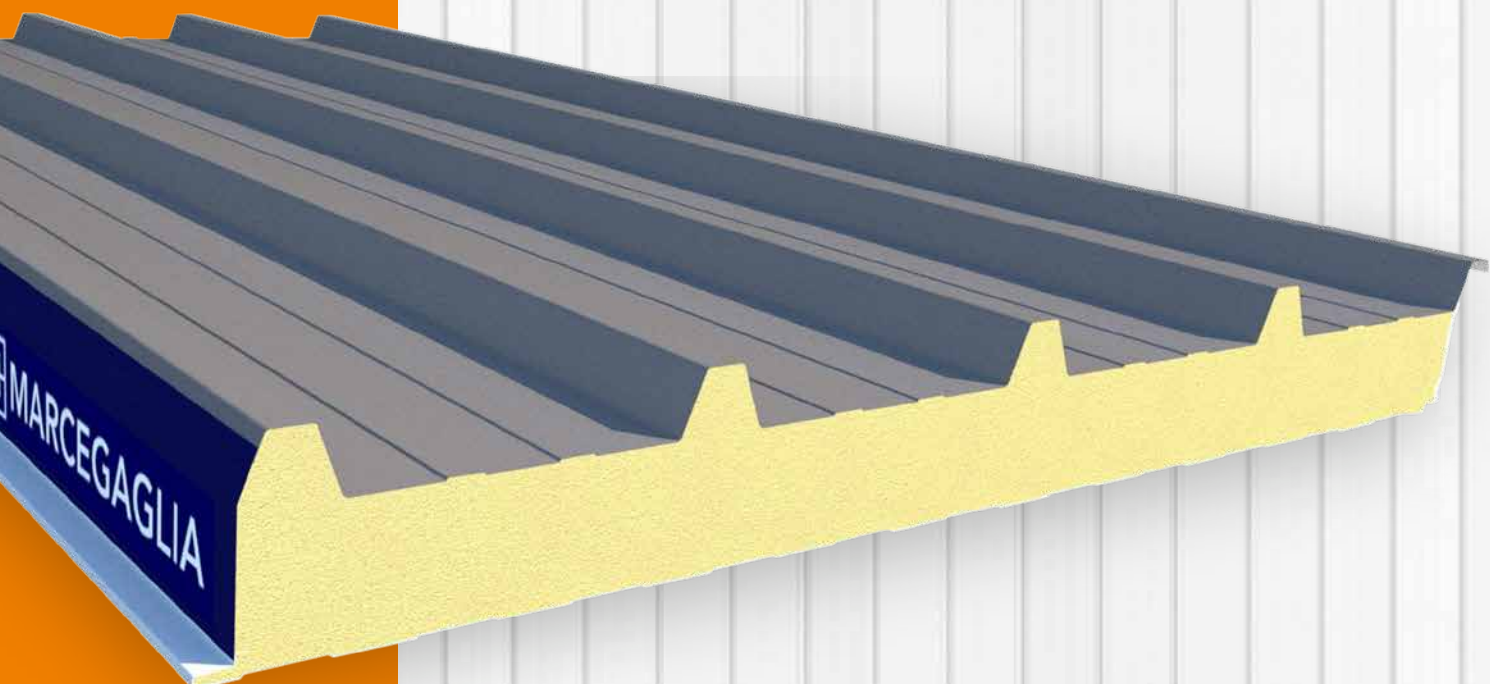




Technical manual



MB ROOF MB ROOF 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 ROOF MB ROOF MONO

MB ROOF - 5 rib sandwich panels with polyurethane foam insulation, used for the construction of sloping roofs.

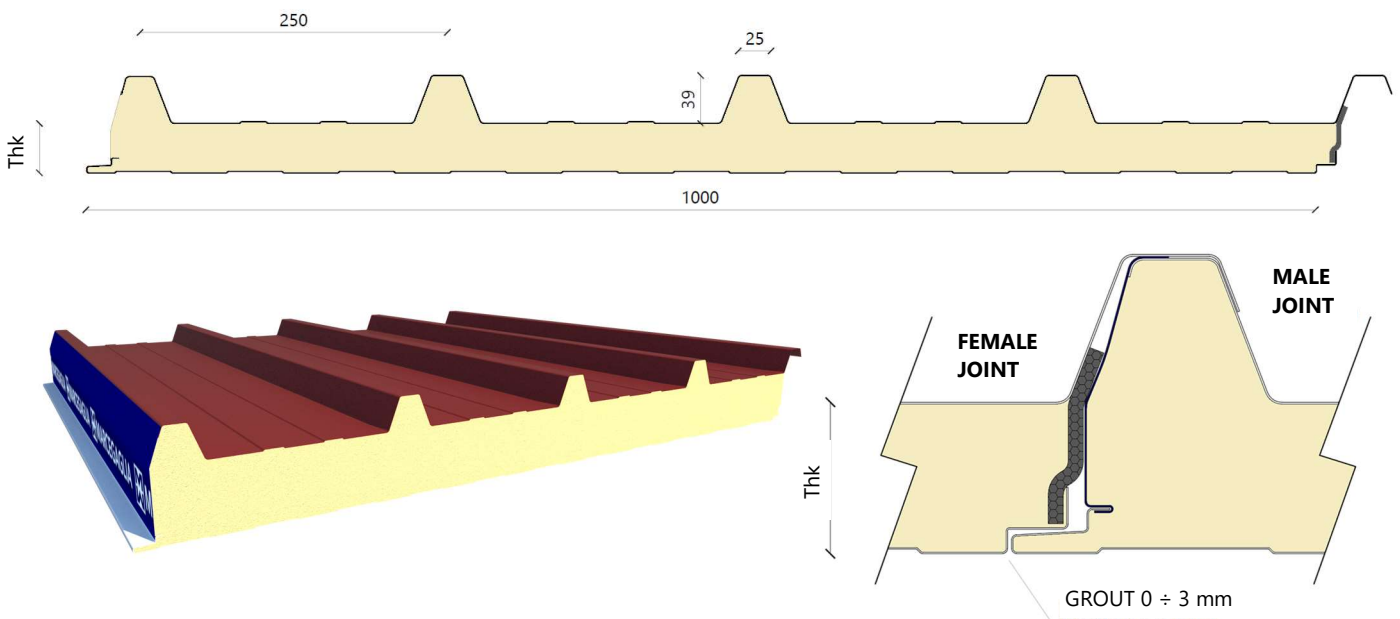
MB ROOF MONO - 5 ribs single-sheet panels with polyurethane foam insulation, used for the construction of sloping roofs.

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

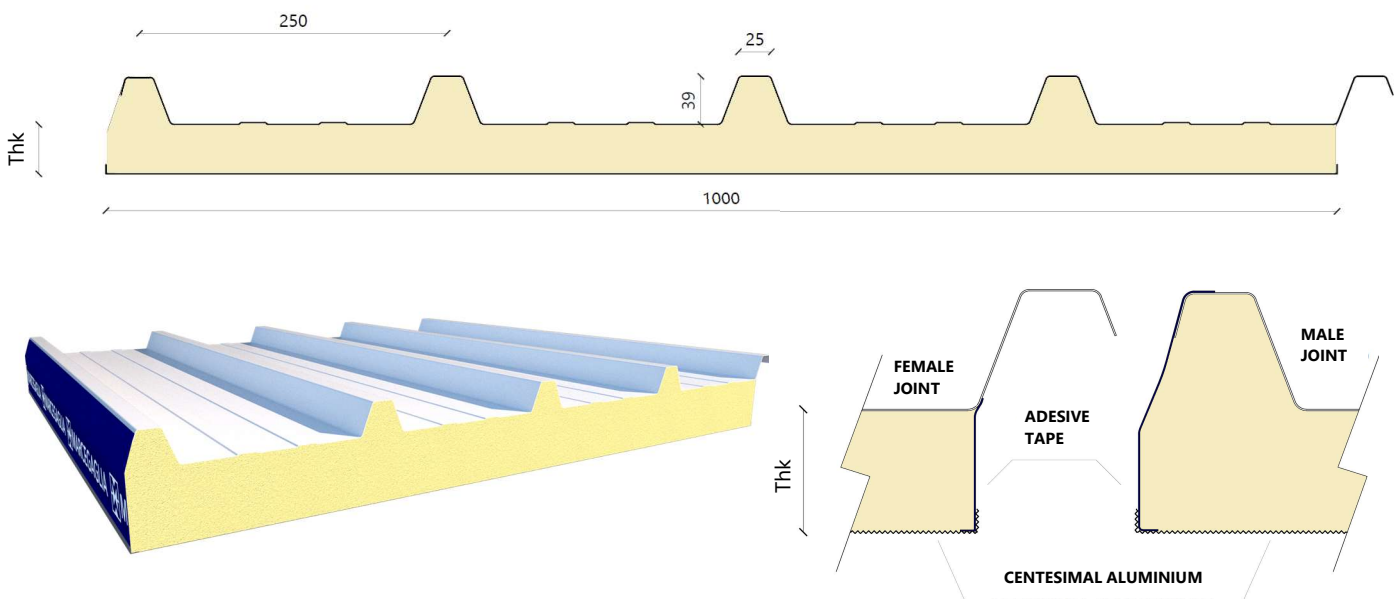
Imperfections related to flatness, undulations and wrinkles are to be considered a normal product feature.

