

IMPORTANT

GENERAL RECOMMENDATIONS FOR APPLICATION

1. Please read this leaflet as soon as you receive the material on site;
2. Please check carefully for any eventual factory defects BEFORE use. If you find any, contact the CS technical department immediately.
3. Install a mixture of tiles from different pallets;
4. If you have any doubts about the use of the material and/or do not understand this leaflet, please contact the CS technical department;
5. In situations where this leaflet is missing, CS - Coelho da Silva, SA must not be held responsible for incorrect use/assembly of the product, in which cases point 4 will always prevail.

6) Fixture of Tecno tiles:

Tecno tiles come with holes already bored for fixing purposes. Screws and o-rings should be used for this with one side of the rings coated in rubber.

Domus tiles should not be fixed with nails but if you do choose this method, you should round the tip of the nail to prevent the tiles from cracking or breaking during application.

CS - COELHO DA SILVA, SA does not accept claims for:

- a) Material used if good application practices for the ceramic material contained in this leaflet or the general recommendations mentioned above are not complied with (points 1 to 6);
- b) Slight variations in shades and dimensions, as these are natural characteristics of the raw material and/or the factory process of the ceramic products used;
- c) Use of any type of chemical (paint, varnish, water-resistant liquid, etc.) for cleaning or waterproofing roofs;
- d) Breaks resulting from transport, unloading or improper handling/packaging of materials on site/at the construction yard.

WARNING: All claims require presentation of the label accompanying and identifying the product on the pallet. Measurements/values shown in this Leaflet must be considered indicative/approximate.



ROOF COVERING ASSEMBLY INSTRUCTIONS



Declaration of performance No. 005/2013 CS



Management
System
ISO 9001:2015
ISO 14001:2015

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ID 9108625200

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Tecno®

Thank you for choosing us. Please be aware that our minimum assembly regulations must be adhered to when installing the roof covering you have just purchased on site, otherwise it may not function correctly.

1. . CLIMATE ZONES AND MINIMUM PITCH SLOPE

ZONE I

ZONE II

ZONE III

The level of exposure varies from place to place in each climate zone so different types of exposure should be distinguished.

Protected location

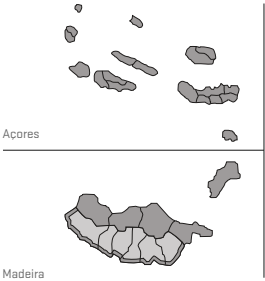
Areas surrounded by high ground that shelters them from different wind directions.

Normal location

Practically flat area with slight elevations, if any.

Exposed location

Coastal area up to 5 km from the sea, on cliff tops, islands or narrow peninsulas, estuaries or very deep indented bays, narrow valleys and high isolated mountains, some plateaux and buildings with 5 or more floors



MINIMUM SLOPETABLE

| Maximum pitch line | Geographic location | ZONE I | | ZONE II | | ZONE III | |
|--------------------|---------------------|--------|-----|---------|-----|----------|-----|
| | | degree | % | degree | % | degree | % |
| Up to 6.5 meters | Protected | 10° | 18% | 13° | 23% | 15° | 27% |
| | Normal | 11° | 20% | 14° | 25% | 17° | 30% |
| | Exposed | 13° | 23% | 16° | 29% | 19° | 34% |
| Up to 9.5 meters | Protected | 11° | 20% | 14° | 25% | 17° | 30% |
| | Normal | 12° | 22% | 16° | 29% | 18° | 32% |
| | Exposed | 14° | 25% | 18° | 32% | 19° | 34% |
| Up to 12 meters | Protected | 12° | 22% | 15° | 27% | 18° | 32% |
| | Normal | 14° | 25% | 17° | 30% | 20° | 36% |
| | Exposed | 16° | 29% | 19° | 34% | 22° | 40% |

Note 1: -Through application of the "stop-vapour" barrier, the slope may be reduced by 1/7.
Note 2:
- For pitches over 12 metres long (maximum pitch line), please contact the Technical Department at CS - Coelho da Silva.

2. TYPE OF GAUGES

Choice of a good support structure.
All solutions require a minimum free area of 1.5 cm below the gauge where an air inlet will be installed at the edge and an outlet at the ridge to allow for air to circulate.
At least 4 cm of free space should be below the bottom surface of the tile. This is the only way of guaranteeing tile durability, quick drying and reduced condensation. A ventilated roof covering also considerably benefits the building's thermal comfort.

30. PROXIMITY TO THE SEA

Like most construction materials, ceramic tiles may also suffer with the undesirable influence of salt mist along the sea coast. Similar to the freezing-thawing phenomenon, here it is the formation of salts that crystallise inside the tile and cause considerable stress, which might result in its deterioration over the years in extreme cases. The same recommendations apply as in the previous point: choose ceramic tiles with low water absorption, apply ventilation accessories and use a support structure that lets a significant amount of air circulate underneath for quick drying of the roof. Although the reason is not explained, the use of water-resistant products also somewhat increases the resistance of ceramic tiles to this phenomenon.

31. DIFFERENT SHADES

Ceramic tiles are considered natural products due to the raw material they are made of and obtain their final colour after firing (either in their natural shade or after glazing). Therefore, pastes used in tile manufacturing may be slightly different to one another according to the proportion of minerals they contain, which results in slight differences in their shade after firing. These are not considered a defect but a characteristic of the materials used, which is mostly appreciated for the natural and nice appearance they give to the tiles. A practical way of reducing the different roof shades is to mix tiles from different pallets during installation.

32. CONDENSATION AND PERMEABILITY

Condensation is a common physical phenomenon that normally occurs in situations in which air saturated by water comes into contact with a colder body or surface. The fact that this occurs on roof coverings may be due to bad ventilation or lack of air circulating between the exterior and interior of the building, in the case of closed environments, or the mere difference in temperature between the surrounding atmosphere and the ceramic tile, in open-roofed structures.
Condensation can also be found in other materials like concrete, glass, iron, painted walls, aluminium, etc. but can be minimised by good construction practices and adequate ventilation.
It is important not to mistake condensation for permeability of ceramic products (when tiles are "crossed" by water), although drops of water appear on the underside of the tiles in both situations. Permeability can be easily verified by placing a certain amount of water on a tile for a long period of time and seeing if it remains visible on the underside. A "healthy" tile is not permeable.

33. WARRANTY

CS-Coelho da Silva provides a 35-YEAR warranty for the Tecno line against peeling in freezing conditions or any factory defect.

We have been producing tiles since 1927 and we are now market leaders in ceramic tiles in Portugal. When we provide a warranty for our products, we have the experience to support this.

Please see our technical documents as our products should be applied according to good construction practices and assembly instructions provided by CS.

We also call your attention to the fact that the use of any chemical on our products is strongly unadvised without the express consent of CS, otherwise the warranty will be immediately cancelled.

Please call our Commercial Department on +351 244479200 or send an e-mail to info@coelhodasilva.com, to clarify any doubts you may have or to request the complete warranty text.

Mortar used in excess or in incorrect places has been proven to cause infiltrations of water inside buildings and the appearance of moss (as it retains moisture long after it has stopped raining) as well as peeling of ceramic parts in freezing-thawing areas. "Weak" or water-resistant mortars are recommended for use according to the instructions contained in this leaflet, in the amounts strictly necessary and in proper places, and only for fixing ceramic parts.

26.7 DISPENSATION OF CERAMIC ACCESSORIES

Roof accessories must be considered additional parts of the roof covering and essential for making details attractive and functional after the application of ceramic tiles. Their correct application on a roof increases its good performance and durability. There are now cheaper solutions for most situations (when compared with other common solutions) that use a minimum amount of mortar, which is one of the major problems when improperly used.

