



# TB-12®

## Characteristics\*

Length: 43,9 cm. / 17,28 "  
 Width: 26 cm. / 10,24 "  
 Weight: 3,15 kg. / 7,00 lb.  
 Units/m<sup>2</sup>: 12,5 uds. / uts./sq.ft.: 1,161  
 Useful length: 37 cm. / 14,57 "

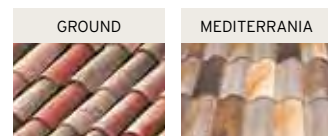
Type: double lateral overlapping and double longitudinal overlapping.

\*Average values: if the installation is with battens, it is necessary to check the useful length

## nature



## CENTENARIA®

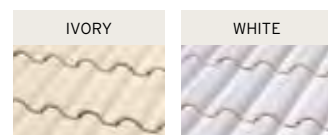


## BORJA decor

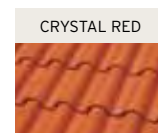
### TAMIZADOS



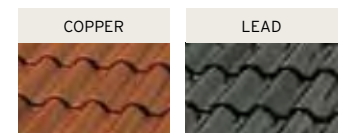
### GLAZED



### CRYSTAL



### METALLIC



1) The tone variations inherent in the ceramic process are according to valid regulations,. See page 194-P.3

See page 148 for installation details

## Formats and finishing accessories



Tile and a Half TB-12<sup>®</sup> roof tile    Half TB-12<sup>®</sup> roof tile    2/3 TB-12<sup>®</sup> roof tile    TB-12<sup>®</sup> Ventilation roof tile    TB-12<sup>®</sup> Eave Closure    TB-12<sup>®</sup> Cover Decocurva<sup>®</sup> roof tile    TB-12<sup>®</sup> Pan Decocurva<sup>®</sup> roof tile    TB-12<sup>®</sup> Corner Decocurva<sup>®</sup> roof tile

Dimensions as average values:

43,6 (L) / 36 (w) / 7 (H)    44 (L) / 16 (w) / 6,5 (H)    30,5 (L) / 26,5 (w) / 7 (H)    44 (L) / 26 (w) / 7 (H)    20 (L) / 10 (w) / 9,4 (H)    47 (L) / 17 (w) / 7 (H)    47 (L) / 16 (w) / 7 (H)    11 pieces  
2,5 (Lm units)    2,5 (Lm units)    5 (Lm units)    5 (Lm units)    5 (Lm units)    5 (Lm units) on monopitch    5 (Lm units)



Universal Under Ridge    TB-12<sup>®</sup> Chimney Carrier    130 Universal Chimney    Universal Ventilation Cap    Universal Straight Edges left - right    Universal TB-12<sup>®</sup> Circular Straight End Cap    Universal TB-12<sup>®</sup> Cover + Straight End Cap    Universal Angular Edge

Dimensions as average values:

24 (L) / 12,2 (w) / 5,6 (H)    43,5 (L) / 25,5 (w) / 11 (H)    20,4 (∅ ext.) / 18 (∅ int.) / 23,5 (H)    24,5 (∅ ext.) / 22 (∅ int.) / 6 (H)    47 (L) / 9 (w) / 17 (H)    7,5 (L) / 24,7 (w) / 27,9 (H)    6,5 (L) / 27 (w) / 31 (H)    43 (L) / 14,5 (w) / 14,5 (H)    2,5 (Lm units)

### New



Under Ridge TB-12<sup>®</sup> roof tile    2/3 Under Ridge TB-12<sup>®</sup> roof tile    Tile and a Half Under Ridge TB-12<sup>®</sup> roof tile    2/3 Tile and a Half TB-12 roof tile    2/3 Tile and a Half Under Ridge TB-12<sup>®</sup> roof tile    By-pass Solar TB-12<sup>®</sup>

Dimensions as average values:

43 (L) / 26 (w) / 6 (H)    30,5 (L) / 26,5 (w) / 7 (H)    43 (L) / 36,5 (w) / 7 (H)    31 (L) / 36,5 (w) / 7 (H)    30,5 (L) / 36,5 (w) / 7 (H)    43,5 (L) / 26,5 (w) / 7 (H)

#### Conversion table:

1 cm. = 0,3937"  
1 Kg. = 2,22 lb.

