



Technical manual

 **MARCEGAGLIA**  
**BUILDTECH**

# MB COPPO MB COPPO MONO





#### INFORMATIVE NOTE

The technical documentation and suggestions contained in this manual are the best understanding of the company regarding the properties and uses of the products and are intended to support the work of installers and technicians operating in the metal construction sector by providing useful information and suggestions concerning use.

However, given the many possibilities of use and the possibility of interference from external elements, the company assumes no responsibility for possible results. It is the responsibility of the user to ascertain the suitability of the product for the intended use, assuming responsibility for any consequential damage.

The user is also required to know the procedures necessary for the installation of the products, including the preparation of the **safety plans** and the updated requirements of all current regulations, in order to avoid dangerous situations.

The values indicated in **the capacity charts** are the result of practical tests carried out in our laboratories and certification bodies; however, the verification of the same, depending on the application, is the responsibility of the design engineer.

For any further information or clarification, please contact the Marcegaglia Buildtech technical office at the addresses listed on the back.

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Any violations will lead to a criminal prosecution as per art. 646 of the Italian Penal code.

## MB COPPO AND MB COPPO MONO

MB COPPO - Sandwich panels with polyurethane foam insulation and upper support shaped like the traditional coppo roof tile, used for the construction of sloping roofs.

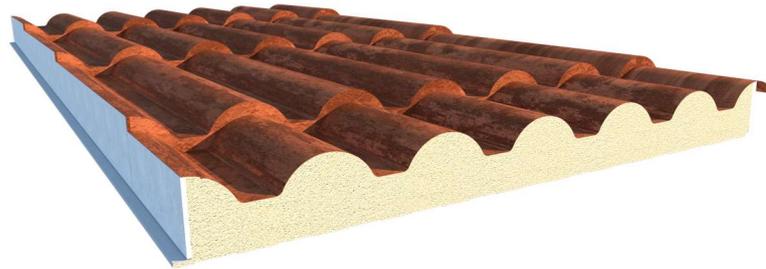
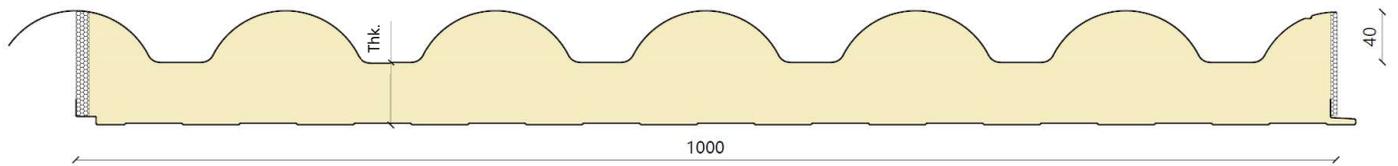
MB COPPO MONO - Single-sheet panels with polyurethane foam insulation and upper support shaped like the traditional coppo roof tile, used for the construction of sloping roofs.

They have a flexible support on the inside and therefore do not guarantee the same aesthetic qualities as MB COPPO panels.

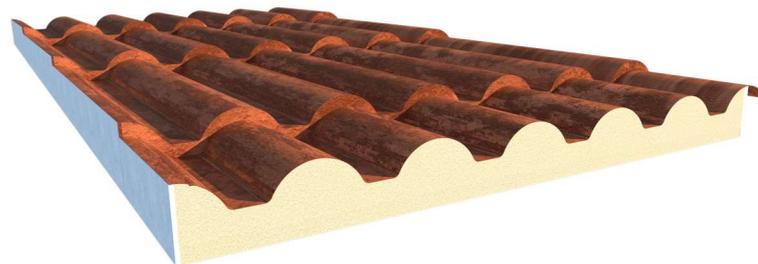
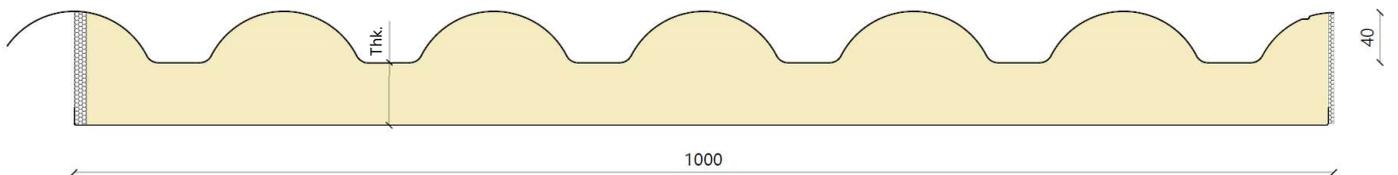
Imperfections related to flatness, undulations and wrinkles are to be considered a normal product feature.

### Product typology

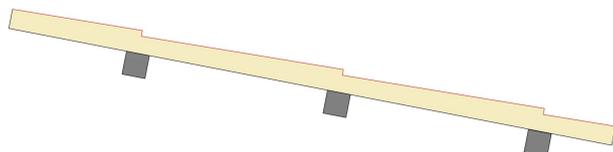
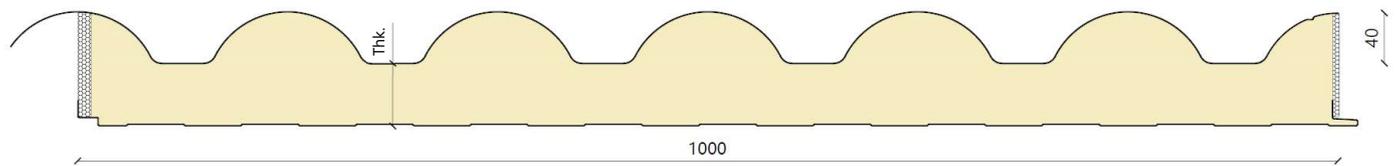
#### MB COPPO - TCP



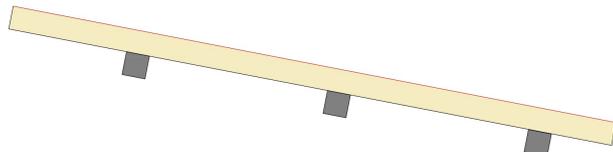
#### MB COPPO MONO with centesimal aluminium facing - TKC



## MB OMEGA - TCO

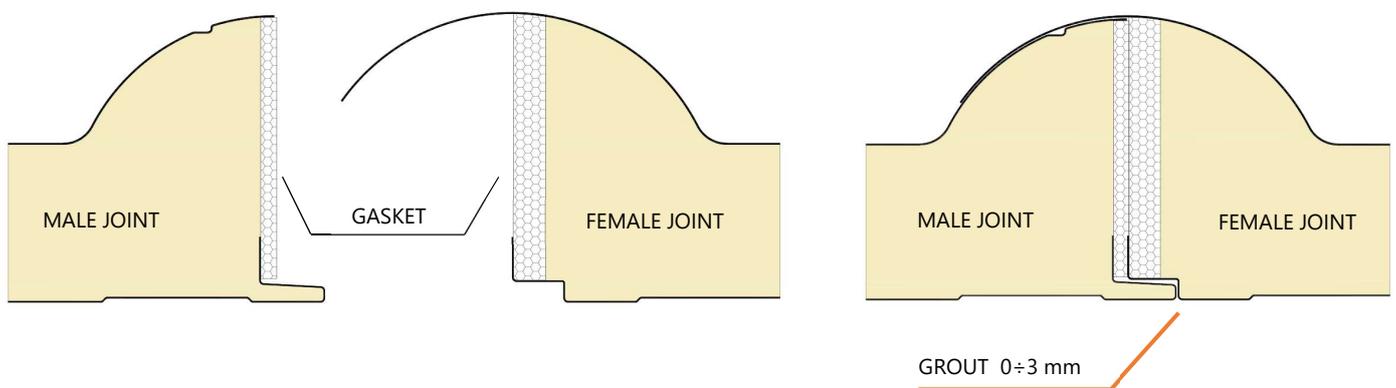


Cross section of the MB COPPO panel that shows the pitch between every "coppo roof tile".



Cross section of the MB OMEGA panel that shows its continuous profile devoid of steps.

## Joint typology



The male-female joint of the MB COPPO panel designed by Marcegaglia Buildtech provides for the use of a fixing system to the metal structure (defined in the design phase) with correctly selected through screws and batz. The gasket inserted during production helps improve the hermeticity of the joint.

## Technical specifications

|                           | TKC  | TCP | TCO |
|---------------------------|--|-----|-----|
| <b>Useful width</b>       | 1000 mm  |     |     |
| <b>Length</b>             | Variable according to the construction needs related to the dimensions of the roofs to be made.<br>Maximum productive length 15 m. Standard transport limits 13.3 m.   |     |     |
| <b>Panel thickness</b>    | 40 / 50 / 100  |     |     |
| <b>Insulation</b>         | CFC and HCFC-free polyurethane formulations are used which produce anisotropic and anti-mould insulating foams with high content of closed cells (>95%). Particularly high-performance fire reaction foams can be used for fire performance requirements.  |     |     |
| Total average density     | 38 kg/m <sup>3</sup> ± 3   |     |     |
| Thermal conductivity λ    | λ = 0,021 W/mK   |     |     |
| <b>Slope of the pitch</b> | <p>The slope applied on building roofing must be <b>greater than or equal to 11% (7°)</b>. Lesser slopes will be permitted only after a technical evaluation by Marcegaglia.</p> <p>An inclination of less than 11% should be avoided to ensure a sufficient rainwater flow to remove debris and dust deposits from the roof. In the presence of protruding parts or transverse joints, it is advisable to increase the slope of the pitch.</p> <p>The correct slope also allows an effective flow of rainwater so as to avoid pooling of water.</p>       |     |     |
| <b>Tolerances</b>         | <p>Panel thickness: ± 2 mm if ≤ 100 mm; ± 2 % if &gt; 100 mm</p> <p>Panel length: ± 5 mm if L ≤ 3 m, ± 10 mm if L &gt; 3 m</p> <p>Panel width (pitch): ± 2 mm</p> <p>Coppo (wave) height: ± 2 mm</p> <p>Pitch between coppo (waves): ± 2 mm</p> <p>Longitudinal deflection: ≤ 0,5% of the length</p> <p>Transversal deflection: ± 10 mm per meter</p> <p>Deviation from straightness: ≤ 1 mm per meter</p> <p>Deviation from flatness: ≤ 1,5 mm per L &gt; 700 mm</p> <p>Deviation from squareness: ± 3 mm</p> <p>Misalignment of the supports: ≤ 3 mm</p> |     |     |
|                           | Slight spills of foam from the joints and any minor faults or irregularities in the position of the gaskets are considered normal.   |     |     |

## Metal supports

Marcegaglia Buildtech provides for the configuration of the panels with the following metal support variants:

**Pre-painted steel**, in accordance with EN 10169 (coil coating) based on EURONORMS:

- for normal production:
  - with MP3 polyester coating
- for special production:
  - with modified MP5 polyester coating
  - with MP10 polyvinylidene coating
  - with MP20 polyurethane / polyamide coating.

