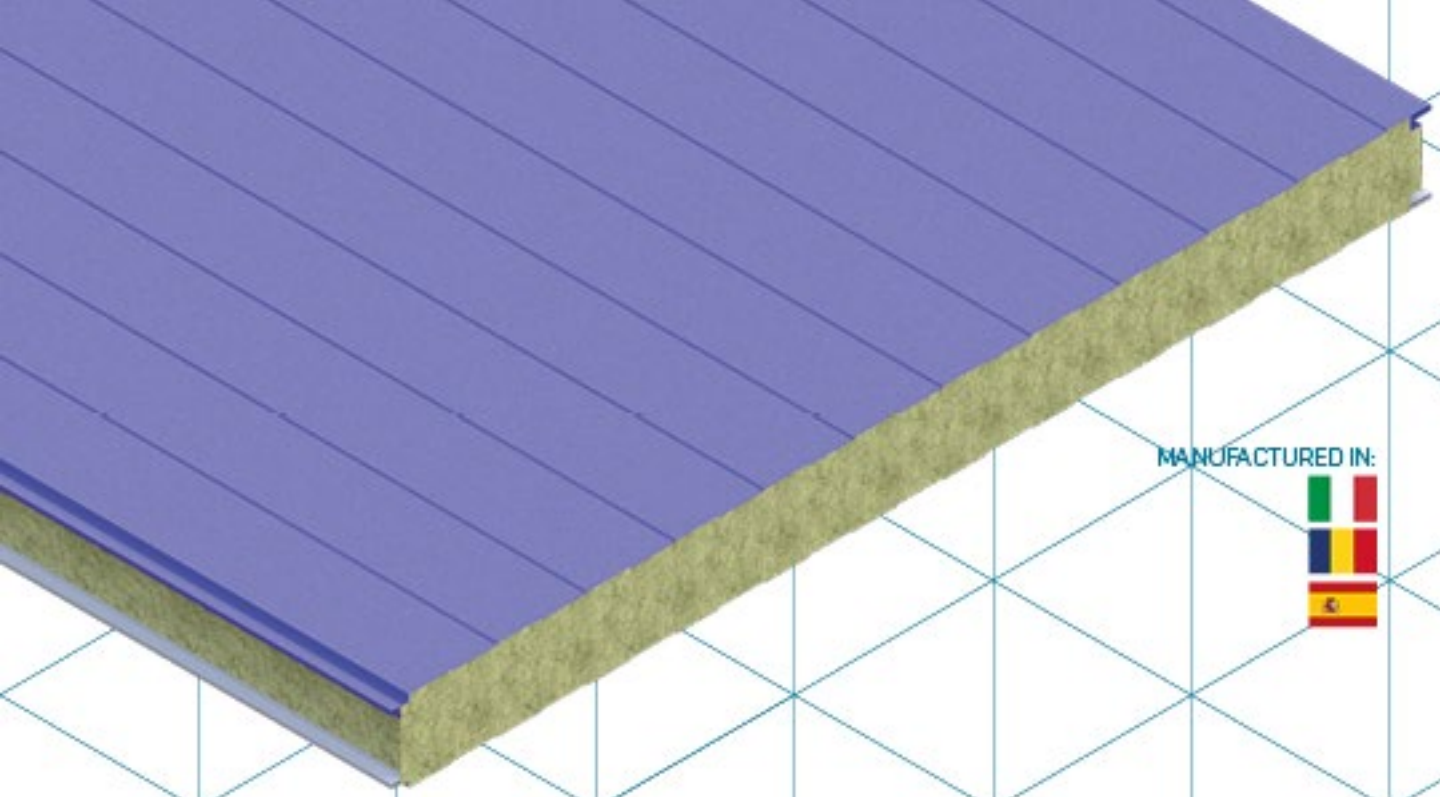

MANUFACTURED IN:

TECHNICAL MANUAL

ISOFIRE WALL Range

ISOFIRE WALL | ISOFIRE WALL FONO

PART OF MANNI GROUP

ISOPAN
INSULATING DESIGN

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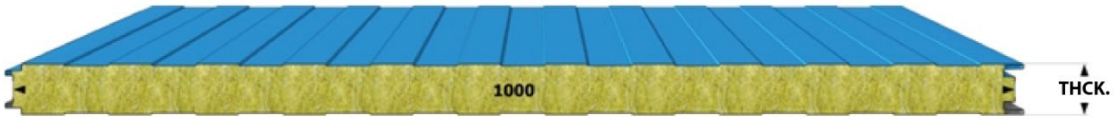
ISOFIRE WALL Range

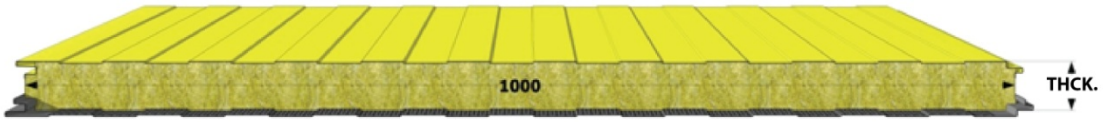
TYPES OF PANELS

ISOFIRE WALL



Double skin sandwich panel for walls with mineral wool insulating core that assures the product's incombustibility in addition to assuring adequate thermal insulation. It was developed to meet growing performance needs and legislative constraints on fire behaviour for buildings, keeping high mechanical and insulation characteristics. Used for wall cladding of industrial and residential buildings.

ISOFIRE WALL Fono



Double skin sandwich panel for walls with mineral wool insulating core that assures adequate thermal insulation.

Solution with internal face in micro-perforated sheet able to increase the panel's sound absorption performance.

