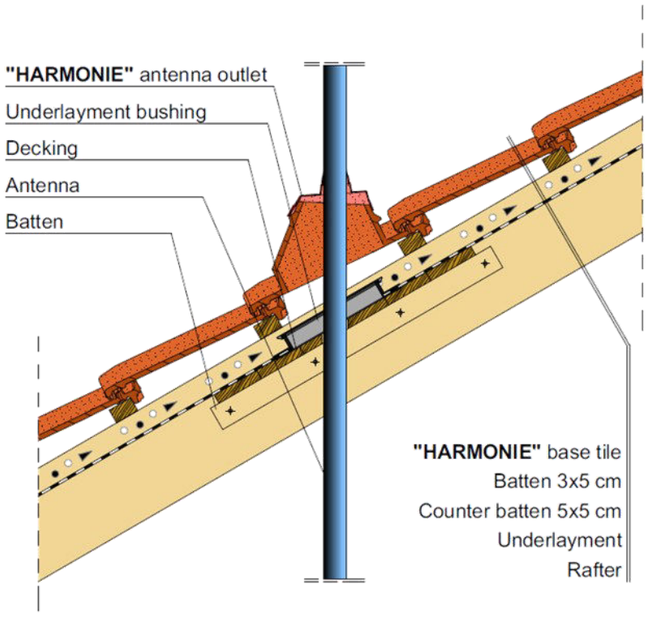
Wall connection detail



Shed ridge detail, with shad roof tile

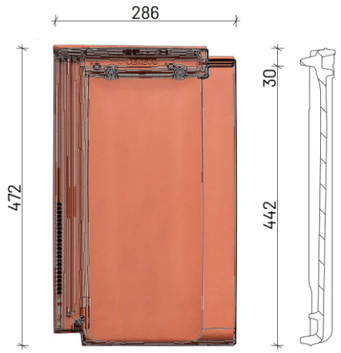


Clay ventilation outlet tile



Clay antenna outlet tile

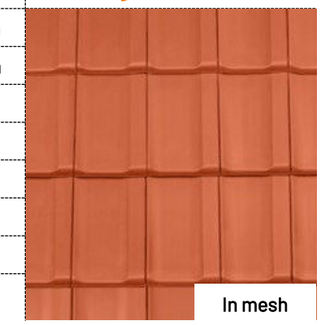
GENEVO®



Product datas

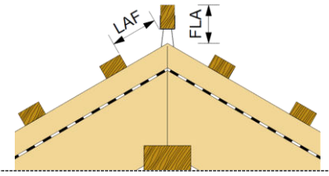
Size	width:	285 mm
	length:	470 mm
	height:	42 mm
	thickness:	9 mm
Weight:		4,1 kg
Packaging	bundle:	4 pcs
	pallet:	256 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance[1]	315 mm	362 mm	410 mm
Covering width	246 mm	247 mm	249 mm
Consumption	12,9 pcs/m²	11,2 pcs/m²	9,8 pcs/m²
Covering type		single cover	
Covering width		44,6 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

LB ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	70	65	60	55	55	50	50	50	45	30	✖
FLA [mm]	125	115	105	95	85	80	65	55	50	50	✖

LB ridge tile and 40x60 batten

LAF [mm]	70	65	55	50	50	45	40	40	35	15	10
FLA [mm]	135	125	115	110	100	90	80	70	65	70	70

LR ridge tile and 30x50 batten

LAF [mm]	70	65	60	55	55	50	50	45	40	✖	✖
FLA [mm]	120	110	105	90	80	75	65	55	50	✖	✖

LR ridge tile and 40x60 batten

LAF [mm]	70	65	55	50	50	45	40	35	30	10	✖
FLA [mm]	130	120	115	105	95	85	75	70	65	70	✖

Underlayment requirement

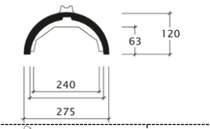
Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

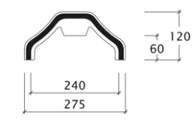
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

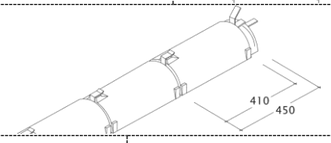
[1] *The corner of the verge tile must be cut between 315-380 mm batten distances!*

"LB" ridge tile 2,5 pcs/m



"LR" ridge tile 2,5 pcs/m





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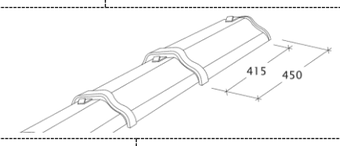


"LB" hip starter	"LB" hip starter, shell shape	3 axis hip cap	"LR" hip starter	"LR" hip starter, shell shape
				
„LB" hip starter, rounded	„LB" closing plate	4 axis hip cap	"LR" closing plate	
				

Clay accessories

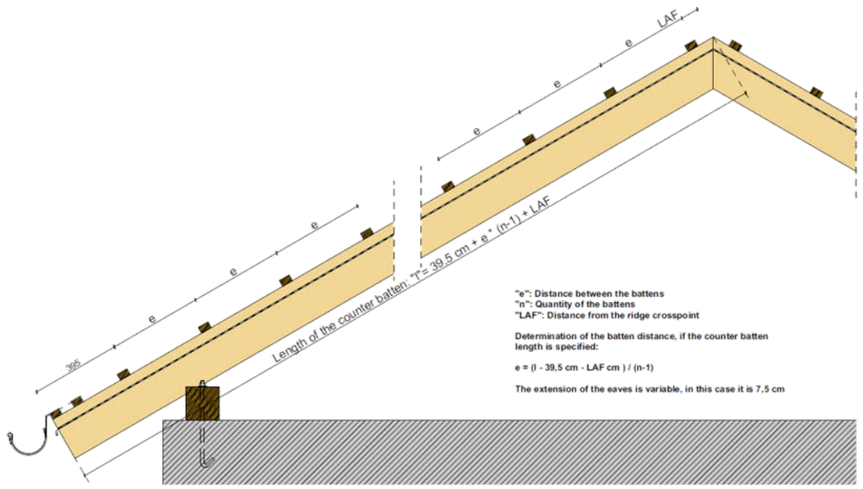
	Size	Quantity
Verge tile - left	285x470	2,8 pcs/m
Verge tile - right	285x470	2,8 pcs/m
Double wave tile	285x470	2,8 pcs/m
Ventilation tile LQ 34	285x470	as required
Ridge connection ventilation tile	285x470	4,0 pcs/m
Ridge conn. vent. verge tl. left	285x470	as needed
Ridge conn. vent. verge tl. right	285x470	as needed

Clay outlets

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

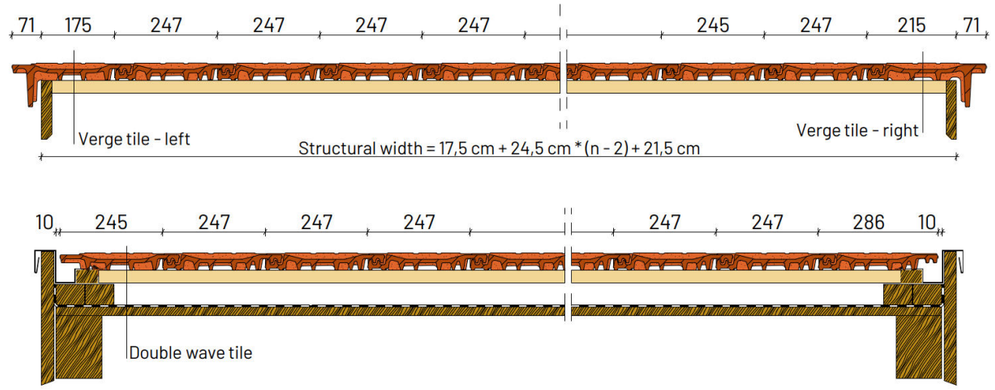
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 70 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "GENEVO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "LB" ridge tile and 30x50 mm roof battens, LAF = 55 mm		
Number of battens	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
(n)	315 mm	362 mm	410 mm
10	3 243	3 666	4 098
11	3 558	4 028	4 508
12	3 873	4 390	4 918
13	4 188	4 752	5 328
14	4 503	5 114	5 738
15	4 818	5 476	6 148
16	5 133	5 838	6 558
17	5 448	6 200	6 968
18	5 763	6 562	7 378
19	6 078	6 924	7 788
20	6 393	7 286	8 198
21	6 708	7 648	8 608
22	7 023	8 010	9 018
23	7 338	8 372	9 428
24	7 653	8 734	9 838
25	7 968	9 096	10 248
26	8 283	9 458	10 658
27	8 598	9 820	11 068
28	8 913	10 182	11 478
29	9 228	10 544	11 888
30	9 543	10 906	12 298
31	9 858	11 268	12 708
32	10 173	11 630	13 118
33	10 488	11 992	13 528
34	10 803	12 354	13 938
35	11 118	12 716	14 348
36	11 433	13 078	14 758
37	11 748	13 440	15 168
38	12 063	13 802	15 578
39	12 378	14 164	15 988
40	12 693	14 526	16 398



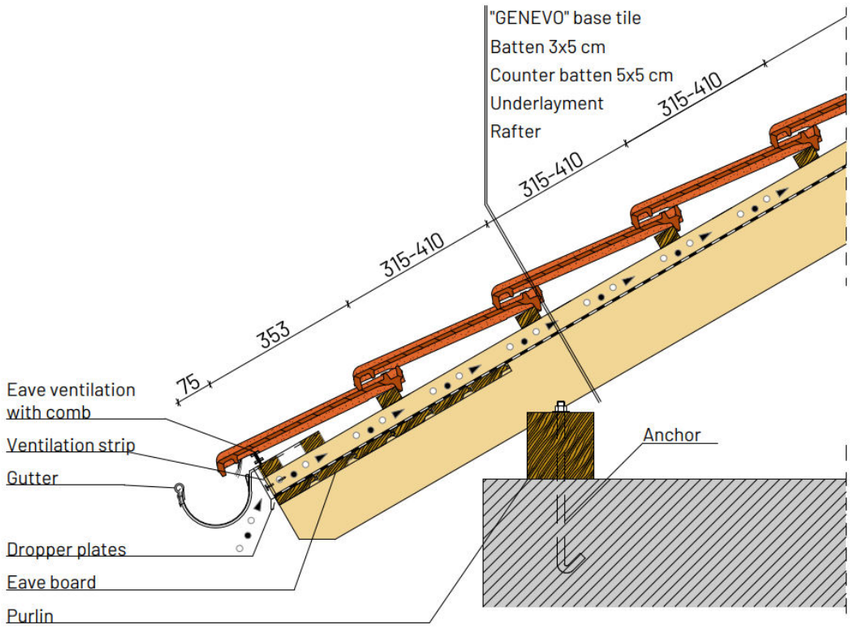
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	0	247	-	390	-	637	-	884	-
10	2 366	-	2 613	-	2 860	-	3 107	-	3 354	-
20	4 836	-	5 083	-	5 330	-	5 577	-	5 824	-
30	7 306	-	7 553	-	7 800	-	8 047	-	8 294	-
40	9 776	-	10 023	-	10 270	-	10 517	-	10 764	-
50	12 246	-	12 493	-	12 740	-	12 987	-	13 234	-
60	14 716	-	14 963	-	15 210	-	15 457	-	15 704	-
70	17 186	-	17 433	-	17 680	-	17 927	-	18 174	-
80	19 656	-	19 903	-	20 150	-	20 397	-	20 644	-
90	22 126	-	22 373	-	22 620	-	22 867	-	23 114	-
100	24 596	-	24 843	-	25 090	-	25 337	-	25 584	-

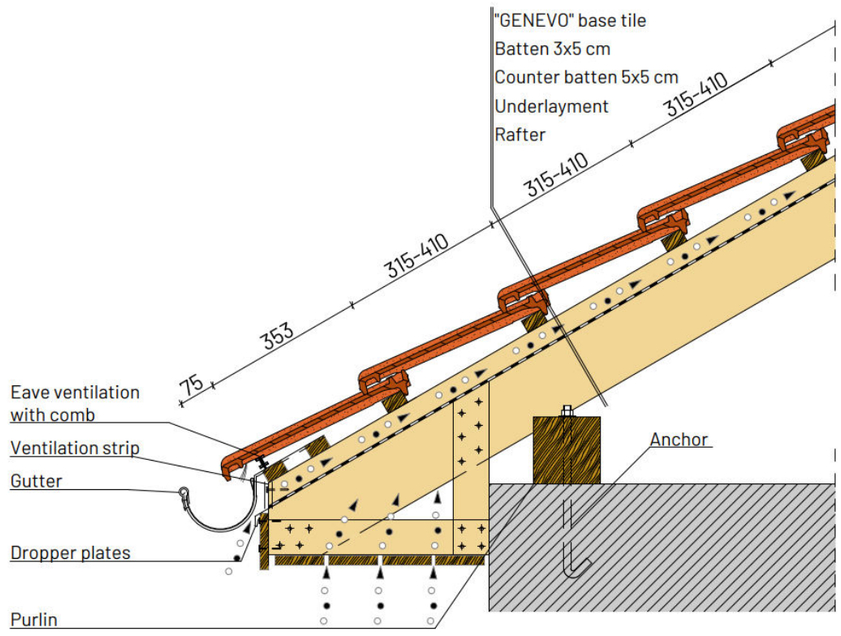
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 131	-	1 378	-	1 625	-	1 872	-	2 119	-
10	3 601	-	3 848	-	4 095	-	4 342	-	4 589	-
20	6 071	-	6 318	-	6 565	-	6 812	-	7 059	-
30	8 541	-	8 788	-	9 035	-	9 282	-	9 529	-
40	11 011	-	11 258	-	11 505	-	11 752	-	11 999	-
50	13 481	-	13 728	-	13 975	-	14 222	-	14 469	-
60	15 951	-	16 198	-	16 445	-	16 692	-	16 939	-
70	18 421	-	18 668	-	18 915	-	19 162	-	19 409	-
80	20 891	-	21 138	-	21 385	-	21 632	-	21 879	-
90	23 361	-	23 608	-	23 855	-	24 102	-	24 349	-
100	25 831	-	26 078	-	26 325	-	26 572	-	26 819	-

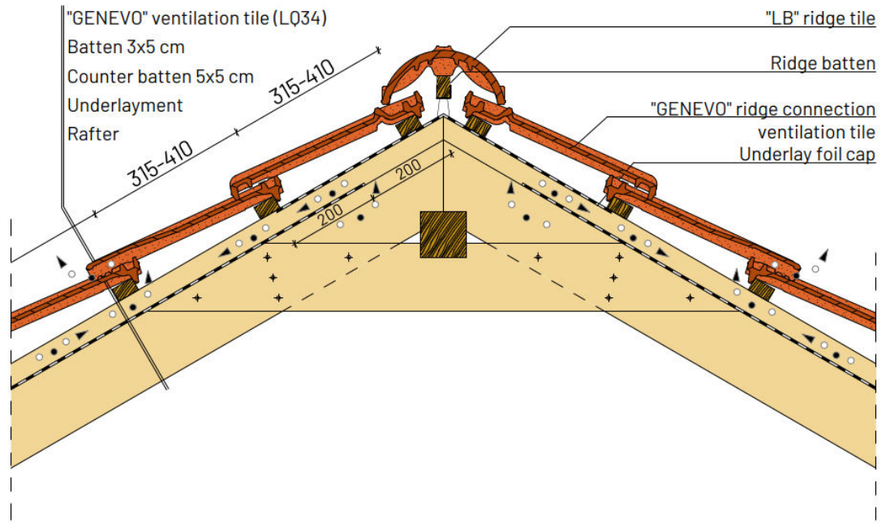
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



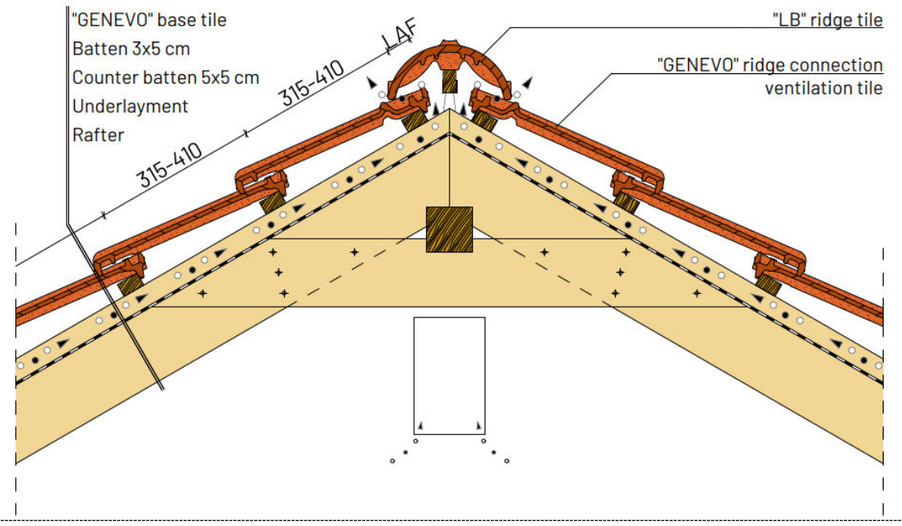
Eave detail



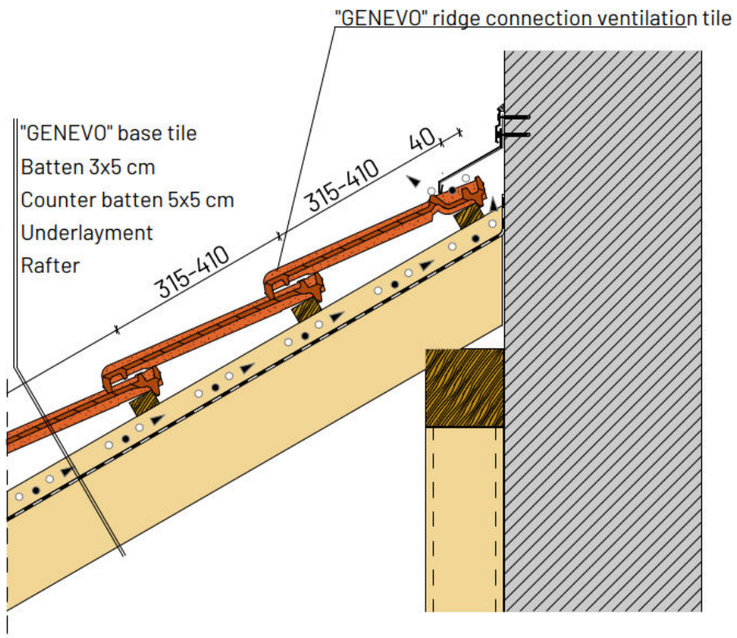
Closed eave detail



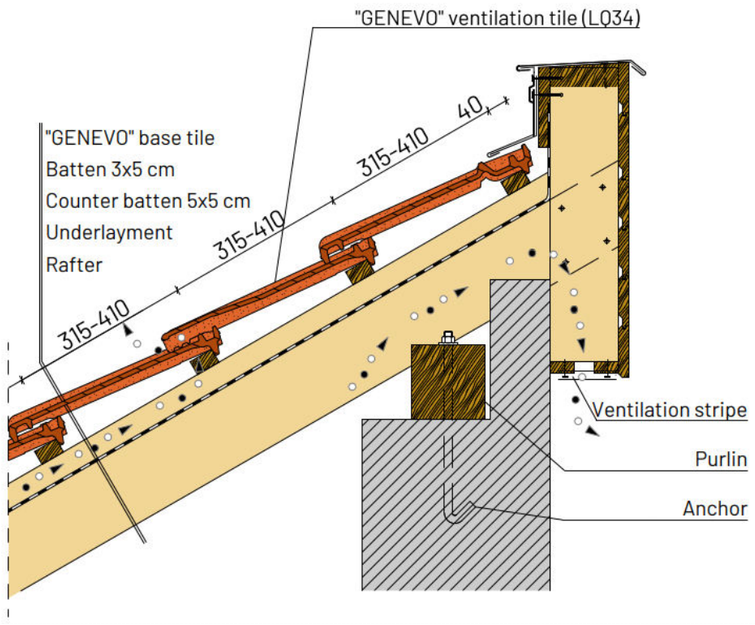
Ridge detail, with ventilation tile



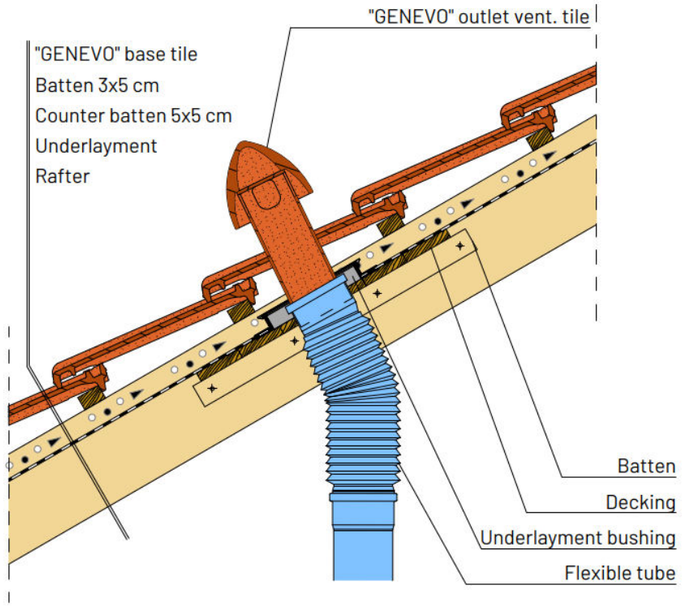
Ridge detail, with ridge connection ventilation tile



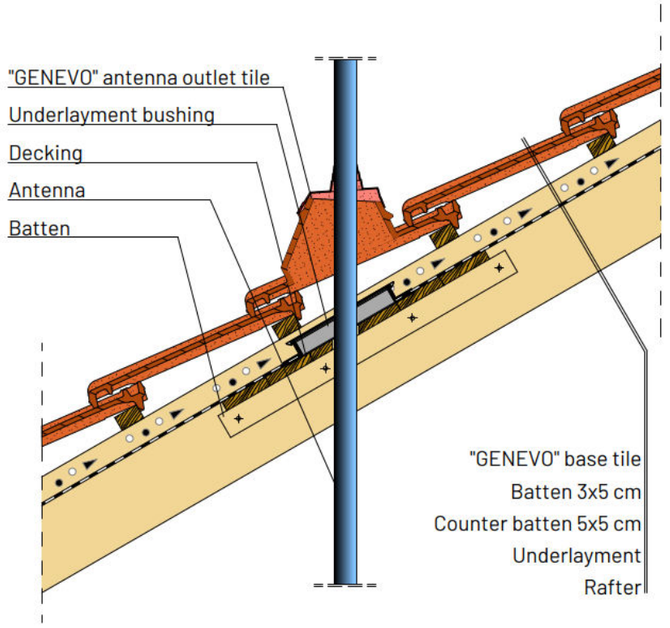
Wall connection detail



Shed ridge detail, with shad roof tile

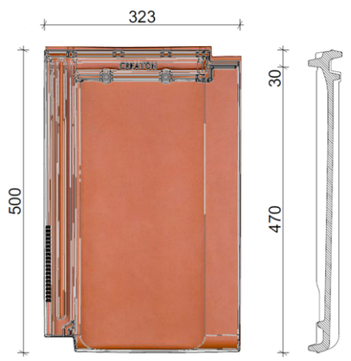


Clay ventilation outlet tile



Clay antenna outlet tile

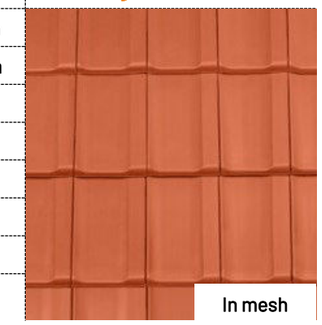
NOMINA®



Product datas

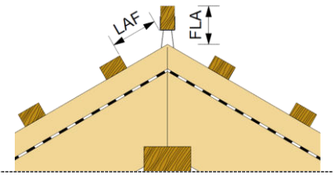
Size	width:	323 mm
	length:	500 mm
	height:	42 mm
	thickness:	9 mm
Weight:		5,9 kg
Packaging	bundle:	4 pcs
	pallet:	192 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	370 mm[1]	402 mm	435 mm
Covering width	277 mm	278 mm	280 mm
Consumption	9,7 pcs/m²	8,9 pcs/m²	8,2 pcs/m²
Covering type		single cover	
Covering width		53,1 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

LB ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	80	75	70	65	60	60	60	60	50	✘	✘
FLA [mm]	120	110	100	90	80	70	60	50	45	✘	✘

LB ridge tile and 40x60 batten

LAF [mm]	75	70	65	60	55	50	50	45	35	✘	✘
FLA [mm]	125	120	110	100	95	85	75	65	60	✘	✘

LR ridge tile and 30x50 batten

LAF [mm]	80	75	70	65	60	60	60	60	50	✘	✘
FLA [mm]	120	110	100	90	80	70	60	50	45	✘	✘

LR ridge tile and 40x60 batten

LAF [mm]	75	70	65	60	55	50	50	45	35	✘	✘
FLA [mm]	125	120	110	100	95	85	75	65	60	✘	✘

Underlayment requirement

Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

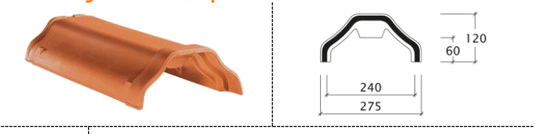
Required batten dimensions

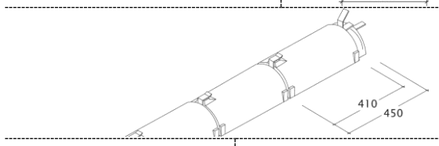
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

[2] *The corner of the verge tile must be cut when using short batten distances!*

"LB" ridge tile 2,5 pcs/m

"LR" ridge tile 2,5 pcs/m





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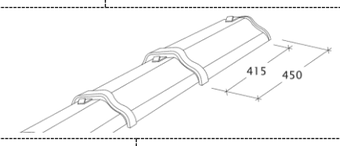


"LB" hip starter	"LB" hip starter, shell shape	3 axis hip cap	"LR" hip starter	"LR" hip starter, shell shape
				

„LB" hip starter, rounded	„LB" closing plate	4 axis hip cap	"LR" closing plate
			

Clay accessories

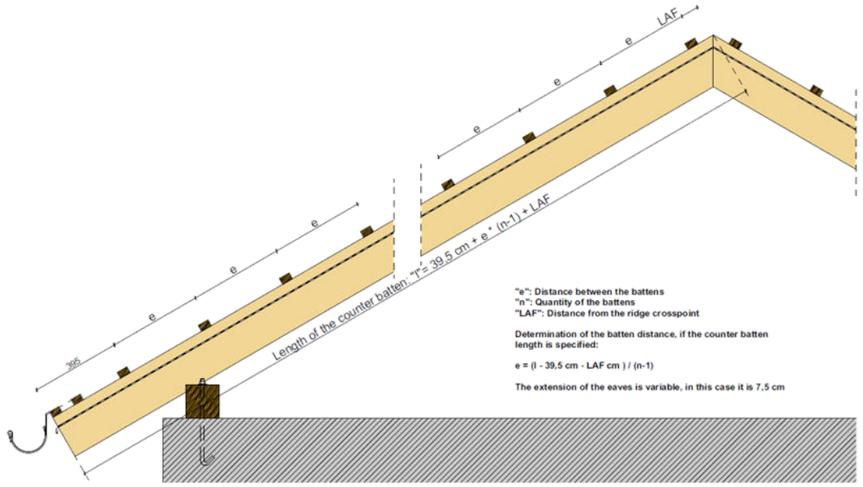
	Size	Quantity
Verge tile - left	323x500	2,5 pcs/m
Verge tile - right	323x500	2,5 pcs/m
Double wave tile	323x500	2,5 pcs/m
Ventilation tile LQ 37,5	323x500	as required
Ridge connection ventilation tile	323x500	3,6 pcs/m
Ridge conn. vent. verge tl. left	323x500	as needed
Ridge conn. vent. verge tl. right	323x500	as needed

Clay outlets

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

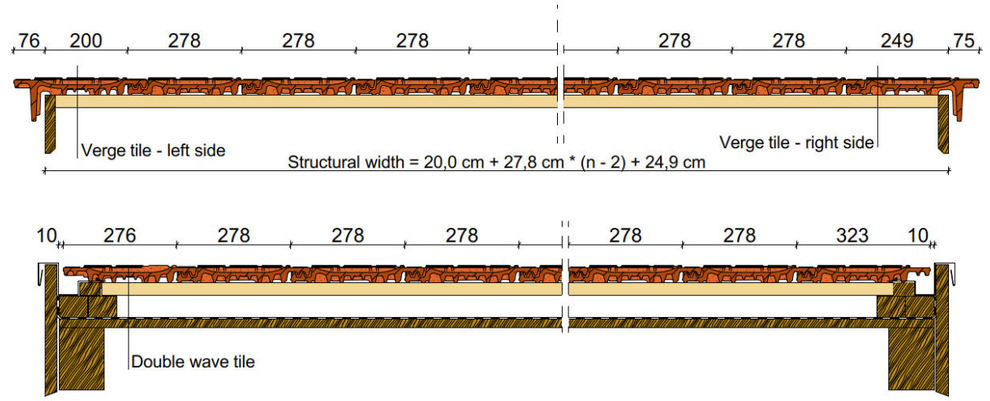
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 70 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "NOMINA" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "LB" ridge tile and 30x50 mm roof battens, LAF = 60 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	370 mm	402 mm	435 mm
10	3 785	4 073	4 370
11	4 155	4 475	4 805
12	4 525	4 877	5 240
13	4 895	5 279	5 675
14	5 265	5 681	6 110
15	5 635	6 083	6 545
16	6 005	6 485	6 980
17	6 375	6 887	7 415
18	6 745	7 289	7 850
19	7 115	7 691	8 285
20	7 485	8 093	8 720
21	7 855	8 495	9 155
22	8 225	8 897	9 590
23	8 595	9 299	10 025
24	8 965	9 701	10 460
25	9 335	10 103	10 895
26	9 705	10 505	11 330
27	10 075	10 907	11 765
28	10 445	11 309	12 200
29	10 815	11 711	12 635
30	11 185	12 113	13 070
31	11 555	12 515	13 505
32	11 925	12 917	13 940
33	12 295	13 319	14 375
34	12 665	13 721	14 810
35	13 035	14 123	15 245
36	13 405	14 525	15 680
37	13 775	14 927	16 115
38	14 145	15 329	16 550
39	14 515	15 731	16 985
40	14 885	16 133	17 420



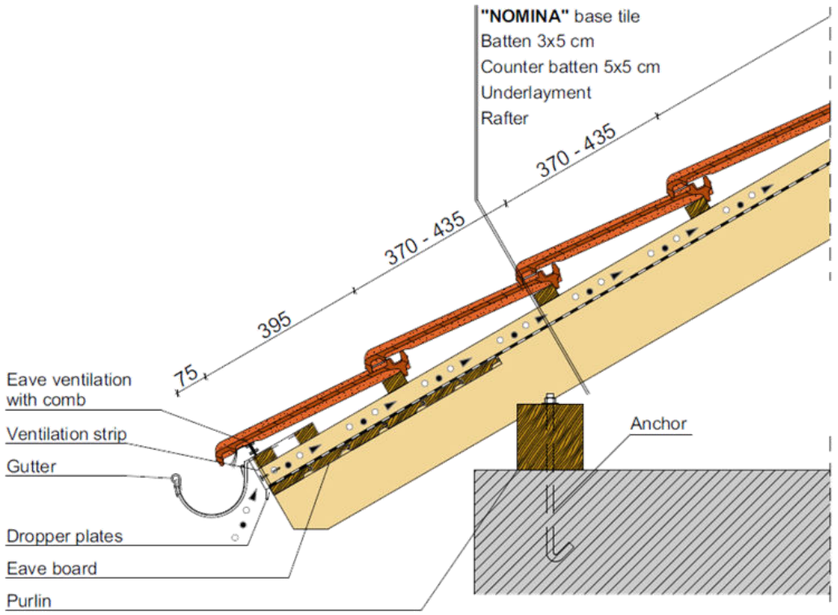
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	-	278	-	465	-	743	-	1 021	-
10	2 689	-	2 967	-	3 245	-	3 523	-	3 801	-
20	5 469	-	5 747	-	6 025	-	6 303	-	6 581	-
30	8 249	-	8 527	-	8 805	-	9 083	-	9 361	-
40	11 029	-	11 307	-	11 585	-	11 863	-	12 141	-
50	13 809	-	14 087	-	14 365	-	14 643	-	14 921	-
60	16 589	-	16 867	-	17 145	-	17 423	-	17 701	-
70	19 369	-	19 647	-	19 925	-	20 203	-	20 481	-
80	22 149	-	22 427	-	22 705	-	22 983	-	23 261	-
90	24 929	-	25 207	-	25 485	-	25 763	-	26 041	-
100	27 709	-	27 987	-	28 265	-	28 543	-	28 821	-

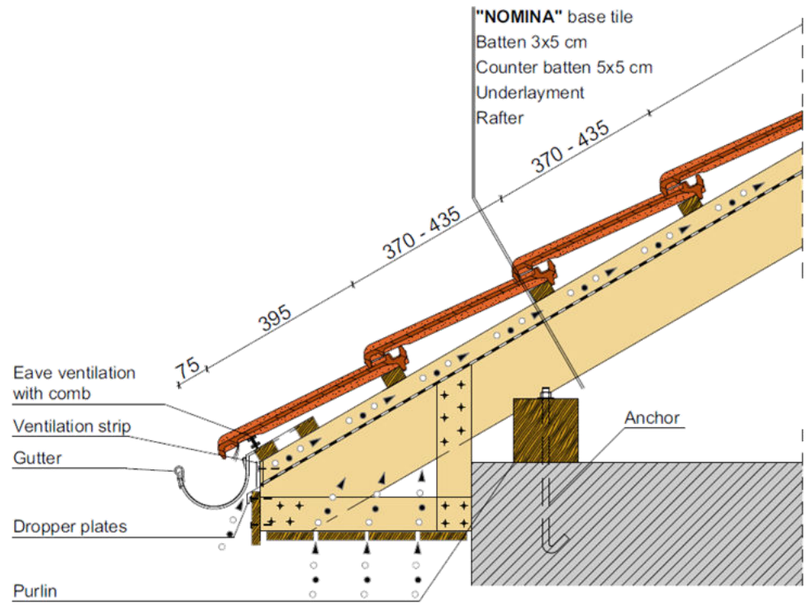
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 299	-	1 577	-	1 855	-	2 133	-	2 411	-
10	4 079	-	4 357	-	4 635	-	4 913	-	5 191	-
20	6 859	-	7 137	-	7 415	-	7 693	-	7 971	-
30	9 639	-	9 917	-	10 195	-	10 473	-	10 751	-
40	12 419	-	12 697	-	12 975	-	13 253	-	13 531	-
50	15 199	-	15 477	-	15 755	-	16 033	-	16 311	-
60	17 979	-	18 257	-	18 535	-	18 813	-	19 091	-
70	20 759	-	21 037	-	21 315	-	21 593	-	21 871	-
80	23 539	-	23 817	-	24 095	-	24 373	-	24 651	-
90	26 319	-	26 597	-	26 875	-	27 153	-	27 431	-
100	29 099	-	29 377	-	29 655	-	29 933	-	30 211	-

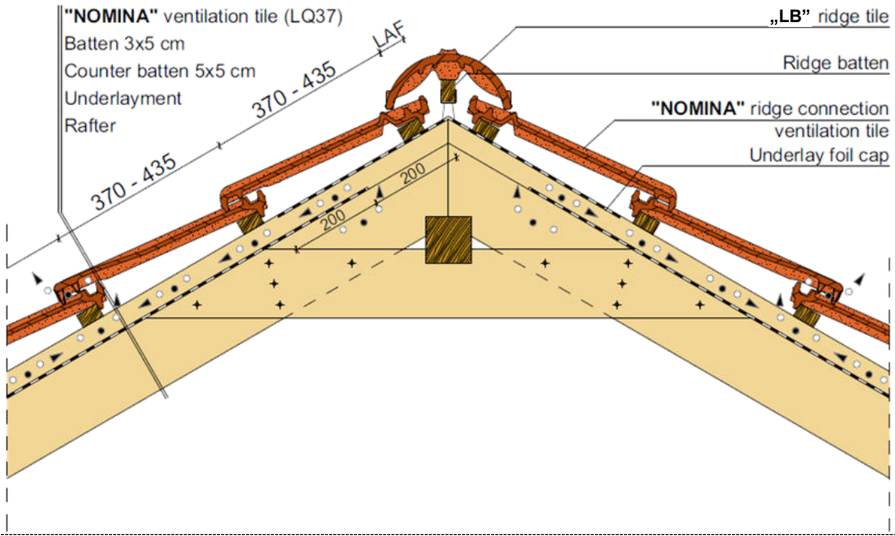
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