**Natural aluminium**, pre-painted EN 485-2, EN 573-3, EN 11396.

## Facings for single sheet panels

Marcegaglia Buildtech foresees the configuration of the panels with the following facing variants:

- **Centesimal aluminium**
- **Bituminous felt paper**

## Protection of the supports

To prevent the pre-painted metal supports from being damaged during production and subsequent movement of the panels, a polyethylene adhesive film is used which must be removed during the installation phase or in any case not later than 60 days from the production of the panels.

Please note that it is highly recommended not to store the panels in a place with prolonged sun exposure.

Marcegaglia Buildtech strongly advises against the request for material without a polyethylene adhesive film and assumes no responsibility for any damage in the event that such a request is submitted.



## Panels weight

MB COPPO - TCP

STEEL

| Supports thk. [mm] | Weight per panel thickness [Kg / m <sup>2</sup> ] |       |       |
|--------------------|---|-------|-------|
|                    | 40  | 50    | 100   |
| 0,5 / 0,4          | 9,40  | 9,80  | 11,70 |
| 0,5 / 0,5          | 10,25   | 10,60 | 12,50 |

ALLUMINIUM AND STEEL

| Supports thk. [mm] | Weight per panel thickness [Kg / m <sup>2</sup> ] |      |       |
|--------------------|---|------|-------|
|                    | 40  | 50   | 100   |
| 0,7 / ,05          | 7,85  | 8,20 | 10,10 |

MB COPPO MONO - TKC

|            | Supports thickness [mm] | Weight per panel thickness [Kg / m <sup>2</sup> ] |      |      |
|------------|-------------------------|---|------|------|
|            |                         | 40  | 50   | 100  |
| Steel      | 0,5                     | 6,25  | 6,65 | 8,55 |
| Alluminium | 0,7                     | 3,90  | 4,30 | 6,20 |



## Static characteristics

The capacity values in the tables below refer to panels subject to a distributed load (width of the supports for the calculation, 100 mm), but they do not take into account the thermal effects that must be considered by the designer. The data in question are therefore indicative and cannot replace the design calculations drawn-up by an expert and qualified technician who must verify and validate these indications taking into account the regulations in force at the place of installation. The number and layout of the fastening systems must be defined by the designer.

For further details and information, please contact the Marcegaglia Buildtech Technical Office.

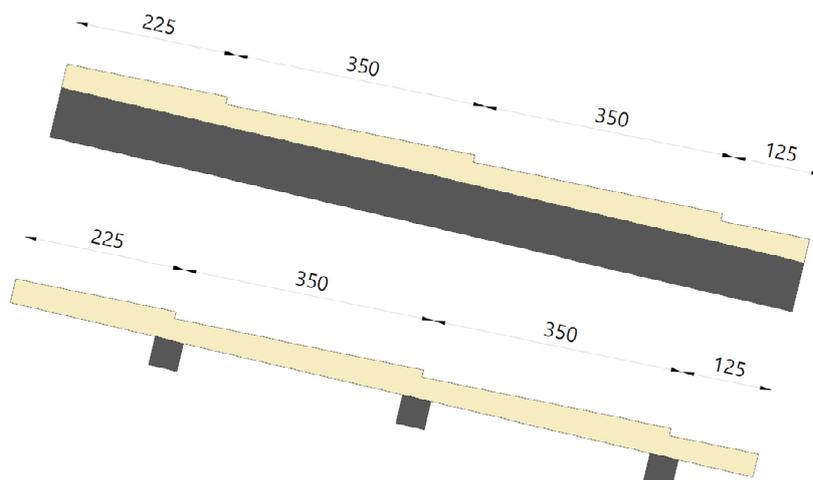
### MB COPPO - TCP

| MB COPPO PANEL <b>STEEL+STEEL</b> |                    |                    |  |      |      |      |      |      |      |
|-----------------------------------|--------------------|--------------------|--|------|------|------|------|------|------|
| Panel thickness                   | U                  | Supports thickness | Uniformly distributed load in kN/m <sup>2</sup> [1/200 span] |      |      |      |      |      |      |
|                                   |                    |                    | MULTIPLE SPAN [m]  |      |      |      |      |      |      |
| mm                                | W/m <sup>2</sup> K | mm                 | 1,05   | 1,40 | 1,75 | 2,10 | 2,45 | 2,80 | 3,15 |
| 40                                | 0,49               | 0,5/0,5            | 3,80   | 2,60 | 1,90 | 1,50 | 1,20 | 0,95 | 0,75 |
|                                   |                    | 0,5/0,4            | 3,61   | 2,47 | 1,81 | 1,43 | 1,14 | 0,90 | 0,71 |
| 50                                | 0,4                | 0,5/0,5            | 6,10   | 4,20 | 3,10 | 2,40 | 1,90 | 1,50 | 1,20 |
|                                   |                    | 0,5/0,4            | 5,80   | 3,99 | 2,95 | 2,28 | 1,81 | 1,43 | 1,14 |
| 100                               | 0,21               | 0,5/0,5            | 8,91   | 6,13 | 4,53 | 3,50 | 2,77 | 2,19 | 1,75 |
|                                   |                    | 0,5/0,4            | 8,46   | 5,83 | 4,30 | 3,33 | 2,64 | 2,08 | 1,66 |

| MB COPPO PANEL <b>ALLUMINIUM+STEEL</b> |                    |                    |  |      |      |      |      |      |      |
|--|--------------------|--------------------|--|------|------|------|------|------|------|
| Panel thickness                        | U                  | Supports thickness | Uniformly distributed load in kN/m <sup>2</sup> [1/200 span] |      |      |      |      |      |      |
|  |                    |                    | MULTIPLE SPAN [m]  |      |      |      |      |      |      |
| mm                                     | W/m <sup>2</sup> K | mm                 | 1,05   | 1,40 | 1,75 | 2,10 | 2,45 | 2,80 | 3,15 |
| 40                                     | 0,35               | 0,7/0,5            | 2,71   | 1,80 | 1,30 | 1,00 | 0,80 | 0,60 | 0,50 |
| 50                                     | 0,30               | 0,7/0,5            | 4,35   | 2,90 | 2,10 | 1,60 | 1,28 | 0,95 | 0,80 |
| 100                                    | 0,17               | 0,7/0,5            | 6,35   | 4,23 | 3,07 | 2,34 | 1,87 | 1,39 | 1,17 |

### MB COPPO MONO - TKC

MB COPPO MONO panels must be installed on a continuous slab or on 350 mm span perkins as shown in the pictures below.



## Advice and instructions for use

### Thermal expansion

Sandwich panels, given the nature of the materials they are made of, are subject to the natural phenomenon of thermal expansion in the presence of a thermal excursion acting on the metal supports.

This phenomenon acts on the straightness of the panel causing bends and deformations that can affect the functionality and the aesthetic appearance in the event that proper precautions are not taken.

The following conditions may affect the deformation of the panels:

- Significant lengths (e.g. 5 m)
- High solar radiation
- Supports colour
- Supports material
- Support thickness

The following charts illustrate the linear thermal expansion coefficients of the different metals used for the supports.

| Material                 | Linear thermal expansion coefficient [ °C <sup>-1</sup> ] |
|--------------------------|---|
| Steel                    | 12,0 x 10 <sup>-6</sup>                                   |
| Stainless steel AISI 304 | 17,0 x 10 <sup>-6</sup>                                   |
| Aluminium                | 23,6 x 10 <sup>-6</sup>                                   |

| Colour     | Surface temperature [ °C] |         |
|------------|---------------------------|---------|
|            | Minimum                   | Maximum |
| Very light | -20                       | +55     |
| Light      | -20                       | +65     |
| Dark       | -20                       | +80     |

The system must absorb the linear elongations of the support due to high surface temperatures.

In the event of thermal fluctuations that are repeated in short periods such as day-night or freeze-thaw fluctuations, tensions are generated on the supports that can cause undulations, imperfections and in some cases even wrinkling phenomena.

Marcegaglia Buildtech recommends:

- Taking into account the deformations due to the thermal expansion of the materials during the design and selection of the panels.
- Avoiding dark colours, especially with significant lengths.
- Choosing the thickness of the metal faces in a manner appropriate to the use and calculated deformations.

Determining adequate fastening systems to compensate for expansions.

## Useful design information

Marcegaglia Buildtech points out that it is necessary to dimension a load-bearing structure in the design phase that can absorb the external load stresses so as not to jeopardize the basic functionality of the panels due to excessive and permanent deformations.

The following environmental conditions must be taken into consideration during the design and selection of the panels:

- **Thermal stress:** can lead to significant deformation of the panels and depends mainly on the exposure of the building and on the colour of the external metal support.
- **Wind action:** exerts a loading pressure on the exposed surfaces of the panel according to the wind speed, which varies according to the climatic zone in which the installation takes place. It is necessary to define the type and number of fixings according to the intensity of the described action.
- **Atmospheric aggressiveness:** it is necessary to choose the covering of the supports suitable for the environment in which the panels are installed (marine, industrial, urban, rural), since some environments are particularly aggressive in terms of corrosiveness of the panel surfaces.
- **Snow load:** varies according to the climatic zone and the altitude above sea level of the place where the installation takes place. It is necessary to take into account the possible pooling of water on the roof when snow is melting, which can lead to infiltration at the overlapping joints. Marcegaglia Buildtech recommends the adoption of appropriate constructive measures and suitable sheet metalwork systems to optimize the runoff of water.
- **Rainfall:** the slope of the pitch must be defined taking into account the amount of rainfall at the place of installation. To avoid oxidation of metal supports due to incorrect water runoff, it is necessary to define the slope of the pitch depending on the type of construction used:
  - roofing without intermediate butt joints;
  - roofing with intermediate butt joints.

