

# BORJATHERM®

Thermal insulated roofing **SYSTEM**



  
**TEJAS BORJA**  
Unique since 1899



## VENTILATED, LIGHTWEIGHT AND INSULATED ROOF

The brand new Tejas Borja **SARKING SYSTEM** is a complete solution for external insulated pitched roofs, designed for use both in repairing and refurbishing roofs on old buildings or creating new projects.

**BORJATHERM** panels are light-weight and easy handling, although to very easy to install. These panels make unnecessary most of the products which used to be essential for the construction of a ventilated roof because the panel itself, installed directly onto the rafters, beams or inclined slabs, performs all the functions of these products in one.

The **BORJATHERM** insulated panels are made of a central core of polyurethane foam (a material with high-performance insulating properties), surrounded by a protective layer of aluminium foil and finished with an integrated Alu-Zinc batten to enable the fixing of the roof tiles.

As they are installed onto the existing roof structure, the panels form an unbroken external layer of insulation, completely free of thermal bridges.

This system proves the existence of long-lasting insulation which is quick and easy to install, and which provides maximum energy efficiency to the roof, offering significant financial savings compared to other roof insulation systems.



# 6 functions in one unique roof system

- 1 Flat supporting structure
- 2 Vapour barrier
- 3 Thermal insulation layer
- 4 Waterproof membrane
- 5 Counter battens
- 6 Tile Fixing battens

## The advantages



Maximum Insulation without thermal bridges.



Quick and easy to install.



More economical than other systems.



Optimal roof waterproofing.



Insulation without losing space.



Excellent roof ventilation.





## BEST INSULATION VALUE

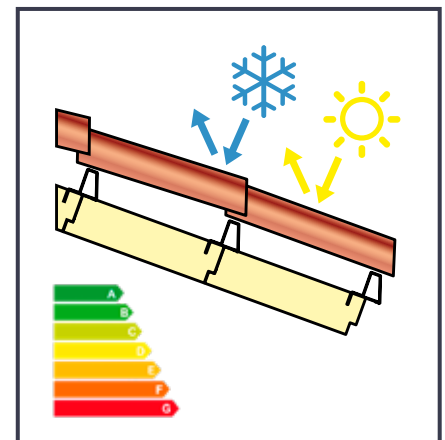
Polyurethane foam is a solid and uniform material with a high insulating capacity thanks to its low thermal conductivity:  $\lambda = 0,022 \text{ W/m}\cdot\text{K}$

BORJATHERM is made of Polyurethane foam coated with aluminium because it is one of the best insulating materials in the building industry and guarantees the best thermal performance possible, along with being extremely light-weight, long lasting and thermally constant (-50/+100°C), which makes it ideal for use under roof tiles:

Insulating material	<b>BORJATHERM</b>	POLYSTYRENE XPS	MINERAL WOOL	WOOD FIBRE
Thermal conductivity $\lambda$	<b>0,022</b>	0,034	0,04	0,048

The following comparative table shows the thicknesses of different insulating materials required to obtain an insulation value of  $R = 5,45 \text{ m}^2\text{K/W}$

Insulating material	Required thickness
<b>BORJATHERM coated polyurethane</b>	<b>12 cm</b>
Non-coated polyurethane	15 cm
Extruded or expanded polystyrene	20 cm
Mineral wool	21 cm
Natural cork	24 cm
Wood fibre wool	26 cm



Thermal values obtained for each available thickness of BORJATHERM panels:

Thickness	60 mm	80 mm	100 mm	120 mm	140 mm	160 mm
<b>Heat resistance</b> $R \text{ (m}^2 \cdot \text{K / W)}$	2,72	3,63	4,54	5,45	6,30	7,20
<b>U</b> ( $\text{W / m}^2 \cdot \text{K}$ )	0,37	0,27	0,22	0,18	0,16	0,14

In addition to outstanding performance in cold climates, BORJATHERM is also an excellent warm climate insulation system thanks to the 41mm high ventilated batten, provided by the panels.