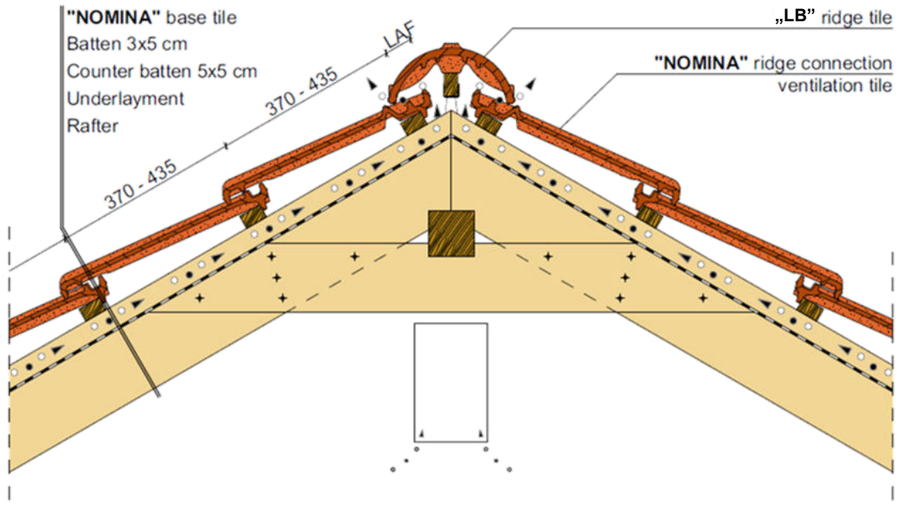
Eave detail



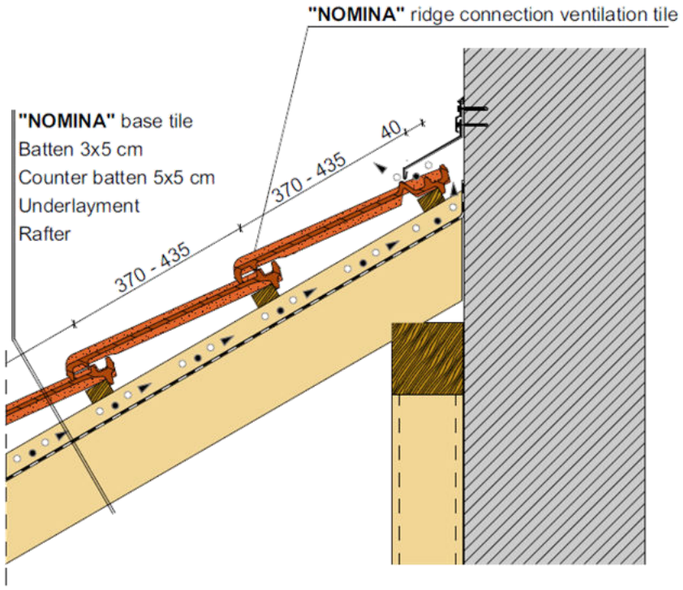
Closed eave detail



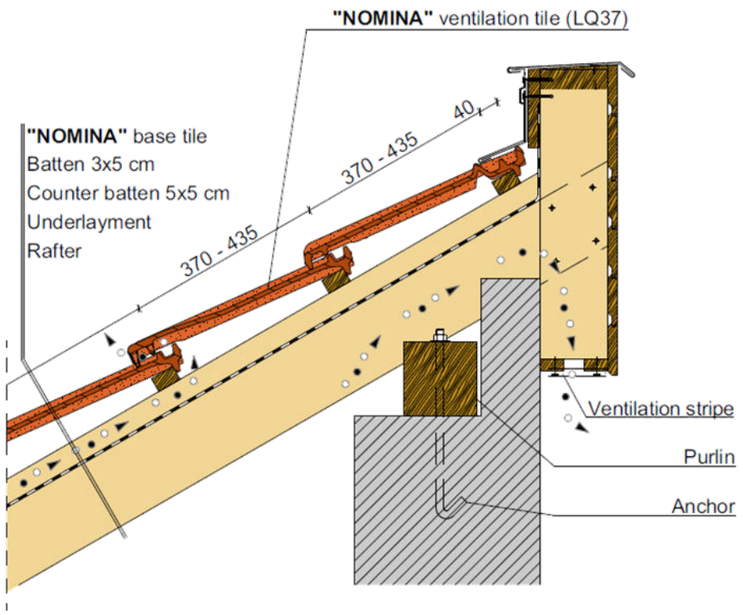
Ridge detail, with ventilation tile



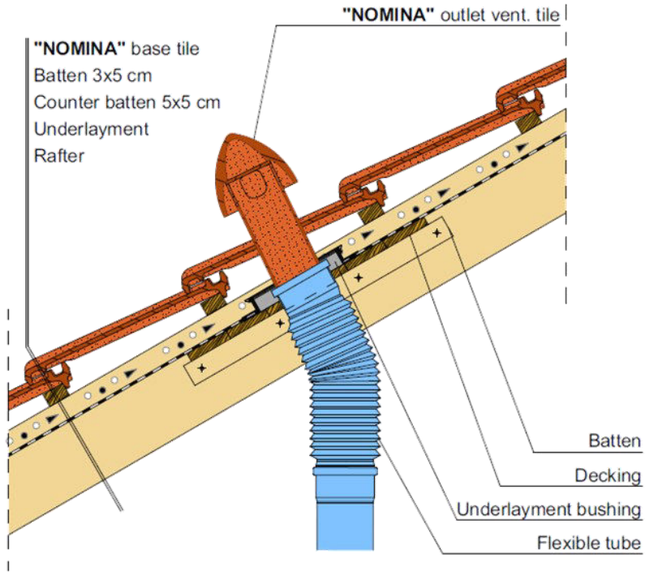
Ridge detail, with ridge connection ventilation tile



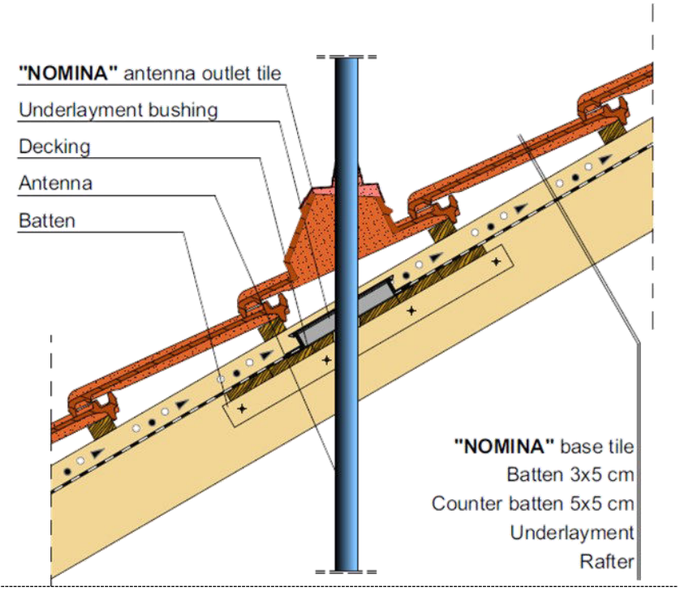
Wall connection detail



Shed ridge detail, with shad roof tile

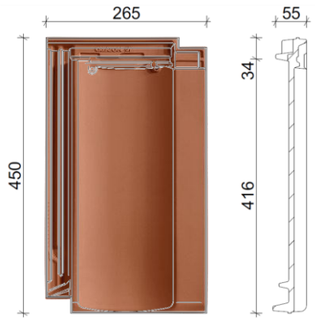


Clay ventilation outlet tile



Clay antenna outlet tile

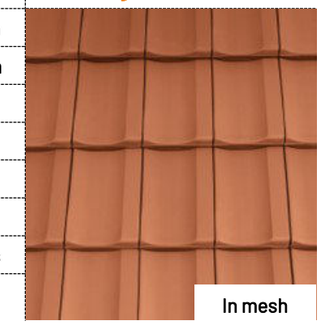
CANTUS®



Product datas

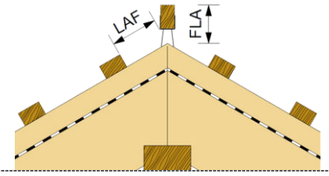
Size	width:	265 mm
	length:	450 mm
	height:	55 mm
	thickness:	10 mm
Weight:		3,55 kg
Packaging	bundle:	5 pcs
	pallet:	240 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	348 mm	366 mm	384 mm
Covering width	222 mm	223 mm	224 mm
Consumption	12,9 pcs/m²	12,3 pcs/m²	11,8 pcs/m²
Covering type		single cover	
Covering width		44,4 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PP ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	70	65	60	55	50	45	40	35	35	30	20
FLA [mm]	105	100	90	85	80	70	65	60	50	45	45

PP ridge tile and 40x60 batten

LAF [mm]	70	65	60	50	45	40	35	25	20	15	5
FLA [mm]	115	110	100	95	90	80	75	70	60	55	55

PHP ridge tile and 30x50 batten

LAF [mm]	60	55	55	50	40	35	30	20	15	10	✖
FLA [mm]	110	105	95	90	85	80	75	70	65	60	✖

PHP ridge tile and 40x60 batten

LAF [mm]	60	55	55	45	35	30	25	10	5	✖	✖
FLA [mm]	120	115	105	100	95	90	85	80	75	✖	✖

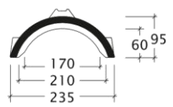
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

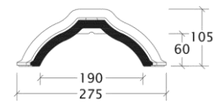
Required batten dimensions

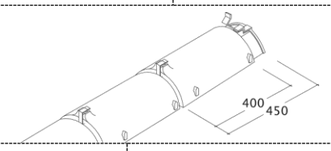
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

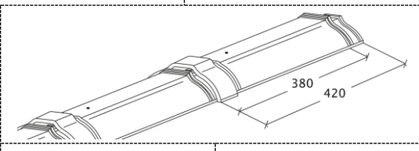
"PP" ridge tile 2,5 pcs/m



"PHP" ridge tile 2,6 pcs/m







"PP" hip starter	"PP" hip starter, shell shape	3 axis hip cap	"PHP" hip starter	"PHP" hip starter, shell shape
				
„PP" funct. closing plate	„PP" closing plate	4 axis hip cap	"PHP" funct. closing plate	
				

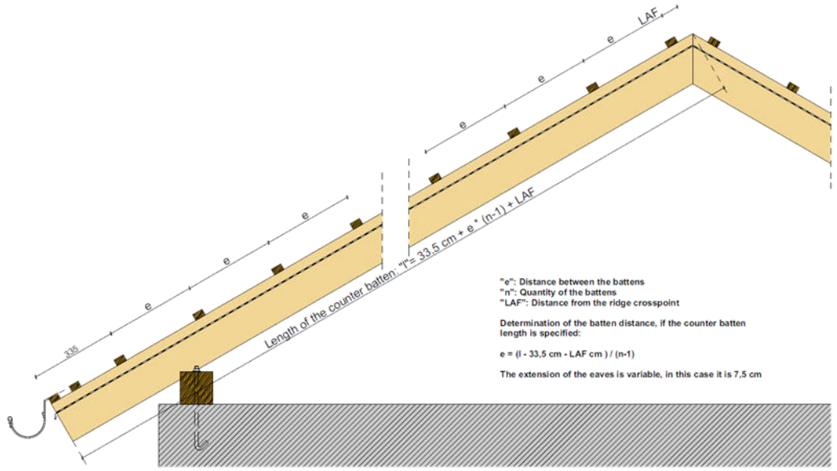
Clay accessories	Size	Quantity
Verge tile - left	266x450	2,8 pcs/m
Verge tile - right	265x450	2,8 pcs/m
Double wave tile	266x450	2,8 pcs/m
Ventilation tile LQ 27	265x450	as required
Ridge connection ventilation tile	265x450	4,5 pcs/m
Ridge conn. vent. verge tl. left	266x450	as needed
Ridge conn. vent. verge tl. right	265x450	as needed
Double wave ridge connection tile	269x450	as needed

Clay accessories	Size	Quantity
Shed roof tile	250x365-	4,5 pcs/m
Shed roof verge tile – left	266x365	as needed
Shed roof verge tile – right	250x365-	as needed
Mansard tile	-	4,5 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

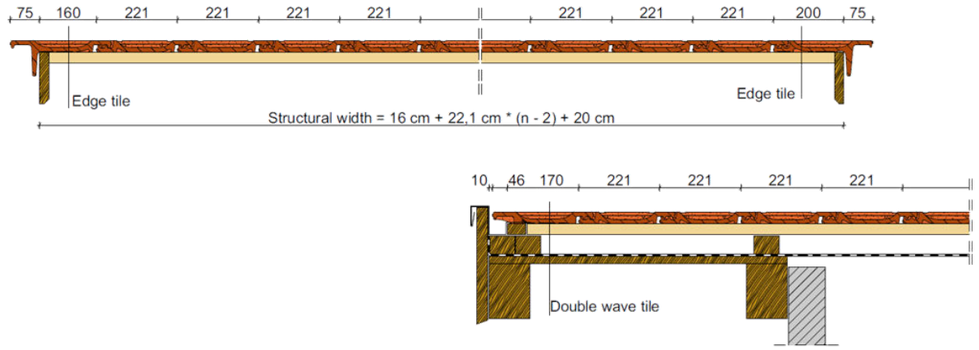
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 60 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "CANTUS" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PP" ridge tile and 30x50 mm roof battens, LAF = 50 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
10	3 517	3 679	3 841
11	3 865	4 045	4 225
12	4 213	4 411	4 609
13	4 561	4 777	4 993
14	4 909	5 143	5 377
15	5 257	5 509	5 761
16	5 605	5 875	6 145
17	5 953	6 241	6 529
18	6 301	6 607	6 913
19	6 649	6 973	7 297
20	6 997	7 339	7 681
21	7 345	7 705	8 065
22	7 693	8 071	8 449
23	8 041	8 437	8 833
24	8 389	8 803	9 217
25	8 737	9 169	9 601
26	9 085	9 535	9 985
27	9 433	9 901	10 369
28	9 781	10 267	10 753
29	10 129	10 633	11 137
30	10 477	10 999	11 521
31	10 825	11 365	11 905
32	11 173	11 731	12 289
33	11 521	12 097	12 673
34	11 869	12 463	13 057
35	12 217	12 829	13 441
36	12 565	13 195	13 825
37	12 913	13 561	14 209
38	13 261	13 927	14 593
39	13 609	14 293	14 977
40	13 957	14 659	15 361



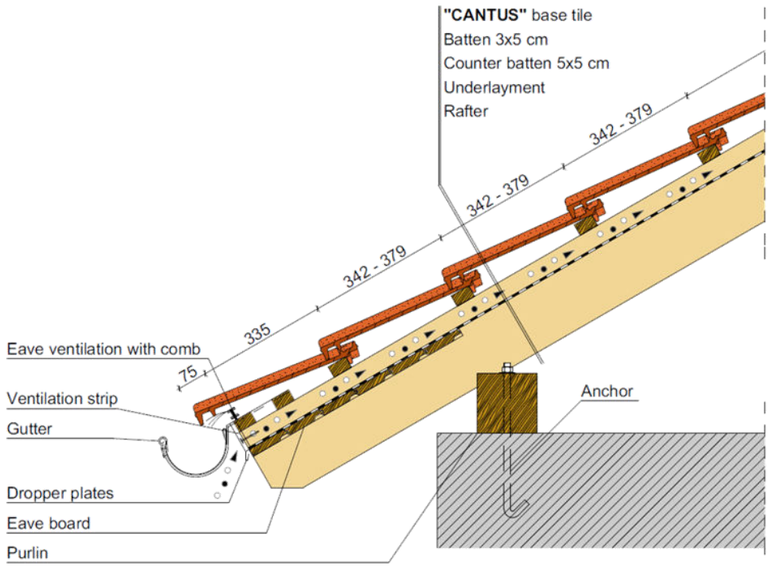
Structx0ural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	-	223	-	340	-	563	-	786	-
10	2 124	-	2 347	-	2 570	-	2 793	-	3 016	-
20	4 354	-	4 577	-	4 800	-	5 023	-	5 246	-
30	6 584	-	6 807	-	7 030	-	7 253	-	7 476	-
40	8 814	-	9 037	-	9 260	-	9 483	-	9 706	-
50	11 044	-	11 267	-	11 490	-	11 713	-	11 936	-
60	13 274	-	13 497	-	13 720	-	13 943	-	14 166	-
70	15 504	-	15 727	-	15 950	-	16 173	-	16 396	-
80	17 734	-	17 957	-	18 180	-	18 403	-	18 626	-
90	19 964	-	20 187	-	20 410	-	20 633	-	20 856	-
100	22 194	-	22 417	-	22 640	-	22 863	-	23 086	-

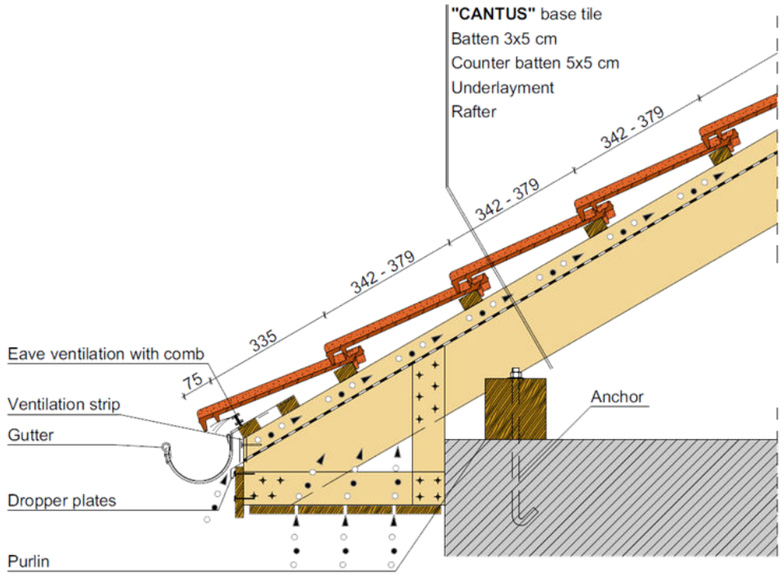
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 009	-	1 232	-	1 455	-	1 678	-	1 901	-
10	3 239	-	3 462	-	3 685	-	3 908	-	4 131	-
20	5 469	-	5 692	-	5 915	-	6 138	-	6 361	-
30	7 699	-	7 922	-	8 145	-	8 368	-	8 591	-
40	9 929	-	10 152	-	10 375	-	10 598	-	10 821	-
50	12 159	-	12 382	-	12 605	-	12 828	-	13 051	-
60	14 389	-	14 612	-	14 835	-	15 058	-	15 281	-
70	16 619	-	16 842	-	17 065	-	17 288	-	17 511	-
80	18 849	-	19 072	-	19 295	-	19 518	-	19 741	-
90	21 079	-	21 302	-	21 525	-	21 748	-	21 971	-
100	23 309	-	23 532	-	23 755	-	23 978	-	24 201	-

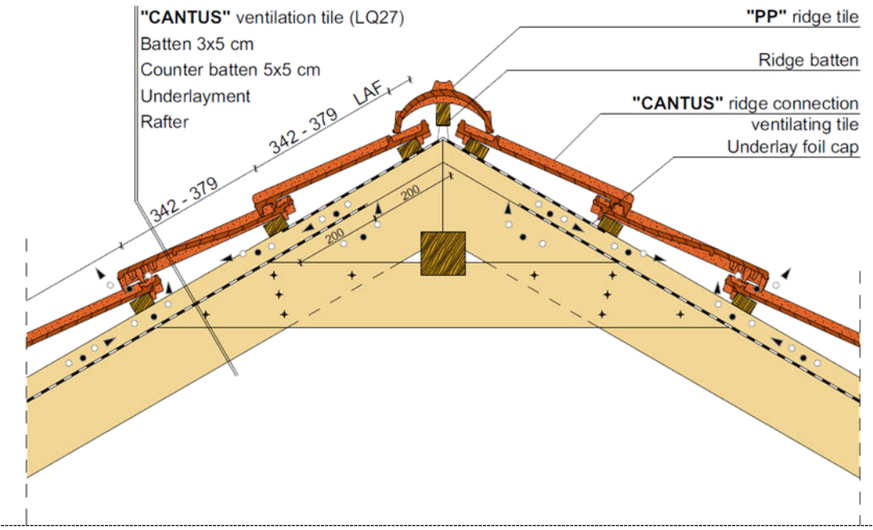
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



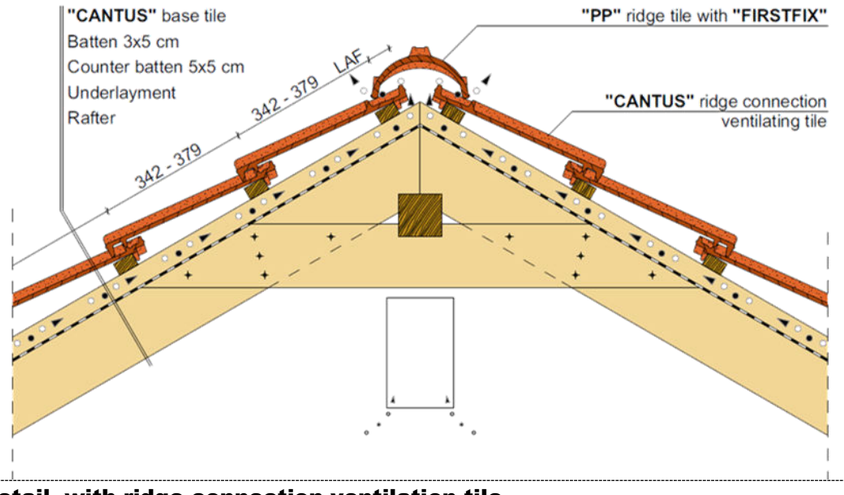
Eave detail



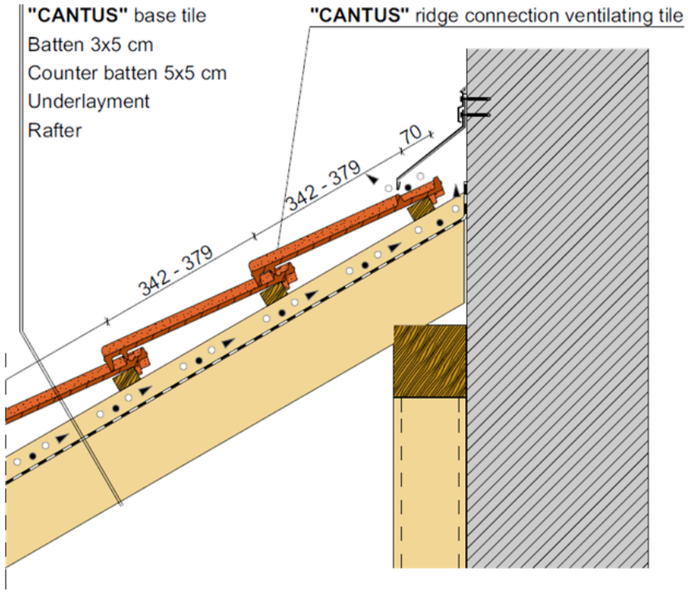
Closed eave detail



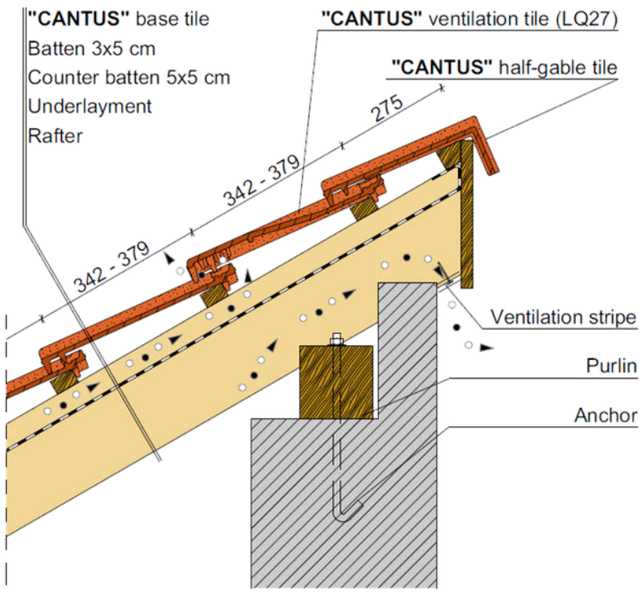
Ridge detail, with ventilation tile



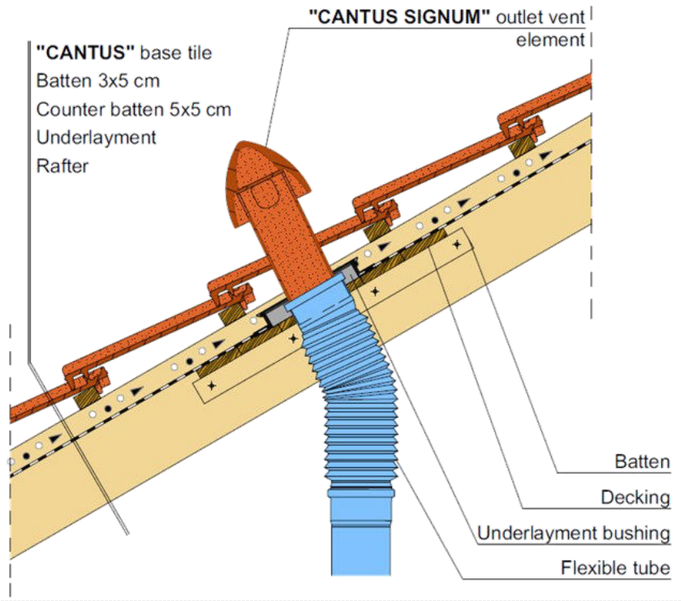
Ridge detail, with ridge connection ventilation tile



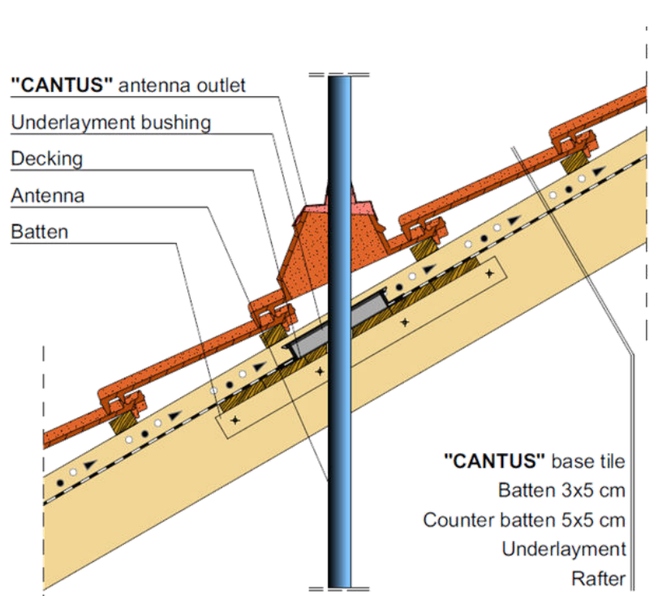
Wall connection detail



Shed ridge detail, with shad roof tile

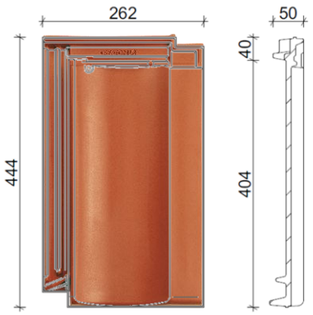


Clay ventilation outlet tile



Clay antenna outlet tile

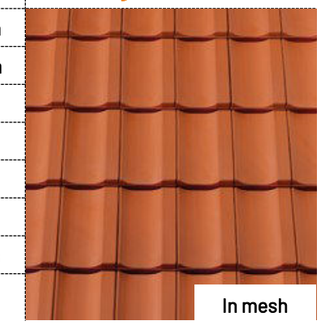
OPTIMA®



Product datas

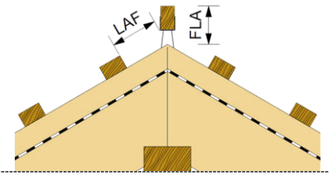
Size	width:	262 mm
	length:	444 mm
	height:	50 mm
	thickness:	10 mm
Weight:		4,9 kg
Packaging	bundle:	6 pcs
	pallet:	288 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	330/350 mm[1]	355 mm	380 mm
Covering width	221 mm	222 mm	223 mm
Consumption	13,7 pcs/m²	12,8 pcs/m²	11,9 pcs/m²
Covering type		single cover	
Covering width		42,2 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PH ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	✘	60	55	50	45	45	40	35	35	✘	✘
FLA [mm]	✘	90	80	75	70	55	55	50	50	✘	✘

PH ridge tile and 40x60 batten

LAF [mm]	✘	✘	55	45	40	40	35	25	20	✘	✘
FLA [mm]	✘	✘	90	85	80	65	65	60	60	✘	✘

PV ridge tile and 30x50 batten

LAF [mm]	✘	60	60	60	55	55	45	45	45	40	40
FLA [mm]	✘	90	80	75	65	60	50	45	35	35	35

PV ridge tile and 40x60 batten

LAF [mm]	✘	✘	60	55	50	50	40	35	30	30	30
FLA [mm]	✘	✘	90	85	75	70	60	55	45	45	45

Underlayment requirement

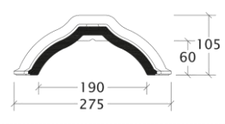
Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

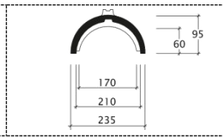
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

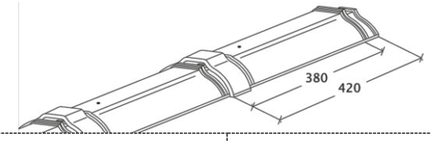
1.) The corner of the verge tile must be cut when using short batten distances

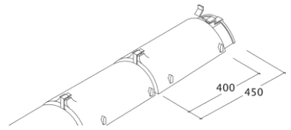
"PH" ridge tile 2,6 pcs/m



"PV" ridge tile 2,5 pcs/m







"PH" hip starter	„PH" hip starter, rounded	3 axis hip cap	"PV" hip starter	„PV" hip starter, rounded
				
"PH" funct. closing plate	„PH" closing plate	4 axis hip cap	"PV"funct. closing plate	"PV" closing plate
				

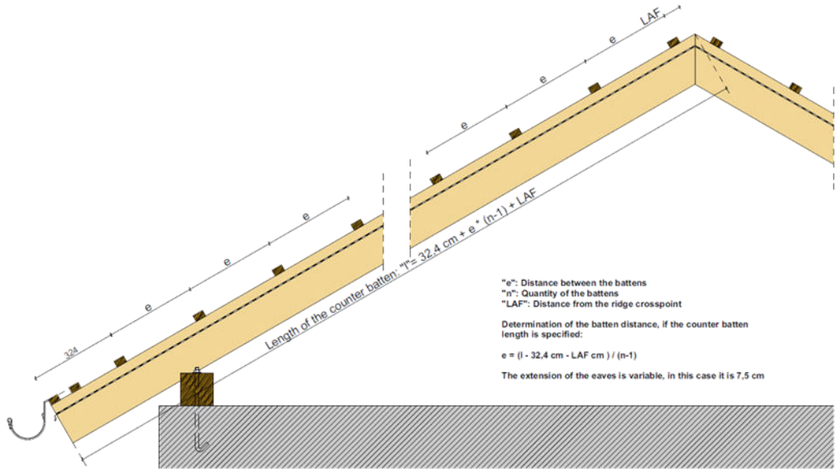
Clay accessories	Size	Quantity
Half tile	151x444	as needed
Verge tile - left	275x444	2,8 pcs/m
Verge tile - right	262x444	2,8 pcs/m
Double wave tile	275x444	2,8 pcs/m
Ventilation tile LQ 25	262x444	as required
Ridge connection ventilation tile	262x444	4,5 pcs/m
Ridge connection vent. half tile	151x444	as needed
Ridge conn. vent. verge tl. left	275x444	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	262x444	as needed
Double wave ridge connection tile	275x444	as needed
Shed roof tile	262x375	4,5 pcs/m
Shed roof half tile	151x375	as needed
Shed roof verge tile – left	275x375	as needed
Shed roof verge tile – right	262x375	as needed
Mansard tile	-	4,5 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

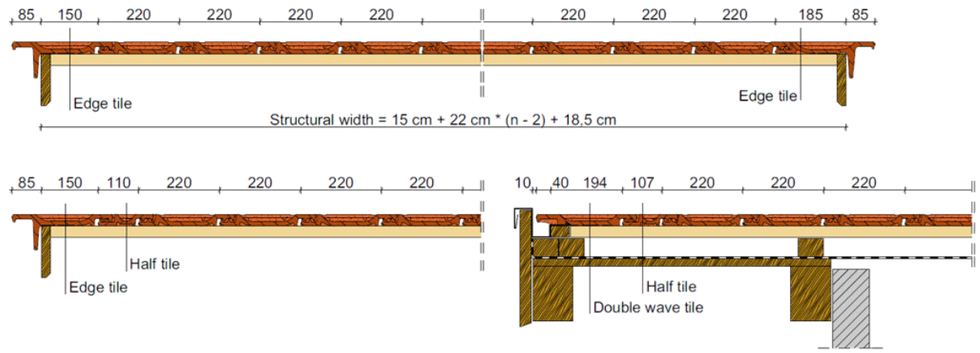
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "OPTIMA" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PP" ridge tile and 30x50 mm roof battens, LAF = 45 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	330 mm	355 mm	380 mm
10	3 339	3 564	3 789
11	3 669	3 919	4 169
12	3 999	4 274	4 549
13	4 329	4 629	4 929
14	4 659	4 984	5 309
15	4 989	5 339	5 689
16	5 319	5 694	6 069
17	5 649	6 049	6 449
18	5 979	6 404	6 829
19	6 309	6 759	7 209
20	6 639	7 114	7 589
21	6 969	7 469	7 969
22	7 299	7 824	8 349
23	7 629	8 179	8 729
24	7 959	8 534	9 109
25	8 289	8 889	9 489
26	8 619	9 244	9 869
27	8 949	9 599	10 249
28	9 279	9 954	10 629
29	9 609	10 309	11 009
30	9 939	10 664	11 389
31	10 269	11 019	11 769
32	10 599	11 374	12 149
33	10 929	11 729	12 529
34	11 259	12 084	12 909
35	11 589	12 439	13 289
36	11 919	12 794	13 669
37	12 249	13 149	14 049
38	12 579	13 504	14 429
39	12 909	13 859	14 809
40	13 239	14 214	15 189



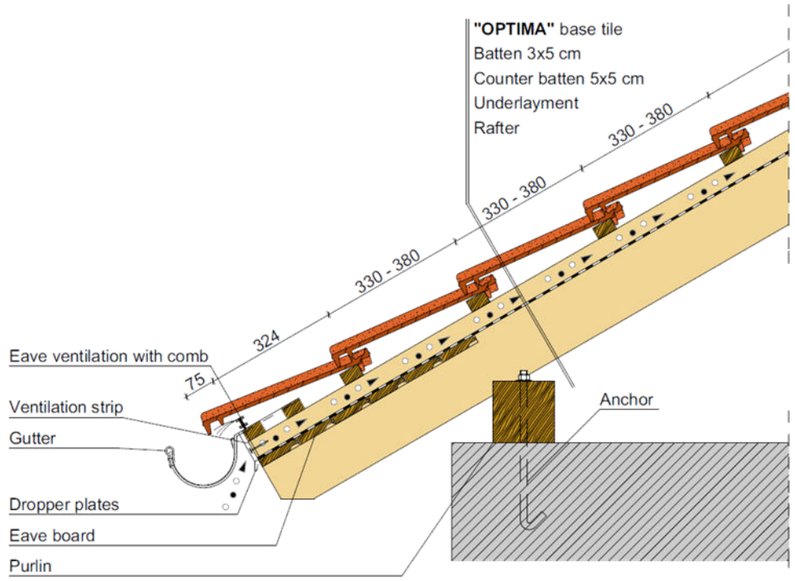
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	110	220	330	335	445	555	665	775	885
10	2 095	2 205	2 315	2 425	2 535	2 645	2 755	2 865	2 975	3 085
20	4 295	4 405	4 515	4 625	4 735	4 845	4 955	5 065	5 175	5 285
30	6 495	6 605	6 715	6 825	6 935	7 045	7 155	7 265	7 375	7 485
40	8 695	8 805	8 915	9 025	9 135	9 245	9 355	9 465	9 575	9 685
50	10 895	11 005	11 115	11 225	11 335	11 445	11 555	11 665	11 775	11 885
60	13 095	13 205	13 315	13 425	13 535	13 645	13 755	13 865	13 975	14 085
70	15 295	15 405	15 515	15 625	15 735	15 845	15 955	16 065	16 175	16 285
80	17 495	17 605	17 715	17 825	17 935	18 045	18 155	18 265	18 375	18 485
90	19 695	19 805	19 915	20 025	20 135	20 245	20 355	20 465	20 575	20 685
100	21 895	22 005	22 115	22 225	22 335	22 445	22 555	22 665	22 775	22 885

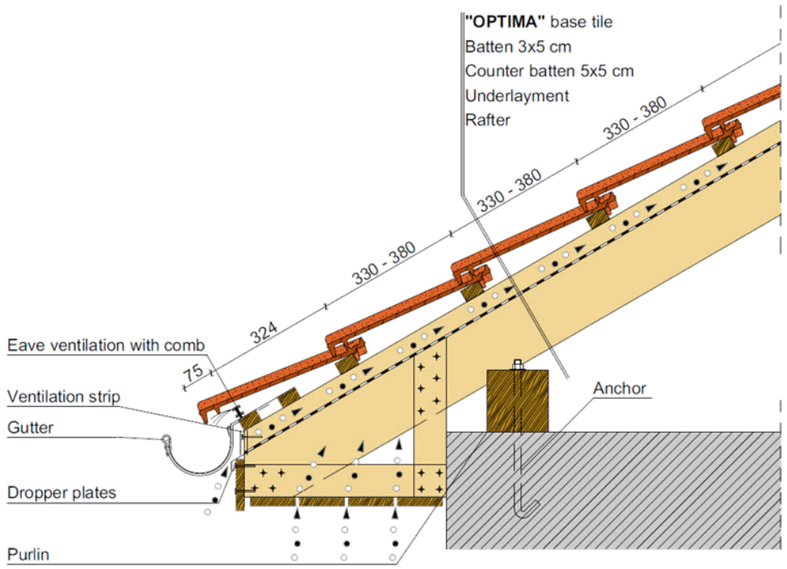
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	995	1 105	1 215	1 325	1 435	1 545	1 655	1 765	1 875	1 985
10	3 195	3 305	3 415	3 525	3 635	3 745	3 855	3 965	4 075	4 185
20	5 395	5 505	5 615	5 725	5 835	5 945	6 055	6 165	6 275	6 385
30	7 595	7 705	7 815	7 925	8 035	8 145	8 255	8 365	8 475	8 585
40	9 795	9 905	10 015	10 125	10 235	10 345	10 455	10 565	10 675	10 785
50	11 995	12 105	12 215	12 325	12 435	12 545	12 655	12 765	12 875	12 985
60	14 195	14 305	14 415	14 525	14 635	14 745	14 855	14 965	15 075	15 185
70	16 395	16 505	16 615	16 725	16 835	16 945	17 055	17 165	17 275	17 385
80	18 595	18 705	18 815	18 925	19 035	19 145	19 255	19 365	19 475	19 585
90	20 795	20 905	21 015	21 125	21 235	21 345	21 455	21 565	21 675	21 785
100	22 995	23 105	23 215	23 325	23 435	23 545	23 655	23 765	23 875	23 985

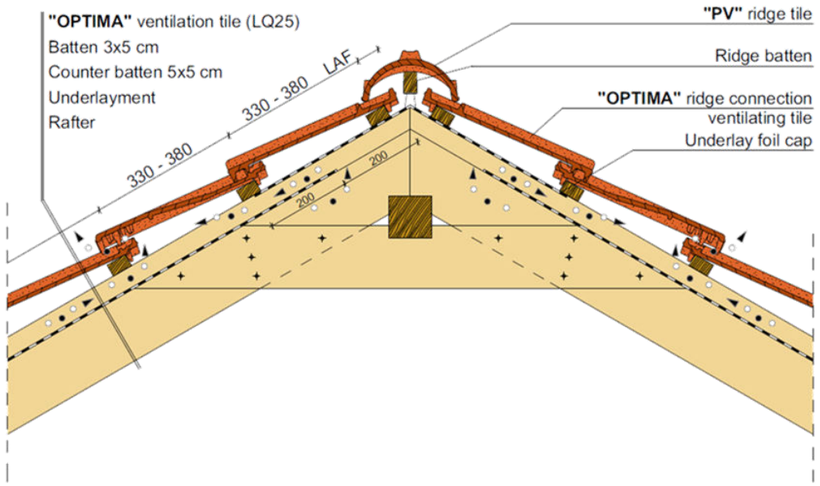
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



