



MANUFACTURED IN:



TECHNICAL MANUAL

ISOCOP Range

ISOCOP | ISOGRECATA | ISOVETRO | ISODECK



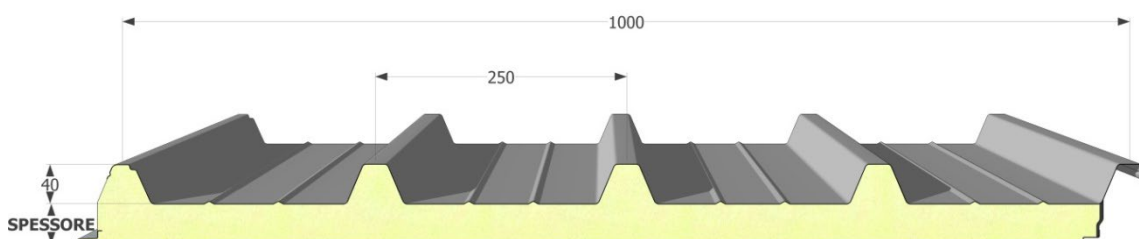
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ISOCOP Range

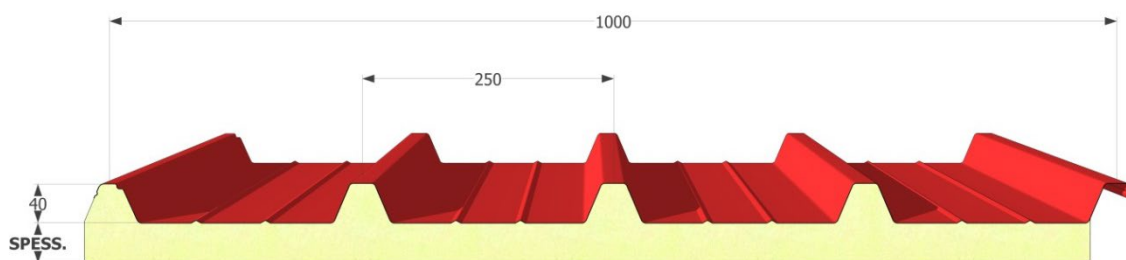
TYPES OF PANELS

ISOCOP



Self-supporting double skin metal faced roof sandwich panel with 5 ribs and polyurethane foam insulated core. The panel is especially suited for use in industrial, zootechnical and residential construction.

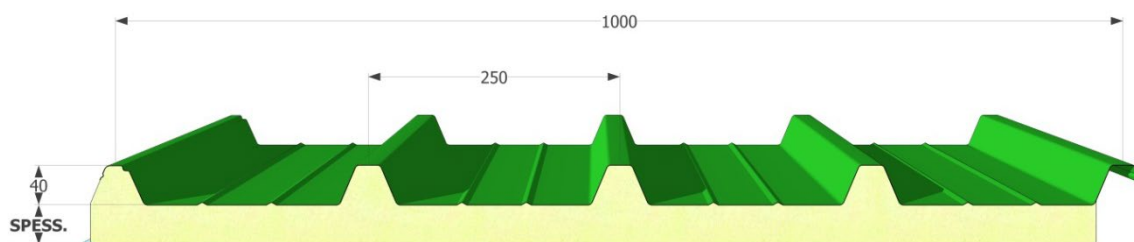
ISOGRECATA



Single skin metal faced roof sandwich panel with 5 ribs and polyurethane foam insulated core. The inner surface is made of embossed centesimal aluminium.

The absence of the internal metal sheet and easy installation make it a cost effective solution with low aesthetic qualities.

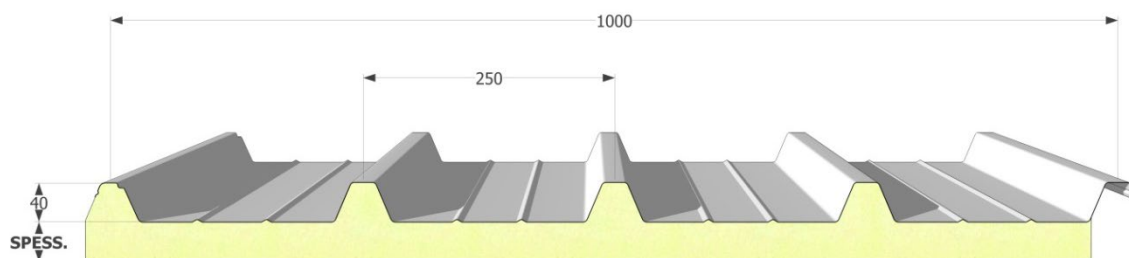
ISOVETRO



Single skin metal faced roof sandwich panel with 5 ribs and polyurethane foam insulated core. The inner surface consists of fibreglass laminate, featuring good resistance to the aggressive agents found in agricultural and livestock settings.

The absence of the internal metal sheet and easy installation make it a cost effective solution with low aesthetic qualities.

ISODECK



Single skin metal faced roof sandwich panel with 5 ribs and polyurethane foam insulated core. The inner surface is made of bituminous felt. The panel can be installed traditionally (ribs facing outward) on a concealed surface and continuous slab, or inside out (ribs facing inward) to create flat roofs to waterproof on-site.

GEOMETRIC FEATURES

	ISOCOP	ISOGRECATA	ISOVETRO	ISODECK
Length	Up to maximum transportable			
Useful Pitch (mm)	1000			
Insulating Thickness (mm)	30-40-50-60-80-100-120-150	30-40-50-60-80-100	30-40-50-60	30-40-50-60-80-100-120
External support	Ribbed metal sheet with 5 ribs: -rib height 40 mm -rib pitch 250 mm			
Internal support	micro-ridged lightly profiled metal sheet	embossed centesimal aluminium	flat fibreglass laminate	bituminous felt

METAL FACINGS

- Hot dip galvanised steel by SENDZIMIR continuous process (UNI EN 10346) and pre-painted by means of a coil coating continuous process with different painting cycles based on end use (see: "Guide to Choosing Pre-painted").
- 3000 or 5000 series aluminium alloys with pre-painted finish with the cycles mentioned in the previous point, with a natural or embossed effect.
- Stainless steel AISI 304, 2B finish, according to EN 10088-1.
- In case of aluminium facings, these must be preferably applied on both sides: in fact, if different materials are used on the two sides, the panel may distort and bend due to the different thermal expansion coefficients of the sheets.
- For stainless steel facings, one should take into account the possible appearance of flaws that are highlighted by such reflecting surfaces.

PROTECTION OF THE PRE-PAINTED FACINGS

All pre-painted metal facings are supplied with an adhesive polyethylene protective film that prevents damage to the paint layer. If the material is specifically requested without protective film, Isopan assumes no liability in case of damages to the paint. The protective film that covers the pre-painted panels must be completely removed during assembly and, in any case, within sixty days after the material preparation.

It is also recommended not to expose the panels covered by a protective film to direct sunlight.

FEATURES OF THE INTERNAL SUPPORTS

Embossed centesimal aluminium (Isogrecata)

Due to the fragility of the aluminium support, Isopan gives no guarantee for aesthetic flaws on the internal side of the panel, including the perfection of the joint. Any imperfections on the internal side like, for example, creases on the facing and the lack of flatness are to be considered normal and accepted for the uses recommended by Isopan.

Bituminous felt (Isodeck)

- **Upper layer:** bitumen
- **Shell:** wool paper
- **Lower layer:** bitumen

Fibreglass laminate (Isovetro, Isovetro Plus, Farmafarm, Famalum, Isobox Farm Plus)

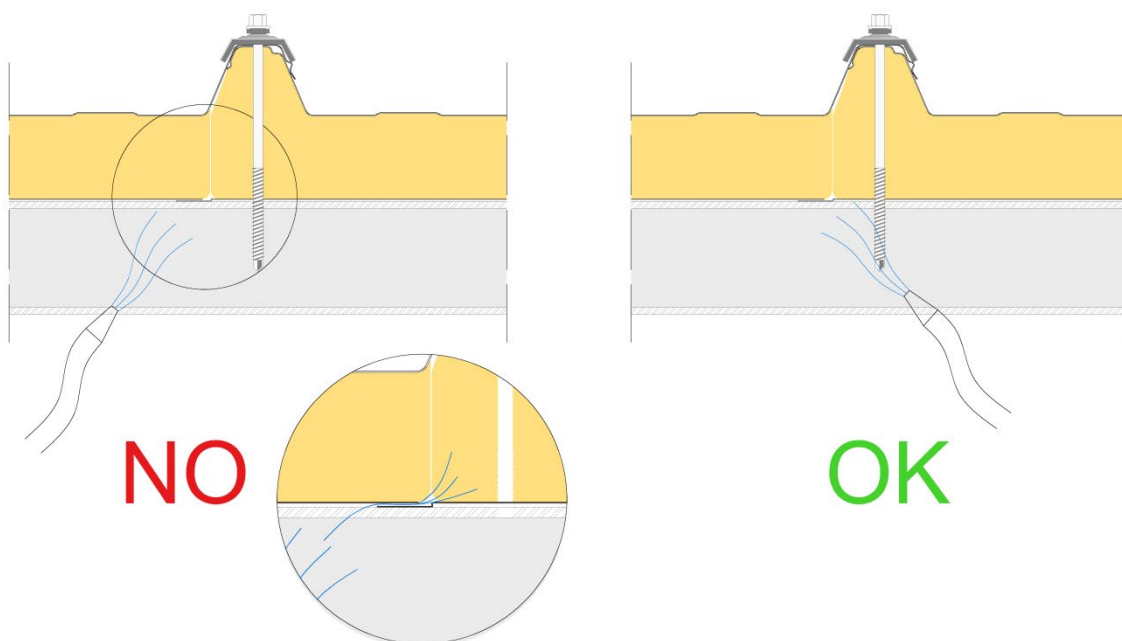
- Flat laminate on reels, manufactured with orthophthalic polyester resin, UV stabilised, reinforced with textile glass fibres, laminated and hot-catalysed.
- Standard colour: matte white (colour consistency is not guaranteed).
- Operating temperature: -40 °C ÷ +120 °C.
- Fire behaviour: classified "non-drip".
- Ageing: using UV ray stabilised polyester resin slows yellowing of the material, which will still be greater and faster when used outdoors with solar radiation. Surface migration of glass fibres mostly occurs when used outdoors and, in any case, does not undermine the laminate's mechanical resistance features.
- Resistance to chemical agents: acids/ excellent, alcohols/ excellent, alkali/ good, solvents/ good. More detailed information requires knowing the nature and concentration of the chemical agent and the environmental conditions of use. Excellent resistance to mould.

Due to the fragility of the fibreglass support, Isopan gives no guarantee for aesthetic flaws on the internal side of the panel, including the perfection of the joint.

Cleaning fibreglass laminate

N.B. The following guidelines are to be considered effective for each product in the Isopan range that uses one or both fibreglass supports (eg Isovetro, Isovetro Plus, Farmafarm, Famalum, Isobox Farm Plus).

The fibreglass laminate can be cleaned using normal cleaning products (degreasers, etc.); should more thorough cleaning be required, acetone or mild solvents can be used.



Power washing is allowed at a distance of at least 80 cm and at moderate spray pressure, in order to avoid damaging the laminate. We recommend testing initially on a limited, hidden area of the roof to make sure the operation is feasible, obviously with the spray pointed so as not to open the joint.

Fibreglass resistance to main chemical agents

Product	% Concentration	Temperature
Acetone	10%	80 °C
Acetic acid	10%	90 °C
Acetic acid	25%	70 °C
Acetic acid	75%	65 °C
Hydrogen cyanide	10%	70 °C
Hydrochloric acid (gas)	10%	150 °C
Hydrochloric acid (gas)	35%	70 °C
Hydrochloric acid (gas)	100%	25 °C
Hydrochloric acid (solution)	10%	90 °C
Hydrochloric acid (solution)	37%	65 °C
Phosphoric acid	80%	90 °C
Lactic acid	100%	90 °C
Nitric acid	5%	65 °C
Nitric acid	60%	room t.
Nitric acid	fumes	80 °C
Hydrogen sulphide	all	90 °C
Sulfuric acid	10%	90 °C
Sulfuric acid	50%	80 °C
Sulfuric acid	70%	70 °C
Chlorine acid	saturated	40 °C
Distilled water	-	100 °C
Ammonia	30%	40 °C
Sodium carbonate	30%	65 °C
Formaldehyde	44%	65 °C
Calcium hydroxide	25%	70 °C
Potassium hydroxide	25%	70 °C
Sodium hydroxide	25%	70 °C
Sodium hydroxide	50%	room t.
Sodium hypochlorite	10%	65 °C
Copper nitrate	all	90 °C
Mineral oils	100%	100 °C
Olive oil	100%	100 °C
Ferric sulphate	all	90 °C
Ferrous sulphate	all	90 °C

The indications in the table are reliable to the best of common knowledge and the values shown are to be considered a helpful guide for use. They must not, in any case, be held as direct and indirect guarantees.

INSULATION

Made with rigid polyurethane foam, having the following physical and mechanical features:

- Compressive strength ≥ 0.11 MPa (at 10% of deformation)
- Tensile strength ≥ 0.10 MPa
- Shear strength ≥ 0.10 MPa
- Thermal conductivity coefficient $\lambda = 0.022$ W/mK
- The 95% closed cells guarantee an anhygroscopic structure
- Operating temperature: minimum - 40 °C
maximum + 80 °C

Foaming agent: N-Pentane according with the Montreal protocol

Thermal transmittance coefficient U^*

Panel thickness (mm)	30	40	50	60	80	100	120	150
U [W/m²K]	0.71	0.54	0.44	0.37	0.28	0.22	0.19	0.15

* Mandatory for CE marking of double skin metal faced sandwich panels according to EN 14509.

Thermal resistance coefficient R

Panel thickness (mm)	30	40	50	60	80	100	120	150
R [m²K/W]	1.41	1.85	2.27	2.70	3.57	4.55	5.26	6.67

PANEL WEIGHT

Sheet thickness (mm)		Nominal panel thickness (mm)							
		30	40	50	60	80	100	120	150
0,4/0,4	kg/m²	8,3	8,7	9,1	9,2	10,4	11,1	11,9	13,1
0,5/0,5	kg/m²	10,1	10,5	10,9	11,4	12,1	12,9	13,7	14,9
0,6/0,6	kg/m²	11,9	12,2	12,7	13,1	13,9	14,7	15,5	16,7
0,6/0,6 Aluminium	kg/m²	5,1	5,5	5,9	6,3	7,1	7,9	8,7	9,9

STATIC FEATURES

The resistance values refer to a panel assembled horizontally and subject to the action of a distributed load; the calculation method used by Isopan does not consider the thermal effects, which are verified by the designer. Depending on the weather conditions of the installation location and the colour of the external face, if the designer feels a detailed verification of the stresses caused by thermal actions and long-term effects is necessary, he/she should contact the Isopan Technical Office. The designer is still responsible for checking the fastening systems, based on their number and the way they are placed.

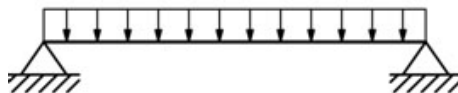
Double skin metal faced panels (Isocop)

ISOCOP double skin metal faced panels are self-supporting according to the UNI EN 14509 definition. "...panel capable of supporting, by virtue of its materials and shape, its own weight and in case of panel fixed to spaced structural supports, all applied loads (snow, wind, air pressure), and transmitting these loads to the supports.", depending on the type of metal facings, their thickness and the thickness of the thermal insulating core.

Below are some examples of indicative load bearing tables:

The indications included in the following tables doesn't take into account the thermal load effects. Furthermore, the indicative values reported may not be used to replace the project calculations drawn up by a qualified technician, who will have to validate these instructions in accordance with the laws in the country of installation of the panels.

- panel on two supports:



STEEL SHEETS 0.4/0.4 mm - Simple support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/m ²]	NOMINAL PANEL THICKNESS mm							
	30	40	50	60	80	100	120	150
	MAX SPAN cm							
80	270	290	310	340	390	440	470	500
100	250	260	280	300	350	390	440	480
120	230	245	260	280	320	360	400	460
140	210	230	255	260	290	330	370	420
160	200	220	230	255	285	310	340	390
180	185	215	220	230	270	290	320	370
200	160	200	210	220	260	270	300	340
220	140	190	200	210	230	260	280	320
250	115	170	190	200	220	240	260	300

STEEL SHEETS 0.5/0.5 mm - Simple support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/m ²]	NOMINAL PANEL THICKNESS mm							
	30	40	50	60	80	100	120	150
	MAX SPAN cm							
80	320	350	390	420	500	570	630	730
100	295	320	360	390	450	510	580	670
120	270	300	330	360	420	480	540	620
140	235	280	315	340	390	450	500	580
160	210	260	300	320	370	420	480	550
180	185	235	280	300	355	400	450	520
200	170	210	250	290	330	380	430	500
220	150	190	230	270	320	360	410	470
250	130	170	205	240	300	340	385	445

ALUMINIUM SHEETS 0.6 / 0.6 mm - Simple support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/ m ²]	NOMINAL PANEL THICKNESS mm							
	30	40	50	60	80	100	120	150
	MAX SPAN cm							
80	255	290	325	370	435	505	565	605
100	225	255	290	315	385	455	510	590
120	205	230	255	285	340	400	460	540
140	190	210	230	255	315	370	420	495
160	170	190	215	230	285	335	385	455
180	155	170	200	215	265	310	360	420
200	145	160	180	200	240	285	335	395
220	130	155	170	190	225	255	310	355
250	110	145	155	165	200	230	275	335

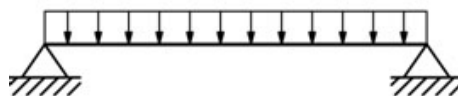
Single skin metal faced panels (Isogrecata, Isovetro and Isodeck)

A single skin metal faced panel capable of supporting, by virtue of its materials and shape, its own weight and in case of panel fixed to spaced structural supports, all applied loads (snow, wind, air pressure), and transmitting these loads to the supports, depending on the type of metal facings and their thickness.

Below are some examples of indicative load bearing tables:

The indications included in the following tables doesn't take into account the thermal load effects. Furthermore, the indicative values reported may not be used to replace the project calculations drawn up by a qualified technician, who will have to validate these instructions in accordance with the laws in the country of installation of the panels.

- panel on two supports:



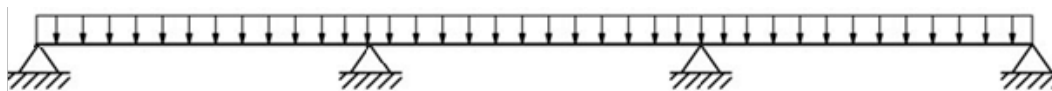
SIMPLE SUPPORT STEEL SHEET					
UNIFORMLY DISTRIBUTED LOAD [kg/m²]	NOMINAL SHEET THICKNESS mm				
	0.5	0.6	0.7	0.8	1.0
	MAX SPAN cm				
80	220*	235	250	265	285
100	200*	220*	235	245	265
120	180*	200*	215*	230	250
140	165*	185*	200*	215*	235
160	155*	170*	185*	200*	225

*Values with stress limitations.

SIMPLE SUPPORT ALUMINIUM SHEET				
UNIFORMLY DISTRIBUTED LOAD [kg/m²]	NOMINAL SHEET THICKNESS mm			
	0.6	0.7	0.8	1.0
	MAX SPAN cm			
80	160*	170	180	190
100	140*	155*	165	180
120	130*	140*	155	170
140	120*	130*	140*	160
160	110*	120*	130*	150

*Values with stress limitations.

- panel on multiple supports:



MULTI-SUPPORT STEEL SHEET					
UNIFORMLY DISTRIBUTED LOAD [kg/m ²]	NOMINAL SHEET THICKNESS mm				
	0.5	0.6	0.7	0.8	1.0
	MAX SPAN cm				
80	250*	270	285	295	320
100	200*	245*	260	275	295
120	200*	225*	240*	260	280
140	185*	205*	225*	240*	265
160	175*	195*	210*	225*	255

*Values with stress limitations.

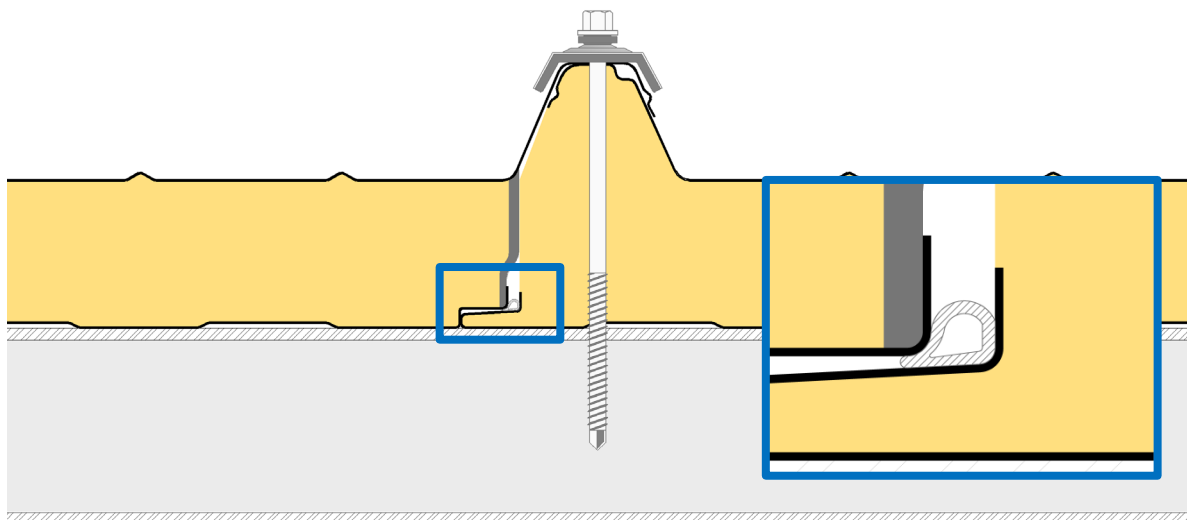
MULTI-SUPPORT ALUMINIUM SHEET				
UNIFORMLY DISTRIBUTED LOAD [kg/m ²]	NOMINAL SHEET THICKNESS mm			
	0.6	0.7	0.8	1.0
	MAX SPAN cm			
80	180*	190	200	220
100	160*	175*	190	205
120	145*	160*	185	190
140	135*	150*	160*	180
160	125*	140*	150*	170

*Values with stress limitations.

