

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 Plasma tiles:

Plasma 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

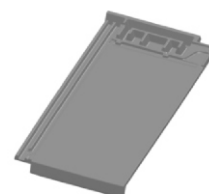


Declaration of performance No. 007/2013 CS



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IT-12/DCM/15.05/Ed.01/Rev.001 (Eng.)



Plasma 

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



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

Protected location

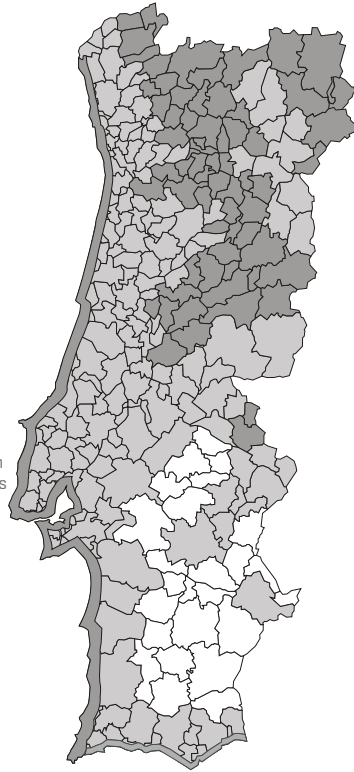
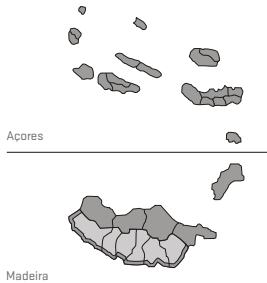
Areas surrounded by high ground that shelters them from different wind directions.

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	15°	27%	18°	32%	20°	36%
	Normal	17°	30%	19°	35%	22°	40%
	Exposed	19°	35%	22°	40%	25°	46%
Up to 9.5 meters	Protected	17°	30%	19°	35%	22°	40%
	Normal	18°	33%	21°	39%	24°	44%
	Exposed	21°	38%	24°	44%	27°	51%
Up to 12 meters	Protected	18°	32%	21°	38%	23°	43%
	Normal	20°	36%	23°	42%	26°	48%
	Exposed	22°	41%	26°	48%	29°	55%

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.

25. FREEZING THAWING

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.

In regions where freezing-thawing cycles are likely to occur, the use of ceramic tiles with low water absorption, application of ventilation accessories and implementation of a support structure that lets a significant amount of air circulate underneath for quick drying of the roof, is recommended.

26. CONDENSATION

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 may 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.

27. AGGRESSION CAUSED SEA SALT

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.

28. WARRANTY

CS-Coelho da Silva provides a 35-YEAR warranty for the PLASMA 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.

21.7 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.

22. 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.

23. 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

24. MOSS ACCUMULATION (SLIME AND DEBRIS)

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.

2.1 RAISED GAUGE

Using mortar points for fixing, battens may be made of wood or pre-stressed material, raised at least 2.5 cm to allow for air to pass from the edge to the ridge (Fig. 1).

2.2 GAUGE LAID ON INSULATION

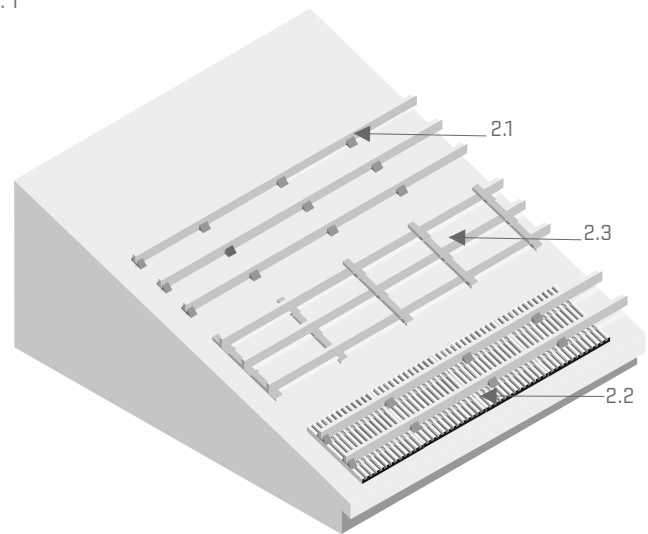
The procedure is similar to that described in the previous point but is now for insulation. If it has nerves, it must be placed on a slab, maintaining the nerves perpendicular to the edge.