	ISOFIRE WALL	ISOFIRE WALL FONO
Length	Up to maximum transportable	
Useful Pitch (mm)	1000-1150	
Insulating Thickness (mm)	50, 60, 80, 100, 120, 150, 170, 200, 240	50, 60, 80, 100, 120, 150
External face	Micro-ridged lightly profiled metal sheet	
Internal face	Micro-ridged lightly profiled metal sheet	perforated metal sheet (diameter 3 mm, pitch 5 mm) micro-ridged

METAL FACINGS

- SENDZIMIR system hot dip galvanised steel by 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 faces.
- 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 FACES

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 FACES

Perforated metal sheet (Isofire Wall Fono)

A layer of dustproof black glass fibres is placed between the perforated internal face and insulating core package to protect the inner side.

INSULATION

Made with rock wool with oriented fibres, having the following physical and mechanical features:

- Incombustibility Class A1 according to standard EN 13501
- Melting temperature > 1000 °C
- Absence of fumes during insulating material combustion
- Resistance to water/vapour penetration $\mu = 1.4$
- Long-term water absorption $W_{lp} < 3$ Kg/m^2
- Specific thermal capacity cp = 840 J/kgK
- Durability: class DUR2 according to standard EN 14509
- Thermal conductivity coefficient $\lambda = 0.04$ W/mK
- Compressive strength ≥ 0.06 MPa (at 10% of deformation)
- Tensile strength ≥ 0.04 MPa
- Shear strength ≥ 0.05 MPa

Thermal transmittance coefficient U*

Panel thickness (mm)	50	60	80	100	120	150	170	200	240
U [W/m²K]	0.75	0.63	0.49	0.39	0.33	0.27	0.24	0.20	0.17

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

Thermal resistance coefficient R

Panel thickness (mm)	50	60	80	100	120	150	170	200	240
R [m²K/W]	1.33	1.59	2.04	2.56	3.03	3.70	4.17	5.00	5.88

SOUNDPROOFING

It is the ability of a system to acoustically insulate a room from sounds from the outside and vice versa.

The tested ISOFIRE WALL steel panels obtained the following results:

Panel thickness (mm)	Rw (dB)
80	30

The tested ISOFIRE WALL FONO steel panels obtained the following results:

Panel thickness (mm)	Rw (dB)
50	34
80	35
100	35

SOUND ABSORPTION (ISOFIRE WALL FONO)

The smooth and hard surfaces have the property of reflecting sound, this means that the sound produced by sources inside these environments can be greatly amplified. This phenomenon is called reverberation. The particular ability of a material to absorb sound can be used to reduce reverberation and reflected noise within the environments. The tested steel ISOFIRE WALL FONO panels obtained acoustic absorption coefficient **α = 1 (CLASS A).**

PANEL WEIGHT

Isofire Wall

Sheet thickness (mm)		Nominal panel thickness (mm)								
		50	60	80	100	120	150	170	200	240
0,5/0,5	kg/m²	13,2	14,2	16,2	18,2	20,2	23,2	25,2	28,2	32,2
0,6/0,6	kg/m²	14,9	15,9	17,9	19,9	21,9	24,9	26,9	28,8	32,9

Isofire Wall Fono – Internal metal sheet thickness 0.6mm

External metal Sheet thickness (mm)		Nominal panel thickness (mm)					
		50	60	80	100	120	150
0,5	kg/m²	12,6	13,6	15,6	17,6	19,6	22,6
0,6	kg/m²	13,5	14,5	16,5	18,5	20,5	23,5

STATIC FEATURES

The resistance values refer to a panel assembled horizontally and subject to the action of a distributed load that simulates the action of wind pressure; 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.

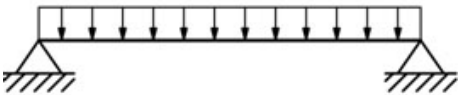
ISOFIRE WALL

ISOFIRE WALL 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 fastened to spaced structural supports, all applied loads (snow, wind, air pressure), and transmitting these loads to the supports.", depending on the type of metal supports, 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 0.5 / 0.5 mm - Simple support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm							
	50	60	80	100	120	150	200	240
	INTERASSI MAX cm							
50	440	480	540	610	670	755	805	890
60	390	430	495	570	625	700	750	825
80	310	355	425	500	550	615	650	715
100	250	295	365	440	490	550	580	630
120	210	250	315	385	435	495	525	565
140	180	210	275	340	390	440	475	510
160	160	185	245	300	350	400	435	465
180	145	165	220	270	320	360	395	425
200	130	150	205	250	295	330	360	390

STEEL SHEETS 0.6 / 0.6 mm - Simple support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm							
	50	60	80	100	120	150	200	240
	MAXIMUM SPAN cm							
50	490	520	600	675	720	800	860	935
60	425	470	545	635	685	755	810	870
80	335	380	465	550	605	670	720	760
100	265	310	385	460	525	585	630	665
120	235	270	330	410	470	525	560	595
140	200	230	290	360	415	470	505	535
160	175	210	260	315	370	415	445	480
180	160	190	230	275	335	375	405	430
200	140	165	210	255	305	335	365	400

- panel on multiple supports:

STEEL SHEETS 0.5 / 0.5 mm – Multi-Support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm							
	50	60	80	100	120	150	200	240
	MAXIMUM SPAN cm							
50	390	420	460	500	540	580	630	670
60	345	380	415	450	490	520	550	585
80	270	310	345	370	400	425	450	485
100	210	250	285	310	335	355	375	405
120	180	205	240	265	285	305	325	350
140	155	175	210	230	250	265	280	300
160	130	155	185	205	220	230	245	265
180	120	135	165	180	195	205	220	240
200	110	120	150	165	180	190	205	220