(L) Length in cm.

(w) Width in cm.

(H) Height in cm.

(∅ ext.) Exterior diameter

(∅ int.) Interior diameter

(Lm units) Units by linear meter



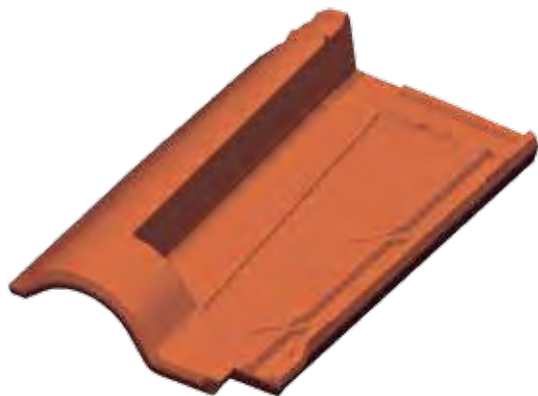
Dimensions as average values:

43,5 (L) / 17 (w) / 18 (H)    15,5 (L) / 27 (w) / 8 (H)    43 (L) / 14,5 (w) / 13,7 (H)    15 (L) / 26 (w) / 26 (H)    17,5 (L) / 26,7 (w) / 26,5 (H)  
2,5 (Lm units)    2,5 (Lm units)

# Solar energy solutions:

For any further information contact our technical department or website [www.tejasborja.com](http://www.tejasborja.com)

## Solar panels bases. On traditional roofing system



Weight*	3,5 kg.
Dimensions*	43,5(L) 26,5(w) 7(H)



Solar aluminium clip for batten base



Solar Inox clip for concrete base

## Installation and application

### With batten



### On mortar base



### Install a By-pass Solar TB-12® over each pipeline



Four By-pass Solar TB-12® units should be installed for each solar panel of 2x1 m.

\*Average values

Conversion table:  
1 cm. = 0,3937"  
1 Kg. = 2,22 lb.

## Scheme position for clips and By-pass Solar TB-12® on the roof



### COMPATIBLE SYSTEM FOR ANY THERMAL OR PHOTOVOLTAIC SOLAR PANEL

n° of modules (panels)	By-Pass TB-12® + clips	(1) By-Pass TB-12® step pipelines
1	4+4	Minimum 1
1	4+4	Minimum 1
2	6+6	Minimum 1
2	8+8	Minimum 1

## SAFETY

- The exclusive design of BY-PASS SOLAR TB-12® system, guarantees the water evacuation, avoiding the incorrect manipulation of the roof tile when fixing the solar panels.
- It assures the fixing between the support and any traditional solar module. Check finishes colours for TB-12®.
- Hooks of aluminium and stainless steel of high resistance to the corrosion. It includes safety screws.
- System protected by patents.

## QUICK INSTALLATION

- Full kit: BY-PASS SOLAR TB-12® + FIXING CLIPS.
- The installation is made following the installation guide for TB-12® roof tiles as if it was one more roof tile, fixing the corresponding hook (depending on the support).
- Compatible installation with any support under ceramic roof tile (forged, tongued and grooved timber or ceramics or light wood, metallic structures and surfaces with batten) to fix the roof tiles.

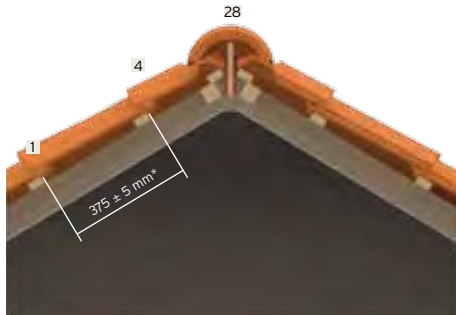
(1) The By-pass Solar TB-12® is specially designed to be used like step pipeline through the underside part of the roof.