If intermediate butt joints are not used, Marcegaglia Buildtech recommends implementing a slope of not less than 11% in situations of reduced or medium snowfall; if intermediate butt joints are used, it is necessary to define the slope of the pitch during the design phase, providing for an increase compared to the previous situation due to the presence of overlaps.

To prevent infiltration into the insulation or inside the building and a possible consequent premature deterioration of the panel head, Marcegaglia Buildtech recommends creating a drip, requesting in advance the predisposition for the eave protrusion. Also note that the continued exposure of the panel heads to stagnant water can cause the onset of oxidation of the metal or the detachment of the insulating material.

Even if the use of the drip is preferable, it is possible to consider as an alternative solution a protection of the head in the form of a liquid membrane.

Note that the nature of metallic coatings in conditions of solar radiation permits the external surface temperature of the panel to reach very high temperatures ( $80 \div 90^\circ \text{C}$ ), with consequent possible bending and wrinkling of the sheet. Marcegaglia Buildtech, in order to limit the occurrence of such phenomena, recommends a choice of colours, lengths and thicknesses of the metal supports that takes into account the conditions of the installation environment, preferably with light colours, limited lengths and supports with minimum thickness 0.60 mm.

If the possibility of using panels with an internal support different from the external one is taken into consideration, it is necessary to take into account the possible deformations due to the different coefficients of thermal expansion.

In particular environmental conditions, it is possible for condensation to form on the internal surfaces of the panels with consequent dripping inside the building; this phenomenon, if not addressed in a sufficiently short time, can promote the natural deterioration of the paintwork and the supports.

Therefore, Marcegaglia Buildtech recommends taking the described phenomenon into consideration during the design phase and possibly performing a thermo-hygrometric check in order to choose the best solution.

Marcegaglia Buildtech also recommends stocking spare panels beforehand (about 5% of the total), so as to make up for any lack of material due to damage during handling and installation.



## Transport, storage and handling

### Transport and standard composition of the packages

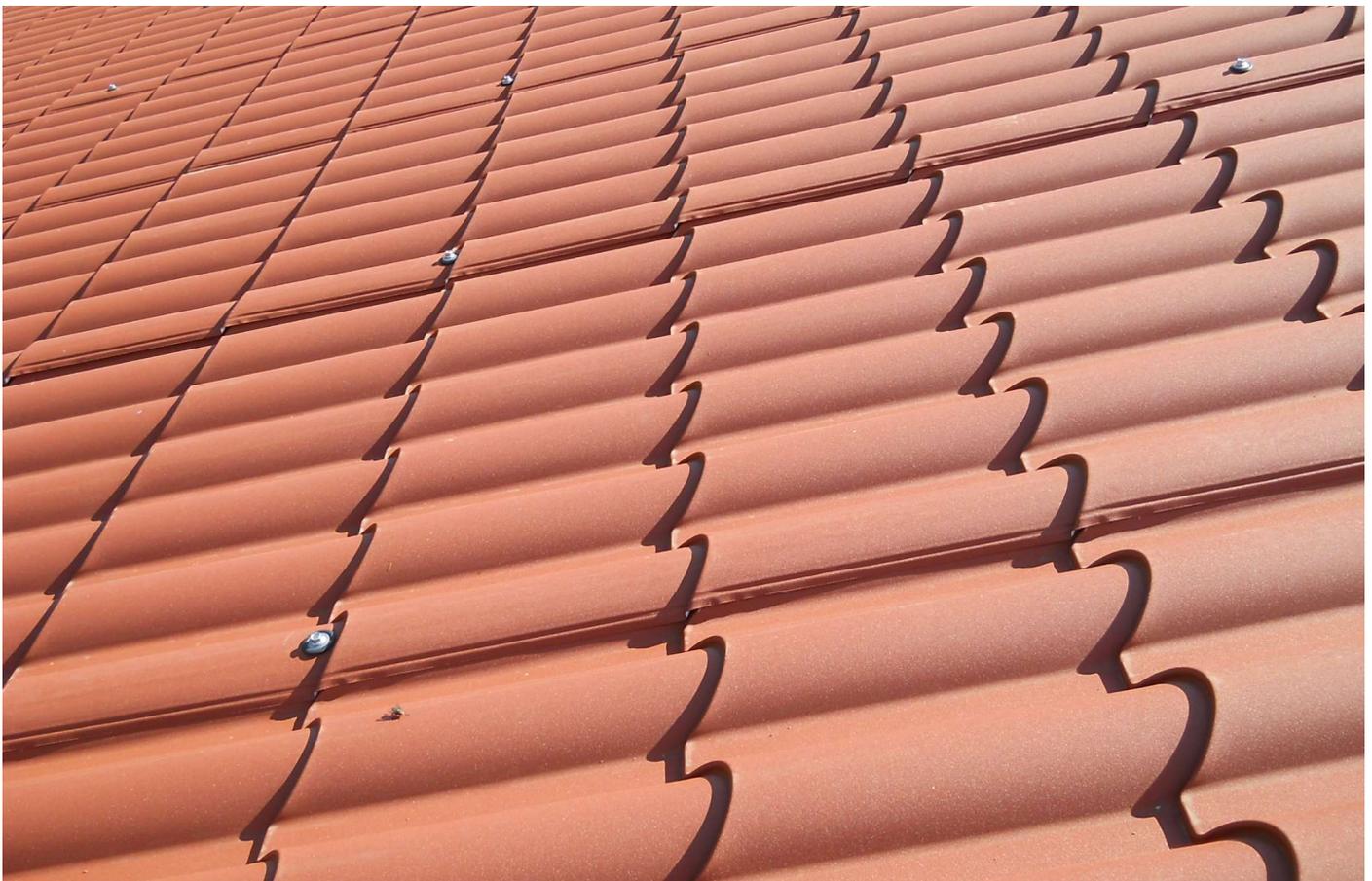
The panels are supplied in a horizontal position, in storage packages that allow handling both by lifting straps and by fork lift trucks.

The standard number of panels contained within the single package varies according to the size and thickness of the panel (see chart).

Before proceeding with unloading and handling operations, it is advisable to check the weight of each package (variable according to the lengths of the panels) and choose a lifting means of adequate lifting capacity.

**The handling of loads and materials on site must always take place in compliance with the requirements of the safety regulations in force with the use of the appropriate personal protective equipment provided by the said regulations.**

| Thickness | Panels / packaging | Packaging height (including blocks) |
|-----------|--------------------|-------------------------------------|
| mm        |                    | mm                                  |
| 40        | 10                 | 756                                 |
| 50        | 8                  | 700                                 |
| 100       | 4                  | 588                                 |



## Handling, storage and installation of panels

In order to guarantee integrity, the packs of panels must be unloaded from the transport means using a suitable sling bar and certified nylon straps.

The distance between lifting points must be equal to or greater than half the length of the package. To avoid damage, the nylon straps must be kept detached from the sides of the pack by using suitable wooden planks placed both above and below the package itself. No more than three packages may be stacked one on top of the other.



In the absence of a sling bar, in some cases unloading can also be done by using suitable forklift trucks. To avoid damaging the panel or even breaking the package, in these cases the distance between the forks and the width of the lifting equipment must take into account the length of the pack, its weight, as well as the panel thickness.

If it is expected that the panels will be stored for a prolonged period of time, this must take place in a covered and ventilated environment and for a maximum period of six months. In these cases, it is a good rule to open the packs, and also to separate the panels with special spacers to ensure ventilation between one panel and another.

If this is not possible, for short storage periods (maximum 30 days) adequate covered place must be made and the panels must be protected with opaque waterproof sheets, taking care however to maintain adequate ventilation, to avoid damaging stagnant condensation between panels.

In any case, suitable supports must be provided to keep the packages raised from the ground. As light slope (5% minimum) must be provided to allow the outflow of any condensation or rain.



**If these rules are not observed, there is the danger that the stagnant humidity will attack the coating, causing it to separate from the galvanized support, forming a phenomenon called "blistering". It is recommended to install the panels within one month of delivery to the building site.**



If transported by container, the products must be removed from the same within 15 days from shipment in order to avoid deterioration of the pre-painted metal supports caused by the high concentration of moisture that can accumulate in the container when closed for a long time.



Due to the possible presence of small cutting burrs or metallic filings, the individual panels must be removed from the package taking care not to damage the panel underneath.

Manual transport must be carried out, keeping the panel in the rib and by at least two people.



The protective film must be removed during the installation of the panels and in any case not over 60 calendar days from the date of production of the panels.

If the panels were ordered, produced and delivered without protective film on the painted support, it is necessary to pay careful attention not to cause damage during handling and assembly.



The panels must be set up by qualified personnel who are familiar with the rules of good technique.

Personnel equipment, in particular all PPE, must be provided for worker safety and to prevent damage to the panels during handling and installation.

**WARRANTY: Failure to comply with these minimum requirements exempts Marcegaglia Buildtech from any responsibility for damage to the products and forfeiture of the warranty provided for by the terms of sale.**



# Installation instructions

## Fixing system

The most appropriate fixing system for the project must be established according to the type of installation, considering the support structures (metal structural work) in order to guarantee safety, stability and leak-tightness.

The fixing elements must be able to withstand the dynamic forces of the stresses to which the insulated panels are subjected (sudden changes in temperature, wind load, trampling, etc.) guaranteeing the mechanical sealing, load capacity and insulation.

The number and positioning of the fixings varies according to the design and according to several variables, including the local wind conditions, the distance between the purlins and the framework elements, and the height of the building.

The **support system** consists mainly of purlins: usually wooden, concrete or steel purlins are used (thickness  $\geq 2$  mm), more rarely aluminium (thickness  $\geq 3$  mm).