2.3 GAUGE LAID ON COUNTER-BATTEN

After installing a mesh using wooden or pre-stressed battens and counter-battens, a ventilation opening of at least 5 cm must be maintained. This requires battens and counter-battens to be at least 2.5 cm high.

NOTE: The use of PVC battens is strongly unadvised due to their flexibility and the way they are fixed to the structure (often using nails or domed headed rivets), which can interfere with the correct support of the PLASMA tile.

Fig. 1



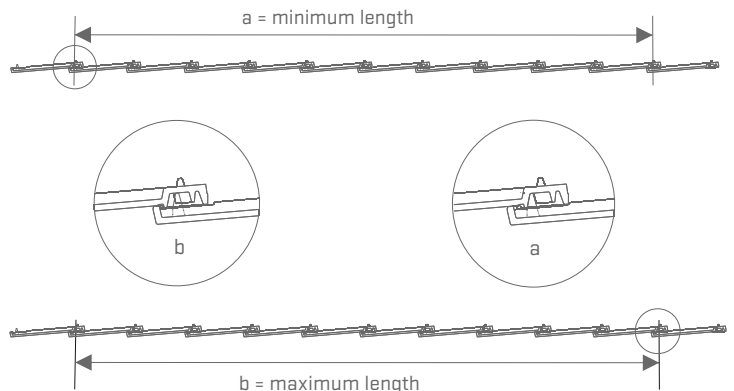
Raised or counter-batten gauges promote ventilation of the underside of the tiles, significantly increasing their durability and delaying the appearance of slime.

3. CALCULATING THE 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: $gauge = (a+b)/20$.

Fig. 2

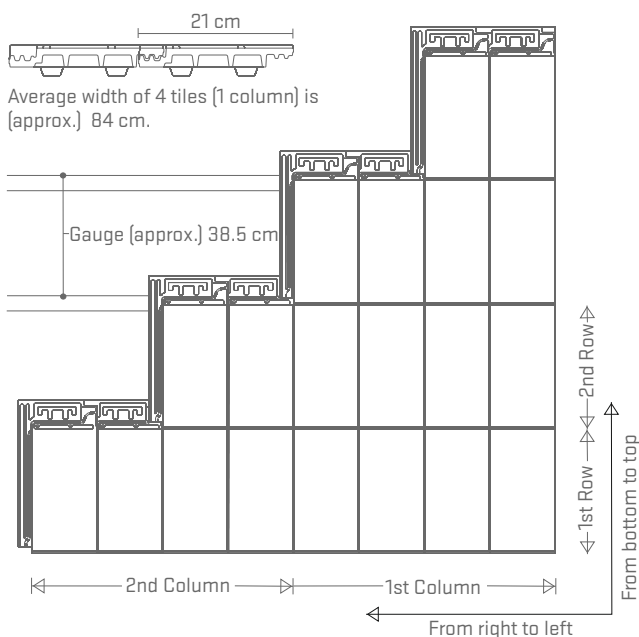


Note: You should always calculate the gauge on site, after receiving the material and mixing together tiles from different pallets.

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 calculated using a similar procedure to that used to calculate the gauge measurement, joining and separating them, but this time laterally. 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.

Fig. 3



Plasma allows for application with an aligned or cross joint. It is a question of appearance as there is no significant difference in functional terms. It comes prepared with pre-punched holes for fixing to the support structure with self-drilling screws for this purpose. Next, general fixing criteria are shown using the pre-punched hole existing in the tile:

- pitches between 10° (18%) and 45° (100%) - no fixing is necessary;
- 45° (100%) and 70° (275%) - at least one pre-punched hole must be used;
- 70° (275%) to 90° (vertical surface) - compulsory fixture in both pre-punched holes and eventual use of an auxiliary clip [these situations should be analysed by the CS technical department].

Note: 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.

5. RIDGES AND CORNERS

At ridges and corners of roofs capped with Plasma tiles, PL1 or PL2 ridge tiles must be used (depending on the slope) fixed only with 2 hydraulic lime mortar beads. 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 to 3 cm gap between the tiles to let air out from inside.