27. MAINTENANCE

Like all construction elements exposed to the weather and polluting substances, preventive maintenance must also be carried out on roof coverings. It must be performed periodically to ensure cleanliness and respective functionality. This includes gutters, downspouts and drainage areas at chimney perimeters and skylights, which must be checked, repaired and cleaned, if necessary.

ONLY pressurised water and soft brushing must be used for general cleaning of roofs, when necessary or every 2-3 years, depending on location and exposure.

Maintenance work that implies the use of paints or other products that prevent or remove slime is strongly unadvised, as it often fails to fulfil its purpose and ends up causing early and significant wear and tear of tiles.

28. EVENTUAL UNDESIRABLE SITUATION

The natural appearance of moss and fungi on ceramic tiles is commonly called "slime". In fact, only a few materials, when exposed, are free of this risk and it may even appear on the least porous ones like glass.

Some decisive factors for its appearance are proximity to trees, agricultural land, the direction in which the building is facing, high exposure to atmospheric agents due to local terrain, reduced exposure to the sun, air pollution, lack of roof maintenance and ventilation, insufficient pitch sloping and excess use of mortar in finishes, among others. As all these factors cannot be controlled, it is impossible to totally avoid the appearance of "slime".

However, there are ways of preventing this.

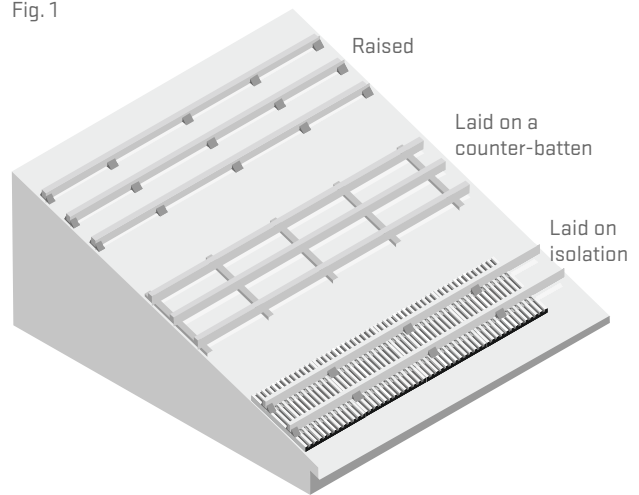
- Roof ventilation, as it promotes air circulation for quicker drying of tiles after it has rained and discourages moss from growing. Ventilation accessories should be used and correctly applied with the right amount of mortar;
- Respect of the minimum slope recommended by the manufacturer for desired water drainage.

Normally, only the appearance is affected but efficient rainwater drainage may be prejudiced and stagnation areas created, which might result in infiltrations due to their quantity or to prevailing winds. As mentioned in the previous point on "Maintenance", the solution requires washing the roof without any chemicals.

29. FREEZING-THAWING PHENOMENA

Ceramic materials are porous and therefore absorbent. It is true that tiles absorb some water when it rains. If there is a sharp drop in temperature to below 0° immediately afterwards, when the roof is still wet, the water inside the tiles will freeze, increasing in volume and causing considerable stress in their interior. In extreme cases, if the tile structure fails to support this stress, they may crack or "peel". Successive repetitions of these freezing-thawing cycles along with harsh differences in temperature make this situation worse.

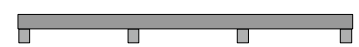
Fig. 1



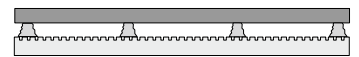
View of the raised gauge



View of the gauge laid on a counter-batten



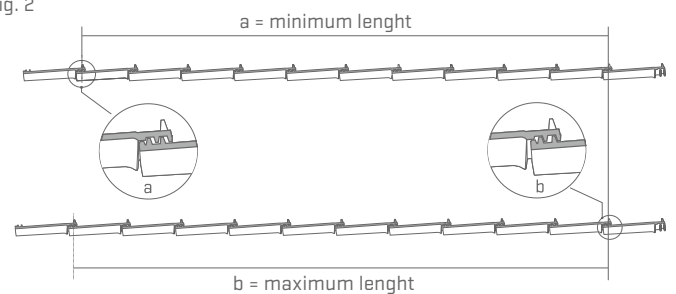
View of the gauge laid on isolation



3. GAUGE

The average distance between battens must be carefully determined to calculate the gauge and ensure that the tiles fit perfectly together. To calculate this distance, 12 inverted tiles are installed on a flat surface. Measurement "a" can be calculated by joining the tiles together and measurement "b" by separating them. The gauge measurement is calculated using the following formula: $\text{gauge} = (a+b)/20$.

Fig. 2



You should always calculate the gauge on site, after receiving the material and mixing together tiles from different pallets.

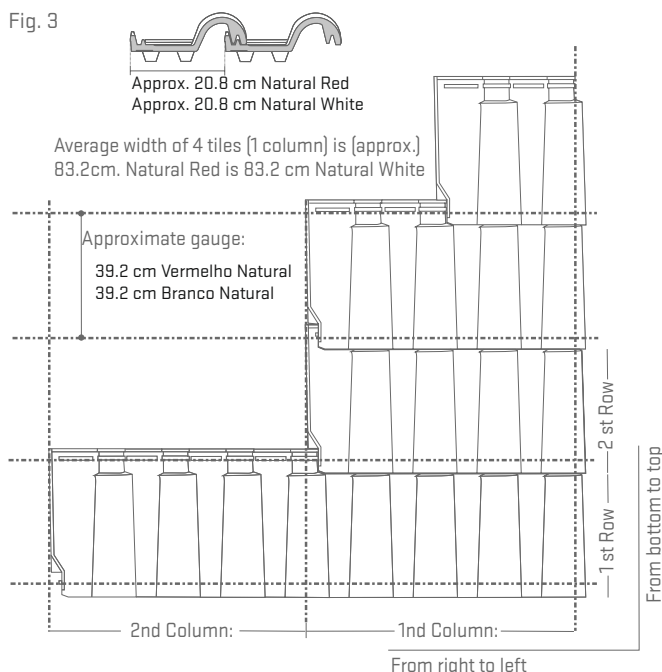
4. ROOF MARKING AND ASSEMBLY

You should first of all mark the whole roof in order to minimise difficult cut-outs and correct positioning on roof pitches, both horizontally (rows) and vertically (columns). Using a chalk line, mark parallel lines along the edge in an upward direction according to the gauge measurement, so that eventual positioning cut-outs can be made in the last row of tiles next to the ridge.

The support structure is installed. The average width of the tiles is then calculated by joining them to one another and separating them sideways. The resulting value is used for marking lines equivalent to the width of 4 tiles (1 column) perpendicular to the gauges and from right to left.

This helps us to calculate the position of the tiles on the left gable and use their lateral interlock (tightening them or stretching them) to finish the row without the need for cut-outs.

It is important to mention that roof planning and marking enables you to identify any places on the roof covering that require installation of special accessories. After installing the gauge according to the marking, tiles are placed from right to left and bottom to top, based on the alignment shown in Fig. 3.



Next, general fixing criteria are shown using the pre-punched hole existing in the Domus tile:

- a) pitches under 45° (100%) - no fixing is necessary;
- b) 45 (100%) to 70° (275%) - each one must be fixed on every five tiles and all tiles placed around the perimeter of the roof covering;
- c) over 70° (275%) - compulsory fixing of all tiles.

Note 1: These criteria may vary according to specific features of the project, location of the site or climate. If in doubt, please contact the CS technical department.

Note 2: See point 6 in GENERAL RECOMMENDATIONS FOR APPLICATION, page 20.

Note 3: The tiles are fixed with screws with washers.