The minimum surface of the end supports or intermediate supports depends on the characteristics of the panel and the material of the supports, therefore it is advisable to rely on the calculation section of the support reaction resistance of the UNI EN 14509 standard.

There are two types of fixing:

- **Main structural anchors**

These fix the roof panel to the supporting structure and guarantee the anchoring, the mechanical resistance and the load capacity applied. The standard fixing group includes: self-tapping / self-drilling screw and batz. The choice of the screw length will depend on the thickness of the panel and the type of underlying structure. The fixing is made in correspondence of the top point of the wave shape: to have a better anchorage a **batz** is inserted between the screw and the profiled sheet, which adapts to the curve profile of the sheet.

- **Stitching**

Non-structural, they are functional for fixing the sheet metal, the metal finishing elements and the sheets of the panel to each other.

The fixing equipment is divided into:

- **Self-tapping screws (A)**

These are applied after having prepared the hole in the panel and on the roof purlin.

- **Self-drilling screws (B)**

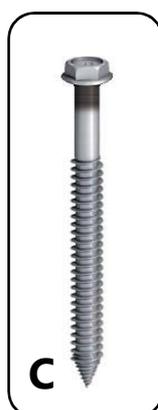
These are applied directly without the preparation of the holes using a screwdriver only.

- **Wood screws (C)**

- **Stitching screws (D)**

Smaller in size, they are used for the fastening of sheet metal elements and for stitching the overlap.

- **Batz (E)**



## Installation and equipment

The supporting structures and the relative fixing devices of the panels must be adequately sized and must meet the conditions set by the project in terms of safety, stability and functionality.

This section aims to provide reference information for the assembly of insulated metal roofing panels.

The reference standard is constituted by the **UNI 10372 standard "Discontinuously laid roof coverings - criteria for design, execution and maintenance of roofing made of metal sheets"**.

Preliminary operations:

- View the project documents and follow the relevant instructions.
- Check that the support structure is positioned correctly, does not present deformations or misalignments and is completely secured to the rest of the structure.
- Make sure that there is no interference with overhead power lines in the handling area of the materials.
- Prepare the appropriate accident prevention facilities according to the regulations in force for work at height.
- Check that all workers operating at height are equipped with the appropriate personal accident prevention devices according to the regulations in force.
- Prepare all the power supply lines for the equipment used according to current regulations.
- Remove the protective film applied to the pre-painted sheets over the entire length of the panel.

Hoisting: the panels must be lifted with the utmost care and attention, avoiding to damage the surface. In most cases it is necessary to move the packs of panels onto the roof to be covered (hoisting). the use of steel cables or chains instead of nylon slings must be strictly avoided.

The hoisted panels must be placed on the purlins (never on the overhangs) near the trusses, avoiding laying more than one row of packs for each truss. Suitable stopping systems must also be set in place to prevent the packs from slipping due to the slope of the roof or due to the wind at high altitude, paying more attention once the package is opened. It is important to ensure that, at the end of the working day, open packs on the roof that are not yet finished are temporarily strapped so as to prevent them from sliding down or flying away under the action of the wind.

### Installation equipment

The use of suitable tools and equipment in an suitable state of maintenance are required for the installation of the insulated panels. The following list shows, in a non-exhaustive manner, the equipment which is recommended for use and those the use of which must be strictly avoided.



**PORTABLE DRILL**  
twist bit  
max 8 mm Ø



**SCREWDRIVER**  
with reverse function



**JIGSAW**



**VACUUM  
CLEANER**



**SHEARS**  
(right and left)



**ANGLE  
GRINDER**



**RIVETER**  
2,5-5 mm



**MOLE GRIPS**



**PLUM LINE**



**LASER  
MEASURER**



**SCRAPER**



**SPiRiT LEVEL**



**UNIVERSAL  
PLIERS**

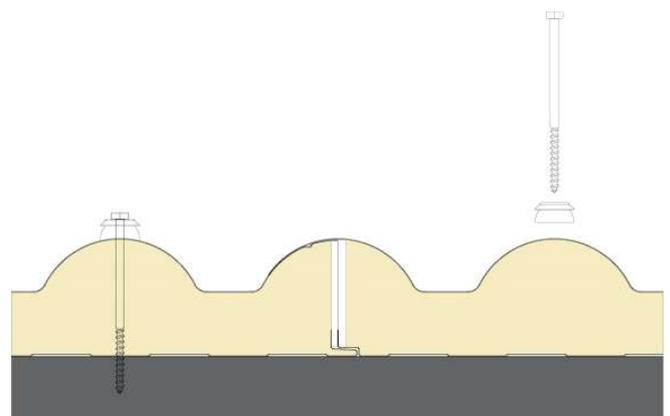
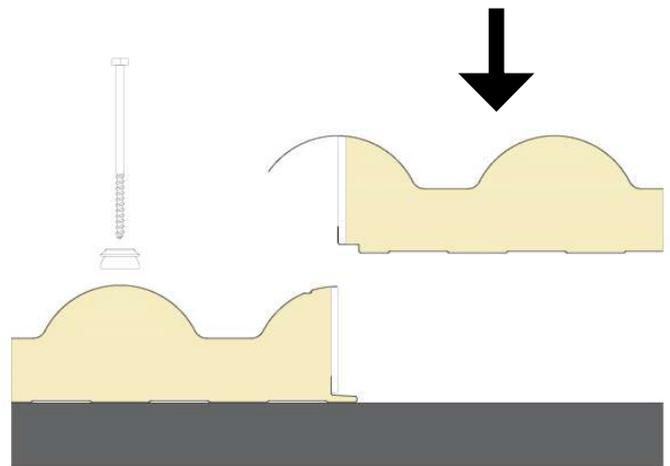
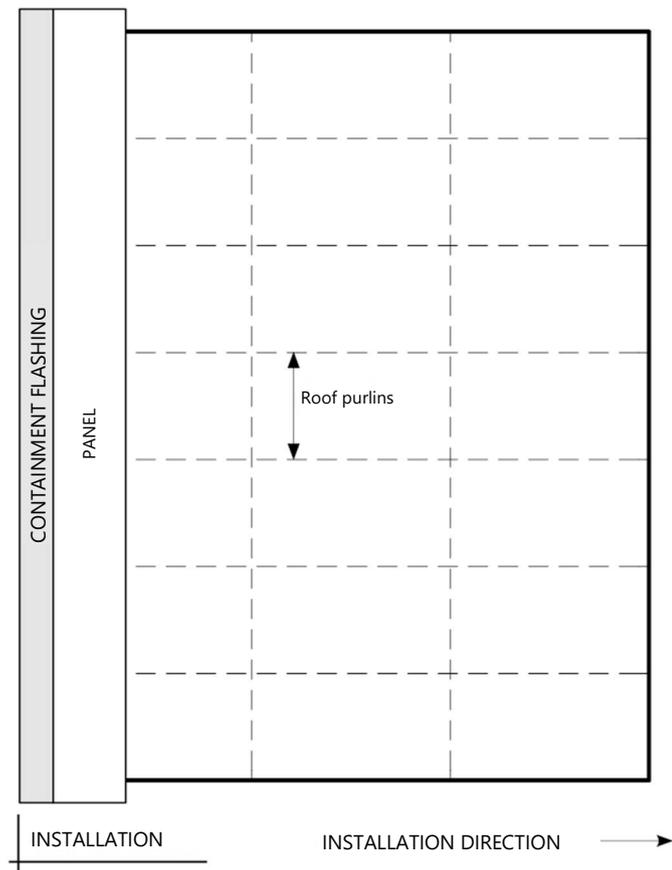


**MALLET**

## Installation and fixing of roofing panels

Once all the preliminary activities have been carried out, based on the project drawings, it is necessary to **prepare and install the complementary sheet metalwork** to complete the roofing, for example, under-ridges, gutter channels, flashings and anything under the panel.

Once the profiles have been laid, the starting point for the installation of the first panel must be carefully identified.



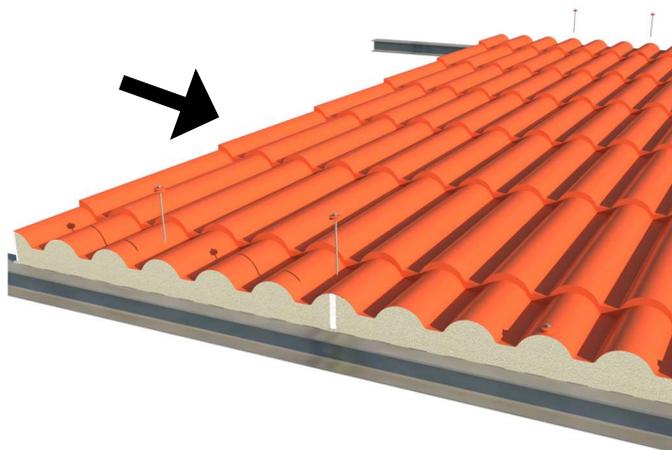
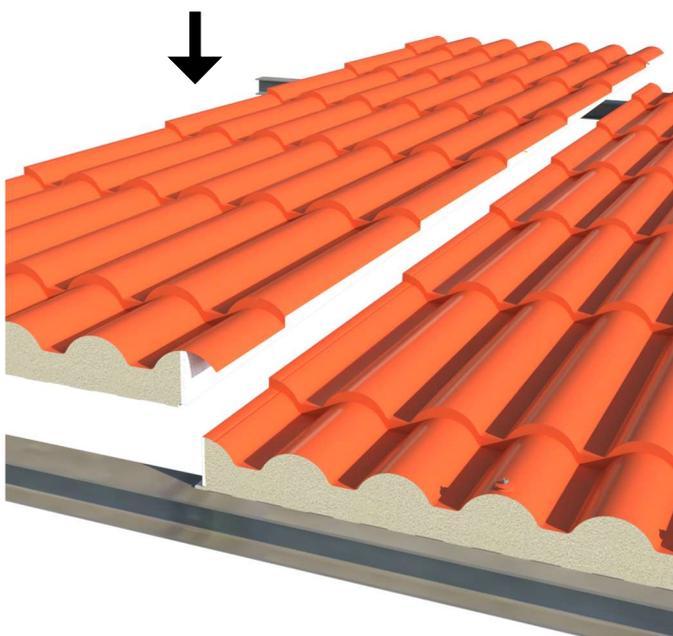
Once the starting point is set and the alignments have been checked with respect to the structural work, it is possible to start laying the first roofing panel, **following the intended installation direction**.

