



Ventilated Cool Roofs

**Roof systems for sustainable roofing
and improved living comfort**

What is a Cool Roof?

A Cool Roof system minimises solar heat gain keeping roof surfaces cooler under the sun. This is due to the materials used, which both reflect the solar radiation (solar reflectance) and release the absorbed heat (infrared emittance).

A Cool Roofing product is characterised by higher solar reflectance in comparison to conventional roof materials of the same colour.

BMI is member of ECRC (European Cool Roof Council, www.coolroofcouncil.eu).

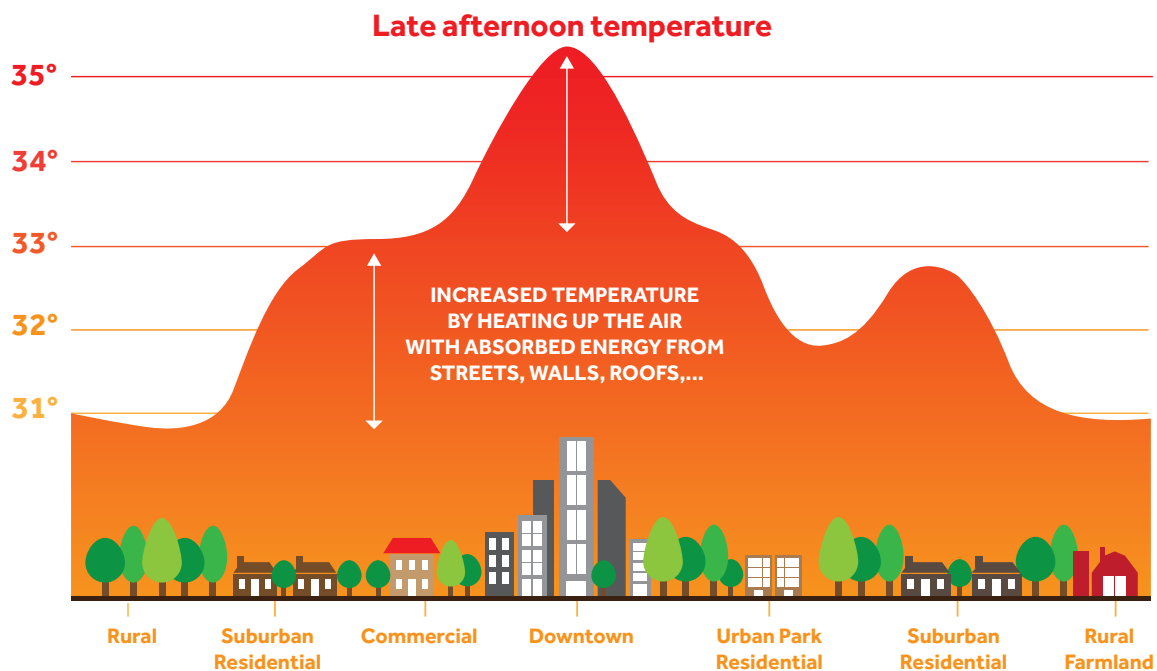


Why is solar reflectivity important?

Most of the sun's energy goes through the atmosphere without warming up the air and arrives on the surface of the earth (a part is reflected and absorbed by clouds and greenhouse gas molecules).

- Some energy is reflected away with no effect on the surface temperature of soil, streets, roofs, ...
- The remaining energy is absorbed in the material. (e.g. roof tiles).
- The hot roof tiles radiate heat into the building as well as they heat up the air above the roof. The same effect happens over streets and other dark surfaces ("Urban Heat Island" effect).

The "Urban Heat Island" effect in brief:



Cool Roofs provide several benefits:

1. Improved summer comfort
 - Less heat in the living space under the roof
 - Less need of AirCon energy to cool down the living space
2. Reduced Heat Island effect with better climate in the city
3. Reduced global warming by CO₂ equivalent savings

How do we measure the reflectivity?