STEEL SHEETS 0.6 / 0.6 mm – Multi-Support 120 mm								
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm							
	50	60	80	100	120	150	200	240
	MAXIMUM SPAN cm							
50	430	460	500	540	580	610	650	680
60	375	415	455	490	530	560	590	615
80	290	330	375	405	440	465	495	515
100	220	260	300	330	360	380	405	425
120	190	220	250	280	305	325	345	365
140	160	190	220	240	265	280	300	320
160	140	165	195	215	230	245	265	280
180	130	150	175	195	210	225	240	255
200	115	135	160	180	195	210	225	240

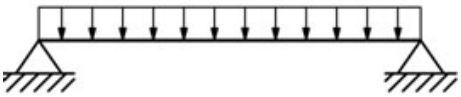
ISOFIRE WALL Fono

ISOFIRE WALL FONO 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 fastened to spaced structural supports, all applied loads (snow, wind, air pressure), and transmitting these loads to the supports.", depending on the type of metal supports, 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:



Ext metal sheet 0,5mm – Micro-holed internal metal sheet 0,6mm – Simple support 120 mm						
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm					
	50	60	80	100	120	150
	MAXIMUM SPAN cm					
50	370	400	450	510	560	635
60	325	360	415	475	525	585
80	260	295	355	420	460	515
100	210	245	305	370	410	460
120	175	210	265	320	365	415
140	150	175	230	285	325	370
160	130	155	205	250	290	335
180	120	135	185	225	265	300
200	105	125	170	210	245	275

Ext metal sheet 0,6mm – Micro-holed internal metal sheet 0,6mm – Simple support 120 mm						
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm					
	50	60	50	100	50	150
	MAXIMUM SPAN cm					
50	410	435	505	565	605	670
60	355	395	455	535	575	635
80	280	320	390	460	505	560
100	220	260	320	385	440	490
120	195	225	275	345	395	440
140	165	190	240	300	345	395
160	145	175	215	265	310	345
180	130	160	190	230	280	315
200	115	135	175	210	255	280

- panel on multiple supports:

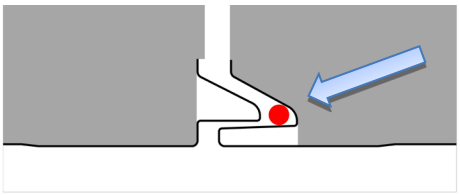
Ext metal sheet 0,5mm – Micro-holed internal metal sheet 0,6mm – Multi support 120 mm						
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm					
	50	60	80	100	120	150
	MAXIMUM SPAN cm					
50	325	350	385	420	455	485
60	290	320	345	375	410	435
80	225	260	290	310	335	355
100	175	210	240	260	280	295
120	150	170	200	220	240	255
140	130	145	175	190	210	220
160	105	130	155	170	185	190
180	100	110	135	150	160	170
200	90	100	125	135	150	160

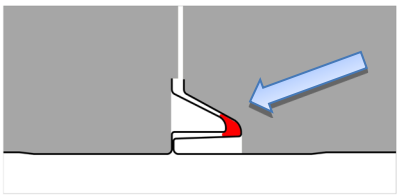
Ext metal sheet 0,6mm – Micro-holed internal metal sheet 0,6mm – Multi support 120 mm						
UNIFORMLY DISTRIBUTED LOAD [kg/m2]	NOMINAL PANEL THICKNESS mm					
	50	60	50	100	50	150
	MAXIMUM SPAN cm					
50	360	385	420	455	485	510
60	315	345	380	410	445	470
80	240	275	315	340	370	390
100	185	215	250	275	300	320
120	160	185	210	235	255	270
140	130	160	185	200	220	235
160	115	135	160	180	190	205
180	105	125	145	160	175	185
200	95	110	130	150	160	175

JOINT

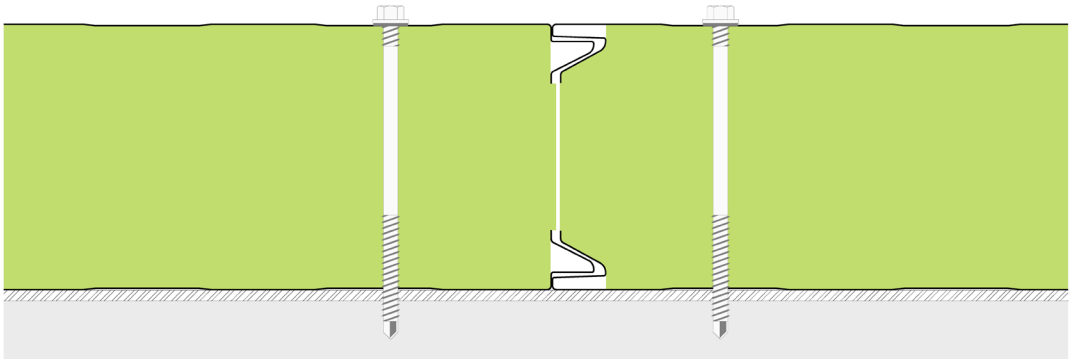
The shape of the labyrinth joint is expressly designed to assure product functionality, even at very low temperatures.