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 roof coverings. However, absence of previous studies and/or poor on-site technical performance are the real causes of most problems detected.

21.1 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 covering.

21.2 ABSENCE OF FIXTURE ON HIGH SLOPES OR STRONG WIND ZONES

On roof coverings with very steep pitches, 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.

21.3 INSUFFICIENT OR INADEQUATE VENTILATION It is essential to guarantee efficient air circulation under the tiles to ventilate the ceramic roof coverings. This requires a) using a batten and counter-batten system for vertical ventilation corridors,

- 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.

21.4 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 5 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, metal or pre-stressed sections), which must be chosen according to the roof covering 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 ribs **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.

21.5 INCORRECT CALCULATION OF THE GAUGE

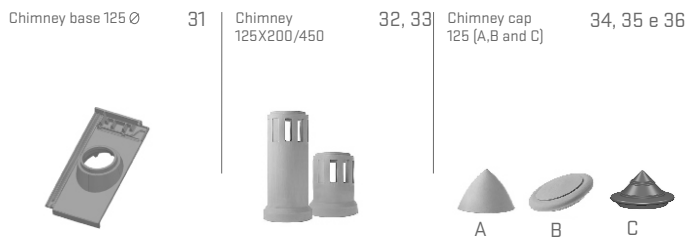
There is a gauge measurement for each tile model, which is obtained from the calculation described in point 3 of this leaflet. If the support structure does not correspond to the measurement calculated, it will be difficult to fit and overlap the tiles during application, which will cause roof misalignment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

21.6 APPLICATION OF EXCESS MORTAR

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.

19. SPECIAL ACCESSORIES



Note 2: Accessories 13, 14, 15, 16, 18, 19 and 20, can also be applied to the façade.

20. POSITIONING OF ACCESSORIES ON THE ROOF COVERING

Fig. 21

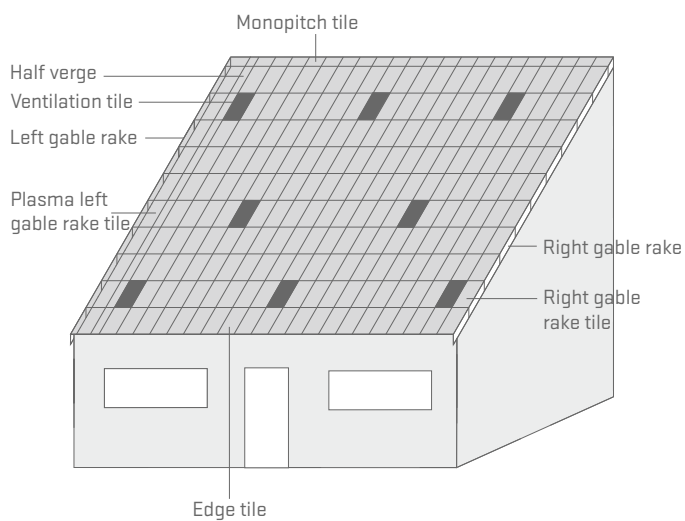
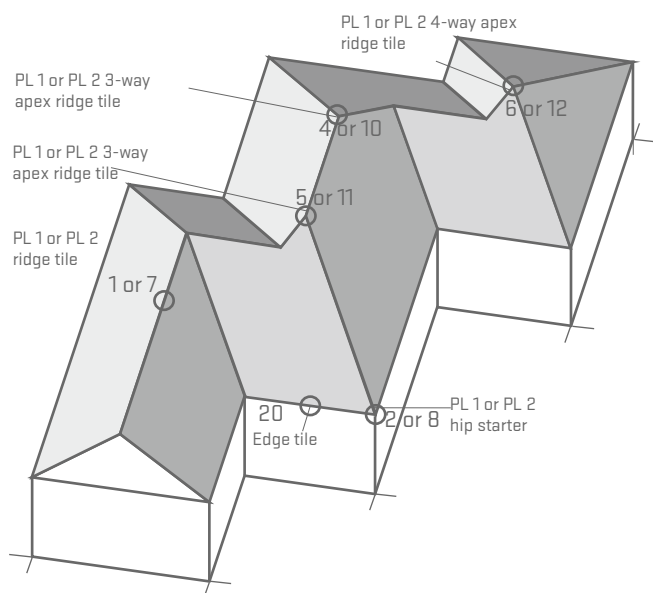