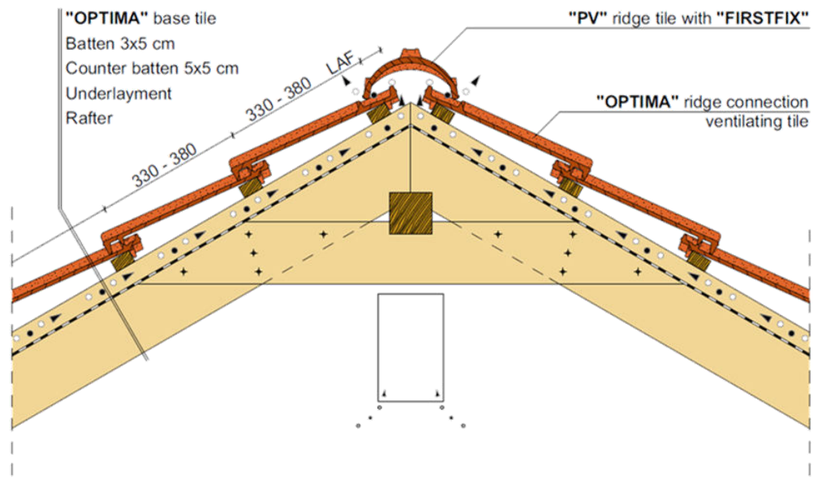
Eave detail



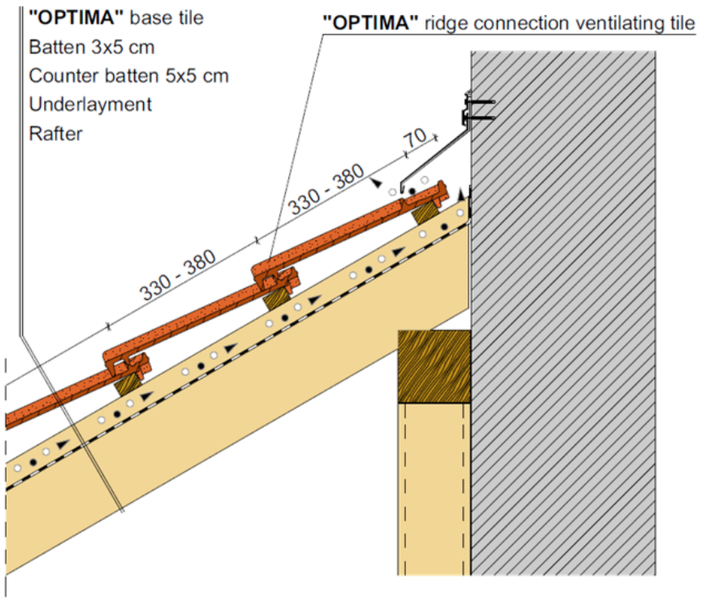
Closed eave detail



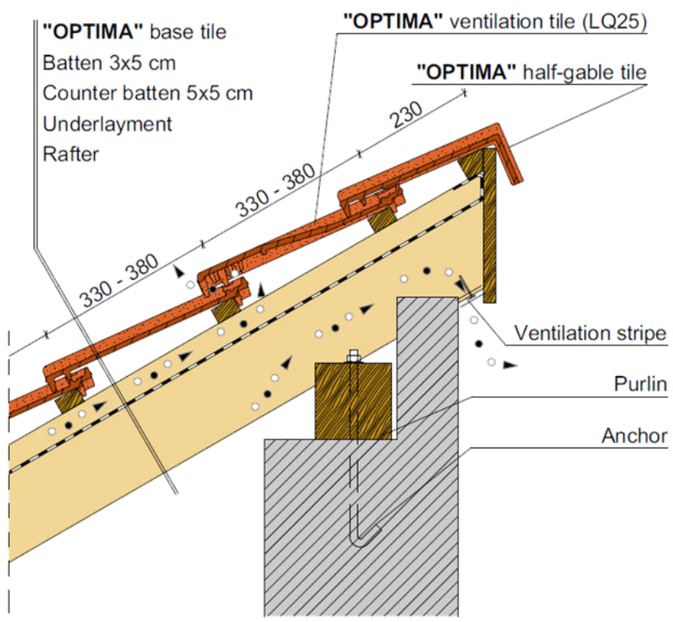
Ridge detail, with ventilation tile



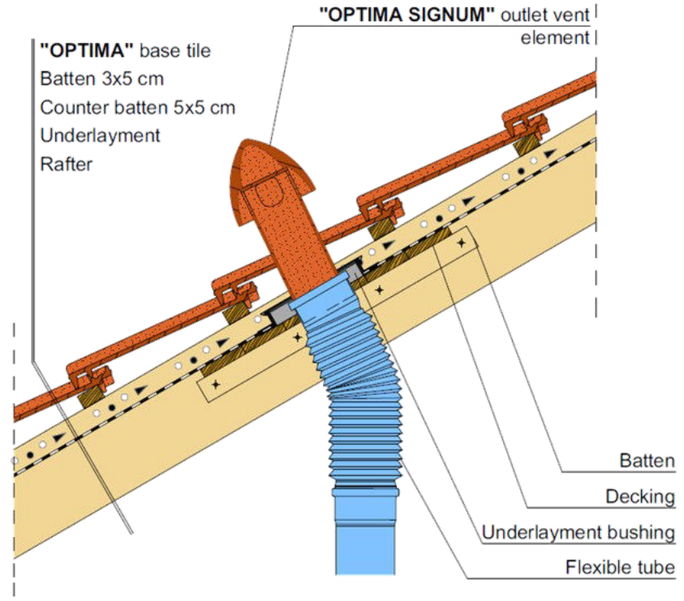
Ridge detail, with ridge connection ventilation tile



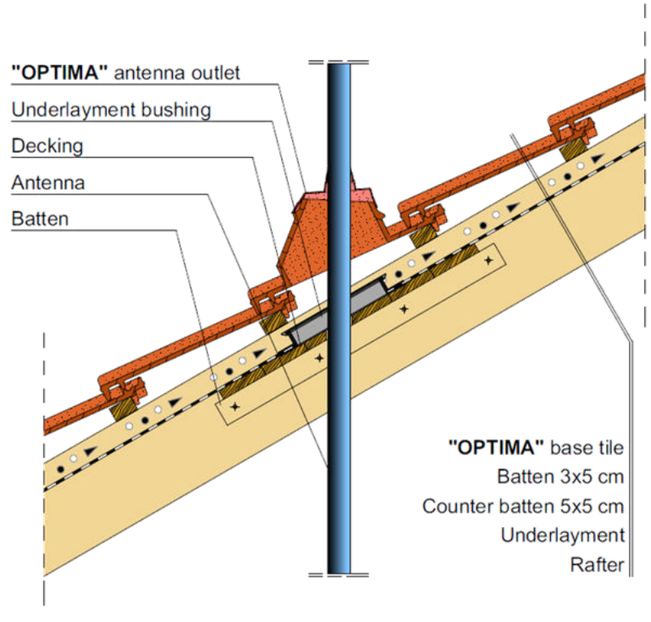
Wall connection detail



Shed ridge detail, with shad roof tile

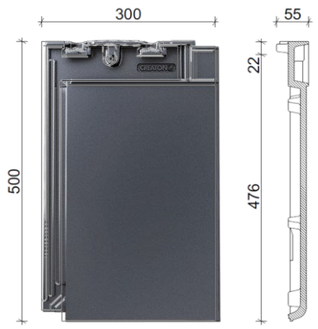


Clay ventilation outlet tile



Clay antenna outlet tile

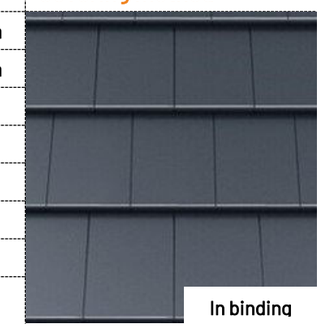
SIMPLA®



Product datas

Size	width:	300 mm
	length:	500 mm
	height:	55 mm
	thickness:	10 mm
	Weight:	4,8 kg
Packaging	bundle:	4 pcs
	pallet:	192 pcs
	Standrad roof pitch:	25°

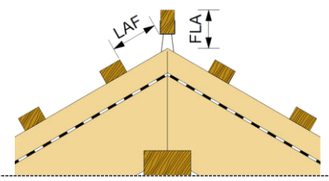
Covering method



In binding

Technical specification of the roof cover

	minimum	average	maximum
Batten distance	338 mm	352 mm	366 mm
Covering width	260 mm	261 mm	263 mm
Consumption	11,4 pcs/m²	10,9 pcs/m²	10,4 pcs/m²
Covering type		single cover	
		52,3 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PS ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	✘	75	70	70	70	65	65	70	90	100	✘
FLA [mm]	✘	120	110	90	80	60	60	55	20	15	✘

PS ridge tile and 40x60 batten

LAF [mm]	✘	75	70	65	65	60	60	60	75	85	✘
FLA [mm]	✘	130	120	100	90	70	70	65	30	25	✘

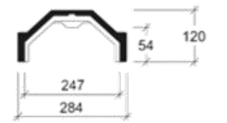
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PS" ridge tile 2,5 pcs/m

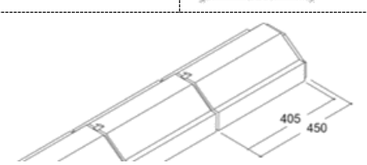


Hip starter

Closing plate

Funct.c.p.

3 axis hip cap



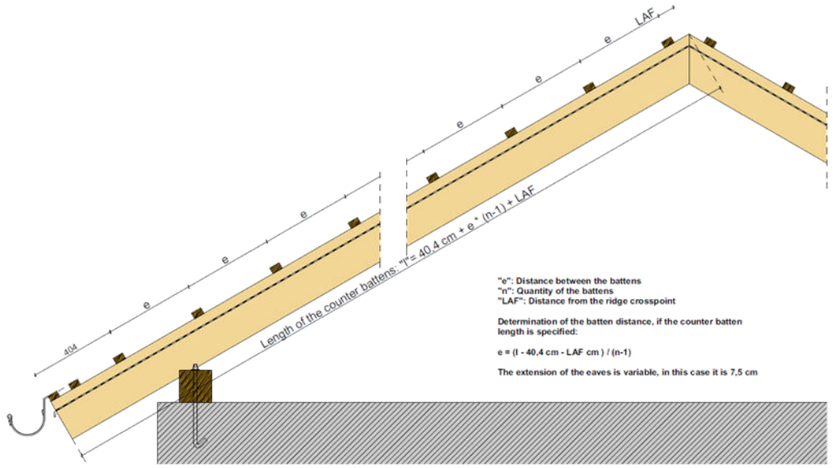
Clay accessories	Size	Quantity
Half tile	170x500	as needed
Verge tile - left	305x500	2,9 pcs/m
Verge tile - right	300x500	2,9 pcs/m
Verge Half tile – bal	170x500	2,9 pcs/m
Verge Half tile – jobb	170x500	2,9 pcs/m
Ventilation tile LQ 35	300x500	as required
Ridge connection ventilation tile	300x500	3,8 pcs/m
Ridge conn. vent. verge tl. left	305x500	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	300x500	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation

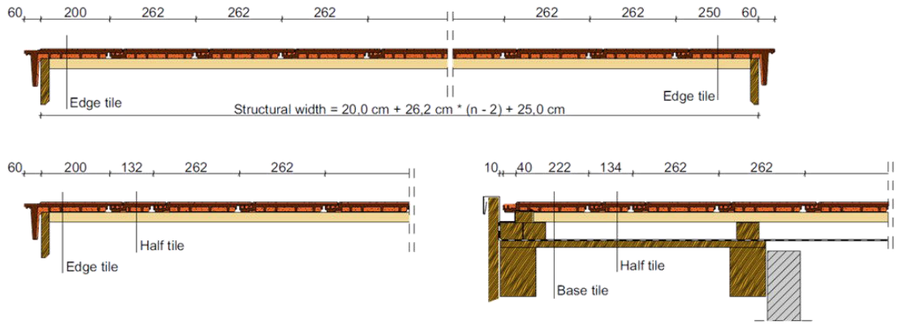
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 60 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "SIMPLA" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PS" ridge tile and 30x50 mm roof battens, LAF = 70 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	338 mm	352 mm	366 mm
10	3 516	3 642	3 768
11	3 854	3 994	4 134
12	4 192	4 346	4 500
13	4 530	4 698	4 866
14	4 868	5 050	5 232
15	5 206	5 402	5 598
16	5 544	5 754	5 964
17	5 882	6 106	6 330
18	6 220	6 458	6 696
19	6 558	6 810	7 062
20	6 896	7 162	7 428
21	7 234	7 514	7 794
22	7 572	7 866	8 160
23	7 910	8 218	8 526
24	8 248	8 570	8 892
25	8 586	8 922	9 258
26	8 924	9 274	9 624
27	9 262	9 626	9 990
28	9 600	9 978	10 356
29	9 938	10 330	10 722
30	10 276	10 682	11 088
31	10 614	11 034	11 454
32	10 952	11 386	11 820
33	11 290	11 738	12 186
34	11 628	12 090	12 552
35	11 966	12 442	12 918
36	12 304	12 794	13 284
37	12 642	13 146	13 650
38	12 980	13 498	14 016
39	13 318	13 850	14 382
40	13 656	14 202	14 748



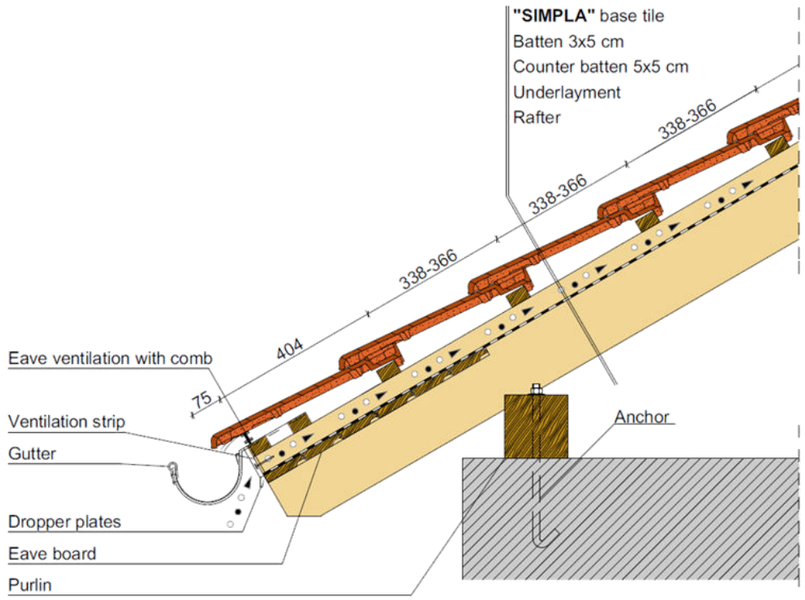
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	132	262	394	414	546	676	808	938	1 070
10	2 510	2 642	2 772	2 904	3 034	3 166	3 296	3 428	3 558	3 690
20	5 130	5 262	5 392	5 524	5 654	5 786	5 916	6 048	6 178	6 310
30	7 750	7 882	8 012	8 144	8 274	8 406	8 536	8 668	8 798	8 930
40	10 370	10 502	10 632	10 764	10 894	11 026	11 156	11 288	11 418	11 550
50	12 990	13 122	13 252	13 384	13 514	13 646	13 776	13 908	14 038	14 170
60	15 610	15 742	15 872	16 004	16 134	16 266	16 396	16 528	16 658	16 790
70	18 230	18 362	18 492	18 624	18 754	18 886	19 016	19 148	19 278	19 410
80	20 850	20 982	21 112	21 244	21 374	21 506	21 636	21 768	21 898	22 030
90	23 470	23 602	23 732	23 864	23 994	24 126	24 256	24 388	24 518	24 650
100	26 090	26 222	26 352	26 484	26 614	26 746	26 876	27 008	27 138	27 270

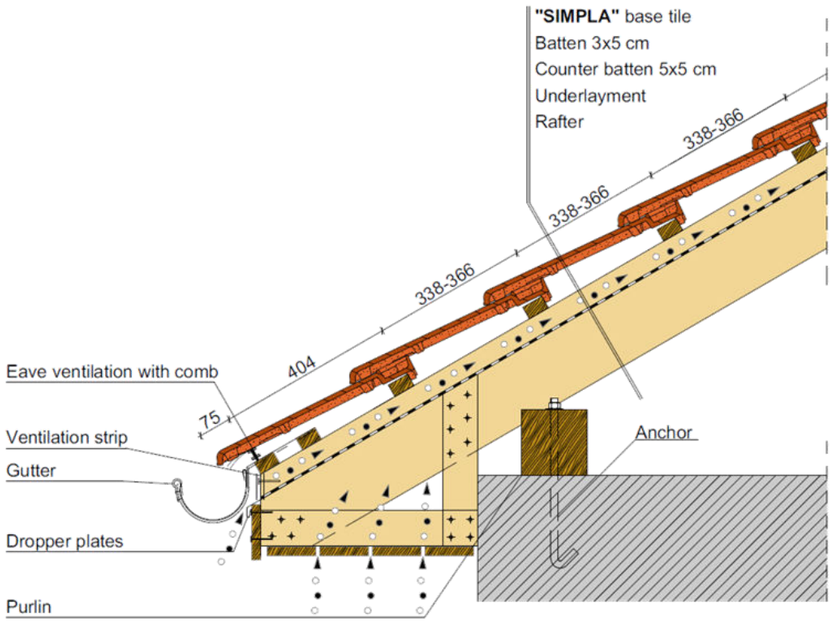
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 200	1 332	1 462	1 594	1 724	1 856	1 986	2 118	2 248	2 380
10	3 820	3 952	4 082	4 214	4 344	4 476	4 606	4 738	4 868	5 000
20	6 440	6 572	6 702	6 834	6 964	7 096	7 226	7 358	7 488	7 620
30	9 060	9 192	9 322	9 454	9 584	9 716	9 846	9 978	10 108	10 240
40	11 680	11 812	11 942	12 074	12 204	12 336	12 466	12 598	12 728	12 860
50	14 300	14 432	14 562	14 694	14 824	14 956	15 086	15 218	15 348	15 480
60	16 920	17 052	17 182	17 314	17 444	17 576	17 706	17 838	17 968	18 100
70	19 540	19 672	19 802	19 934	20 064	20 196	20 326	20 458	20 588	20 720
80	22 160	22 292	22 422	22 554	22 684	22 816	22 946	23 078	23 208	23 340
90	24 780	24 912	25 042	25 174	25 304	25 436	25 566	25 698	25 828	25 960
100	27 400	27 532	27 662	27 794	27 924	28 056	28 186	28 318	28 448	28 580

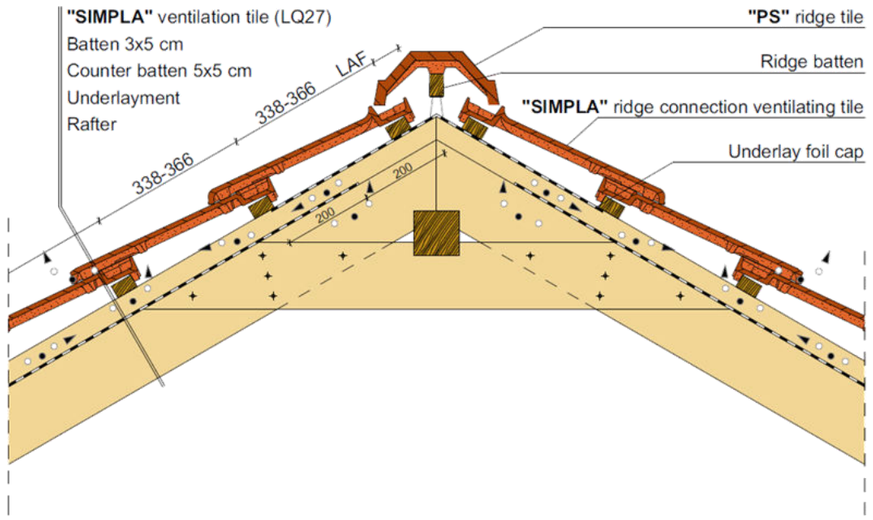
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



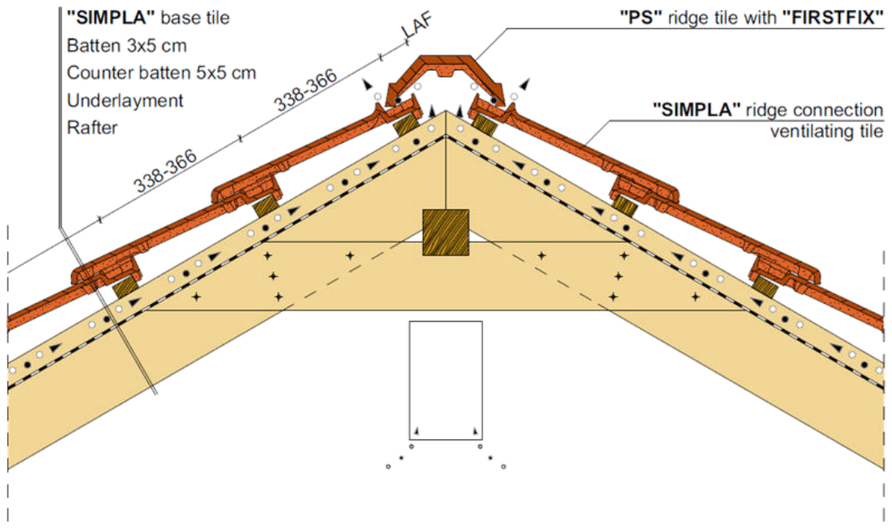
Eave detail



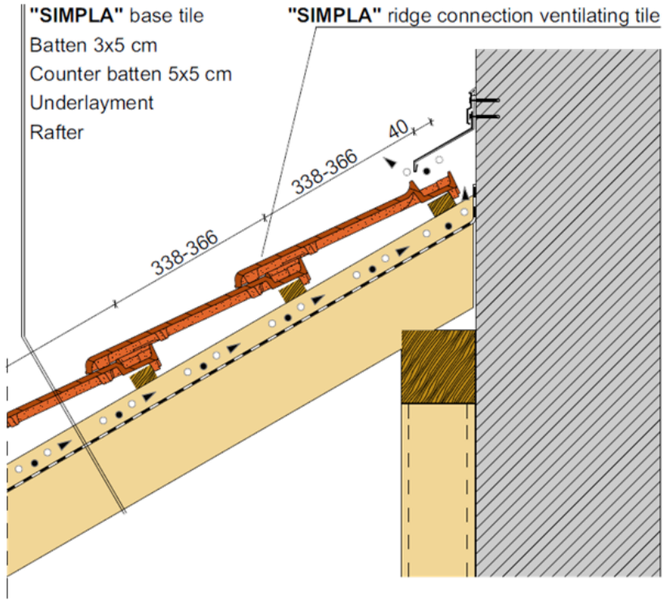
Closed eave detail



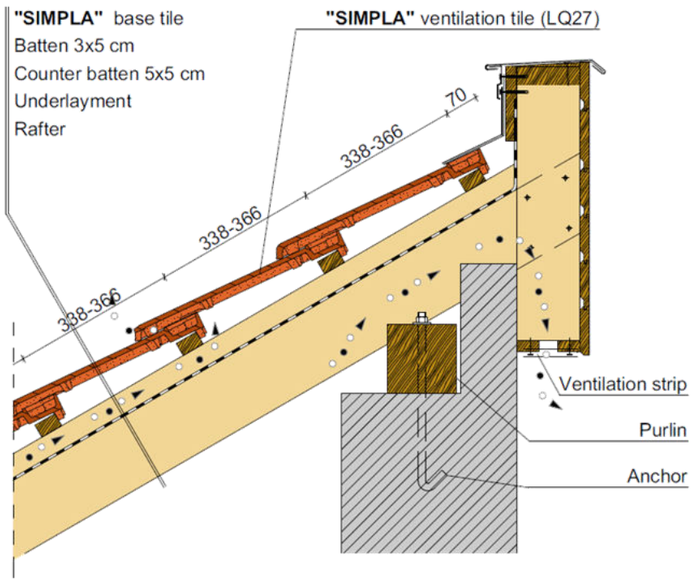
Ridge detail, with ventilation tile



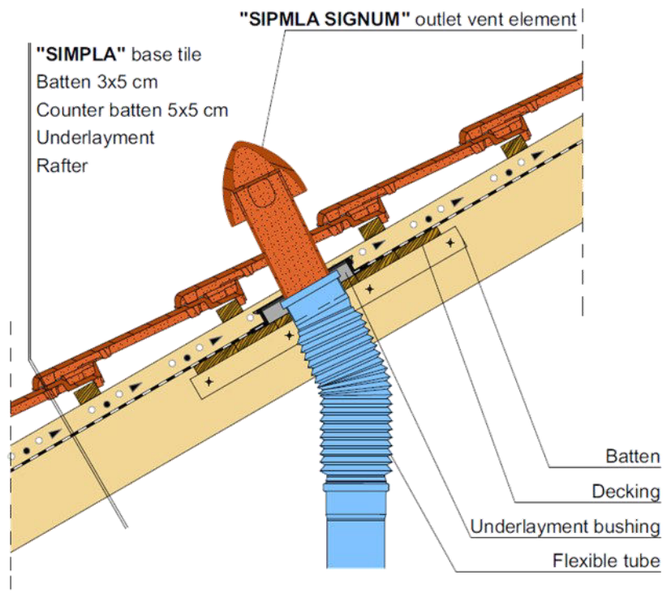
Ridge detail, with ridge connection ventilation tile



Wall connection detail

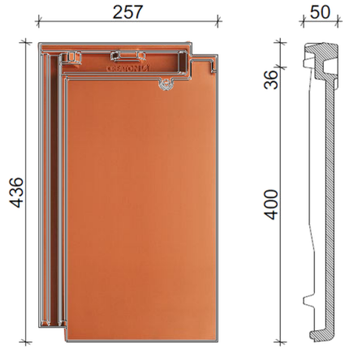


Shed ridge detail, with shad roof tile



Clay ventilation outlet tile

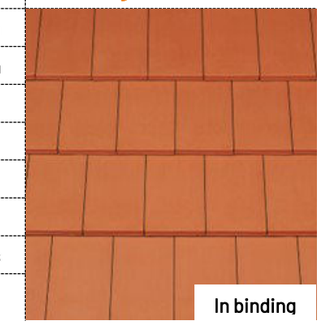
DOMINO®



Product datas

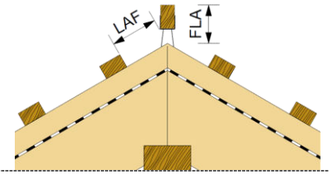
Size	width:	257 mm
	length:	436 mm
	height:	50 mm
	thickness:	10 mm
Weight:		4,2 kg
Packaging	bundle:	4 pcs
	pallet:	240 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	343 mm	348 mm	354 mm
Covering width	224 mm	225 mm	226 mm
Consumption	13,1 pcs/m²	12,7 pcs/m²	12,4 pcs/m²
Covering type		single cover	
Covering width		53,30 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PD ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	✘	95	90	85	85	85	85	85	85	85	✘
FLA [mm]	✘	85	80	70	60	50	40	30	25	15	✘

PD ridge tile and 40x60 batten

LAF [mm]	✘	95	90	80	80	80	80	75	70	70	✘
FLA [mm]	✘	95	90	80	70	60	50	40	35	25	✘

PD ridge tile and50x50 batten

LAF [mm]	✘	90	85	75	75	70	70	65	60	60	✘
FLA [mm]	✘	105	100	90	80	75	65	55	55	45	✘

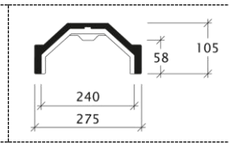
Underlayment requirement

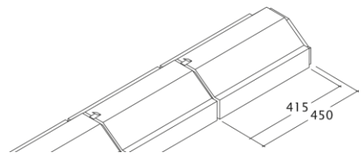
Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PD" ridge tile 2,5 pcs/m





Rounded hip starter	Closing plate	Funct.c.p.	3 axis hip cap
			

Hip starter	Shell shapedhip starter	4 axis hip cap
		

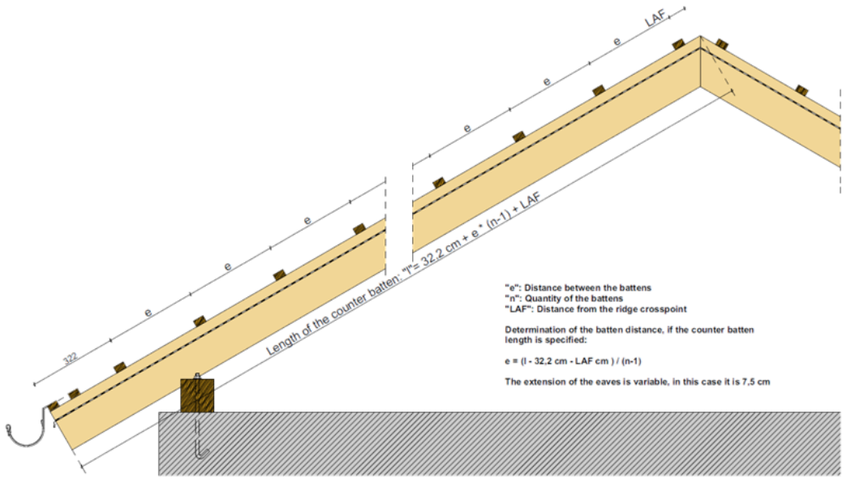
Clay accessories	Size	Quantity
Half tile	144x436	as needed
Verge tile - left	257x436	2,9 pcs/m
Verge tile - right	257x436	2,9 pcs/m
Double wave tile	257x436	2,9 pcs/m
Ventilation tile LQ 27,3	257x436	as required
Ridge connection ventilation tile	257x436	4,5 pcs/m
Ridge connection vent. half tile	144x436	as needed
Ridge conn. vent. verge tl. left	257x436	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	250x410	as needed
Double wave ridge connection tile	275x410	as needed
Shed roof tile	250x375	4,5 pcs/m
Shed roof half tile	150x375	as needed
Shed roof verge tile – left	275x375	as needed
Shed roof verge tile – right	250x375	as needed
Mansard tile	-	4,5 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

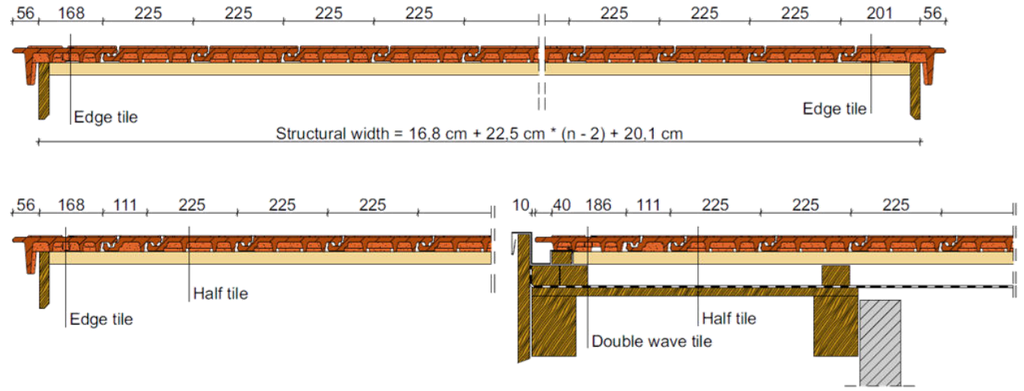
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 70 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "DOMINO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PD" ridge tile and 30x50 mm roof battens, LAF = 85 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	343 mm	348 mm	354 mm
10	3 494	3 539	3 593
11	3 837	3 887	3 947
12	4 180	4 235	4 301
13	4 523	4 583	4 655
14	4 866	4 931	5 009
15	5 209	5 279	5 363
16	5 552	5 627	5 717
17	5 895	5 975	6 071
18	6 238	6 323	6 425
19	6 581	6 671	6 779
20	6 924	7 019	7 133
21	7 267	7 367	7 487
22	7 610	7 715	7 841
23	7 953	8 063	8 195
24	8 296	8 411	8 549
25	8 639	8 759	8 903
26	8 982	9 107	9 257
27	9 325	9 455	9 611
28	9 668	9 803	9 965
29	10 011	10 151	10 319
30	10 354	10 499	10 673
31	10 697	10 847	11 027
32	11 040	11 195	11 381
33	11 383	11 543	11 735
34	11 726	11 891	12 089
35	12 069	12 239	12 443
36	12 412	12 587	12 797
37	12 755	12 935	13 151
38	13 098	13 283	13 505
39	13 441	13 631	13 859
40	13 784	13 979	14 213



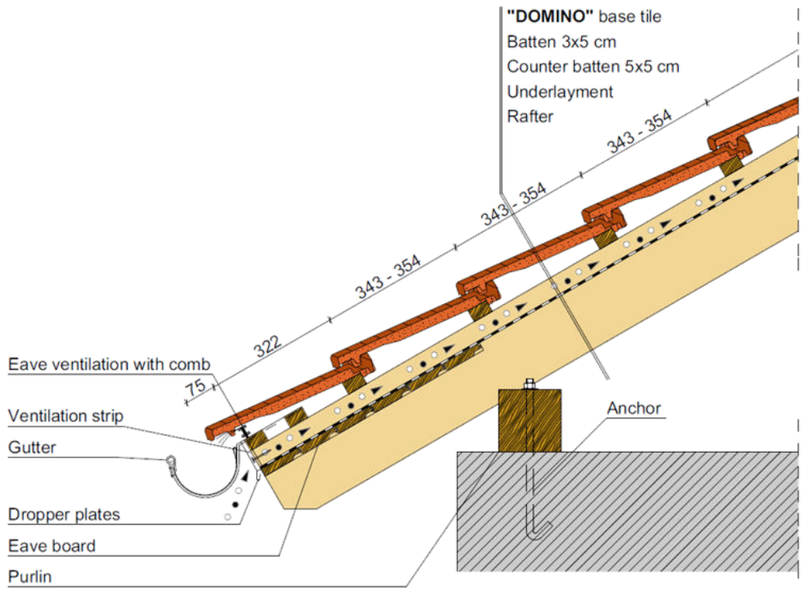
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	111	225	336	369	480	594	705	819	930
10	2 169	2 280	2 394	2 505	2 619	2 730	2 844	2 955	3 069	3 180
20	4 419	4 530	4 644	4 755	4 869	4 980	5 094	5 205	5 319	5 430
30	6 669	6 780	6 894	7 005	7 119	7 230	7 344	7 455	7 569	7 680
40	8 919	9 030	9 144	9 255	9 369	9 480	9 594	9 705	9 819	9 930
50	11 169	11 280	11 394	11 505	11 619	11 730	11 844	11 955	12 069	12 180
60	13 419	13 530	13 644	13 755	13 869	13 980	14 094	14 205	14 319	14 430
70	15 669	15 780	15 894	16 005	16 119	16 230	16 344	16 455	16 569	16 680
80	17 919	18 030	18 144	18 255	18 369	18 480	18 594	18 705	18 819	18 930
90	20 169	20 280	20 394	20 505	20 619	20 730	20 844	20 955	21 069	21 180
100	22 419	22 530	22 644	22 755	22 869	22 980	23 094	23 205	23 319	23 430

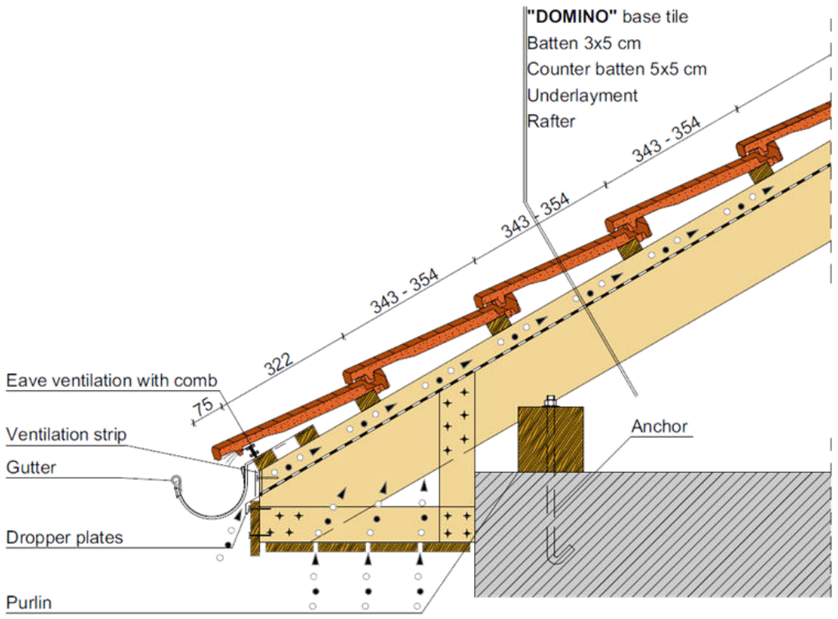
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 044	1 155	1 269	1 380	1 494	1 605	1 719	1 830	1 944	2 055
10	3 294	3 405	3 519	3 630	3 744	3 855	3 969	4 080	4 194	4 305
20	5 544	5 655	5 769	5 880	5 994	6 105	6 219	6 330	6 444	6 555
30	7 794	7 905	8 019	8 130	8 244	8 355	8 469	8 580	8 694	8 805
40	10 044	10 155	10 269	10 380	10 494	10 605	10 719	10 830	10 944	11 055
50	12 294	12 405	12 519	12 630	12 744	12 855	12 969	13 080	13 194	13 305
60	14 544	14 655	14 769	14 880	14 994	15 105	15 219	15 330	15 444	15 555
70	16 794	16 905	17 019	17 130	17 244	17 355	17 469	17 580	17 694	17 805
80	19 044	19 155	19 269	19 380	19 494	19 605	19 719	19 830	19 944	20 055
90	21 294	21 405	21 519	21 630	21 744	21 855	21 969	22 080	22 194	22 305
100	23 544	23 655	23 769	23 880	23 994	24 105	24 219	24 330	24 444	24 555