Products typology

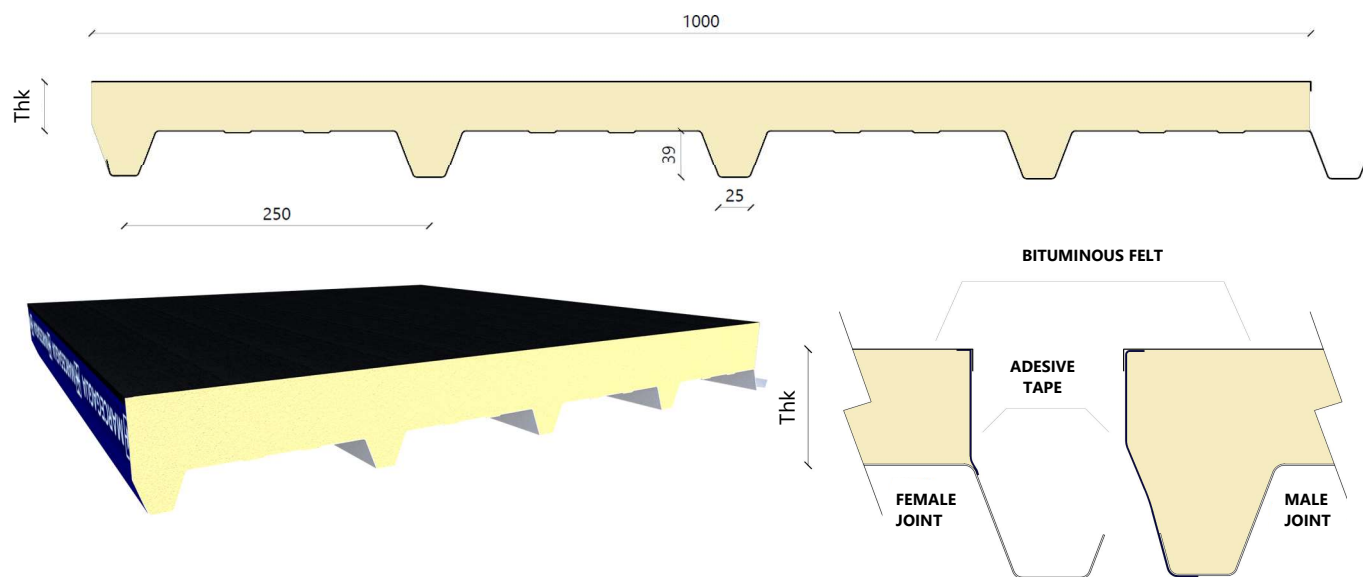
MB ROOF - TD5



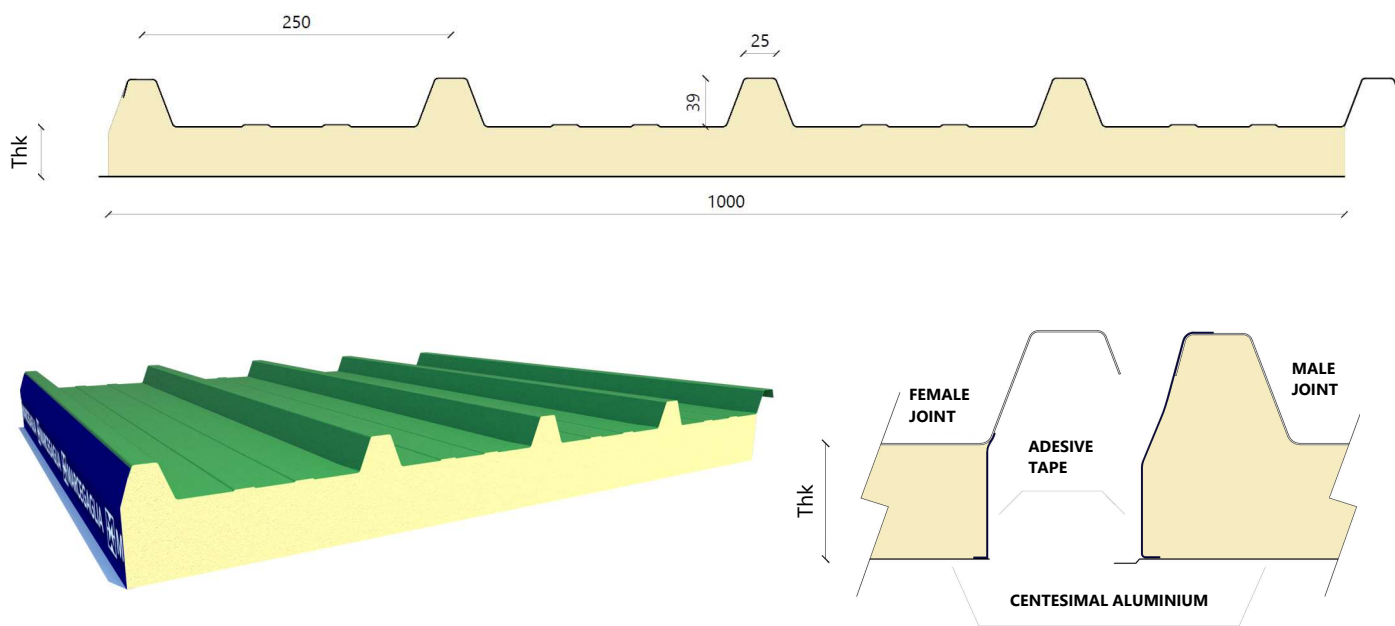
MB ROOF MONO with centesimal aluminium facing - TK5 AC



MB ROOF MONO with bituminous felt facing - TK5 CF



MB ROOF MONO with fibreglass facing - TV5



The seal of the joint depends mainly on the rib overlap and the correct installation of the panel. Given the nature of the single-sheet panels and the modest air-tightness from the inside, it is possible that the aggressive agents present in the environment can penetrate into the joint, thus affecting the external support from the unprotected side causing premature corrosion.

Therefore it is essential to know the environmental conditions, the aggressive agents present and the degree of ventilation of the environment in order to assess the suitability of the product in question.

Considering the fragility of the fibreglass sheet, we recommend the utmost care during installation.

It is possible that imperfections due to the flatness of the support are present, but they CANNOT be the subject of a complaint as they respond to the normal characteristics of the product.

Technical specifications

	TD5	TK5 AC	TK5 CF	TV5
Useful width	1000mm			
Length	Variable according to the construction needs related to the dimensions of the roofs to be made. Maximum productive length 15 m. Standard transport limits 13.5 m.			
Panel thickness	30 / 40 / 50 / 60 / 80 / 100 / 120 / 150	15 / 30 / 40 / 50 / 60 / 80 / 100 / 120 / 150		30 / 40 / 50 / 60 / 80 / 100
Insulation	CFC and HCFC-free polyurethane formulations are used which produce anigroscopic 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/m³ ± 3			
Thermal conductivity λ	λ = 0,021 W/mK			
Slope of the pitch	<p>The slope applied on building roofing must be greater than or equal to 7% (4°). Lesser slopes will be permitted only after a technical evaluation by Marcegaglia.</p> <p>An inclination of less than 7% is 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>			
Tolerances	<p>Panel thickness: ± 2 mm if ≤ 100 mm; ± 2 % if > 100 mm</p> <p>Panel length: ± 5 mm if L ≤ 3 m, ± 10 mm if L > 3 m</p> <p>Panel width (pitch): ± 2mm</p> <p>Rib height: ± 1mm</p> <p>Pitch between ribs: ± 2mm</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 for L >700 mm</p> <p>Deviation from squareness: ± 3mm</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.

Plasticized galvanized steel EN 10346

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

Stainless Steel, in accordance with requirements EN 1172, EN 1173, EN 1412.

Facings for single sheet panels

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

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

Description: flat rolled in coils, made of orthophthalic polyester resin, UV stabilized, reinforced with textile glass fibres, laminated and heat cured.

Standard colour: opal white.

Fire behaviour: classified "non-drip".

Ageing: the use of polyester resins stabilized to UV rays slows down the yellowing of the material which will in any case be greater and more rapid in applications with direct sunlight; the surface emergence of glass fibres occurs mainly in outdoor use and in any case does not affect the functional characteristics of the laminate.

Resistance to chemical agents: acids/ excellent, alcohols/ excellent, alkali/ good, solvents/ good. For more detailed information, it is necessary to know the nature and concentration of the chemical agent and the environmental conditions of use. Excellent resistance to moulds.

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 ROOF - TD5

STEEL

Supports thk [mm]	Weight per panel thickness [Kg / m ²]							
	30	40	50	60	80	100	120	150
0,4 / 0,4	8,20	8,60	8,95	9,35				
0,5 / 0,5	10,00	10,40	10,80	11,15	11,90	12,65	13,45	13,45
0,6 / 0,6	11,85	12,20	12,60	13,00	13,75	14,50	15,25	16,40

ALUMINIUM

Supports thk [mm]	Weight per panel thickness [Kg / m ²]					
	30	40	50	60	80	100
0,6 / 0,6	5,00	5,40	5,80	6,15	6,95	7,70

MB ROOF MONO - TK5 AC - TK5 CF - TV5

	Supports thk [mm]	Weight per panel thickness [Kg / m ²]								
		15	30	40	50	60	80	100	120	150
Steel	0,5	5,95	6,55	6,90	7,30	7,65	8,45	9,20	9,95	11,10
	0,6	6,95	7,50	7,90	8,30	8,65	9,40	10,20	10,95	12,10
	0,7	7,95	8,50	8,90	9,25	9,65	10,40	11,15	11,90	13,05
	0,8	8,90	9,50	9,85	10,25	10,60	11,40	12,15	12,90	14,05
	1,0	10,90	11,45	11,80	12,20	12,60	13,35	14,10	14,85	16,00
Aluminium	0,6	3,25	3,85	4,20	4,60	5,00	5,75	6,50	7,25	8,40
	0,7	3,60	4,20	4,55	4,95	5,30	6,10	6,85	7,60	8,75
	0,8	3,95	4,50	4,90	5,30	5,65	6,40	7,20	7,95	9,10
	1,0	4,60	5,20	5,55	5,95	6,35	7,10	7,85	8,60	9,75

The maximum thickness of MB ROOF MONO panels with fibreglass facing is 100 mm.