Position and then anchor the first panel, always making sure to check its alignment with the underlying purlins.

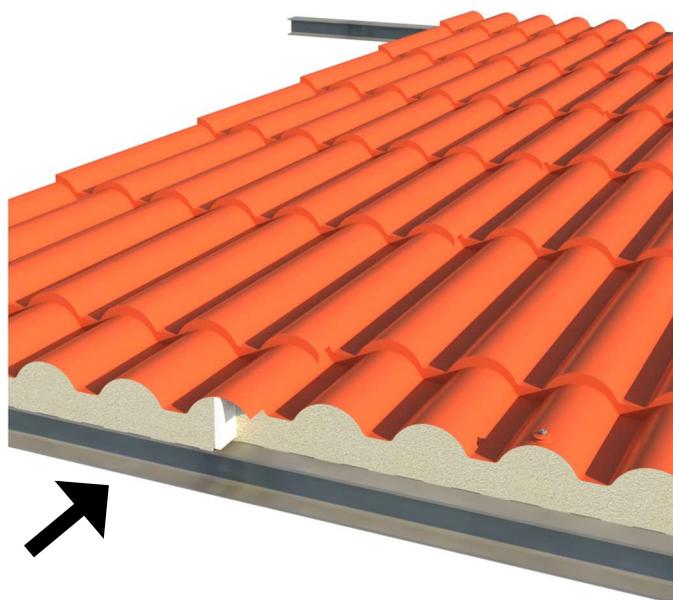
**For the first panel only, fix it on the top part of the first full wave (coppo) available, for each underlying purlin.**

Fixing of the panels with the batz interposed between the appropriate screw and the panel.

Overlap the half-empty wave (coppo) of the second panel on the half wave of the first keeping an offset as shown in the picture below.

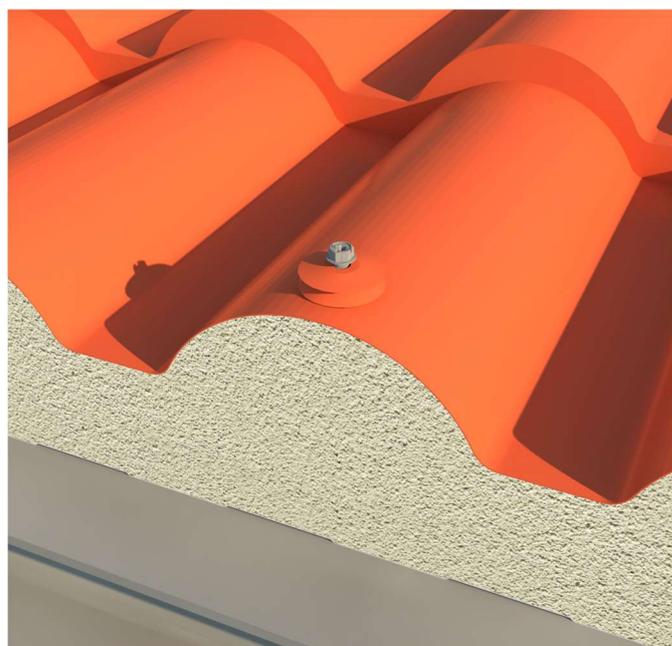


Maintaining the pressure exerted, place the first fixing screw on one of the free wave (coppo) after the joint, making sure that it is perpendicular to the surface of the panel.



As the panel is placed, it is appropriate to push it and align it with the fixed panel in order to obtain a good coupling between the waves (coppi) in correspondence of the waves height gap.

Once the panel has been positioned, it is advisable to apply lateral force to ensure that the panels are well secured.



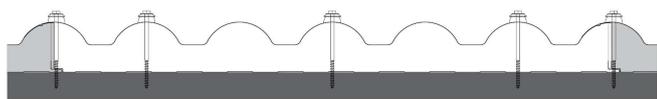
Finally, check for perfect overlapping, making sure that the external surfaces of the two adjacent panels are completely in contact and levelled.

Similarly, proceed with the installation of the subsequent panels according to the installation sequences provided in the design phase.

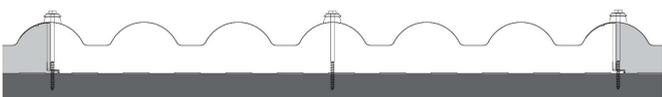
When carrying out the installation operations, avoid placing pointed or sharp objects and concentrated loads on the surfaces of the panels. Also avoid performing other welding or cutting operations in the immediate vicinity of the panels.

With regard to the fixing methods, some valid indications are provided below:

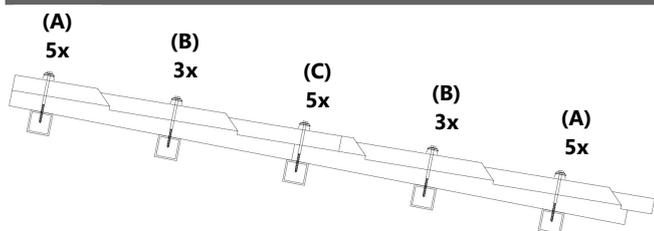
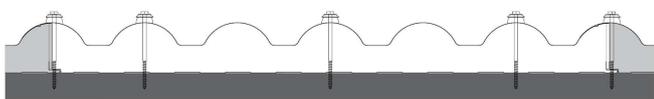
- **Ridge and eave end supports (A):**  
application of minimum five screws per panel.



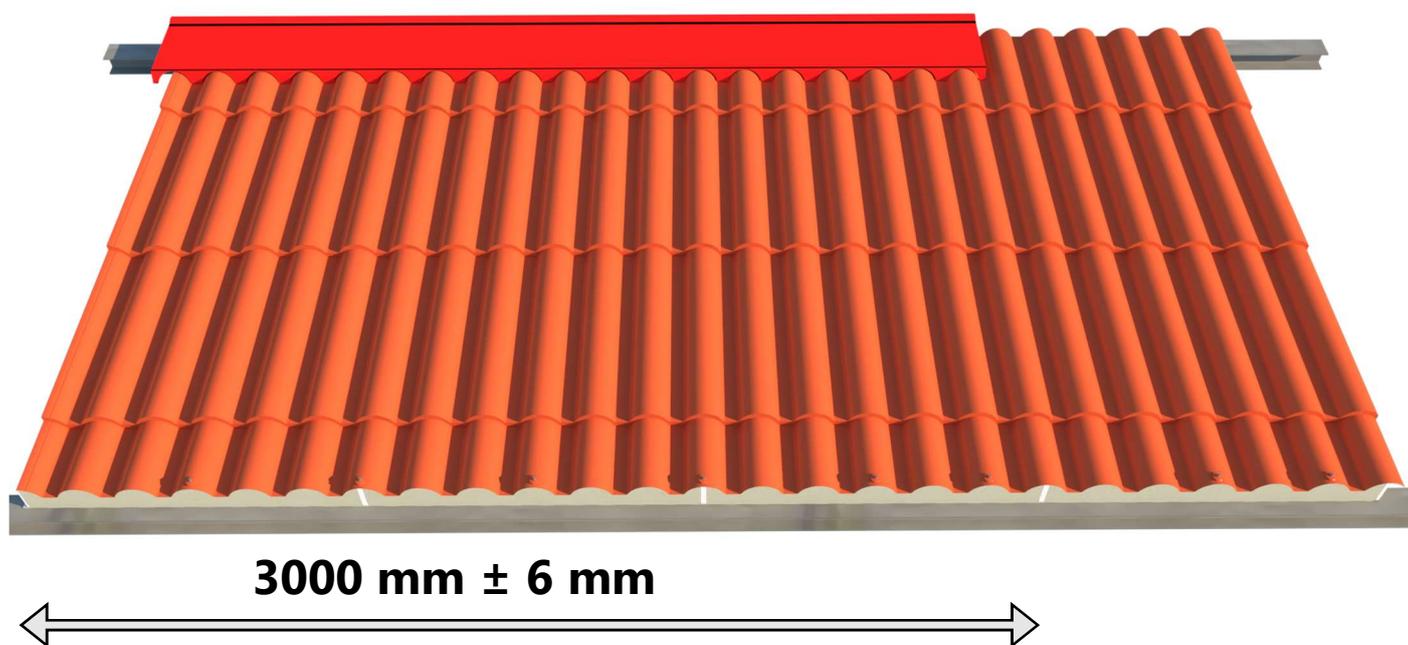
- **Internal supports (B):**  
application of at least three screws per panel.



- **Supports with transversal overlapping (C):**  
application of minimum five screws per panel..



Fix the roofing panel with the appropriate screws.



Pay close attention to the right coupling of the panels during the installation (3 panels = 3000 mm ± 6 mm) in order to avoid problems during the installation of the roof ridge.

The picture above shows that the roof ridge is a metal sheet bending product with a fixed pitch. The right coupling of the panels is strictly needed to avoid matching difficulties between the roof ridge and the waves.

La The chart shows the **recommended useful lengths for the screws** according to the thickness in mm of the roofing panel to be fitted regardless of its type.

For purlins or wooden or concrete supports, add 10 mm to the indicated lengths.

| Panel thickness | Minimum screws lenght |
|-----------------|-----------------------|
| 40              | 100 mm                |
| 50              | 110 mm                |
| 100             | 160 mm                |

For each type of project, depending on the wind conditions, the topography of the land and the length of the purlins, it will be up to the designer to identify the number of fixings to be applied (their function is also that of reacting to negative loads).

On completion of any cutting, drilling and fixing operation, make sure that **any metal scraps are thoroughly removed** to ensure the surfaces remain clean.