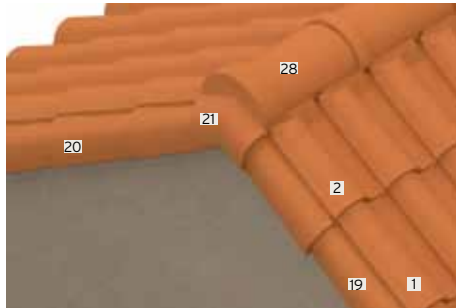
## Installation details

See formats and finishing accessories in page 112

Ridge line



TB-12® curved edges and Universal cover + curved end cap



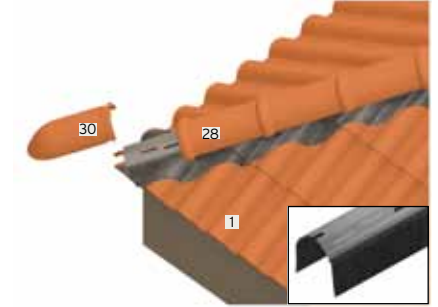
3-Ways



TB-12® Bardelis edges and TB-12® cover + Bardelis end cap

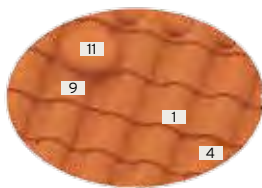
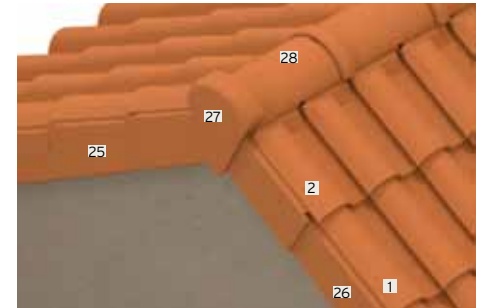


Hip line ventilation

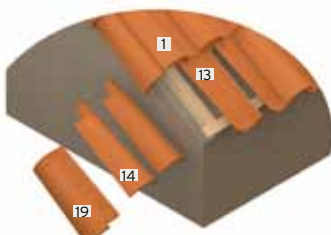


LH 517 section

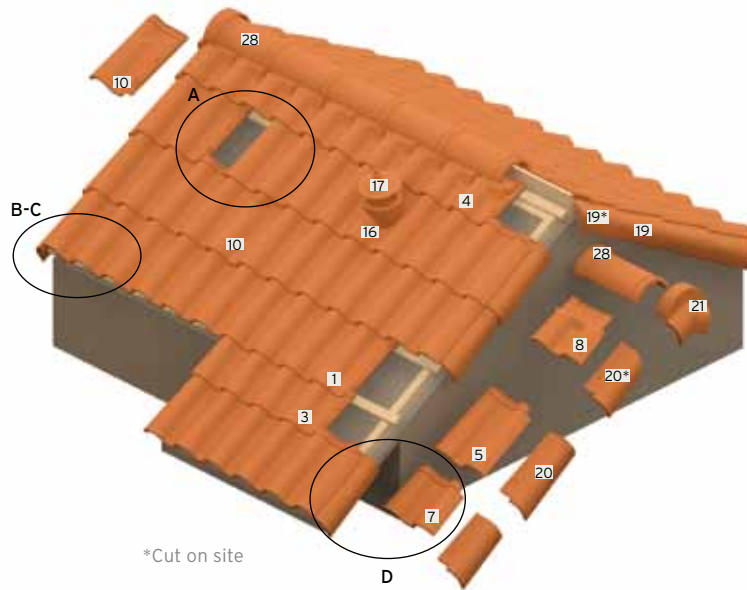
Universal circular edges and Universal circular straight end cap



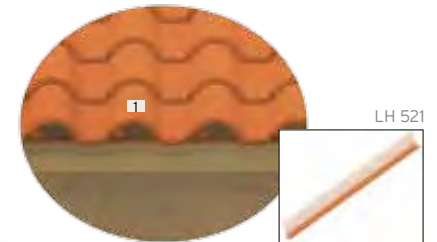
Ventilation cap option (Diagram A)