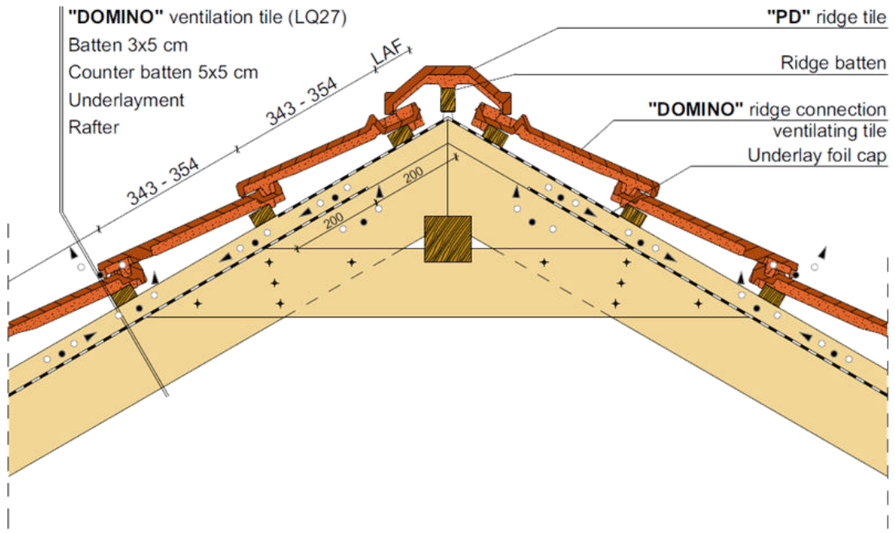
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



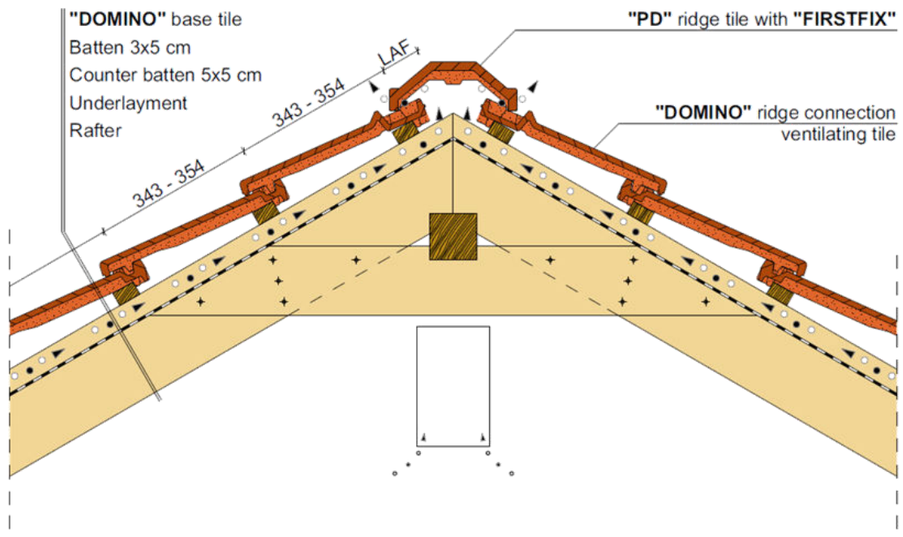
Eave detail



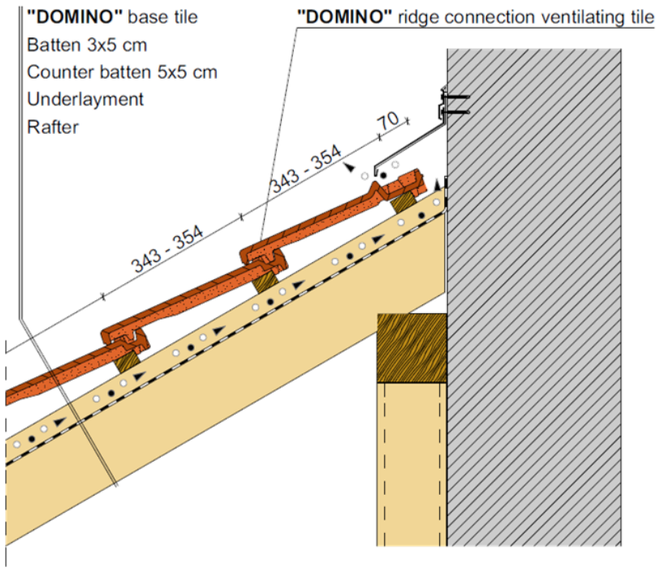
Closed eave detail



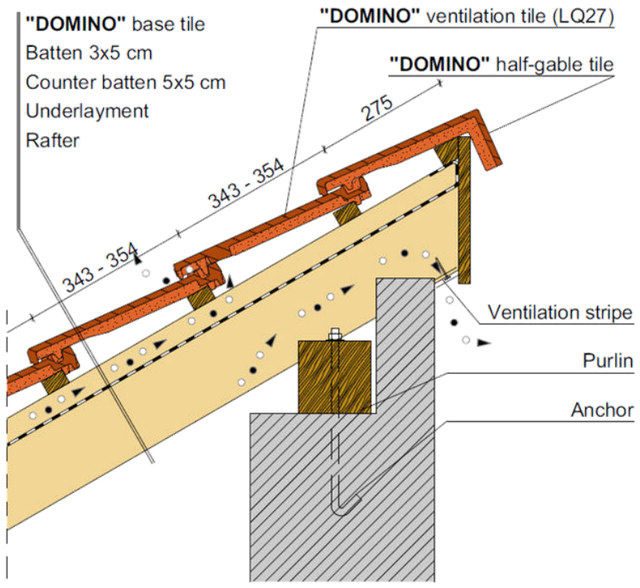
Ridge detail, with ventilation tile



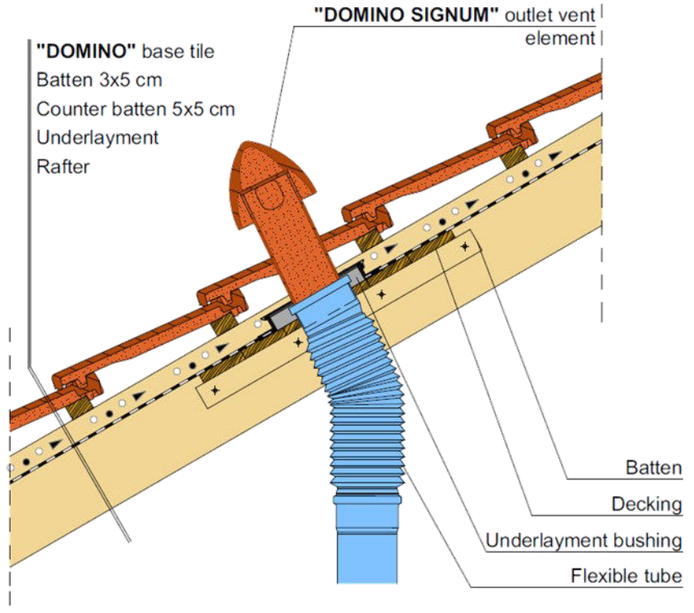
Ridge detail, with ridge connection ventilation tile



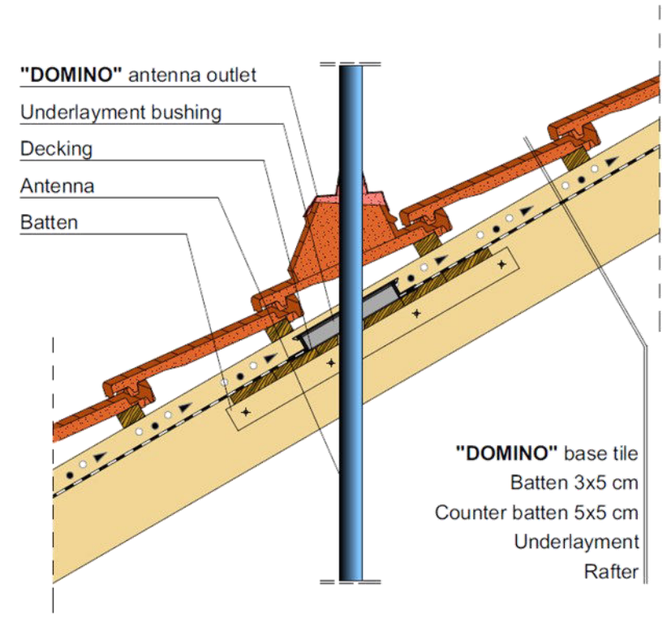
Wall connection detail



Shed ridge detail, with shad roof tile

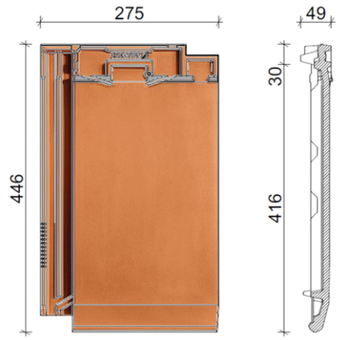


Clay ventilation outlet tile



Clay antenna outlet tile

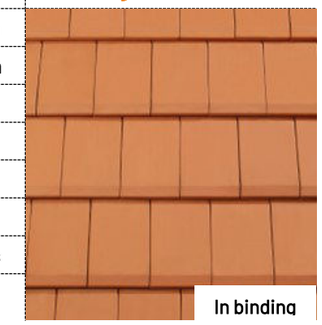
MIKADO®



Product datas

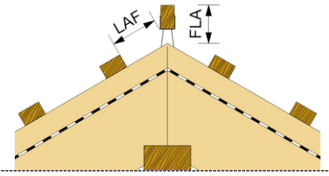
Size	width:	275 mm
	length:	446 mm
	height:	49 mm
	thickness:	10 mm
Weight:		3,4 kg
Packaging	bundle:	5 pcs
	pallet:	240 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	343 mm	357 mm	371 mm
Covering width	227 mm	229 mm	231 mm
Consumption	12,8 pcs/m²	12,2 pcs/m²	11,7 pcs/m²
Covering type		single cover	
Covering width		39,8 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PI ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	70	70	65	60	55	50	45	40	30	✘	✘
FLA [mm]	95	90	80	75	70	60	60	50	55	✘	✘

PI ridge tile and 40x60 batten

LAF [mm]	70	70	65	55	50	45	40	30	15	✘	✘
FLA [mm]	105	100	90	85	80	70	70	60	65	✘	✘

PI ridge tile and50x50 batten

LAF [mm]	65	65	60	50	45	35	30	20	5	✘	✘
FLA [mm]	115	110	100	95	90	85	85	75	85	✘	✘

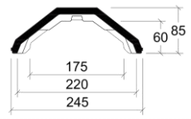
Underlayment requirement

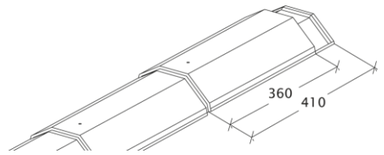
Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PI" ridge tile 2,8 pcs/m





Rounded hip starter

Closing plate

Funct.c.p.

3 axis hip cap

Hip starter

Shell shapedhip starter

4 axis hip cap

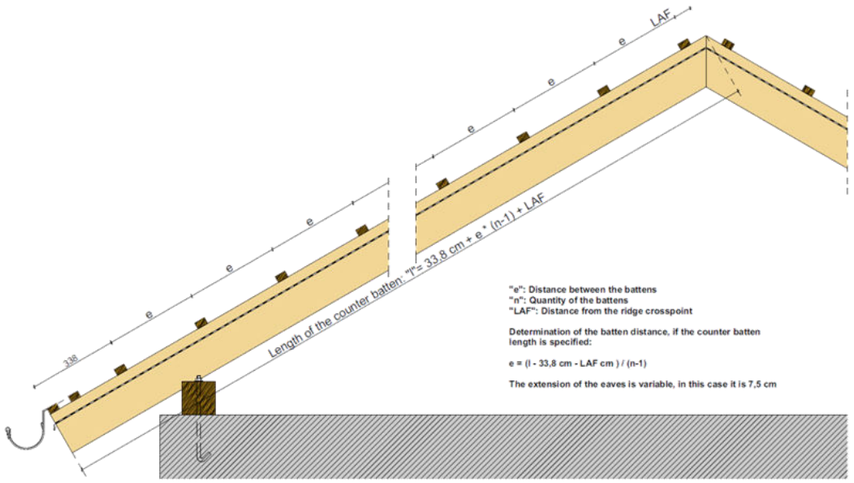
Clay accessories	Size	Quantity
Half tile	160x446	as needed
Verge tile - left	228x446	2,8 pcs/m
Verge tile - right	275x446	2,8 pcs/m
Double wave tile	228x446	2,8 pcs/m
Ventilation tile LQ 32	275x446	as required
Ridge connection ventilation tile	275x446	4,4 pcs/m
Ridge connection vent. half tile	160x446	as needed
Ridge conn. vent. verge tl. left	228x446	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	275x446	as needed
Double wave ridge connection tile	228x446	as needed
Shed roof tile	275x375	4,4 pcs/m
Shed roof half tile	160x375	as needed
Shed roof verge tile – left	228x375	as needed
Shed roof verge tile – right	275x375	as needed
Mansard tile	-	4,4 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

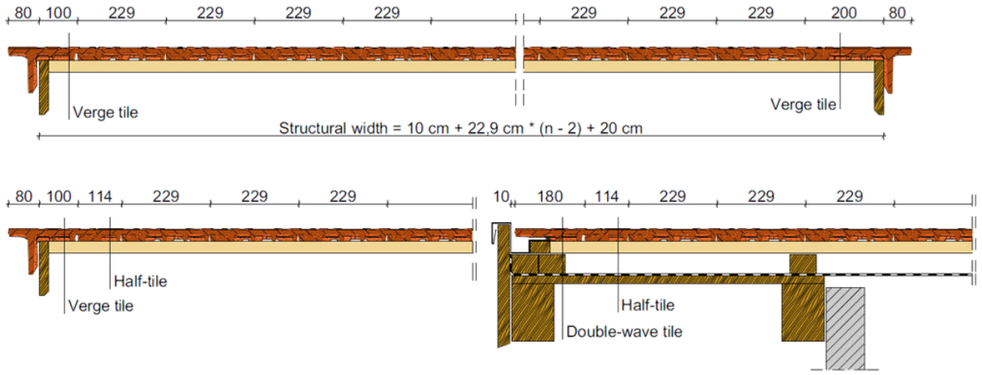
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 60 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "MIKADO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PI" ridge tile and 30x50 mm roof battens, LAF = 55 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
10	3 480	3 606	3 732
11	3 823	3 963	4 103
12	4 166	4 320	4 474
13	4 509	4 677	4 845
14	4 852	5 034	5 216
15	5 195	5 391	5 587
16	5 538	5 748	5 958
17	5 881	6 105	6 329
18	6 224	6 462	6 700
19	6 567	6 819	7 071
20	6 910	7 176	7 442
21	7 253	7 533	7 813
22	7 596	7 890	8 184
23	7 939	8 247	8 555
24	8 282	8 604	8 926
25	8 625	8 961	9 297
26	8 968	9 318	9 668
27	9 311	9 675	10 039
28	9 654	10 032	10 410
29	9 997	10 389	10 781
30	10 340	10 746	11 152
31	10 683	11 103	11 523
32	11 026	11 460	11 894
33	11 369	11 817	12 265
34	11 712	12 174	12 636
35	12 055	12 531	13 007
36	12 398	12 888	13 378
37	12 741	13 245	13 749
38	13 084	13 602	14 120
39	13 427	13 959	14 491
40	13 770	14 316	14 862



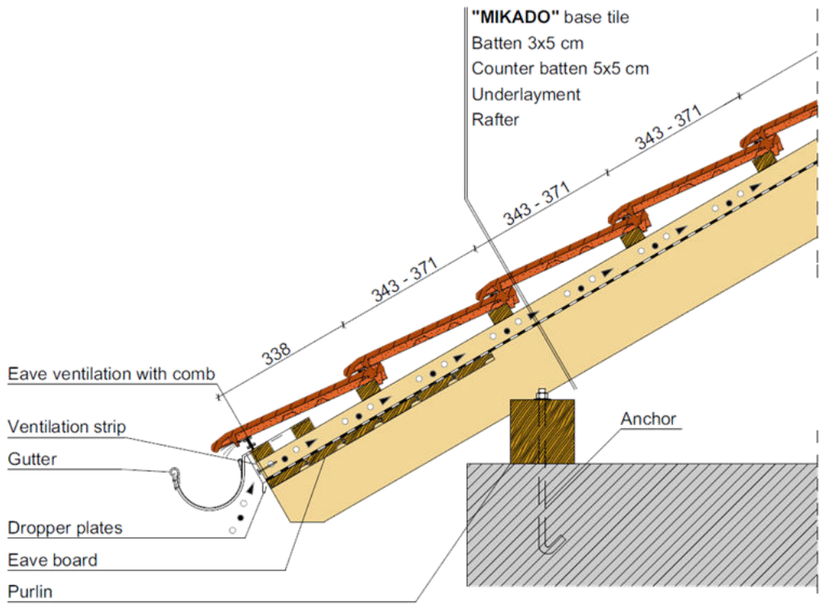
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	114	229	343	300	414	529	643	758	872
10	2 132	2 246	2 361	2 475	2 590	2 704	2 819	2 933	3 048	3 162
20	4 422	4 536	4 651	4 765	4 880	4 994	5 109	5 223	5 338	5 452
30	6 712	6 826	6 941	7 055	7 170	7 284	7 399	7 513	7 628	7 742
40	9 002	9 116	9 231	9 345	9 460	9 574	9 689	9 803	9 918	10 032
50	11 292	11 406	11 521	11 635	11 750	11 864	11 979	12 093	12 208	12 322
60	13 582	13 696	13 811	13 925	14 040	14 154	14 269	14 383	14 498	14 612
70	15 872	15 986	16 101	16 215	16 330	16 444	16 559	16 673	16 788	16 902
80	18 162	18 276	18 391	18 505	18 620	18 734	18 849	18 963	19 078	19 192
90	20 452	20 566	20 681	20 795	20 910	21 024	21 139	21 253	21 368	21 482
100	22 742	22 856	22 971	23 085	23 200	23 314	23 429	23 543	23 658	23 772

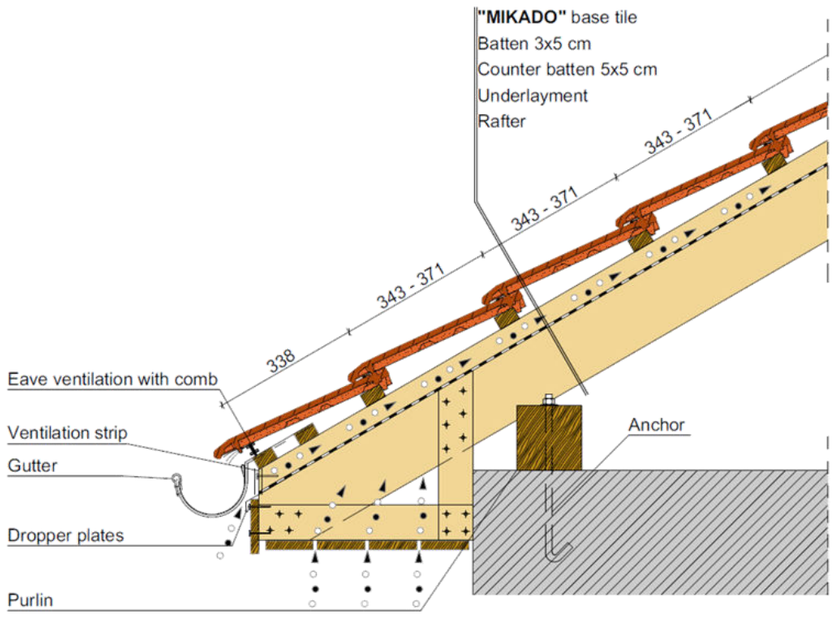
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	987	1 101	1 216	1 330	1 445	1 559	1 674	1 788	1 903	2 017
10	3 277	3 391	3 506	3 620	3 735	3 849	3 964	4 078	4 193	4 307
20	5 567	5 681	5 796	5 910	6 025	6 139	6 254	6 368	6 483	6 597
30	7 857	7 971	8 086	8 200	8 315	8 429	8 544	8 658	8 773	8 887
40	10 147	10 261	10 376	10 490	10 605	10 719	10 834	10 948	11 063	11 177
50	12 437	12 551	12 666	12 780	12 895	13 009	13 124	13 238	13 353	13 467
60	14 727	14 841	14 956	15 070	15 185	15 299	15 414	15 528	15 643	15 757
70	17 017	17 131	17 246	17 360	17 475	17 589	17 704	17 818	17 933	18 047
80	19 307	19 421	19 536	19 650	19 765	19 879	19 994	20 108	20 223	20 337
90	21 597	21 711	21 826	21 940	22 055	22 169	22 284	22 398	22 513	22 627
100	23 887	24 001	24 116	24 230	24 345	24 459	24 574	24 688	24 803	24 917

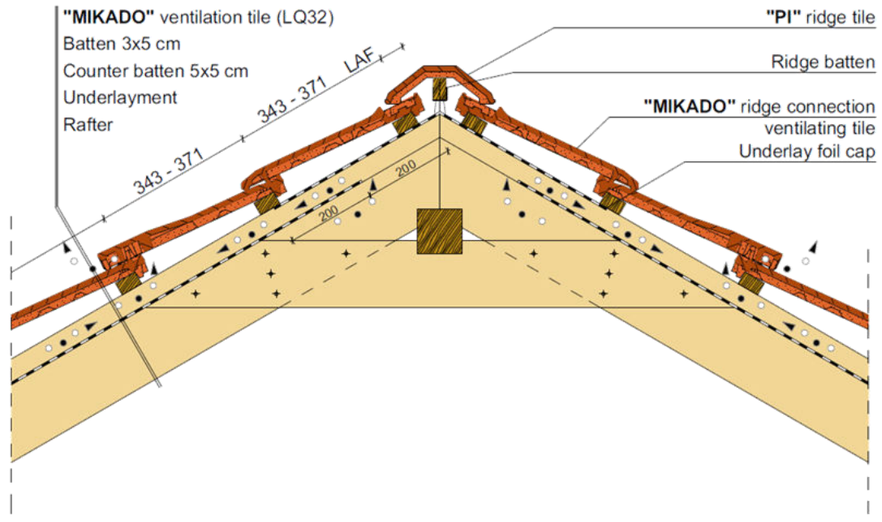
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



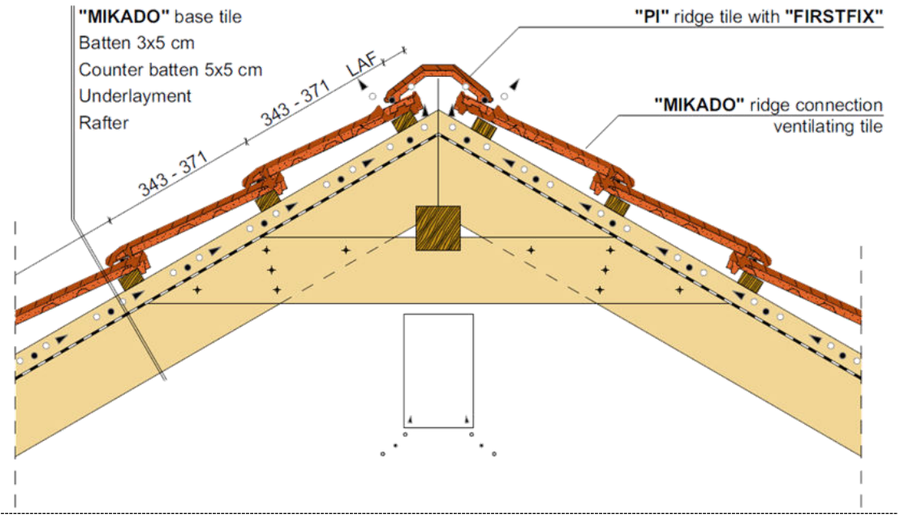
Eave detail



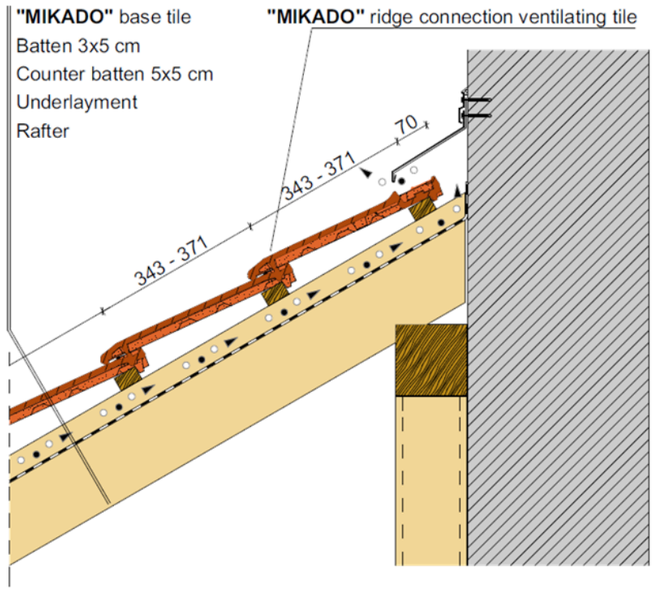
Closed eave detail



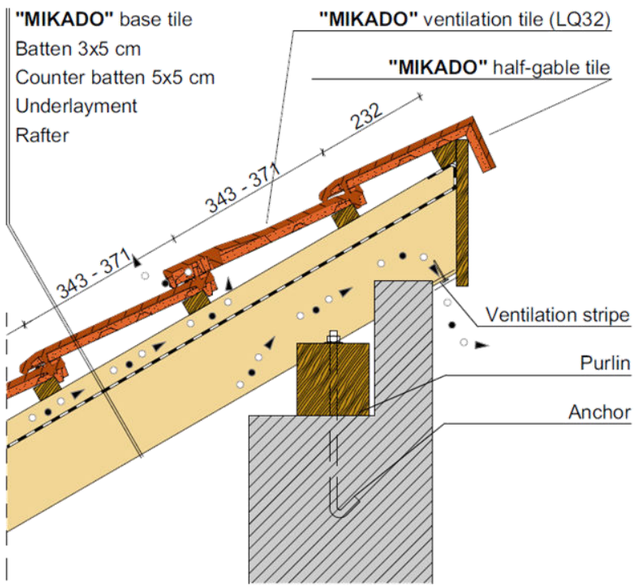
Ridge detail, with ventilation tile



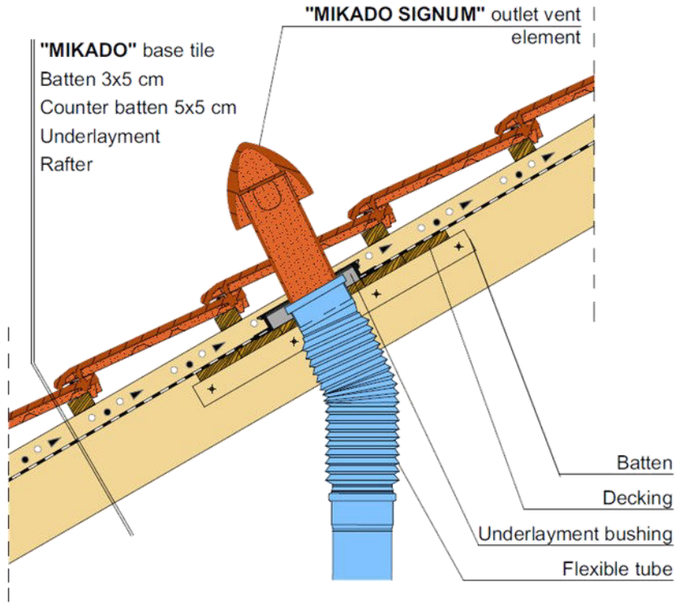
Ridge detail, with ridge connection ventilation tile



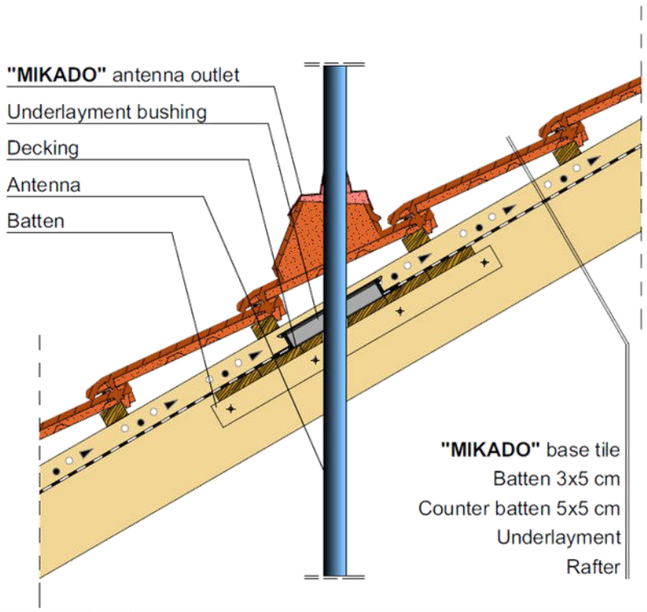
Wall connection detail



Shed ridge detail, with shad roof tile

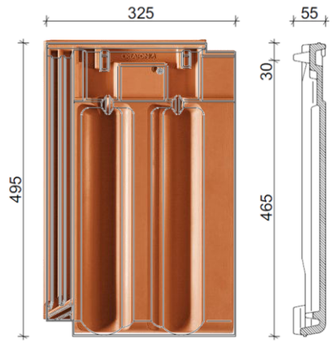


Clay ventilation outlet tile



Clay antenna outlet tile

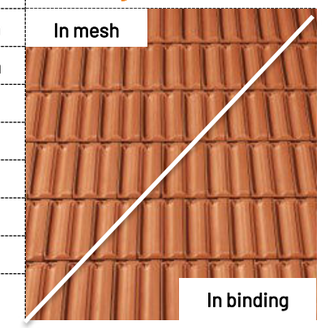
RAPIDO®



Product datas

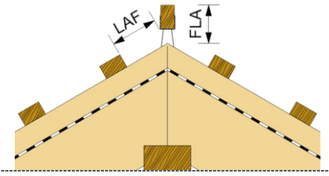
Size	width:	325 mm
	length:	495 mm
	height:	55 mm
	thickness:	10 mm
Weight:		5,2 kg
Packaging	bundle:	4 pcs
	pallet:	168 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	410 mm	425 mm	440 mm
Covering width	277 mm	278 mm	280 mm
Consumption	8,8 pcs/m²	8,4 pcs/m²	8,1 pcs/m²
Covering type		single cover	
Covering width		43,68 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

LB ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	75	70	70	65	60	60	60	60	60	55	✘
FLA [mm]	110	95	85	75	65	60	50	35	30	30	✘

LB ridge tile and 40x60 batten

LAF [mm]	75	70	70	60	55	55	55	50	45	40	✘
FLA [mm]	120	105	95	85	75	70	60	45	40	20	✘

LR ridge tile and 30x50 batten

LAF [mm]	75	70	70	65	60	60	60	60	60	55	✘
FLA [mm]	110	95	85	75	65	60	50	35	30	30	✘

LR ridge tile and 40x60 batten

LAF [mm]	75	70	70	60	55	55	55	50	45	40	✘
FLA [mm]	120	105	95	85	75	70	60	45	40	20	✘

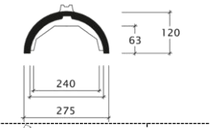
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

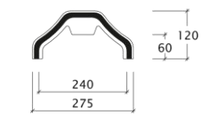
Required batten dimensions

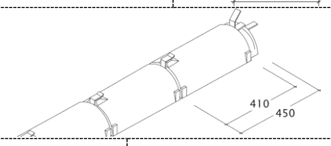
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"LB" ridge tile 2,5 pcs/m



"LR" ridge tile 2,5 pcs/m



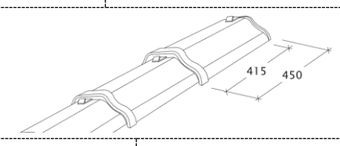


"LB" hip starter

"LB" hip starter, shell shape

Funct.c.p.

3 axis hip cap



"LR" hip starter

"LR" hip starter, shell shape

„LB" hip starter, rounded

„LB" closing plate

4 axis hip cap

"LR" closing plate

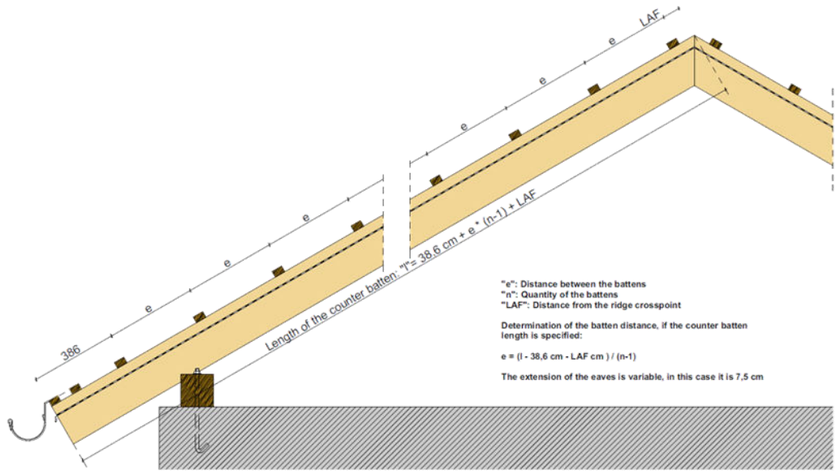
Clay accessories	Size	Quantity
Half tile	182x495	as needed
Verge tile - left	325x495	2,4 pcs/m
Verge tile - right	325x495	2,4 pcs/m
Double wave tile	325x495	2,4 pcs/m
Ventilation tile LQ 37,5	325x495	as required
Ridge connection ventilation tile	325x495	3,6 pcs/m
Ridge connection vent. half tile	182x495	as needed
Ridge conn. vent. verge tl. left	325x495	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	325x495	as needed
Double wave ridge connection tile	325x502	as needed
Shed roof tile	-	3,6 pcs/m
Shed roof half tile	-	as needed
Shed roof verge tile – left	-	as needed
Shed roof verge tile – right	-	as needed
Mansard tile	-	3,6 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

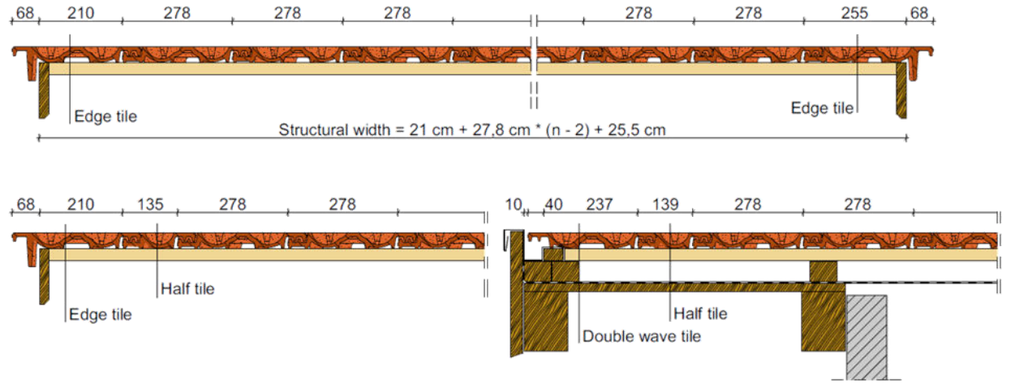
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 60 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "RAPIDO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "LR" ridge tile and 30x50 mm roof battens, LAF = 60 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	410 mm	425 mm	440 mm
10	4 136	4 271	4 406
11	4 546	4 696	4 846
12	4 956	5 121	5 286
13	5 366	5 546	5 726
14	5 776	5 971	6 166
15	6 186	6 396	6 606
16	6 596	6 821	7 046
17	7 006	7 246	7 486
18	7 416	7 671	7 926
19	7 826	8 096	8 366
20	8 236	8 521	8 806
21	8 646	8 946	9 246
22	9 056	9 371	9 686
23	9 466	9 796	10 126
24	9 876	10 221	10 566
25	10 286	10 646	11 006
26	10 696	11 071	11 446
27	11 106	11 496	11 886
28	11 516	11 921	12 326
29	11 926	12 346	12 766
30	12 336	12 771	13 206
31	12 746	13 196	13 646
32	13 156	13 621	14 086
33	13 566	14 046	14 526
34	13 976	14 471	14 966
35	14 386	14 896	15 406
36	14 796	15 321	15 846
37	15 206	15 746	16 286
38	15 616	16 171	16 726
39	16 026	16 596	17 166
40	16 436	17 021	17 606



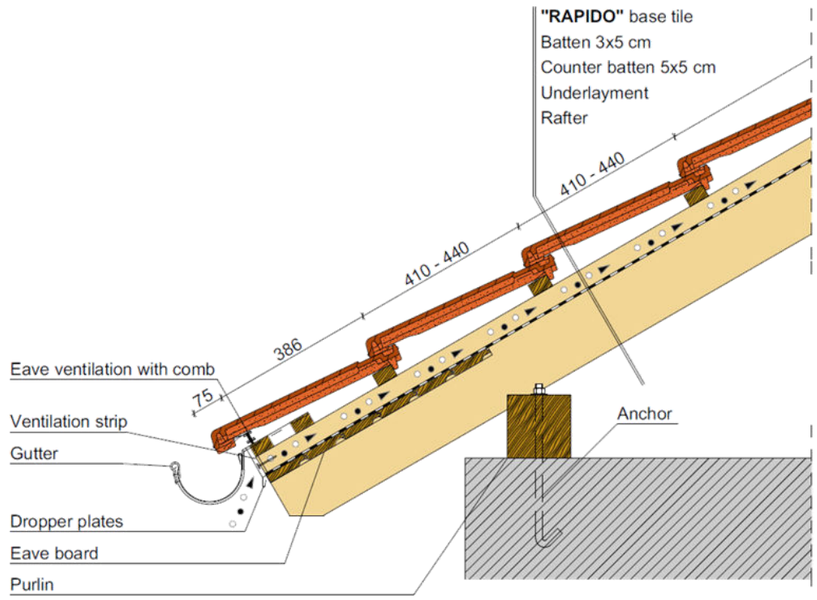
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	135	278	413	465	600	743	878	1 021	1 156
10	2 689	2 824	2 967	3 102	3 245	3 380	3 523	3 658	3 801	3 936
20	5 469	5 604	5 747	5 882	6 025	6 160	6 303	6 438	6 581	6 716
30	8 249	8 384	8 527	8 662	8 805	8 940	9 083	9 218	9 361	9 496
40	11 029	11 164	11 307	11 442	11 585	11 720	11 863	11 998	12 141	12 276
50	13 809	13 944	14 087	14 222	14 365	14 500	14 643	14 778	14 921	15 056
60	16 589	16 724	16 867	17 002	17 145	17 280	17 423	17 558	17 701	17 836
70	19 369	19 504	19 647	19 782	19 925	20 060	20 203	20 338	20 481	20 616
80	22 149	22 284	22 427	22 562	22 705	22 840	22 983	23 118	23 261	23 396
90	24 929	25 064	25 207	25 342	25 485	25 620	25 763	25 898	26 041	26 176
100	27 709	27 844	27 987	28 122	28 265	28 400	28 543	28 678	28 821	28 956