Polyurethane foam PUR is a closed-cell insulation material which means it absorbs minimal amounts of water. This promotes hygiene and guarantees long-lasting insulation as it is not affected by moisture.

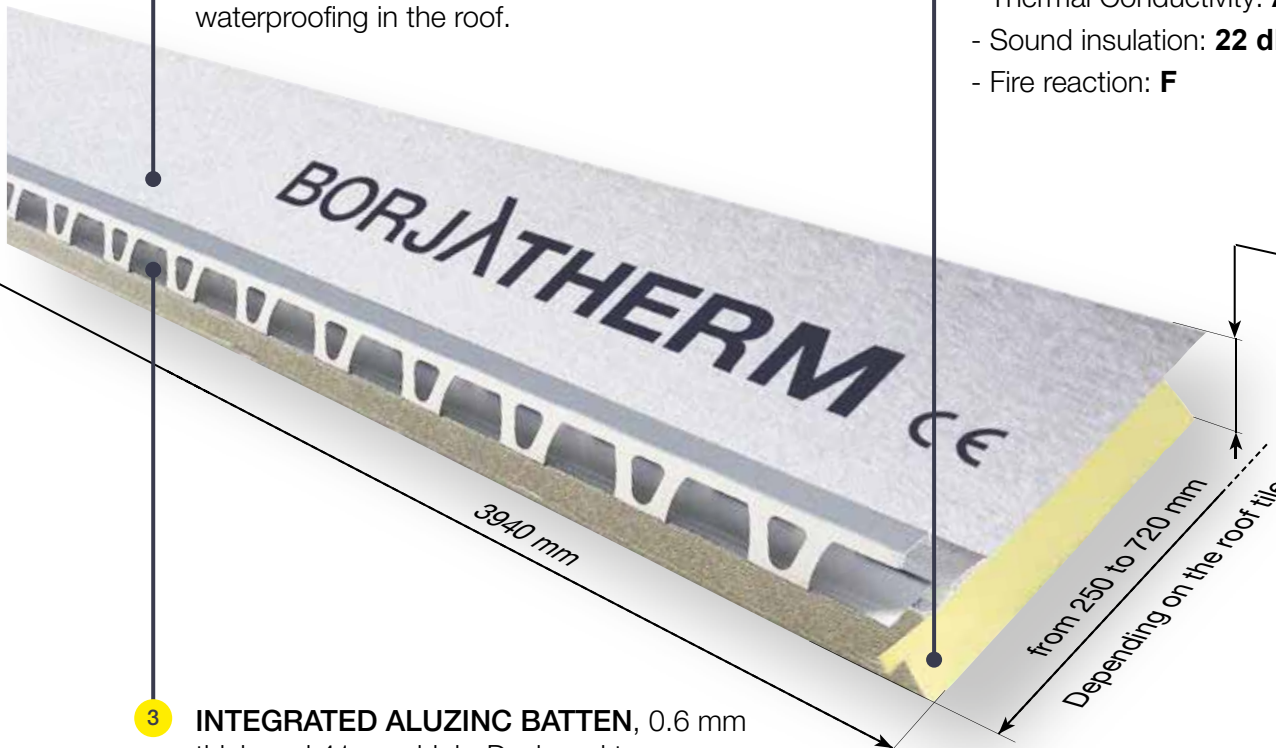
# Technical parameters

**1 EMBOSSED ALUMINIUM** Foil protecting the four faces of the panels. Its purpose is to protect the insulating material, form a vapour barrier and provide an additional layer of waterproofing in the roof.