JOINT

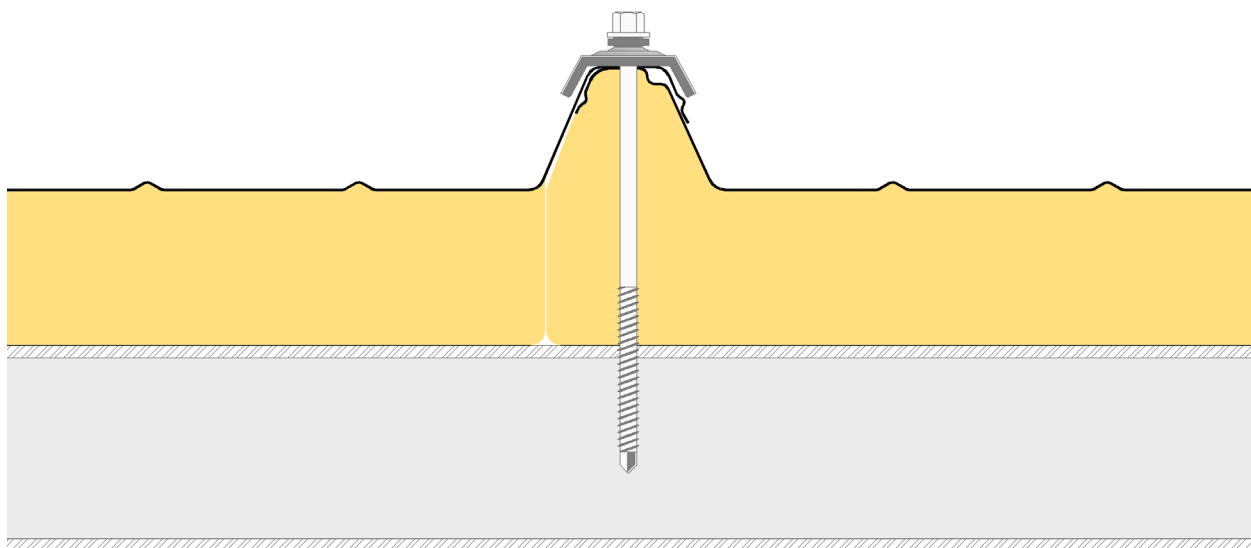
Double skin metal faced panel (Isocop)

The joint is equipped with a sealant gasket, inserted during production. The joint shape is specifically designed to prevent leaks and reduce thermal bridges. In heavy-duty conditions, to try to prevent condensate, an optional gasket should be placed on site to increase airtightness of the joint (as shown below); this element can be supplied by Isopan and will be installed and must be installed directly on site during panel installation.



Single skin metal faced panels (Isogrecata, Isovetro and Isodeck)

The internal support coupling cannot reach the perfection typical of a double skin metal faced panel (like ISOCOP); considering the field of application and the limited performance features required of single skin metal faced panels, no sealing gaskets are inserted in the joint. It is recommended for the designer to carry out a thorough thermo-hygrometric assessment of the application.



TOLERANCES (ANNEX D EN 14509)

- Facing thickness: according to the reference standards for the products used
- Panel thickness: nominal, ± 2 mm
- Length: if ≤ 3000 mm ± 5 mm; if > 3000 mm ± 10 mm

REACTION TO FIRE (EN 13501-1)

The reaction to fire indicates the degree to which a material participates in the fire it is subjected to.

The European reference standards to classify the reaction to fire of construction material is **EN 13501-1** (Fire classification of construction products and building elements). This standard specifies:

Euroclasses: the standard distinguishes seven classes, with increasing contribution to fire, from A1 (non-combustible product) to F (product not tested/not classified).

Smoke: opacity growth speed of the smoke

- **s1** no smoke emission
- **s2** low smoke emission
- **s3** strong smoke emission

Burning droplets: fall of burning particles

- **d0** no burning particles
- **d1** few burned particles
- **d2** many burned drops

The fire classification of the panel depends on the type of polyurethane foam used and the thickness of the insulation; for further information, please refer to the Isopan catalogue, the website www.isopan.com or contact the Technical Department.

BROOF

The external fire resistance classification system for roofing (Broof) is based on four test levels that simulate different fire triggering and development conditions:

- **t1:** burning brand alone
- **t2:** burning brand and wind
- **t3:** burning brand, wind and solar radiation
- **t4:** burning brand, wind and supplementary radiant heat

The panels may be Broof certified; please contact the Isopan Technical Department to check what classifications have been obtained based on the type of insulating material and metal support.

WATER PERMEABILITY

The resistance of a sandwich panel assembly to driving rain under air pressure must be subjected to testing according to **EN 12865**.

The Isocop panel is classified as class B according to EN 14509 for water permeability.

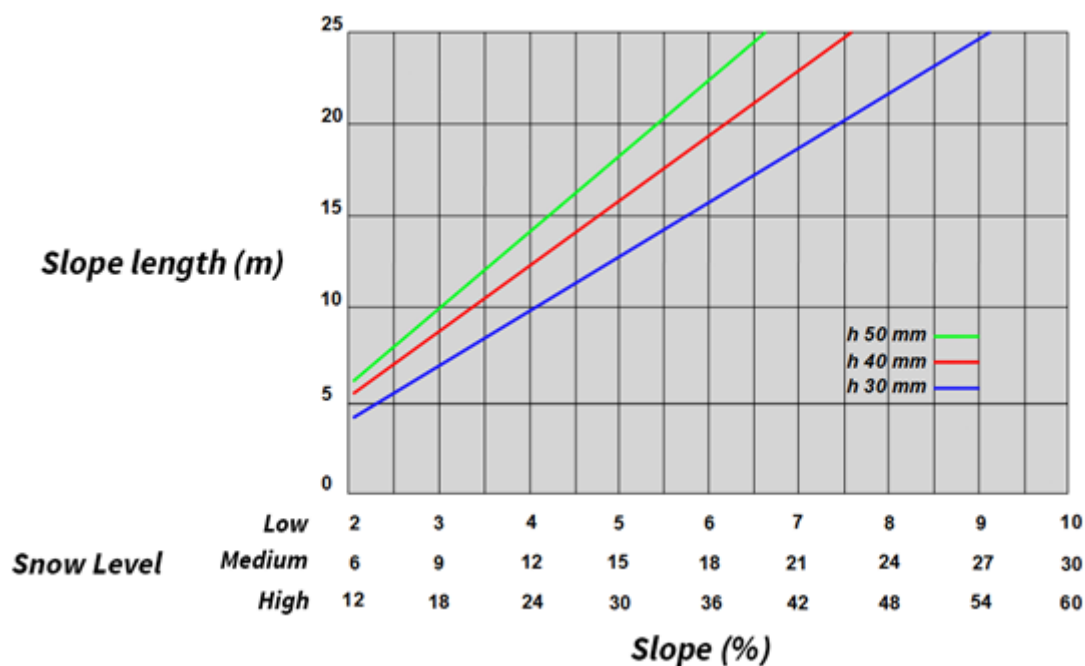
RESTRICTIONS OF USE

- A thermohygrometric check should be performed during the design stage. In certain conditions (e.g. high indoor humidity level) condensation can appear on the internal face of the panel with consequent dripping inside the building. If these conditions persist long enough, they can accelerate the natural degradation of the organic facing of the support itself.
- **Due to solar radiation, the external face of the panel can reach relatively high temperatures. In some cases, it can reach a temperature of 80÷90°C.** A high temperature gradient could cause the panel deflection the panel and wrinkle the metal sheet. The occurrence of the problem may be limited with an accurate design, taking into account environmental conditions, length, colour of the panels and the number of fastening elements. (**See the "Thermal expansion" section**).
- **Given the low aesthetic qualities of Isogrecata, Isovetro and Isodeck single skin metal faced panels, concealing them or using them in conditions with low aesthetic requirements is recommended.**

GENERAL DESIGN INSTRUCTIONS

The roof panels generally require, during the design phase, a structure able to absorb the external loading stress that will not submit the metal face of the panels to excessive and permanent distortions to the detriment of their basic characteristics. When choosing the panel types during the design phase, you should consider some parameters related to environmental actions like:

- **Wind action:** depends on the climatic zone of the building installation; the values vary depending on the wind speed, with consequent greater or lesser load pressure on the exposed surfaces (affects the type and number of panel fastening systems).
- **Snow load:** depends on the elevation above sea level compared to the one at the building construction site. The formation of water puddles resulting from snowmelt must be taken into account, which can expose the overlapping joints to being pressed under a load of water and possibly create infiltrations. It is recommended to implement appropriate flashing systems (or suitable constructive measures) to ensure normal water run-off.
- **Thermal stress:** largely depends on the colour of the external surface of the panel and the building exposure, and can induce significant system deformations.
- **Atmospheric corrosion:** depends on the environment where the panels are installed (marine, industrial, urban, rural); mainly affects the degree of corrosivity on the panel surfaces. In this regard, suitable metallic or organic facings should be chosen (refer to the available documentation or contact the Isopan Technical Department).
- **Rainfall:** the degree of rainfall affects the slope angle of the roof; in order to ensure normal water run-off and to prevent the metal supports from oxidising, the slope angle of the panels must be chosen on the basis on two types of construction:
 - Roof without intermediate overlapping joints;
 - Roof with intermediate overlapping joints.



In the first case, the minimum slope, in relation to the climatic area and the rib height, can be taken from the **Slope diagram**. We recommend (in the event of low or average level of snowfall) a slope no less than 7%.

In the event of roofs built with intermediate overlapping joints, the slope can be taken from the Slope diagram, increasing it (for roof pitches with slope <25%) by a value equal to $0.2 \cdot L$, with L = length of the roof pitch (expressed in metres). The presence of intermediate overlapping joints depends on the slope, the snow load and exposure to wind. Under normal weather conditions, the overlap values generally used are:

Slope (%)	Overlap (mm)
$7 < P \leq 10$	250
$10 < P \leq 15$	200
$P > 15$	150

Gutter drip edge: Isopan, in consideration of the rules of best practice, recommends asking for the projection of the eaves to be arranged in order to create a drop and prevent possible infiltrations into the insulating core or within the building.

This solution is required to prevent premature panel head decay since, if exposed to stagnating water, the metal might oxidise and the supports might detach from the insulating mass in places.

After the drip edge, it is recommended to protect the heads (insulation and sheets) with liquid Isopan sheath that can be applied on-site.

In order to make up for possible lack of material due to damages during handling and assembly, Isopan recommends procuring spare panels (quantity equal to approximately 5% of the total).

THERMAL EXPANSION

All the materials used for the construction of walls, especially metals, are subject to **thermal expansion and contraction** phenomena, resulting from the effect of temperature changes. The stresses due to thermal expansions of the metal sheet act on the roofing and can cause functional and structural product anomalies, particularly in case of:

- Significant length of the panel ($L > 8000$ mm);
- Solar radiation;
- Medium and dark colours;
- High panel thickness.

These stresses are exerted on the head of the fastening element, with bend and shear stress in the event of fastening on rib. These are important parallel to the ribbing, as transversally, they are cancelled out by the flexibility of the metal sheet profile itself.

Material	Thermal expansion coefficient ($^{\circ}\text{C}^{-1}$)
Aluminium	23.6×10^{-6}
Steel	12.0×10^{-6}
Stainless steel AISI 304	17.0×10^{-6}
Fibreglass laminate	32.0×10^{-6}

-Linear thermal expansion coefficient values-

Type of facing		Surface temperature ($^{\circ}\text{C}$)	
		Min.	Max.
Insulated	Light	-20	+60
	Dark	-20	+80

Where "insulated" means that an insulating core is inserted between the external sheet and the structure; "light or dark" means the surface colour of the sheet.

-Temperature range-

For high surface temperature values, linear lengthening of the metal support must be absorbed by the system. If this is not so, tensions occur that discharge near the sheet section changes by effect of the shape variation. Furthermore, cyclical temperature changes associated to day-night or freeze-thaw differences cause uncontrollable cyclical stresses that fatigue the support elements. These stresses can exceed the material yield point (formation of bubbles) or the failure limit. The effect of this phenomenon is the formation of fatigue cracks, initially not visible, that cause cracking on the support, undermining the product's structural features and water tightness. This problem can be overcome by adopting the requirements:

- Calculate in advance the deformation induced on the panel by the thermal expansion
- Do not use dark colours on long panels
- Use suitable thickness of the metallic supports (minimum 0.6 mm to be assessed based on specific design issues)
- Segment the panels
- Use suitable type of fixing elements (see proposed Isopan fastening in the "Roofing panel fastening" section in this manual)

In the event of **Aluminium** panel installation, we recommend using stainless steel screws with cap and specific washer.

If the pitch length requires the use of several panels, the heads of the panels must be spaced by about 5-10 mm (minimum distance in the hotter season, maximum distance in the colder season), taking care to put a flexible gasket between the heads to prevent condensate from forming.

For anything that is not expressly indicated, refer to the **Isopan General Sales Conditions** and annexes.

FASTENING INSTRUCTIONS

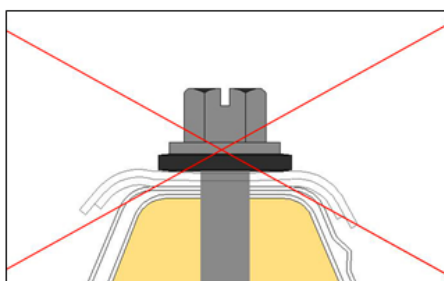
The purpose of the fastening elements is to efficiently anchor the panel to the load-bearing structure; the type of fastening unit depends on the type of support. The number and position of the fastening elements must guarantee resistance to the stresses induced by dynamic load, which can also exist in depression.

Isopan recommends fastening at the top of the ribs; the possibility of fastening at the bottom of the rib is not to be ruled out, provided the system assures water tightness.

Appropriately coated carbon steels or austenitic type stainless steels must be chosen as suitable materials to fasten panels. You should pay particular attention to the compatibility of the steel and aluminium materials in order to prevent the formation of galvanic currents.

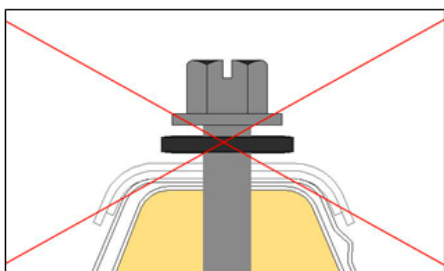
Fastening methods

Fastening varies based on the design to be constructed and on the panel application system at the construction site.



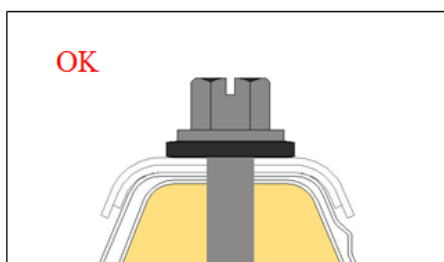
A

Incorrect tightening due to a high torque applied to the screw with marked deformations of the sheet metal. **In this situation the optimal closing of the interlocking is no longer guaranteed, therefore, the aesthetic functionality of the product remains compromised.**



B

Incorrect tightening due to the torque applied to the screw being insufficient to ensure correct fastening of the panel to the structure.

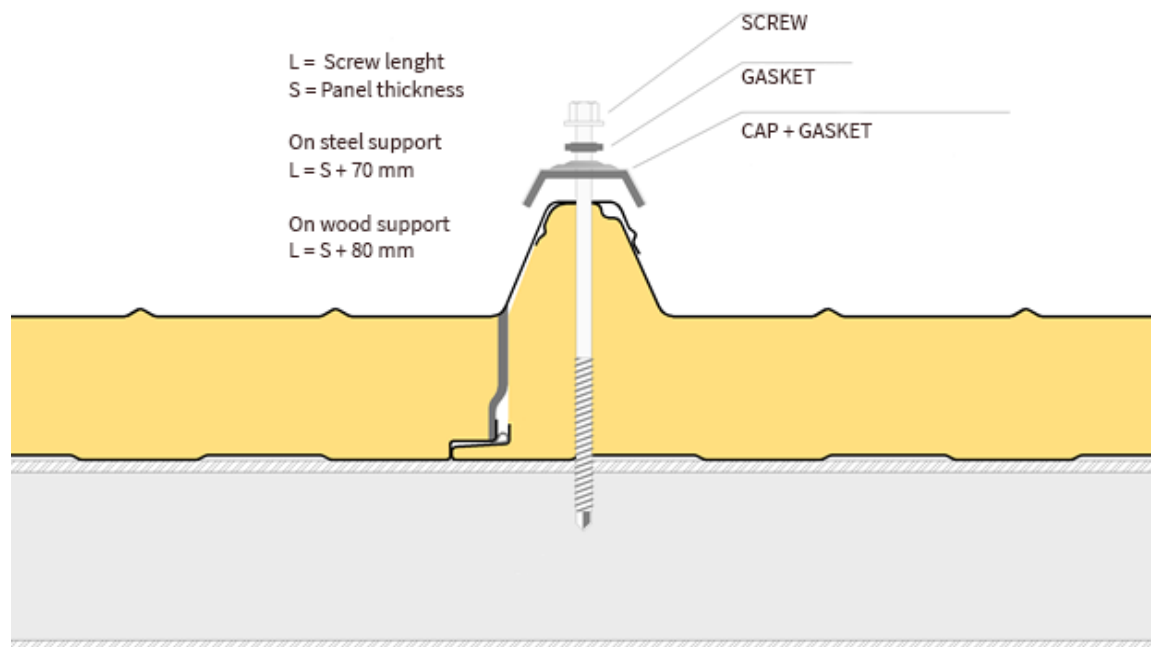


C

Correct tightening obtained by applying sufficient torque to the screw to ensure fastening of the panel to the structure.

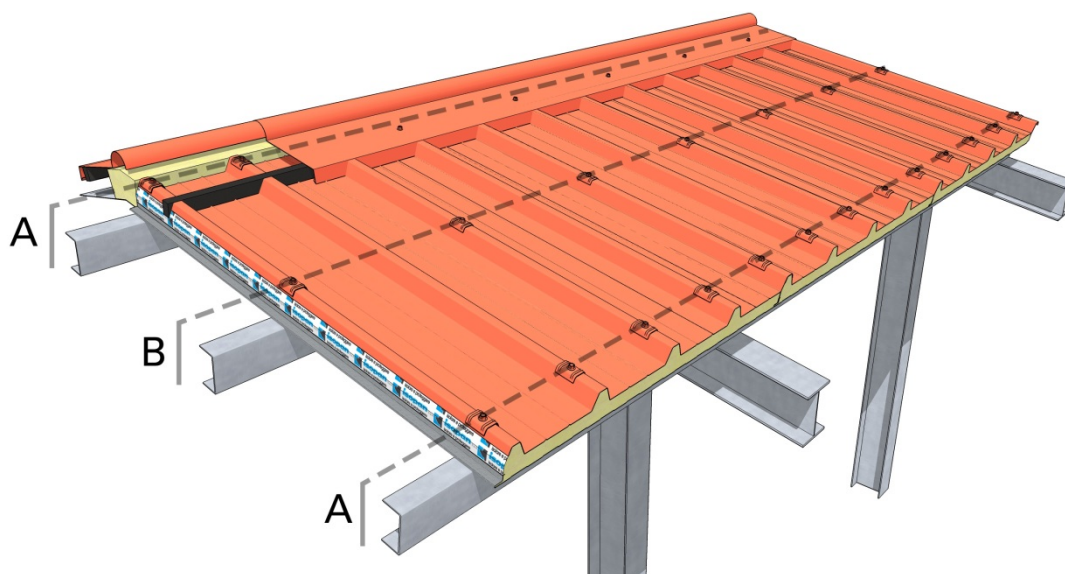
Screw length

The proper screw length depends on panel thickness and on the type of support (steel, wood); when installing roof panels, caps must be used.



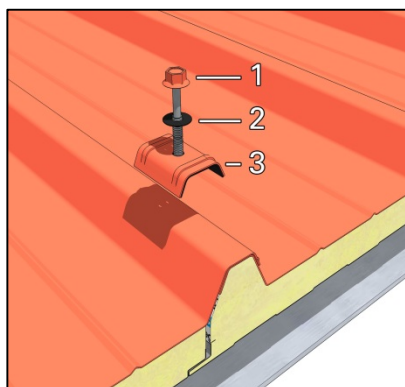
Roof panel fastening

The panels must be installed opposite the direction of the prevailing winds, frequently checking to make sure they are parallel and aligned. The holes must have a smaller diameter than the fastening elements. The number of fastenings depends on the local climatic zone. The normal fastening density entails one on alternating ribs on central beams and one on every rib on terminal beams.