5. RIDGES AND CORNERS

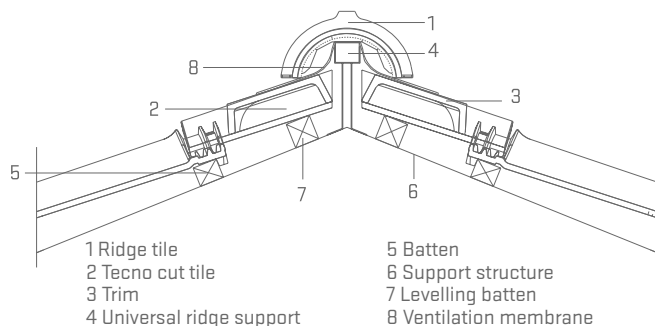
For ridges and corners of Lusa tile roofs, trims (or clogs, water furrows) and ridge tiles (or peaks), both of which are only fixed with a water-resistant or hydraulic lime mortar bead. Use only enough mortar for air to circulate between tiles.

When positioning the ridge and corners, you should cut the last row of tiles with a tile cutter to create a 2 cm gap between the tiles to let air out from inside.

However, dry assembly accessories, specific for these situations, are becoming increasingly popular as they guarantee improved ventilation and quick application and eliminate problems resulting from excess use of mortar by not using it at all.

Ceramic parts are fixed with clamps, metal supports and other additional accessories.

Fig. 4 - Dry application of the ridge



26. FREQUENT ASSEMBLY ERRORS

The roof plays a very important role in a building's durability, comfort and smooth functioning. Its design, planning and performance must comply with the regulations and procedures mentioned in the previous points in order to prevent, reduce or avoid the anomalies mentioned below.

Although the functional characteristics of ceramic tiles comply with European definitions and standards and respect all the necessary requirements, they are often considered responsible for irregularities encountered in roofs. However, absence of previous studies and/or poor on-site technical performance are the real causes of most problems detected.

26.1 INSUFFICIENT SLOPE

Depending on their functional characteristics, each tile model must be applied with the minimum slope indicated by the manufacturer for its efficient performance. An insufficient slope prevents satisfactory rainwater drainage, facilitates infiltration in more adverse conditions and promotes accumulation of rubbish and appearance of moss that prevents the efficient performance of the roof.

26.2 ABSENCE OF FIXTURE ON HIGH SLOPES OR STRONG WIND ZONES

On very steep roofs, tiles must be fixed to support elements to prevent them from moving or even falling. They must also be fixed at points directly affected by very adverse weather conditions like strong winds. Depending on the tile model, metal clamps and/or screws may be used, taking advantage of the holes already in the tiles for this purpose.

26.3 INSUFFICIENT OR INADEQUATE VENTILATION

It is essential to guarantee efficient air circulation under the tiles to ventilate the ceramic roof. This requires a) using a batten and counter-batten system that enables vertical ventilation corridors to be installed, b) installing a vent between the insulation/plate and tiles, c) installing air inlets at the edge/eaves, and d) applying sufficient, correctly laid ventilation tiles.

Insufficient roof ventilation causes:

- Increased production of moss and slime, altering the look of the roof;
- Drastic reduction in tile durability;
- Increased probability of the occurrence of condensation and peeling due to freezing-thawing cycles;
- Degradation of the roof support structure and accessories.

26.4 NON-EXISTENCE OF AN ADEQUATE SUPPORT STRUCTURE

Any tile needs a support structure to guarantee its correct support and positioning and facilitate ventilation. The batten and counter-batten slat system is considered the most appropriate to satisfy these requirements and guarantees a minimum air gap of approximately 4 cm [between a tile and insulation/slab] without interrupting ventilation from the edge/eaves to the ridge.

Various types of batten materials and formats may be used to build this structure (wood, PVC, metal or pre-stressed sections), which must be chosen according to the roof elements used, load to be supported and other specific construction work characteristics.

Mortar battens and installation of tiles directly on the slab or insulation MUST BE AVOIDED (insulation trims CANNOT be used to support the tiles). These bad solutions often result in:

- Serious infiltrations due to tile movement;
- Condensation and appearance of moss and slime due to difficult drying conditions;
- Roof misalignments and deformations;
- Greater risk of breakage during application/maintenance due to lack of correct support for parts.

26.5 INCORRECT CALCULATION OF THE GAUGE

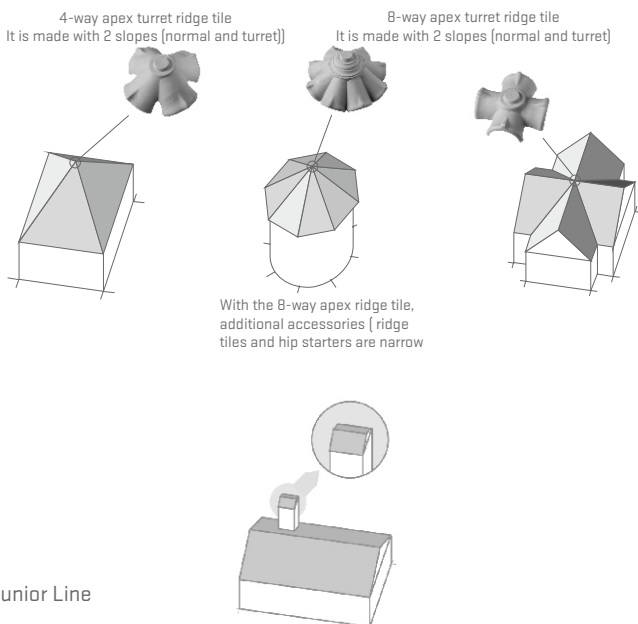
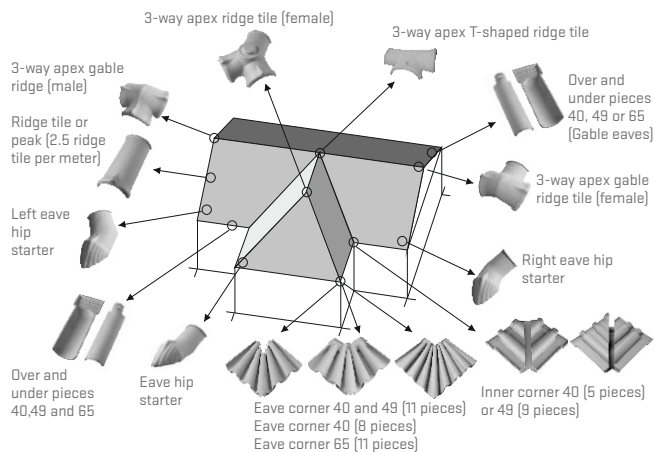
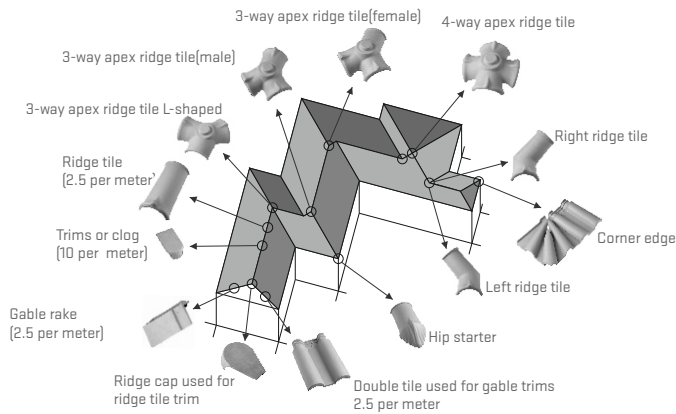
There is a gauge measurement for each tile model, which is obtained from the calculation described in point 3 of this leaflet. If the support structure does not correspond to the measurement calculated, it will be difficult to fit and overlap the tiles during application, which will cause roof misalignment and unevenness or even seriously compromise its performance.