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 ROOF - TD5

TD5 PANEL STEEL																
Panel thickness	U	Supports thickness	Uniformly distributed load in kN/m ² [1/200 span]													
			SINGLE SPAN [m]							MULTIPLE SPAN [m]						
mm	W/m ² K	mm	2	2,5	3	3,5	4	4,5	5	2	2,5	3	3,5	4	4,5	5
30	0,67	0,4/0,4	1,43	0,97	0,63	0,43				1,48	1,06	0,77	0,52	0,36		
		0,5/0,5	2,50	1,70	1,10	0,75				3,29	2,35	1,70	1,15	0,80	0,55	
		0,6/0,6	2,68	1,82	1,18	0,80				3,48	2,51	1,82	1,23	0,86	0,59	
40	0,51	0,4/0,4	1,69	1,26	0,91	0,63	0,42			1,88	1,33	0,97	0,74	0,52	0,39	
		0,5/0,5	2,95	2,20	1,60	1,10	0,74	0,50		4,18	2,95	2,15	1,65	1,15	0,86	0,62
		0,6/0,6	3,13	2,35	1,71	1,18	0,79	0,54		4,38	3,72	2,30	1,77	1,23	0,92	0,66
50	0,41	0,4/0,4	1,97	1,51	1,14	0,80	0,54	0,40		2,16	1,67	1,22	0,90	0,68	0,47	0,37
		0,5/0,5	3,45	2,65	2,00	1,40	0,95	0,70		4,81	3,72	2,70	2,00	1,50	1,05	0,82
		0,6/0,6	3,61	2,84	2,14	1,50	1,02	0,75	0,50	5,00	3,88	2,98	2,14	1,61	1,12	0,88
60	0,34	0,4/0,4	2,33	1,66	1,34	1,06	0,74	0,55	0,42	2,61	2,02	1,45	1,12	0,89	0,70	0,49
		0,5/0,5	4,08	2,90	2,35	1,85	1,30	0,96	0,73	5,79	4,48	3,23	2,48	1,98	1,55	1,08
		0,6/0,6	4,21	3,10	2,51	1,98	1,39	1,03	0,78	5,98	4,67	3,41	2,65	2,12	1,66	1,16
80	0,26	0,5/0,5	5,10	3,74	2,80	2,25	1,78	1,30	1,10	7,03	5,31	4,43	3,38	2,50	2,10	1,50
		0,6/0,6	5,30	3,90	2,98	2,41	1,90	1,39	1,18	7,19	5,52	4,62	3,59	2,68	2,25	1,61
100	0,21	0,5/0,5	6,20	4,48	3,30	2,72	2,20	1,70	1,40	8,06	6,31	5,06	4,00	3,42	2,85	2,05
		0,6/0,6	6,30	4,67	3,50	2,92	2,40	1,90	1,60	8,30	6,53	5,22	4,28	3,70	3,06	2,27
120	0,17	0,5/0,5	6,51	4,98	3,61	3,03	2,51	2,01	1,71	8,34	6,59	5,34	4,28	3,70	3,13	2,33
		0,6/0,6	6,61	5,19	3,81	3,23	2,71	2,21	1,91	8,58	6,81	5,50	4,56	3,98	3,34	2,55
150	0,14	0,5/0,5	6,84	5,54	3,95	3,38	2,86	2,38	2,09	8,63	6,88	5,64	4,58	4,00	3,44	2,65
		0,6/0,6	6,94	5,77	4,15	3,57	3,06	2,57	2,28	8,87	7,10	5,80	4,86	4,28	3,65	2,86

TD5 PANEL ALUMINIUM																
Panel thickness	U	Supports thickness	Uniformly distributed load in kN/m ² [1/200 span]													
			SINGLE SPAN [m]							MULTIPLE SPAN [m]						
mm	W/m ² K	mm	2	2,5	3	3,5	4	4,5	5	2	2,5	3	3,5	4	4,5	5
30	0,68	0,6/0,6	1,60	0,90						2,20	1,30	0,80				
40	0,51	0,6/0,6	2,10	1,25	0,70					2,80	1,90	1,15	0,76			
50	0,41	0,6/0,6	2,25	1,60	1,00	0,65				3,10	2,30	1,45	1,00	0,70		
60	0,35	0,6/0,6	2,70	2,10	1,32	0,90	0,62			3,40	2,75	2,00	1,28	0,90	0,68	
80	0,26	0,6/0,6	3,35	2,50	1,80	1,25	0,90	0,60		3,75	3,20	2,50	1,85	1,20	0,90	0,65
100	0,21	0,6/0,6	3,90	3,00	2,45	1,90	1,40			4,15	3,65	2,90	2,40	1,90	1,10	0,85

MB ROOF MONO - TK5 AC - TK5 CF - TV5

TK5 AC - TK5 CF - TV5 PANELS STEEL												
Panel thickness	Uniformly distributed load in kN/m ² [1/200 span]											
	SINGLE SPAN [m]											
mm	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3	3,25	3,5	3,75
0,5	5,10	3,32	2,31	1,69	1,30	0,96	0,71					
0,6	6,14	3,93	2,73	2,00	1,53	1,15	0,84	0,63	0,48	0,38		
0,7	7,16	4,58	3,18	2,34	1,79	1,35	0,98	0,73	0,57	0,44	0,35	
0,8	8,20	5,24	3,64	2,67	2,05	1,54	1,12	0,84	0,65	0,51	0,41	0,33
1,0	10,24	6,55	4,55	3,34	2,56	1,93	1,40	1,05	0,81	0,64	0,51	0,41

TK5 AC - TK5 CF - TV5 PANELS STEEL												
Panel thickness	Uniformly distributed load in kN/m ² [1/200 span]											
	MULTIPLE SPAN [m]											
mm	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3	3,25	3,5	3,75
0,5	6,64	4,30	2,88	2,12	1,63	1,30	1,05	0,56	0,69	0,54		
0,6	7,68	4,91	3,41	2,51	1,92	1,52	1,23	1,01	0,81	0,64	0,51	
0,7	9,46	6,12	4,27	3,13	2,39	1,81	1,43	1,18	10,95	0,74	0,59	0,48
0,8	11,04	7,04	4,87	3,56	2,71	2,13	1,64	1,35	1,08	0,85	0,68	0,55
1,0	14,13	9,16	6,33	4,63	3,52	2,77	2,04	1,69	1,35	1,06	0,85	0,69

TK5 AC - TK5 CF - TV5 PANELS ALUMINIUM														
Panel thickness	Uniformly distributed load in kN/m ² [1/200 span]													
	SINGLE SPAN [m]							MULTIPLE SPAN [m]						
mm	1	1,25	1,5	1,75	2	2,25	2,5	1	1,25	1,5	1,75	2	2,25	2,5
0,6	2,97	1,90	1,28	0,80	0,54	0,38	0,28	3,71	2,37	1,65	1,21	0,90	0,60	0,45
0,7	3,46	2,21	1,49	0,94	0,63	0,44	0,32	4,33	2,77	1,92	1,41	1,05	0,74	0,54
0,8	3,96	2,53	1,70	1,07	0,72	0,51	0,37	4,95	3,16	2,20	1,62	1,20	0,84	0,61
1,0	4,94	3,16	2,13	1,34	0,90	0,63	0,46	6,18	3,96	2,75	2,02	1,50	1,05	0,77

MB ROOF MONO con supporto in cartonfeltro - TK5 CF utilizzati in modalità deck

TK5 CF PANEL - DECK assembly system STEEL												
Panel thickness	Uniformly distributed load in kN/m ² [1/200 span]											
	SINGLE SPAN [m]											
mm	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3	3,25	3,5	3,75
0,5	4,02	2,55	1,85	1,15	0,76	0,51	0,36	0,26	0,20			
0,6	6,35	4,04	2,54	1,58	1,04	0,71	0,50	0,36	0,27	0,20		
0,7	8,47	5,40	3,13	1,95	1,28	0,88	0,62	0,45	0,33	0,25		
0,8	10,60	6,56	3,77	2,34	1,54	1,06	0,75	0,55	0,40	0,30	0,23	
1,0	12,71	8,11	5,17	3,22	2,13	1,46	1,04	0,76	0,56	0,42	0,32	0,24

TK5 CF PANEL - DECK assembly system STEEL												
Panel thickness	Uniformly distributed load in kN/m ² [1/200 span]											
	MULTIPLE SPAN [m]											
mm	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3	3,25	3,5	3,75
0,5	3,83	2,44	1,70	1,24	0,94	0,74	0,59	0,48	0,44	0,34	0,28	0,21
0,6	5,62	3,60	2,50	1,83	1,39	1,09	0,87	0,71	0,59	0,46	0,36	0,28
0,7	7,21	4,63	3,21	2,35	1,79	1,40	1,12	0,92	0,72	0,56	0,43	0,34
0,8	8,01	5,15	3,57	2,61	1,99	1,56	1,25	1,02	0,85	0,66	0,51	0,40
1,0	10,40	6,68	4,64	3,39	2,58	2,03	1,63	1,33	1,10	0,89	0,69	0,55

Fire behaviour

Reaction to fire

Indicates the degree of participation of a material in the fire to which it is subjected.

The European standard **UNI EN 13501-1** of 2009 regulates the reaction to fire classification of construction products and elements by defining:

- 7 **Euroclasses** that indicate the contribution to fire of products in an increasing manner, from class A1 for non-combustible products, to class F for products that are not tested or classified.
- 3 classes for **smoke** emission:
 - **s1** smoke absent
 - **s2** low emission of smoke
 - **s3** high emission of smoke
- 3 classes for **dripping**:
 - **d0** absence of flaming particles
 - **d1** low presence of flaming particles
 - **d2** high presence of flaming particles (drips)

MB ROOF panels can reach the Bs2d0 fire performance level under certain configuration conditions agreed upon with the technical and commercial office. The declaration concerning the performance degree will only be issued under these conditions.

Fire resistance

This refers to the ability of a construction element (wall, intermediate floor, roof slab) to maintain the following requirements for a certain period of time under certain thermal and load conditions:

- **mechanical strength (R)**: ability of the construction element to withstand loading actions during exposure to fire;
- **hermeticity (E)**: ability of the constructive element not to let pass or produce flames, vapours or hot gases on the unexposed side;
- **thermal insulation (I)**: ability of the construction element to limit the transmission of heat during exposure to fire.

The three requirements listed are combined in the following ways: **REI / RE / EI / R** followed by a number indicating **the fire resistance class** (time in minutes during which resistance is guaranteed).

MB ROOF panels can reach different fire performance levels under certain configuration conditions agreed upon with the technical and commercial office. The declaration concerning the performance degree will only be issued under these conditions.