A: terminal beams

B: central beams

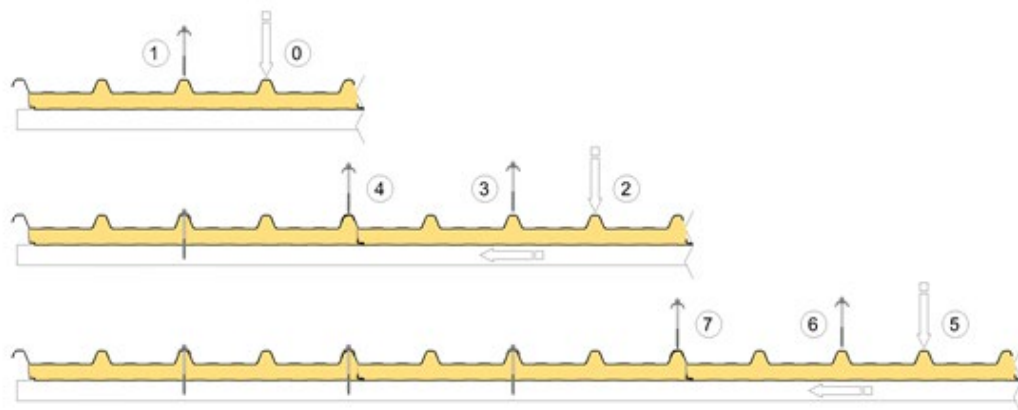


1: screw

2: washer

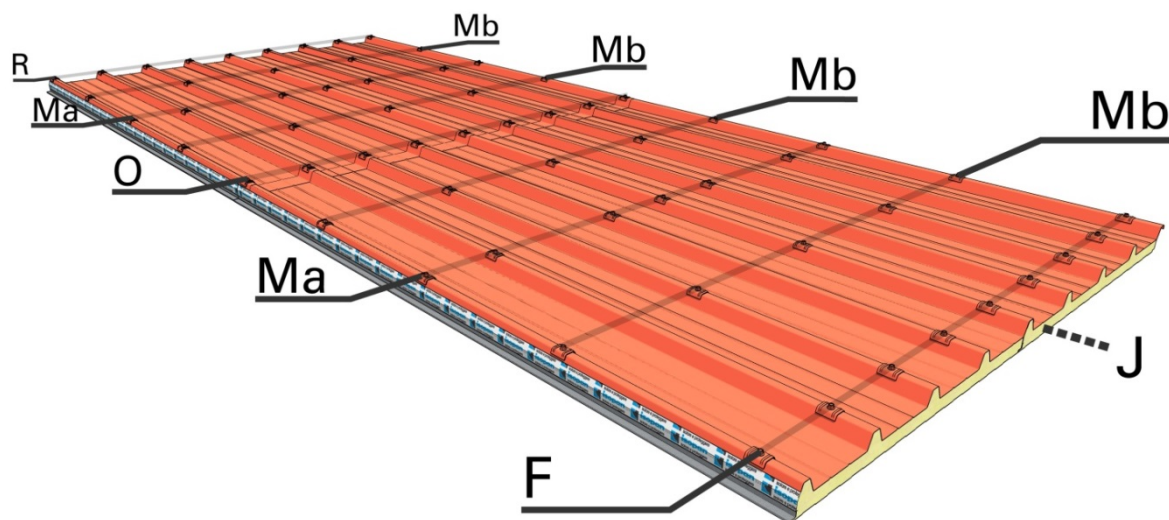
3: cap with gasket

Assembly sequence



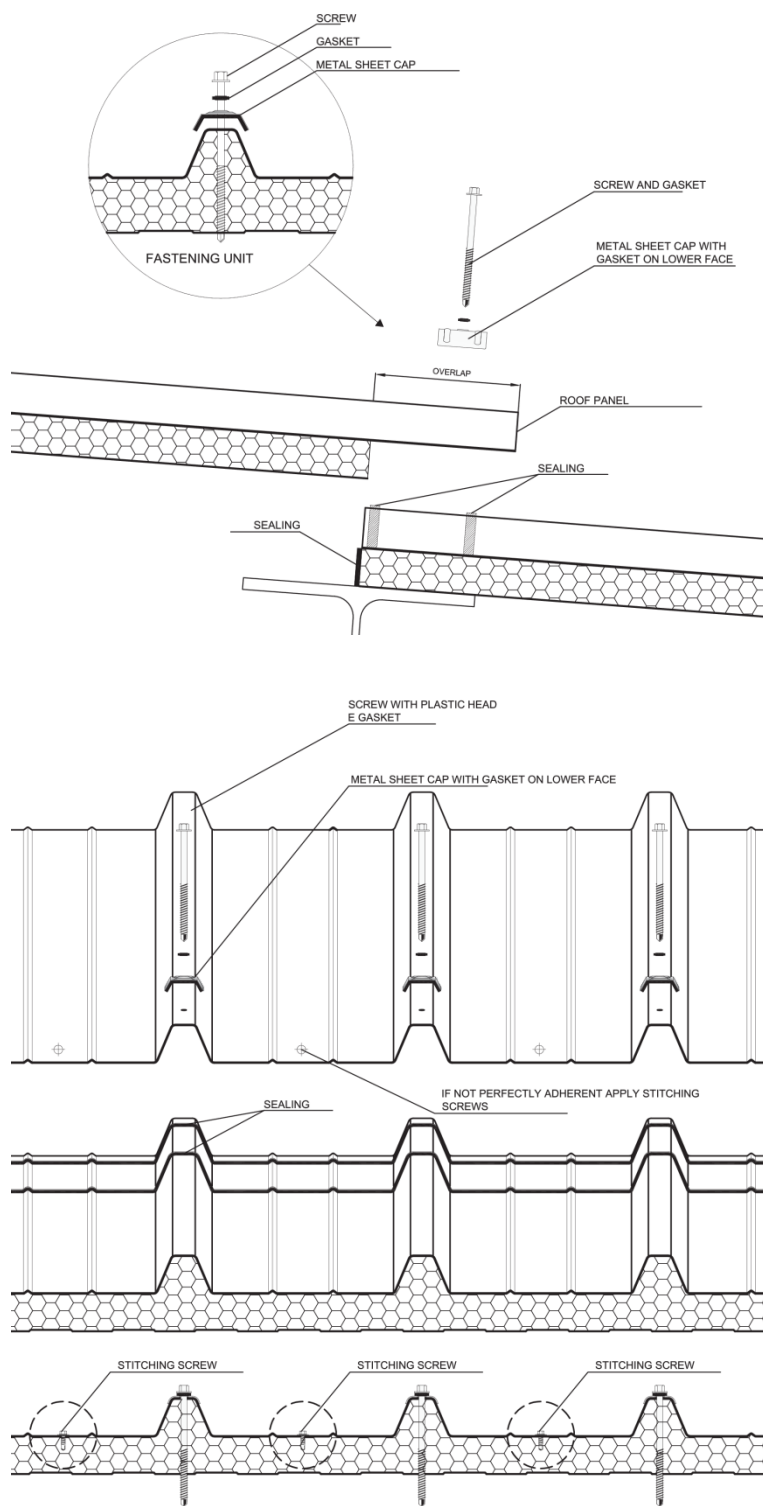
- 0) Install the first panel
- 1) Fasten the screw on the central rib
- 2) Install the second panel and couple it to the already installed first panel
- 3) Fasten the screw on the central rib of the second panel, exerting slight pressure in order to ensure the panels are coupled during this step
- 4) Fasten the screw on the overlapping rib

Proposed Isopan fastening system



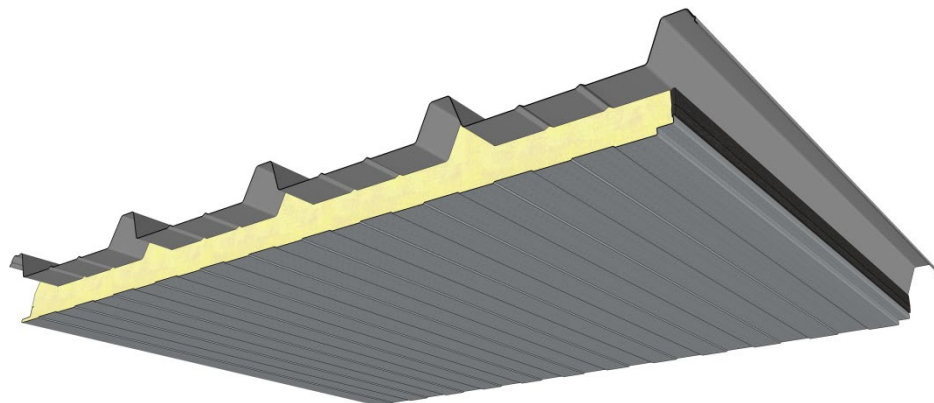
- R: terminal support (ridge)
 F: terminal support (gutter)
 Ma-Mb: intermediate supports
 O: support at the head junction
 J: longitudinal joint

Isopan detail of the head junction



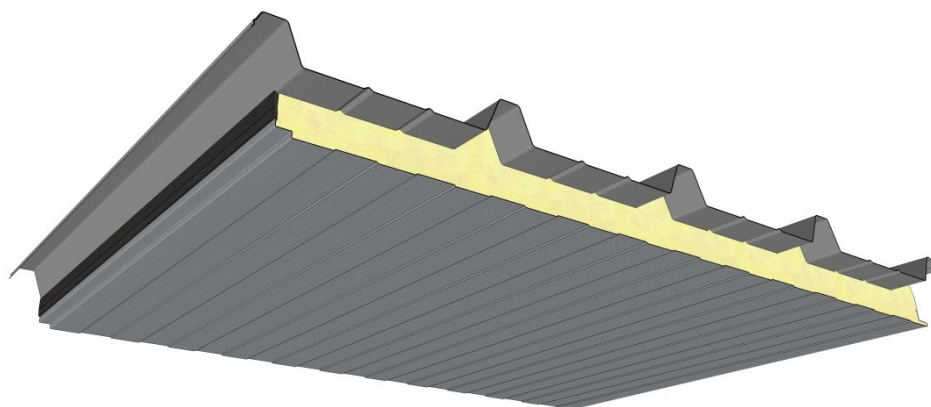
Isopan convention called overlapping

**Right
overlap**



* the image is indicative and shows an example of Isocop. In the event of Isogrecata, Isovetro and Isodeck, there is no internal lightly profiled metal sheet.

**Left
overlap**



* the image is indicative and shows an example of Isocop. In the event of Isogrecata, Isovetro and Isodeck, there is no internal lightly profiled metal sheet.

Note: should the panels not fit perfectly between the ribs, Isopan recommends applying stitching screws.

ASSEMBLY INSTRUCTIONS

The correct sequence of assembly operations is the following:

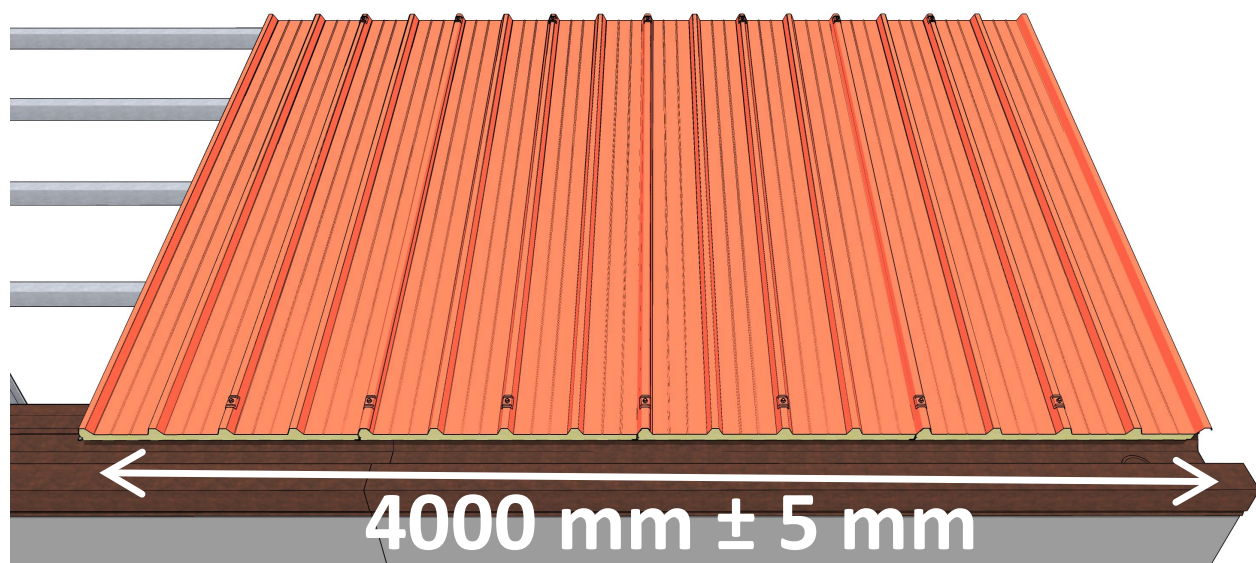
Preliminary operations

- Verify that the supports are properly aligned.
- Pay particular attention to the contact points between the supports and the panel support plates to avoid phenomena linked to electrochemical corrosion if non-compatible metals are coupled. For this purpose, elastomer or expanded resin strips may be applied as separators.
- Ensure that the site area has appropriate storage and handling capacity in order to prevent material damage.
- Use suitable tools (toothed circular saw, jigsaw, shears, nibbler) for on-site cutting operations. The use of equipment that produces metallic sparks (e.g. abrasive discs, disc cutter) is absolutely not recommended.
- Use suitable handling systems, particularly for long or heavy panels, in order to prevent safety risks on site and damages to the product.

Using acetic silicones is prohibited as they tend to attack the pre-painted galvanised sheet and form incipient oxidation. It is best to use single component sealant silicones with neutral curing that tend to harden due to the air humidity and, being free of solvents, do not attack the paint.

Assembly

- Install gutters and any sub-ridges and connection flashings.
- Remove the protective film from the panels, if any.
- Install the roof panels starting from the gutter and the side of the building, taking care to properly overlap and align the elements and check for perfect orthogonality to the underlying structure.
- Systematically fasten the elements after ensuring they match correctly. All the residual materials must be quickly removed, with special attention to metallic residues.
- Install the subsequent row of elements overlapping the gutter row (when there are roof pitches in two or more elements). The insulating core in the overlapping area must first be removed.
- Fasten the elements on all the ribs on the ridge, gutter, valley and head overlap lines.
- Install finishing elements (ridges, flashings, and tinsmithery in general) and any related insulating elements.
- Check and clean the roof, with particular attention to metal scraps, fastenings and fittings with door and window frames. After completing panel and tinsmithery element assembly, make sure no foreign material or processing scraps are left behind, as these may trigger corrosion phenomena, prevent proper rainwater draining or create a build-up of aggressive, undesired substances.



Note: take care to properly place the panels during the assembly step (4 panels = 4000 mm ± 5 mm) in order to prevent problems during the next ridge installation step, as shown in the figure.

PACKAGE COMPOSITION

The panels are normally supplied packaged and wrapped with extensible polyethylene film; the standard composition of the package is as shown below:

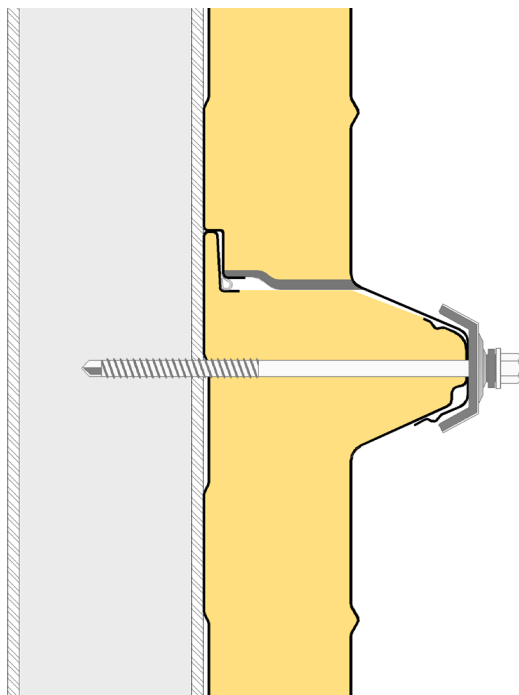
Panel thickness (mm)	30	40	50	60	80	100	120	150
No. of panels per package	16	12	10	8	6	6	4	4

Package compositions and types of packaging other than standard must be explicitly requested when ordering.

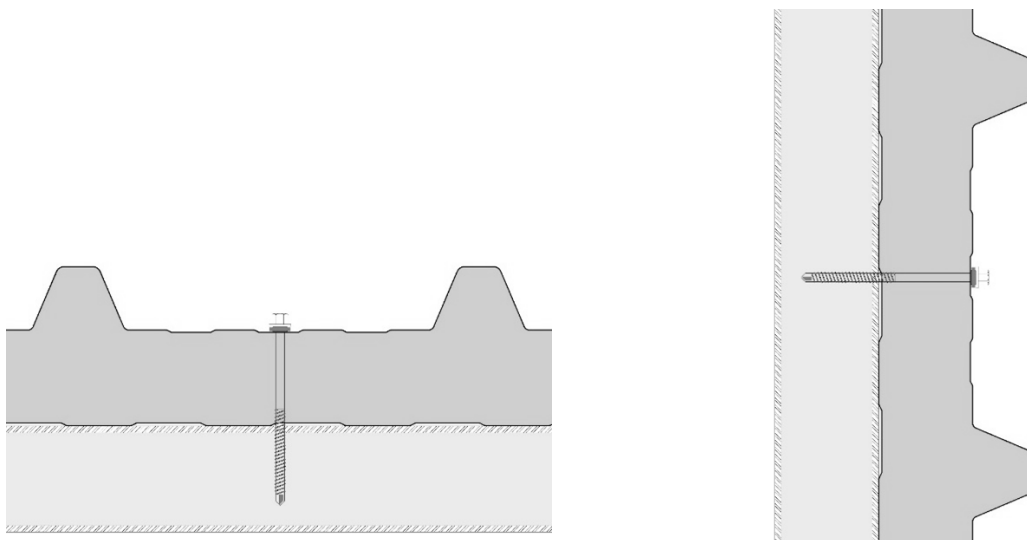
WALL INSTALLATION

Isocop Range Panels can be installed for wall application, with horizontal or vertical installing configuration. In this kind of application, instruction contained in previous chapter of this document can be considered valid.

Panel installation (specially with orizontal panel configuration) must be done in such a way as to allow the rain water outflow, to prevent stagnation and infiltrations.



Regarding to fastenings installation and assembly instructions, please refer to FASTENING INSTRUCTIONS chapter in this document.

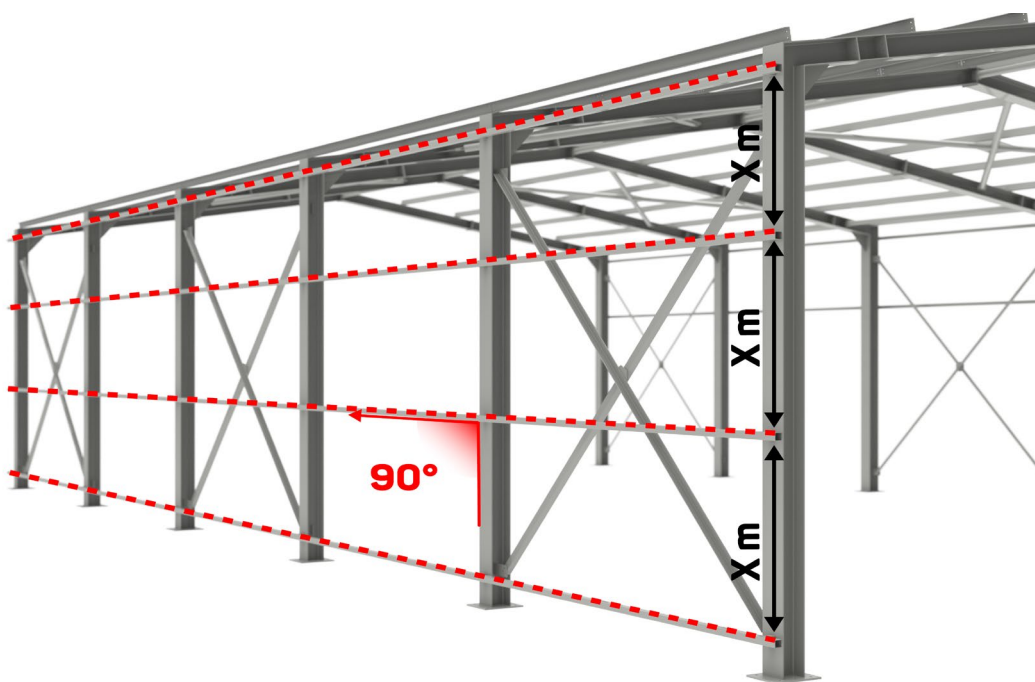
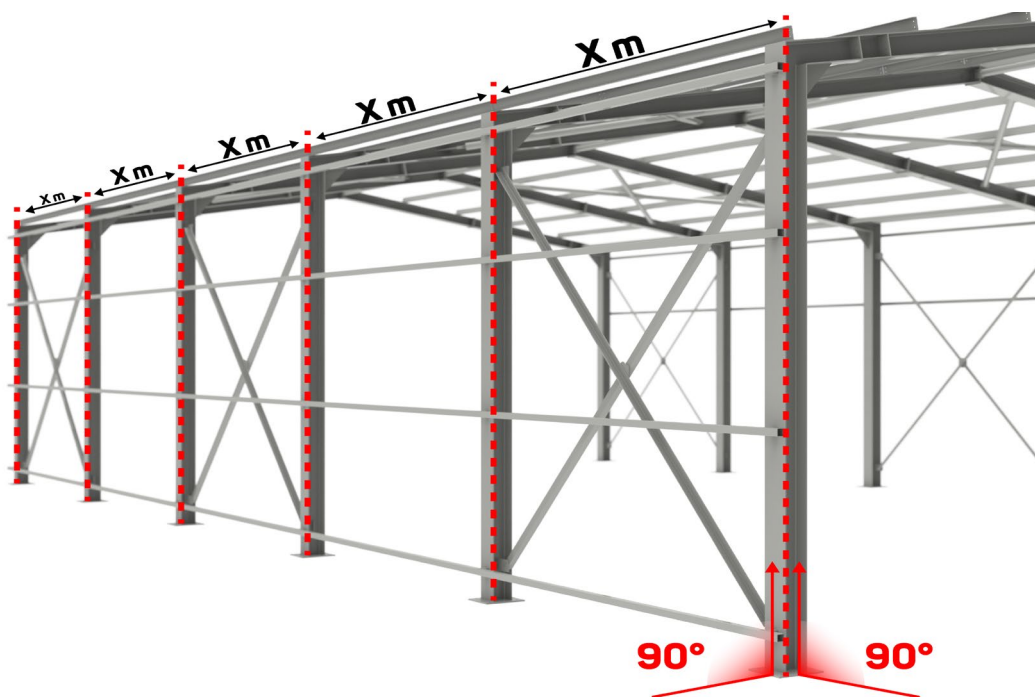


If design conditions require an increase in the number of fixings, it is possible to place additional fixing screws even on the non-corrugated part of the metal profile.

Wall structures alignment

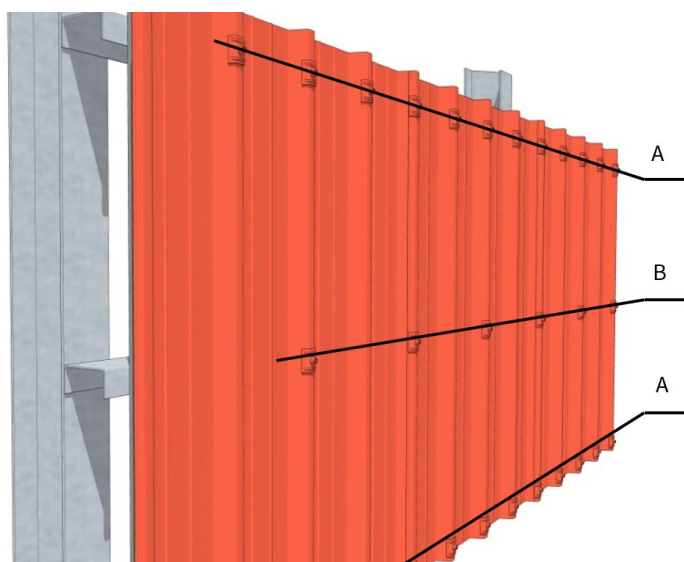
The installation of the corrugated roof panels on the wall is subject to the correct alignment of the supporting substructures.

In order to ensure correct installation, and to avoid damage and imperfections to the products, Isopan recommends carrying out a check on the perpendicularity and alignment of the structural frame.



Fastenings for ROOF CORRUGATED PANELS in wall application

The panels are installed with the direction of installation opposite to that of the prevailing winds, frequently checking their parallelism and alignment. The holes must be smaller in diameter than the fasteners. The number of fasteners depends on the local climatic situation. The normal fixing density is that which foresees one on alternate ribs on the central joists and one on each rib on the terminal joists.