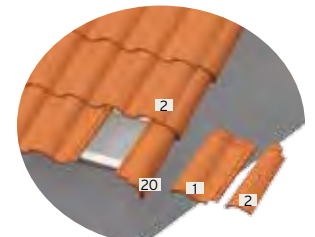
Decocurva® option (Diagram B)



\*Cut on site

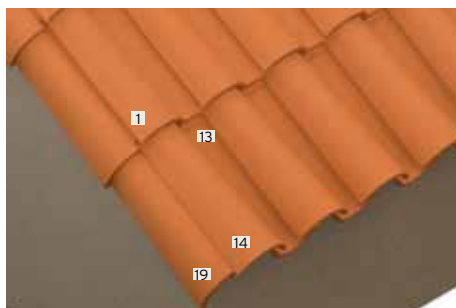


Plastic bird barrier (Diagram C)

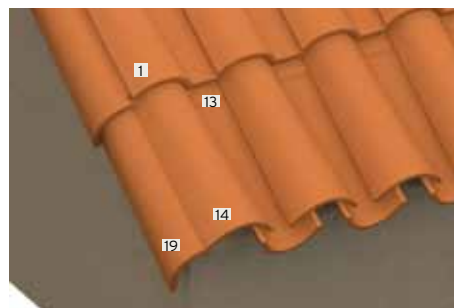


Half TB-12® option (Diagram D)

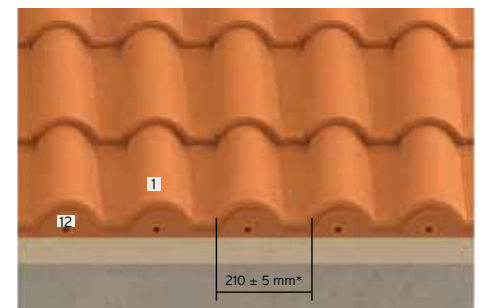
Eave line



Eave line with TB-12® Pan Decocurva® overhanging



Eave line with TB-12® eave closure



# Installation

See AutoCAD files on [www.tejasborja.com](http://www.tejasborja.com)

## SUPPORT

This format can be placed on any type of structure, on mortar base or with wooden, metallic or PVC battens (RECOMMENDED) or continuous waterproof decking.

In any case, the deck surface has to be perfectly levelled. Special attention should be paid to sloping planes decks by smoothing down and levelling them with finishing mortar.

## ROOF TILE INSTALLATION

Start placing the roof tiles at the left bottom corner of the deck. First the LEFT EDGE (19, 22 or 26) is placed and then all the tiles of the eave line; to guide the placing use a set square, and draw perpendiculars from the ridge line.

Then the tiles are placed from bottom to top and from left to right, checking that the roof tiles are correctly aligned. End in the right side with the RIGHT EDGE (20, 21 or 27) and the HALF TB-12® ROOF TILE (9) or the TILE AND A HALF TB-12® (5).

The use of the TILE AND A HALF TB-12® and HALF TB-12® ROOF TILE (2) enables us to avoid the need of the longitudinal cut of the roof tile. When the dimensions of the deck require it, the 2/3 TILE AND A HALF TB-12® ROOF TILE (7) shall be used.

The CURVED edges (19 and 20), BARDELIS EDGES (22 and 23) or STRAIGHT EDGES (25 and 26) protect the side wall plaster from dampness, providing the vertexes of the deck with an efficient protection, as well as giving a more aesthetic finishing.

The ridge line and hip line must be completed with ridges accessories (28, 29, 30, 31; see page 128 for accessories) and UNIVERSAL UNDER RIDGE (31), in order to guarantee better covering\*. At the end of the ridge line, the UNIVERSAL CURVED END CAP (21), TB-12® BARDELIS END CAP (24) or UNIVERSAL STRAIGHT END CAP (27) shall be placed and SENSE CHANGEMENT (29), 3 WAYS (32) or 4 WAYS pieces are used when needed. At the starting position of the hip line, the HIP STARTER (30) is placed.