Fire behaviour from the outside (Broof)

This refers to the capacity of a building roof to prevent an external fire from entering the building and is based on tests that simulate the ignition and propagation of the fire on the roof:

- **t1**, burning ember only;
- **t2**, burning ember in the presence of wind;
- **t3**, burning ember in the presence of wind and irradiation;
- **t4**, burning ember in the presence of wind and additional radiant heat.

MB ROOF panels can reach different Broof performance levels under certain configuration conditions agreed upon with the technical and commercial office. The declaration concerning the performance degree will only be issued under these conditions.

Please note that the mechanical, reaction and resistance performance to fire and behaviour to fire on roofs must be requested and agreed upon in advance when purchasing the material.

Unless specifically requested, the product supplied will have no fire behaviour performance.

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 ⁻¹]
Steel	12,0 x 10 ⁻⁶
Stainless steel AISI 304	17,0 x 10 ⁻⁶
Aluminium	23,6 x 10 ⁻⁶
Fiberglass	3,2 x 10 ⁻⁵

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 7% 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.

The overlapping values that are generally adopted in normal weather conditions are as follows:

Slope [%]	Overlapping [mm]
$7 < P \leq 10$	250
$10 < P \leq 15$	200
$P > 15$	150

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.

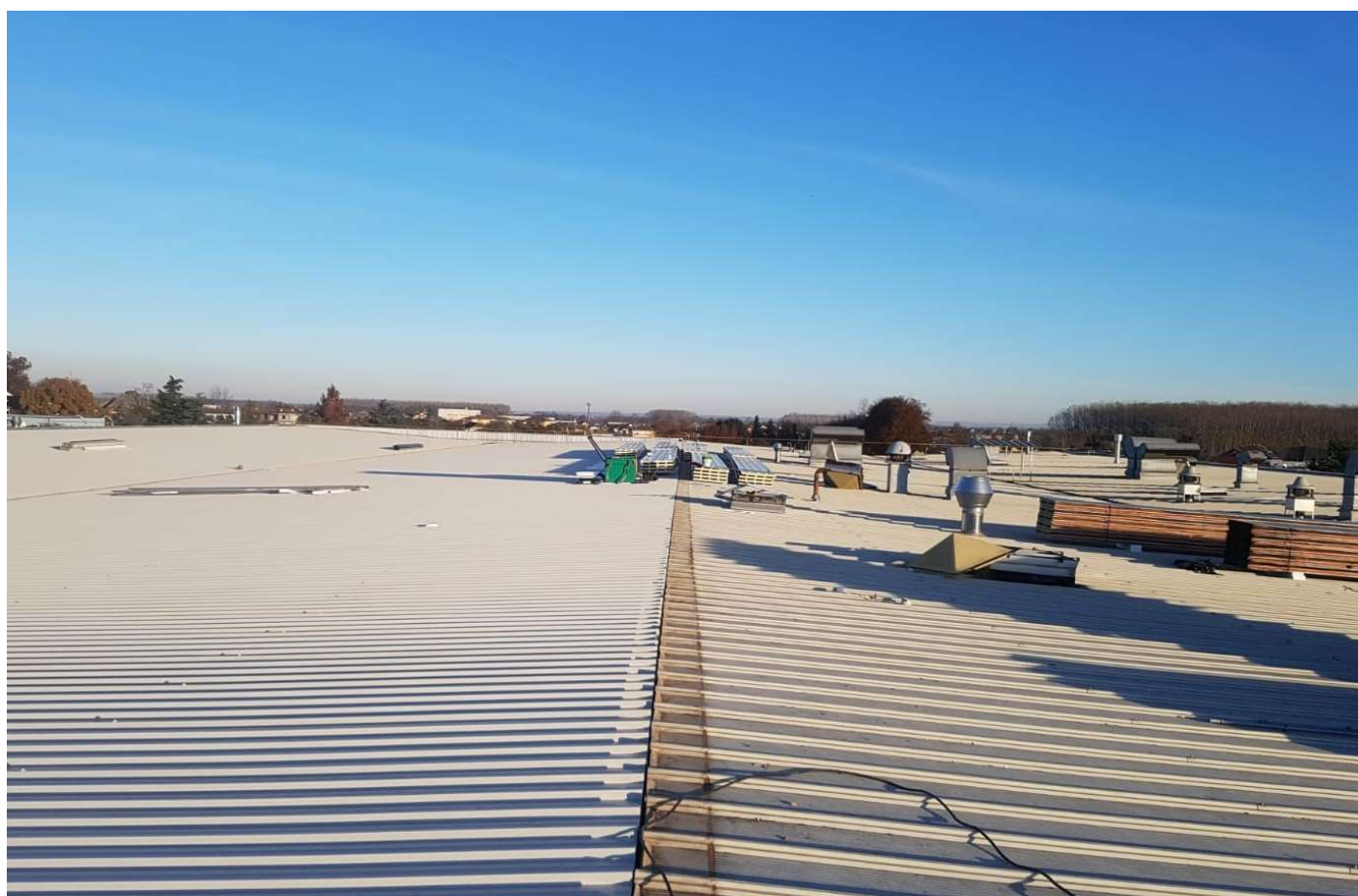
Note that the nature of metallic coatings in conditions of solar radiation permits the external surface temperature of the panel to reach very high temperatures ($80 \div 90^{\circ} \text{C}$), with consequent possible bending and wrinkling of the sheet. Marcegaglia Buildtech, in order to limit the occurrence 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 / Package	Package height (including blocks)
mm		mm
15	18	724
30	16	860
40	12	784
50	10	766
60	10	866
80	8	868
100	6	790
120	4	632
150	4	752



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.

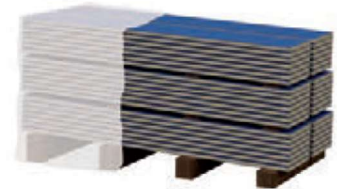


In the absence of a sling bar, in some cases unloading can also be done by using suitable forklift trucks. To avoid damaging the panel or even breaking the package, in these cases the distance between the forks and the width of the lifting equipment must take into account the length of the pack, its 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 ≥ 2 mm), more rarely aluminium (thickness ≥ 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, cap with gasket and washer. 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 ribs: to have a better anchorage, a **cap**, pressure cap and cover is inserted between the screw and the profiled sheet, which adapts to the trapezoidal profile of the sheet, fitted with an internal gasket. A **PVC washer** positioned between the cap and the screw prevents the penetration of moisture.

- **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.

- **Stitching screws (C)**

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

- **Pre-painted steel / aluminium caps (D)**



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



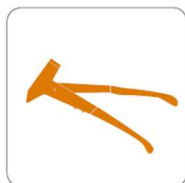
**VACUUM
CLEANER**



SHEARS
(right and left)



**ANGLE
GRINDER**



RIVETER
2,5-5 mm



MOLE GRIPS



PLUM LINE



**LASER
MEASURER**



SCRAPER



SPIRIT LEVEL



**UNIVERSAL
PLIERS**



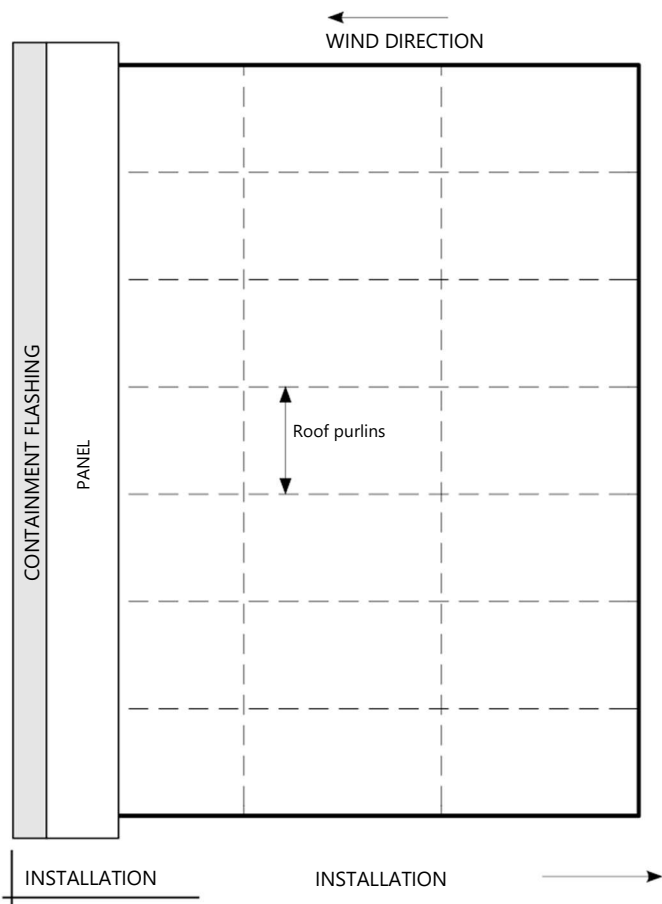
MALLET

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.

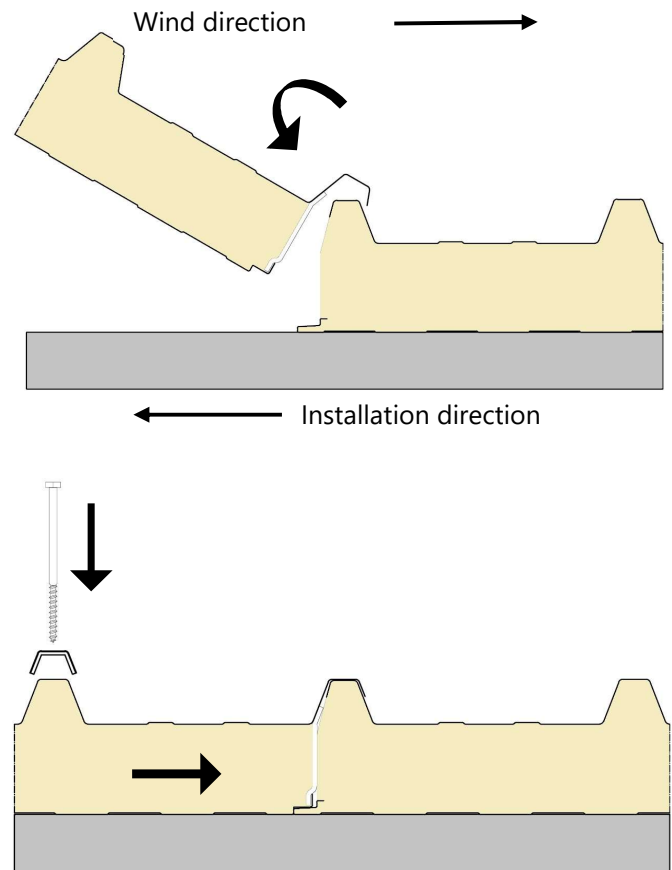
It is good practice to lay the panels **following the direction of the prevailing winds**, with the male facing the wind. In this way it is possible to avoid the risk that the action of the wind can cause infiltration through the joint.