A: Terminal joists

B: Central joist

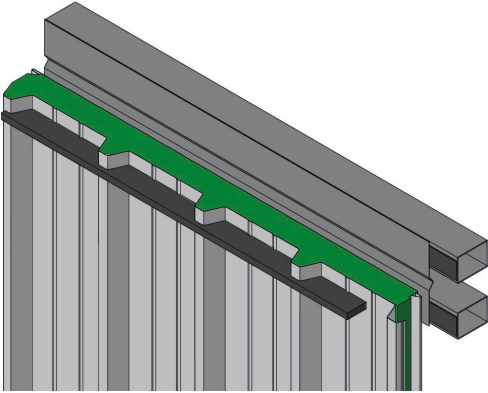
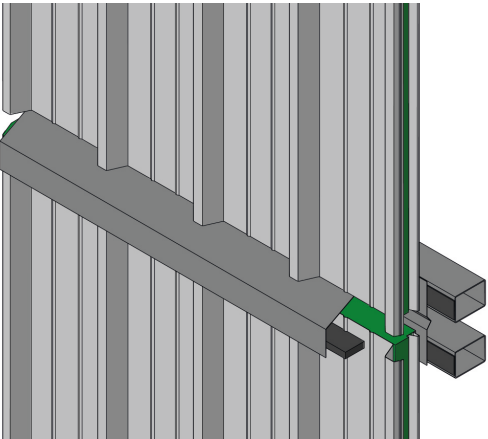
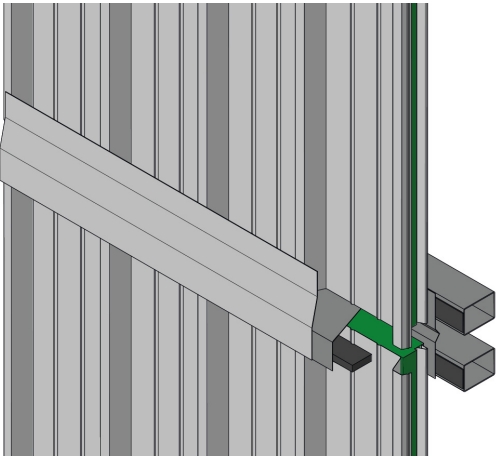
Fastenings installation

Regarding to fastenings installation and assembly instructions, please refer to FASTENING INSTRUCTIONS and ASSEMBLY INSTRUCTIONS chapters in this document.

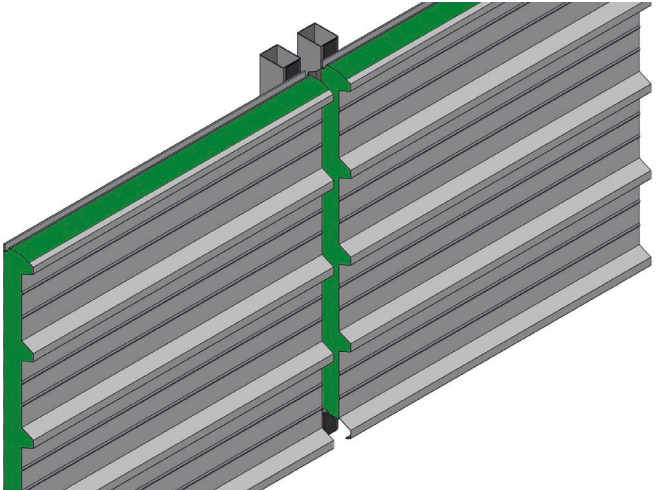
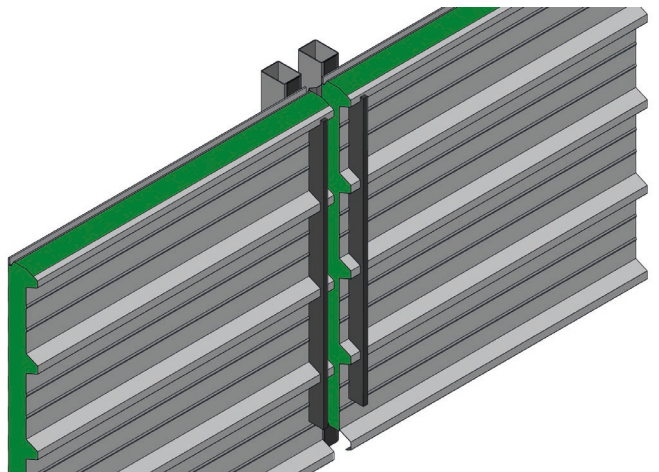
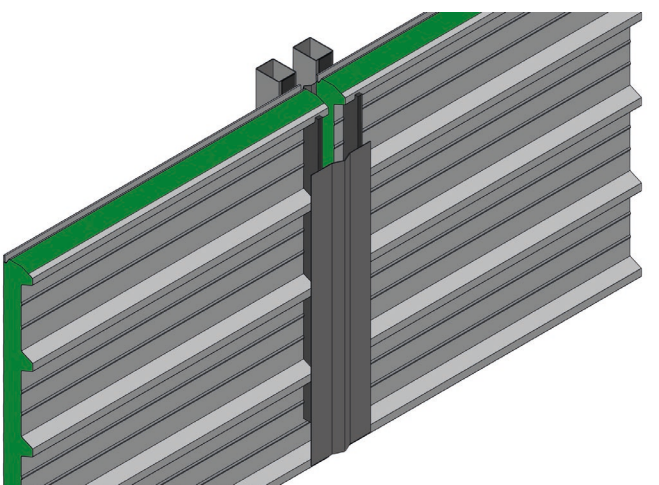


Note: it is necessary to pay attention to the correct juxtaposition of the panels during assembly (4 panels = 4000 mm \pm 5 mm) in order to avoid problems during the subsequent installation of the ridge, as shown in the figure.

Panel-to-panel joint – Vertical configuration panels, with dripping and joint-cover flashing

	<ol style="list-style-type: none"> 1. At the joint between the upper and lower panels, install an internal joint cover sheet metal. 2. Then install the lower panel, and place the Giuntoplast shaped gasket.
	<ol style="list-style-type: none"> 3. The space between the panel and the drip sheet metal must be filled with on-site insulation. 4. Install a drip sheet metal above the lower panel, so that it covers the Giuntoplast gasket. 5. Then place the upper panel, taking care to align it correctly with the lower panel.
	<ol style="list-style-type: none"> 6. Install the joint cover sheet metal so that it covers the drip cover sheet metal.

Panel-to-panel joint – Horizontal configuration panels, with joint-cover flashing

	<ol style="list-style-type: none"> 1. The panels must be correctly installed, so that the profiles are aligned with each other. 2. The space between the panel and the drip sheet metal must be filled with on-site insulation.
	<ol style="list-style-type: none"> 3. Position the Giuntoplast gaskets on both panels.
	<ol style="list-style-type: none"> 4. Install the joint cover sheet metal so that it covers the jointplast gaskets.

TRANSPORT AND STORAGE

Lorry loading

- The packages of panels are loaded on lorries, usually two in width and three in height. The packages include polystyrene spacers at the base, which are thick enough to allow for the lift straps.
- The goods are arranged on the vehicles so as to ensure safe transportation and integrity of the material, in accordance with the requirements of the carrier, who is solely responsible for load integrity. Pay special attention to ensure the weight bearing on the bottom package, as well as the pressure exerted in the tying points, do not cause damage and the straps do not distort the shape of the product in any way.
- Isopan assumes no liability for loading lorries that are already partially occupied with other materials, or that do not have a suitable loading floor.

The customer who will pick up the material must instruct drivers for the purpose.

Lorry unloading with crane

- Use any type of crane equipped with lifting beam and equipped straps. Isopan can advise customers on the choice of lifting beams and straps. By using correct lifting systems, the panels will not be damaged.
- Never use chains or metal cables for lifting under any circumstances. As a general rule, sling the packages leaving about 1/4 of their length protruding from each end.

Lorry unloading with forklifts

- If the lorries are unloaded using a forklift, the length of the packages and their possible bending should be taken into account in order to prevent damages to the bottom of the package.
- The forks must be wide and long enough in order not to damage the product. When possible, protective material against surface abrasion and scratches should be applied between the fork and the package.

Indoor storage (Annex A)

- The materials must be stored in ventilated indoor facilities that are free of dust and humidity and not subject to temperature changes.
- Moisture that can penetrate (rain) or form (condensation) between two panels can damage the facings since it is particularly aggressive on metals and facings, with subsequent oxidation.
- Pre-painted facings may be more exposed to the negative consequences of combined heat/humidity conditions.

Outdoor storage (Annex A)

- If the packages and accessories are stored outdoors, the surface must absolutely be inclined longitudinally to prevent the accumulation of moisture and allow water run-off and natural air circulation.
- If storage is not shortly followed by pick-up for installation, it is advisable to cover the packages with a protective tarp, assuring impermeability as well as adequate ventilation to prevent condensate from accumulating and puddles of water from forming.

Storage terms (Annex A)

- Based on experience, in order to maintain original product performance, continuous indoor storage in closed and ventilated facilities should not exceed six months, while outdoor storage should never exceed sixty days from the date of production. These terms refer to the properly stored product, as instructed in the "storage" chapter in Annex A. However, the materials must always be protected against direct sunlight, as it may cause alterations.
- In case of transport in containers, the products must be removed from the containers as soon as possible and, however, no later than 15 days from the loading date, to prevent deterioration of the metal facings and organic coatings (e.g. blistering). Moisture inside the container must absolutely be avoided. Upon customer request, Isopan can provide special packages that are more suitable for transport in containers.

PACKAGING

Isopan suggests carefully choosing the type of packaging depending on destination, type of transport, conditions and length of storage.

To choose the correct type of packaging, please refer to the document "**Packaging and Services**" on www.isopan.com.

DURABILITY

Product durability depends on the intrinsic features of the panel used in relation with its final use. The panel, including the features of the metal sheets, must be chosen after a proper design of the wall.

In this regard we recommend, if necessary, using the Isopan documentation, also available on the web (www.isopan.com), and/or the reference standards.

We recommend, especially for roof panels with metal facings in pre-painted galvanised steel, checking the roof pitch slope and other construction details in order to promote normal water drainage and prevent aggressive materials from accumulating, which would lead to premature oxidation.

In the event of roof pitches with longitudinal overlapping (panel overlap), we recommend paying special attention during installation to seal the plates in order to prevent leaks or stagnation on the end part of the panel.

We recommend using accessories like ridge flashing, caps and gaskets supplied by Isopan, as they are appropriately designed for the specific use of the products.

MAINTENANCE

All types of roofs, including those made with metal sandwich panels, require maintenance.

The type and frequency of maintenance activities depend on the product used for the outer facing (steel, aluminium); in any case, we recommend periodically inspecting the building (at least once a year), in order to assess its conditions.

In order to maintain the aesthetic and physical properties of the elements and to extend the efficiency of the protective facing, it is also recommended to regularly clean the wall, paying special attention to the areas that could facilitate rain water stagnation, where substances that are harmful to the durability of the metal sheet may be concentrated.

If you notice any problems following an on-site inspection, you must react immediately in order to restore the initial general conditions (e.g. restoring the paint where there are local abrasions or scratches).

At the customer's request, Isopan can provide useful information to solve some problems related to this topic.

SAFETY AND DISPOSAL

Pursuant to Directive 68/548/EEC the sandwich panel does not require labelling. To meet customers' requirements, Isopan has drawn-up a "Technical details for safety" document, to be referenced for any kind of information related to safety.

Caution: all information contained in the product data sheets must be validated by a qualified technician according to the laws in force in the country of installation of the panels.

Technical data and features are not binding. Isopan reserves the right to make changes without prior notice; the latest documentation is available on our website www.Isopan.com. For whatever is not explicitly specified herein, please refer to the "General conditions of sale of the corrugated metal sheets, insulated metal panels and accessories". All the products that fall under the EN 14509 standard field of application are CE marked.

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Annex A

LORRY UNLOADING WITH CRANE

For lifting, the packages must always be sling in at least two points. The distance between them must be no less than half the length of the packages.

Lifting should be possibly carried out using synthetic fibre straps (Nylon) no thinner than 10 cm, so that the load is distributed on the strap and does not cause distortion. (see Figure 1)

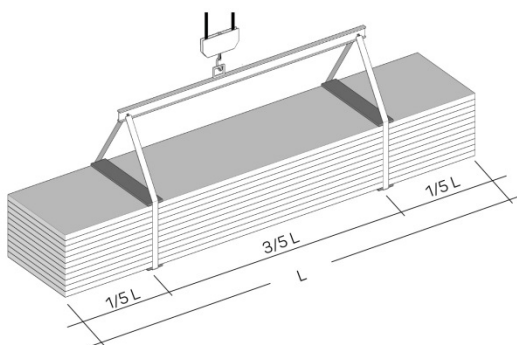


Figure 1

Suitable spacers must be placed under and above the package, made of sturdy solid wood or plastic elements to avoid direct contact of the strap with the package.

These spacers must be at least 4 cm longer than the width of the package and be at least as wide as the strap.

Make sure that the straps and supports cannot move during lifting and that manoeuvres are performed cautiously.

LORRY UNLOADING WITH FORKLIFTS

If the lorries are unloaded with a forklift, take into account the length of the packages and their possible bending in order to avoid damaging the bottom of the package and/or to the extreme failure limit of the panels.

We recommend using forklifts that are suitable for handling panels and similar products.

STORAGE

The packages must always be kept off the ground both in the warehouse and, more so, at the construction site. They must have plastic foam supports with flat surfaces longer than the width of the panels and at a distance adequate to the features of the product.

The packages should preferably be stored in dry facilities to prevent stagnation of condensation water on inner, less ventilated, elements, which is particularly aggressive on metals, resulting in the formation of oxidation.

The panels must be stored in dry ventilated facilities; should this not be possible, open the packages and ventilate the panels (spacing them from one other). If the panels remain packaged outdoors, the galvanised facing may oxidise (white rust) even after a few days, due to electrolytic corrosion.

The panels must be stored to facilitate water run-off, especially when it is necessary to temporarily store them outside (see Figure 2).

If storage is not shortly followed by pick-up for installation, it is advisable to cover the packages with protective tarps.

To maintain original product performance, continuous indoor storage in ventilated facilities should not exceed six months, while outdoor storage should never exceed 60 days.

Packages stored at a height must always be properly bound to the structure.

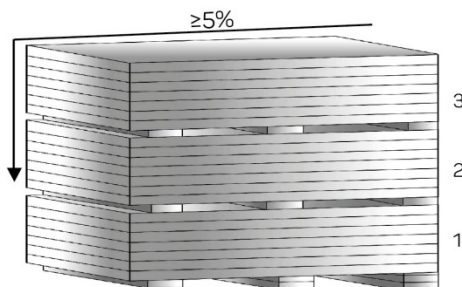


Figure 2

PRE-PAINTED FACES



In case of prolonged storage, the pre-painted products must be stored indoors or under a canopy. There is the risk that stagnant humidity may attack the paint layer, causing it to detach from the galvanised support. It is not advisable to

let more than two weeks elapse from when the products were stored at the site.

In case of container transport, the products must be removed from the container within 15 days from the loading date in order to prevent the metal supports from deteriorating.

HANDLING THE PANELS

The panels must be handled using adequate protection equipment (safety shoes, gloves, overalls, etc.) in compliance with current regulations.

The individual element must always be manually handled by lifting the element without dragging it on the ground and turning it sideways beside the package; it must be transported by at least two people according to the length, keeping the element on its side. (see Figure 3)



Figure 3

Pick-up equipment as well as gloves must be clean and such as not to damage the items.

INSTALLATION

The panel installation personnel must be qualified and know the correct technique to perform the work in a workmanlike manner.

If required, the seller can provide appropriate guidance and instructions.

The installation personnel must be equipped with footwear with soles that do not damage the external surface of the panel. On-site cutting operations must be done with suitable tools (jigsaw, shears, nibbler, etc.).

We do not recommend using tools with abrasive discs.

To fasten the panels, it is advisable to use devices that can be provided by the seller.

Tighten the screws using a screwdriver with torque limitation.

For roofs with pitch elements without intermediate joints (overlaps), the slope should usually be no less than 7%. For slopes below that, the seller's requirements must be implemented.

In case of head overlaps, the slope should take into account the type of joint and material used, as well as the specific environmental conditions.

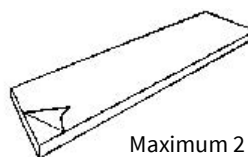
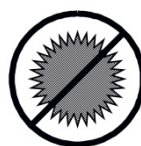
During panel assembly and, in particular, in roofs, it is necessary to immediately remove all residual materials paying special attention to metal ones that may cause early deterioration of the metal faces by oxidising.

PROTECTIVE FILM

The pre-painted metal facings are supplied upon request with adhesive polyethylene protective film that prevents damage to the paint layer.

The protective film covering the pre-painted panels must be completely removed during assembly or, in any case, within 60 days from material preparation.

It is also recommended not to expose the panels covered by a protective film to direct sunlight.



Maximum 2 months

For the panels expressly requested without protective film, special care is required during handling on site and installation.

MAINTENANCE

The main routine maintenance operation is cleaning the panels. The panel surfaces that, following visual inspection, are found to be dirty or oxidised can be washed with soap and water using a soft brush. The cleaning water pressure can be applied up to 50 bar, but the jet must not be too close or perpendicular to the surfaces. Near the joints the water must be sprayed at a sufficient angle not to undermine their tightness.

YEARLY CHECKS OF THE ISOPAN PANELS

WHAT TO INSPECT	CORRECTIVE ACTIONS
Conditions of the pre-painted surfaces (cracks and colour unevenness)	Assess the condition of the surfaces Repaint where possible
Scratches and dents	Repaint and repair dents
Fastening screws	Remove a screw and check if oxidised Tighten the screws where necessary
Angle parts of cut	Check the state of oxidation Clean and repaint

These provisions are taken from the General Conditions of Sale.

Annex B

VACUUM LIFTER

If the panels are handled with vacuum lifters, the operations must be performed avoiding stresses on the panel metal sheet. The action which performs the suction pad on the metal sheet during lifting must be redistributed properly taking into account the length and the weight of the panel itself.

To prevent excessive actions of the suction pads that could cause the detachment of the metal sheet from the insulating layer, Isopan recommends to observe the following restrictions:

Polyurethane Panels:

Minimal surfaces for all the suction pads - Panels with Steel supports 0,4 / 0,4												
Panel length [mm]	Panel thickness [mm]											
	25	30	35	40	50	60	80	100	120	150	180	200
2000	340 cm2	350 cm2	350 cm2	360 cm2	380 cm2	390 cm2	430 cm2	460 cm2	490 cm2	540 cm2	590 cm2	620 cm2
3500	590 cm2	600 cm2	620 cm2	630 cm2	660 cm2	690 cm2	740 cm2	800 cm2	850 cm2	940 cm2	1.020 cm2	1.080 cm2
5000	840 cm2	860 cm2	880 cm2	900 cm2	940 cm2	980 cm2	1.060 cm2	1.140 cm2	1.220 cm2	1.340 cm2	1.460 cm2	1.540 cm2
6500	1.090 cm2	1.120 cm2	1.140 cm2	1.170 cm2	1.220 cm2	1.270 cm2	1.380 cm2	1.480 cm2	1.580 cm2	1.740 cm2	1.900 cm2	2.000 cm2
8000	1.340 cm2	1.370 cm2	1.400 cm2	1.440 cm2	1.500 cm2	1.560 cm2	1.690 cm2	1.820 cm2	1.950 cm2	2.140 cm2	2.330 cm2	2.460 cm2
10000	1.670 cm2	1.710 cm2	1.750 cm2	1.790 cm2	1.870 cm2	1.950 cm2	2.110 cm2	2.270 cm2	2.430 cm2	2.670 cm2	2.910 cm2	3.070 cm2
13000	2.170 cm2	2.230 cm2	2.280 cm2	2.330 cm2	2.430 cm2	2.540 cm2	2.750 cm2	2.950 cm2	3.160 cm2	3.470 cm2	3.790 cm2	3.990 cm2

Minimal surfaces for all the suction pads - Panels with Steel supports 0,6 / 0,6

Panel length [mm]	Panel thickness [mm]											
	25	30	35	40	50	60	80	100	120	150	180	200
2000	490 cm2	490 cm2	500 cm2	510 cm2	530 cm2	540 cm2	570 cm2	610 cm2	640 cm2	690 cm2	730 cm2	770 cm2
3500	850 cm2	860 cm2	870 cm2	890 cm2	920 cm2	940 cm2	1.000 cm2	1.060 cm2	1.110 cm2	1.200 cm2	1.280 cm2	1.340 cm2
5000	1.210 cm2	1.230 cm2	1.250 cm2	1.270 cm2	1.310 cm2	1.350 cm2	1.430 cm2	1.510 cm2	1.590 cm2	1.710 cm2	1.830 cm2	1.910 cm2
6500	1.570 cm2	1.590 cm2	1.620 cm2	1.640 cm2	1.700 cm2	1.750 cm2	1.850 cm2	1.960 cm2	2.060 cm2	2.220 cm2	2.370 cm2	2.480 cm2
8000	1.930 cm2	1.960 cm2	1.990 cm2	2.020 cm2	2.090 cm2	2.150 cm2	2.280 cm2	2.410 cm2	2.530 cm2	2.730 cm2	2.920 cm2	3.050 cm2
10000	2.410 cm2	2.450 cm2	2.490 cm2	2.530 cm2	2.610 cm2	2.690 cm2	2.850 cm2	3.010 cm2	3.170 cm2	3.410 cm2	3.650 cm2	3.810 cm2
13000	3.130 cm2	3.180 cm2	3.230 cm2	3.280 cm2	3.390 cm2	3.490 cm2	3.700 cm2	3.910 cm2	4.120 cm2	4.430 cm2	4.740 cm2	4.950 cm2

Minimal surfaces for all the suction pads - Panels with Steel supports 0,8 / 0,8

Panel length [mm]	Panel thickness [mm]											
	25	30	35	40	50	60	80	100	120	150	180	200
2000	630 cm2	640 cm2	650 cm2	660 cm2	670 cm2	690 cm2	720 cm2	750 cm2	780 cm2	830 cm2	880 cm2	910 cm2
3500	1.100 cm2	1.120 cm2	1.130 cm2	1.140 cm2	1.170 cm2	1.200 cm2	1.260 cm2	1.310 cm2	1.370 cm2	1.450 cm2	1.540 cm2	1.590 cm2
5000	1.570 cm2	1.590 cm2	1.610 cm2	1.630 cm2	1.670 cm2	1.710 cm2	1.790 cm2	1.870 cm2	1.950 cm2	2.070 cm2	2.190 cm2	2.270 cm2
6500	2.040 cm2	2.070 cm2	2.100 cm2	2.120 cm2	2.170 cm2	2.230 cm2	2.330 cm2	2.430 cm2	2.540 cm2	2.690 cm2	2.850 cm2	2.950 cm2
8000	2.510 cm2	2.550 cm2	2.580 cm2	2.610 cm2	2.670 cm2	2.740 cm2	2.870 cm2	2.990 cm2	3.120 cm2	3.310 cm2	3.510 cm2	3.630 cm2
10000	3.140 cm2	3.180 cm2	3.220 cm2	3.260 cm2	3.340 cm2	3.420 cm2	3.580 cm2	3.740 cm2	3.900 cm2	4.140 cm2	4.380 cm2	4.540 cm2
13000	4.080 cm2	4.130 cm2	4.190 cm2	4.240 cm2	4.340 cm2	4.450 cm2	4.650 cm2	4.860 cm2	5.070 cm2	5.380 cm2	5.690 cm2	5.900 cm2

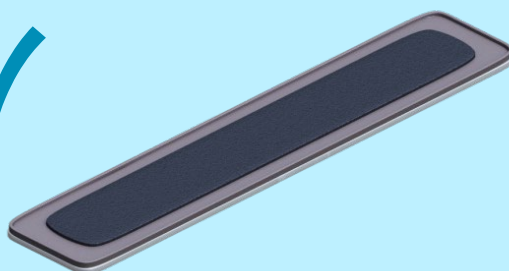
Mineral wool Panels:

Minimal surfaces for all the suction pads - Panels with Steel supports 0,5 / 0,5							
Panel length [mm]	Panel thickness [mm]						
	50	60	80	100	120	150	200
2000	470 cm ²	490 cm ²	510 cm ²	530 cm ²	570 cm ²	610 cm ²	690 cm ²
3500	820 cm ²	860 cm ²	890 cm ²	930 cm ²	1.000 cm ²	1.070 cm ²	1.210 cm ²
5000	1.170 cm ²	1.220 cm ²	1.270 cm ²	1.320 cm ²	1.420 cm ²	1.520 cm ²	1.720 cm ²
6500	1.520 cm ²	1.590 cm ²	1.650 cm ²	1.720 cm ²	1.850 cm ²	1.980 cm ²	2.240 cm ²
8000	1.870 cm ²	1.950 cm ²	2.030 cm ²	2.110 cm ²	2.270 cm ²	2.430 cm ²	2.750 cm ²
10000	2.340 cm ²	2.440 cm ²	2.540 cm ²	2.640 cm ²	2.840 cm ²	3.040 cm ²	3.440 cm ²
13000	3.040 cm ²	3.170 cm ²	3.300 cm ²	3.430 cm ²	3.690 cm ²	3.950 cm ²	4.470 cm ²

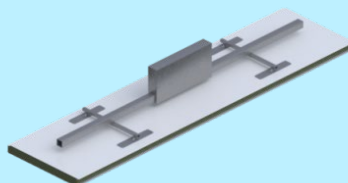
Minimal surfaces for all the suction pads - Panels with Steel supports 0,8 / 0,8							
Panel length [mm]	Panel thickness [mm]						
	50	60	80	100	120	150	200
2000	690 cm ²	710 cm ²	730 cm ²	750 cm ²	790 cm ²	830 cm ²	910 cm ²
3500	1.210 cm ²	1.240 cm ²	1.280 cm ²	1.310 cm ²	1.380 cm ²	1.450 cm ²	1.590 cm ²
5000	1.720 cm ²	1.770 cm ²	1.820 cm ²	1.870 cm ²	1.970 cm ²	2.070 cm ²	2.270 cm ²
6500	2.240 cm ²	2.300 cm ²	2.370 cm ²	2.430 cm ²	2.560 cm ²	2.690 cm ²	2.950 cm ²
8000	2.750 cm ²	2.830 cm ²	2.910 cm ²	2.990 cm ²	3.150 cm ²	3.310 cm ²	3.630 cm ²
10000	3.440 cm ²	3.540 cm ²	3.640 cm ²	3.740 cm ²	3.940 cm ²	4.140 cm ²	4.540 cm ²
13000	4.470 cm ²	4.600 cm ²	4.730 cm ²	4.860 cm ²	5.120 cm ²	5.380 cm ²	5.900 cm ²

N.B. : Thicknesses that are not listed in the tables can be interpolated linearly.