It is therefore advisable to calculate the gauge on site and technically incorrect to "stretch" all tiles into position, in an attempt to reduce the number of tiles to be used, or "squash them together", forcing them to overlap.

26.6 APPLICATION OF EXCESS MORTARS

Mortar is mainly used on roofs for fixing ceramic trims/finishes and must not be used instead of these or as an alternative trim that requires sealant (or specific adequate procedures), for which there are no ceramic accessories.

25.POSITIONING OF ACCESSORIES ON THE ROOF



Junior Line

Notes:

Minimum dimensions:

- 0.50 x 0.50m - minimum wall measurements for application of JUNIOR edge corner.

- 0.55 x 0.55m - minimum wall measurements for application of JUNIOR eave corner.

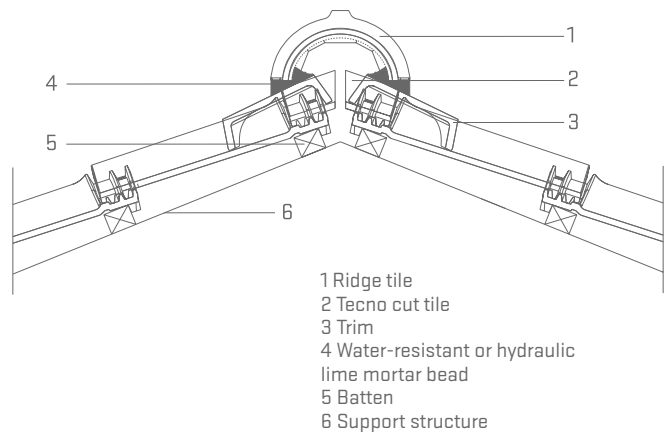
(S) Recommended jut-out (tile and eaves):

- between 10 and 12 cm.

Approximate gauge: 22 cm

When tiles coincide with gable length, the ridge should be levelled using a crown border for the tiles to cover the whole space created by the intersection of two gables.

Fig. 5 - Application with mortar



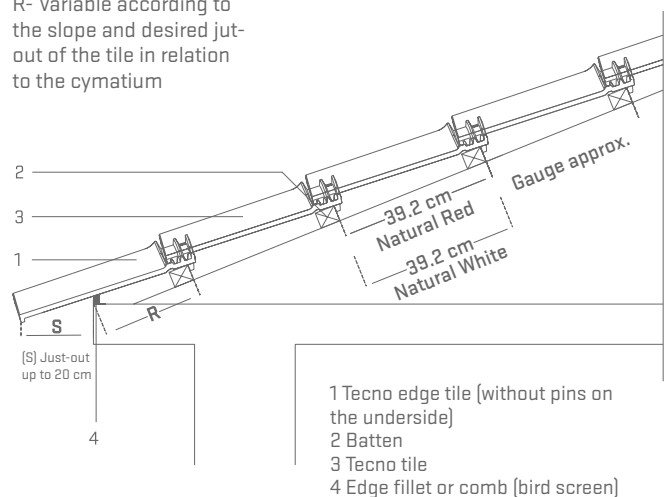
Given the slope of the ridge tiles in relation to the trims, corners must be cut by the frieze installed for this purpose on their underside.

6. EDGE

For edge assembly using Tecno tiles, you must first of all mark the whole perimeter of the roof for it to overhang (max. 20 cm). Then install the edge fillet to prevent the tiles from fitting solidly together, thus releasing the underside of the tile to ventilate it. The air inlet at the edge may be made through making small openings in the mortar to complete garrets created by tile curves. Hydraulic or water-resistant mortar must be used to install the edge tiles. Another way of guaranteeing efficient ventilation at the edge is by installing combs (bird screens) screwed to the cymatium surface.

Fig. 6

R- Variable according to the slope and desired jut-out of the tile in relation to the cymatium



7. CURVED FINISH EAVES

Under pieces and Over pieces are used to assemble the curved finish eaves, following the same procedures as the previous point (6). The respective accessories are used for roof coverings with inner or outer corners: curved finish eave corners 40, 49 or 65 (11 pieces) and curved finish eave corners 40 (8 pieces) are used for outer corners; curved finish inner corners 40 (5 pieces) or 49 (9 pieces) are used for inner corners according to whether eave 40 or 49 is used.

Fig. 7

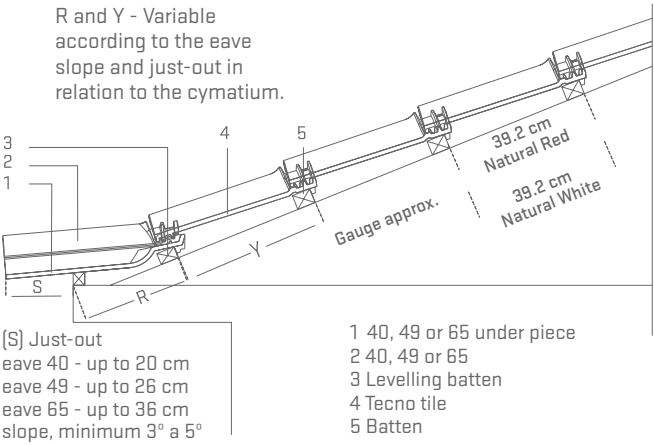
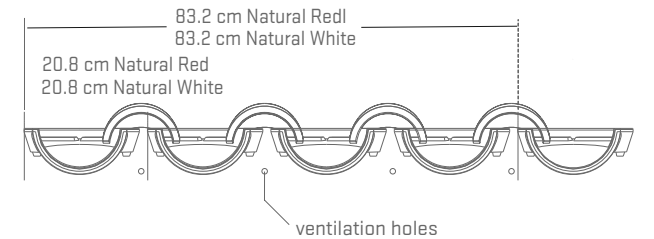


Fig. 8 Approximate values:



8. GABLE RAKES

Gable rakes improve the look and function of the point at which the roof joins the gable without the need for metal flashings, firewalls or low walls. Frequent tile cutting can also be avoided through the combined use of double or half verge tiles and the respective gable rake. Previous roof planning is required for the use of gable rakes. The right gable rake is the first piece to be applied (marked "D") on the right gable and the left gable rake is the last (marked "E") on the left gable. Each piece has two holes at the sides and one at the top and is supplied with screws and O-rings for fixing to avoid using mortar.

Fig. 9 - Gable finish with double Tecno tiles

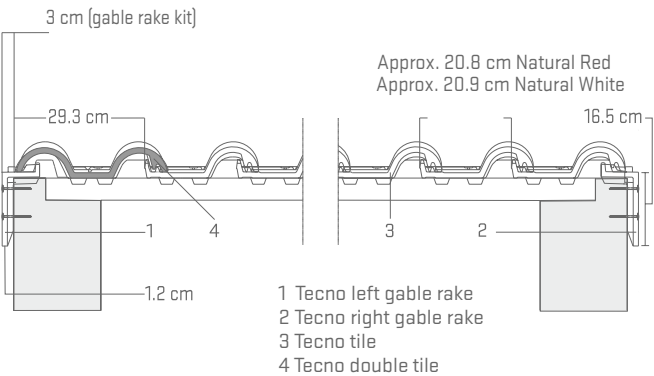
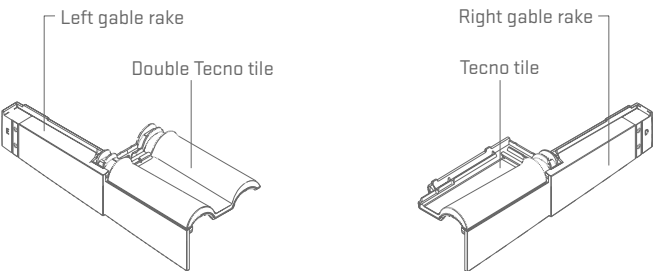