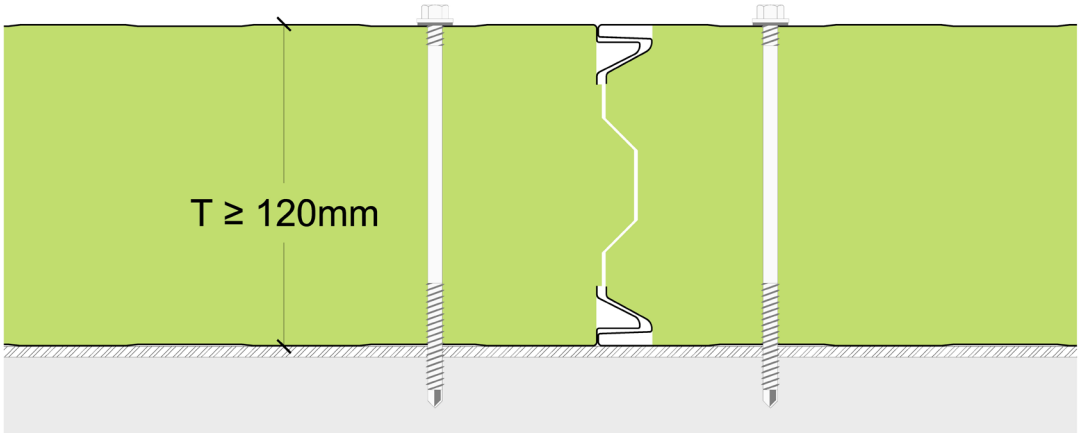
For special end-use requirements, an optional gasket can be put in on site to increase the airtightness of the joint.





Gasket crushing, leading to increased seal, due to the side pressure required to assure suitable coupling.





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

FIRE RESISTANCE

The concept of fire resistance is defined, within national legislation, as the ability of a construction element, component, or structure, to retain, according to a predetermined temperature programme and for a set time, in whole or in part, the following requirements:

- **The stability or load bearing ability (R)**: “ability of a structure or a member thereof to withstand the specific actions during the relevant fire exposure” (Eurocodes);
- **The seal or integrity (E)**: “ability of the separation members to prevent the passage of hot gases or ignition beyond the exposed surface, during the relevant fire exposure” (Eurocodes);
- **Thermal insulation (I)**: “ability of a separating member to restrict excessive heat transmission” (Eurocodes).

The tested ISOFIRE WALL steel panels obtained the following results:

Panel thickness (mm)	According to EN 13501-2 (European standard)
50	EI 15 // EI 30*
80	EI 60
100	EI 60 // EI 120*
120	EI 90
150	EI 180

***Performance achievable by applying stitching screws along the joints. For more details see the corresponding Assembly Instructions.**

REACTION TO FIRE (EN 13501–1)

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

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: smoke opacity growth speed

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

Burning droplets: fall of burning particles

- **d0** no burning particles
- **d1** few burning particles
- **d2** many burning droplets

The ISOFIRE WALL panel, in rock wool has been tested for fire reaction in accordance to standard **EN 13501-1** obtaining the classification: **A2 S1 D0.** For further information, please refer to the Isopan catalogue, the website www.isopan.com or contact the Technical Department.

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 and the face 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 should cause the panel deflection the panel and wrinkle the metal sheet. Isopan recommends a minimum thickness of 0.6 mm for the external side face. The occurrence of the problem may be limited with appropriate design, taking into account environmental conditions, length, colour of the panels and thickness of the sheet metal. **(See the "Thermal expansion" section).**
- If an aluminium sheet is used as an external face, it is necessary to consider the possible distortions of the panel (bending) due to the different thermal expansion coefficients.
- The perforated face in pre-painted galvanised steel has no protection in the area of the hole, as it is produced by punching. The exposed perforated panel side should be used towards the inside of the building in order to prevent corrosion phenomena.

GENERAL DESIGN INSTRUCTIONS

The wall panels generally require, during the design phase, a structure able to absorb the external loading stress that will not submit 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 area where the building is installed; the values fluctuate based on wind speed, with subsequent greater or lesser load pressure on the exposed surfaces (affects the type and number of panel fastening elements). For this particular panel (with concealed fastening elements), wind action in depression should be considered, bearing on joint resistance and fastening points, and it is required to use the specific Isopan plate on each screw to distribute stress (we recommend consulting with the ISOPAN Technical Department).
- **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 corrosiveness 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).

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).

DESIGN FOR FIRE CRITICAL CONDITIONS

The panel may be used for possible fire exposure on both faces only positioned on walls and vertically. Pursuant to the regulations the certified performances refer to and are guaranteed only in conventional test conditions: application of a Standard Fire Curve, as per standard **ISO 834**, implemented in Italy by regulation **UNI EN 1363**, used on small-sized structural elements assembled with the specific joint.

It is the designer's responsibility to justify from an engineering point of view the performance extension at dimensions and under methods other than the laboratory tests, in particular with regards to length and, therefore, the need for intermediate supports, head junction and coupling with other constructive elements, especially structural.

THERMAL EXPANSIONS

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

- Significant panel length (L > 5000 mm);
- Solar radiation;
- Medium and dark colours;
- High panel thickness;
- Inadequate thickness of the metal support.