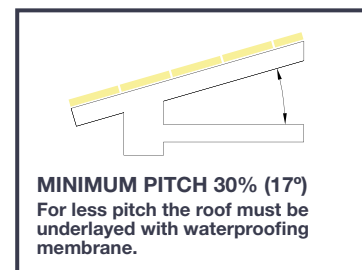
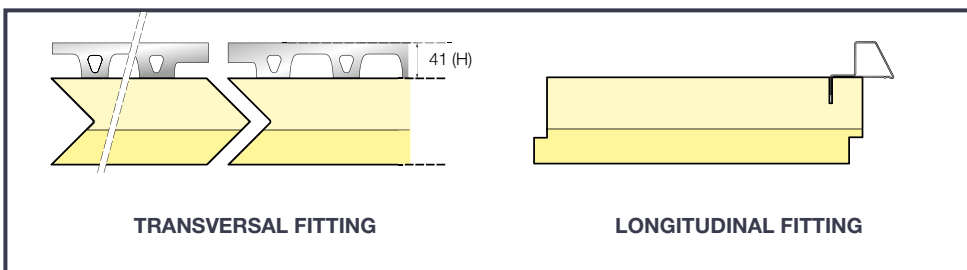
**2 THERMAL INSULATION** made from rigid expanded polyurethane:

- Density: **39 kg/m<sup>3</sup>**
- Thermal Conductivity:  **$\lambda=0,022 \text{ W/m}\cdot\text{K}$**
- Sound insulation: **22 dB**
- Fire reaction: **F**

Available Thicknesses  
60 - 80  
100 - 120  
140 - 160



**3 INTEGRATED ALUZINC BATTEN**, 0.6 mm thick and 41 mm high. Designed to ensure the tiles are fixed correctly and to create a roof ventilation greater than 200 cm<sup>2</sup> per meter thanks to the wide perforations in the profile.



Bending strength/breaking load depending on the thickness of the panel and the distance between supports:

Panel Thickness	Support spacing 600 mm	Support spacing 800 mm	Support spacing 1.100 mm	Support spacing 1.300 mm
60 mm	278 kg	245 kg	167 kg	152 kg
80 mm	331 kg	298 kg	187 kg	168 kg
100 mm	515 kg	384 kg	302 kg	282 kg
120 mm	559 kg	500 kg	346 kg	300 kg



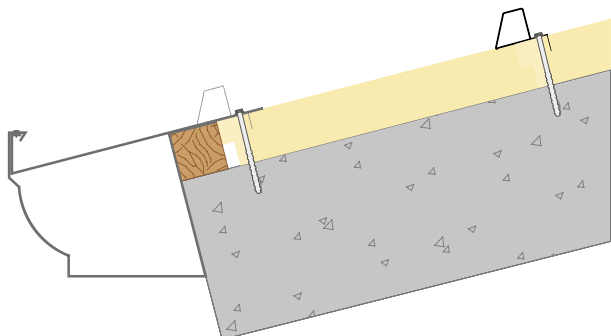
## INSTALLATION INSTRUCTIONS



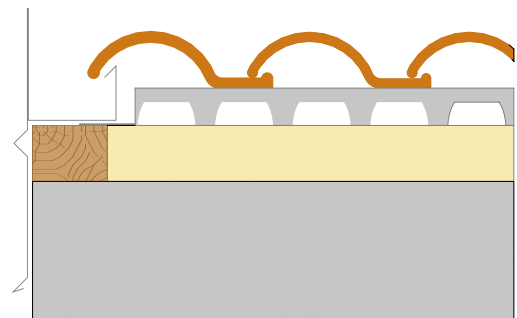
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### 1 Start of the slope and guttering

The first step is to fix a wood batten to the supporting structure in line with the eaves. This batten will act as a starting point for the installation of the thermal panels. The height of the starter batten must be the same as the thickness of the BORJATHERM panels. If a rainwater gutter needs to be installed, this will also be fixed to the starter batten.