Fig. 10 - Simulation of assembly of the double tile with gable rakes



| | | |
|------------------------|--------------------------|-------------------------|
| Chimney Tecno base 125 | Chimney Tecno base 150 * | Tile with opening 250 * |
| | | |

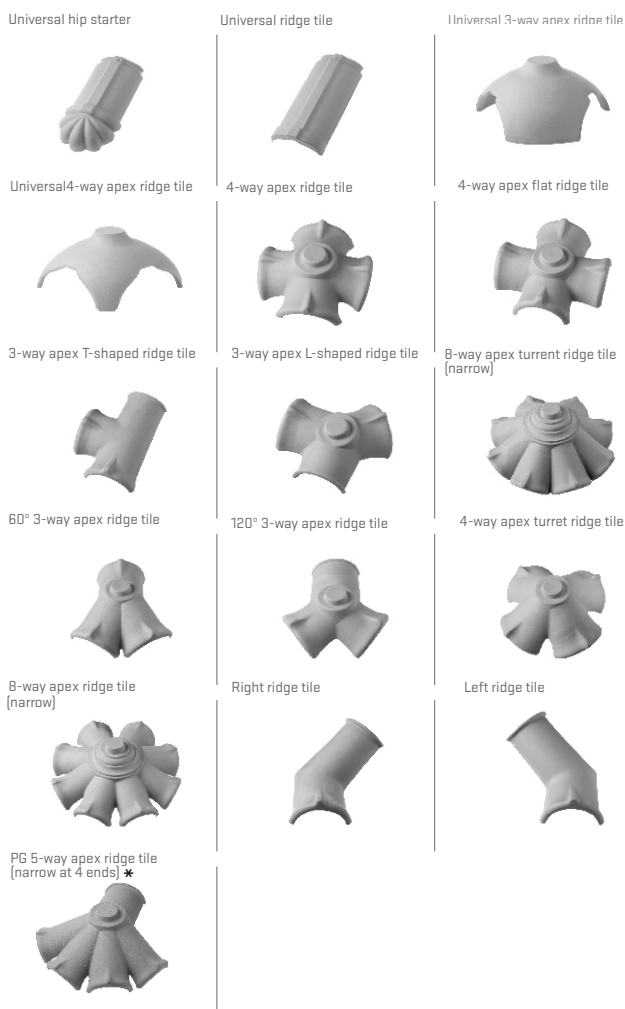
23. DECORATIVE ACCESSORIES

| | | |
|---------------|--------------------------|--------------|
| Turtle dove | Pigeon I | Pigeon II |
| | | |
| Large pyramid | Arrows (small and large) | Ball pyramid |
| | | |
| Small pyramid | Buds pyramid | |
| | | |

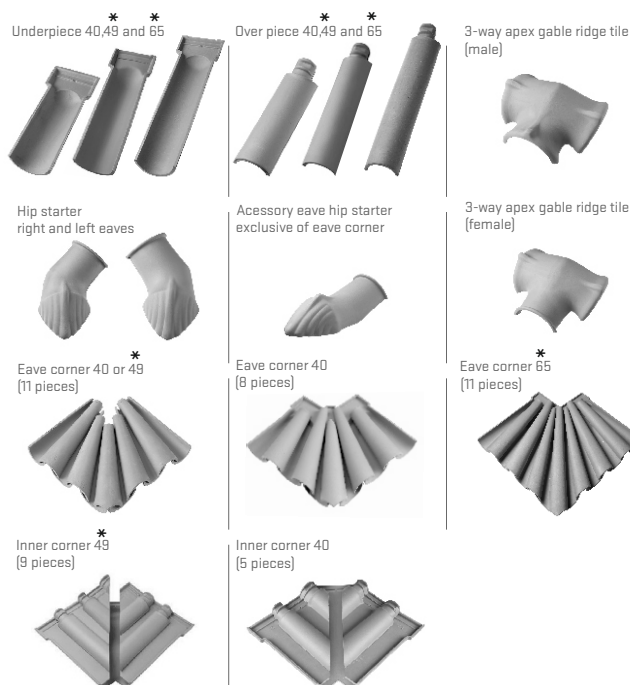
24. JUNIOR LINE

| | | |
|--------------------------------|---------------------------------|--------------------------------|
| Lusa tile | Trim | Lusa ridge tile |
| | | |
| Lusa hip starter | Lusa 4-way apex ridge tile | Under piece |
| | | |
| Lusa edge corner | Over piece | 3-way apex ridge tile (female) |
| | | |
| 3-way apex ridge tile (male) | Eave corner (5 pieces) | Canudo tile * |
| | | |
| Canudo hip starter * | Ball pyramid | Fine pyramid |
| | | |
| Canudo 4-way apex ridge tile * | Canudo eave corner (7 pieces) * | |
| | | |

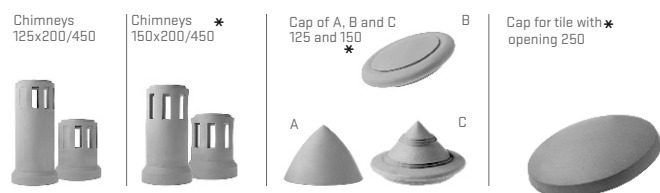
* These accessories are not available in Natural White



21. EAVES



22. OTHERS



* These accessories are not available in Natural White

Fig. 11 - Gable finish with half verge Tecno tiles

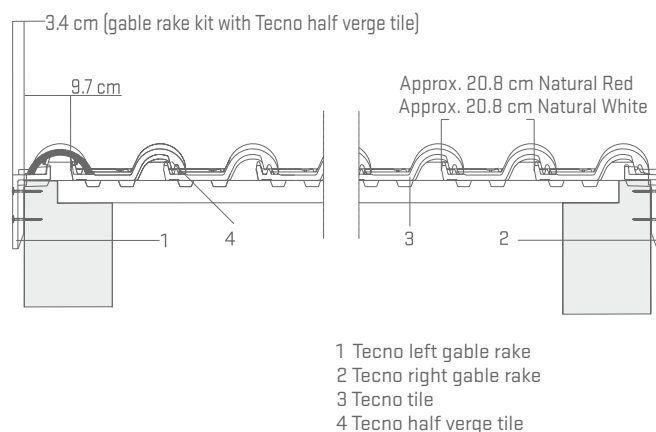
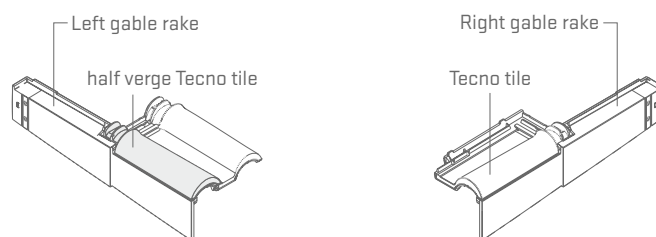


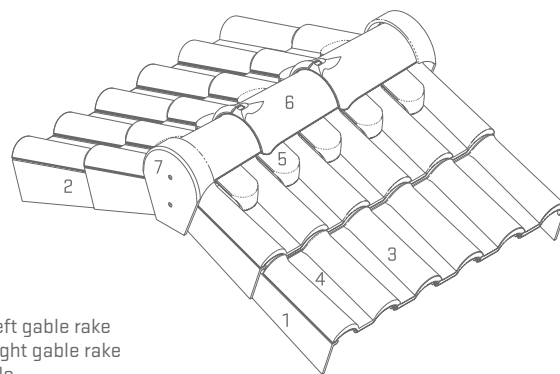
Fig. 12 - Simulation of assembly of the half verge tile with gable rakes



9. RIDGE CAP

On a gable roof, for example, where gable rakes are used, Tecno ridge caps are applied to the edges to close the tile opening, overlapping the last gable rakes. These come prepared with two holes for screwing them on.