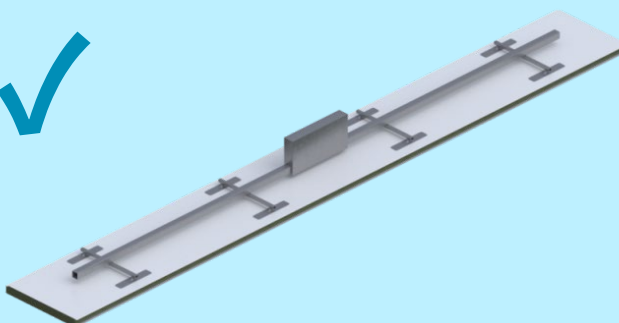
TO ENSURE THE FLATNESS OF THE METAL SHEET DURING THE AIR INTAKE YOU MUST PUT IN THE SUCTION PADS AN APPROPRIATE BUFFER STIFFENING



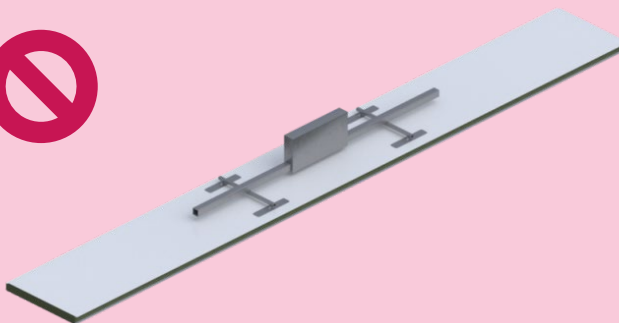
AT LEAST 4 SUCTION PADS EQUALLY DISTRIBUTED FOR PANEL LENGTHS LOWER THAN 6 METERS



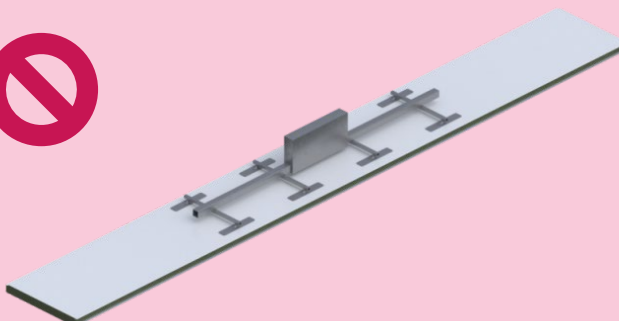
AT LEAST 8 SUCTION PADS EQUALLY DISTRIBUTED FOR PANEL LENGTHS HIGHER THAN 6 METERS



NOT ENOUGH SUCTION PADS



SUCTION PADS NOT EQUALLY DISTRIBUTED



Annex C

BUILDING DETAILS

RPCV 01 – Roof wall connection with insulated gutter

RPCV 03 – Roof wall connection with gutter

RPCV 04 – Roof wall connection with single roof pitch ridge

RPCV 06 – Cantilever roof wall connection with gutter

RPCV 13 – Flat roof wall connection

RPCV 14 – Roof wall connection with insulated gutter with parapet

RPCV 51 – Parallel flat roof wall connection

SCV 01 – Dual roof pitch roof single piece ridge

SCV 02 – Dual roof pitch roof hinged ridge

SCV 03 – Flat roof wall connection

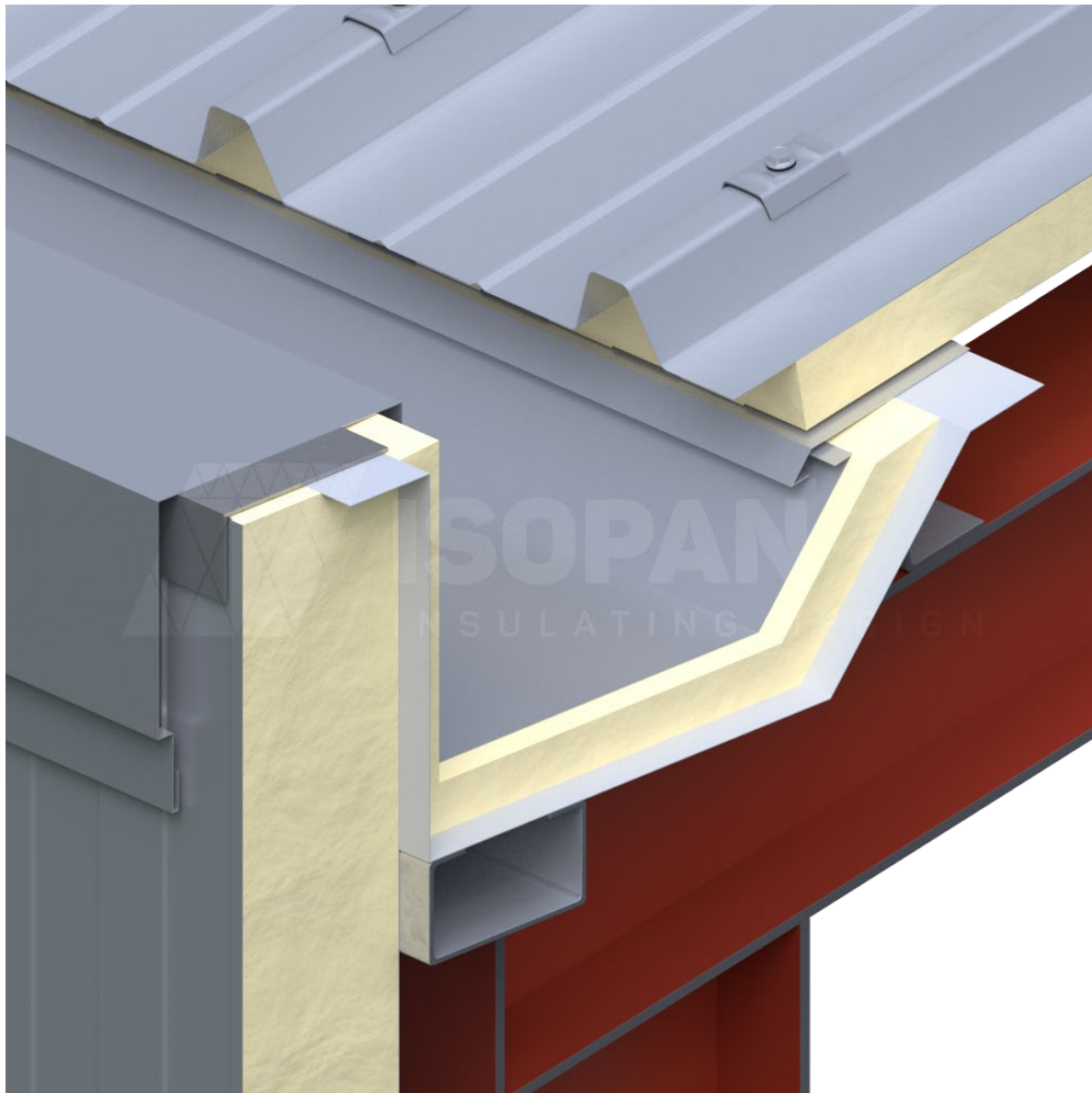
SCV 04 – Inclined roof wall connection

SCV 05 – Roof connection on valley gutter

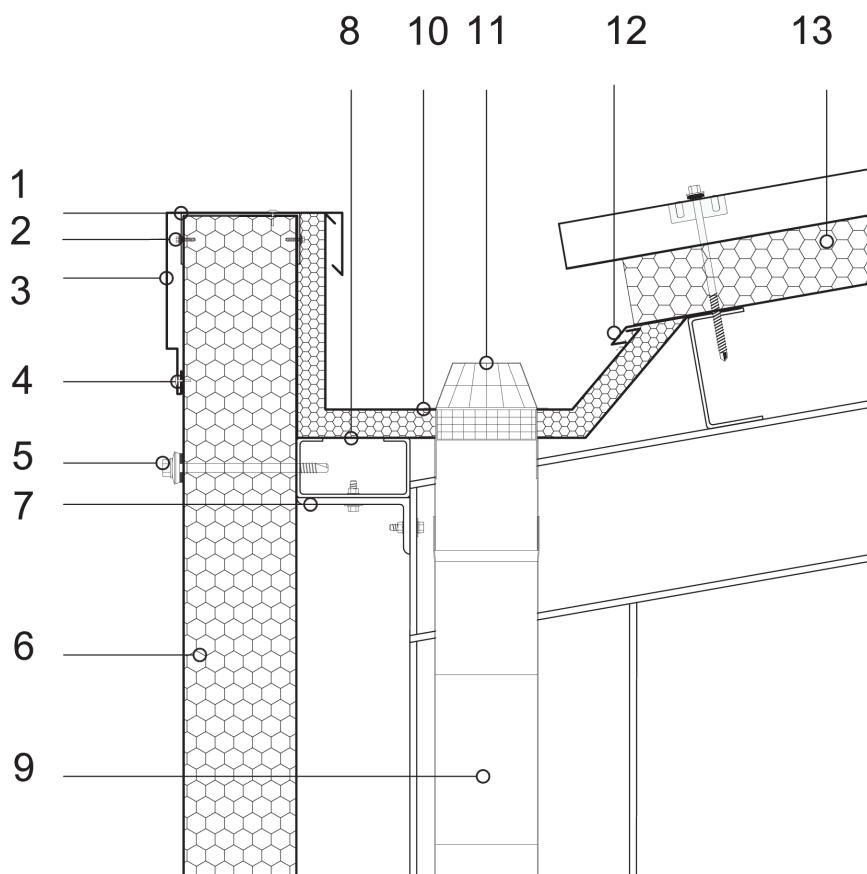
SCV 24 – Overlap fastening

SCV 25 – Stitching screw positioning

ROOF WALL CONNECTION WITH INSULATED GUTTER



Roof wall with insulated gutter connection



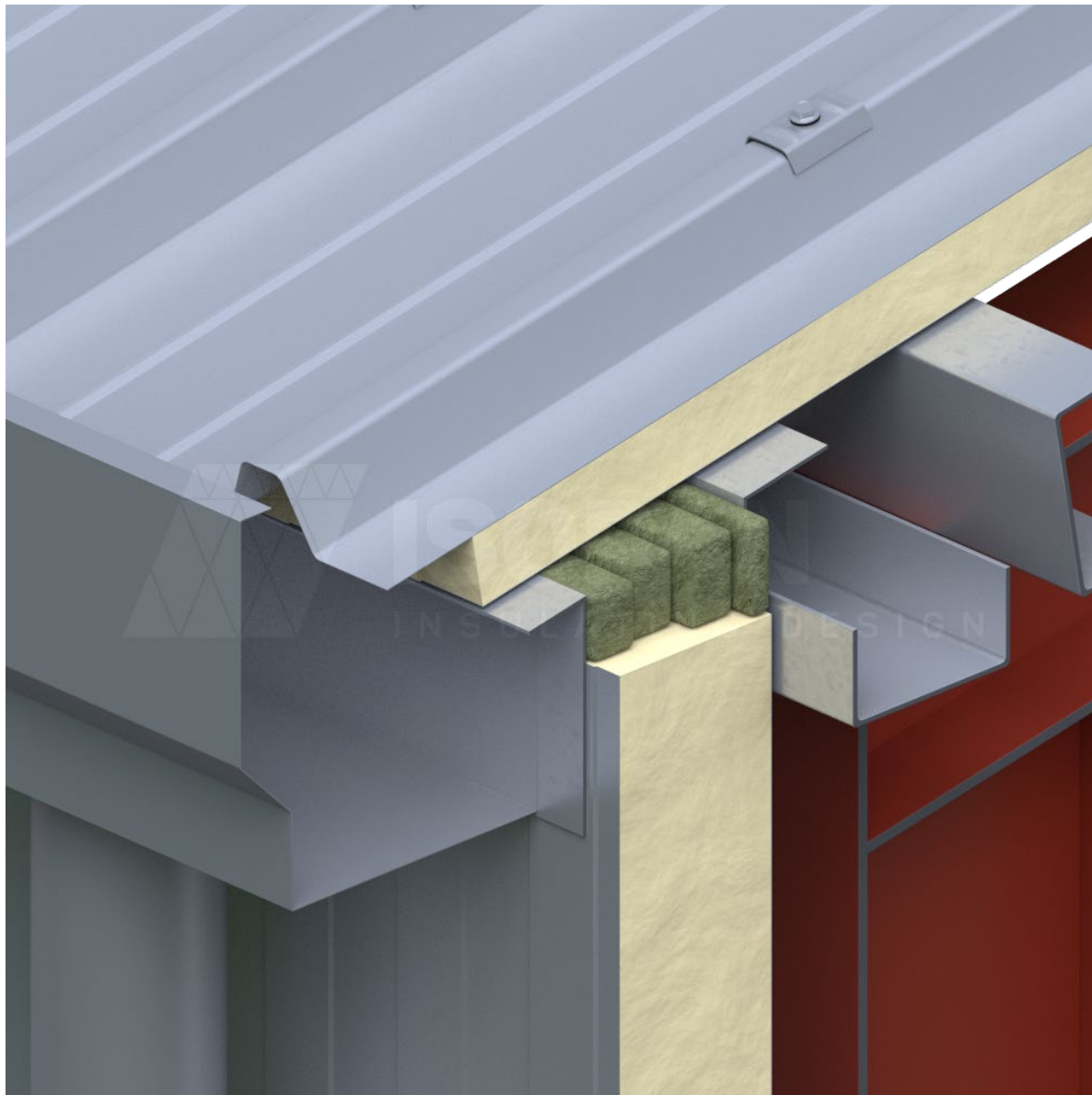
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

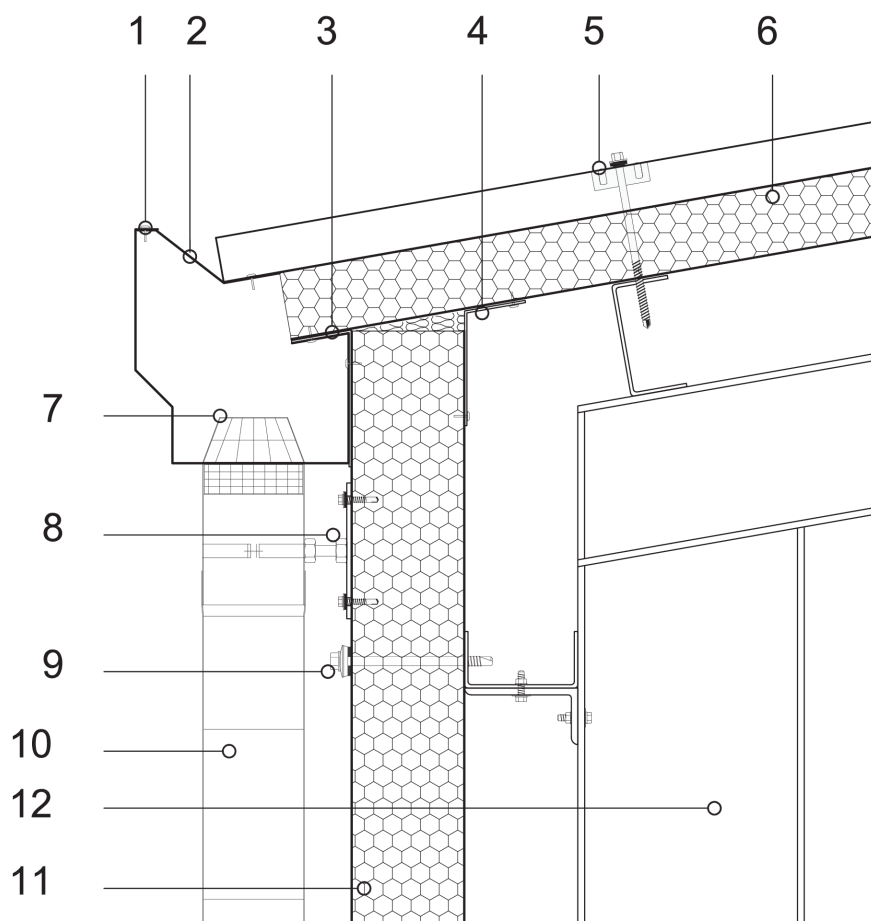
1	Head closing metal sheet	11	Leaf screen
2	Fastening screw	12	Drip edge metal sheet
3	Protective metal sheet	13	ISOPAN roof panel
4	Rivet		
5	Through fastening screw		
6	ISOPAN wall panel		
7	Steel load-bearing structure		
8	Sub-gutter metal sheet		
9	Drainpipe		
10	Gutter		

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ROOF WALL CONNECTION WITH GUTTER



Type 1 roof wall with gutter connection



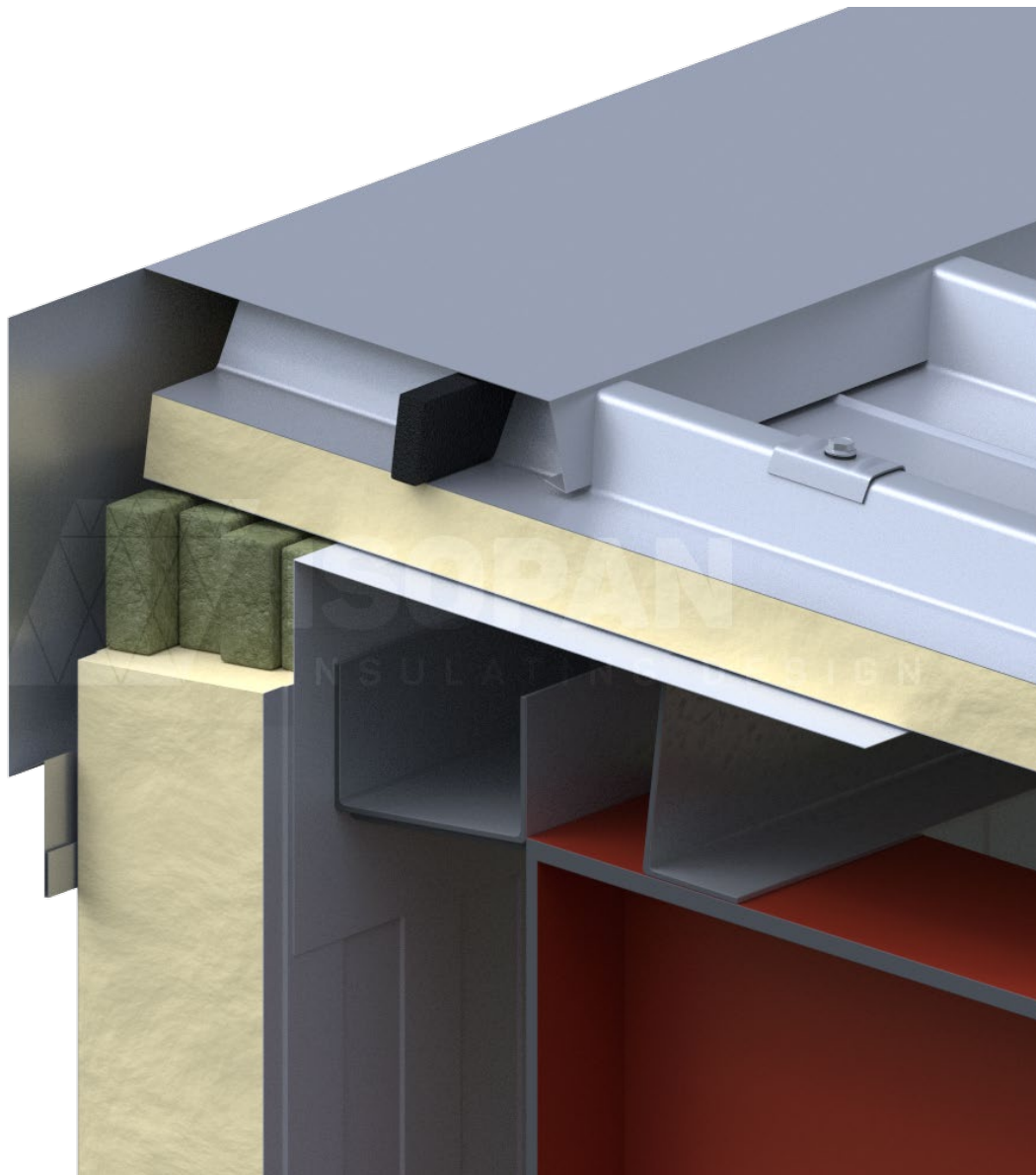
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