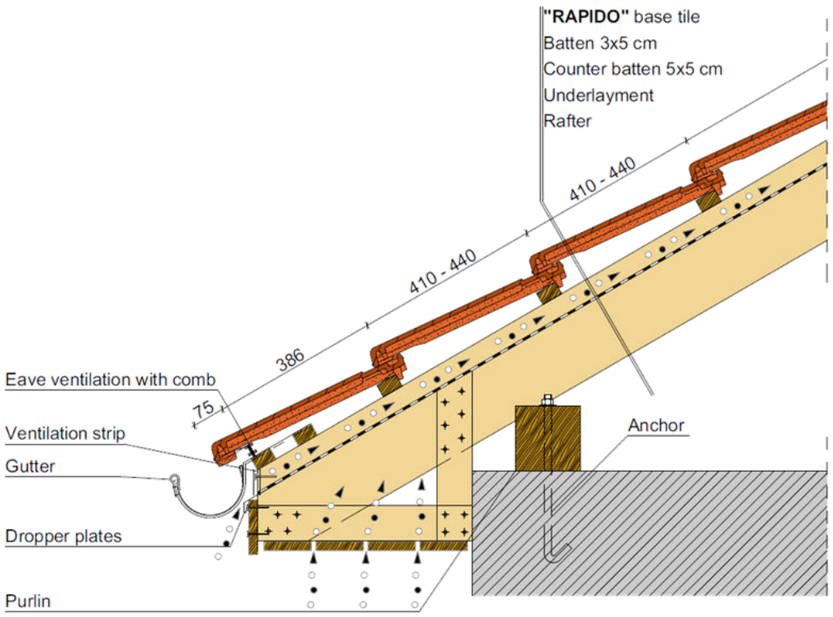
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 299	1 434	1 577	1 712	1 855	1 990	2 133	2 268	2 411	2 546
10	4 079	4 214	4 357	4 492	4 635	4 770	4 913	5 048	5 191	5 326
20	6 859	6 994	7 137	7 272	7 415	7 550	7 693	7 828	7 971	8 106
30	9 639	9 774	9 917	10 052	10 195	10 330	10 473	10 608	10 751	10 886
40	12 419	12 554	12 697	12 832	12 975	13 110	13 253	13 388	13 531	13 666
50	15 199	15 334	15 477	15 612	15 755	15 890	16 033	16 168	16 311	16 446
60	17 979	18 114	18 257	18 392	18 535	18 670	18 813	18 948	19 091	19 226
70	20 759	20 894	21 037	21 172	21 315	21 450	21 593	21 728	21 871	22 006
80	23 539	23 674	23 817	23 952	24 095	24 230	24 373	24 508	24 651	24 786
90	26 319	26 454	26 597	26 732	26 875	27 010	27 153	27 288	27 431	27 566
100	29 099	29 234	29 377	29 512	29 655	29 790	29 933	30 068	30 211	30 346

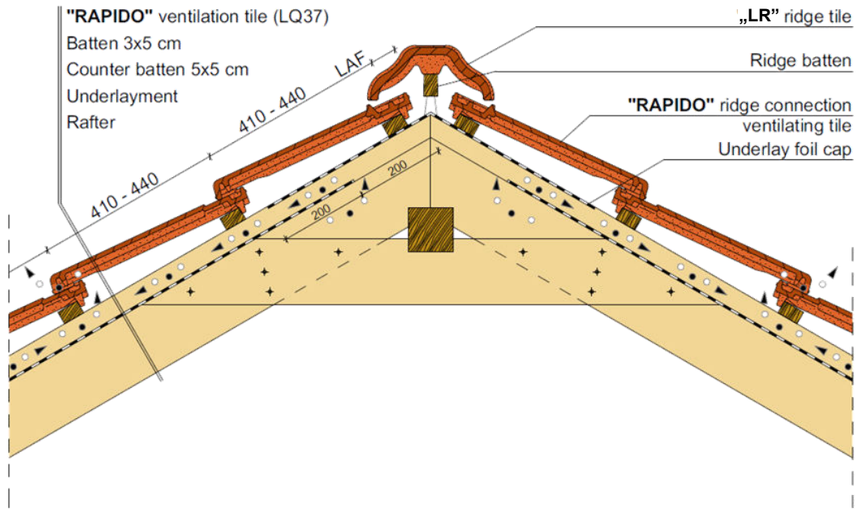
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



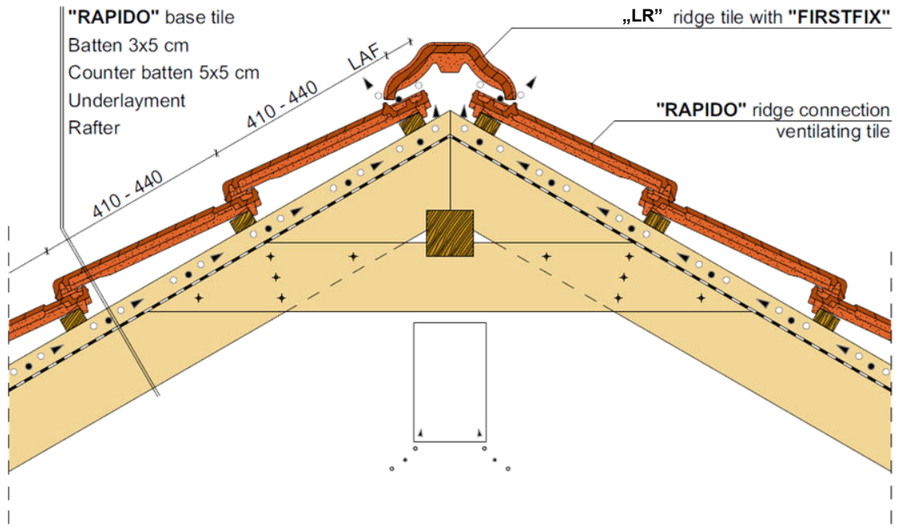
Eave detail



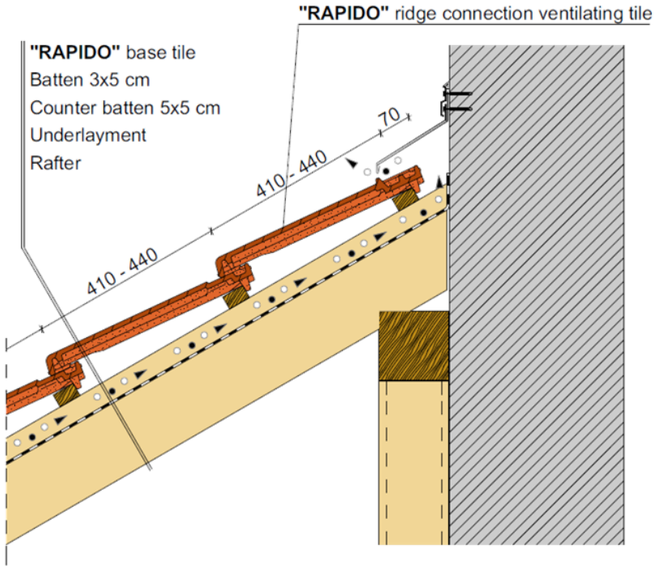
Closed eave detail



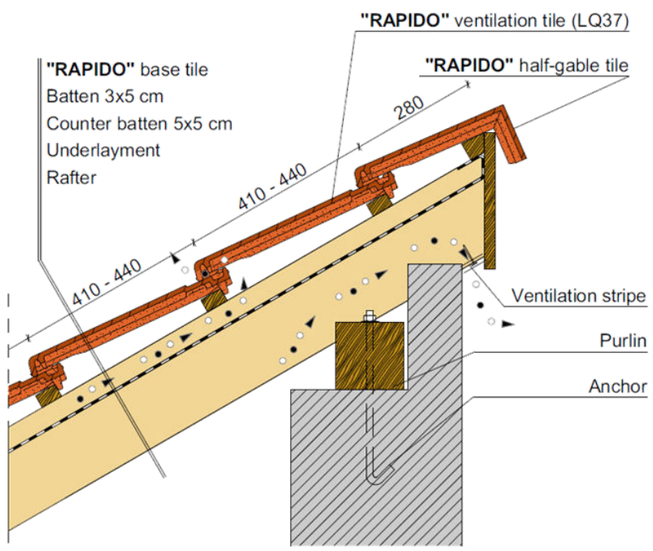
Ridge detail, with ventilation tile



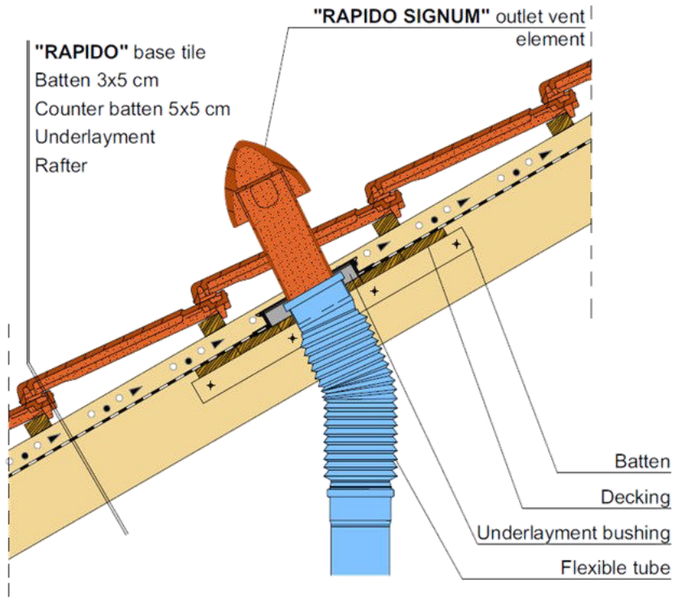
Ridge detail, with ridge connection ventilation tile



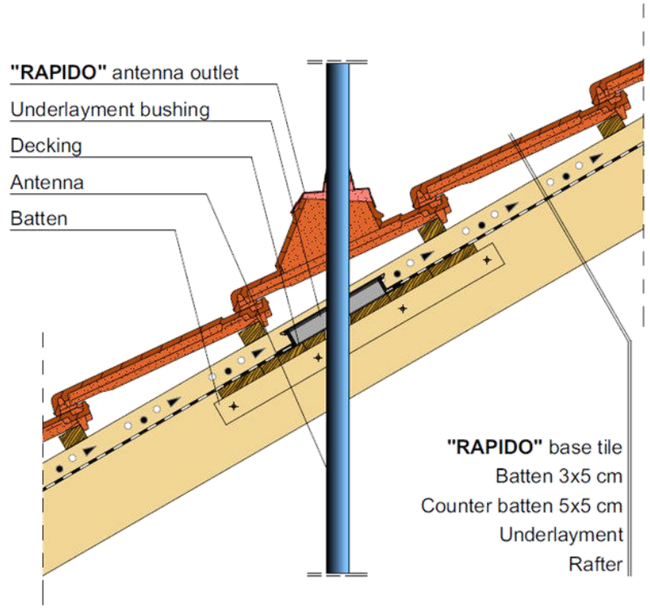
Wall connection detail



Shed ridge detail, with shad roof tile

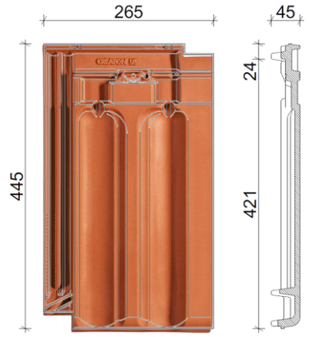


Clay ventilation outlet tile



Clay antenna outlet tile

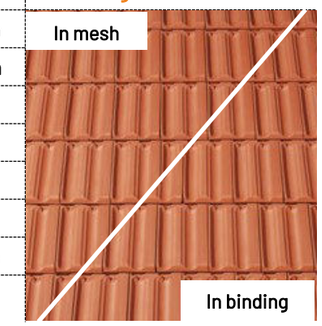
RATIO®



Product datas

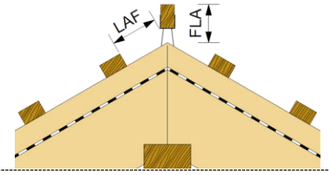
Size	width:	265 mm
	length:	445 mm
	height:	45 mm
	thickness:	10 mm
Weight:		3,4 kg
Packaging	bundle:	6 pcs
	pallet:	288 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	357 mm	368 mm	380 mm
Covering width	221 mm	223 mm	225 mm
Consumption	12,7 pcs/m²	12,2 pcs/m²	11,7 pcs/m²
Covering type		single cover	
Covering width		40,3 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PH ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	✘	60	55	50	50	45	45	40	30	✘	✘
FLA [mm]	✘	95	80	75	70	65	55	55	55	✘	✘

PH ridge tile and 40x60 batten

LAF [mm]	✘	60	55	45	45	40	40	30	15	✘	✘
FLA [mm]	✘	105	90	85	80	75	65	65	65	✘	✘

PH ridge tile and50x50 batten

LAF [mm]	✘	55	50	40	40	30	30	20	5	✘	✘
FLA [mm]	✘	115	100	95	90	90	80	80	85	✘	✘

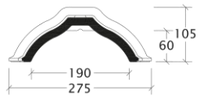
Underlayment requirement

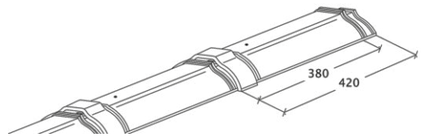
Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PH" ridge tile 2,6 pcs/m





Rounded hip starter

Closing plate

3 axis hip cap

Hip starter

Funct. closing plate

4 axis hip cap

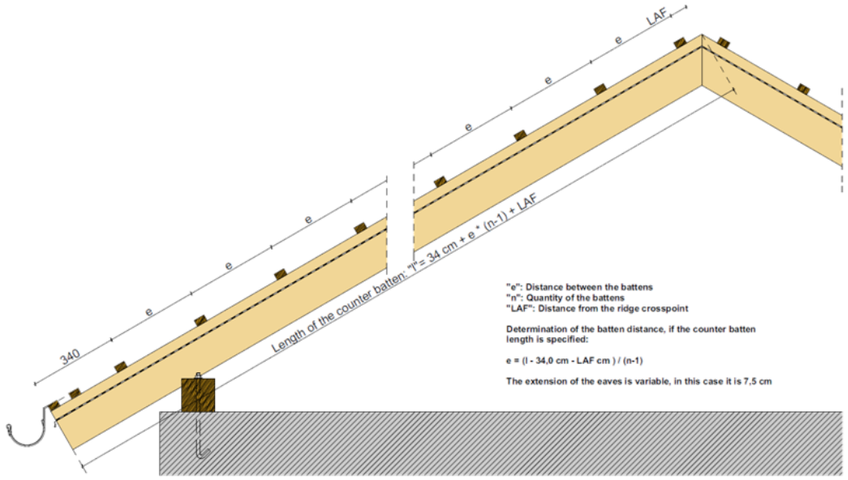
Clay accessories	Size	Quantity
Half tile	155x445	as needed
Verge tile - left	265x445	2,7 pcs/m
Verge tile - right	265x445	2,7 pcs/m
Double wave tile	265x445	2,7 pcs/m
Ventilation tile LQ 27	265x445	as required
Ridge connection ventilation tile	265x445	4,5 pcs/m
Ridge connection vent. half tile	155x445	as needed
Ridge conn. vent. verge tl. left	275x445	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	265x445	as needed
Double wave ridge connection tile	265x445	as needed
Shed roof tile	265x375	4,5 pcs/m
Shed roof half tile	155x375	as needed
Shed roof verge tile – left	265x375	as needed
Shed roof verge tile – right	265x375	as needed
Mansard tile	-	4,5 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

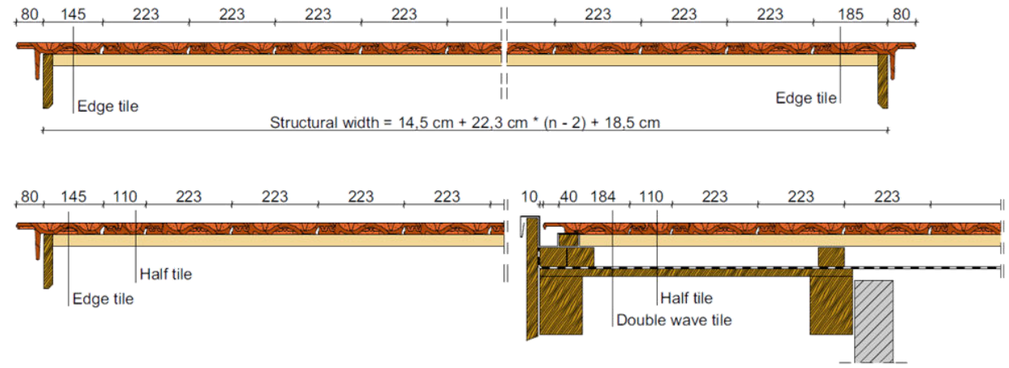
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 70 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "RATIO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PH" ridge tile and 30x50 mm roof battens, LAF = 50 mm		
Number of battens	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
(n)	357 mm	368 mm	380 mm
10	3 603	3 702	3 810
11	3 960	4 070	4 190
12	4 317	4 438	4 570
13	4 674	4 806	4 950
14	5 031	5 174	5 330
15	5 388	5 542	5 710
16	5 745	5 910	6 090
17	6 102	6 278	6 470
18	6 459	6 646	6 850
19	6 816	7 014	7 230
20	7 173	7 382	7 610
21	7 530	7 750	7 990
22	7 887	8 118	8 370
23	8 244	8 486	8 750
24	8 601	8 854	9 130
25	8 958	9 222	9 510
26	9 315	9 590	9 890
27	9 672	9 958	10 270
28	10 029	10 326	10 650
29	10 386	10 694	11 030
30	10 743	11 062	11 410
31	11 100	11 430	11 790
32	11 457	11 798	12 170
33	11 814	12 166	12 550
34	12 171	12 534	12 930
35	12 528	12 902	13 310
36	12 885	13 270	13 690
37	13 242	13 638	14 070
38	13 599	14 006	14 450
39	13 956	14 374	14 830
40	14 313	14 742	15 210



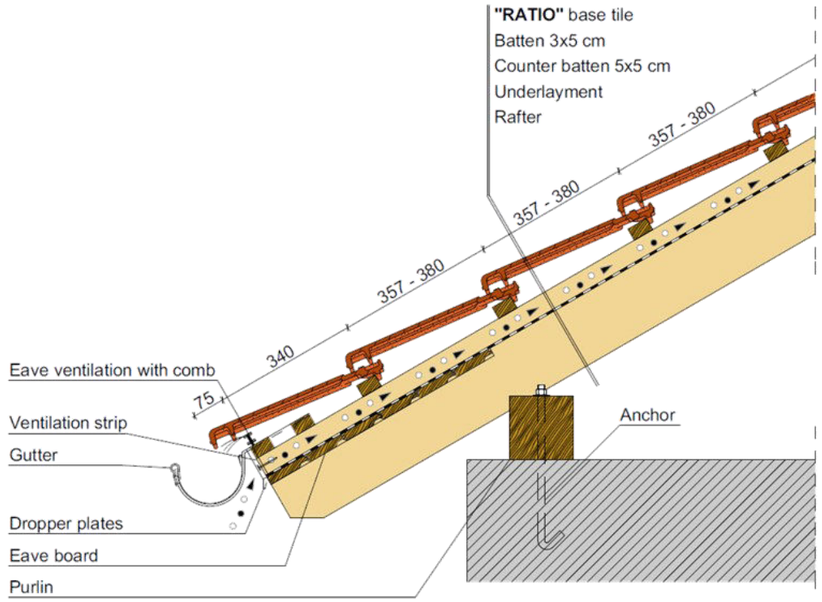
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	110	223	333	330	440	553	663	776	886
10	2 114	2 224	2 337	2 447	2 560	2 670	2 783	2 893	3 006	3 116
20	4 344	4 454	4 567	4 677	4 790	4 900	5 013	5 123	5 236	5 346
30	6 574	6 684	6 797	6 907	7 020	7 130	7 243	7 353	7 466	7 576
40	8 804	8 914	9 027	9 137	9 250	9 360	9 473	9 583	9 696	9 806
50	11 034	11 144	11 257	11 367	11 480	11 590	11 703	11 813	11 926	12 036
60	13 264	13 374	13 487	13 597	13 710	13 820	13 933	14 043	14 156	14 266
70	15 494	15 604	15 717	15 827	15 940	16 050	16 163	16 273	16 386	16 496
80	17 724	17 834	17 947	18 057	18 170	18 280	18 393	18 503	18 616	18 726
90	19 954	20 064	20 177	20 287	20 400	20 510	20 623	20 733	20 846	20 956
100	22 184	22 294	22 407	22 517	22 630	22 740	22 853	22 963	23 076	23 186

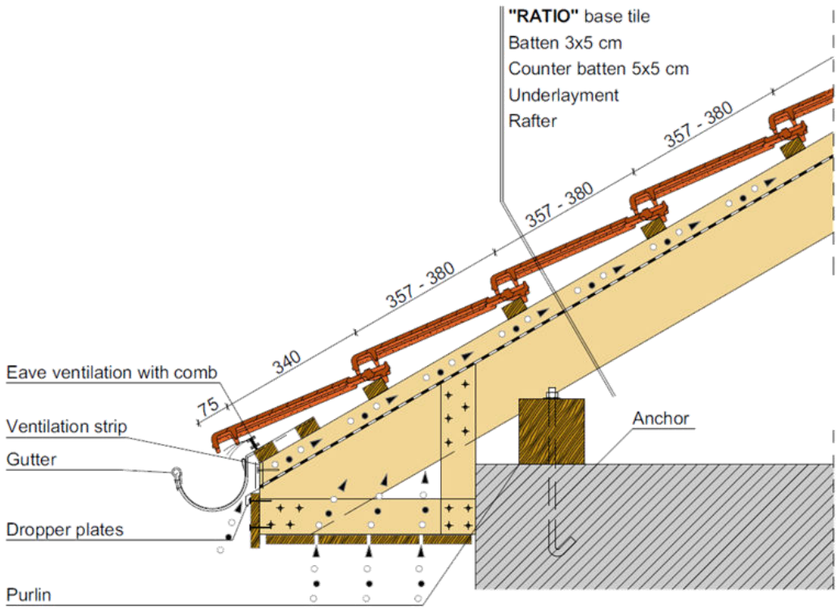
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	999	1 109	1 222	1 332	1 445	1 555	1 668	1 778	1 891	2 001
10	3 229	3 339	3 452	3 562	3 675	3 785	3 898	4 008	4 121	4 231
20	5 459	5 569	5 682	5 792	5 905	6 015	6 128	6 238	6 351	6 461
30	7 689	7 799	7 912	8 022	8 135	8 245	8 358	8 468	8 581	8 691
40	9 919	10 029	10 142	10 252	10 365	10 475	10 588	10 698	10 811	10 921
50	12 149	12 259	12 372	12 482	12 595	12 705	12 818	12 928	13 041	13 151
60	14 379	14 489	14 602	14 712	14 825	14 935	15 048	15 158	15 271	15 381
70	16 609	16 719	16 832	16 942	17 055	17 165	17 278	17 388	17 501	17 611
80	18 839	18 949	19 062	19 172	19 285	19 395	19 508	19 618	19 731	19 841
90	21 069	21 179	21 292	21 402	21 515	21 625	21 738	21 848	21 961	22 071
100	23 299	23 409	23 522	23 632	23 745	23 855	23 968	24 078	24 191	24 301

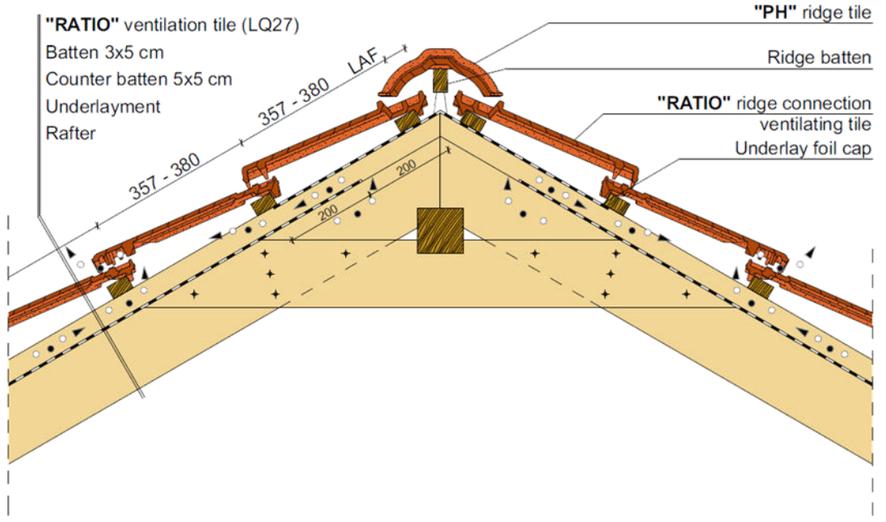
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



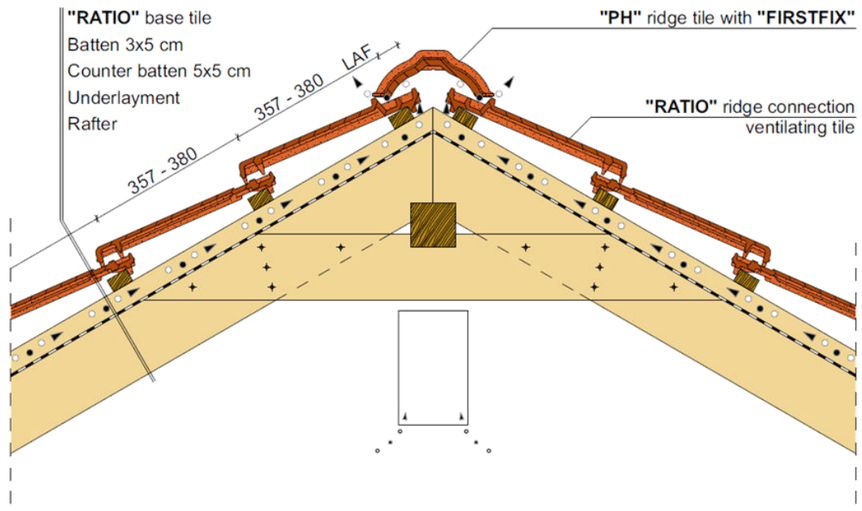
Eave detail



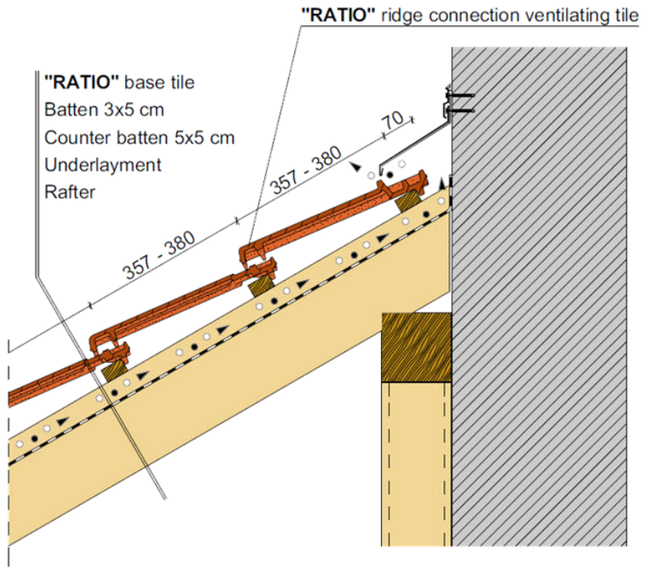
Closed eave detail



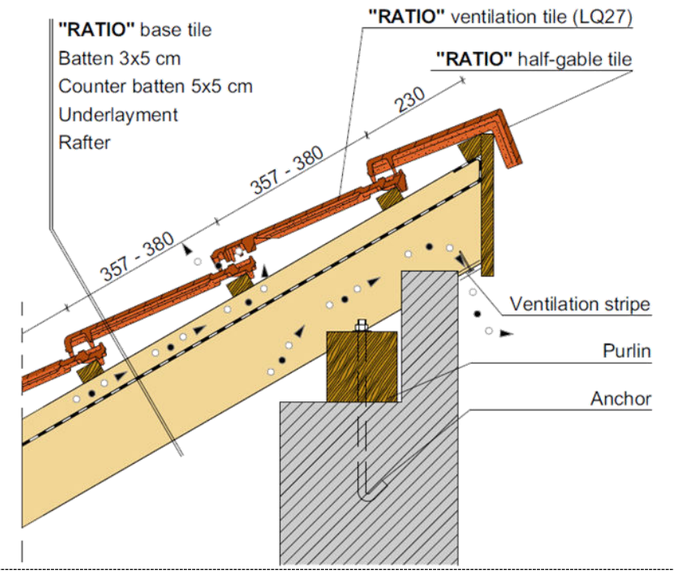
Ridge detail, with ventilation tile



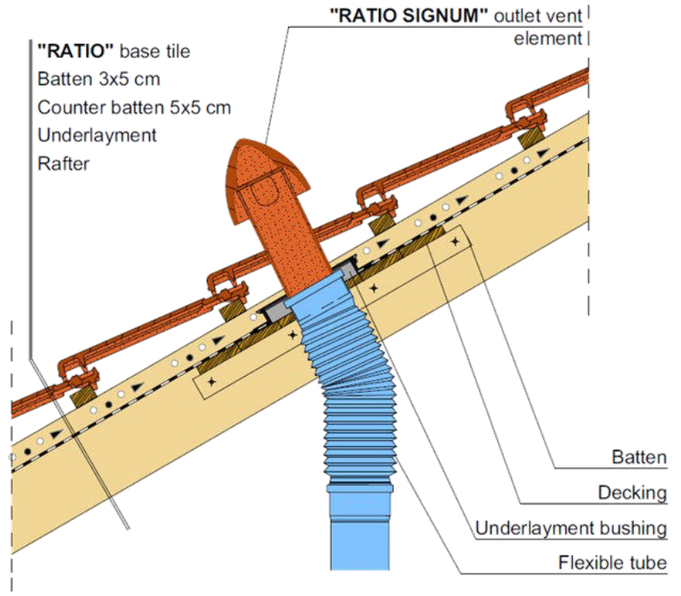
Ridge detail, with ridge connection ventilation tile



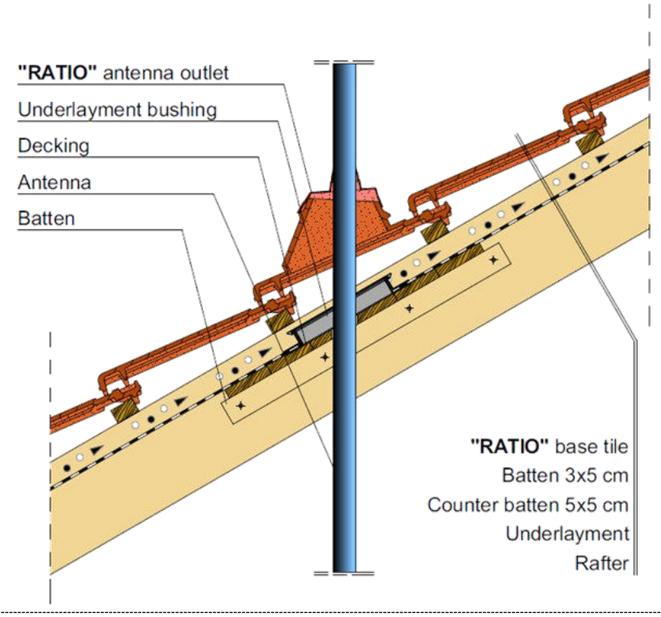
Wall connection detail



Shed ridge detail, with shad roof tile

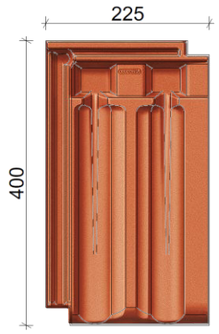


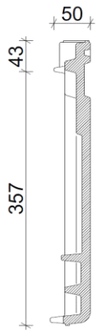
Clay ventilation outlet tile



Clay antenna outlet tile

RUSTICO®

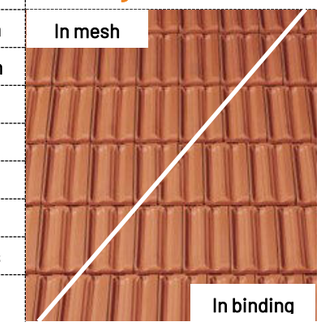




Product datas

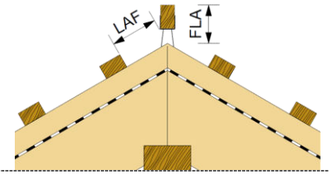
Size	width:	225 mm
	length:	400 mm
	height:	50 mm
	thickness:	12 mm
Weight:		3,0 kg
Packaging	bundle:	5 pcs
	pallet:	240 pcs
Standrad roof pitch:		25°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	328 mm	338 mm	348 mm
Covering width	198 mm	200 mm	202 mm
Consumption	15,3 pcs/m²	14,7 pcs/m²	14,2 pcs/m²
Covering type		single cover	
Covering width		45,6 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PRU ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	80	75	75	70	65	60	55	50	50	45	45
FLA [mm]	100	95	85	80	75	65	60	55	45	40	35

PRU ridge tile and 40x60 batten

LAF [mm]	80	80	75	65	60	55	50	40	35	30	30
FLA [mm]	110	105	95	90	85	75	70	65	55	50	45

PRU ridge tile and50x50 batten

LAF [mm]	75	75	70	60	55	45	40	30	25	20	20
FLA [mm]	115	110	105	100	95	90	85	80	75	70	65

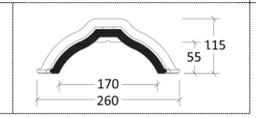
Underlayment requirement

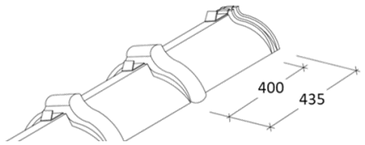
Unsupported underlayment	"ECO"	≥ 18°
Windproof underlayment	"BASIC"	≥ 16°
Watertight underlayment	"PRO"	≥ 14°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PRU" ridge tile 2,5 pcs/m





Hip starter

Closing plate

3 axis hip cap

Funct. closing plate

4 axis hip cap

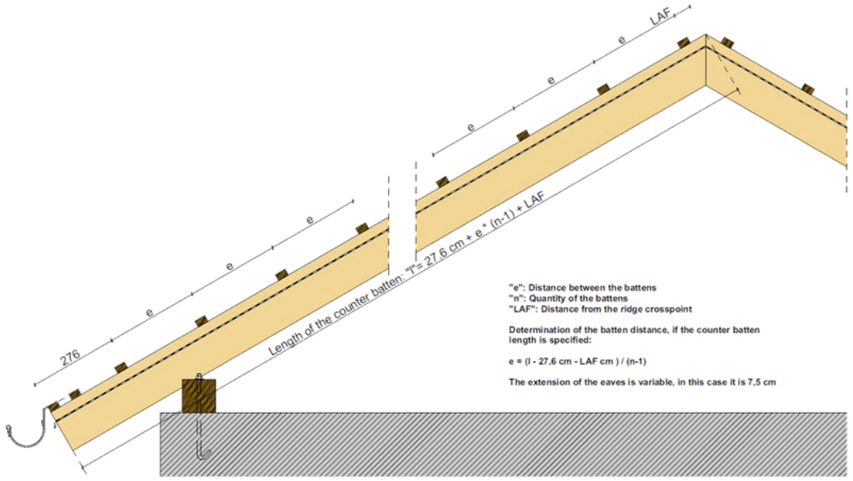
Clay accessories	Size	Quantity
Half tile	130x400	as needed
Verge tile - left	225x400	3,0 pcs/m
Verge tile - right	225x400	3,0 pcs/m
Ventilation tile L0 30	225x400	as required
Shed roof tile	225x310	5,0 pcs/m
Shed roof verge tile – left	225x310	as needed
Shed roof verge tile – right	225x310	as needed
Mansard tile	-	5,0 pcs/m

Clay accessories	Size	Quantity
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

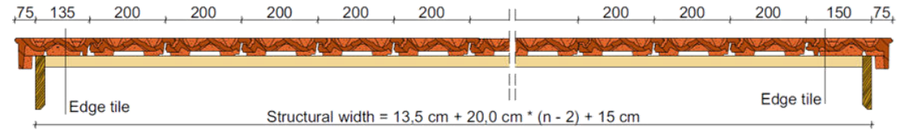
Fixing products

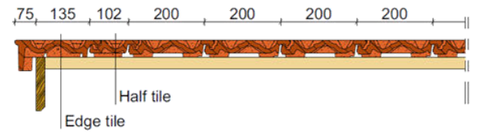
Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 70 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "RUSTICO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PRU" ridge tile and 30x50 mm roof battens, LAF = 65 mm		
Number of battens	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
(n)	328 mm	338 mm	348 mm
10	3 293	3 383	3 473
11	3 621	3 721	3 821
12	3 949	4 059	4 169
13	4 277	4 397	4 517
14	4 605	4 735	4 865
15	4 933	5 073	5 213
16	5 261	5 411	5 561
17	5 589	5 749	5 909
18	5 917	6 087	6 257
19	6 245	6 425	6 605
20	6 573	6 763	6 953
21	6 901	7 101	7 301
22	7 229	7 439	7 649
23	7 557	7 777	7 997
24	7 885	8 115	8 345
25	8 213	8 453	8 693
26	8 541	8 791	9 041
27	8 869	9 129	9 389
28	9 197	9 467	9 737
29	9 525	9 805	10 085
30	9 853	10 143	10 433
31	10 181	10 481	10 781
32	10 509	10 819	11 129
33	10 837	11 157	11 477
34	11 165	11 495	11 825
35	11 493	11 833	12 173
36	11 821	12 171	12 521
37	12 149	12 509	12 869
38	12 477	12 847	13 217
39	12 805	13 185	13 565
40	13 133	13 523	13 913