## Overlapping

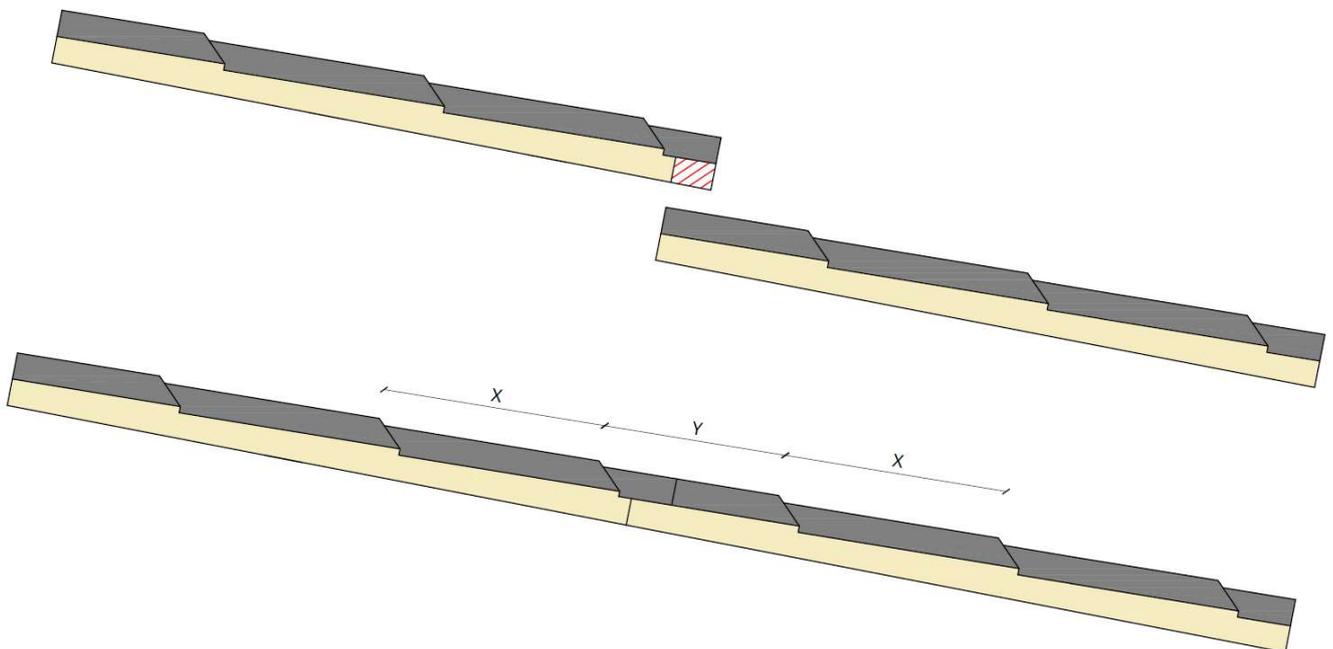
When the length of the pitch requires the use of several panels in a longitudinal direction of the panel itself, it is advisable to install the panels starting from the eaves line and continuing, once the first course of panels is completed, towards the ridge line.

It is possible to choose between two different overlapping systems, but independently from the system chosen, in order to give to the overlapping a greater resistance to atmospheric agents, it is good practice to place one or two strips of sealing material between the sheets downstream of the fixing unit.

It is also a good idea to apply self-expanding gaskets on the purlin on which overlapping takes place, to avoid thermal dispersion.

The overlapping between the panels is executed as illustrated in the following figures.

### Simple overlapping

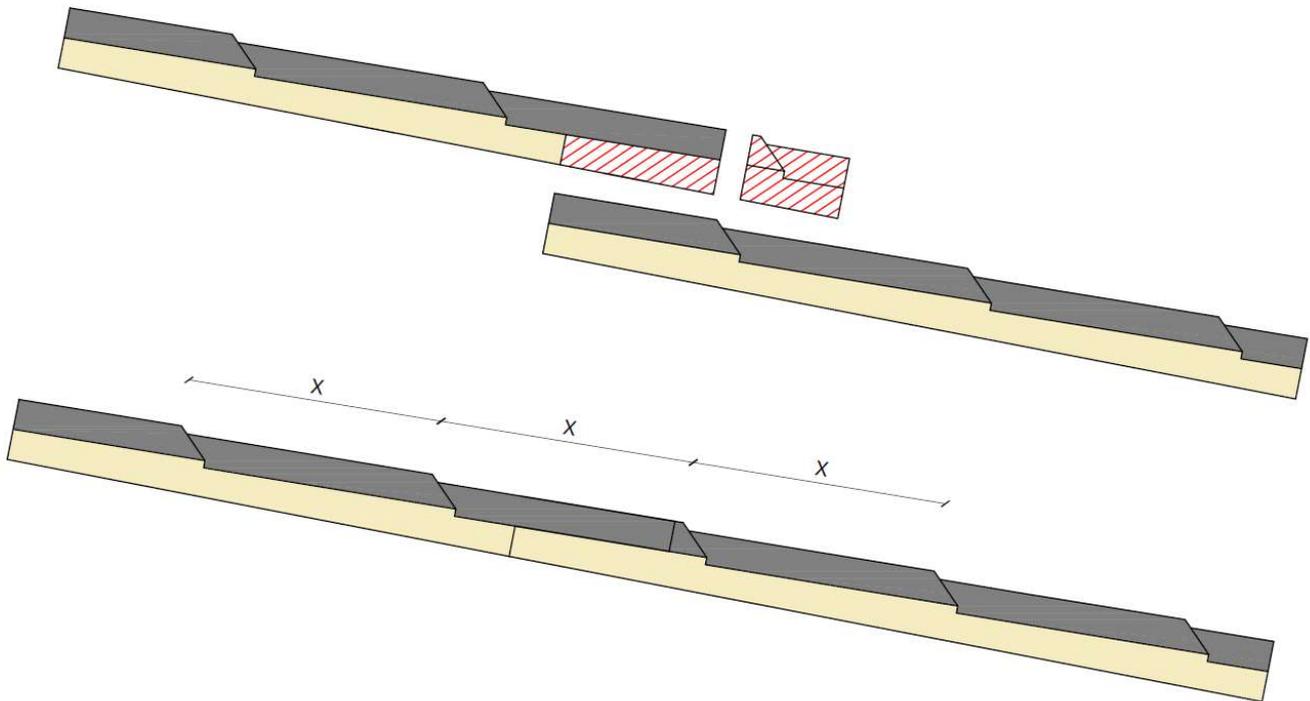


This overlapping method consists in the removal of a limited portion of the polyurethane foam in correspondence of the head side of the upstream panel that will overlap on the downstream one.

The simple overlapping system allows to avoid the removal of polyurethane foam from the waves height gap (coppi) but it is NOT possible to have a regular seized wave (350 mm) in correspondence of the overlapping.

The small size of the sheet portion that is make necessary a feasibility study of the system, case by case, even if it turns out to be the most economic and easy-feasible solution

## Advanced overlapping



This overlapping method consists in the cut of a portion of the panel and the further removal of the polyurethane foam in correspondence of the head side of the upstream panel that will overlap on the downstream one.

The advanced overlapping system allows to have a regular 350 mm pitch of the waves (coppi) in correspondence of the overlapping and even if it is the best technical option it requires a large number of post-production machining which significantly increase its cost.

## **Fixing the panels**

Once the panel is in place, make the first hole with the drill. Always make sure the hole is perpendicular to the panel surface.

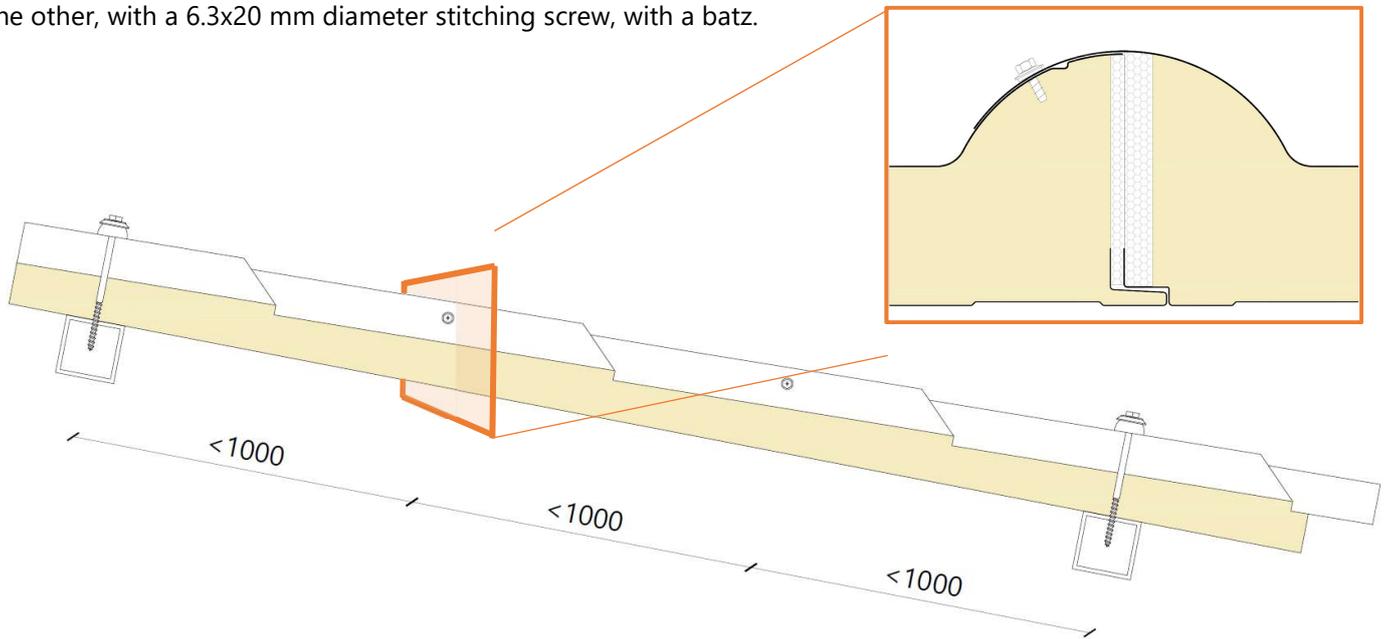
To properly fix the two overlapping panels in the joint area, it is recommended to use an **additional fixing**, as described in the following figure.