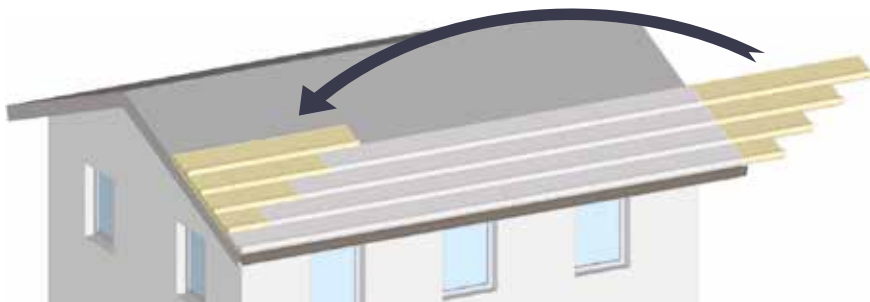
Battens will also be installed on the edges of the roof slopes to fix the roof edge pieces and protect the panels. A line of Tejas Borja PU Foam will be applied between the edge battens and the panels to avoid thermal bridges.



## 2 Installation of BORJATHERM panels

The panels are installed in horizontal rows from left to right, starting at the eaves and working up towards the ridge. Each panel slots laterally into the one next to it and the surplus parts of each row are installed at the start of the next row.

The first panel installed in line with the eaves must not be as wide as the rest of the panels to provide an overhang for the first row of tiles. This can be achieved by installing a panel with less width (eaves panel) or by cutting the panel to the desired width in situ.



When cutting panels, a circular saw should be used to cut the Aluzinc profile and a handsaw to cut the polyurethane panel.



## 3 Fixing

Once in position, each panel must be fixed to the roof support structure in accordance with these instructions:

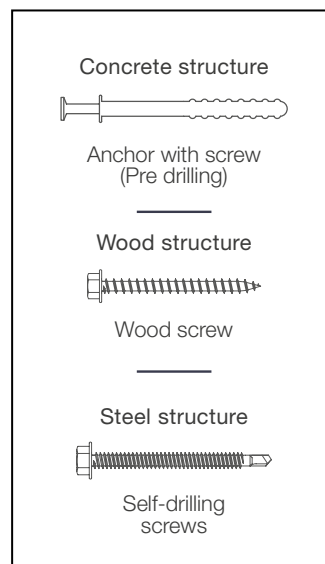
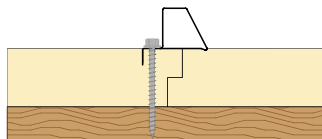
**At least one fixing per linear metre.**

**The fixing must always be applied to the back side of the integrated Aluzinc profile.**

**The fastener must penetrate the supporting structure by at least 4 cm.**



Depending on the type of roof structure, different types of fixings are used:

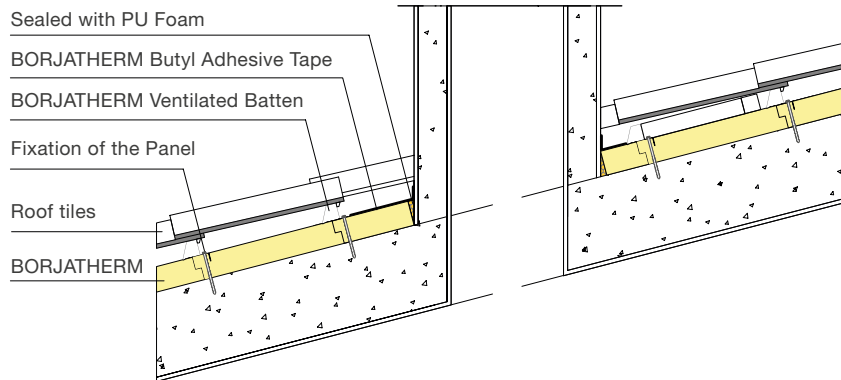


Before the panels are adjusted, the lateral joints between them are sealed using a continuous line of MS Polymer Sealant Adhesive or Tejas Borja Polyurethane Putty. Once the panel has been sealed and positioned, the joint is waterproofed using a piece of BORJATHERM Butyl Adhesive Tape.