Material	Thermal expansion coefficient ($°C^{-1}$)
Aluminium	23.6×10^{-6}
Steel	12.0×10^{-6}
Stainless steel AISI 304	17.0×10^{-6}

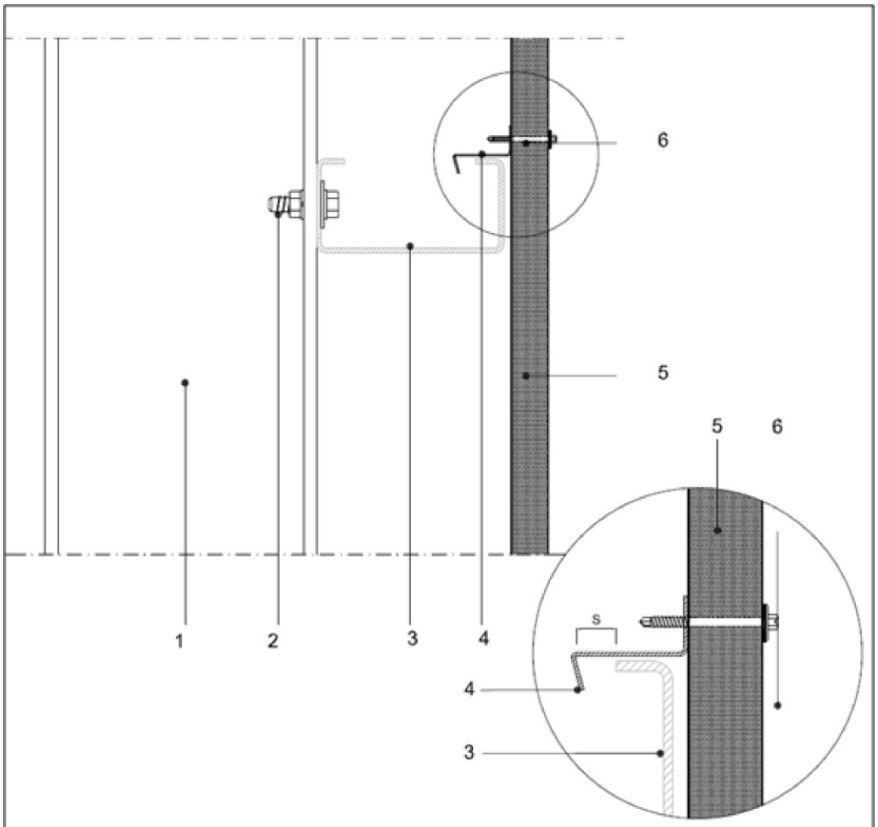
-Linear thermal expansion coefficient values-

Type of facing		Surface temperature (°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 temperatures, the linear extension of the metal support must be absorbed by the system; cyclic temperature changes related to the day-night or freeze-thaw fluctuations create uncontrollable cyclic stresses that fatigue the support elements. These stresses may cause flaws and undulations in wall panels and, in more severe cases, even wrinkling phenomena. These issues may be overcome by complying with 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 metal supports (minimum 0.6 mm to be assessed based on the design specifics)
- Segment the panels
- Use a panel fastening system able to offset the shift caused by the excessive thermal expansions; this solution is particularly important when using panels with aluminium face (see for example figure below).



No.	Description
1	Steel load-bearing structure
2	Bolt
3	Steel C-shaped profile for intermediate support
4	Block profile
5	ISOPAN wall panel
6	Fastening screw
S	Compensation clearance for thermal expansion

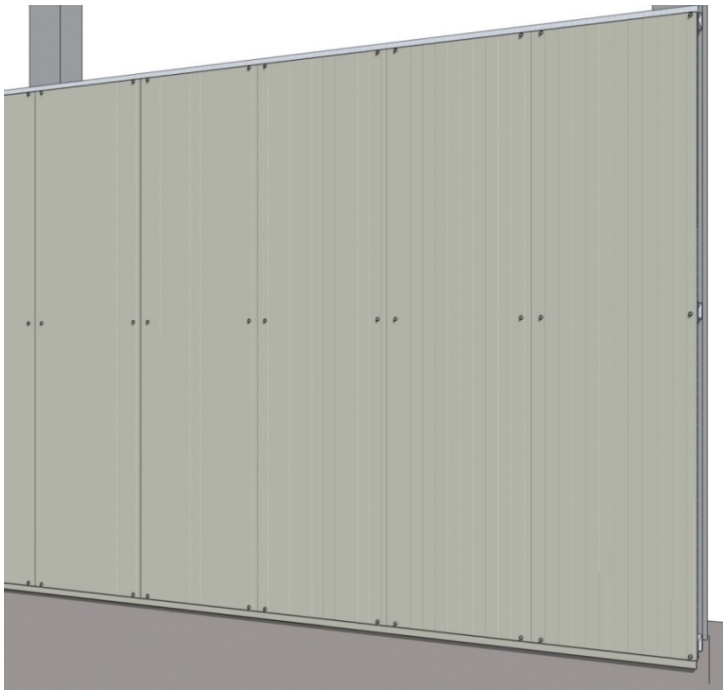
FASTENING INSTRUCTIONS

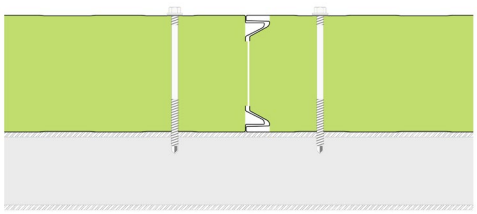
The purpose of the fastening elements is to efficiently anchor the panel to the load-bearing structure; the type of fastening unit depends on the type of face. The number and position of the fastening elements must guarantee resistance to the stresses induced by dynamic loads, which can also exist in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

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

Wall panel fastening

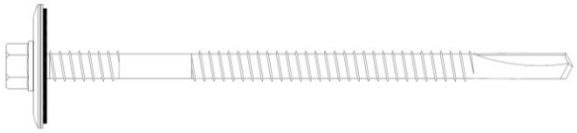
The panels are usually anchored to metal sheets positioned transversally to the length of the panels, which are, in turn, appropriately fastened to the load-bearing structure of the building as required by the design for stability. The width of the support must be at least 50 mm; said width must be checked and, if necessary, increased based on design requirements. In the event of head junction between two panels, said width must be at least 120 mm. Panels must be fastened to the load-bearing structure using the devices identified and sized in the design. The number of fastening elements varies depending on the different climatic conditions where the building is situated. Normally, for each panel, a fastening unit must be used at each support sheet. With high spans between supports and/or in areas that are particularly exposed to wind action, the density of the fastening elements must be established by the designer on a case by case basis, appropriately increasing the number.