Fig. 22



21. ERROS DE MONTAGEM FREQUENTES

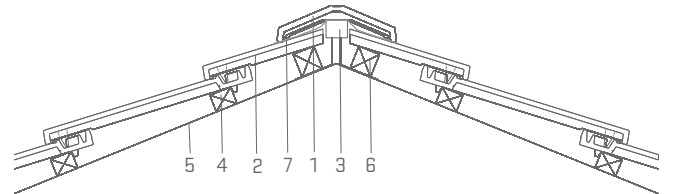
The roof covering plays a very important role in a building's durability, comfort and smooth functioning. Its design, planning and performance must comply with the regulations and procedures mentioned in the previous points in order to prevent, reduce or avoid the anomalies mentioned below.

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.

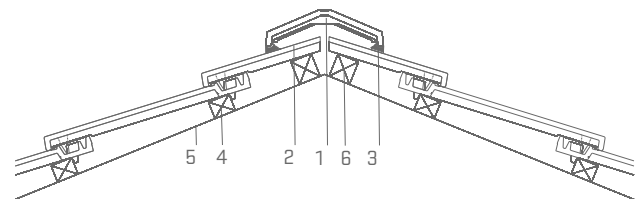
Note: PL1 ridge tile, used on pitches with a slope between 10° (18%) and 31° (60%)
 - PL2 ridge tile, used on pitches with slopes of 31° or more.

Fig. 4 - Dry application of the ridge (using PL1 ridges tiles and a levelling cut in the tile)



- 1 PL1 ridge tile
- 2 Plasma cut tile
- 3 Universal ridge support
- 4 Batten
- 5 Support structure
- 6 Levelling batten
- 7 Ventilated aluminium membrane

Fig. 5 - Manufacture of the ridge using mortar (using PL1 ridges and a levelling cut in the tile)

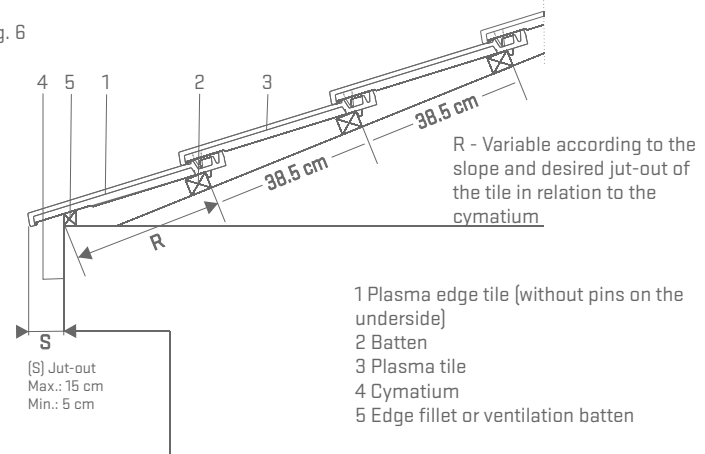


- 1 PL1 Plasma ridge tile
- 2 Plasma cut tile
- 3 Water-resistant or hydraulic lime mortar bead
- 4 Batten
- 5 Support structure
- 6 Levelling batten

6. EDGE

To assemble the edge with Plasma tiles, you must first of all mark the whole perimeter of the roof where you want it to overhang between 5 and 15 cm.

Fig. 6



7. 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 be avoided through the combined use of gable rake tiles and gable rakes.

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 pre-punched holes at the sides and one at the top and is supplied with screws and o-rings for fixing to avoid using mortar.