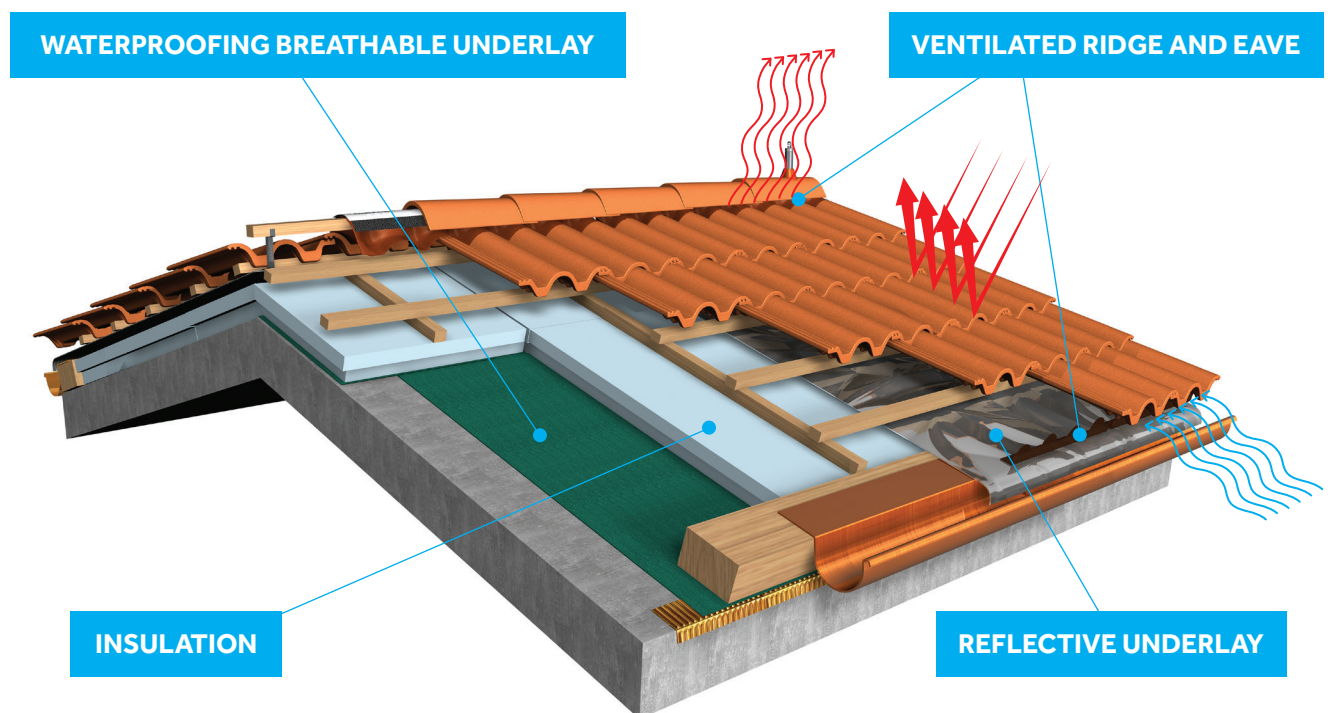
The reflectivity of a material is measured by the SRI or TSR values.

The Solar Reflectance Index (SRI) or Total Solar Reflectivity (TSR) is the capability of a material to reflect solar energy from the surface of material. The value of the solar reflectance index varies from 0 to 100. The higher the value the more sunlight is reflected.

Light coloured roof tiles have a higher solar reflectivity than dark tiles.

The BMI Cool Roof System

The BMI Cool Roof System combines the benefits of reflectivity and ventilation and enhances the performance of the roof