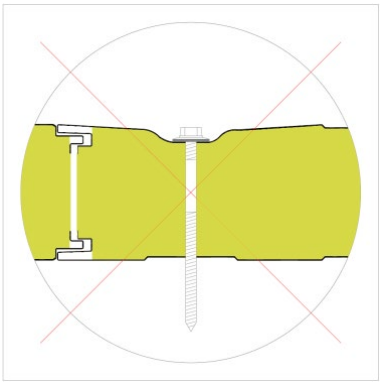




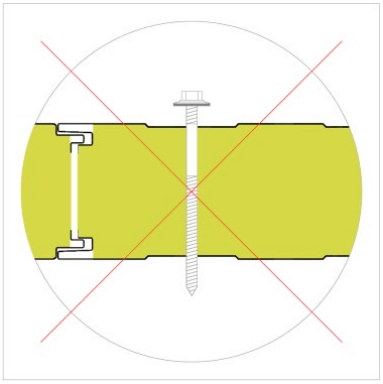
Fastening methods

Fastening varies depending on the project to be implemented and site application system of the panels. Isopan recommends using double-threaded screws with washer and sealing gasket with 19 mm minimum diameter. In order to prevent the making of galvanic current between screw and mineral wool, Isopan recommends to use stainless steel screws.

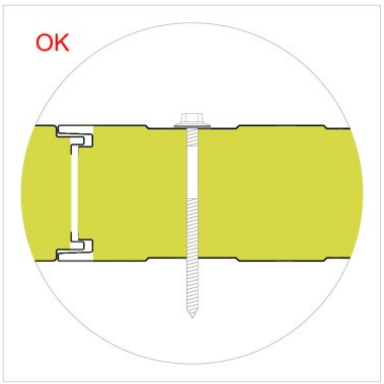




A
Incorrect tightening due to high torque applied to the screw with marked deformations of the sheet. **In this situation the optimal closing of the interlocking is no longer guaranteed, therefore, the aesthetic functionality of the product remains compromised.**



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.

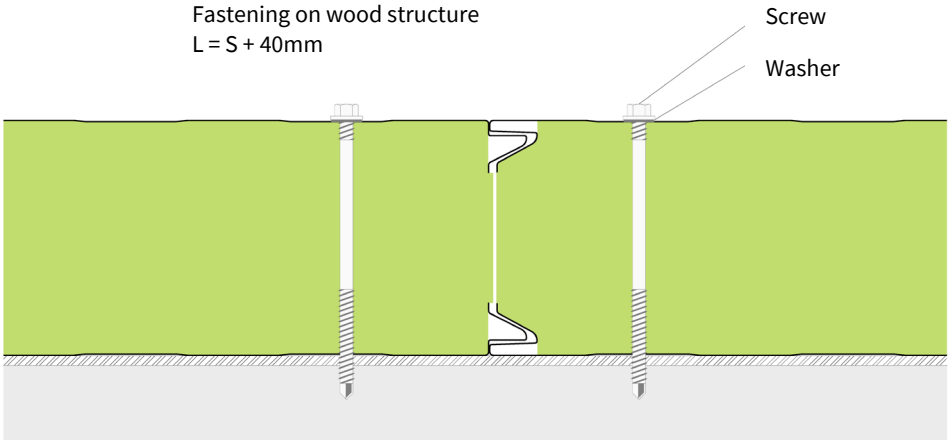
Screw length

The correct length of the screw depends on the panel thickness and on the type of support (steel, wood).

L = Screw length
S = Panel nominal thickness

Fastening on steel structure
L = S + 30mm

Fastening on wood structure
L = S + 40mm



ASSEMBLY INSTRUCTIONS

Mineral wool panels, if too long, for example longer than 6 m and with inadequate metal sheet supports, can present problems during handling and installation. In fact it must be taken into account the high weight of mineral wool panels. Consequently the handling (both the unloading and the assembly) may be difficult and problematic with a high risk of damaging the material. Finally being the bending of the panels directly related to their length, the assembly of the joints can also be aggravated by imperfections, lack of straightness of the supporting structure and too much space between fasteners.

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 incompatible 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 face 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

- Apply the basic tinwork (when provided) to the foot of the wall, as well as the tinwork that must be installed before the wall, such as drip edges, roof fittings, etc.
- Remove the protective film from the panels, if any.
- Apply the panels starting from the bottom of the wall, or the side end in case of vertical assembly, taking care to join them properly and to ensure they are plumb.*
- Systematically fasten the elements after ensuring they match correctly. The fastening screw must be inserted orthogonally to the panel.
- If the wall height involves the need to assemble panels vertically, the junction is made at the frame and requires appropriate use of shaped fitting tinwork (ridge caps, drip edges, etc.).
- Use ''U''-shaped ridge caps and drip edges for doors and window frames.
- Apply the finishing elements (angle bars, perimeter edgings, fittings).
- Check and clean the walls, with particular attention to metal scraps, fastenings and fittings with door and window frames.
- For horizontal installation, the groove part of the panel must always be facing downward in order to prevent rainwater from stagnating and to promote normal run-off.

***Note: it is mandatory to adhere to the correct installation direction of the panels during assembly**

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)	50	60	80	100	120	150	170	200
No. of panels per package	15	12	9	7	6	5	4	3

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

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 lifting 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 by other materials, or that do not have a suitable loading floor.