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 flat part downstream of the first rib, for each underlying purlin.



The second panel must be installed overlapping the empty rib on the full rib of the first panel.

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

Maintaining the exerted pressure, place the first fixing screw on one of the free ribs after the false rib of the joint, making sure that it is perpendicular to the surface of the panel and centred on the rib; to be sure of the centring, we recommend using the cap as a template.

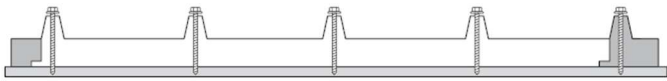
Finally, check for perfect overlapping, making sure that the external surfaces of the two adjacent panels are completely in contact and levelled.

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

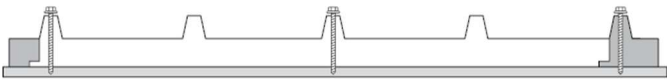
When carrying out the installation operations, avoid placing pointed or sharp objects and concentrated loads on the surfaces of the panels. Also avoid performing other welding or cutting operations in the immediate vicinity of the panels.

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

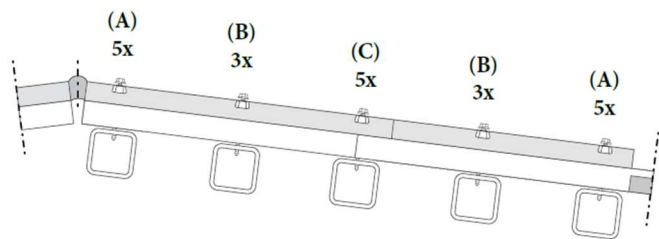
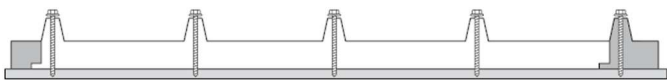
- **Ridge and eave end supports (A):**
application of a screw on each rib.



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



- **Supports with transversal overlapping (C):**
application of a screw on each rib.



Fix the roofing panel with the appropriate screws.

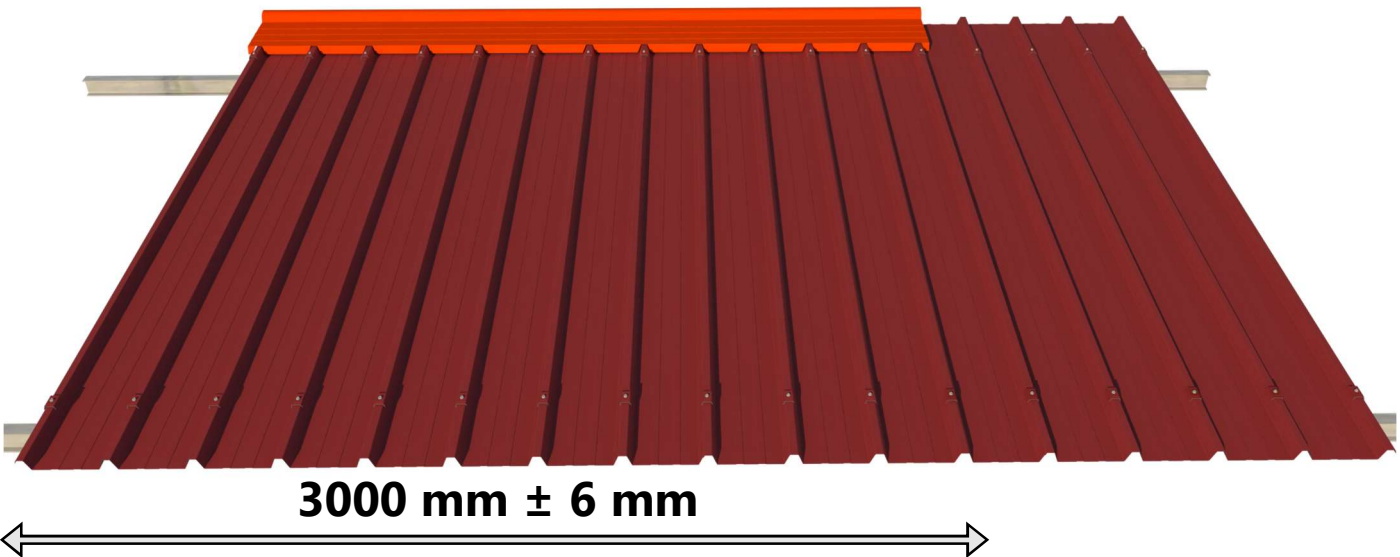
The chart shows the **recommended useful lengths for the screws** according to the thickness in mm of the roofing panel to be fitted regardless of its type.

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

Panel thickness	Minimum length of the screws
15	75 mm
30	90 mm
40	100 mm
50	110 mm
60	120 mm
80	140 mm
100	160 mm
120	180 mm
150	210 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.



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 ribs.

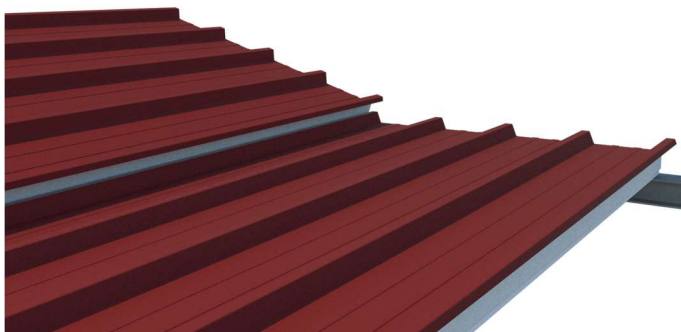
Overlapping

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 following the sequence illustrated.

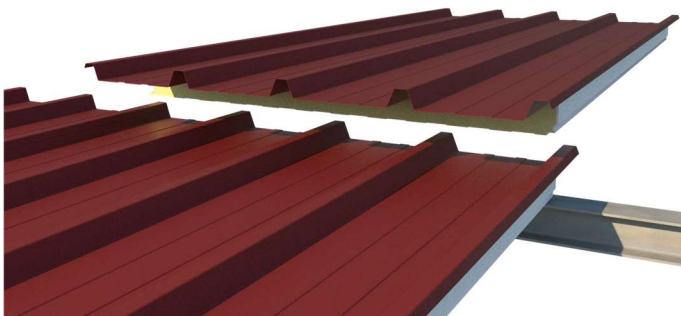
The pitch overlapping between panels can range from a minimum of 100 mm to a maximum of 300 mm, depending on the slope of the roof. In the case of gentle slopes, to give the overlap a greater resistance to atmospheric agents, it is good practice to place one or two strips of sealing material between the sheets downstream of the fixing unit.

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

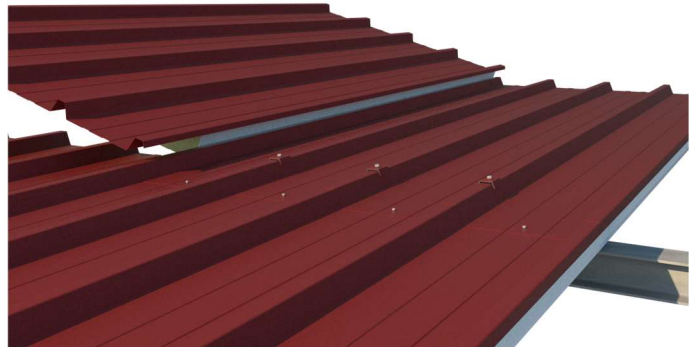
The pitch overlapping between the panels is executed as illustrated in the following figures.



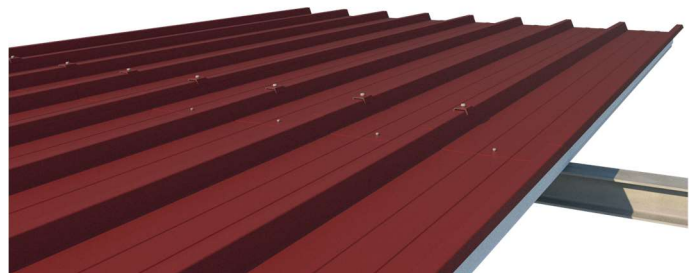
Fixing the panels along the eaves line.



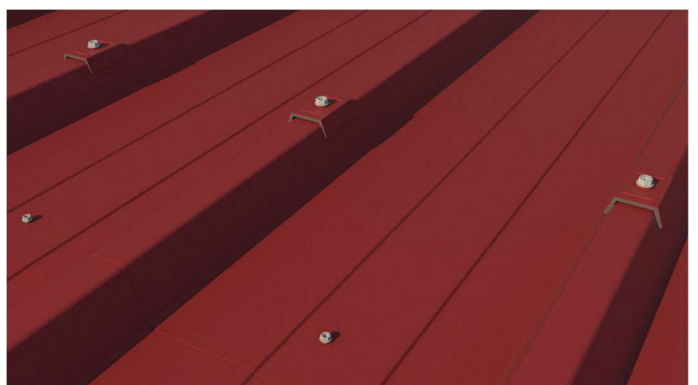
With the first line of panels completed, proceed with the overlapping of the first panel.



Complete the overlapping phase by positioning the panels one at a time, making sure that they are correctly fixed with the screws.