\*Like a solution for the ridge line, depending on the finishings available, those accessories can be used: ridges accessories (28, 29, 30 and 32, or see page nº 136 for accessories), UNDER RIDGE TB-12® (2), 2/3 UNDER RIDGE TB-12® (4) TILE AND A HALF UNDER RIDGE TB-12® (6) and 2/3 TILE AND A HALF TB-12® (8).

When the eave line is solved with Decocurva® pieces (13 and 14), these have to be placed according to the specific installation details for TB-12® roof tile, or in general, according to the recommendations from Installation guide, page 174.

For this format TB-12® accessories to fix solar energy panels over the roofs are available. See page 138-139 for more information.

## FIXING

- WITH BATTENS (This is the recommended type of installation):

Wood, metal or PVC battens can be used. Place them perpendicular to the maximum pitch line, spacing each piece every 2 meters to allow the ventilation through the underside part of the tiles, ensuring a minimum air passing thru of 30 mm.

Keep in mind that in order to fix of the edges, the counter battens are prepared parallel with the maximum pitches line and perpendicular to the eave line.

To fix the ceramic pieces use nails or self drilling screws made of tempered and galvanized steel and washers for fixing them with a hammer or gun, or polyurethane foam or paste specially designed for fixing tiles. Finally, seal all holes\*.

- WITH MORTAR:

Use the minimum quantity of mortar necessary to fix the ceramic pieces, and always do so in a way that allows the correct ventilation of all of the roofing pieces. We recommend the use of mortars (preferably waterproof) with a 1:2:10 ratio dosage; that is, for every m<sup>3</sup> of dry sand, use 200 kg of hydraulic lime and 100 kg of cement.

\* According to TEJAS BORJA's specifications

## VENTILATION

The underside part of the tiles must be suitably ventilated to guarantee the adequate conservation of the covering, to prevent the formation of condensations and to prevent the ceramic pieces getting to the degree of saturation, issues that cause serious problems, especially in climatic zones with a high risk of frosts, throughout time.

Always provide an air entrance, an under tile air flow for the entire surface and an air exit on the highest part of the roof, usually to the ridgeline and hip line (on each face of the deck).

The air entrance is done on the eave line, without closing it off with mortar, using the plastic bird barrier or the TB-12® EAVE CLOSURE (12). The same goes for the valleys, if there are any.

The air flow over the entire roof it is obtained placing 1 TB-12® VENTILATION ROOF TILE for every 5 m<sup>2</sup>, for a continuous deck (fixing with mortar) and 1 tile for every 10 m<sup>2</sup> for discontinuous deck (fixing with battens). Minimum 4 ventilation tiles are needed, two in the lower part of the roof and two in the upper part.

The air exit through the ridge line and hip line; be sure not to close these off with mortar, while placing RIDGES (28) (see page nº page 128 for accessories) and under ridges (31). Use VENTILATED ENCLOSURES FOR RIDGE LINE

To prevent the obstruction of air flow throughout the entire roof, use the minimum amount of mortar to fix the ceramic pieces (attaching with mortar), or interrupt the placement of the laths at two meter intervals (dry fixing) ensuring so the minimum air flow under tile of 30 mm.

See more information in page 176.

## PITCH

Depending of the length of the deck and the geographical area or the place where it's situated (depending of wind, rain, altitude, nearness to the sea, etc.)

PITCH PANNEL (according to the roof length and geographical area)

	up to 6,5m.	from 6,5 to 9,5m.	from 9,5 to 12m.
Protected place	30%	33%	35%
Normal place	33%	36%	40%
Exposed place	40%	43%	50%

Para longitudes de faldón superior a 12 m., consultar.

## LONG ROOF SURFACES

For roof lengths greater than 12 m, an intermediary gutter shall be used or waterproof the entire roof surface\*.



## MAINTENANCE

For a full conservation of the roof we recommend a regular inspection of it, removing moss, lichen, plants or any strange body that impedes the proper functioning of the roof.

**TEJAS BORJAS' products are in agreement with the EU regulations, conforming to our certificates and documentation published in our catalogue and our website.**

**The method of roof tile placement is the responsibility of the installer. It should follow TEJAS BORJA's technical specifications.**