Average dimensions	C = 48,7 cm x L = 25,1 cm
Weight (approx.)	4 Kg
Units per m2 (approx.)	12,5
Gauge (approx.)	38,5 cm

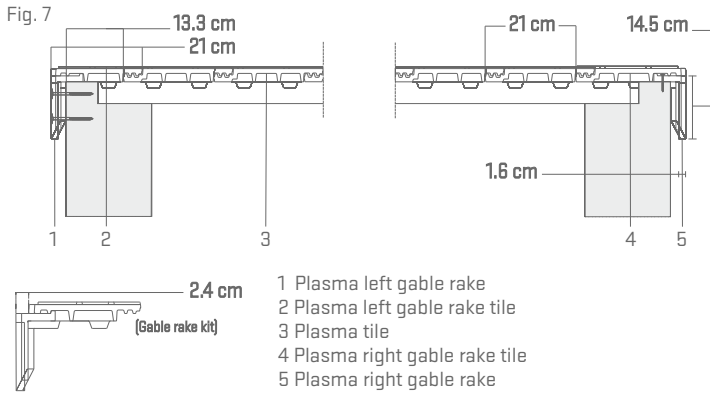


Fig. 71 - Aligned joint

- 1 Plasma right gable rake
- 2 Plasma tile
- 3 Plasma right gable rake tile
- 4 Plasma edge tile

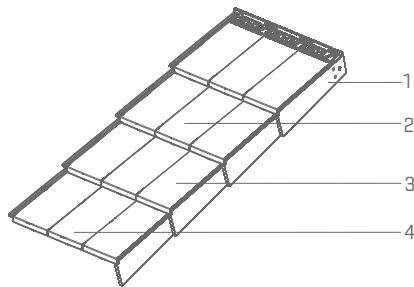
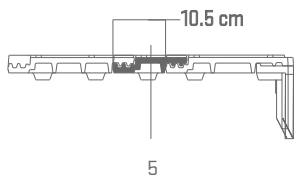
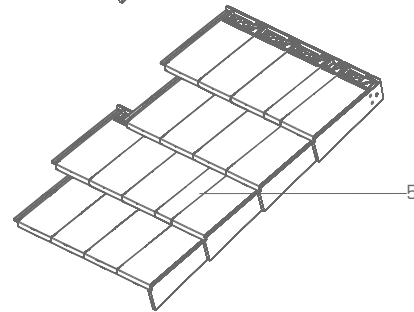


Fig. 72 - Cross joint



- 1 Plasma right gable rake
- 2 Plasma tile
- 3 Plasma right gable rake tile
- 4 Plasma edge tile
- 5 Plasma half verge tile

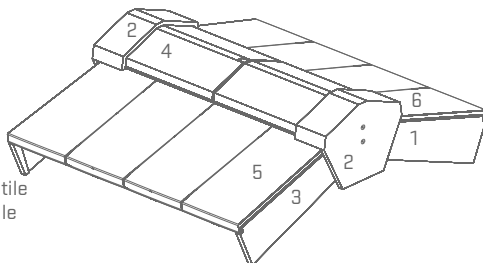


8. RIDGE CAP

On a gable roof, for example, where 2 gable rakes are used, ridge caps (PL1 or PL2) 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. 8

- 1 Plasma left gable rake
- 2 PL1 ridge cap
- 3 Plasma right gable rake
- 4 P11 ridge tile
- 5 Plasma right gable rake tile
- 6 Plasma left gable rake tile



9. 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.

17. ROOF COVERING ACCESSORIES

PL 1 ridge tile	1	PL 1 hip starter	2	PL 1 ridge cap	3
PL 13-way apex (male)	4	PL 13-way apex(female)	5	PL 14-way apex	6
PL 2 ridge tile	7	TPL 2 hip starter	8	PL 2 ridge cap	9
PL 2 3-way apex ridge tile (male)	10	PL 2 3-way apex ridge tile(female)	11	PL 2 4-way apex ridge tile	12
Left gable rake tile	13	Right gable rake tile	14	Right gable rake	15
Left gable rake	16	Ventilation tile	17	Half tile	18
Left finish tile	19	Edge tile (without pins on the underside)	20	Monopitch tile	21

18. ROOF ACCESSORIES

Linkage tile	22	Half verge link tile	23	Linkage tile left	24
Right linkage tile	25	Linkage trim left	26	Linkage trim right	27
Facade tile	28	Half verge facade tile	29	Linkage tile left finish	30

14. APPLICATION ON THE FAÇADE

The Plasma tile enables combined use on the roof covering and façade coating (there are specific interface accessories). It comes equipped with two pre-punched holes on the vertical section with self-drilling screws and washers. CS also developed an additional metal clip for joint application, one for each tile on the façade.