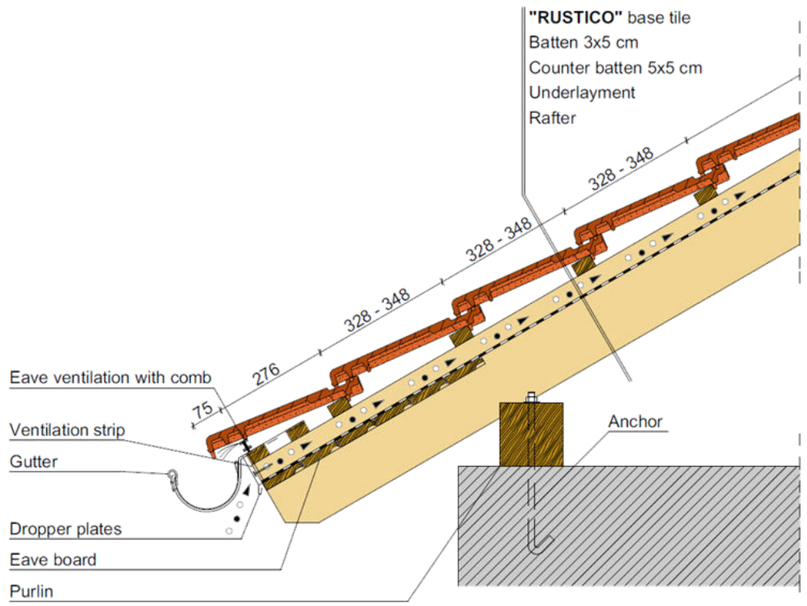
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	102	200	302	275	377	475	577	675	777
10	1 875	1 977	2 075	2 177	2 275	2 377	2 475	2 577	2 675	2 777
20	3 875	3 977	4 075	4 177	4 275	4 377	4 475	4 577	4 675	4 777
30	5 875	5 977	6 075	6 177	6 275	6 377	6 475	6 577	6 675	6 777
40	7 875	7 977	8 075	8 177	8 275	8 377	8 475	8 577	8 675	8 777
50	9 875	9 977	10 075	10 177	10 275	10 377	10 475	10 577	10 675	10 777
60	11 875	11 977	12 075	12 177	12 275	12 377	12 475	12 577	12 675	12 777
70	13 875	13 977	14 075	14 177	14 275	14 377	14 475	14 577	14 675	14 777
80	15 875	15 977	16 075	16 177	16 275	16 377	16 475	16 577	16 675	16 777
90	17 875	17 977	18 075	18 177	18 275	18 377	18 475	18 577	18 675	18 777
100	19 875	19 977	20 075	20 177	20 275	20 377	20 475	20 577	20 675	20 777

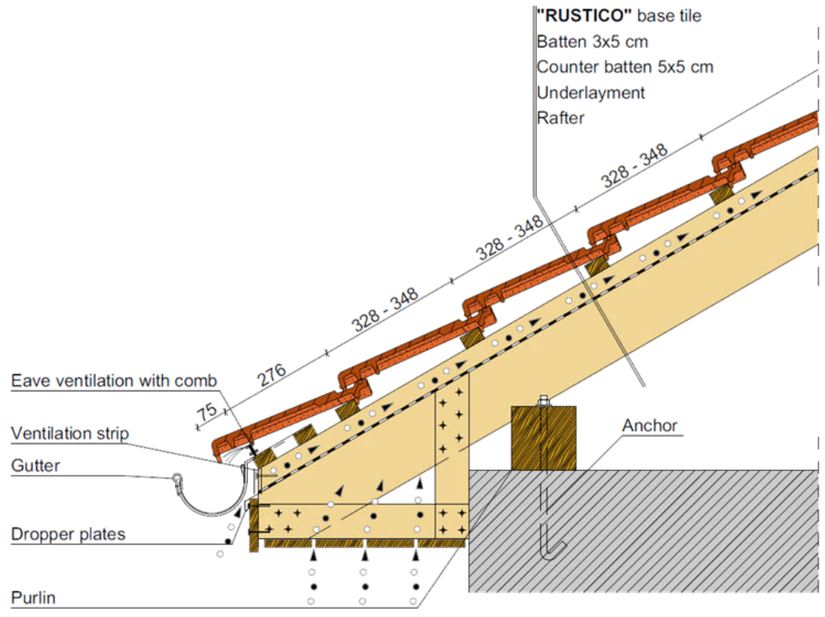
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	875	977	1 075	1 177	1 275	1 377	1 475	1 577	1 675	1 777
10	2 875	2 977	3 075	3 177	3 275	3 377	3 475	3 577	3 675	3 777
20	4 875	4 977	5 075	5 177	5 275	5 377	5 475	5 577	5 675	5 777
30	6 875	6 977	7 075	7 177	7 275	7 377	7 475	7 577	7 675	7 777
40	8 875	8 977	9 075	9 177	9 275	9 377	9 475	9 577	9 675	9 777
50	10 875	10 977	11 075	11 177	11 275	11 377	11 475	11 577	11 675	11 777
60	12 875	12 977	13 075	13 177	13 275	13 377	13 475	13 577	13 675	13 777
70	14 875	14 977	15 075	15 177	15 275	15 377	15 475	15 577	15 675	15 777
80	16 875	16 977	17 075	17 177	17 275	17 377	17 475	17 577	17 675	17 777
90	18 875	18 977	19 075	19 177	19 275	19 377	19 475	19 577	19 675	19 777
100	20 875	20 977	21 075	21 177	21 275	21 377	21 475	21 577	21 675	21 777

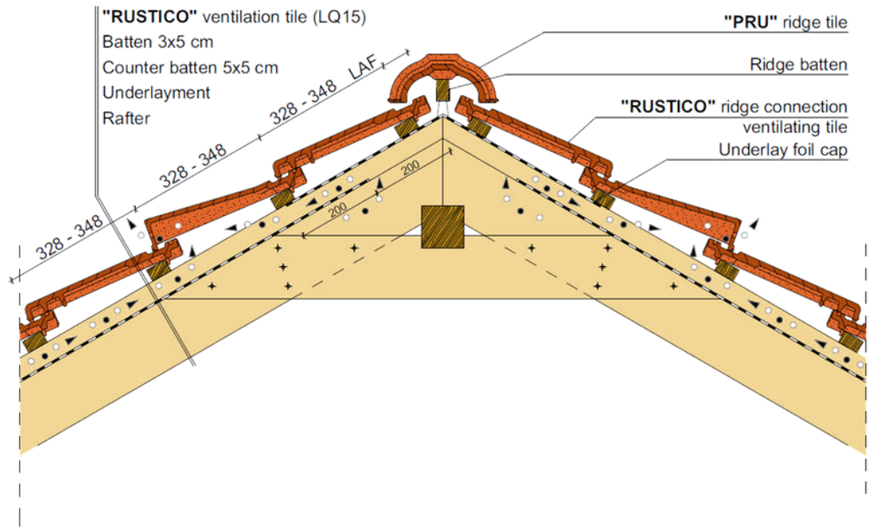
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



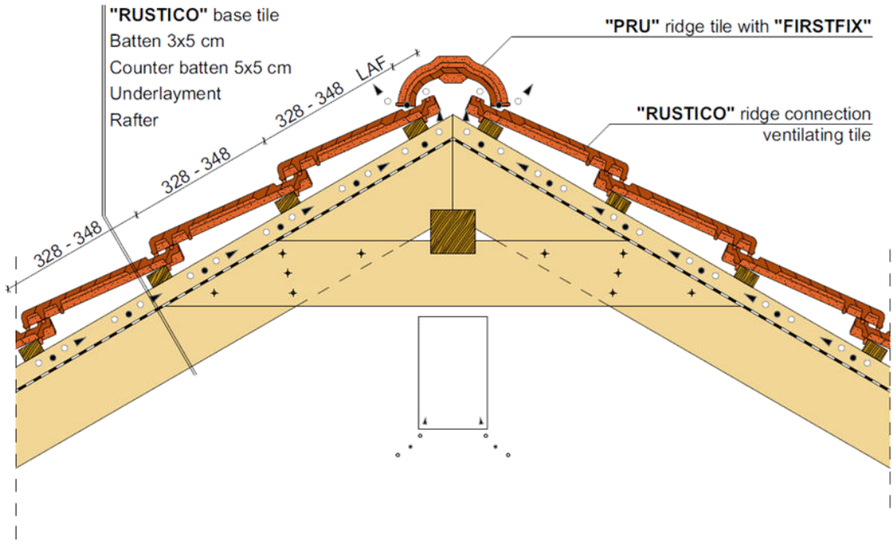
Eave detail



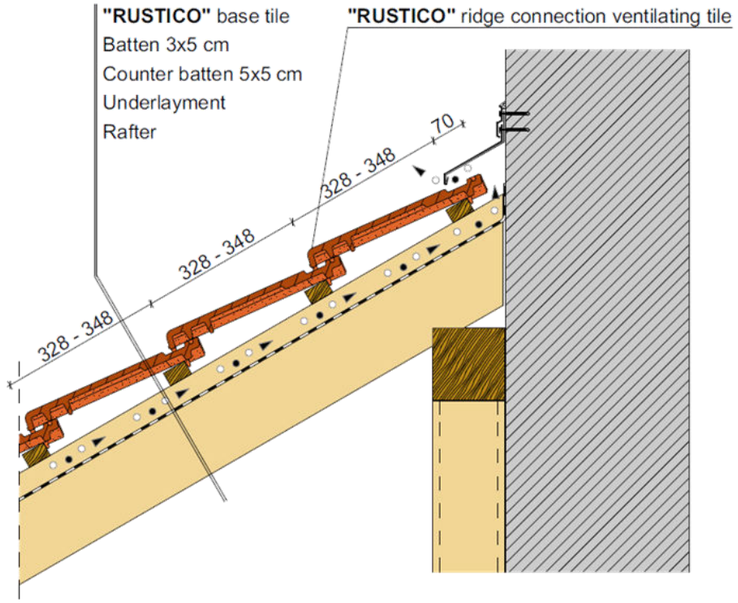
Closed eave detail



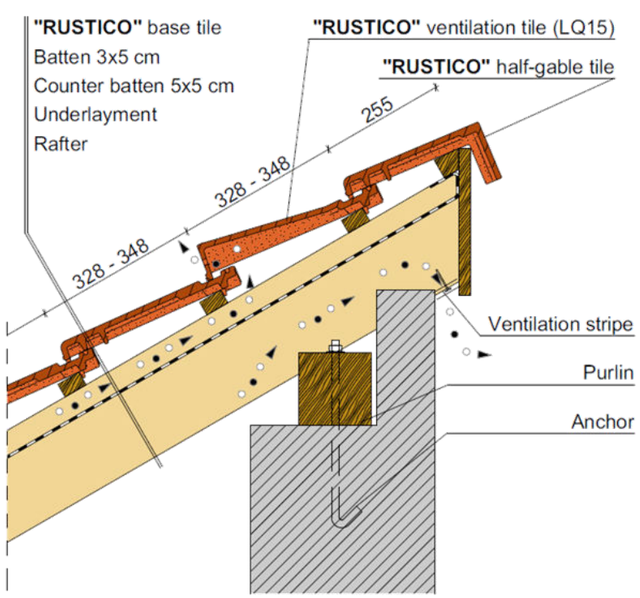
Ridge detail, with ventilation tile



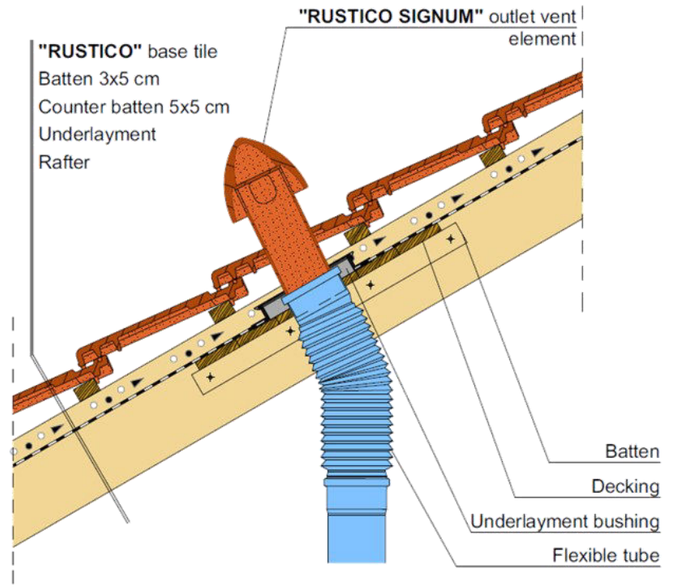
Ridge detail, with ridge connection ventilation tile



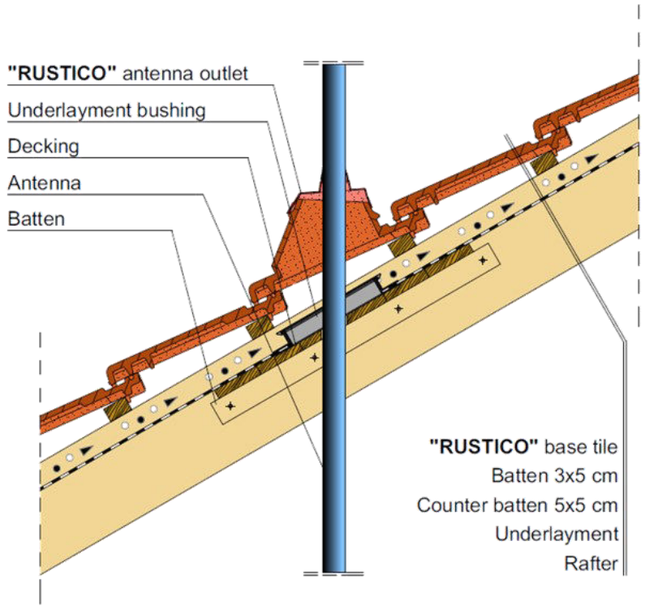
Wall connection detail



Shed ridge detail, with shad roof tile

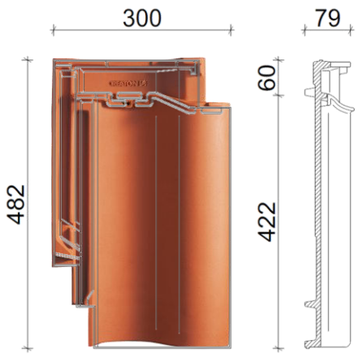


Clay ventilation outlet tile



Clay antenna outlet tile

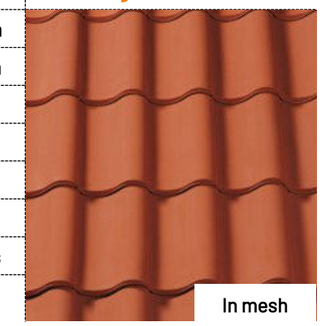
SINFONIE®



Product datas

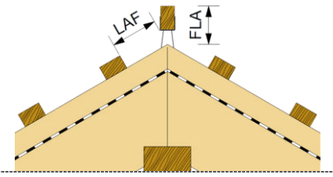
Size	width:	300 mm
	length:	482 mm
	height:	79 mm
	thickness:	11 mm
Weight:		4,7 kg
Packaging	bundle:	5 pcs
	pallet:	200 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	361 mm	375 mm	389 mm
Covering width	228 mm	230 mm	232 mm
Consumption	12,2 pcs/m²	11,5 pcs/m²	10,9 pcs/m²
Covering type		single cover	
Covering width		52,9 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PF ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	80	80	70	65	60	60	60	50	45	45	45
FLA [mm]	100	100	90	80	75	65	65	55	50	50	40

PF ridge tile and 40x60 batten

LAF [mm]	80	80	70	60	55	55	55	40	30	30	30
FLA [mm]	110	110	100	90	85	75	75	65	60	60	55

PR ridge tile and 30x50 batten

LAF [mm]	80	80	70	65	60	60	60	50	45	45	45
FLA [mm]	100	100	90	80	75	65	65	55	50	50	40

PR ridge tile and 40x60 batten

LAF [mm]	80	80	70	60	55	55	55	40	30	30	30
FLA [mm]	110	110	100	90	85	75	75	65	60	60	55

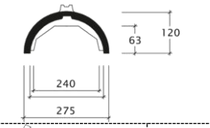
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 14°
Windproof underlayment	"BASIC"	≥ 12°
Watertight underlayment	"PRO"	≥ 10°
Waterproof underlayment	"ULTRA"	≥ 7°

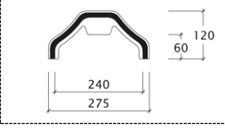
Required batten dimensions

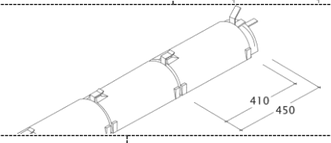
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PF" ridge tile 2,5 pcs/m



"PR" ridge tile 2,5 pcs/m





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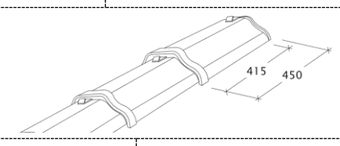


"PF" hip starter	"PF" hip starter, shell shape	3 axis hip cap	"PR" hip starter	"PR" hip starter, shell shape
				
„PF" hip starter, rounded	**„PF" closing plate**	**4 axis hip cap**	**"PR" closing plate**	
				

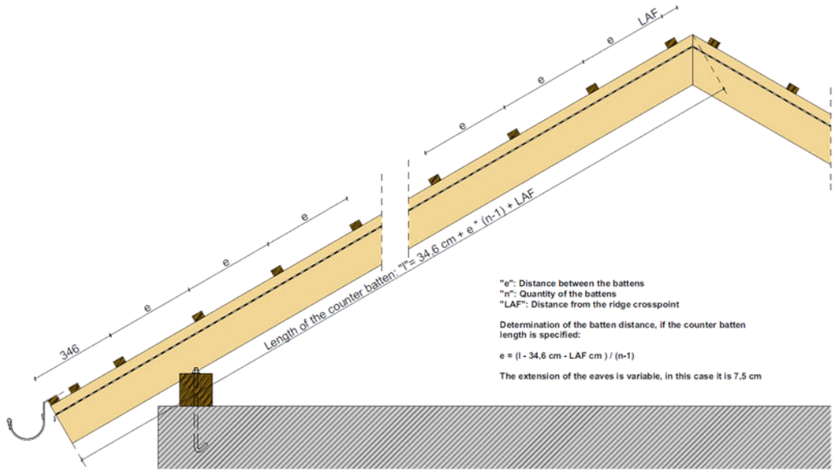
Clay accessories	Size	Quantity
Half tile	260x482	as needed
Verge tile - left	340x482	2,7 pcs/m
Verge tile - right	300x482	2,7 pcs/m
Double wave tile	340x482	2,7 pcs/m
Ventilation tile LQ 32,5	300x482	as required
Ridge connection ventilation tile	300x482	4,4 pcs/m
Ridge connection vent. half tile	260x482	as needed
Ridge conn. vent. verge tl. left	340x482	as needed

Clay accessories	Size	Quantity
Ridge conn. vent. verge tl. right	300x482	as needed
Double wave ridge connection tile	340x482	as needed
Shed roof tile	300x395	4,4 pcs/m
Shed roof half tile	260x395	as needed
Shed roof verge tile – left	340x395	as needed
Shed roof verge tile – right	300x395	as needed
Mansard tile	-	4,4 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

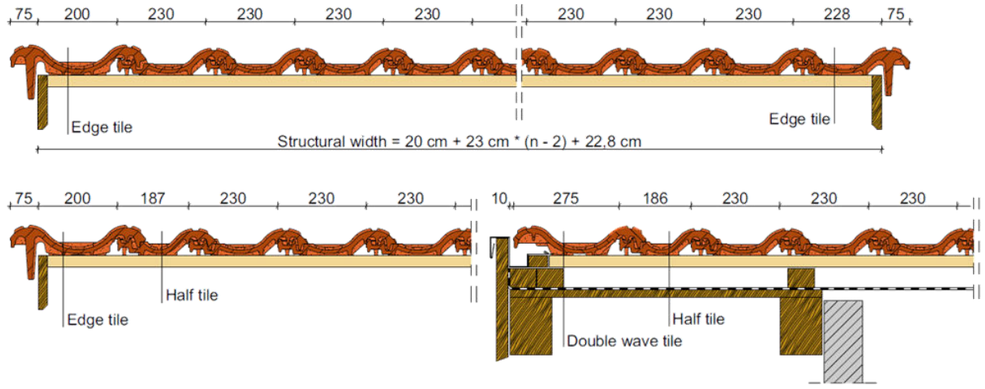
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "SINFONIE" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PF" ridge tile and 30x50 mm roof battens, LAF = 60 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	361 mm	375 mm	389 mm
10	3 655	3 781	3 907
11	4 016	4 156	4 296
12	4 377	4 531	4 685
13	4 738	4 906	5 074
14	5 099	5 281	5 463
15	5 460	5 656	5 852
16	5 821	6 031	6 241
17	6 182	6 406	6 630
18	6 543	6 781	7 019
19	6 904	7 156	7 408
20	7 265	7 531	7 797
21	7 626	7 906	8 186
22	7 987	8 281	8 575
23	8 348	8 656	8 964
24	8 709	9 031	9 353
25	9 070	9 406	9 742
26	9 431	9 781	10 131
27	9 792	10 156	10 520
28	10 153	10 531	10 909
29	10 514	10 906	11 298
30	10 875	11 281	11 687
31	11 236	11 656	12 076
32	11 597	12 031	12 465
33	11 958	12 406	12 854
34	12 319	12 781	13 243
35	12 680	13 156	13 632
36	13 041	13 531	14 021
37	13 402	13 906	14 410
38	13 763	14 281	14 799
39	14 124	14 656	15 188
40	14 485	15 031	15 577



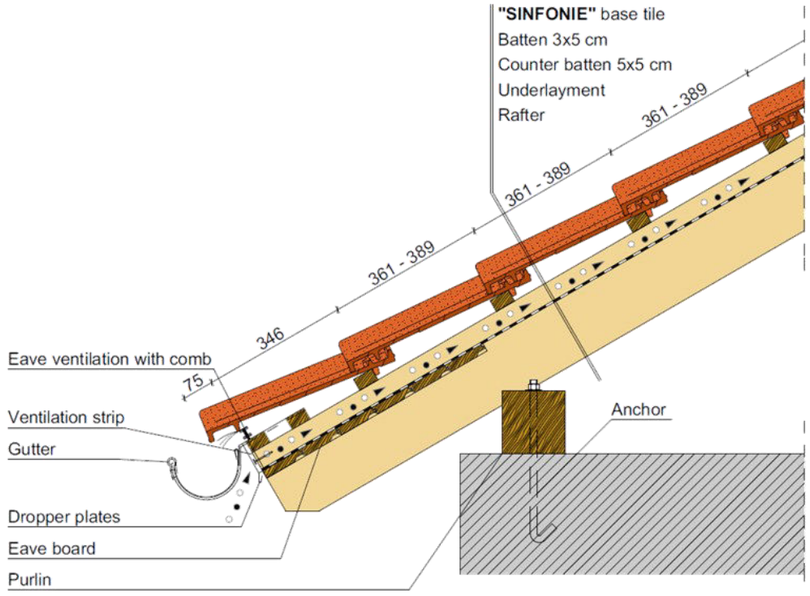
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	187	230	417	428	615	658	845	888	1 075
10	2 268	2 455	2 498	2 685	2 728	2 915	2 958	3 145	3 188	3 375
20	4 568	4 755	4 798	4 985	5 028	5 215	5 258	5 445	5 488	5 675
30	6 868	7 055	7 098	7 285	7 328	7 515	7 558	7 745	7 788	7 975
40	9 168	9 355	9 398	9 585	9 628	9 815	9 858	10 045	10 088	10 275
50	11 468	11 655	11 698	11 885	11 928	12 115	12 158	12 345	12 388	12 575
60	13 768	13 955	13 998	14 185	14 228	14 415	14 458	14 645	14 688	14 875
70	16 068	16 255	16 298	16 485	16 528	16 715	16 758	16 945	16 988	17 175
80	18 368	18 555	18 598	18 785	18 828	19 015	19 058	19 245	19 288	19 475
90	20 668	20 855	20 898	21 085	21 128	21 315	21 358	21 545	21 588	21 775
100	22 968	23 155	23 198	23 385	23 428	23 615	23 658	23 845	23 888	24 075

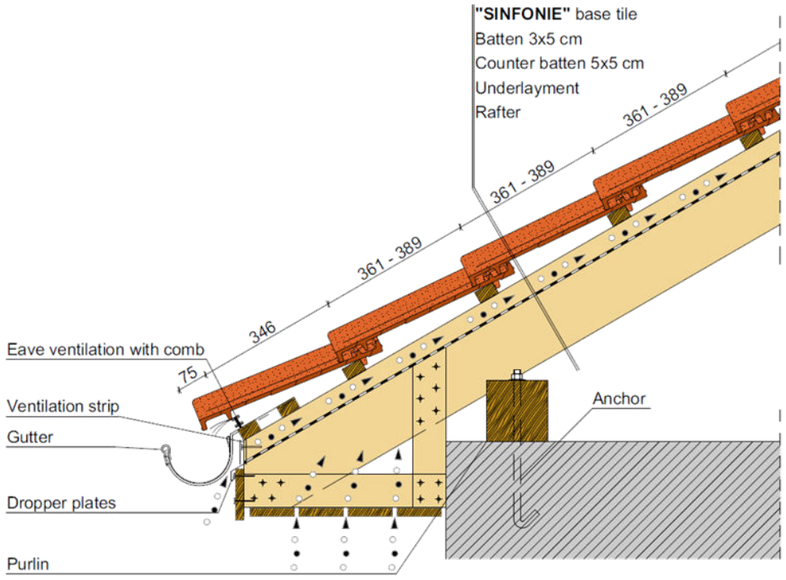
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 118	1 305	1 348	1 535	1 578	1 765	1 808	1 995	2 038	2 225
10	3 418	3 605	3 648	3 835	3 878	4 065	4 108	4 295	4 338	4 525
20	5 718	5 905	5 948	6 135	6 178	6 365	6 408	6 595	6 638	6 825
30	8 018	8 205	8 248	8 435	8 478	8 665	8 708	8 895	8 938	9 125
40	10 318	10 505	10 548	10 735	10 778	10 965	11 008	11 195	11 238	11 425
50	12 618	12 805	12 848	13 035	13 078	13 265	13 308	13 495	13 538	13 725
60	14 918	15 105	15 148	15 335	15 378	15 565	15 608	15 795	15 838	16 025
70	17 218	17 405	17 448	17 635	17 678	17 865	17 908	18 095	18 138	18 325
80	19 518	19 705	19 748	19 935	19 978	20 165	20 208	20 395	20 438	20 625
90	21 818	22 005	22 048	22 235	22 278	22 465	22 508	22 695	22 738	22 925
100	24 118	24 305	24 348	24 535	24 578	24 765	24 808	24 995	25 038	25 225

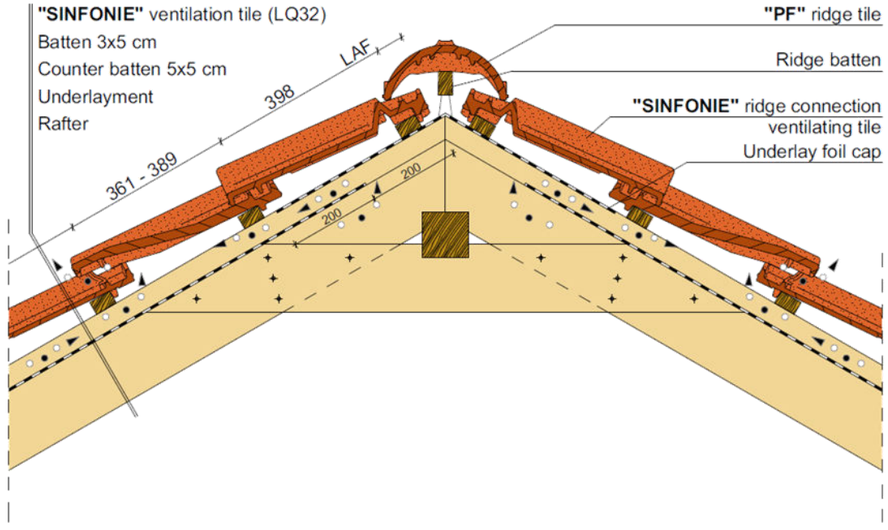
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



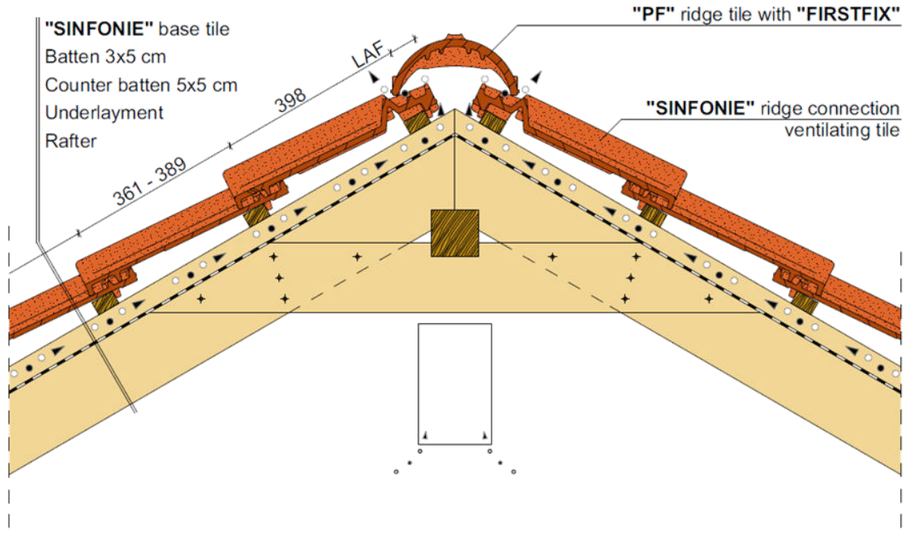
Eave detail



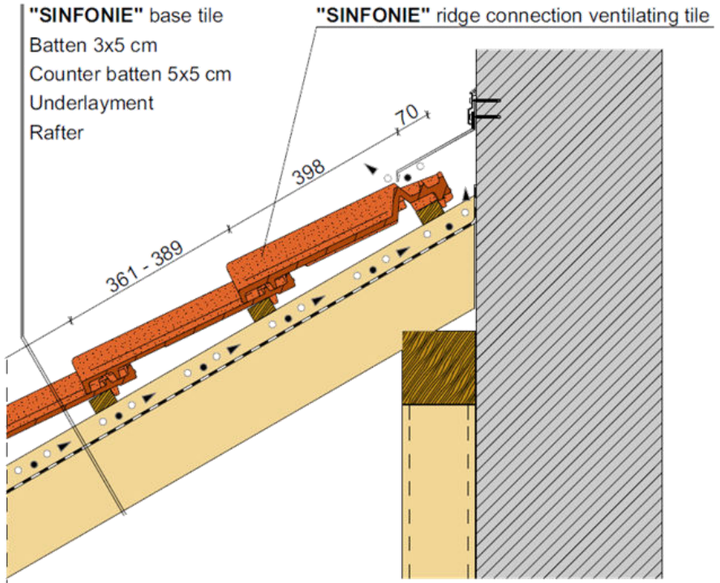
Closed eave detail



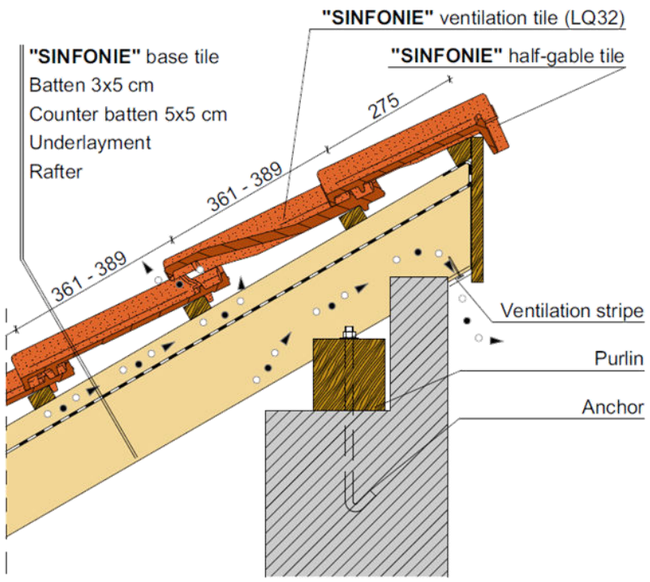
Ridge detail, with ventilation tile



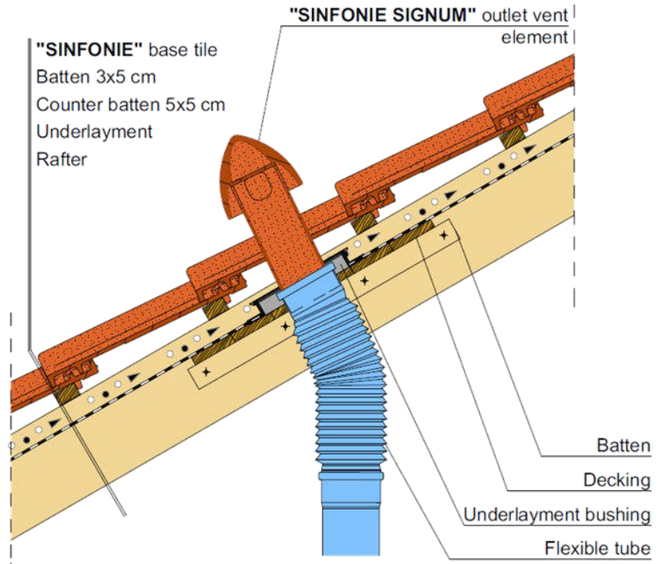
Ridge detail, with ridge connection ventilation tile



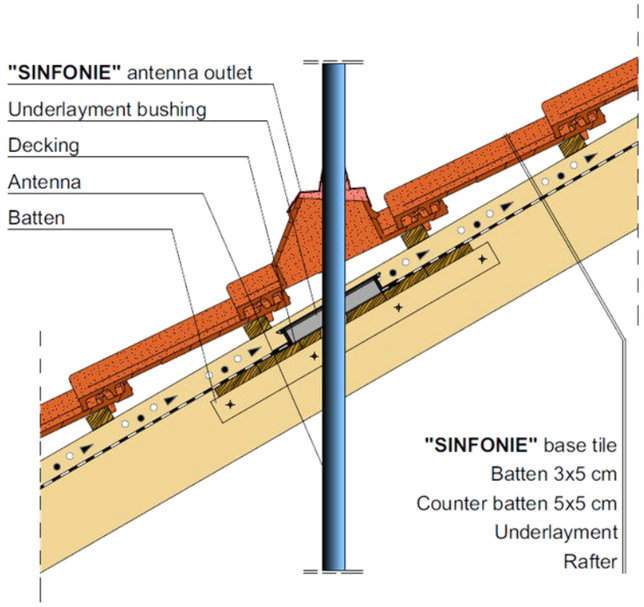
Wall connection detail



Shed ridge detail, with shad roof tile

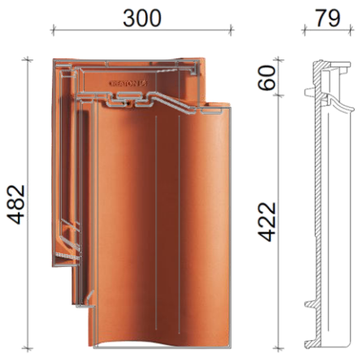


Clay ventilation outlet tile



Clay antenna outlet tile

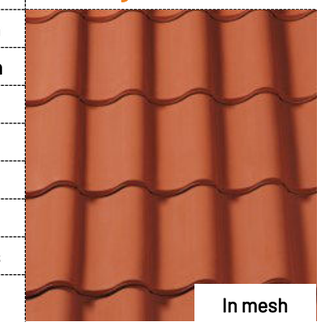
MELODIE®



Product datas

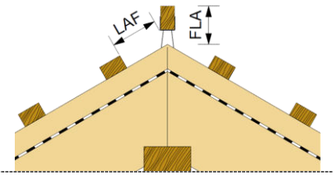
Size	width:	255 mm
	length:	440 mm
	height:	75 mm
	thickness:	10 mm
Weight:		3,3 kg
Packaging	bundle:	6 pcs
	pallet:	240 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	314 mm	330 mm	348 mm
Covering width	208 mm	209 mm	210 mm
Consumption	15,3 pcs/m²	14,5 pcs/m²	13,7 pcs/m²
Covering type		single cover	
Covering width		47,9 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PZ ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	65	65	65	60	60	60	50	50	45	40	40
FLA [mm]	110	110	105	100	90	85	80	70	65	60	50

PZ ridge tile and 40x60 batten

LAF [mm]	65	65	65	55	55	55	45	40	30	25	25
FLA [mm]	120	120	115	110	100	95	90	80	75	70	60

PMoN ridge tile and 30x50 batten

LAF [mm]	50	50	45	40	30	20	15	15	15	10	10
FLA [mm]	115	115	105	100	95	90	80	75	75	70	70

PMoN ridge tile and 40x60 batten

LAF [mm]	50	50	45	35	25	15	10	10	10	✘	✘
FLA [mm]	125	125	115	110	105	100	90	85	80	✘	✘

Underlayment requirement

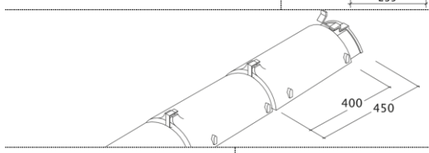
Unsupported underlayment	"ECO"	≥ 16°
Windproof underlayment	"BASIC"	≥ 14°
Watertight underlayment	"PRO"	≥ 12°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PZ" ridge tile 2,5 pcs/m

"PMoN" ridge tile 2,8 pcs/m



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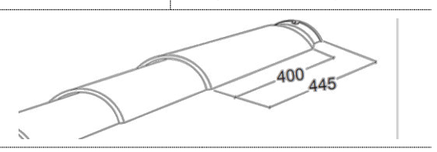


"PZ" hip starter	"PZ" hip starter, shell shape	3 axis hip cap	"PMoN" hip starter
			
„PZ" hip starter, rounded	**„PZ" closing plate**	**4 axis hip cap**	**"PMoN" closing plate**
			

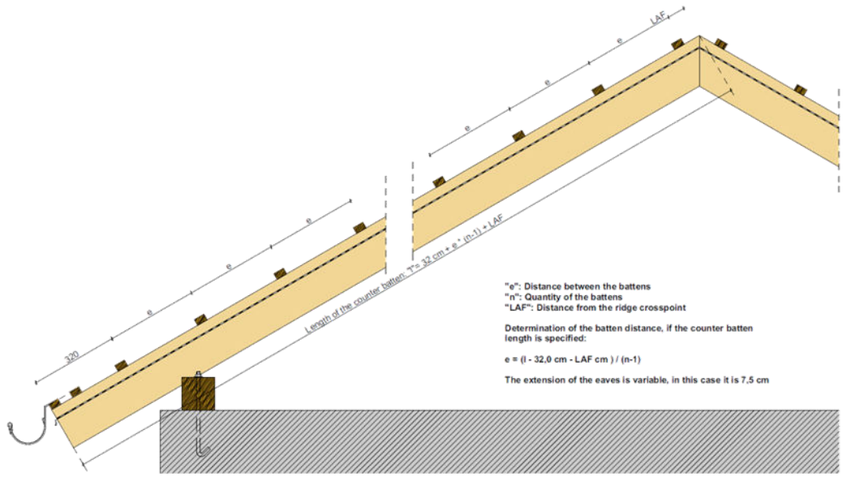
Clay accessories	Size	Quantity
Verge tile - left	267x440	3,0 pcs/m
Verge tile - right	255x440	3,0 pcs/m
Double wave tile	267x440	3,0 pcs/m
Ventilation tile LQ 32,5	255x440	as required
Ridge connection ventilation tile	255x440	4,8 pcs/m
Ridge conn. vent. verge tl. left	267x440	as needed
Ridge conn. vent. verge tl. left	255x440	as needed
Double wave ridge connection tile	267x440	as needed