In this way the shear stresses are more effectively discharged on the supporting structure, through the fixing units. This layout is suitable above all for overlapping panels of great length.

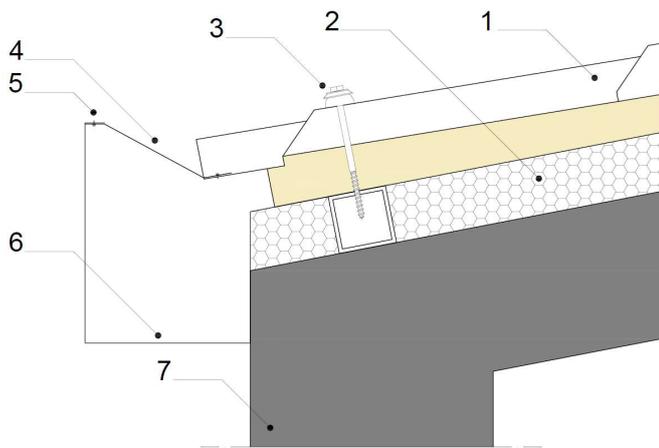
The sheet of the upstream overlapping panel is overlapped on the downstream panel and is fixed with stitching screws in correspondence with the waves, so as to avoid deformation and bending of the overlapping sheet.

To ensure a uniform effect on the roof panels, they should be connected where they overlap between one purlin and the other, with a 6.3x20 mm diameter stitching screw, with a batz.



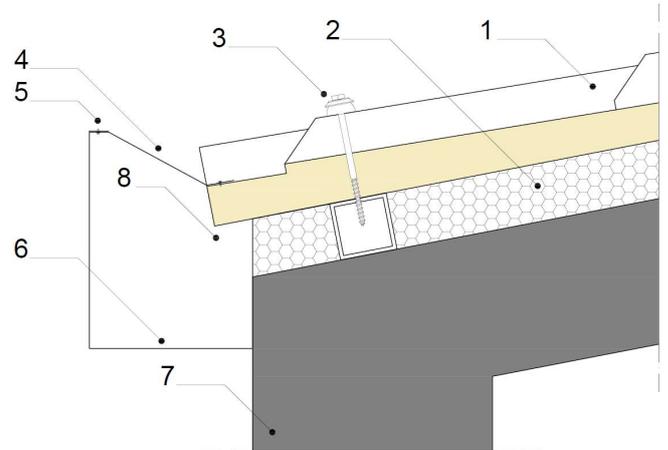
# Examples of solutions for the installation of MB COPPO panels

## Connection roof / external gutter



|   |                        |
|---|------------------------|
| 1 | MB COPPO panel         |
| 2 | On site insulation     |
| 3 | Fixing screw with batz |
| 4 | Gutter bracket         |
| 5 | Rivet                  |
| 6 | Gutter                 |
| 7 | Supporting structure   |

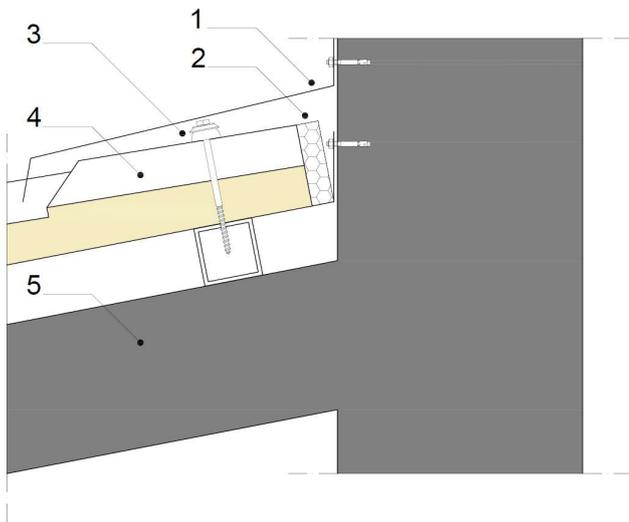
## Connection roof / external gutter with waterproofing sheet



|   |                        |
|---|------------------------|
| 1 | MB COPPO panel         |
| 2 | On site insulation     |
| 3 | Fixing screw with batz |
| 4 | Gutter bracket         |
| 5 | Rivet                  |
| 6 | Gutter                 |
| 7 | Supporting structure   |
| 8 | Waterproofing sheet    |

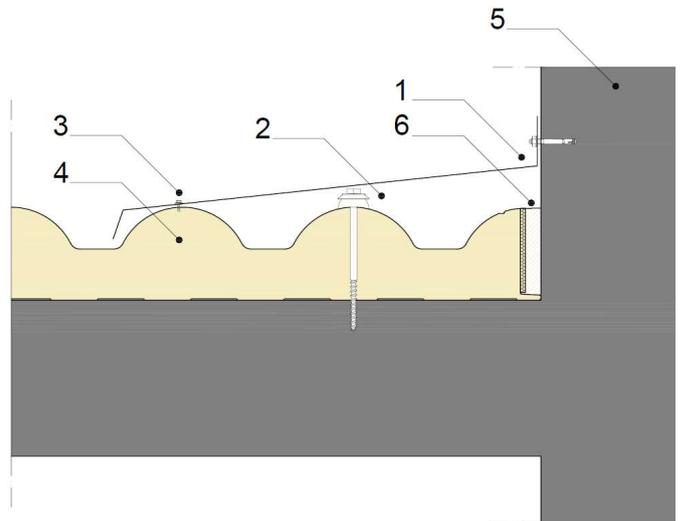
The solutions represented in this chapter only show some installation variants and they do not have any design value. The designer and the project manager must choose and design the most appropriate solution, case by case.

## Connection roof / wall



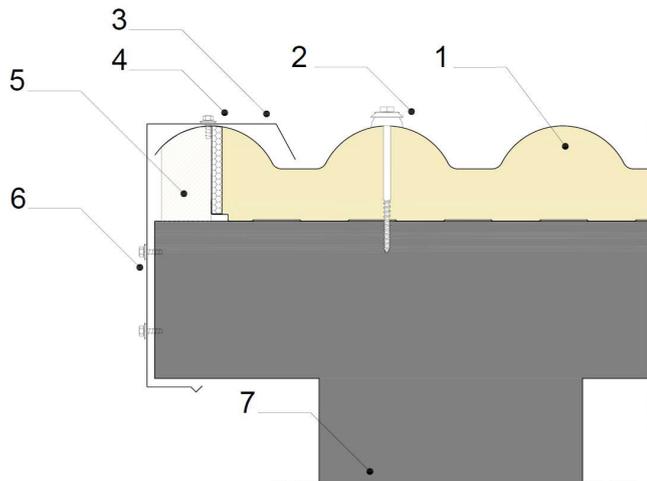
|   |                                  |
|---|----------------------------------|
| 1 | Wall flashing with fixing system |
| 2 | On site insulation               |
| 3 | Fixing screw with batz           |
| 4 | MB COPPO panel                   |
| 5 | Supporting structure             |

## Side connection roof / wall



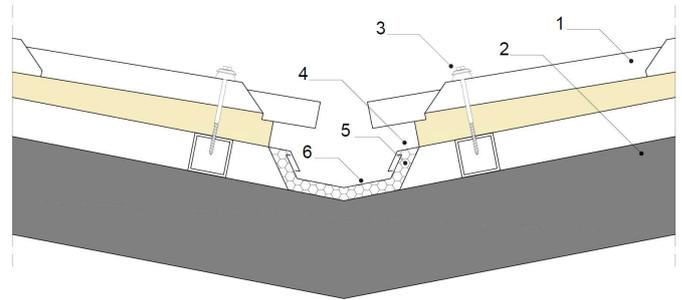
|   |                                  |
|---|----------------------------------|
| 1 | Wall flashing with fixing system |
| 2 | Fixing screw with batz           |
| 3 | Flashing / panel fixing screw    |
| 4 | MB COPPO panel                   |
| 5 | Supporting structure             |
| 6 | On site insulation               |

## Ending side pitch detail



|   |                                   |
|---|-----------------------------------|
| 1 | MB COPPO panel                    |
| 2 | Fixing screw with batz            |
| 3 | External tinsmith                 |
| 4 | Tinsmith / panel fixing screw     |
| 5 | On site insulation                |
| 6 | Tinsmith / structure fixing screw |
| 7 | Supporting structure              |

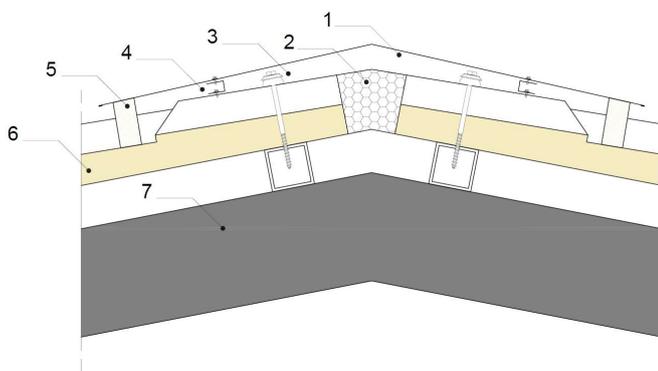
## Connection roof / internal gutter



|   |                             |
|---|-----------------------------|
| 1 | MB COPPO panel              |
| 2 | Supporting structure        |
| 3 | Fixing screw with batz      |
| 4 | Drip tray                   |
| 5 | Insulation below the gutter |
| 6 | Gutter                      |

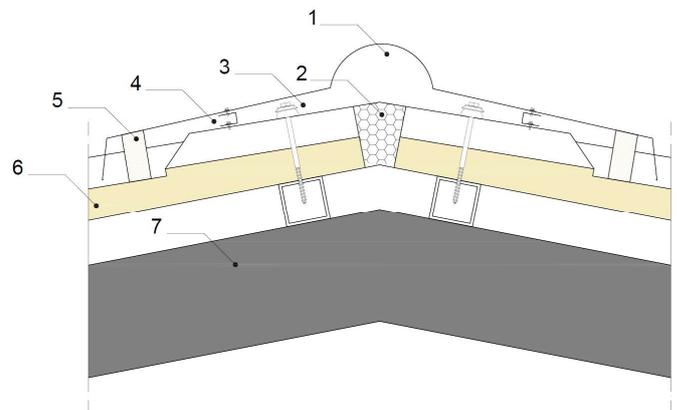
The solutions represented in this chapter only show some installation variants and they do not have any design value. The designer and the project manager must chose and design the most appropriate solution, case by case.