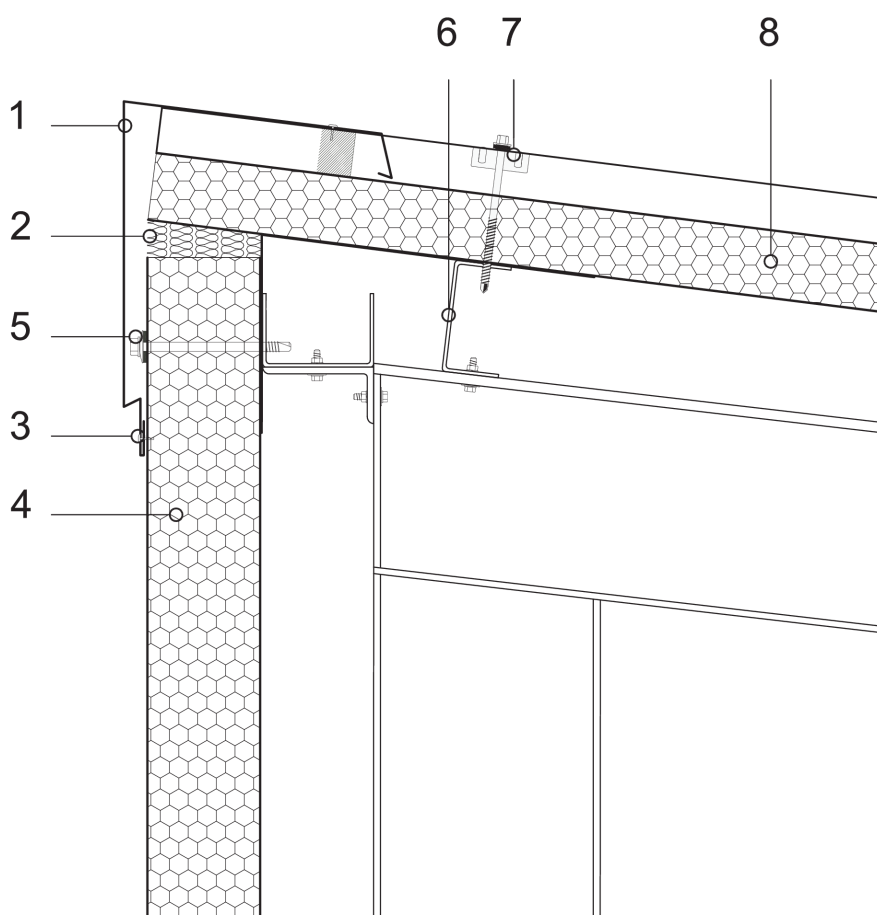
1	Rivet	11	ISOPAN wall panel
2	Gutter support metal sheet	12	Main structure
3	External corner metal sheet closing		
4	Internal corner metal sheet closing		
5	Roof panel fastening unit		
6	ISOPAN roof panel		
7	Leaf screen		
8	Gutter fastening unit		
9	Through fastening screw		
10	Gutter		

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ROOF WALL CONNECTION WITH SINGLE PITCH RIDGE



Type 1 roof wall connection



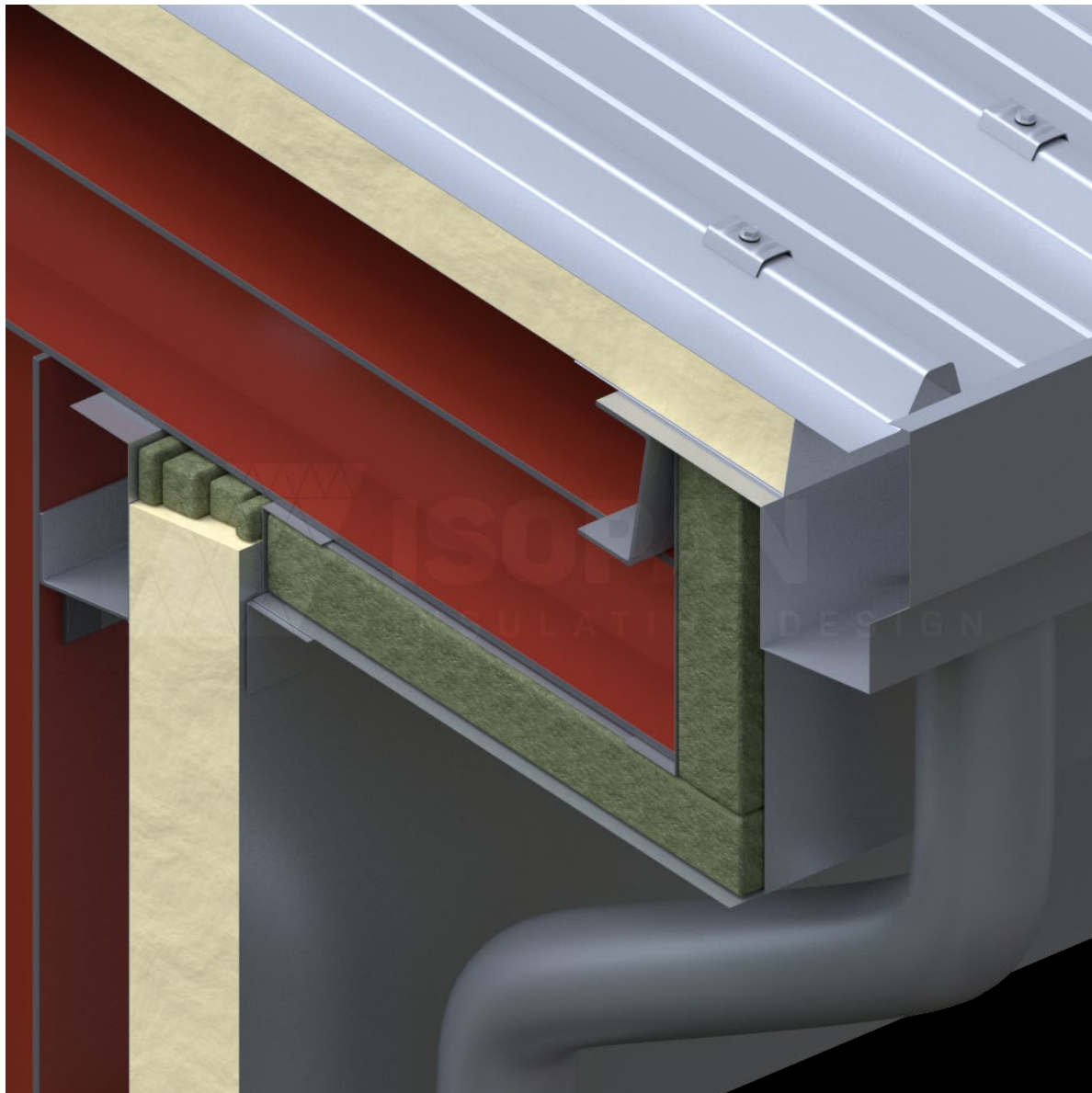
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

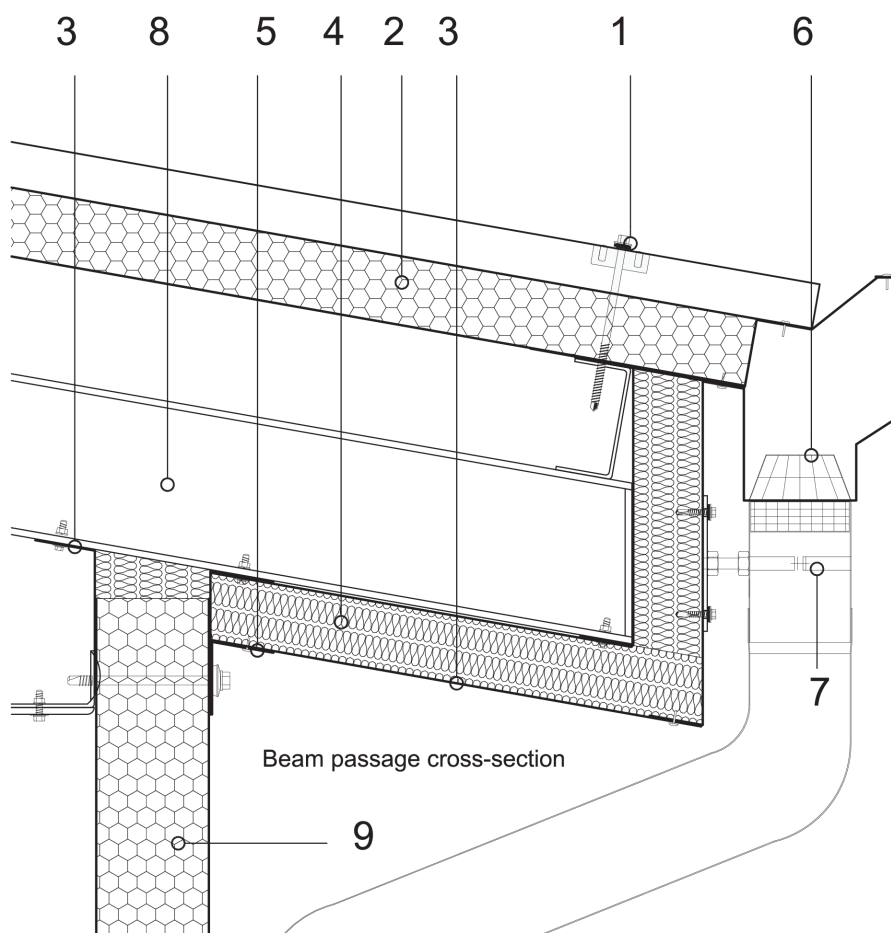
1	Closing metal sheet
2	Polyurethane foam insulating material
3	Rivet
4	ISOPAN wall panel
5	Through fastening screw
6	Secondary steel structure
7	Roof -metal sheet through fastening screw
8	ISOPAN roof panel

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CANTILEVER ROOF WALL CONNECTION WITH GUTTER



Type 2 roof wall with gutter connection



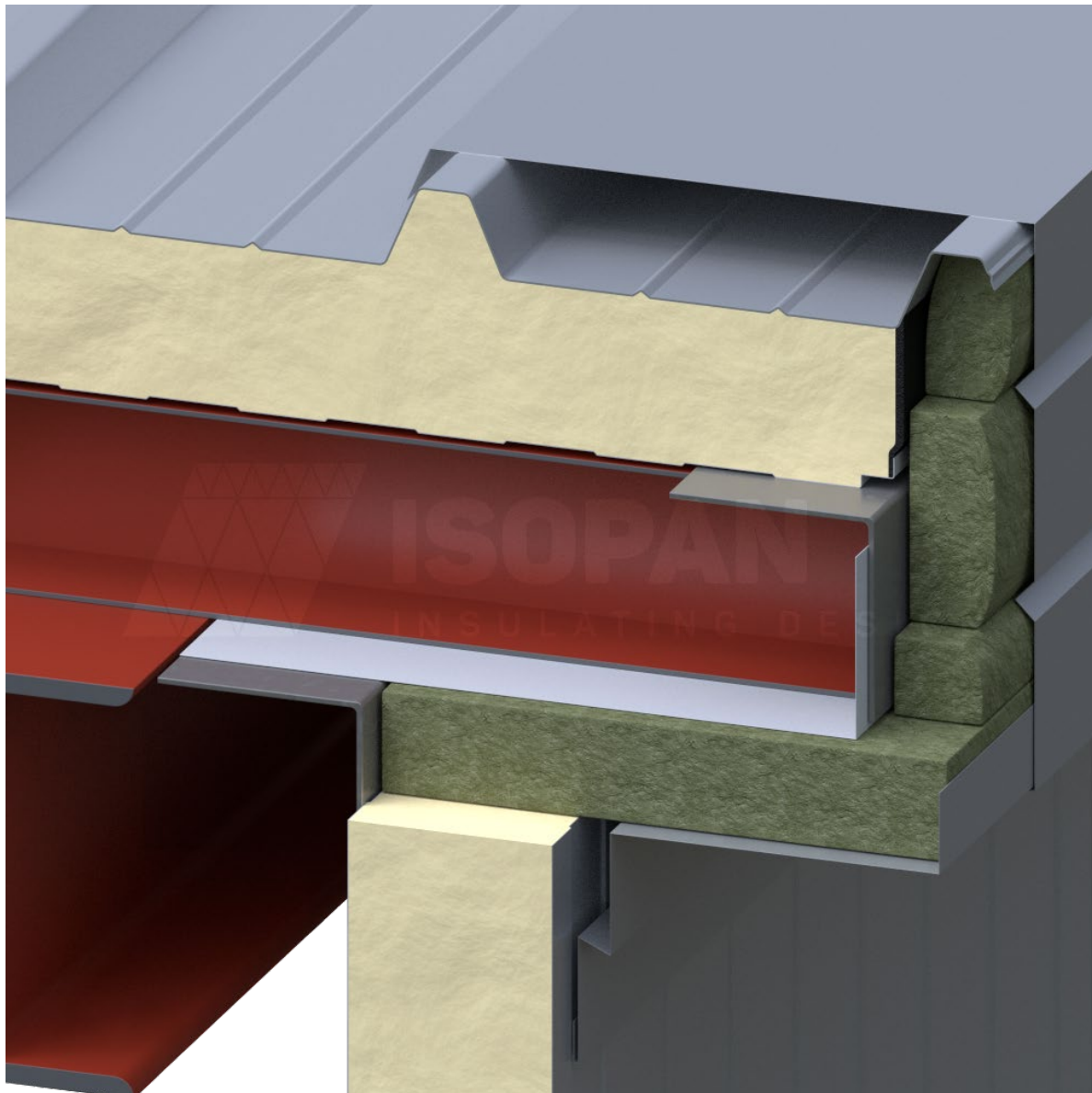
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

1	Roof insulation panel fastening unit
2	ISOPAN roof insulation panel
3	Closing metal sheet
4	Mineral wool
5	Rivet
6	Leaf screen
7	Gutter fastening unit
8	Main steel structure
9	ISOPAN wall panel

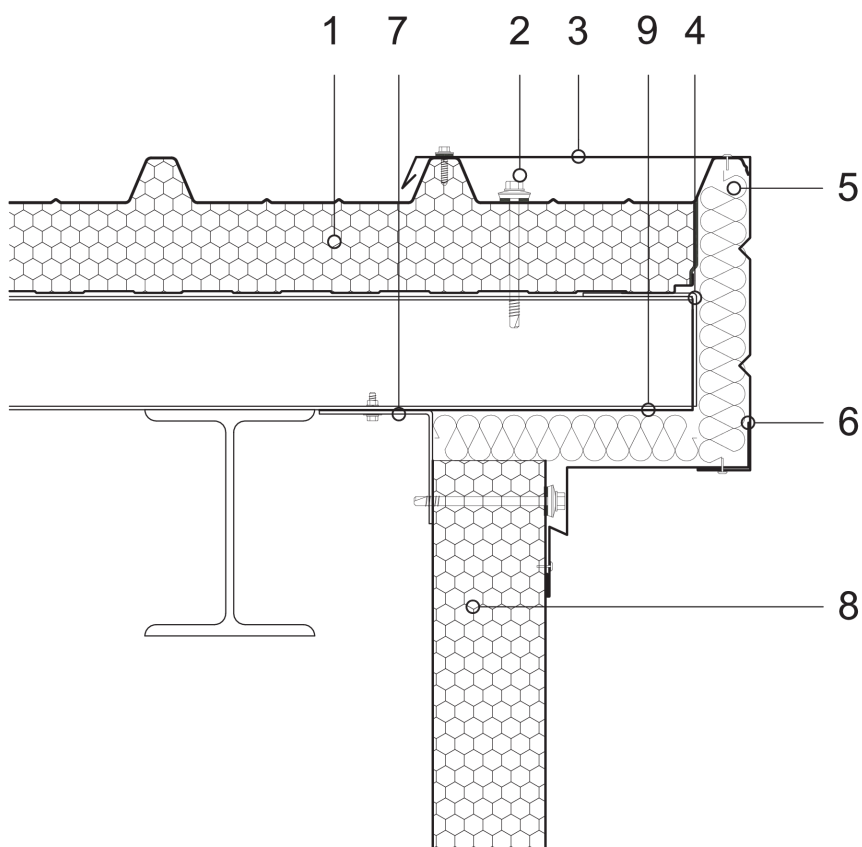
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FLAT ROOF WALL CONNECTION




RPCV 13b

Roof wall side connection



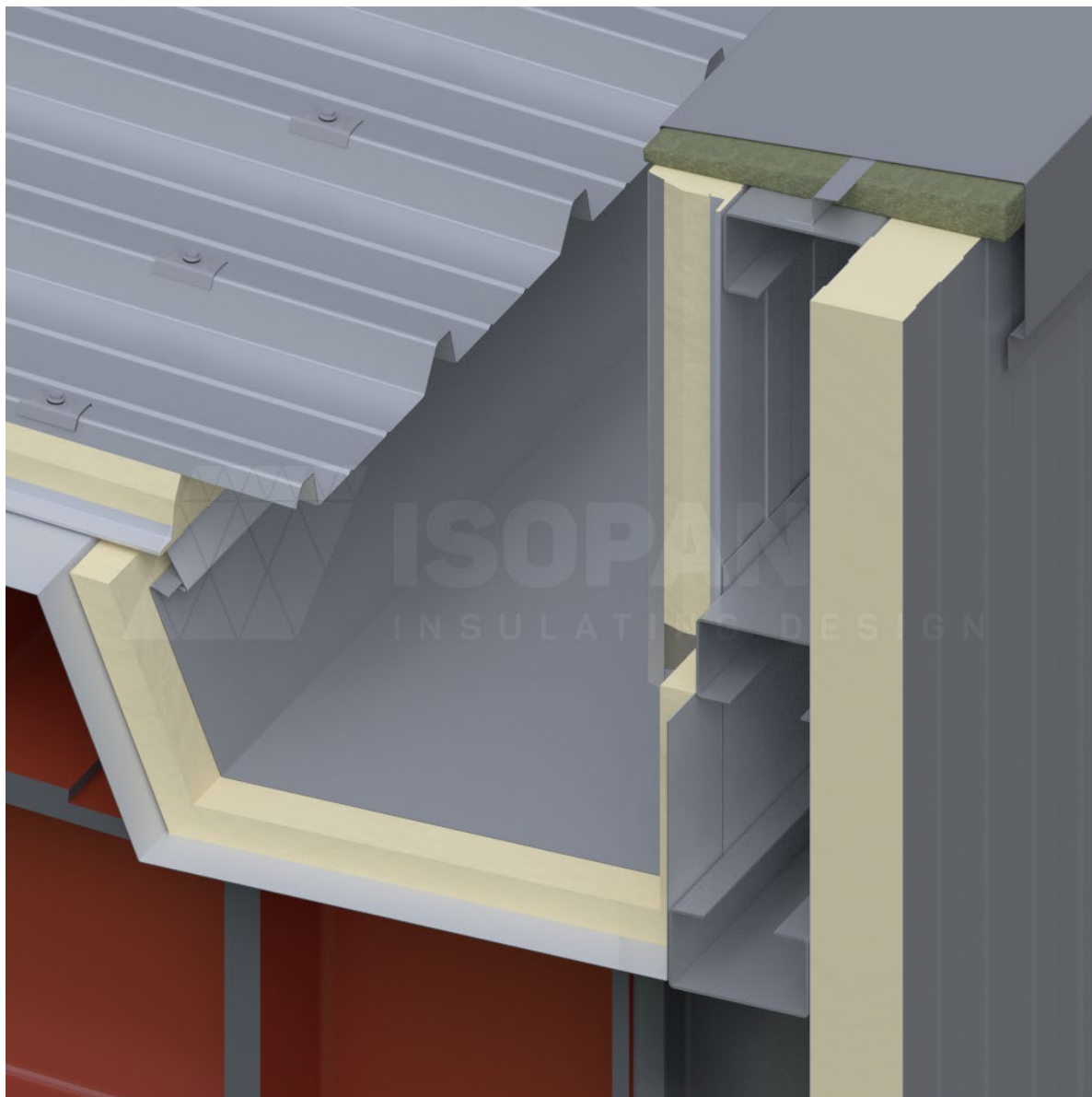
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

1	ISOPAN roof panel
2	Roof panel fastening screw
3	Protective metal sheet
4	L-shaped closing metal sheet
5	Mineral wool insulating material
6	Protective metal sheet
7	Internal closing metal sheet
8	ISOPAN wall panel
9	L-shaped closing metal sheet

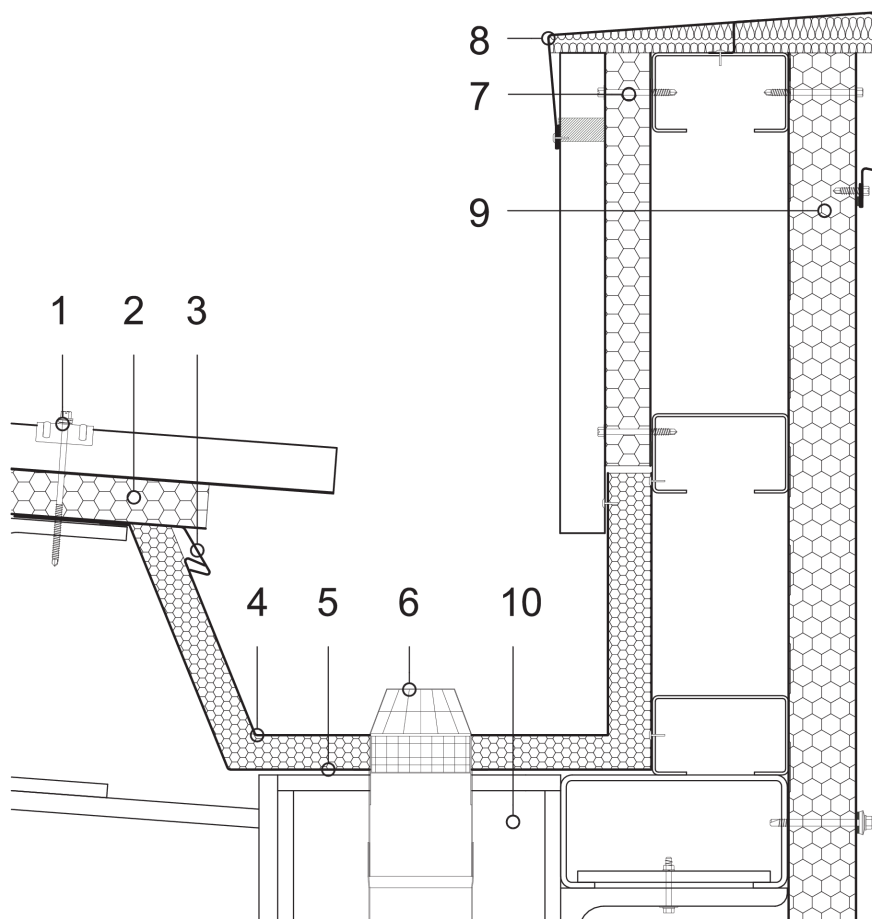
ATTENTION: the proposed solution does not constitute the project, and must be firstly assessed and evaluated by the designer and construction supervision. The property rights of this document belong to ISOPAN S.p.a.. The contents can't be reproduced without prior written permission by the author. To choose the type of fastening, please refer to the screw type choice sheet; To choose the screw length, please refer to the data sheet for the correct screw length).