## 4 Waterproofing

The joint between the top of both BORJATHERM panels should be filled up with PU Foam to avoid thermal bridges. Afterwards the joint should be taped with the BORJATHERM adhesive butyl band.



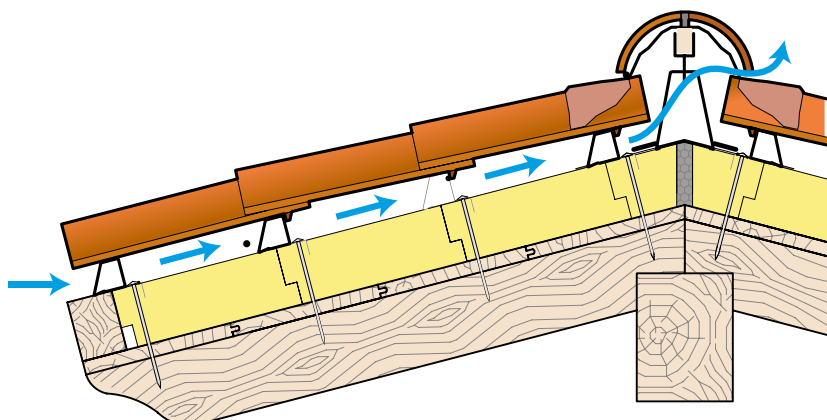
When the joints between panels occur at a valley or hip, the procedure is the same as when dealing with protruding features: first the panels are adjusted to fit as closely as possible, then the joint is filled with PU Foam and sealed with Butyl Adhesive Tape.

To fix features and tiles at joints in valleys and on hips, a BORJATHERM ventilated batten is installed diagonally on both sides.

## 5 Ventilated Ridge

If the panels are not the same length as the roof slope, they must be cut in line with the ridge so they fit the upper part of the ridge as closely as possible. BORJATHERM ventilated extra battens will be installed on the ridge of both roof slopes to support and fix the last row of tiles and the Ridge batten support.

The necessary elements for the ventilated ridge will be installed on these battens: adjustable batten support, 40x30 ridge batten, rigid or rolled under-ridge tape and the correctly fixed ridge tiles.





## 6 Eaves and tile fitting

The eaves filler combs are fixed to the BORJATHERM starter batten to elevate the ends of the first row of tiles.

The tiles are positioned so their nibs rest on the profiles of each row of panels. The method of fixing the tiles will be determined by the local climate and the slope of the roof, making sure that tiles and special pieces on the edge of each slope are always properly fixed in place.

Acceptable fixing methods are mechanical, using the correct screws or with special tile adhesives.



The following table shows the appropriate panel for each type of tile:

Roof tile model	Panel Width
TB-12®	370 mm
TB-4®	370 mm
FLAT-10 Tech *	370 mm
ALICANTINA-12	370 mm
FLAT-5XL® *	370 mm
STEP Celler® 50/45	370 mm
TB-10 Tech *	390 mm
TECHNICA-10 *	390 mm

\* These tiles are available with variable batten spacing. Consequently they can also be installed with panels of other widths. BORJATHERM panels can be made with widths from 25 to 72 cm. Ask our technical-sales team for more information. Standard eaves panels are 28cm wide.





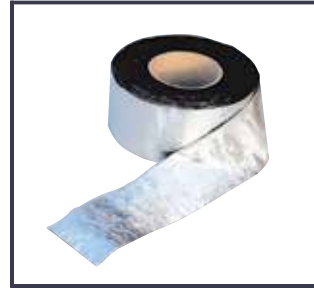
## ROOF COMPONENTS



PU Foam for Roof tiles  
(Gun application)



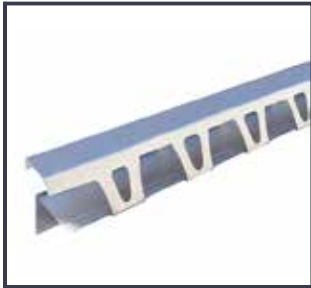
MS Adhesive and Sealant



Butyl adhesive band  
BORJATHERM



Eave Comb With Batten



Ventilated BORJATHERM  
Extra Batten



Fixing Screws (type and  
length depending on the  
project)