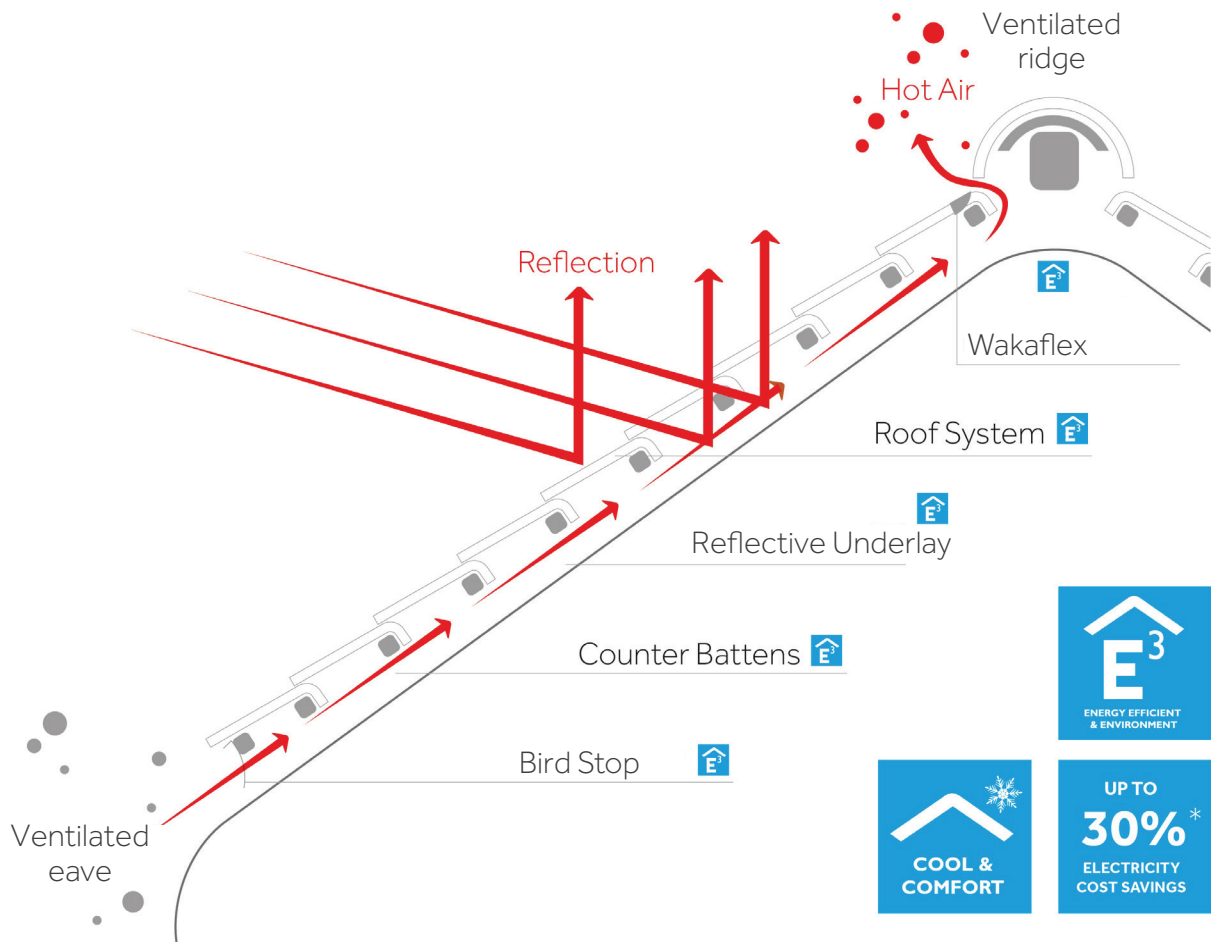
Why is ventilation important?

Roof ventilation is essential for many reasons:

- it helps to prevent humidity that can wet insulation and affect its efficiency.
- it helps to prevent ice build-up and ice damming at the eaves.
- it reduces the algae and moss growth on the cladding due to better drying of the roof tiles.
- it keeps upper floor rooms comfortable and cool during hot summer months.
- it helps to get rid of moisture and discharges steam, water vapour and penetrated rainwater.

The use of mortar for the ridge, hip and eave prevents the continuous ventilation of the space under the tiles and deteriorates the performance of the roof. Dry fix solutions give a traditional appearance to the ridge whilst combining the security and weather-tightness of mechanically fixed ridge tiles.

Case study Malaysia



The building

The BMI Monier CoolRoof system **reduces the living space temperature of Malaysian homes up to 10°C** compared to the conventional roofs often installed on residential buildings in Malaysia.