Fig. 13



- 1 Tecno left gable rake
- 2 Tecno right gable rake
- 3 Tecno tile
- 4 Tecno double tile
- 5 Trim
- 6 Ridge tile
- 7 Ridge cap

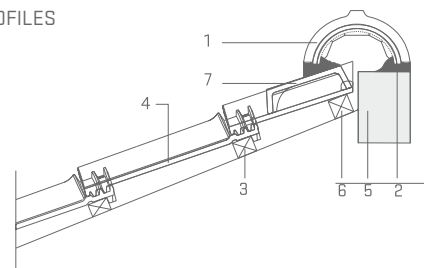
10. FINISHING PROFILES

The figures below show frequent finishes on roofs and the correct solution for them, paying special attention to metal flashings compatible with ceramic pieces or application of mortar at specific points and in the amounts only necessary for fixing parts.

10.1 LEVEL FINISHING PROFILES

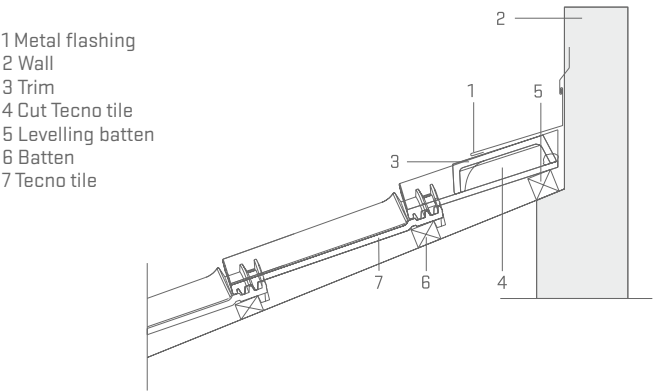
Fig. 14

- 1 Ridge tile
- 2 Water-resistant mortar
- 3 Batten
- 4 Tecno tile
- 5 Wall
- 6 Levelling batten
- 7 Trim



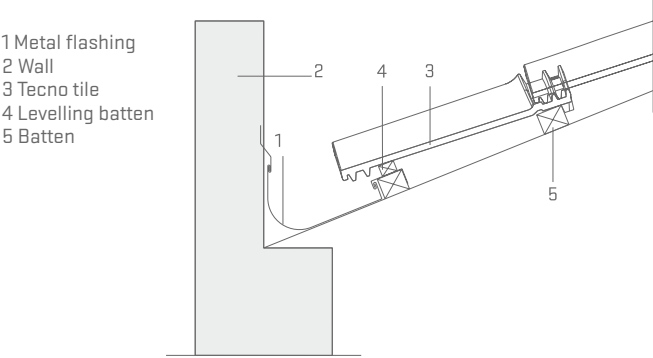
10.2 LEVEL FINISHING PROFILE ON THE UPPER PART OF THE PITCH

Fig. 15



10.3 LEVEL FINISHING PROFILE ON THE UNDERSIDE OF PITCH

Fig. 16



11. GABLE FINISH WITH LOW WALL

Traditional roof finishes with low walls/firewalls and a lateral metal downspout combined with the tiles may be used instead of gable rakes (described in point 8). The figure below shows how to make the traditional finish with low walls/firewalls and a lateral metal downspout embedded in the tiles. Tecno double or half verge tiles are applied to the last vertical row on the left of the pitch beside the lateral downspout to achieve an efficient good-looking and functional finish. Omission of lateral downspouts embedding tiles on the low wall often causes serious infiltration problems.

Fig. 17 - Gable finish with Tecno double tiles on a low wall

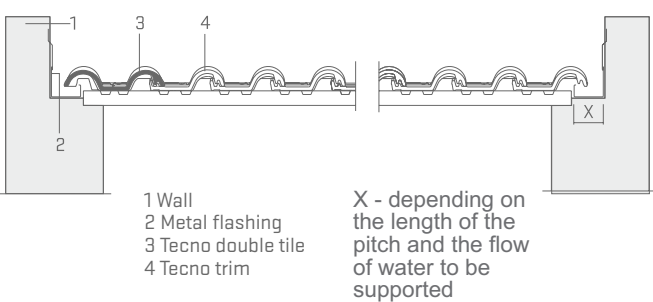
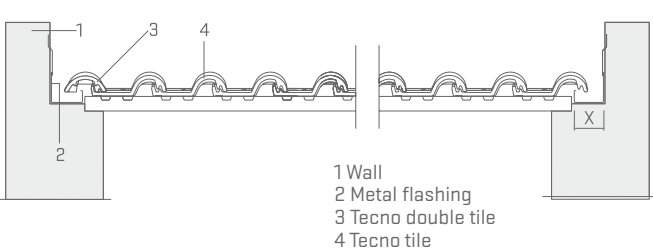


Fig. 18 - Gable finish with Tecno double tiles on a low wall

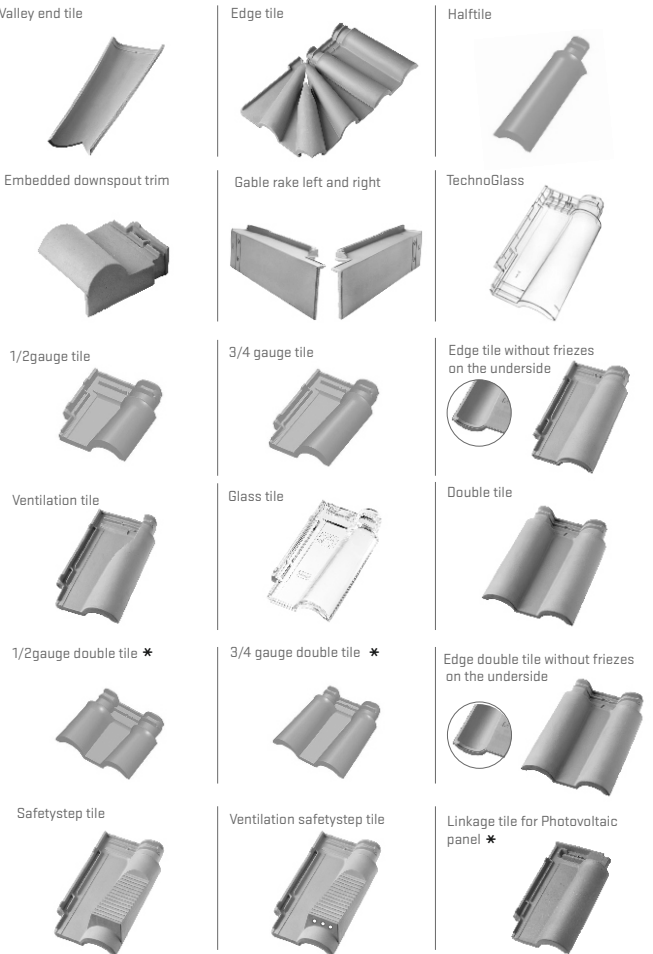


18. APPLICABLE STANDARD

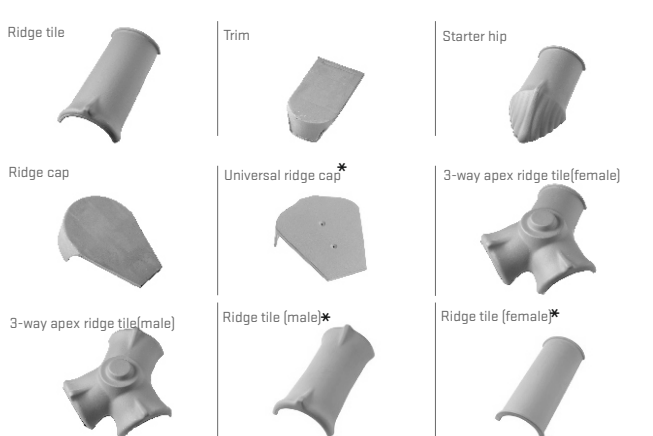
Product definitions and specifications.