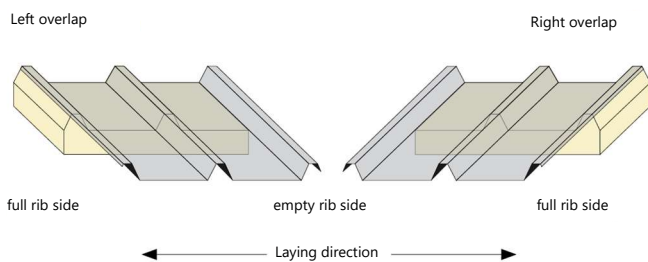
Example of a complete overlapping with structural and stitching fixing screws.



Example of structural and stitching fastenings.

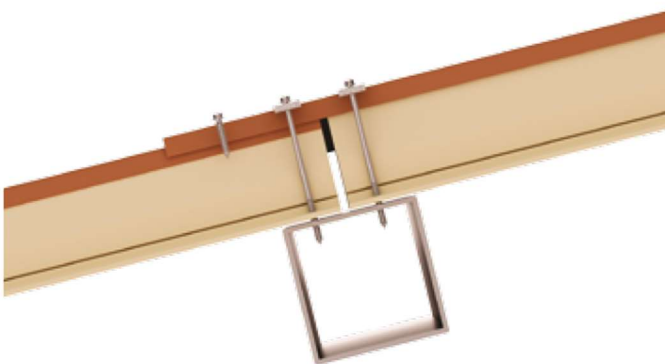
When the roof of a building has two or more fascia, it must be remembered that the panel has its own laying direction.

The panel has a "hand" when the preparation of the overlapping cut is provided during the machining operation. The panel has a **"right hand"** if, looking from the eaves towards the ridge, the overlapping rib is on the left; the panels are thus fitted from left to right. If the empty rib is instead on the right, the panel has a **"left hand"**. The laying direction in this case is from right to left.



Once the panel is in place, drill the first hole. Remember to use the cap as a template, to center hole on the rib well. Always make sure the hole is perpendicular to the panel surface.

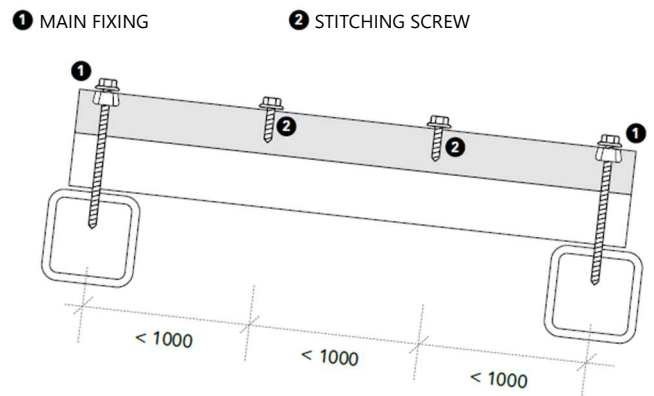
To properly fix the two overlapping panels in the joint area, it is recommended to use an **additional fixing**, as described in the following figure.



In this way the shear stresses are more effectively relieved on the supporting structure via the fixing units. This layout is suitable above all for overlapping panels of greater length.

The sheet of the upstream overlapping panel overlaps the downstream panel and is fixed with stitching screws at the ribs 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 using a 6.3x20 mm diameter stitching screw with a washer cap.



Additional measures to be taken in the event:

Additional measures are provided during the design and construction phase if the safety requirements of the roof are increased; a similar case occurs, for example, when the slope is not regular, when strong wind loads are present or with rain and snow accompanied by high wind the same happens when several surfaces and valleys meet at one point of the eaves, when protruding parts on the roof surface impede the flow of water or when working with transverse joints.

The following additional measures may apply, to name some examples:

- increase in the slope of the roof
- additional hermetic sealing measures
- increase in longitudinal covering
- increase in transversal covering

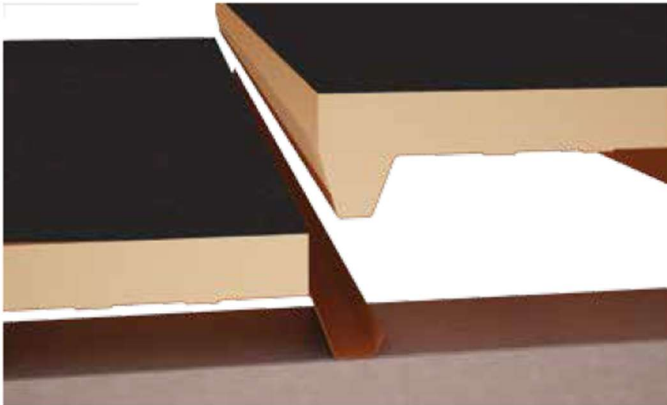
It is possible to assemble the corrugated double-wall panels with wall positioning (horizontal - vertical installation).

Deck installation system

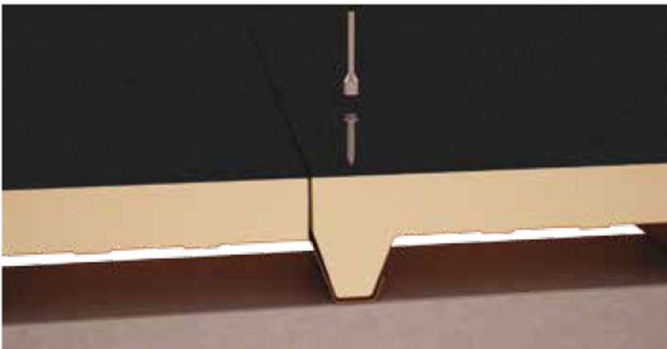
The deck installation system is suitable for the creation of flat or inclined roofs to be waterproofed during the work phase and for applications with false ceilings.

These installations are made by using single-sheet 5 ribs and felt paper panels installed **upside down** which means having the ribs facing the inside of the building.

At the end of the installation, the outer surface of the felt paper panels must be completed with a **bituminous membrane**.



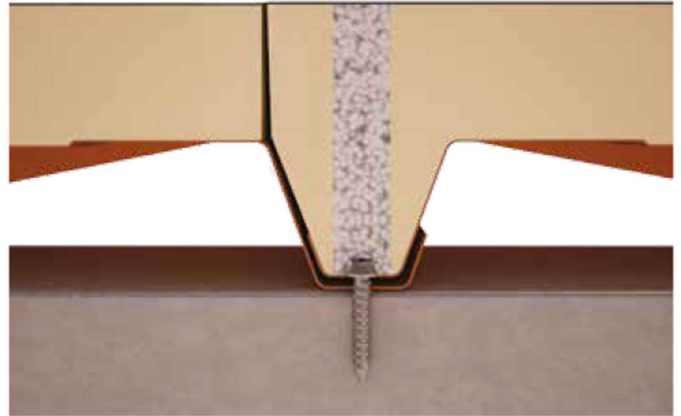
Transversely overlap the roofing panels.



Create the **through core** down to the rib below.



Tighten the appropriate fixing screw on the supporting substructure (for example using self-drilling screws). Then fill the core hole with **polyurethane foam** or other insulation.



Notes:

- The bituminous felt layer should never come into contact with open flames.
- The sides of the upper surface must not remain in direct contact with atmospheric agents.

In the case of continuous slabs or non-visible surfaces, the single-sheet 5 ribs and felt paper panels can be fitted in the traditional configuration. In this case we recommend using the standard fixing system (screw and cap).

Installation of fibreglass roofing panels

For agro-zootechnical applications, it is advisable to use panels with a lower fibreglass support, which gives the panel a **high resistance to chemical and bacterial agents** (in particular urea and ammonia) and good resistance to abrasion.

Proceed with fixing the established points with the standard screw and cap system.

Cleaning:

- It is possible to clean the fibreglass with normal detergents (degreaser, etc.) or, if necessary, it is possible to apply mild solvents or acetone.
- A pressure washer can be used at a distance NOT less than 100 mm and with reduced pressure jets. It is advisable to carry out a preliminary test on a limited area and continue cleaning with the jet in a direction that does not open the joint.

Installation of translucent elements

Translucent corrugated sheets are generally made of polyvinyl chloride (PVC), polymethylmethacrylate (acrylic glass), polycarbonate (PC) and fibreglass.

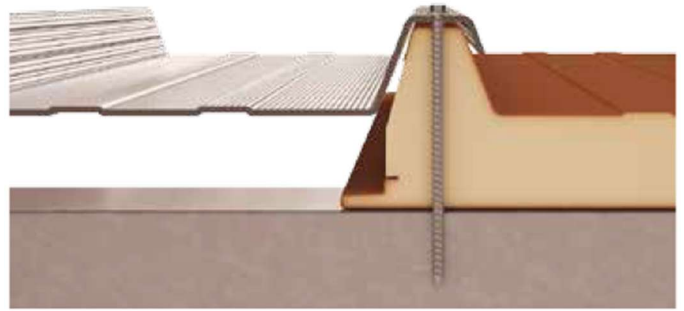
They are used in roofing applications in combination with insulating panels and metal corrugated profiles, to create **skylights and lighting points**



The installation involves the use of suitable fixing systems (screws, gaskets and caps) and is completed with the positioning of upper and lower rib sealing elements to allow insulation and eliminate infiltrations.



The sheets can also be very large and used in large structures; for this it is necessary to provide the support with intermediate structures in metal or other material, to avoid deformation or damage.



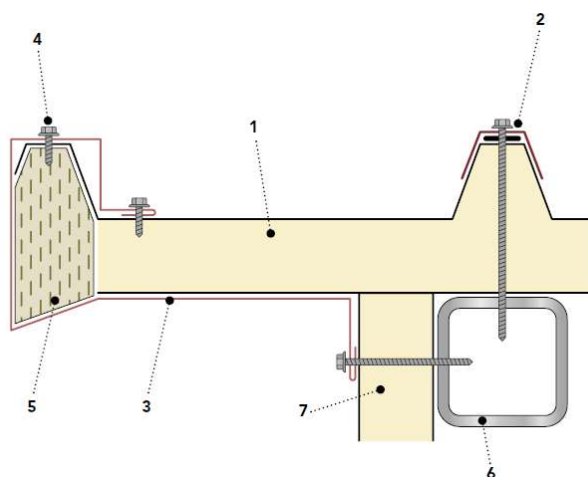
Fixing of the translucent corrugated sheet on the corrugated panel.