The material and solution

The BMI Monier CoolRoof System keeps indoor building temperatures 10°C cooler through natural airflow and heat transfers, even through the most tropical of weather. The complete solution comprises of a ventilated eave, counter battens and a radiant surface barrier that reflects up to 97% of infrared rays.

The result

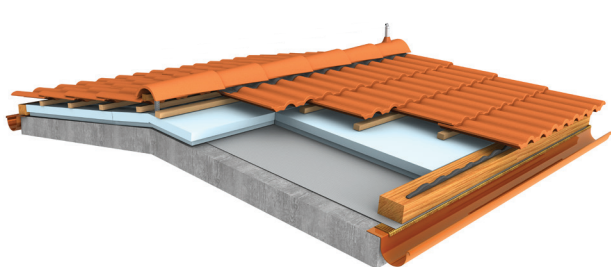
The system fits entirely under tiles, keeping their neat aesthetic, but also gives you a total protection against tropical weather.

- Cooler home and cost savings
- Reduce up to 60% of air conditioning usage (*)
- Reduce up to 30% of electricity bills (*)
- Less than 2 years payback period

(*) BMI Monier Technical Centre validated the data in Europe for tropical weather, in collaboration with Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory, USA.

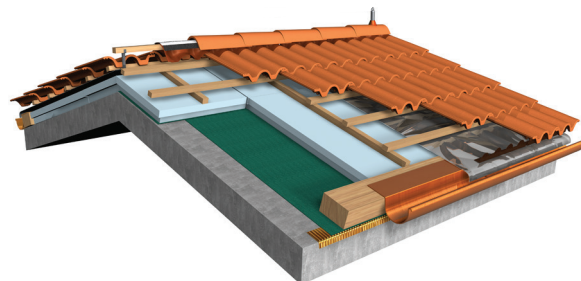
Case study Italy

BMI simulated the behaviour of two roofs to demonstrate the benefits of a Ventilated Cool Roof vs a traditional non-ventilated roof. Simulations were developed using the MRPS (BMI Monier Roof Physics Software).



Traditional construction (non ventilated mortared, non-reflective roof)

- Medium-profile clay tiles, SRI 30%
- Battenspace with 30mm battens
- Mortared (unventilated) eaves and ridge
- No reflective underlay
- 100mm EPS insulation
- Vapour Control Layer
- 200mm concrete deck
- Living space



Ventilated Cool Roof construction (ventilated, reflective roof)

- Medium-profile clay tiles, SRI 15% & SRI 35%
- Increased height batten space with counter-battens
- Ventilated eaves and ridge
- Reflective underlay
- 100mm EPS insulation
- Vapour Control Layer
- 200mm concrete deck
- Living space