| Characteristics | Application standard | Standard requirements | Performance |
|----------------------------------|----------------------|--|-------------------------|
| Mechanical resistance | EN 538 | Resistance $\geq 1200\text{N}$ | Surpassed |
| Waterproofness | EN 539-1 | According to Level 1 (Method 2) | Observed |
| Ice-resistant | EN 539-2 | Level 1 Resistant (Method E) ≥ 150 cycles | Surpassed |
| Geometric characteristics | EN 1024 | Flatness $1.5\% \leq$ Straightness $1.5\% \leq$ | Observed |
| Burning behaviour | — | — | Considered satisfactory |
| Reaction to fire | — | — | Category A1 |
| Emission of hazardous substances | — | — | Not determined |

19. GENERAL ASPECTS



20. RIDGES AND CORNERS



* These accessories are not available in Natural White

Fig. 28 - SIMULATION OF ASSEMBLY (EDGE LEVELLING)

- 1 Tecno tile
- 2 3/4gauge tile
- 3 1/2gauge tile
- 4 Tecno edge tile
- 5 Tecno 3/4double tile
- 6 Tecno 1/2double tile

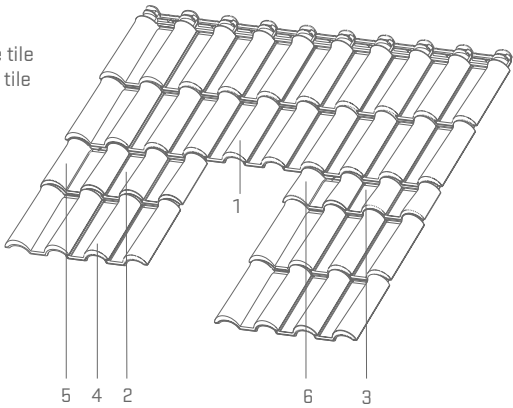
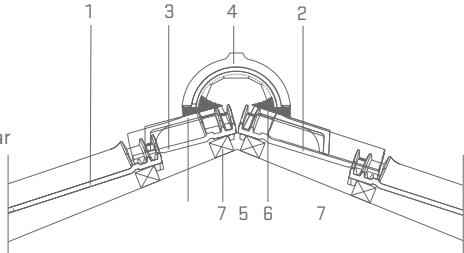
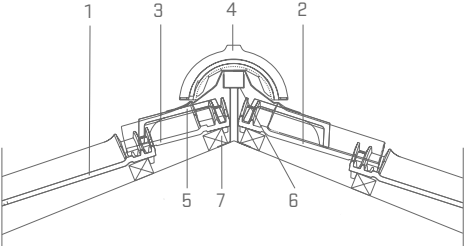


Fig. 29 - SIMULATION OF ASSEMBLY (RIDGE LEVELLING)

- 1 Tecno tile
- 2 3/4gauge tile
- 3 1/2gauge tile
- 4 Ridge tile
- 5 Trim
- 6 Water-resistant mortar
- 7 Levelling batten



- 1 Tecno tile
- 2 3/4gauge tile
- 3 1/2gauge tile
- 4 Ridge tile
- 5 Trim
- 6 Universal ridge support
- 7 Levelling batten



12. GABLE FINISH WITH CURVED FINISH EAVES

In the previous points (8 and 9), some solutions were provided for gable finishes but when the curved finish eave is applied to roof coverings, sometimes under and over pieces are also applied at gables, maintaining their attractiveness. Similar care to that mentioned in point 7 must be taken in this type of finish.

When possible, "wide" ridge tiles should be used for better covering of eave parts and pitch tile curves.

This must cover 2/3 of the tile curve to prevent accumulation of waste or running water near mortar at points where tiles come into contact with ridge tiles.

Two weak water-resistant or hydraulic lime mortar beads are required for fixing ridge tiles.

Fig. 19 -Gable finish with curved finish eaves and double Tecno tiles

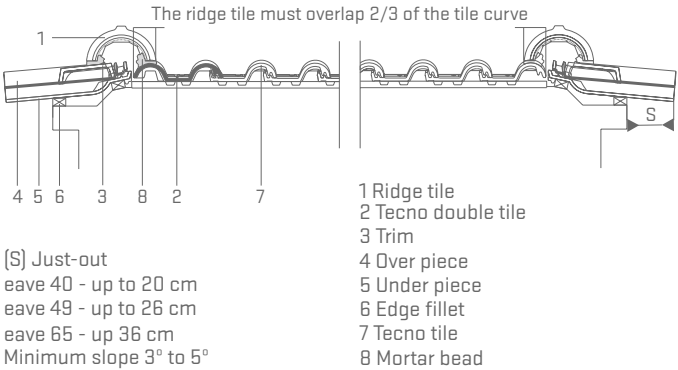


Fig. 20 - Gable finish with curved finish eaves and half verge Tecno tiles

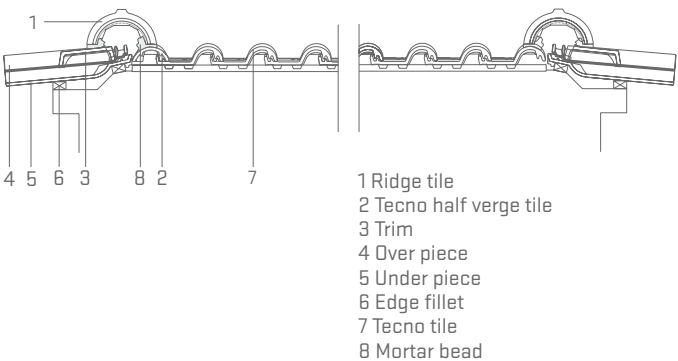
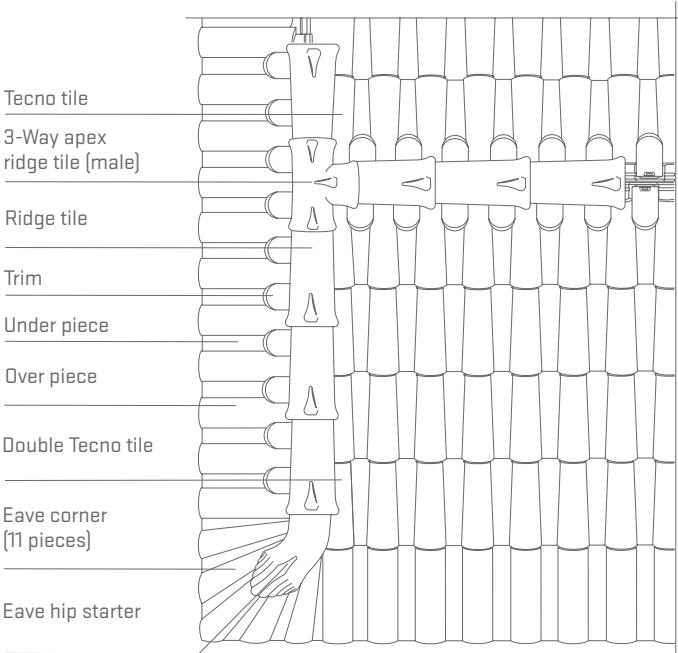
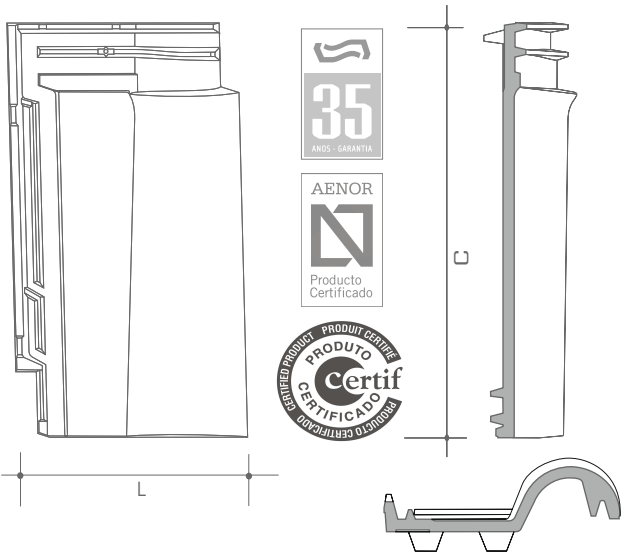