Clay accessories	Size	Quantity
Shed roof tile	255x335	4,8 pcs/m
Shed roof verge tile – left	267x335	as needed
Shed roof verge tile – right	255x335	as needed
Mansard tile	-	4,8 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

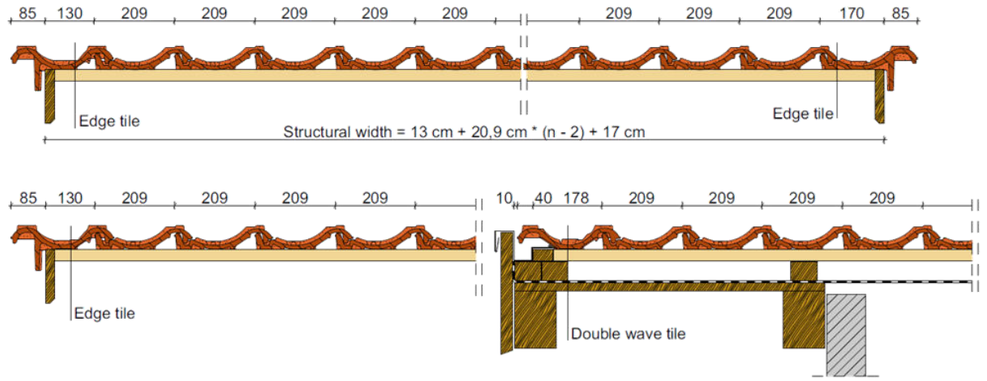
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "MELODIE" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PZ" ridge tile and 30x50 mm roof battens, LAF = 60 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	314 mm	330 mm	348 mm
10	3 206	3 350	3 512
11	3 520	3 680	3 860
12	3 834	4 010	4 208
13	4 148	4 340	4 556
14	4 462	4 670	4 904
15	4 776	5 000	5 252
16	5 090	5 330	5 600
17	5 404	5 660	5 948
18	5 718	5 990	6 296
19	6 032	6 320	6 644
20	6 346	6 650	6 992
21	6 660	6 980	7 340
22	6 974	7 310	7 688
23	7 288	7 640	8 036
24	7 602	7 970	8 384
25	7 916	8 300	8 732
26	8 230	8 630	9 080
27	8 544	8 960	9 428
28	8 858	9 290	9 776
29	9 172	9 620	10 124
30	9 486	9 950	10 472
31	9 800	10 280	10 820
32	10 114	10 610	11 168
33	10 428	10 940	11 516
34	10 742	11 270	11 864
35	11 056	11 600	12 212
36	11 370	11 930	12 560
37	11 684	12 260	12 908
38	11 998	12 590	13 256
39	12 312	12 920	13 604
40	12 626	13 250	13 952



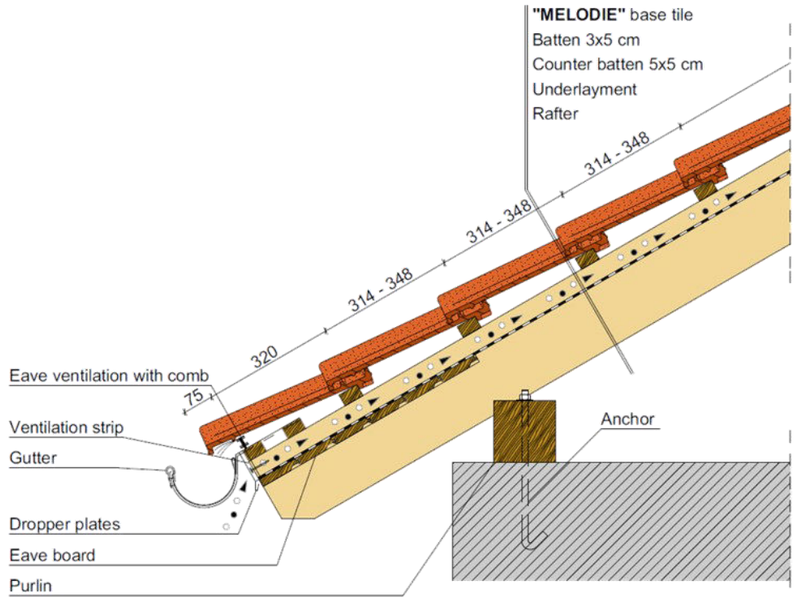
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	-	209	-	300	-	509	-	718	-
10	1 972	-	2 181	-	2 390	-	2 599	-	2 808	-
20	4 062	-	4 271	-	4 480	-	4 689	-	4 898	-
30	6 152	-	6 361	-	6 570	-	6 779	-	6 988	-
40	8 242	-	8 451	-	8 660	-	8 869	-	9 078	-
50	10 332	-	10 541	-	10 750	-	10 959	-	11 168	-
60	12 422	-	12 631	-	12 840	-	13 049	-	13 258	-
70	14 512	-	14 721	-	14 930	-	15 139	-	15 348	-
80	16 602	-	16 811	-	17 020	-	17 229	-	17 438	-
90	18 692	-	18 901	-	19 110	-	19 319	-	19 528	-
100	20 782	-	20 991	-	21 200	-	21 409	-	21 618	-

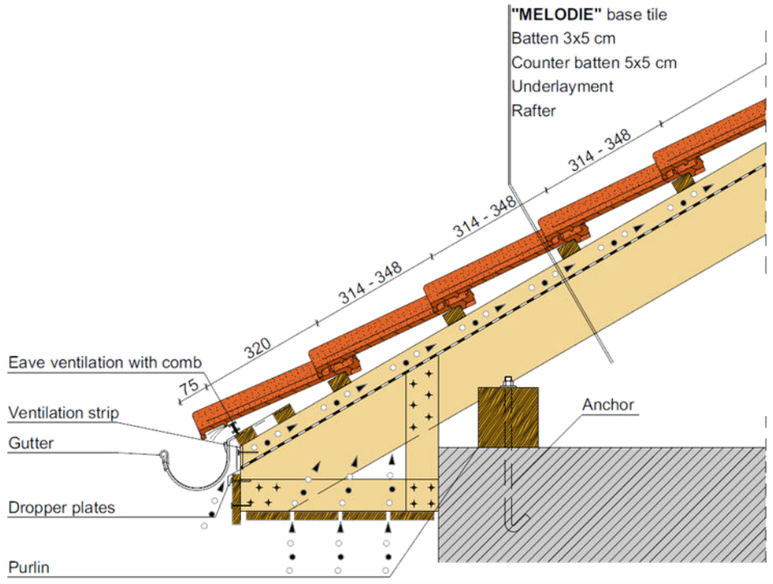
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	927	-	1 136	-	1 345	-	1 554	-	1 763	-
10	3 017	-	3 226	-	3 435	-	3 644	-	3 853	-
20	5 107	-	5 316	-	5 525	-	5 734	-	5 943	-
30	7 197	-	7 406	-	7 615	-	7 824	-	8 033	-
40	9 287	-	9 496	-	9 705	-	9 914	-	10 123	-
50	11 377	-	11 586	-	11 795	-	12 004	-	12 213	-
60	13 467	-	13 676	-	13 885	-	14 094	-	14 303	-
70	15 557	-	15 766	-	15 975	-	16 184	-	16 393	-
80	17 647	-	17 856	-	18 065	-	18 274	-	18 483	-
90	19 737	-	19 946	-	20 155	-	20 364	-	20 573	-
100	21 827	-	22 036	-	22 245	-	22 454	-	22 663	-

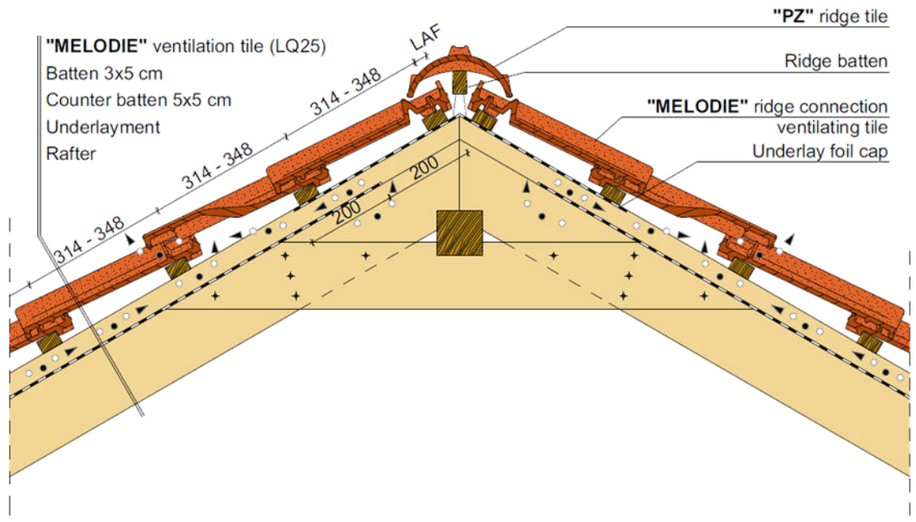
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



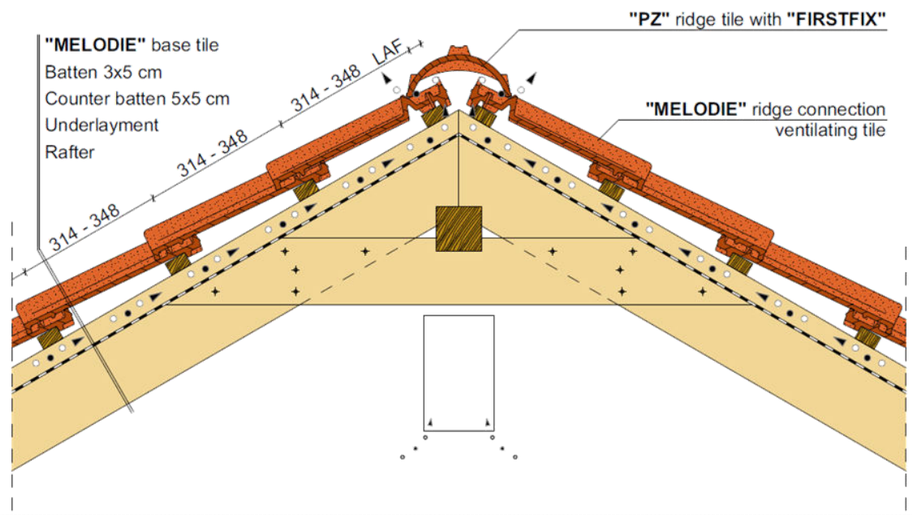
Eave detail



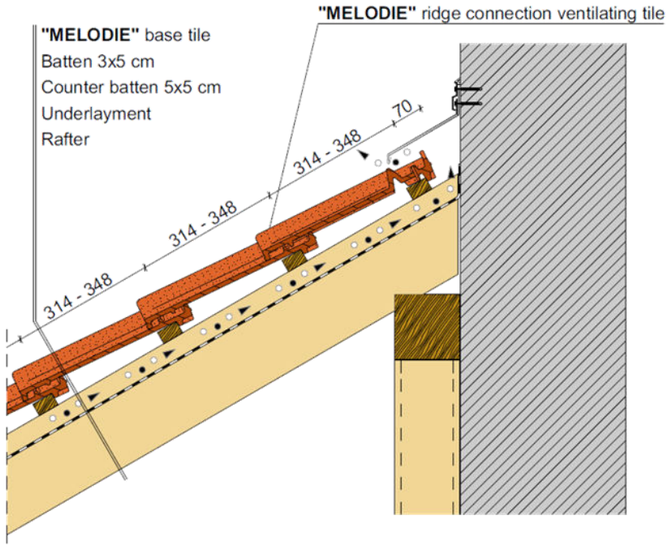
Closed eave detail



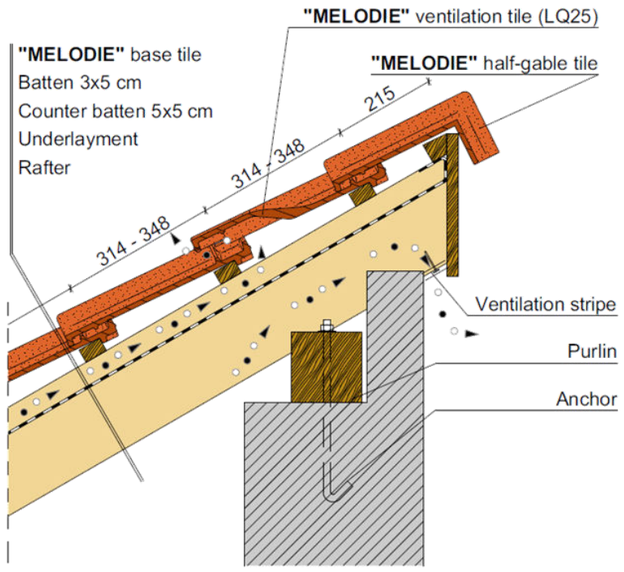
Ridge detail, with ventilation tile



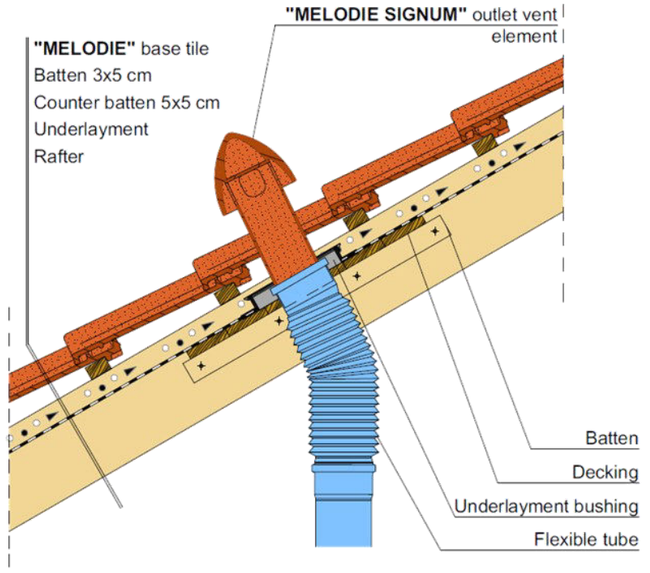
Ridge detail, with ridge connection ventilation tile



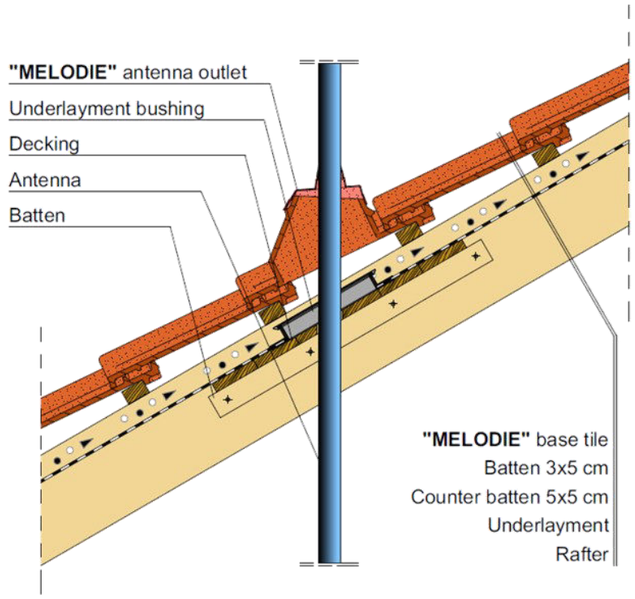
Wall connection detail



Shed ridge detail, with shad roof tile

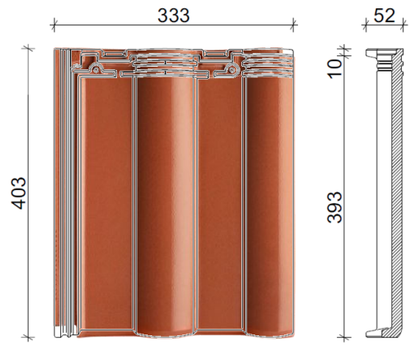


Clay ventilation outlet tile



Clay antenna outlet tile

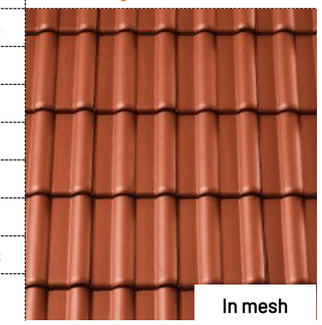
MAXIMA PRO®



Product datas

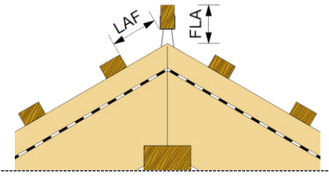
Size	width:	329 mm
	length:	397 mm
	height:	52 mm
	thickness:	11 mm
Weight:		3,7 kg
Packaging	bundle:	4 pcs
	pallet:	240 pcs
Standrad roof pitch:		22°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	310 mm	330 mm	350 mm
Covering width	300 mm	300 mm	300 mm
Consumption	10,8 pcs/m²	10,1 pcs/m²	9,5 pcs/m²
Covering type		single cover	
Covering width		37,40 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PT ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	115	110	100	100	100	100	100	100	105	110	✘
FLA [mm]	105	95	85	75	65	55	45	35	25	10	✘

PT ridge tile and 40x60 batten

LAF [mm]	115	110	100	95	95	95	95	90	90	95	95
FLA [mm]	110	105	95	85	75	65	55	45	35	20	10

PT ridge tile and50x50 batten

LAF [mm]	110	105	95	90	90	85	85	80	80	85	85
FLA [mm]	120	115	105	95	85	80	70	60	50	35	25

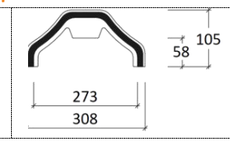
Underlayment requirement

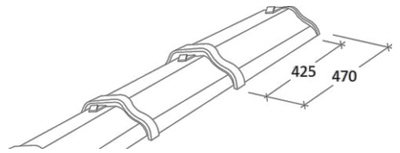
Unsupported underlayment	"ECO"	≥ 16°
Windproof underlayment	"BASIC"	≥ 14°
Watertight underlayment	"PRO"	≥ 12°
Waterproof underlayment	"ULTRA"	≥ 10°

Required batten dimensions

Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

"PT" ridge tile 2,5 pcs/m





Rounded hip starter

Closing plate

Funct.c.p.

3 axis hip cap

Hip starter

Shell shapedhip starter

4 axis hip cap

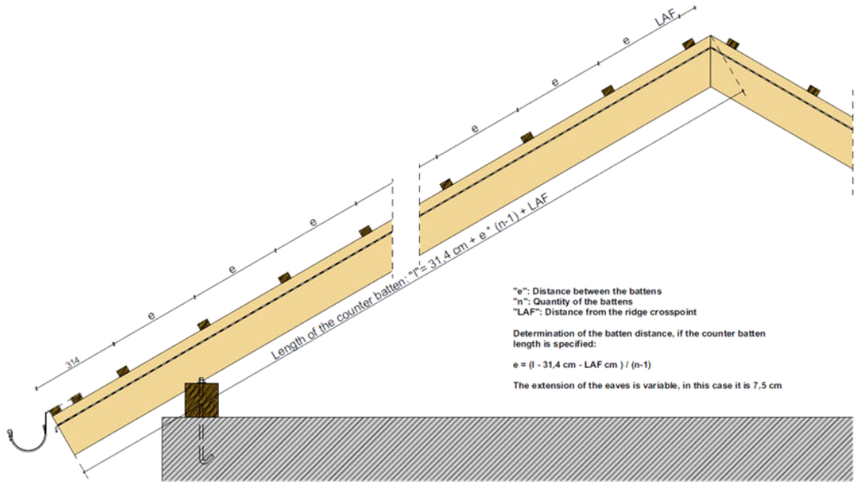
Clay accessories	Size	Quantity
Half tile	179x397	as needed
Verge tile - left	329x397	3,0 pcs/m
Verge tile - right	329x397	3,0 pcs/m
Double wave tile	329x397	3,0 pcs/m
Ventilation tile LQ 35	329x397	as required
Ridge connection ventilation tile	329x397	3,3 pcs/m
Ridge conn. vent. verge tl. left	329x397	as needed
Ridge conn. vent. verge tl. right	329x397	as needed

Clay accessories	Size	Quantity
Shed roof tile	-	3,3 pcs/m
Shed roof verge tile – left	-	as needed
Shed roof verge tile – right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

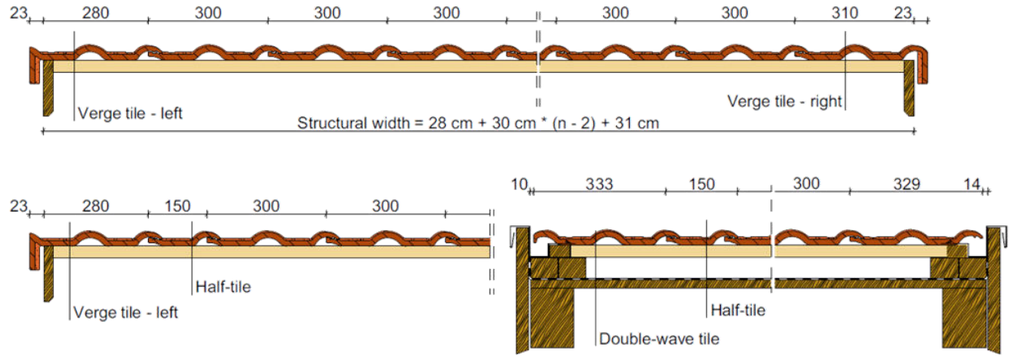
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 50 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "MAXIMA PRO" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PT" ridge tile and 30x50 mm roof battens, LAF = 100 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
	310 mm	330 mm	350 mm
10	3 204	3 384	3 564
11	3 514	3 714	3 914
12	3 824	4 044	4 264
13	4 134	4 374	4 614
14	4 444	4 704	4 964
15	4 754	5 034	5 314
16	5 064	5 364	5 664
17	5 374	5 694	6 014
18	5 684	6 024	6 364
19	5 994	6 354	6 714
20	6 304	6 684	7 064
21	6 614	7 014	7 414
22	6 924	7 344	7 764
23	7 234	7 674	8 114
24	7 544	8 004	8 464
25	7 854	8 334	8 814
26	8 164	8 664	9 164
27	8 474	8 994	9 514
28	8 784	9 324	9 864
29	9 094	9 654	10 214
30	9 404	9 984	10 564
31	9 714	10 314	10 914
32	10 024	10 644	11 264
33	10 334	10 974	11 614
34	10 644	11 304	11 964
35	10 954	11 634	12 314
36	11 264	11 964	12 664
37	11 574	12 294	13 014
38	11 884	12 624	13 364
39	12 194	12 954	13 714
40	12 504	13 284	14 064



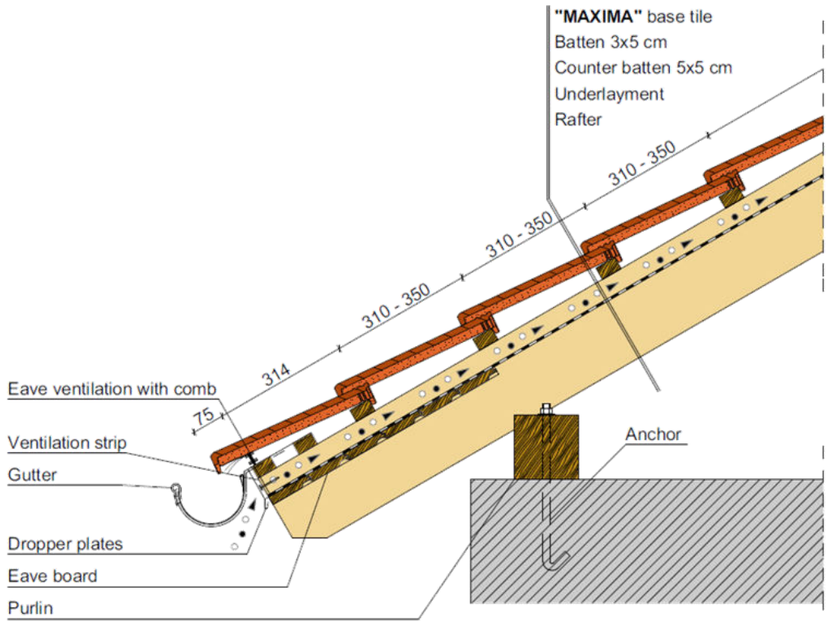
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	150	300	450	590	740	890	1 040	1 190	1 340
10	2 990	3 140	3 290	3 440	3 590	3 740	3 890	4 040	4 190	4 340
20	5 990	6 140	6 290	6 440	6 590	6 740	6 890	7 040	7 190	7 340
30	8 990	9 140	9 290	9 440	9 590	9 740	9 890	10 040	10 190	10 340
40	11 990	12 140	12 290	12 440	12 590	12 740	12 890	13 040	13 190	13 340
50	14 990	15 140	15 290	15 440	15 590	15 740	15 890	16 040	16 190	16 340
60	17 990	18 140	18 290	18 440	18 590	18 740	18 890	19 040	19 190	19 340
70	20 990	21 140	21 290	21 440	21 590	21 740	21 890	22 040	22 190	22 340
80	23 990	24 140	24 290	24 440	24 590	24 740	24 890	25 040	25 190	25 340
90	26 990	27 140	27 290	27 440	27 590	27 740	27 890	28 040	28 190	28 340
100	29 990	30 140	30 290	30 440	30 590	30 740	30 890	31 040	31 190	31 340

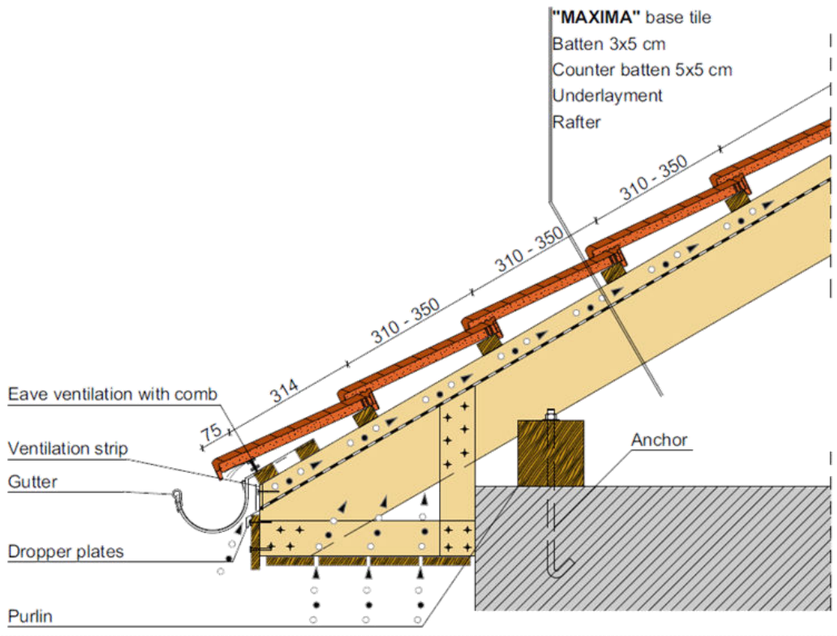
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	1 490	1 640	1 790	1 940	2 090	2 240	2 390	2 540	2 690	2 840
10	4 490	4 640	4 790	4 940	5 090	5 240	5 390	5 540	5 690	5 840
20	7 490	7 640	7 790	7 940	8 090	8 240	8 390	8 540	8 690	8 840
30	10 490	10 640	10 790	10 940	11 090	11 240	11 390	11 540	11 690	11 840
40	13 490	13 640	13 790	13 940	14 090	14 240	14 390	14 540	14 690	14 840
50	16 490	16 640	16 790	16 940	17 090	17 240	17 390	17 540	17 690	17 840
60	19 490	19 640	19 790	19 940	20 090	20 240	20 390	20 540	20 690	20 840
70	22 490	22 640	22 790	22 940	23 090	23 240	23 390	23 540	23 690	23 840
80	25 490	25 640	25 790	25 940	26 090	26 240	26 390	26 540	26 690	26 840
90	28 490	28 640	28 790	28 940	29 090	29 240	29 390	29 540	29 690	29 840
100	31 490	31 640	31 790	31 940	32 090	32 240	32 390	32 540	32 690	32 840

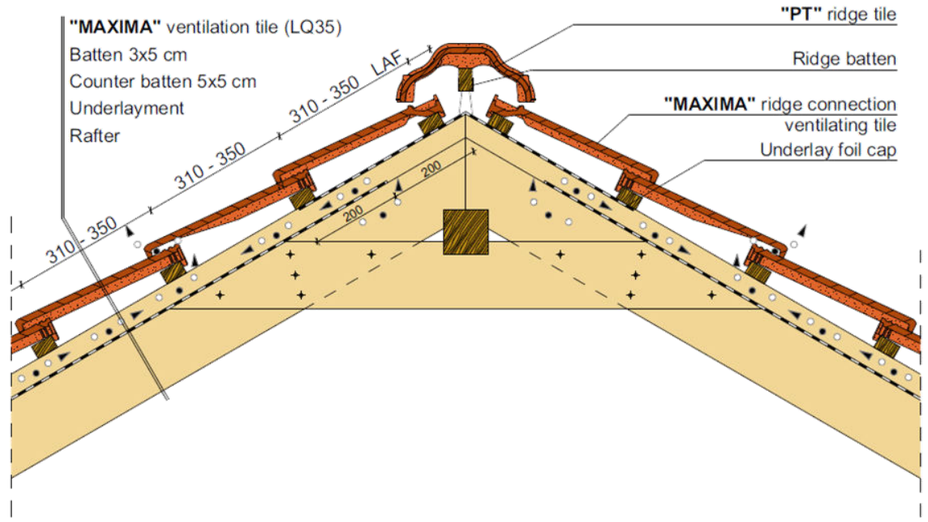
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



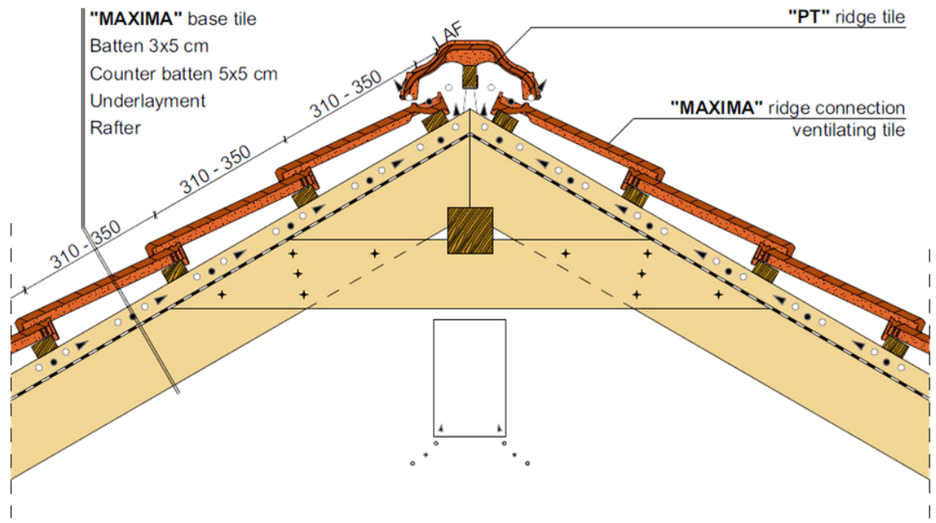
Eave detail



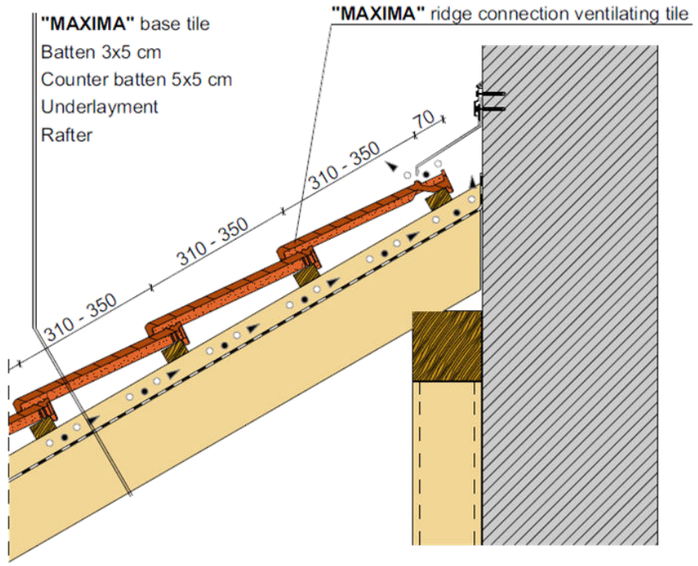
Closed eave detail



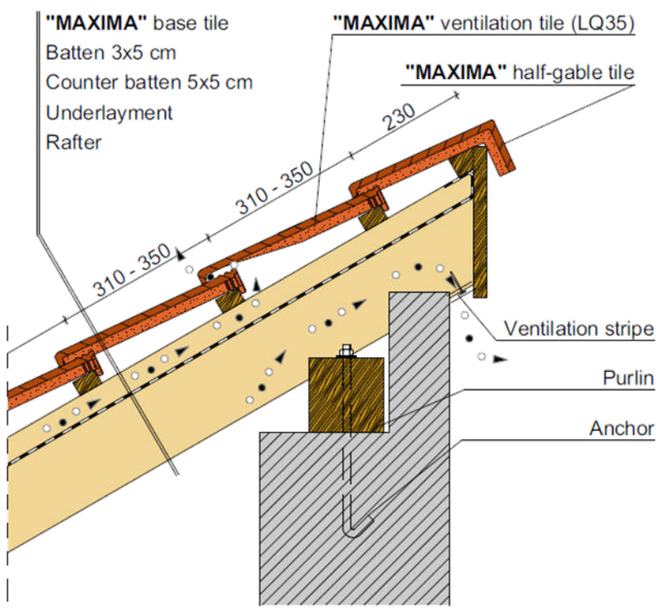
Ridge detail, with ventilation tile



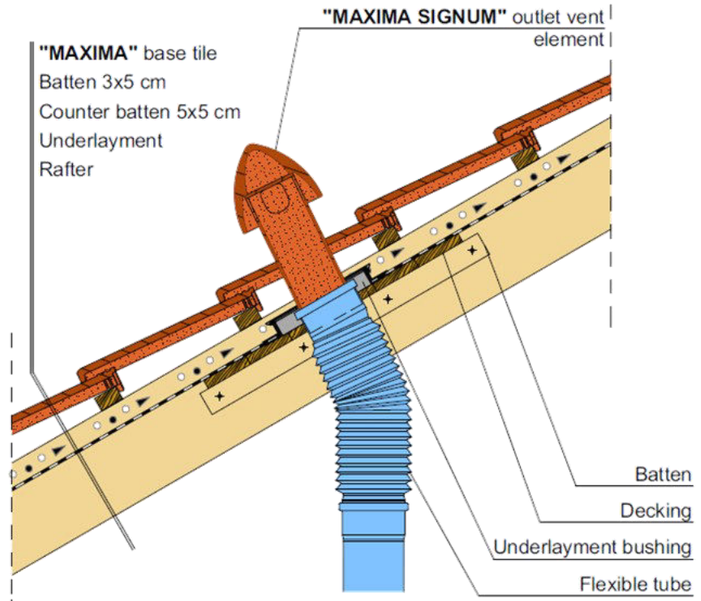
Ridge detail, with ridge connection ventilation tile



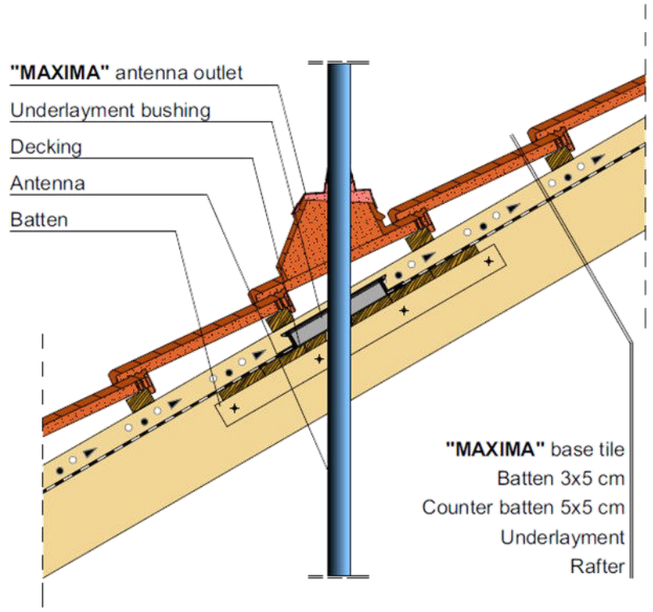
Wall connection detail



Shed ridge detail, with shad roof tile

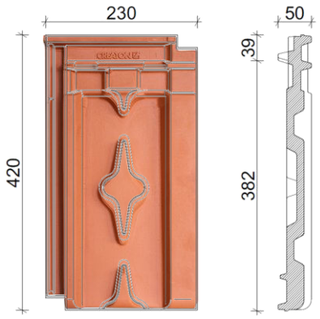


Clay ventilation outlet tile



Clay antenna outlet tile

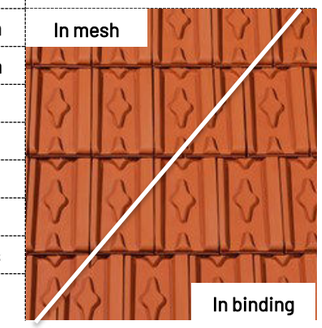
HERZZIEGEL®



Product datas

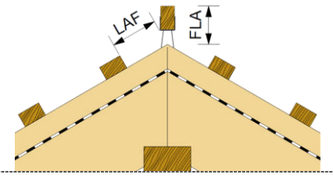
Size	width:	230 mm
	length:	420 mm
	height:	50 mm
	thickness:	12 mm
Weight:		3,1 kg
Packaging	bundle:	5 pcs
	pallet:	240 pcs
Standrad roof pitch:		30°

Covering method



Technical specification of the roof cover

	minimum	average	maximum
Batten distance	337 mm	344 mm	350 mm
Covering width	205 mm	207 mm	209 mm
Consumption	14,5 pcs/m²	14,1 pcs/m²	13,7 pcs/m²
Covering type		single cover	
Covering width		43,7 kg/m²	



LAF: distance of the upper batten

FLA: height of the ridge batten

PRU ridge tile and 30x50 batten

Roof pitch	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
LAF [mm]	✘	✘	70	65	60	60	55	50	50	✘	✘
FLA [mm]	✘	✘	100	90	85	80	65	60	50	✘	✘

PRU ridge tile and 40x60 batten

LAF [mm]	✘	✘	70	60	55	55	50	40	35	✘	✘
FLA [mm]	✘	✘	110	100	95	90	75	70	60	✘	✘

PZ ridge tile and 30x50 batten

LAF [mm]	✘	✘	70	65	60	60	55	50	50	✘	✘
FLA [mm]	✘	✘	80	70	65	55	50	45	35	✘	✘

PZ ridge tile and 40x60 batten

LAF [mm]	✘	✘	70	60	55	55	50	40	35	✘	✘
FLA [mm]	✘	✘	90	80	75	65	60	55	45	✘	✘

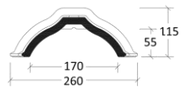
Underlayment requirement

Unsupported underlayment	"ECO"	≥ 24°
Windproof underlayment	"BASIC"	≥ 22°
Watertight underlayment	"PRO"	≥ 18°
Waterproof underlayment	"ULTRA"	≥ 10°

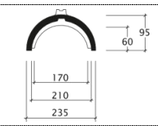
Required batten dimensions

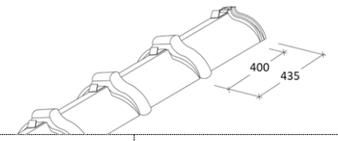
Rafter distance	Batten dimension
≤ 800 mm	30 x 50 mm
810 – 900 mm	30 x 50 mm
910 – 1000 mm	40 x 60 mm

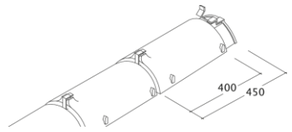
"PRU" ridge tile 2,5 pcs/lm



"PZ" ridge tile 2,5 pcs/lm







"PRU" hip starter

„PRU" closing plate

3 axis hip cap

"PZ" hip starter

"PZ" keződkúp, rounded

„PRU" funkciós zárók.