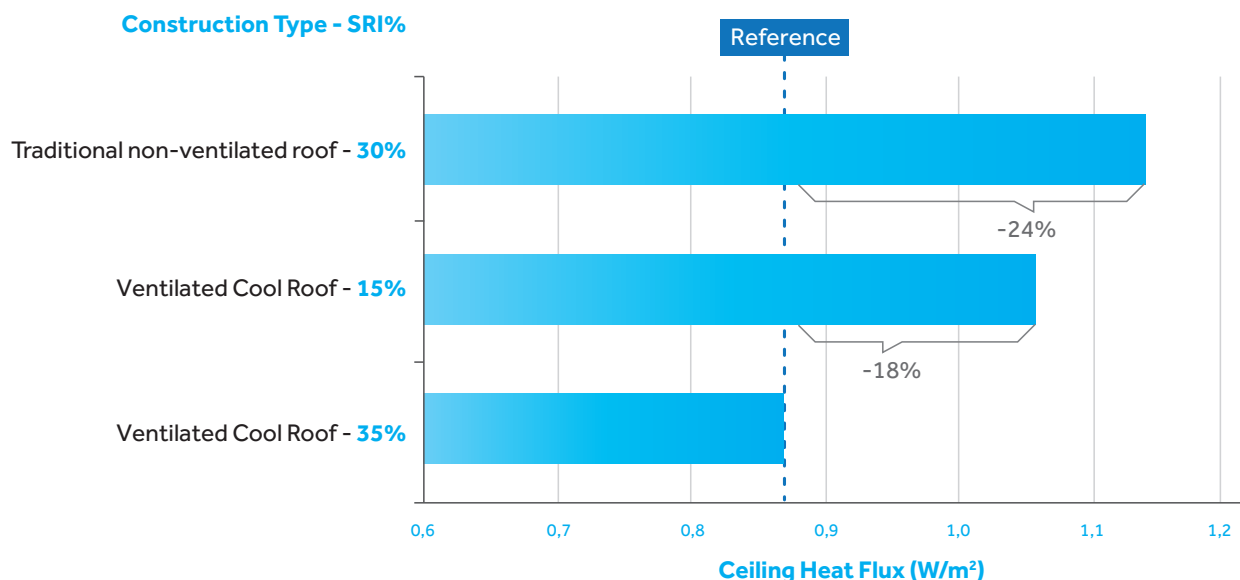
Results

The energy requirement to maintain the internal temperature at 22.5°C is significantly lower for a ventilated Cool Roof compared to a non ventilated roof.

Simulations show that a **Ventilated Cool Roof with SRI=35%** requires:

- **24% less energy** than a non ventilated roof with similar SRI (30%)
- **18% less energy** than a ventilated cool roof with lower SRI (15%)

Cooling energy required to keep the internal temperature at 22.5°C



Roofing Components

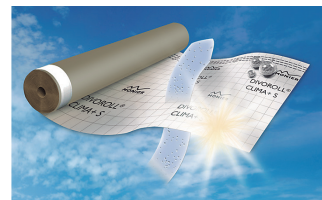
Waterproofing underlays

DIVOROLL CLIMA+S

Breathable and reflective underlay

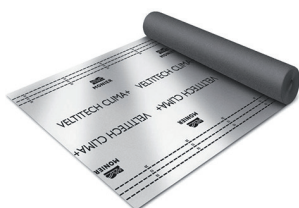


Waterproof and breathable 4 layers underlay, with a metallized polypropylene (MPP) finish, reflecting up to 80% of radiated heat. Reduces heat input by 21%, allowing a decrease in indoor temperature (measured on the roof) of 3 °C. It has a self-adhesive tape on one of the longitudinal zones of the roll, for a proper fit and overlap. It is durable and easy to install and can effectively contribute to energy saving and comfort.

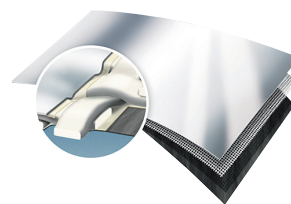


VELTITECH CLIMA+

Reflective vapour barrier



Waterproof, reflective vapour underlay with 3 layers and metallized polypropylene (MPP) finish, reflecting up to 55% of the heat.



ADHESIVE TAPE FOR UNDERLAY



Adhesive tape used for sealing and bonding waterproof film undertiles. Has a reinforced, UV-resistant surface with good ductility and high adhesion thanks to its Firestone joints. Highly resistant to moisture and frost attacks.

SEALROLL

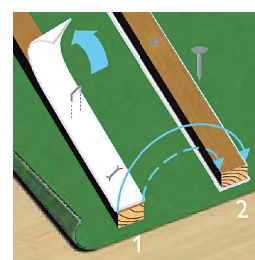


Adhesive tape

Dimensions

0.05 x 30 m

Adhesive	Acrylate (UV-resistant)
Dimensions	0.06 x 25 m
Mass (adhesive weight)	200 gr/m ²
Thickness	0.27 mm
Resistance to temperature	From - 40 C° to 80 C°
Resistance to fire	Class E



Ventilation

METALROLL®

Ventilated ridge



Made of highly resistant, high-performance materials, Metalroll® is the most suitable ventilated ridge for the roofer's needs.

TECHNICAL DATA

Length	5 ml/roll
Width	26 to 32 or 32 to 38 cm
Extensibility	50%
Ventilation	110 to 240 cm²/ml

- 1** - Reinforcement for nailing.
- 2** - Adjustable widths even in tiles with a higher profile.
- 3** - Ample protected ventilation area with solid felt.
- 4** - Unique CrepTec technology with a stretching ratio of 40% to 50%
- 5** - Extremely robust material with good grip for fast installation.
- 6** - High adherence through butyl tested strip.
- 7** - Protection strip with silicone.