Notes:

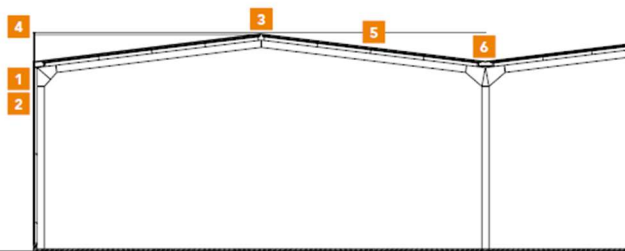
- Observe the minimum slope indication of 7% to facilitate the runoff of rainwater. Air and water tightness is strictly dependent on the type of profiles and gaskets used.
- Do not walk directly on the polycarbonate sheets during installation or maintenance. The sheets cannot be walked on directly and may be susceptible to breakage.
- If it is necessary to access the roof, it is advisable to position boards that rest on multiple support cross-piece, so as to distribute the weight. Protect the sheet from scratches with appropriate cloths.

Examples of solutions for the installation of roofing panels

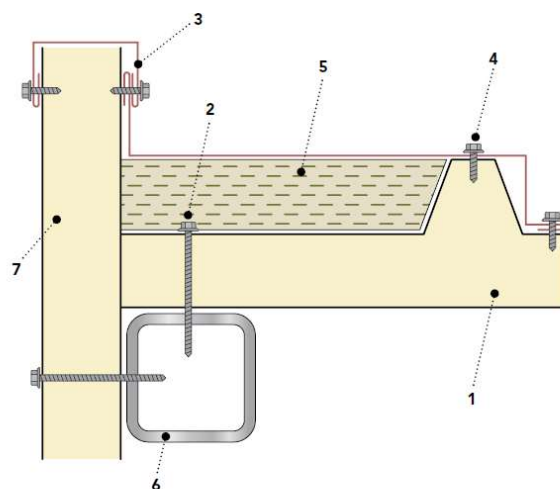
1a - Cantilever roof panels on the external wall



1	Roof panel
2	Fixing system (screw, cap, washer)
3	Sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screws
5	Filler mineral wool
6	Steel structure according to the technical drawing
7	Wall panel

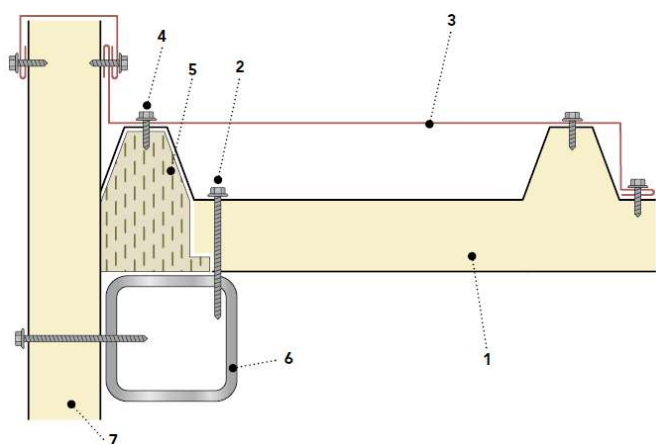


1b - Connection of roof panels with wall panels



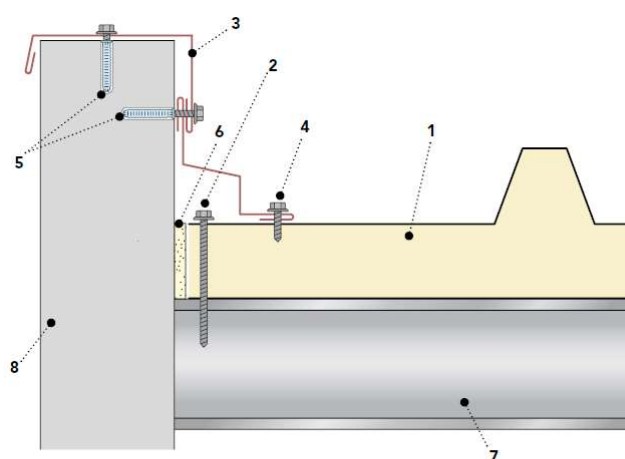
1	Roof panel
2	Panel fixing screws
3	Sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screws
5	Filler mineral wool
6	Steel structure according to the technical drawing
7	Wall panel

1c - Connection of roof panels with wall panels



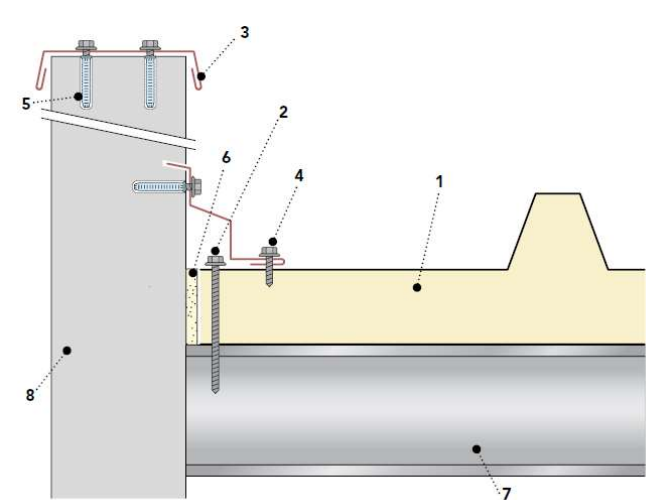
1	Roof panel
2	Panel fixing screws
3	Sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screws
5	Filler mineral wool
6	Steel structure according to the technical drawing
7	Wall panel

2a - Connection of roof panels with masonry walls



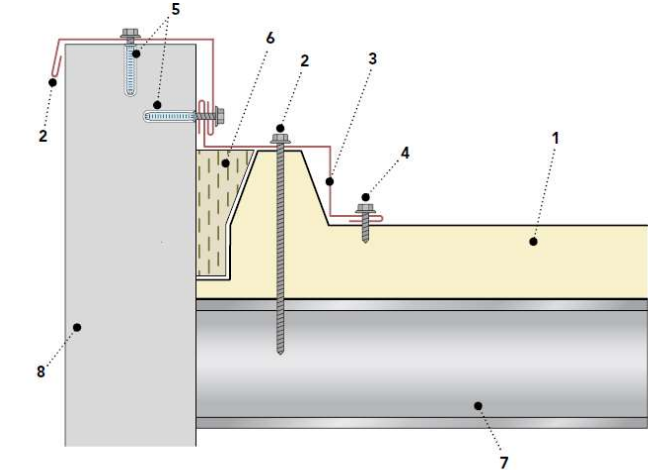
1	Roof panel
2	Panel fixing screw
3	Sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screws
5	Anchor
6	Filler polyurethane foam
7	Steel structure according to the technical drawing
8	Masonry wall

2b - Connection of roof panels with masonry walls

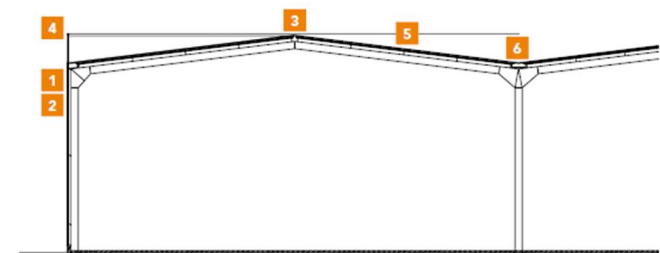


1	Roof panel
2	Panel fixing screw
3	Sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screw
5	Anchor
6	Filler polyurethane foam
7	Steel structure according to the technical drawing
8	Masonry wall

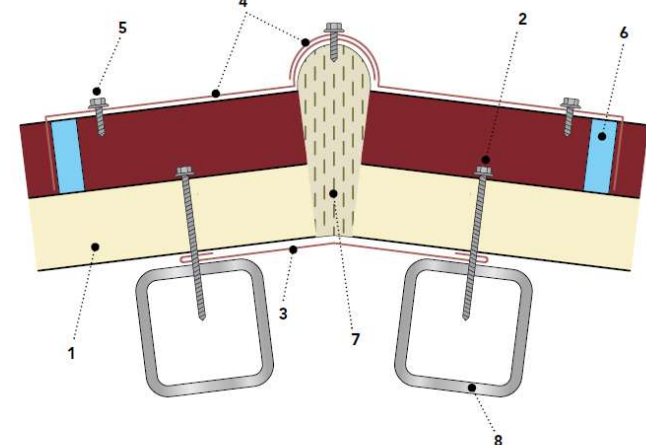
2c - Connection of roof panels with masonry walls



1	Roof panel
2	Panel fixing screw
3	sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screws
5	Anchor
6	Filler mineral wool
7	Steel structure according to the technical drawing
8	Masonry wall

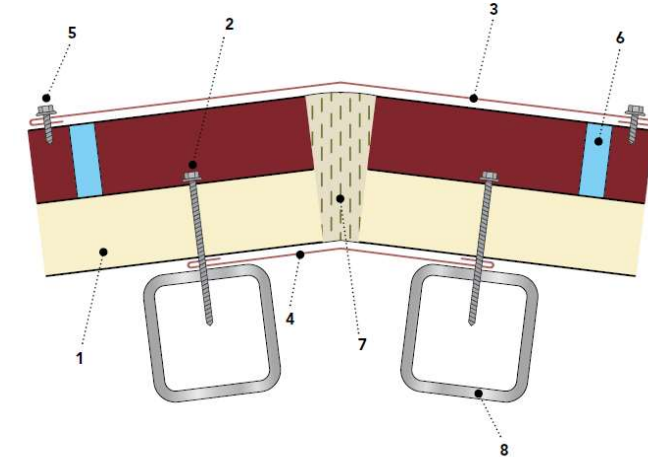


3a - Roof panel joining at ridge



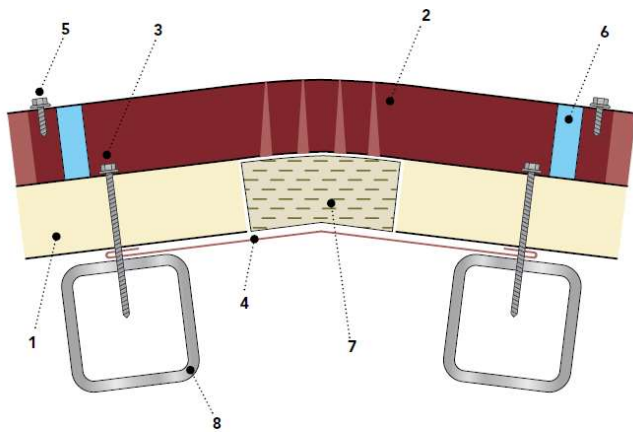
1	Roof panel
2	Panel fixing screws
3	Under-ridge sheet metalwork
4	Hinged ridge
5	Sheet metalwork fixing
6	Polypropylene corrugation closer
7	Filler mineral wool
8	Steel structure according to the technical drawing