The type of clip and screw and their characteristics should be defined case by case according to application and, especially, the support structure. Several solutions and materials can be chosen for the structure, which must be defined in detail by the entity responsible for the project. However, CS suggests the general application of vertical struts for a ventilation system to be installed between the tile and the insulation. The horizontal brace will be placed on top of them to support the tile, allowing it to be screwed on and the auxiliary clip inserted.

The application of Plasma tiles on façades always implies prior assessment and advice from the Technical Department of CS - Coelho da Silva, using architectural design elements.

15. APPLICABLE STANDARD

EN 1304 - Ceramic tiles for discontinuous installation. product definitions and specifications.

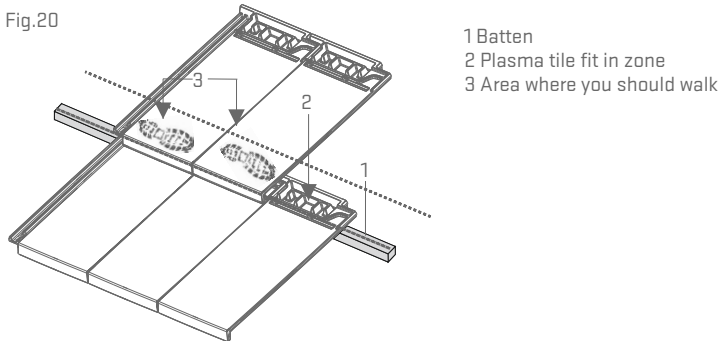
Characteristics	Application standard	Standard requirements	Performance
Mechanical resistance	EN 538	Resistance $\geq 900\text{N}$	Surpassed
Waterproofness	EN 539-1	According to Level 1 (Method 2)	Observed
Ice-resistant	EN 539-2	Level 1 Resistant (Method E) ≥ 150 cycles	Surpassed
Caraterísticas geométricas	EN 1024	Flatness $1.5\% \leq$ Straightness $1.5\% \leq$	Observed
Burning behaviour	—	—	Considered satisfactory
Reaction to fire	—	—	Category A1
Emission hazardous substances	—	—	Not determined

15.1 WALKING ON PLASMA ROOF COVERINGS

Plasma tiles comply with all requirements of Standard EN 1304:2005 but care must be taken when walking across a Plasma roof covering.

You must walk on the overlaps and batten supports to prevent tiles from breaking and eventual accidents.

Fig.20



16. PLASMA TILE CHARACTERISTICS

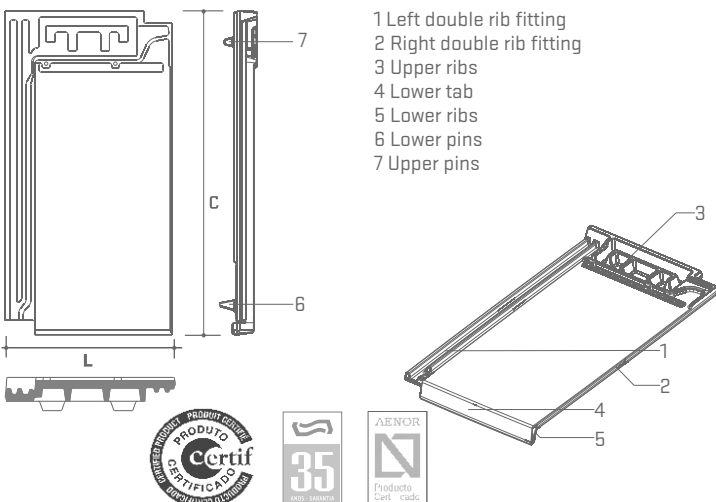
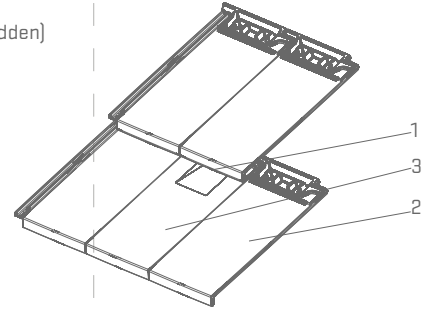