FIGAROLL® PLUS

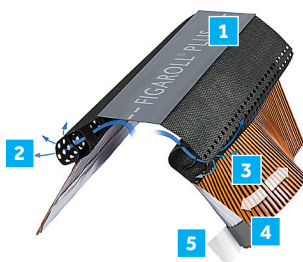
Ventilated ridge



Side skirting of aluminium, deformable and mouldable up to 50%, with a central section of waterproof polypropylene, double ventilation channel and geometric openings system for optimal ventilation (150 cm²/ml) and total protection against external elements.

TECHNICAL DATA

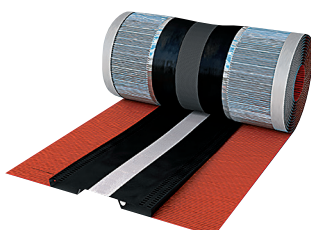
Length	5 ml/roll
Width	28 to 32 - 24 to 38 cm
Extensibility	50%
Ventilation	> 150 cm²/ml



- 1** - Reinforcement for nailing.
- 2** - Ample protected ventilation area with water-repellent polypropylene.
- 3** - Folded aluminium with stretchability of approx. 50%
- 4** - High adherence through butyl tested strip.
- 5** - Protection strip with silicone.

RAPIDROLL 390

Ventilated ridge



- Stretchable side strip (up to 40%) and variable product width 37-39 cm
- One-channel technology to provide optimal roof ventilation and protection against intrusion of driving rain
- Drain holes to drain condensed water or collected rain out of the channel
- Robust full Alu-body for high durability

TECHNICAL DATA

Length	5 ml/roll
Width	37 to 39 cm
Extensibility	40%
Ventilation	130 cm²/ml
Colours	Red - Brown - Anthracite grey
Packaging	5 rolls/box

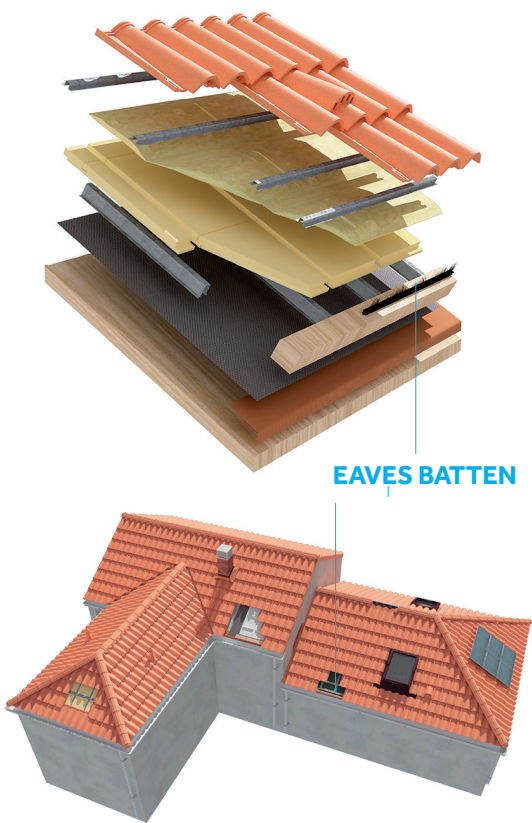
VENTILATED EAVE

Eaves batten are designed to ventilate and prevent entry by animals (e.g. birds or mice) in the eaves area.
The ventilation area depends on the tile profile used and, on the height the eaves batten.