Customers who will pick up the material must instruct the drivers accordingly.

Lorry unloading with crane

- Use any type of crane equipped with spreader beam and equipped straps. Isopan can advise customers on the choice of spreader 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 moisture from accumulating and to 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 supports 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 "**Packaging and Services**" document 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 supports, must be chosen after the wall has been properly designed.

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

MAINTENANCE

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

The type and frequency of maintenance activities depend on the product used for the external 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 walls, paying special attention to the areas that could facilitate rain water stagnation, where substances that are harmful to the durability of the metal support 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).

Upon customer 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 customer 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 where the panels are installed.

Technical specifications 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.it. 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.

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)

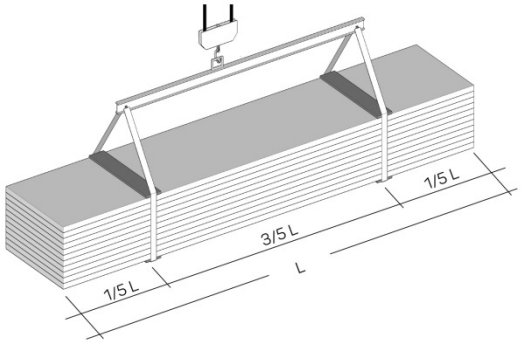


Figure 1
Suitable spacers must be placed under and above the package, made of sturdy solid wood or plastic elements to prevent the strap from coming into direct contact with the package.
These spacers must be at least 4 cm longer than the width of the package and be at least as wide as the strap.
Make 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 each 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 6 months, while outdoor storage should never exceed 60 days.
Packages stored at a height must always be properly bound to the structure.

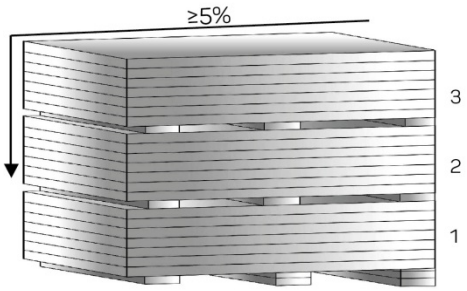


Figure 2

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 face. It is not advisable to wait for more than two weeks 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.

PANEL HANDLING

The panels must be handled using adequate protection equipment (accident-prevention 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)

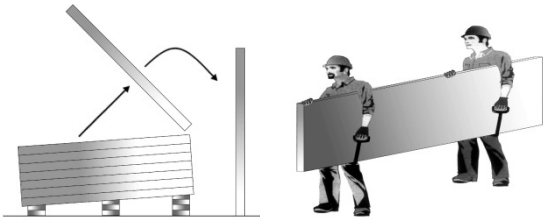


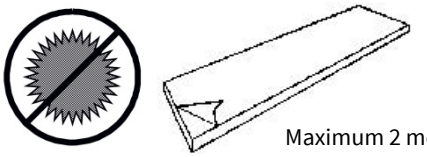
Figure 3
Handling equipment as well as gloves must be clean and such not to damage the items.

INSTALLATION

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.
Installation personnel must be equipped with footwear with soles that do not damage the external facing 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 is usually no less than 7%. For smaller slopes, adopt the seller's provisions.
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 supports 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.



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

MAINTENANCE

The main routine maintenance operation is cleaning the panels. Panel surfaces that, following visual inspection, are found to be dirty or oxidised can be washed with soap and water using a soft brush. 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
Angular cut-edge parts	Check the state of oxidation Clean and repaint

These provisions are taken from the General Conditions of Sale.

Annex B

SUCTION CUP LIFTERS

In the event the panels are handled using **suction cup lifters** the operations must be carried out ensuring the panel is not deformed. The action of the suction cup on the sheet during lifting must be **adequately redistributed** taking into account the panel's **length** and **weight**.

To prevent excessive force by the suction cups from causing detachment of the sheet from the insulating core, Isopan recommends complying with the following restrictions:

Polyurethane panels:

Minimum Total Surface of Suction Cups for Polyurethane Panel with Steel face 0.4 / 0.4												
Panel Length	Panel thickness [mm]											
	25	30	35	40	50	60	80	100	120	150	180	200
2000 mm	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 mm	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 mm	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 mm	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 mm	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 mm	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 mm	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

Minimum Total Surface of Suction Cups for Polyurethane Panel with Steel face 0.6 / 0.6												
Panel Length	Panel thickness [mm]											
	25	30	35	40	50	60	80	100	120	150	180	200
2000 mm	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 mm	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 mm	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 mm	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 mm	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 mm	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 mm	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