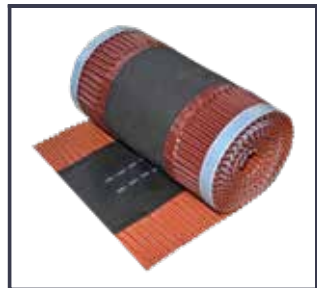
Waterproofing and  
Breathable Membrane



Roof Battens  
(Various thickness)



Ridge Batten Adjustable  
Support



Ridge Ventilating Element  
(Rolls or Metal)



PREMIUM Flashing Band  
300



Flashing band fixing  
profile



# Price List

BORJATHERM PANELS (3.980 MM LENGHT) *	PVP	ROOF COMPONENTS **	PVP
BORJATHERM PANEL 60	57,14 €/sq. m.	BUTYL ADHESIVE BAND BORJATHERM 100 MM	1,79 €/lm
BORJATHERM PANEL 80	67,14 €/sq. m.	PU FOAM FOR ROOF TILES (GUN APPLICATION) 750 LM	6,88 €/unit
BORJATHERM PANEL 100	77,00 €/sq. m.	MS ADHESIVE AND SEALANT 600 LM	10,15 €/unit
BORJATHERM PANEL 120	Ask for price	VENTILATED BORJATHERM EXTRA BATTEN	6,14 €/lm
BORJATHERM PANEL 140	Ask for price	RIDGE BATTEN ADJUSTABLE SUPPORT	1,22 €/unit
BORJATHERM PANEL 160	Ask for price	UNDER RIDGE MIXED ROLL TAPE	5,40 €/lm
EAVE PANEL 60	Ask for price	UNDER RIDGE ALU ROLL TAPE	5,50 €/lm
EAVE PANEL 80	Ask for price	RIDGE VENTILATION METAL CAP RED	18,34 €/lm
EAVE PANEL 100	Ask for price	STARTER WOOD BATTEN 60	Consultar
		STARTER WOOD BATTEN 80	Consultar
		STARTER WOOD BATTEN 100	Consultar
		VENTILATION COMB 100	1,03 €/lm
		EAVE COMB WITH BATTEN	1,35 €/lm
		WATERPROOF BREATHABLE MEMBRANE 130	1,33 €/sq. m.
		PREMIUM FLASHING BAND 300	18,20 €/lm
		FLASHING BAND FIXING PROFILE	5,11 €/lm

\* Available for TB-12®, TB-10 Tech, TB-4®, FLAT-10 Tech, FLAT-5XL®, ALICANTINA-12, TECHNICA-10, C-50.21 STEP CELLER.

FIXING	PVP
FRAME FIXING FOR CONCRETE 100 MM	Ask for price
FRAME FIXING FOR CONCRETE 120 MM	Ask for price
FRAME FIXING FOR CONCRETE 140 MM	Ask for price
WOOD SCREW 100 MM	Ask for price
WOOD SCREW 120 MM	Ask for price
WOOD SCREW 140 MM	Ask for price
ROOF TILE FIXING SCREW 50 MM	Ask for price

\*\* All the roof components, colors and measures available should be checked in the current Tejas Borja price list.

In case of different width of Borjatherm panels ask for delivery time.  
For other type of fixing ask availability.  
Returns of Borjatherm panels won't be accepted once the material is sent to its destination.



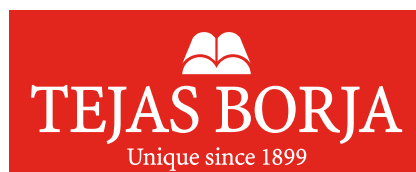


RAISE  
the Roof  
A century around tiles

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