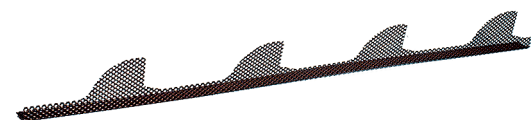


TECHNICAL DATA

Material	HDPE
Colours	Black, Red
Length	1 000 mm
Comb Height	77 mm (Black and Red) - 120 mm (Red)
Packaging	30 pieces/box
Ventilation	Max. 300 cm²/m (depending on the profile of the tile)
Process	Moulding by injection



VENTILATED EAVE



METALVENT TECHNICAL DATA

Material	Metal
Tiles	Coppo Domus
Colours	Brown
Dimensions	Coppo Domus: 91.2 cm 88 cm
Ventilation section	Coppo Domus: 450 cm²/m 380 cm²/m
Packaging	30 pieces/box

INSTALLATION



Abutment

WAKAFLEX



- All Wall abutments and Upstands
- Chimneys - for chasing into brickwork
- Pipe Flashings
- Easy to apply over deeply profiled tiles & around corners
- Large range of colours

TECHNICAL DATA

Width	180, 280, 370, 560 mm
Length	5 or 10 m/roll
Colours	Red, brown, anthracite grey
Stability	50% roll longitudinal, ≥ 15% transverse to the roll
Composition	Butyl rubber structure, aluminium mesh, butyl adhesive strips and protective paper
Protective paper	Perforated
Temperature range	-40°C to 100°C
Installation temperature	+5°C to 40°C
Physical properties	Watertight, weatherproof and self-fixing



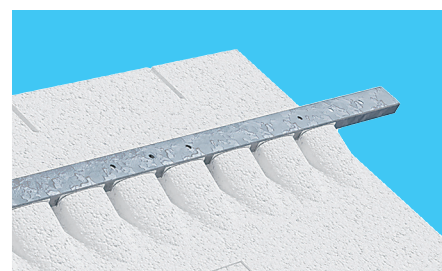
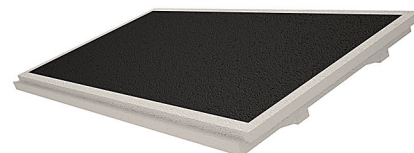
Insulation

CLIMA PRO

Integrated and double density expanded polystyrene panel white ESP with density 30 kg/m² and Neopor EPS with density 15 kg/m²

Suitable for roof insulation, it facilitates the installation of battens and tiles thanks to its preformed design.

PRODUCT	THICKNESS	METAL BATTEN	TILES
CLIMA PRO T-320	60 mm	32 cm	Logica Plana > 37%
	100 mm	32 cm	
CLIMA PRO T-380	60 mm	38 cm	Klinker Virtus
	100 mm	38 cm	
CLIMA PRO T-397	60 mm	39.5 cm	Klinker Hydra Duna, Cazorla, Klinker K2, Klinker Virtus
	100 mm	39.5 cm	



TECTUM PRO

This is the most complete roofing construction system in the world market.

It is formed by BMI roof tiles and special pieces (concrete or clay) and BMI roof components of different families: waterproof-breathable films, insulation, fixing, waterproofing dry ridge, eaves ventilation products and accessories for finishing any single point on the roof.

The most exclusive element of the Technical System for roofing Tectum®- Pro is the preformed Cobert Insulation. It is made of EPS Neopor and EPS white, preformed according to the shape of the bottom face of the tile and with a delimited area for battent fixing, providing high insulation, waterproofing and precision in the installation of concrete or clay tiles.



PRODUCTS	SYSTEM T-320	SYSTEM T-380	SYSTEM T-395
TYPE OF TILE	CONCRETE TILE COBERT Logica Plana with roof slope higher than 37% (rafter length less than 6,5 meters)	Logica Lusa Marselha MG Plus Lusa MG Telhasol Piemontesa Telhasol 12 Klinker K2 (except grafito) Klinker Virtus	Duna Cazorla Klinker Hydra
SPECIALE PIECES	ACCORDING TO EACH MODEL OF CONCRETE TILES	ACCORDING TO EACH MODEL OF CLAY TILES	
UNDERLAYS	ECOTECH 145 DIVOROLL ELITE 200 COBERT HYPER 200 SK DIVOROLL MAXIMUM 200 DIVOTAPE SEALROLL		
INSULATION	COBERT INSULATION T-320	COBERT INSULATION T-380	COBERT INSULATION T-395
METAL BATTEN	METAL BATTEN FOR COBERT INSULATION U 1.900x40x15x0,8mm		



CUSTOMER SERVICE:

contact.export@bmigroup.com