ROOF WALL CONNECTION WITH INSULATED GUTTER WITH PARAPET




RPCV 14b

Type 4 roof wall with insulated gutter connection



The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

1	Roof panel fastening unit
2	ISOPAN roof panel
3	Drip edge metal sheet
4	Gutter metal sheet
5	Sub-gutter metal sheet
6	Leaf screen
7	Through fastening screw
8	Railing protection metal sheet
9	ISOPAN wall panel
10	Main steel structure

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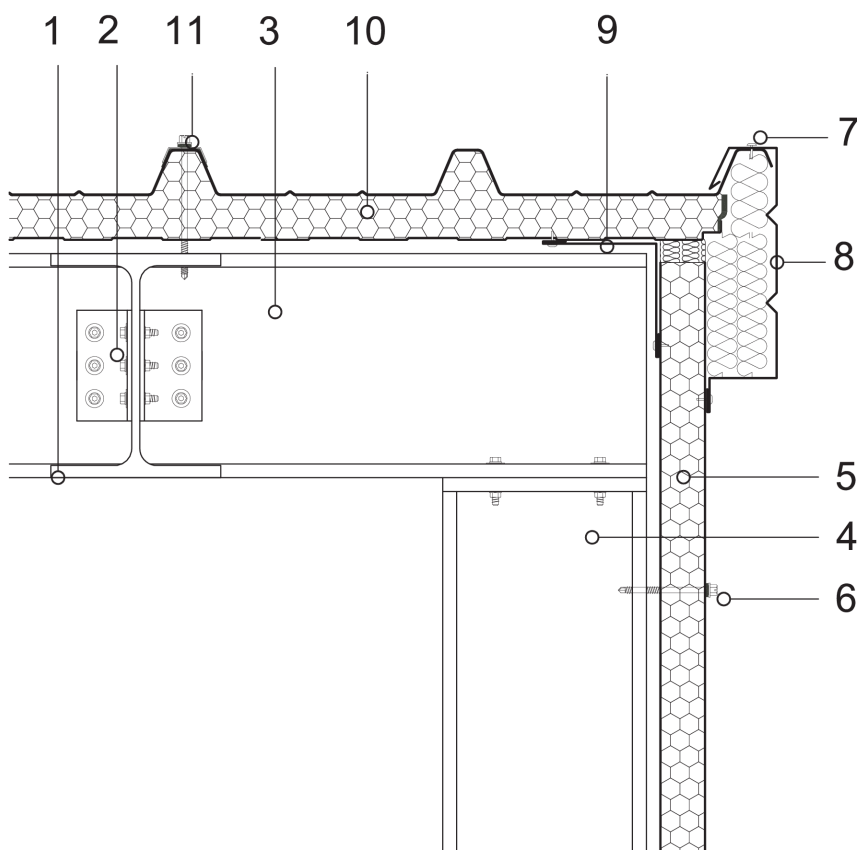
PARALLEL FLAT ROOF WALL CONNECTION





RPCV 51

Type 19 roof wall connection



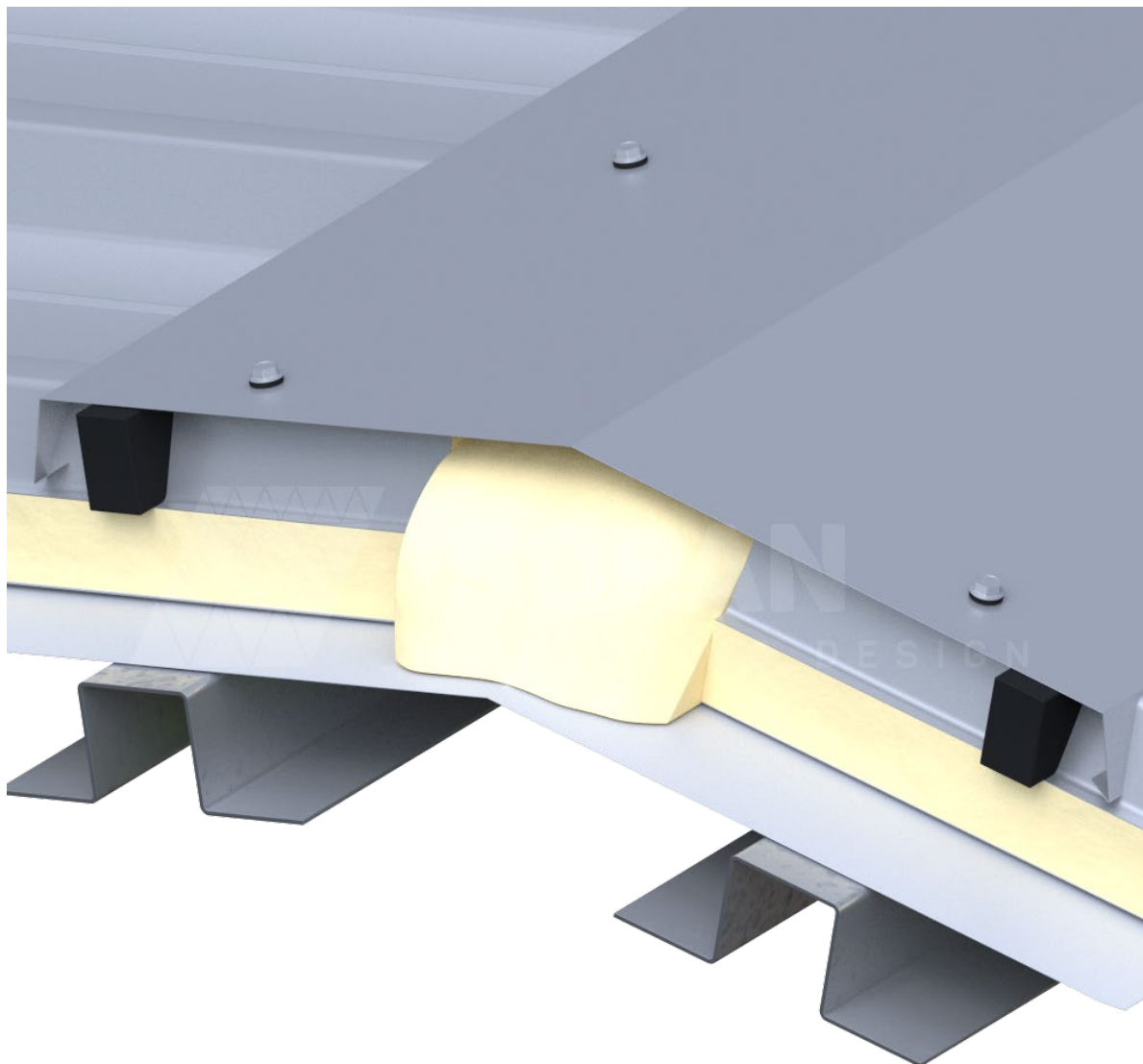
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

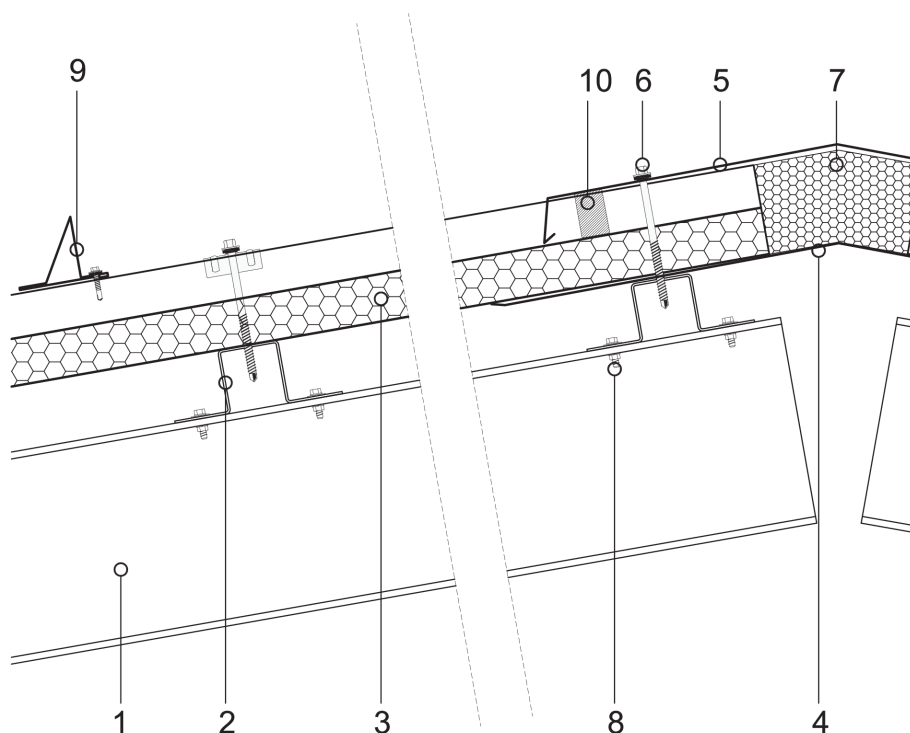
1	IPE profile	11	Fastening unit
2	L-shaped bracket and bolts		
3	Steel load-bearing structure		
4	Steel load-bearing structure		
5	ISOPAN Wall panel		
6	Panel fastening screw		
7	Rivet		
8	Metal sheet for roof wall connection		
9	Internal side corder metal sheet		
10	ISOPAN roof panel		

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DUAL PITCH ROOF SINGLE PIECE RIDGE



Type 1 roof ridge: vertical cross-section



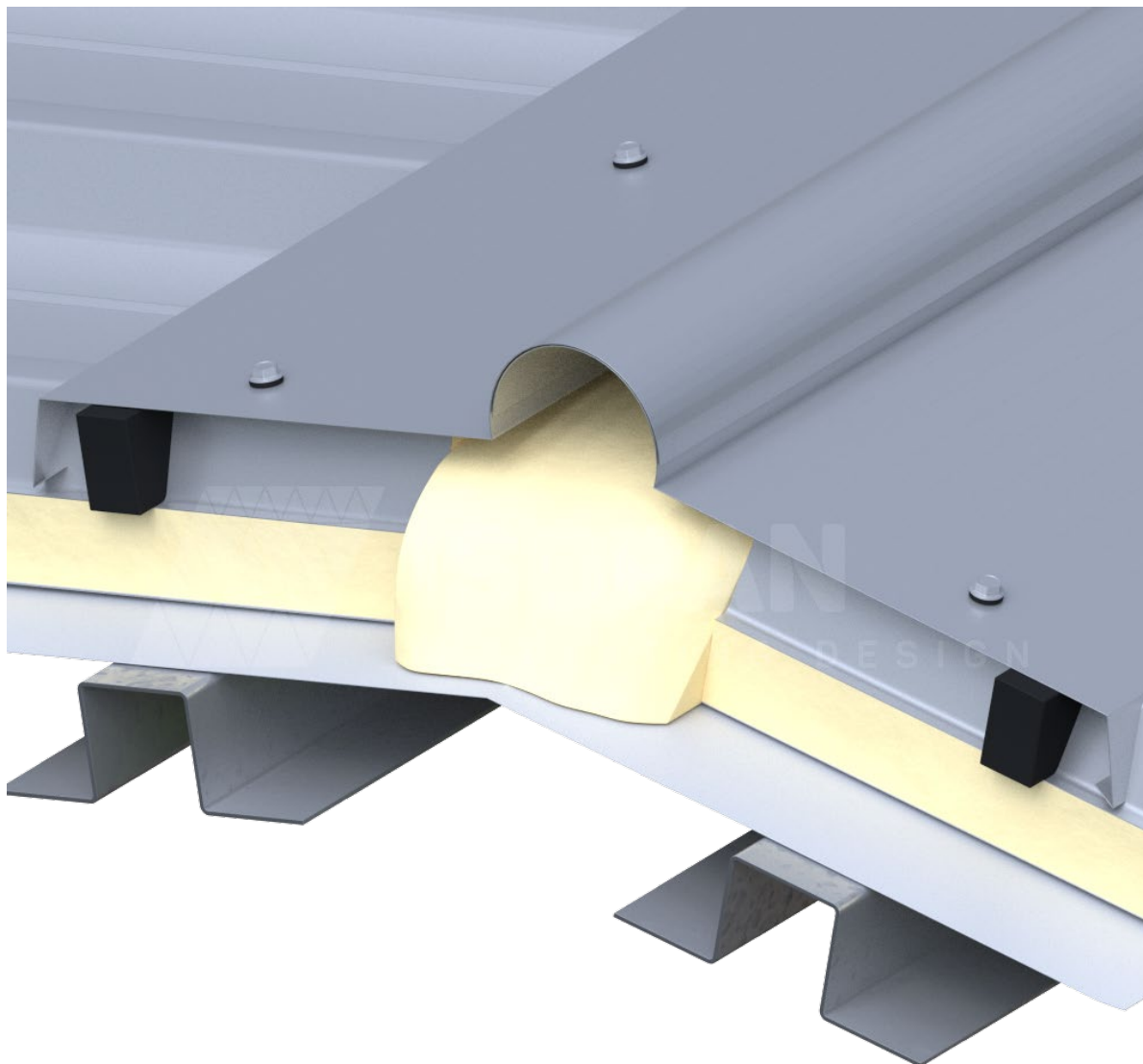
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

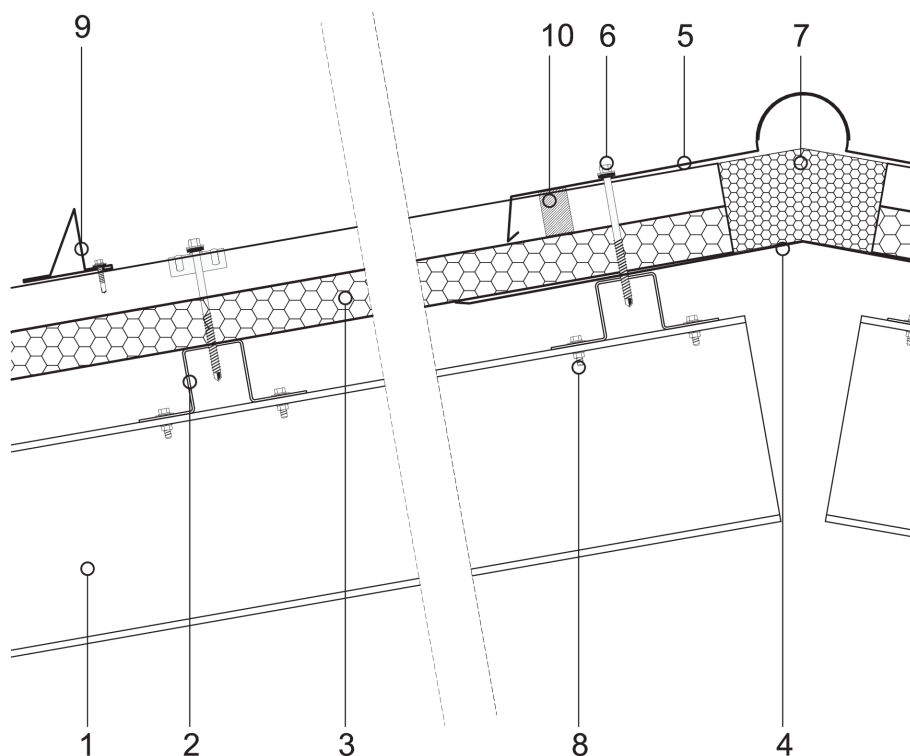
1	Steel structure profile
2	Steel standard profile
3	ISOPAN roof panel
4	Under-ridge internal flashing
5	Punched ridge
6	Roof and ridge panel fastening screw
7	Polyurethane or mineral wool insulating material
8	Structural fastening screw
9	Snow guard
10	Rib closing gasket

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DUAL PITCH ROOF HINGED RIDGE



Type 2 roof ridge: vertical cross-section



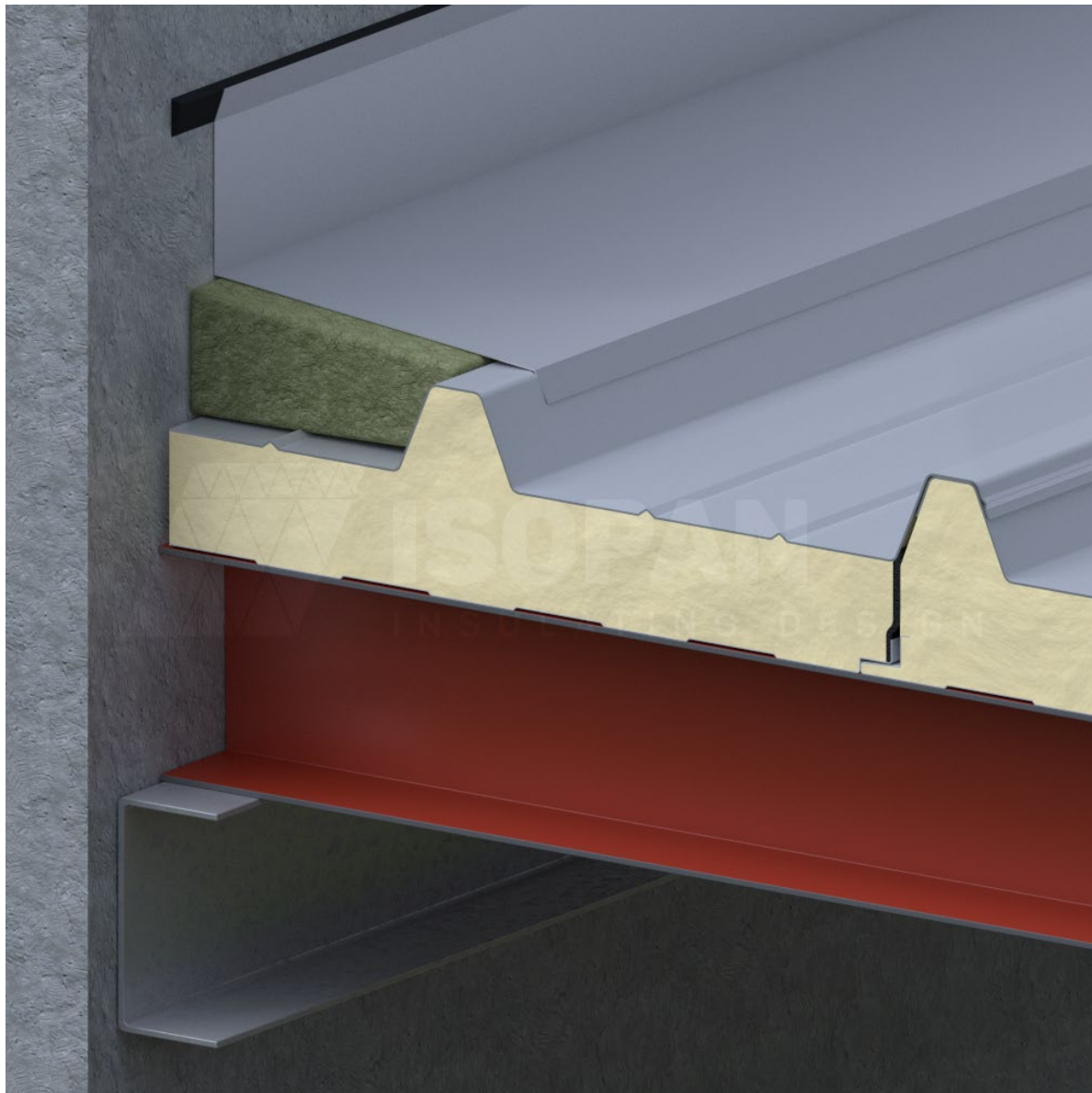
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

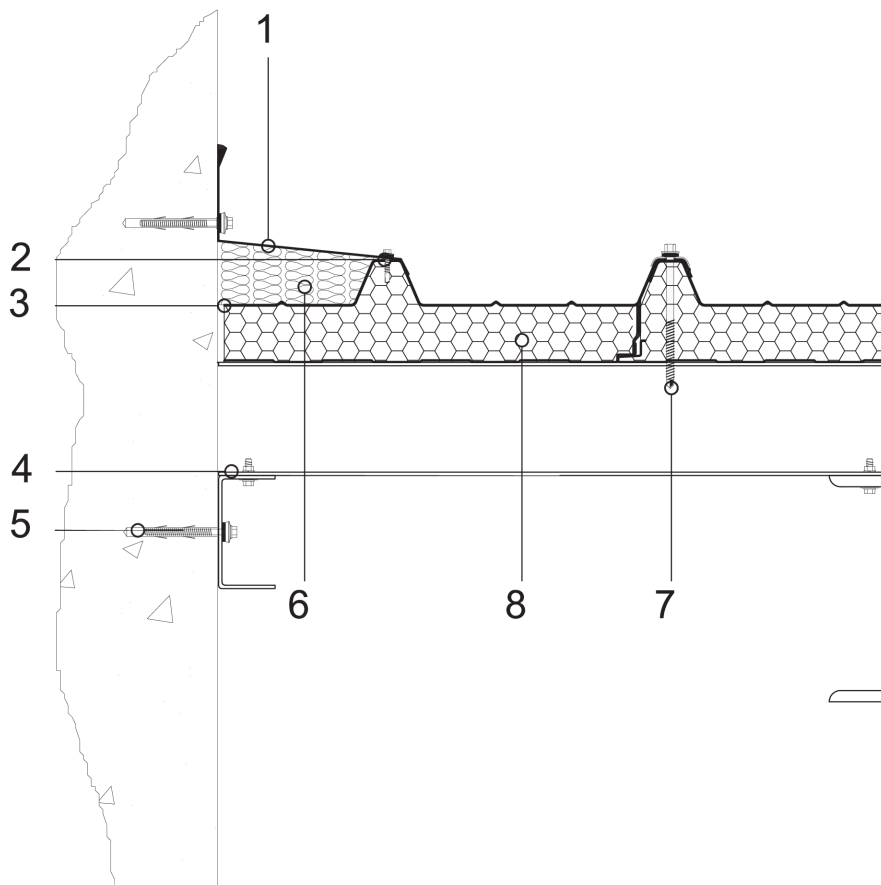
1	Steel structure profile
2	Steel standard profile
3	ISOPAN roof panel
4	Under-ridge internal flashing
5	Punched ridge
6	Roof and ridge panel fastening screw
7	Polyurethane or mineral wool insulating material
8	Structural fastening screw
9	Snow guard
10	Rib closing gasket