Fig. 9

- 1 Plasma ventilation grid (hidden)
- 2 Plasma tile
- 3 Plasma ventilation tile



9.1 CALCULATION FOR VENTILATION TILES

9.1.1 - 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 9 m ²	

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

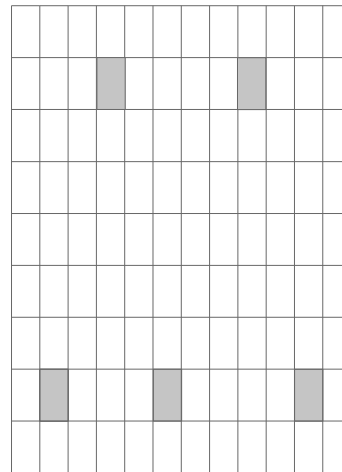
Maximum pitch line	Assembly type	No. of tiles per m ²	Ventilation tile layout
Up to 6.5 meters	Edge with air inlet	1 tile every 11 m ²	Half of them are placed as close as possible to the ridge and the others as close as possible to the edge.
	Edge without air inlet	1 tile every 5 m ²	
Over 6.5 meters	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	

9.2 - LAYOUT OF VENTILATION TILES

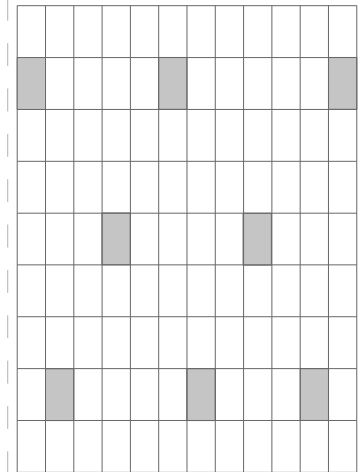
Ventilation tiles may be laid in 2 or 3 lines.

Fig. 10

a) 2 lines



b) 3 lines



Plasma ventilation tile

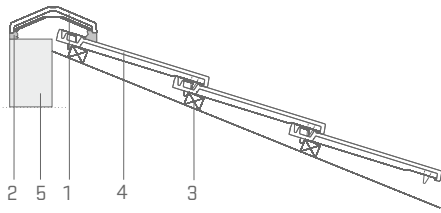
10. FINISHING PROFILES

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 PROFILE

Fig.11

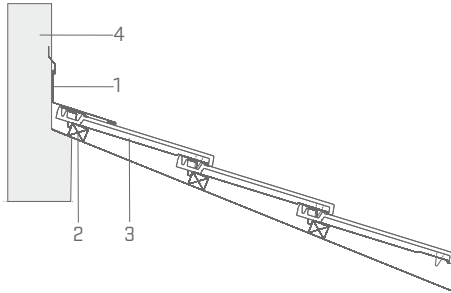
- 1 PL1 ridge tile
- 2 Water-resistant mortar
- 3 Batten
- 4 Plasma tile
- 5 Wall



10.2 LEVEL FINISHING PROFILE ON THE UPPER PART OF THE PITCH

Fig.12

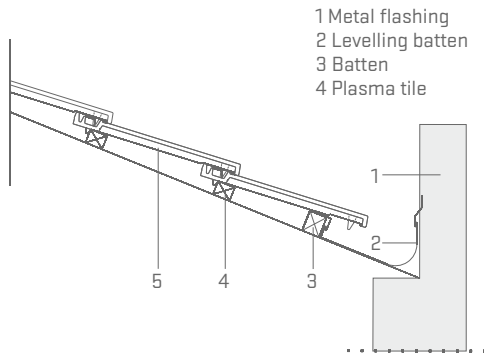
- 1 Metal flashing
- 2 Batten
- 3 Plasma tile
- 4 Wall