4 axis hip cap

"PZ" closing plate

PZ" funkciós zárók

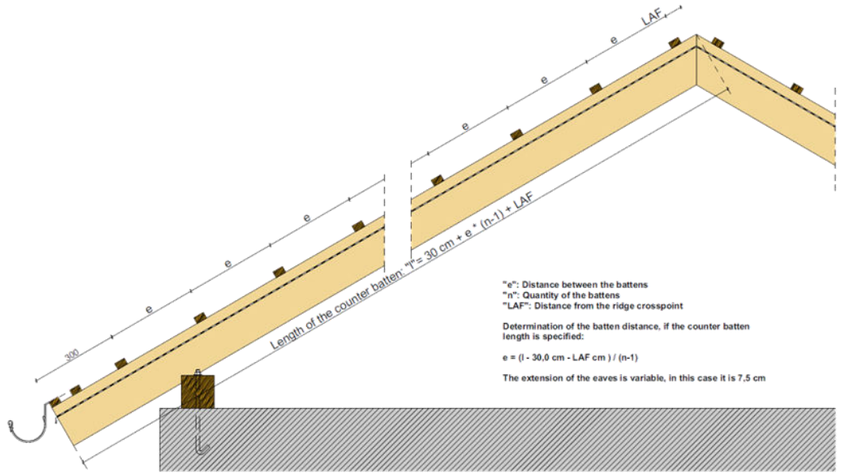
Clay accessories	Size	Quantity
Half tile	127x420	as needed
Verge tile - left	230x420	2,9 pcs/m
Verge tile - right	230x420	2,9 pcs/m
Ventilation tile LO 15	230x420	as required
Shed roof tile	230x320	4,9 pcs/m
Shed roof verge tile – left	230x320	as needed
Shed roof verge tile – right	230x320	as needed
Half tile	127x420	as needed

Clay accessories	Size	Quantity
Mansard tile	-	4,9 pcs/m
Mansard verge tile – left/right	-	as needed

Clay outlets	Package content	Outlet type
Ø110 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø125 outlet vent tile with "A" type unscrewable cap	outlet tile, underlay connection bush	waste pipe ventilation room ventilation kitchen ventilation
Ø150 outlet vent tile	outlet tile, underlay connection bush	room ventilation kitchen ventilation
Ø200 outlet vent tile	outlet tile, underlay connection bush,	room ventilation kitchen ventilation
Antenna outlet tile Ø60 mm	outlet tile, underlay connection bush,	antenna and telecommunication tubes
Solar outlet tile Ø70 mm	outlet tile, underlay connection bush,	solar and photovoltaic cables
Flue gas outlet tile Ø 110 mm or Ø 125 mm	outlet tile, underlay connection bush,	flue pipe of the condensation boilers

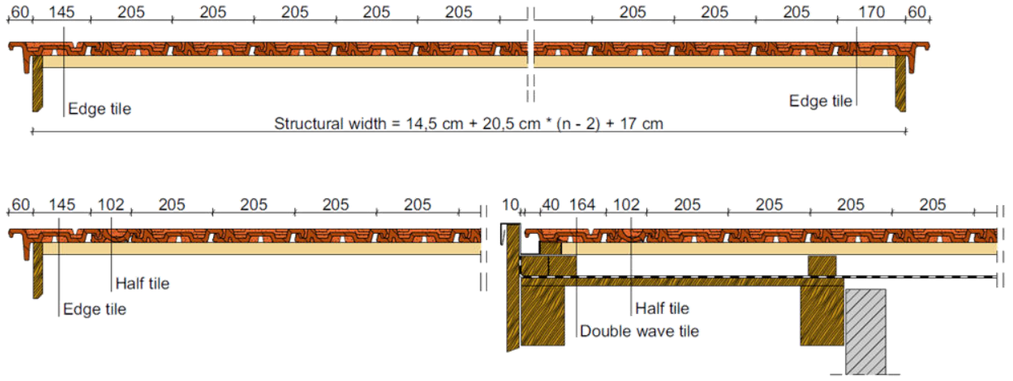
Fixing products

Name	Material	Application field
Mount-on stromclip for 30x50 mm battens	zinc-aluminium	Fixing against the wind in the edge zones and some cases in the genereal roof surface .
Mount-on stromclip for 40x50 mm battens	zinc-aluminium	
Mount-on stromclip for 40x60 mm battens	zinc-aluminium	
Nail-in stormclip	zinc-aluminium	
Fixing screw with EPDM sealing ring, 70 mm length	stainless steel	Fixing against loosed tiles along the edges and some cases in the average roof surfaces.
Clip with wire, 7-22 mm	stainless steel	Fixing cutted tiles along the hips and valleys
Universal stormclip	zinc-aluminium	Fixing shed roof tiles and tiles along the eaves



Roof batten alignement for "HERZZIEGEL" clay roof tile

Specification:	7,5 cm eave overhang and 30° roof pitch "PRU" ridge tile and 30x50 mm roof battens, LAF = 60 mm		
Number of battens (n)	**min. batten dist.(e)**	**avg. batten dist.(e)**	**max. batten dist.(e)**
10	337 mm	344 mm	350 mm
11	3 393	3 456	3 510
12	3 730	3 800	3 860
13	4 067	4 144	4 210
14	4 404	4 488	4 560
15	4 741	4 832	4 910
16	5 078	5 176	5 260
17	5 415	5 520	5 610
18	5 752	5 864	5 960
19	6 089	6 208	6 310
20	6 426	6 552	6 660
21	6 763	6 896	7 010
22	7 100	7 240	7 360
23	7 437	7 584	7 710
24	7 774	7 928	8 060
25	8 111	8 272	8 410
26	8 448	8 616	8 760
27	8 785	8 960	9 110
28	9 122	9 304	9 460
29	9 459	9 648	9 810
30	9 796	9 992	10 160
31	10 133	10 336	10 510
32	10 470	10 680	10 860
33	10 807	11 024	11 210
34	11 144	11 368	11 560
35	11 481	11 712	11 910
36	11 818	12 056	12 260
37	12 155	12 400	12 610
38	12 492	12 744	12 960
39	12 829	13 088	13 310
40	13 166	13 432	13 660
	13 503	13 776	14 010



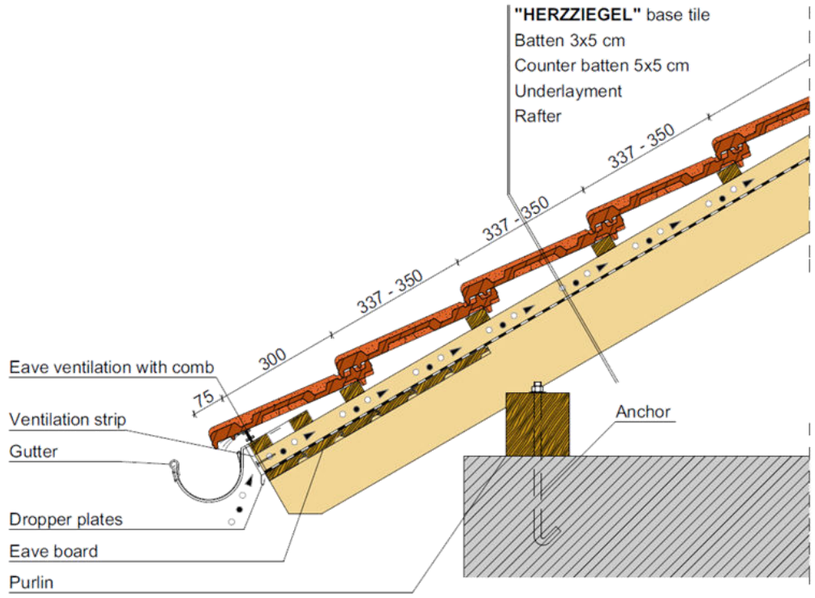
Structural width between the verge boards

	0	**1/2**	**1**	**1 1/2**	**2**	**2 1/2**	**3**	**3 1/2**	**4**	**4 1/2**
0	-	102	205	307	315	417	520	622	725	827
10	1 955	2 057	2 160	2 262	2 365	2 467	2 570	2 672	2 775	2 877
20	4 005	4 107	4 210	4 312	4 415	4 517	4 620	4 722	4 825	4 927
30	6 055	6 157	6 260	6 362	6 465	6 567	6 670	6 772	6 875	6 977
40	8 105	8 207	8 310	8 412	8 515	8 617	8 720	8 822	8 925	9 027
50	10 155	10 257	10 360	10 462	10 565	10 667	10 770	10 872	10 975	11 077
60	12 205	12 307	12 410	12 512	12 615	12 717	12 820	12 922	13 025	13 127
70	14 255	14 357	14 460	14 562	14 665	14 767	14 870	14 972	15 075	15 177
80	16 305	16 407	16 510	16 612	16 715	16 817	16 920	17 022	17 125	17 227
90	18 355	18 457	18 560	18 662	18 765	18 867	18 970	19 072	19 175	19 277
100	20 405	20 507	20 610	20 712	20 815	20 917	21 020	21 122	21 225	21 327

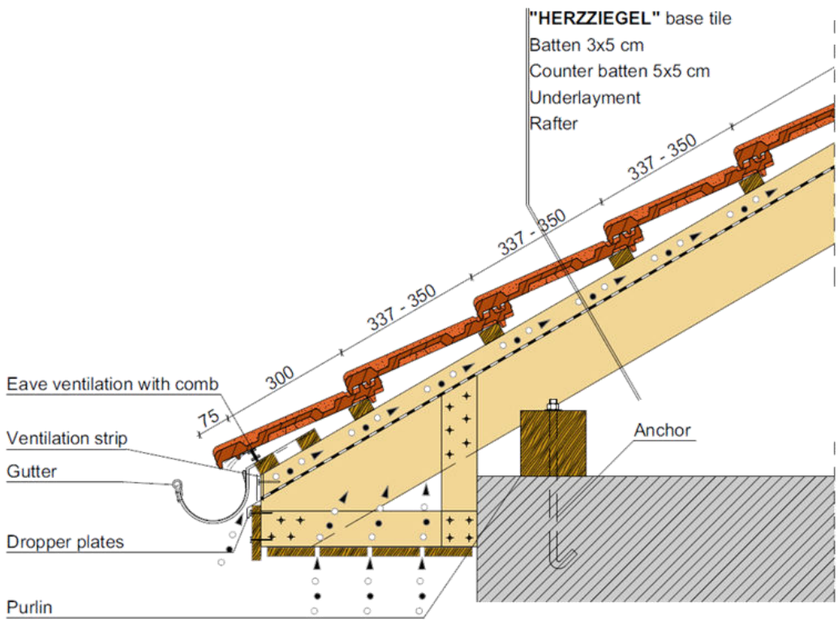
Structural width between the verge boards

	5	**5 1/2**	**6**	**6 1/2**	**7**	**7 1/2**	**8**	**8 1/2**	**9**	**9 1/2**
0	930	1 032	1 135	1 237	1 340	1 442	1 545	1 647	1 750	1 852
10	2 980	3 082	3 185	3 287	3 390	3 492	3 595	3 697	3 800	3 902
20	5 030	5 132	5 235	5 337	5 440	5 542	5 645	5 747	5 850	5 952
30	7 080	7 182	7 285	7 387	7 490	7 592	7 695	7 797	7 900	8 002
40	9 130	9 232	9 335	9 437	9 540	9 642	9 745	9 847	9 950	10 052
50	11 180	11 282	11 385	11 487	11 590	11 692	11 795	11 897	12 000	12 102
60	13 230	13 332	13 435	13 537	13 640	13 742	13 845	13 947	14 050	14 152
70	15 280	15 382	15 485	15 587	15 690	15 792	15 895	15 997	16 100	16 202
80	17 330	17 432	17 535	17 637	17 740	17 842	17 945	18 047	18 150	18 252
90	19 380	19 482	19 585	19 687	19 790	19 892	19 995	20 097	20 200	20 302
100	21 430	21 532	21 635	21 737	21 840	21 942	22 045	22 147	22 250	22 352

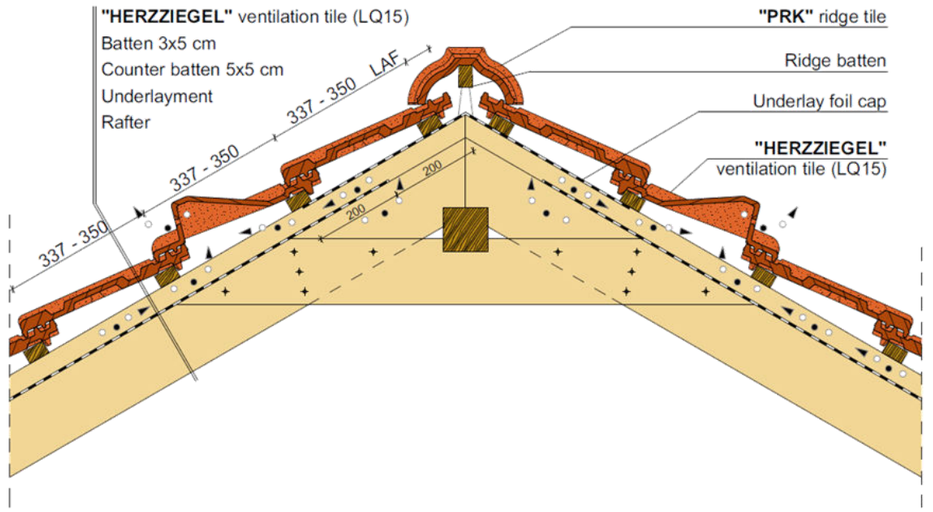
The structural widths below are calculated with 1-1 cm gap between the side plate of the verge tiles and the verge board!



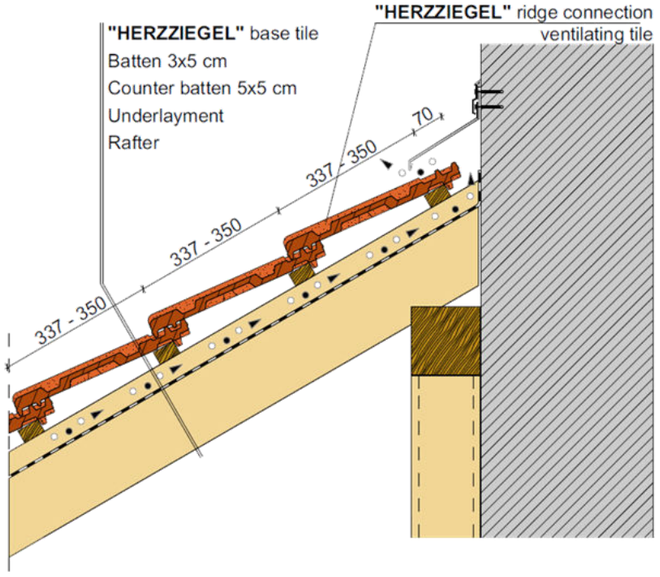
Eave detail



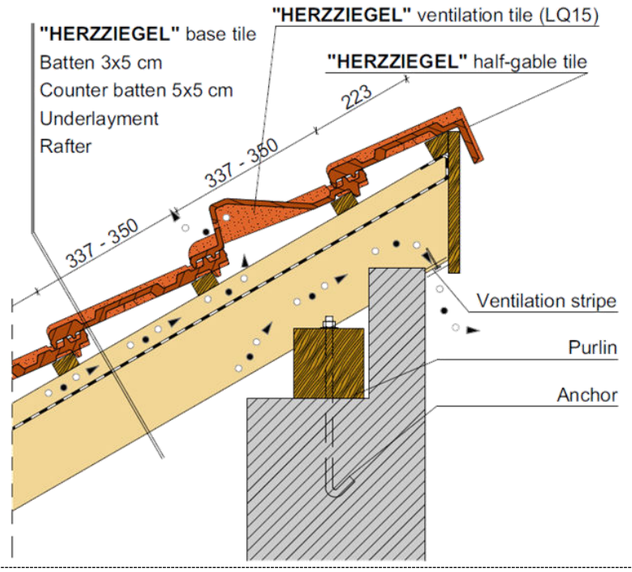
Closed eave detail



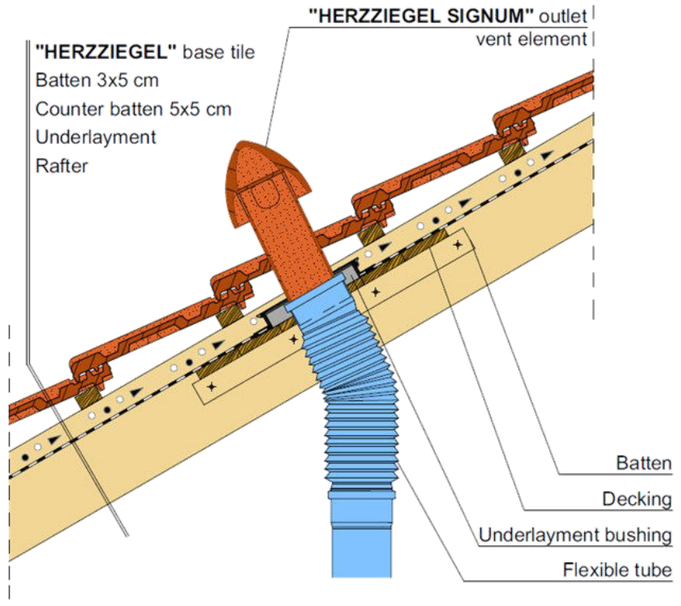
Ridge detail, with ventilation tile



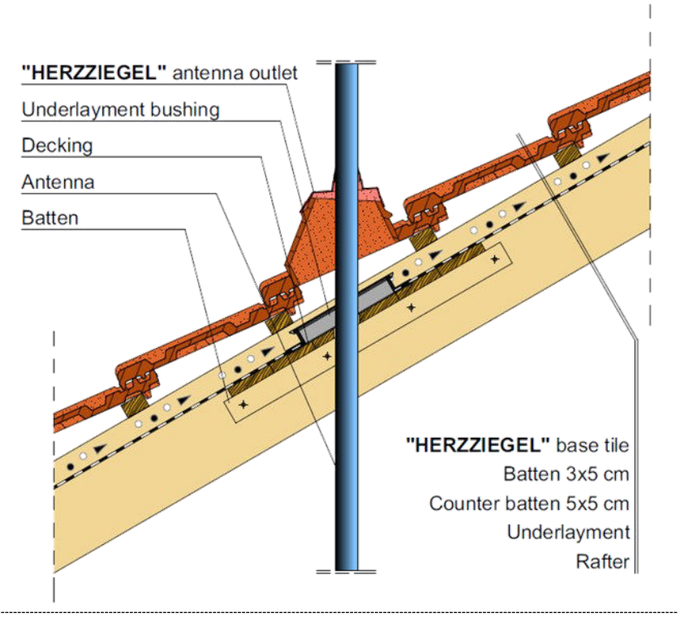
Wall connection detail



Shed ridge detail, with shad roof tile



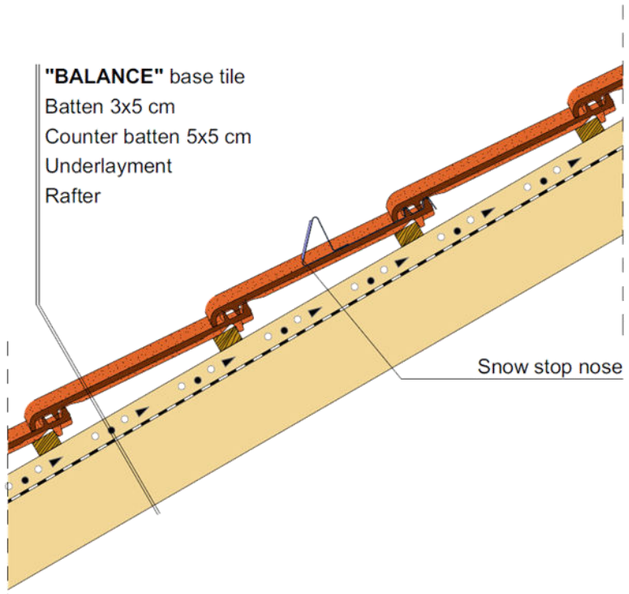
Clay ventilation outlet tile



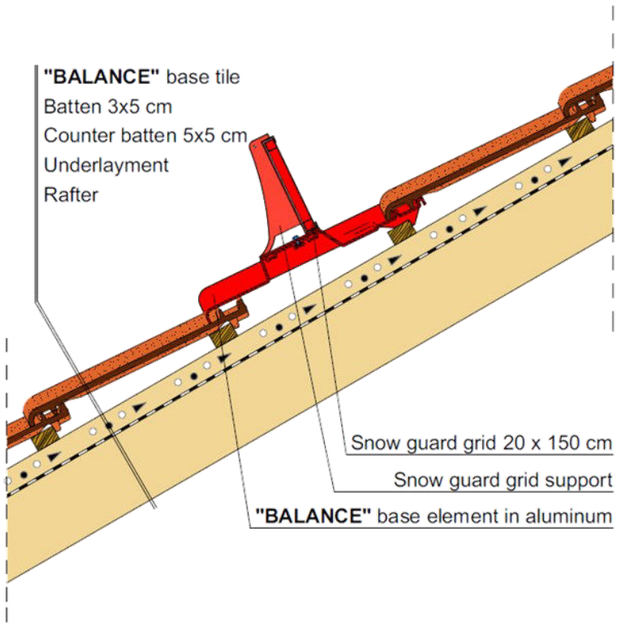
Clay antenna outlet tile

PART III.
Roof components

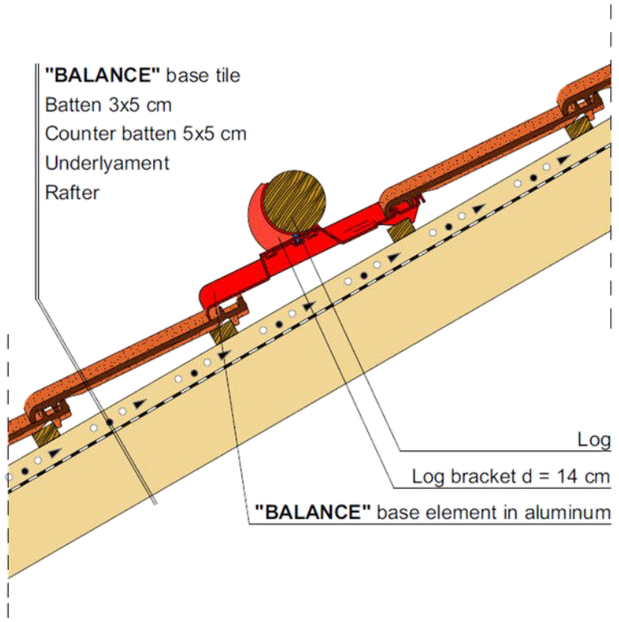
More informations:: swissporTON.hu



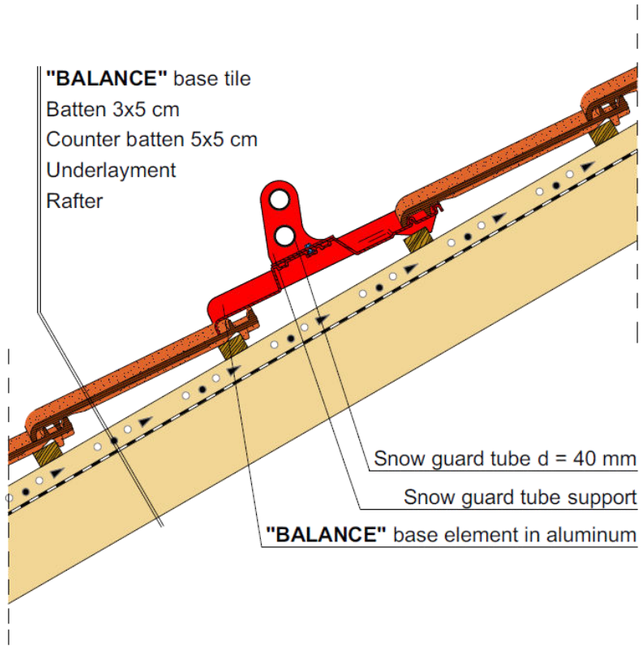
Snow stop nose placement



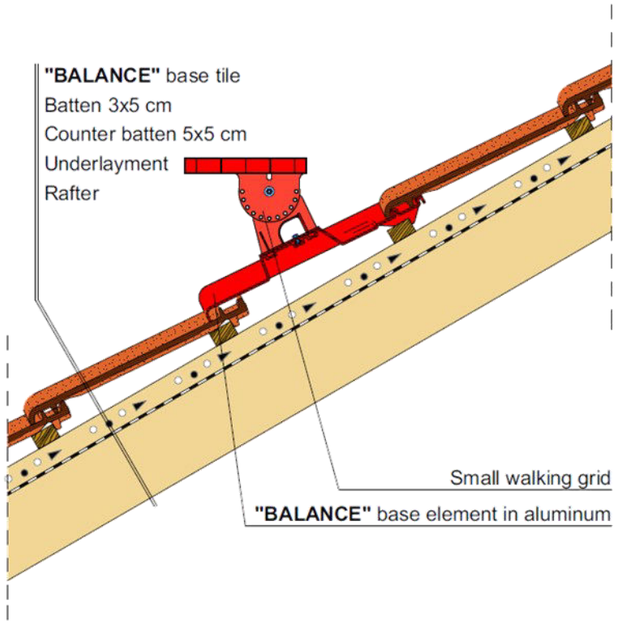
Snow guard grid placement



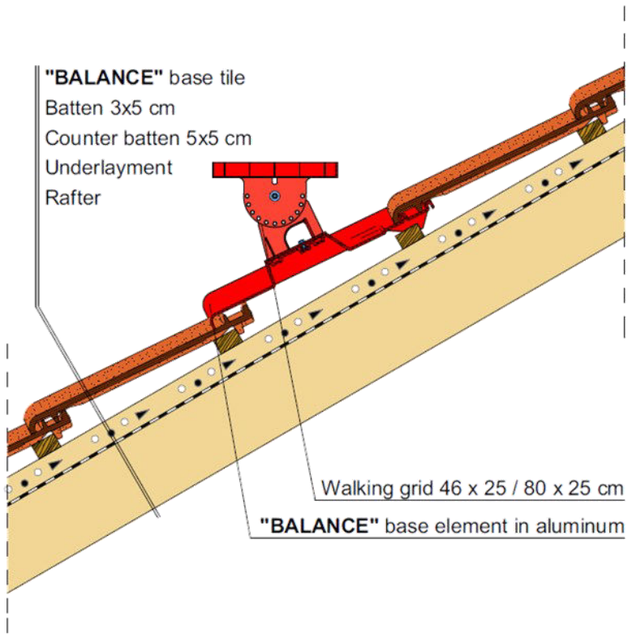
Log support placement



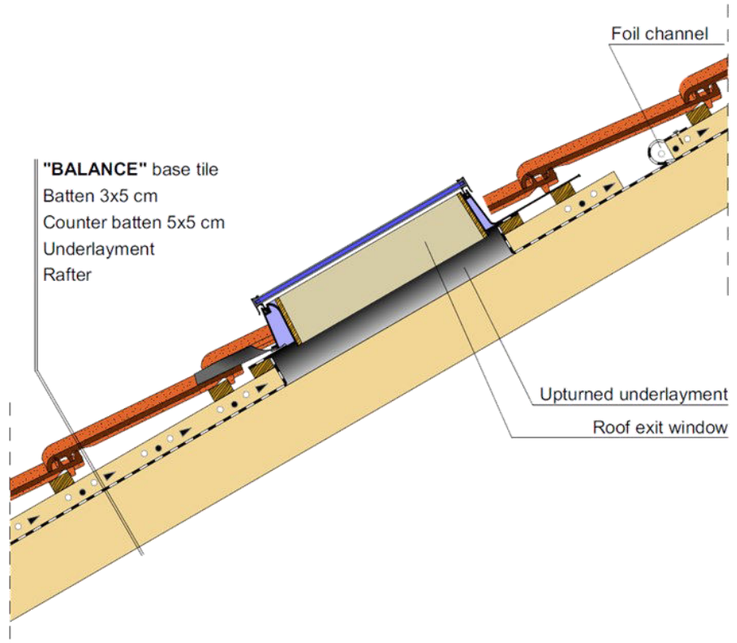
Snow guard tube placement



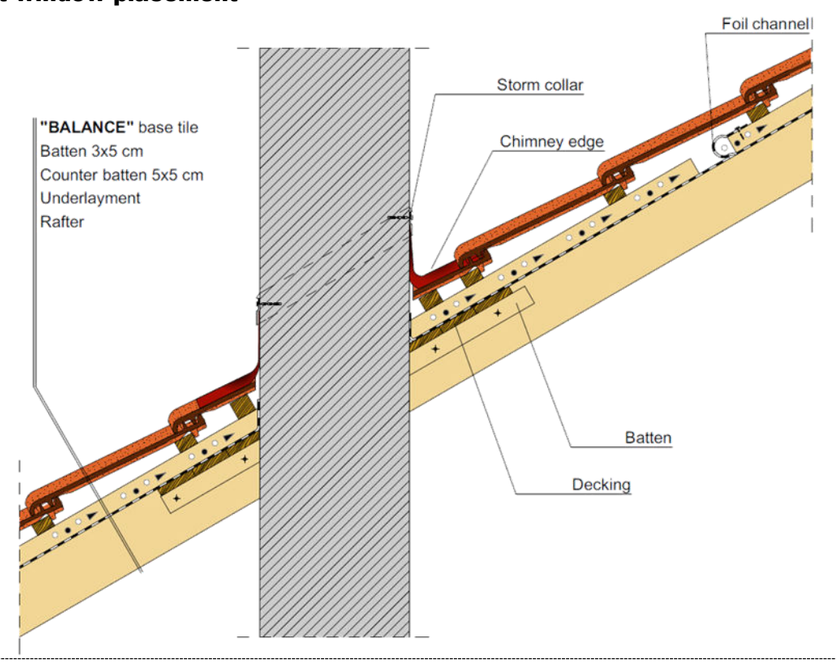
Single step placement



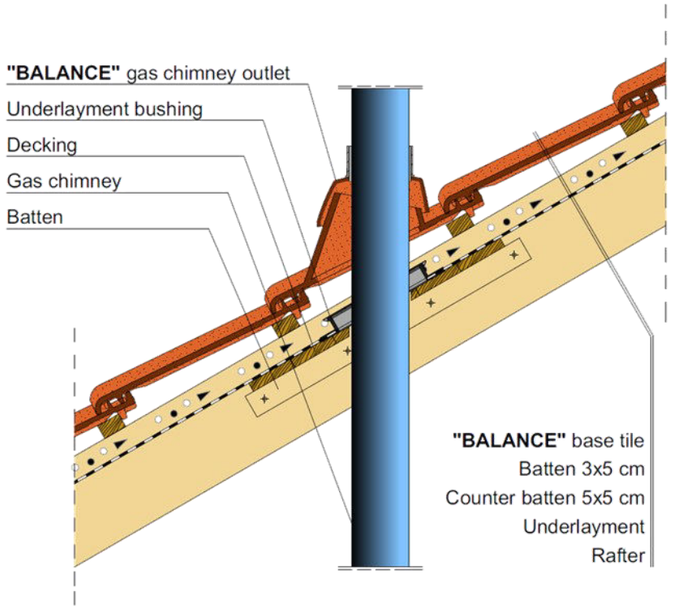
Walking grid placement



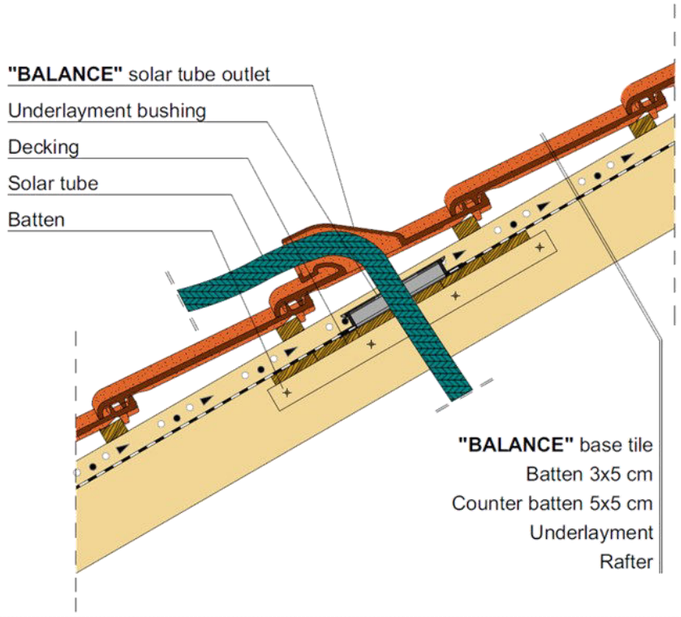
Roof exit window placement



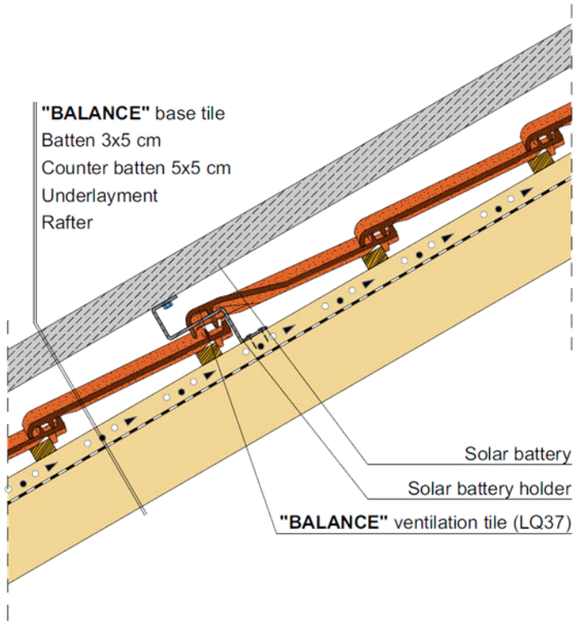
Chimney connection detail



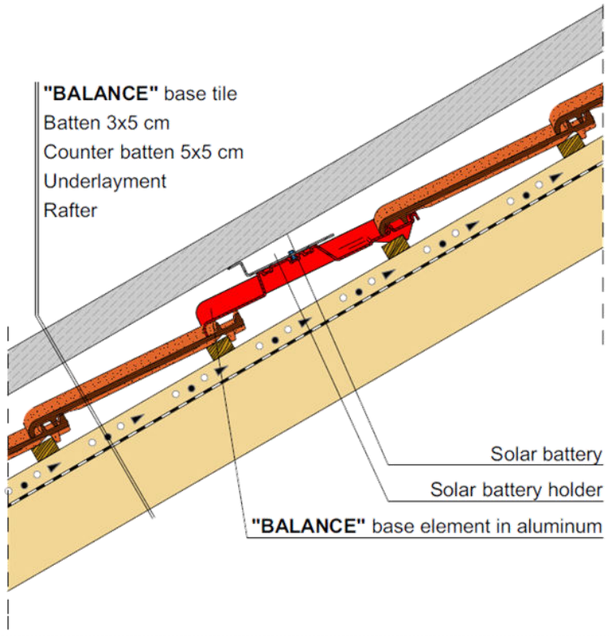
Clay gas chimney outlet detail



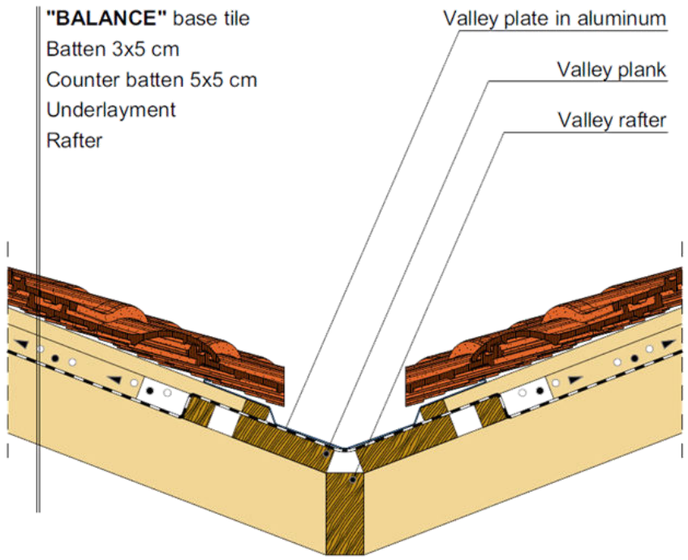
Clay solar tube outlet detail



Solar support set detail



Solar support detail



Valley detail

More informations:: swissporTON.hu

Notes

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