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FLAT ROOF WALL CONNECTION



Type 1 roof detail



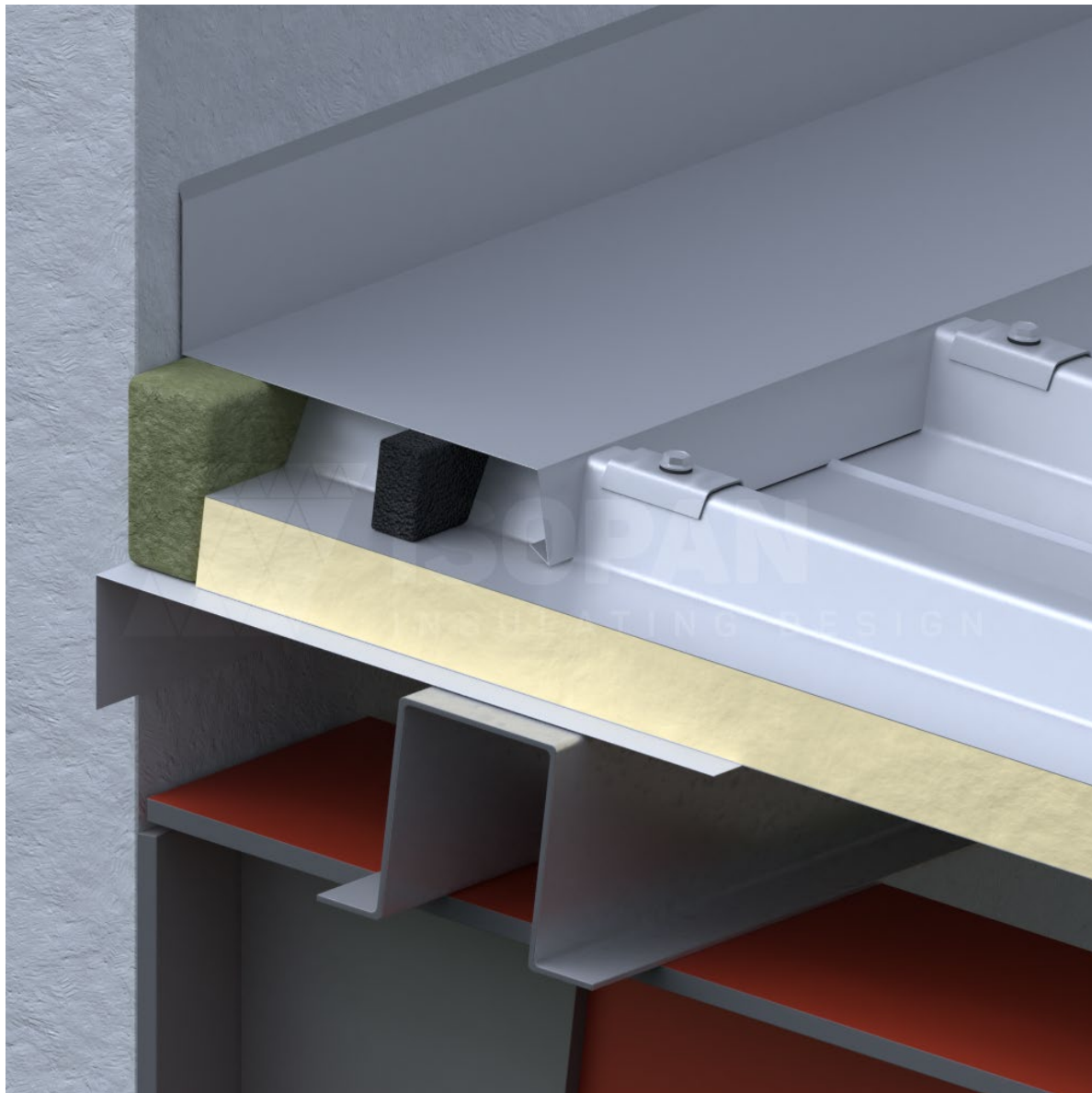
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

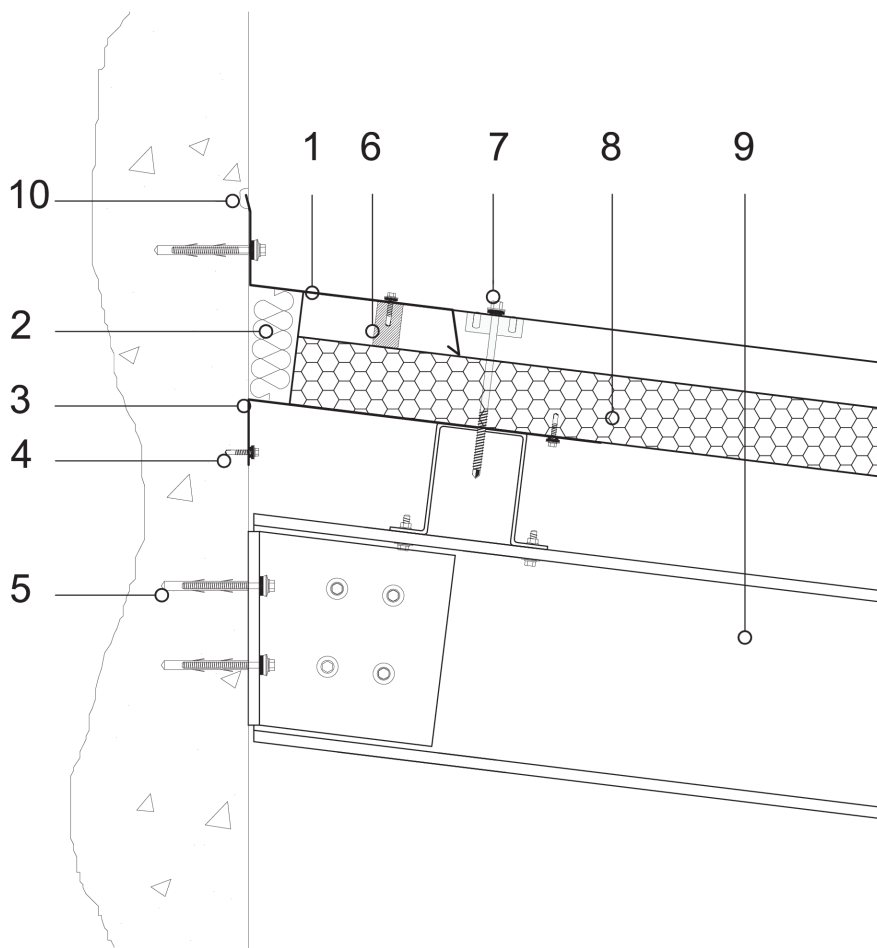
1	Supporting wall flashing
2	Corner metal sheet closing
3	Self-tapping fastening screw
4	Steel C-shaped profile
5	Main structure fastening screw
6	Mineral wool insulating material
7	Roof panel fastening unit
8	ISOPAN roof panel

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INCLINED ROOF WALL CONNECTION



Type 2 roof detail



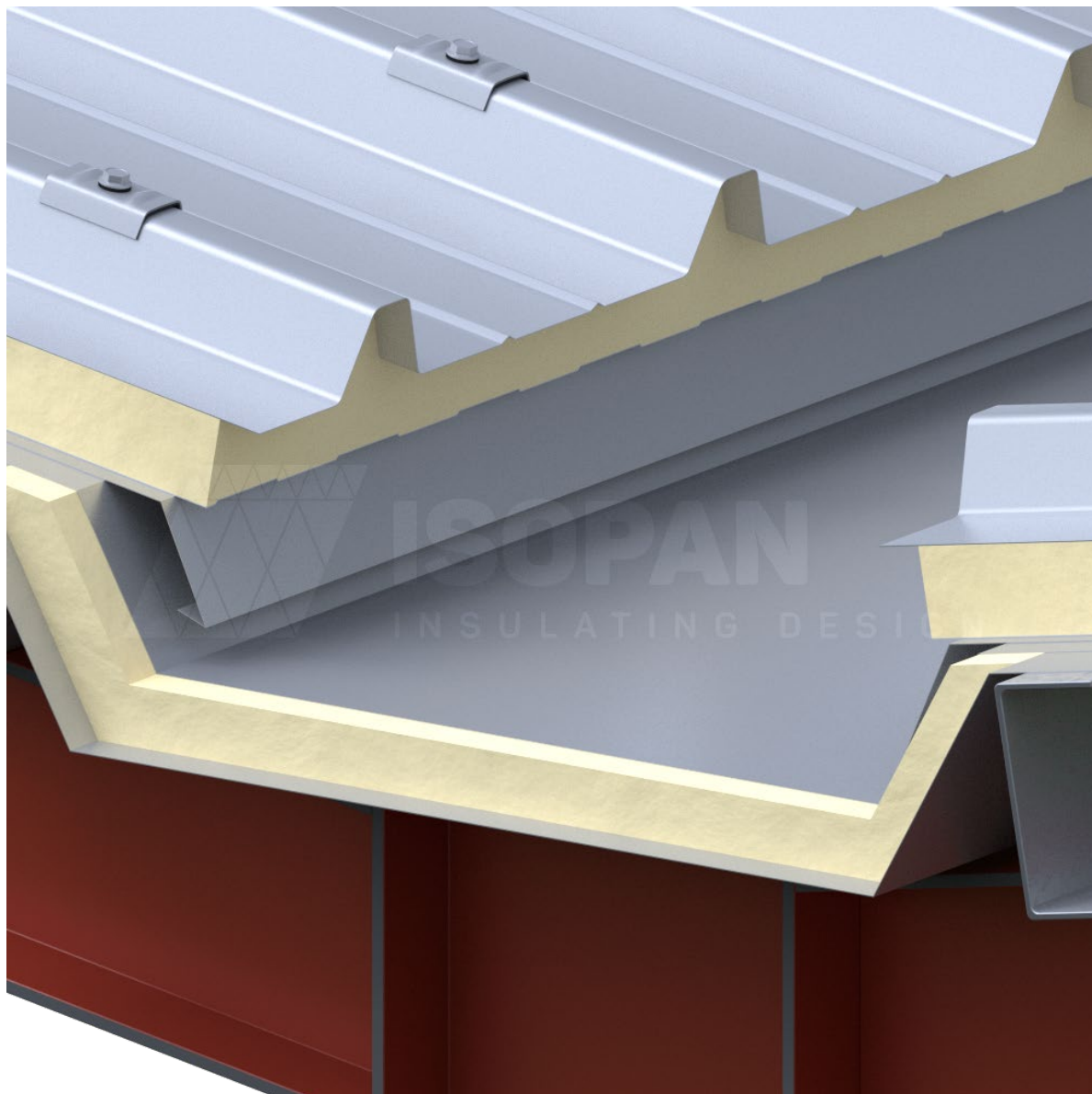
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

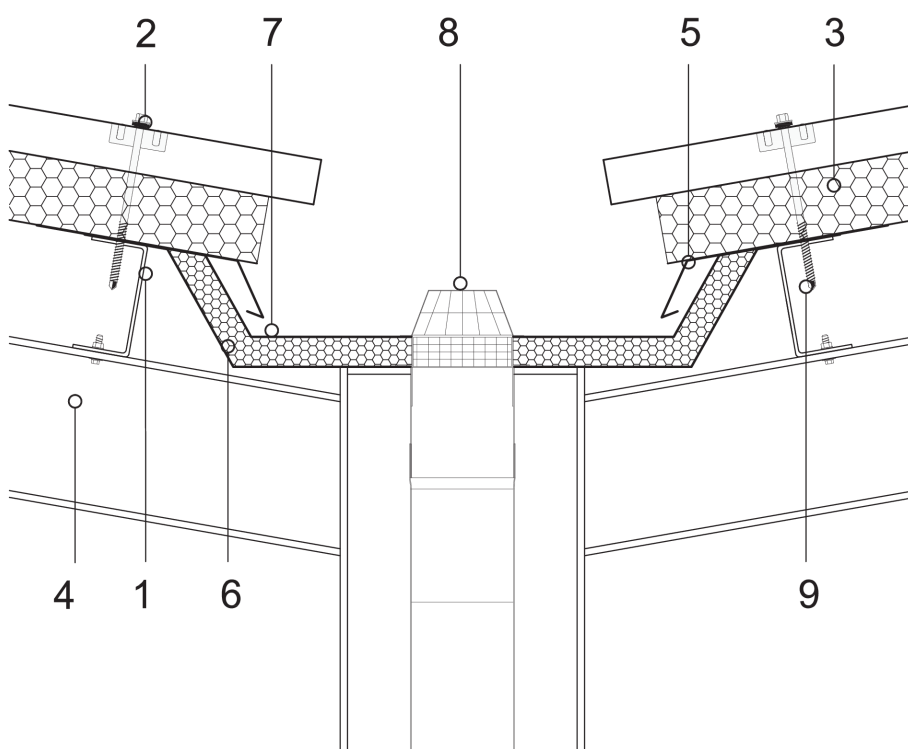
1	Supporting wall flashing
2	Mineral wool insulating material
3	Corner metal sheet closing
4	Metal sheet fastening screw
5	Main structure fastening screw
6	Rib closing gasket
7	Roof panel fastening unit
8	ISOPAN roof panel
9	Main steel structure
10	Silicone sealing

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ROOF CONNECTION ON VALLEY GUTTER



Type 1 gutter with valley detail



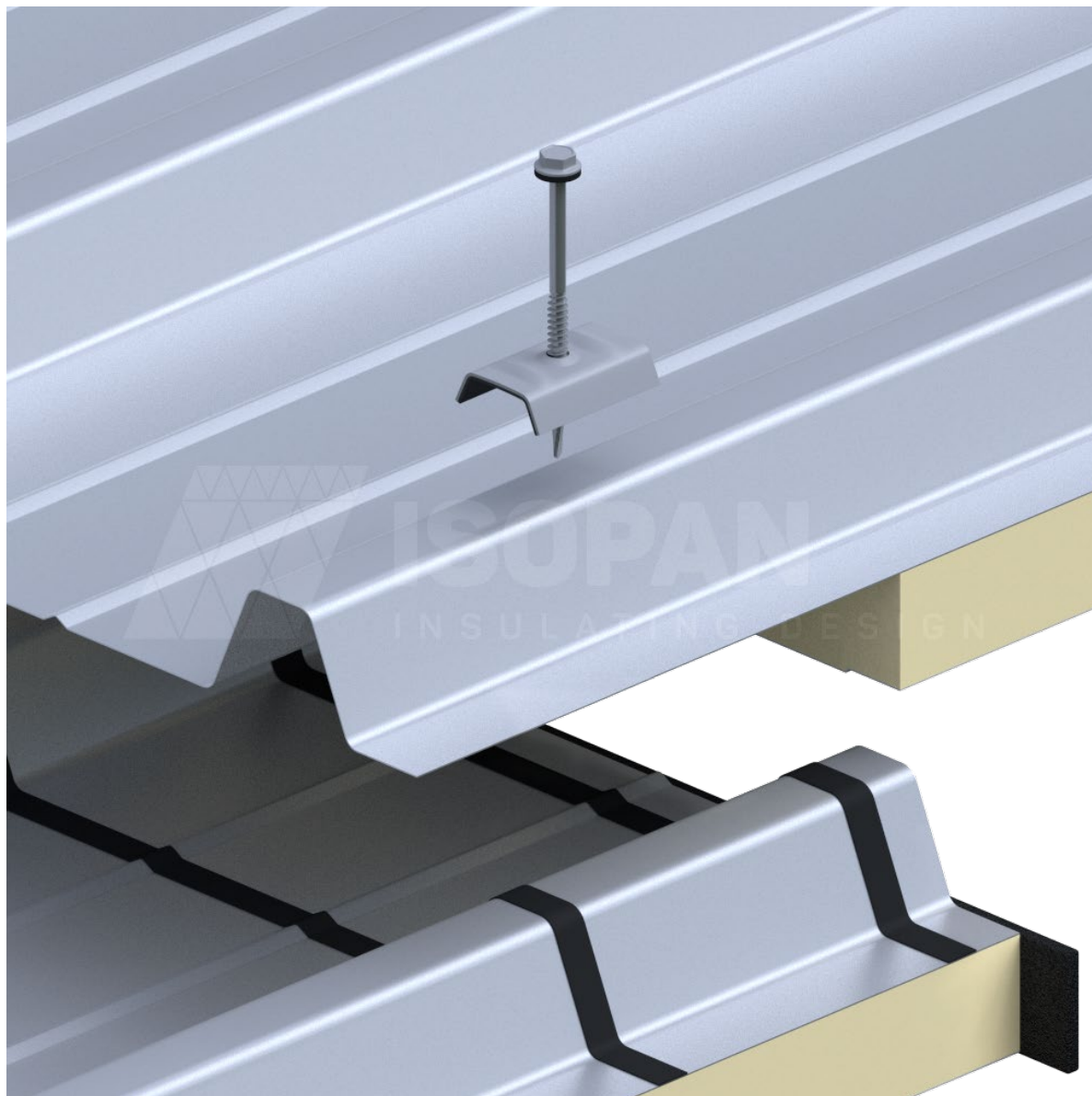
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

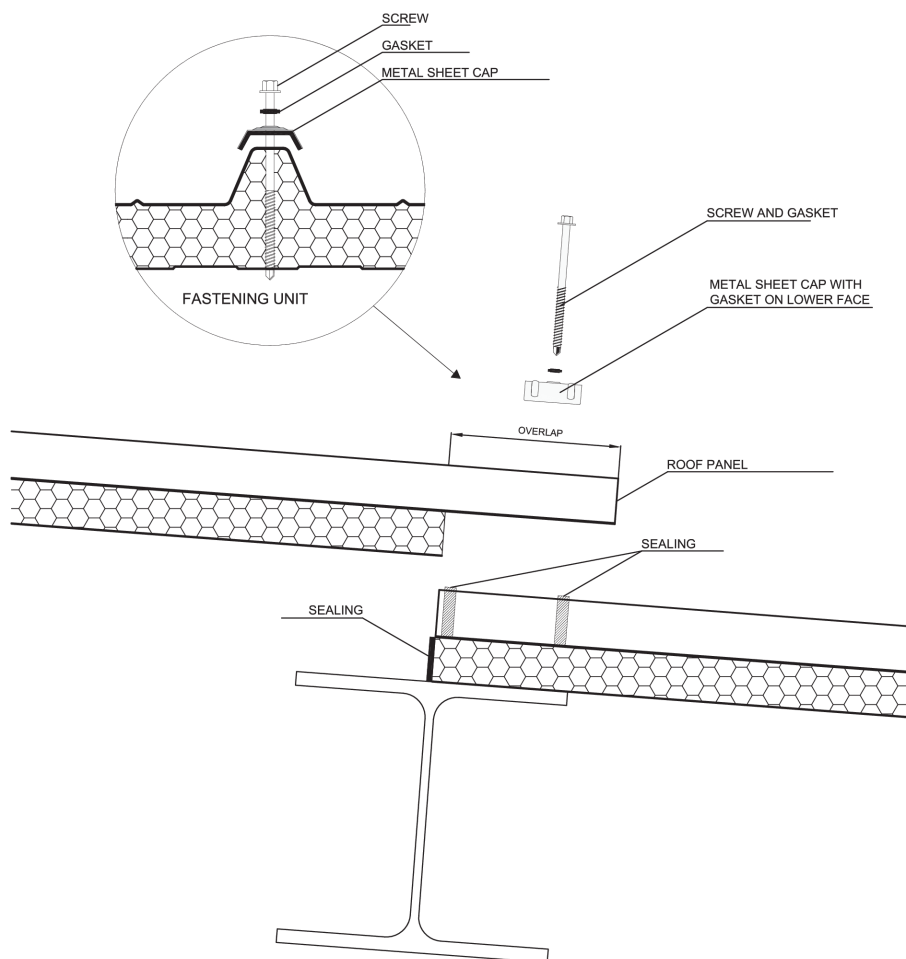
1	Secondary steel structure
2	Roof panel fastening unit
3	ISOPAN roof panel
4	Main steel structure
5	Drip edge metal sheet
6	Sub-gutter metal sheet
7	Gutter metal sheet
8	Leaf screen
9	Fastening screw

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OVERLAP FASTENING



Head overlap cross-section

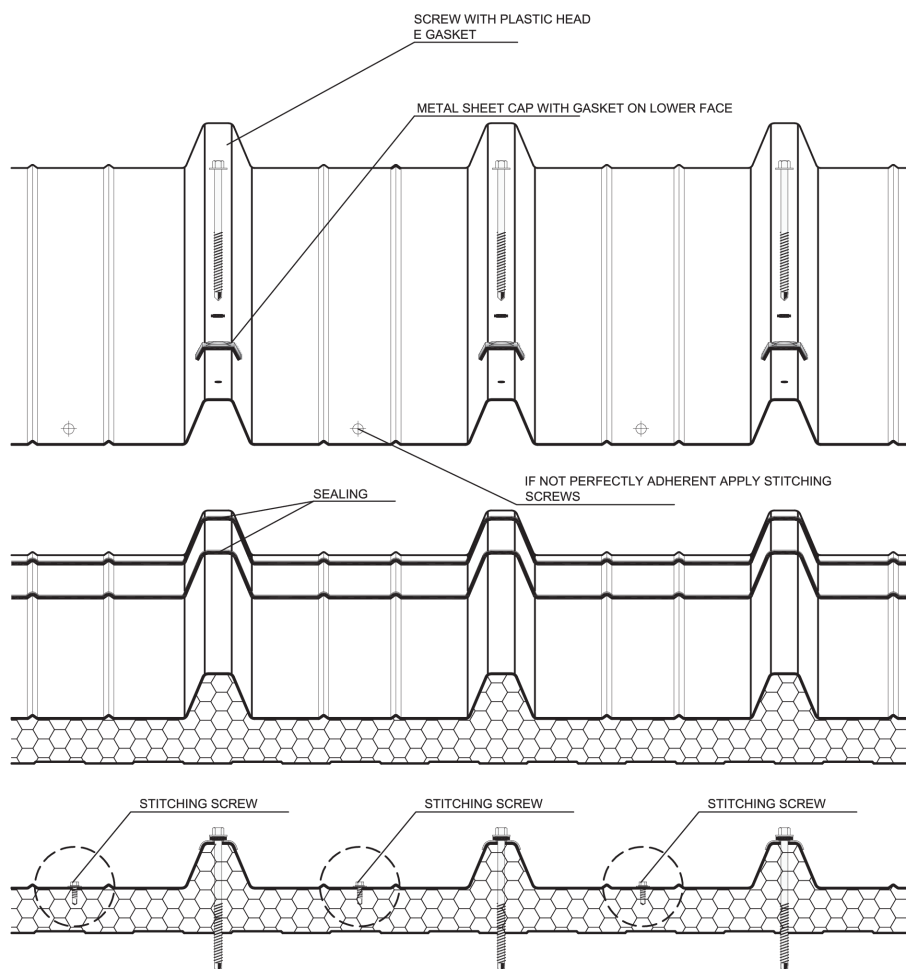


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STITCHING SCREW POSITIONING



Head overlap cross-section



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