10.3 LEVEL FINISHING PROFILE ON THE UNDERSIDE OF THE PITCH

Fig.13

- 1 Mouldings
- 2 Downspout
- 3 Levelling batten
- 4 Batten
- 5 Plasma tile



- 1 Metal flashing
- 2 Levelling batten
- 3 Batten
- 4 Plasma tile

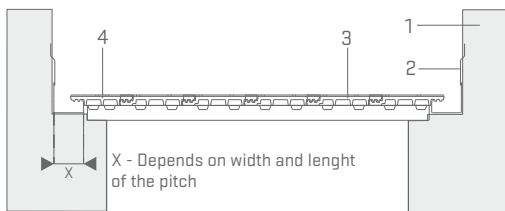
11. GABLE FINISH WITH LOW WALL

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 7). The figure below shows how to make the traditional finish with low walls/firewalls and a lateral metal downspout embedded in the tiles. Left finish 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. 14

- 1 Low wall/Firewall
- 2 Downspout
- 3 Plasma tile
- 4 Left finish Plasma tile



12. 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.

See figure 15.

Fig. 15

X - Variable according to pitch length and flow of water to be supported by the metal flashing, which must not be less than 15 cm long.

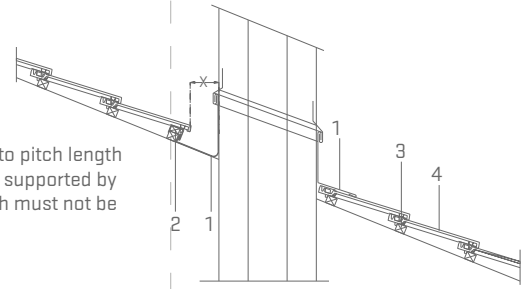
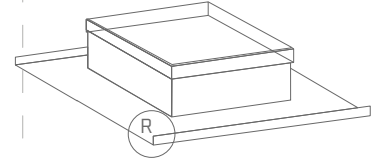


Fig. 16

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

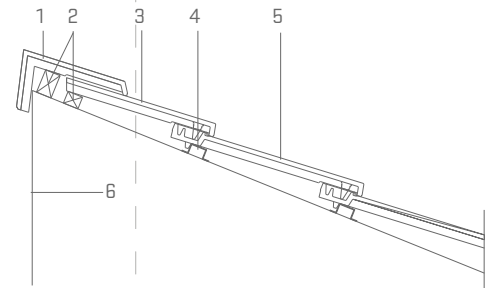


13. MONOPITCH TILE

The monopitch tile is a versatile accessory used to solve common situations on roofs that are normally solved with other materials or cut pieces and which, when not properly applied, can cause roof covering problems. The figures below show the monopitch tile in the top coat of a single gable roof (Fig. 17) or trim on an embedded downspout (Figures 18 and 19).

Fig. 17

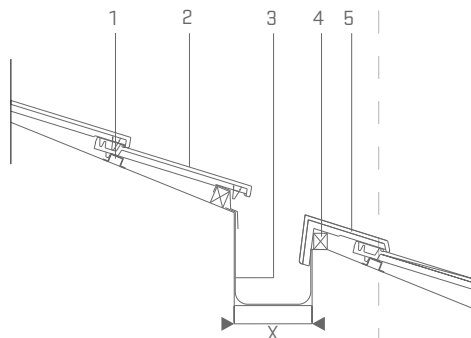
- 1 Monopitch tile
- 2 Levelling batten
- 3 Cut Plasma tile
- 4 Batten
- 5 Plasma tile
- 6 Wall



13.2 MONOPITCH TILE IN AN EMBEDDED DOWNSPOUT

Fig. 18

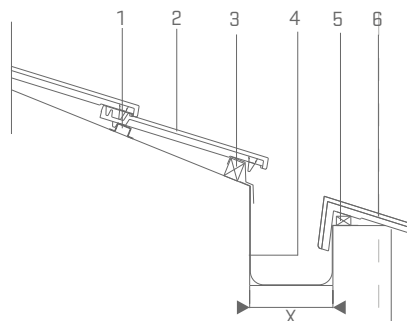
- 1 Batten
- 2 Plasma tile
- 3 Metal flashing
- 4 Levelling batten
- 5 Monopitch tile



X - Variable depending on the length of the pitch and the flow of water to be supported by the metal flashing.

Fig.19

- 1 Batten
- 2 Plasma tile
- 3 and 5 Levelling batten
- 4 Metal flashing
- 3 and 5 Levelling batten
- 6 Monopitch tile



X - Variable depending on the length of the pitch and the flow of water to be supported by the metal flashing.