## Connection roof / flat ridge



|   |   |
|---|---|
| 1 | Flat ridge                                      |
| 2 | On site insulation                              |
| 3 | Fixing screw with batz                          |
| 4 | Supporting element with flashing - ridge fixing |
| 5 | Finishing element below the ridge               |
| 6 | MB COPPO panel                                  |
| 7 | Supporting structure                            |

## Connction roof / curved ridge



|   |   |
|---|---|
| 1 | Curved ridge                                    |
| 2 | On site insulation                              |
| 3 | Fixing screw with batz                          |
| 4 | Supporting element with flashing - ridge fixing |
| 5 | Finishing element below the ridge               |
| 6 | MB COPPO panel                                  |
| 7 | Supporting structure                            |

# Maintenance and disposal

## Roof inspection

During the installation and completion of the panels installation, the installing company **will be responsible for the removal of all the material no longer necessary**, including the possible scraps of protective film.

The company must pay the utmost attention in eliminating **metal shavings and abrasive elements** in the event that they are deposited on the roof.

During the initial inspection, it is also necessary to check that foreign materials or processing scraps capable of triggering corrosion or damage to the building envelope or that can impede the correct runoff of rainwater have not been left behind.

**Periodic inspections** should therefore be carried out (recommended every 6 months) to check the conservation status of the surfaces. [roofing]

## Routine maintenance

Routine maintenance is the responsibility of the end user and has the function of keeping the aesthetics and the functionality of the building's roof unchanged over the years following its construction.

A **periodic maintenance plan** is provided that must include the checking:

- of **seals**, the deterioration and wear of which could cause a reduction in air and water tightness;
- of all the **fixings** to verify they are correctly tightened.

The following are the main causes of intervention and the measures to be taken:

- **Deposits of aggressive substances present in an industrial atmosphere on the roof:** remove the substances with jets of water, if the action of the rains is not sufficient. If the normal jets are not sufficient to remove the deposited substances, mild and non-abrasive detergents dissolved in water can be used. During the inspection, pay particular attention to products of an aggressive nature coming from **chimneys or ventilation systems**.
- Confluence of materials deposited by the wind or the atmosphere in **gutters** and **valleys:** proceed with a vigorous washing to prevent the metallic support from being damaged or the normal flow of water to be obstructed.

- **Scratches or abrasions of the pre-painted parts** caused by the transit of operators or by accidental causes: eliminate by touching up the paint.
- **Loss of the elastic or sealing properties of the seal** in the joints of the sheet metalwork: restore the seal, after cleaning the pre-existing one.
- **Settling of the structures and panels with loosening of the fixing screws:** check and carefully tighten the screws.
- **Dents caused by impacts:** in some cases it will be possible to intervene by restoring the surface; if this type of intervention is not feasible, the damaged panel must be replaced.
- **Formation of mould and algae**, possible in the case of environments with high humidity, in the shade or with stagnant water: moisten the area to be cleaned with cold water and then, using a non-abrasive brush, remove the deposits with a very diluted solution of water, bleach and a cup of liquid soap. Rinse with clean water.
- **Deposits of salt**, for example in marine environments: in the case of light superficial incrustations, it is sufficient to use cold water through a garden hose at the standard pressure of the mains water supply. For all other cases, it is necessary to dampen the surface to be treated with cold water and then, using a non-abrasive brush, remove the deposits with a very diluted solution of water, bleach and a cup of liquid soap. Rinse with clean water.

**Failure to comply with these warnings, as well as the use of boiling water or abrasive material (brushes with metal bristles, etc.) can cause permanent damage to the surface, compromising the lifespan of the product. For further information consult the technical information, "Maintenance and restoration of pre-painted parts".**

## Disposal

The disposal of insulated roofing panels must only be entrusted to authorized companies and carried out in compliance with the laws in force.

# Safety data

Please note that the product to which this document refers is classified in accordance with the regulation (EC) 1907/06-REACH as an article without intentional release of chemical substances and as such does not require the preparation of a safety data sheet.

However, Marcegaglia Buildtech wishes to identify the main dangers due to the use of the article in question.

## 1. Product identification

Insulated panel composed of two metal layers that contain a solid insulating layer of polyurethane foam.

### Company / business identification

MARCEGAGLIA Buildtech S.r.l.

Via Giovanni della Casa 12 - 20151 Milano - Italy

Phone +39.0230704.1 fax +39.0233402706

e-mail: tamponamento@marcegaglia.com

## 2. Dangers identification

The product does not pose dangers to human health under normal conditions of use in accordance with REG EC 1272/08.

## 3. Composition / information on ingredients

The product is composed of two pre-painted steel sheets containing an insulating layer of polyurethane foam.

| Component           | % in weight |
|---------------------|-------------|
| Metal supports      | 47-63       |
| Gaskets             | ≈1          |
| Insulating material | 36-52       |

## 4. First aid measures

The handling of the product without the appropriate PPE can cause injuries to the skin and eyes due to the presence of the steel sheets; in the event of injuries contact a doctor immediately. In case of prolonged exposure to the dust, transport the affected person to a ventilated place.

## 5. Fire prevention measures

Polyurethane foam is not flammable, but as an organic material it is combustible. However, the protection of the metallic supports allows the risk of fire to be reduced to a low level.

The material used for packaging is combustible and if involved in a fire produces gases and fumes which could reduce visibility.

## Extinguishing media

All extinguishing media are applicable. For large fires, use water, alcohol-resistant foams or universal foams according to the manufacturer's instructions. For fires of limited proportion, use carbon dioxide or chemical powder.

## 6. Measures in case of accidental release

The product is stable; no special measures are expected to be taken.

In the event of accidental release of polyurethane dusts (coming, for example, from cutting operations), remove the material preferably with suction systems, ventilate the room and keep away from sources of ignition. Perform these operations with a protective mask.

## 7. Handling and storage

Handle using the appropriate personal protective equipment. For more information about handling and the personal protective equipment to be used, see section 8. For correct handling and correct storage, refer to the "Regulations for handling and storage of materials" in the technical manual.

## 8. Personal protection

### Respiratory protection

Normal use does not require any protection for the respiratory tract. If it is necessary for work activities to cut the panels and carry out any operation that could lead to the generation of dust, it is advisable to install an appropriate extraction and reduction system.

When this is not possible or the concentrations of dust in the working environment remain at high concentrations, the possibility of isolating the dust production area or providing the operators with devices for the protection of the respiratory tract is evaluated.

### Hands protection

The presence of steel sheets can cause cuts or injuries to the skin tissue, and in this regard during normal operations involving the handling of the panels, leather or hide gloves resistant to abrasion, cutting, tearing and perforation must be worn in conformity with the UNI EN 388 standard.

### Eyes protection

Normal use does not require any protection for the eyes. If it is necessary for work activities to cut the panels and carry out any operation that could lead to the production of shards or projectile particles, it is advisable to wear polycarbonate glasses to protect against the projection of

particles at high speed / low impact energy; compliant with standard EN 166.

#### Skin protection

Normal use does not require any specific protection other than work clothes.

#### **Control of the environmental exposure**

Normal use does not require any specific measure to reduce environmental exposure as the product is to be considered non-toxic. Should it be necessary to cut the panels and carry out any operation that could lead to the generation of dust, install an extraction system with an appropriate abatement system in order to limit environmental pollution.

### **9. Physical and chemical properties**

Appearance: the product comes in the form of a panel clad in metal and a core of straw-coloured expanded polyurethane foam.

Odour: Odourless

Boiling point: not applicable

Melting point: the sheet melts based on the metal, the polyurethane does not melt or drip.

Flash point: polyurethane between 300 and 400°C.

Calorific value: 6500-7500 kcal / kg

Auto-ignition: not applicable

Explosive properties: not applicable

Oxidizing properties: not applicable

Vapour pressure: not applicable

Water solubility: not applicable

Fat solubility: not applicable

Partition coefficient: not applicable

### **10. Stability and reactivity**

Pre-painted steel and polyurethane are stable under normal weather conditions.

#### **Conditions to avoid:**

Avoid using naked flames near polyurethane dust.

### **11. Toxicological information**

With the present state of knowledge, the material is to be considered non-toxic.

### **12. Ecological information**

There are no known harmful effects on the environment.

Should it be necessary to cut the panels and carry out any operation that could lead to the generation of dust, install an extraction system with an appropriate abatement system in order to limit environmental pollution.

### **13. Disposal considerations**

The disposal of polyurethane insulated panels must only be entrusted to authorized companies and carried out in compliance with the laws in force.

### **14. Transport information**

No special measures must be taken during transport.

### **15. Regulatory information**

No restrictions pursuant to Annex XVII of the REACH Regulation. No ingredient is included in the REACH Candidate List (> 0.1 % m/m). Regulation (EC) No. 1907/2006 of the European Parliament and of the Council, of December 18, 2006, concerning the registration, evaluation, authorization and restriction of chemical substances (REACH).

Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of December 16, 2008 concerning the classification, labelling and packaging of substances and mixtures which amends and repeals Directives 67/548/EEC and 1999/45/EC and amends regulation (EC) No. 1907/2006.

Regulation 830/2015 Annex II of REACH.

Legislative decree 81/2008 Consolidated Law on Occupational Health and Safety.

### **16. Other information**

The information contained in this sheet are based on our knowledge and experience at the date of the latest version. The user must verify the suitability and completeness of the information in relation to the specific use of the product.

This document must not be interpreted as a guarantee of any specific property of the product. Since the use of the product does not fall under our direct control, it is the user's obligation under its responsibility to observe the laws and regulations in force concerning hygiene and safety.

No liability is assumed for improper use. Provide adequate training for the personnel involved in the use of chemical products.



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