Fig. 21 - Gable finish with curved finish eaves - Plan



17. TECNO TILE CHARACTERISTICS



| | Natural Red | Natural White |
|--------------------------------|---------------|---------------|
| Dimensions (approx.) | 46.2 x 25,8cm | 46.3 x 25,7cm |
| Weight (approx.) | 3,9 Kg | 3,55 Kg |
| Units per m2 (approx.) | 12 | 12 |
| Gauge (approx.) | 39.2 cm | 39.2 cm |
| Cross-linked coating (approx.) | 83.2 cm | 83.2 cm |

13. CHIMNEY TRIM

Metal flashings must be used for areas where the roof covering comes into contact with brick chimneys and, when necessary, adhesive waterproof coating to help combine the adhesive metal sheeting with the tiles.

Metal frames that are easy to adapt to most tiles and most common chimney dimensions are already available on the market.

Fig. 22

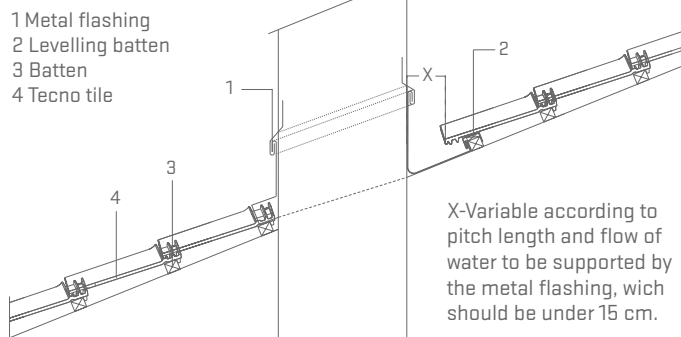
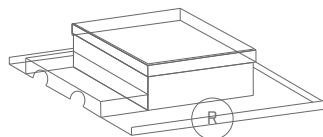


Fig. 23

R- A 2 cm rim must be inserted on the flashing for chimney trims, depending on the type of roof covering structure.



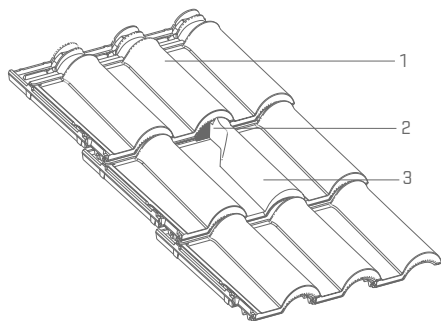
14. VENTILATION

Smooth functioning of the ceramic tile roof covering depends on good ventilation under the tiles to speed up drying and evaporation of eventual condensation and achieve thermal balance between the upper and lower tile surfaces.

Efficient pitch slopes and a proper gauge are not sufficient to guarantee adequate ventilation. Vents are required to force air to circulate from the edge to the ridge. It is therefore essential to install ventilation tiles.

Fig. 24

- 1 Tecno tile
- 2 Links
- 3 Tecno ventilation tile



14.1 CALCULATION FOR VENTILATION TILES

14.1.1 - Roof supported by a discontinuous structure (pre-stressed, wood or metal).

| Maximum pitch line | Assembly type | No. of tiles per m ² | Ventilation tile Layout |
|--------------------|------------------------|---------------------------------|--|
| Up to 12,5 meters | Edge with air inlet | 1 tile every 18 m ² | Half of them are placed as close as possible to the ridge and the others as close as possible to the edge. |
| | Edge without air inlet | 1 tile every 9m ² | |

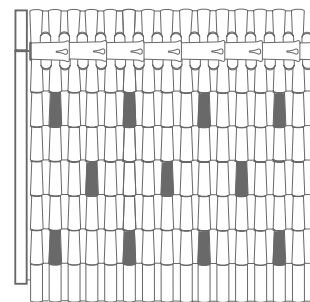
14.1.2 - Roof supported by a continuous structure (solid or lightweight slab)

| Maximum pitch line | Assembly type | No. of tiles per m ² | Ventilation tile Layout |
|-----------------------------|------------------------|---------------------------------|--|
| Up to 6.5 meters | Edge with air inlet | 1 tile every 11 m ² | Half of them are placed as close as possible to the ridge and the others as close as possible to the edge. |
| | Edge without air inlet | 1 tile every 5 m ² | |
| Between 6.5 and 12,5 meters | Edge with air inlet | 1 tile every 15 m ² | 1/3 of them are placed as close as possible to the ridge, another 1/3 as close as possible to the pitch and the last third as close as possible to the edge. |
| | Edge without air inlet | 1 tile every 5 m ² | |

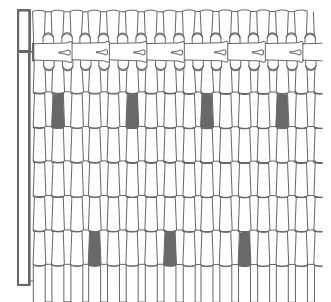
14.2 - LAYOUT OF VENTILATION TILES

Fig. 25

(3 - line layout) Plan



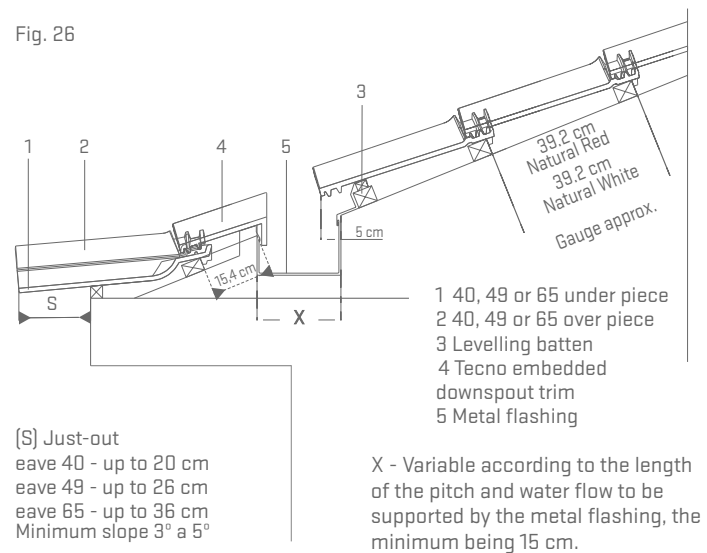
(2 - line layout) Plan



15. EMBEDDED DOWNSPOUT TRIM

Curved finish edges or eaves can be used for this to avoid cutting the tiles and combining waterproofing materials. This is done for the gables to enter a downspout located before the edge or eaves. This prevents water draining of the pitch from passing over the under pieces or edge tiles.

Fig. 26



16. 1/2 GAUGE TILE AND 3/4 TECNOC GAUGE

The 3/4 gauge tile and 1/2 Tecno gauge tile were developed for longitudinal pitch levelling on uneven edges or ridges to avoid cuts that normally cause problems on roof coverings.

Fig. 27 - 1/2 AND 3/4 GAUGE TILE ON PITCH