3b - Roof panel joining at ridge

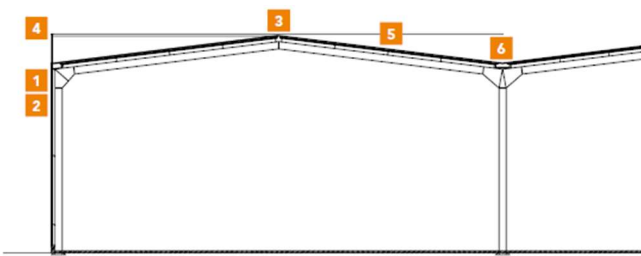


1	Roof panel
2	Panel fixing screws
3	Ridge sheet metalwork
4	Under-ridge sheet metalwork
5	Sheet metalwork fixing screws
6	Polypropylene corrugation closer
7	Filler mineral wool
8	Steel structure according to the technical drawing

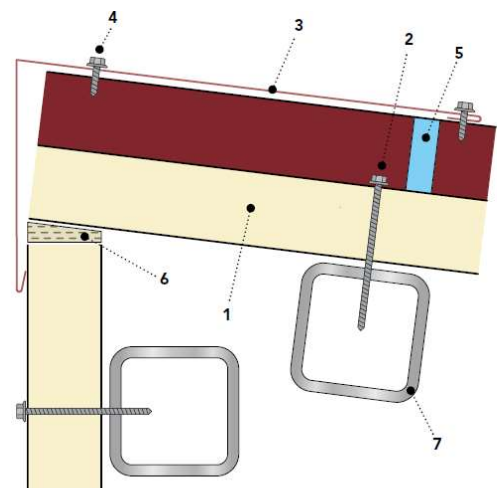
3c - Roof panel joining at ridge



- | | |
|---|--|
| 1 | Roof panel |
| 2 | Ribbed ridge |
| 3 | Panel fixing screws |
| 4 | Under-ridge sheet metalwork |
| 5 | Sheet metalwork fixing screws |
| 6 | Polypropylene corrugation closer |
| 7 | Filler mineral wool |
| 8 | Steel structure according to the technical drawing |

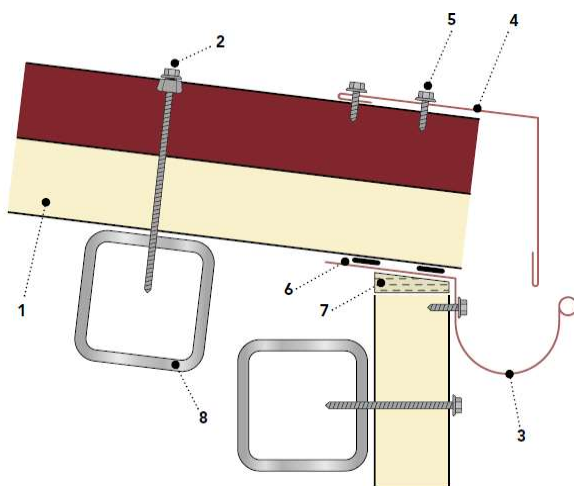


4a - Connection of roof panels with wall panels



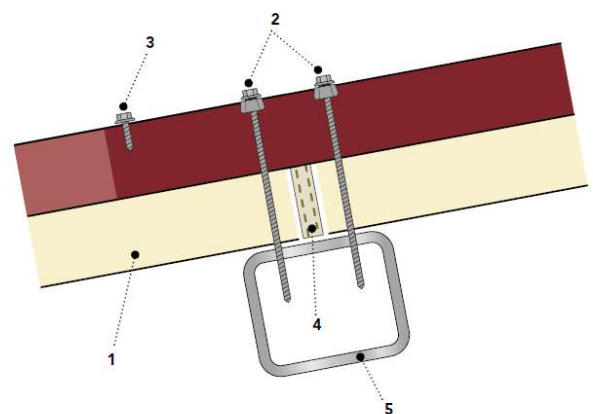
- | | |
|---|--|
| 1 | Roof panel |
| 2 | Panel fixing screws |
| 3 | Sheet metalwork according to the technical drawing |
| 4 | Sheet metalwork fixing screws |
| 5 | Polypropylene corrugation closer |
| 6 | Filler mineral wool |
| 7 | Steel structure according to the technical drawing |

4b - Connection of roof panels with wall panels and external gutter



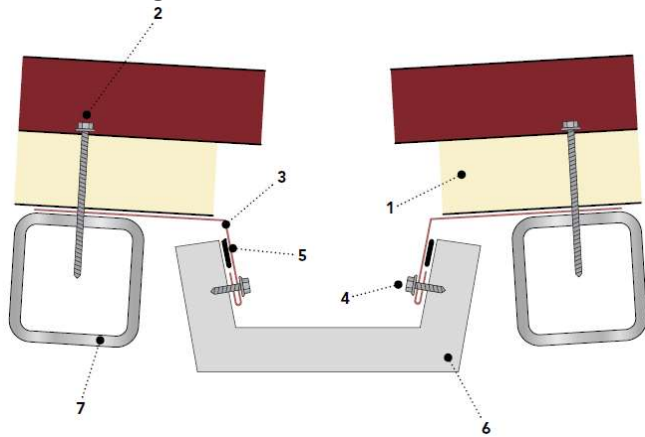
- | | |
|---|--|
| 1 | Roof panel |
| 2 | Fixing system (screw, cap, washer) |
| 3 | Steel gutter |
| 4 | Sheet metalwork according to the technical drawing |
| 5 | Sheet metalwork fixing screws |
| 6 | Flexible gasket |
| 7 | Filler mineral wool |
| 8 | Steel structure according to the technical drawing |

5 - Longitudinal overlap of roof panels (overlapping)

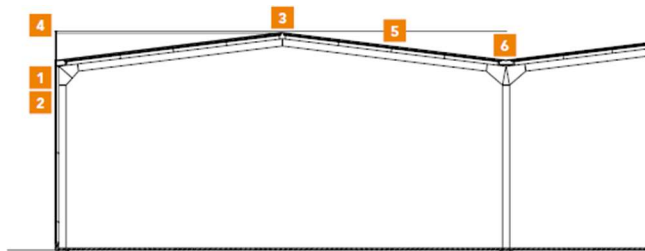


- | | |
|---|--|
| 1 | Roof panel |
| 2 | Fixing system (screw, cap, washer) |
| 3 | Sheet metalwork fixing screw |
| 4 | Filler mineral wool |
| 5 | Steel structure according to the technical drawing |

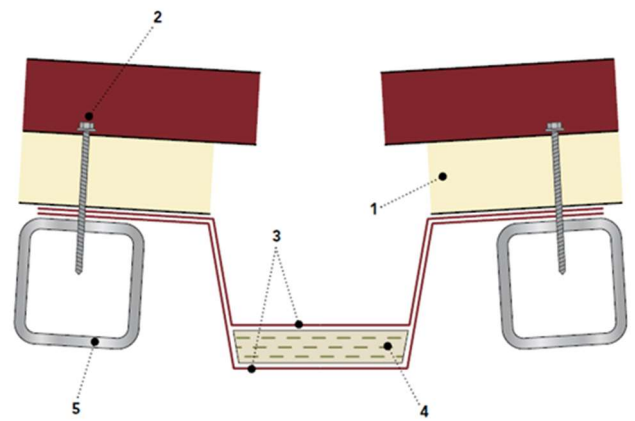
6a - Internal gutter



1	Roof panel
2	Panel fixing screws
3	Sheet metalwork according to the technical drawing
4	Sheet metalwork fixing screws
5	Flexible gasket
6	Prefabricated gutter
7	Steel structure according to the technical drawing

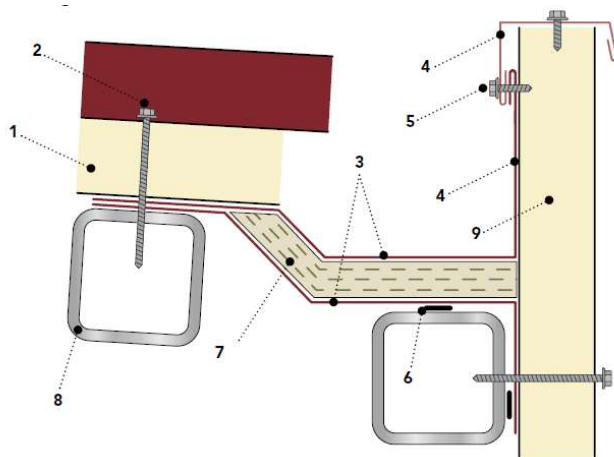


6b - Internal gutter



1	Roof panel
2	Panel fixing screws
3	Steel gutter
4	Filler mineral wool
5	Steel structure according to the technical drawing

6c - Connection of roof panels with wall panels and internal gutter



1	Roof panel
2	Panel fixing screws
3	Steel gutter
4	Sheet metalwork according to the technical drawing
5	Sheet metalwork fixing screws
6	Flexible gasket
7	Filler mineral wool
8	Steel structure according to the technical drawing
9	Wall panel

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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