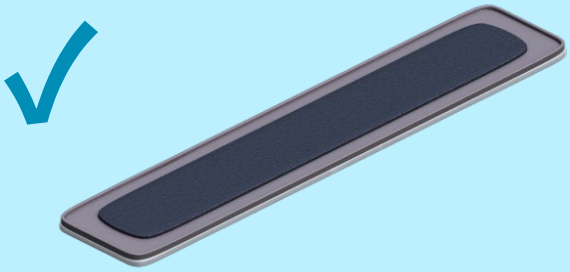
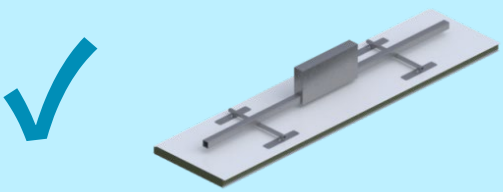
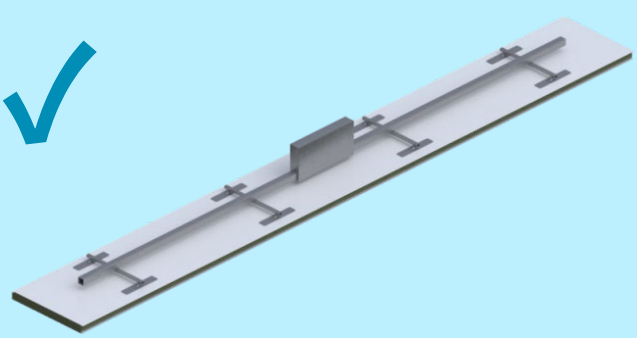
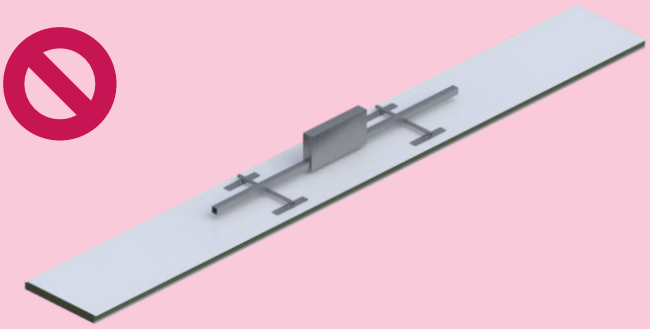
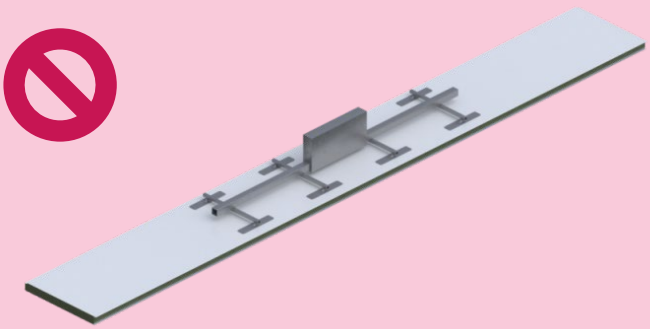
Minimum Total Surface of Suction Cups for Polyurethane Panel with Steel face 0.8 / 0.8												
Panel Length	Panel thickness [mm]											
	25	30	35	40	50	60	80	100	120	150	180	200
2000 mm	630 cm2	640 cm2	650 cm2	660 cm2	670 cm2	690 cm2	720 cm2	750 cm2	780 cm2	830 cm2	880 cm2	910 cm2
3500 mm	1,100 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 mm	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 mm	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 mm	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 mm	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 mm	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:

Minimum Total Surface of Suction Cups for Mineral Wool Panel with Steel face 0.5 / 0.5							
Panel Length	Panel thickness [mm]						
	50	60	80	100	120	150	200
2000 mm	470 cm2	490 cm2	510 cm2	530 cm2	570 cm2	610 cm2	690 cm2
3500 mm	820 cm2	860 cm2	890 cm2	930 cm2	1,000 cm2	1,070 cm2	1,210 cm2
5000 mm	1,170 cm2	1,220 cm2	1,270 cm2	1,320 cm2	1,420 cm2	1,520 cm2	1,720 cm2
6500 mm	1,520 cm2	1,590 cm2	1,650 cm2	1,720 cm2	1,850 cm2	1,980 cm2	2,240 cm2
8000 mm	1,870 cm2	1,950 cm2	2,030 cm2	2,110 cm2	2,270 cm2	2,430 cm2	2,750 cm2
10000 mm	2,340 cm2	2,440 cm2	2,540 cm2	2,640 cm2	2,840 cm2	3,040 cm2	3,440 cm2
13000 mm	3,040 cm2	3,170 cm2	3,300 cm2	3,430 cm2	3,690 cm2	3,950 cm2	4,470 cm2

Minimum Total Surface of Suction Cups for Mineral Wool Panel with Steel face 0.8 / 0.8							
Panel Length	Panel thickness [mm]						
	50	60	80	100	120	150	200
2000 mm	690 cm2	710 cm2	730 cm2	750 cm2	790 cm2	830 cm2	910 cm2
3500 mm	1,210 cm2	1,240 cm2	1,280 cm2	1,310 cm2	1,380 cm2	1,450 cm2	1,590 cm2
5000 mm	1,720 cm2	1,770 cm2	1,820 cm2	1,870 cm2	1,970 cm2	2,070 cm2	2,270 cm2
6500 mm	2,240 cm2	2,300 cm2	2,370 cm2	2,430 cm2	2,560 cm2	2,690 cm2	2,950 cm2
8000 mm	2,750 cm2	2,830 cm2	2,910 cm2	2,990 cm2	3,150 cm2	3,310 cm2	3,630 cm2
10000 mm	3,440 cm2	3,540 cm2	3,640 cm2	3,740 cm2	3,940 cm2	4,140 cm2	4,540 cm2
13000 mm	4,470 cm2	4,600 cm2	4,730 cm2	4,860 cm2	5,120 cm2	5,380 cm2	5,900 cm2

Note: For thicknesses not listed in the table, perform linear interpolation.

TO ASSURE SHEET PLANARITY DURING SUCTION, A SUITABLE STIFFENING PAD MUST BE INSERTED IN THE SUCTION CUP	
AT LEAST 4 SUCTION CUPS EQUALLY DISTRIBUTED FOR PANEL LENGTHS LESS THAN 6 m	
AT LEAST 8 SUCTION CUPS EQUALLY DISTRIBUTED FOR PANEL LENGTHS EXCEEDING 6 m	
INSUFFICIENT NUMBER OF SUCTION CUPS	
SUCTION CUPS NOT EQUALLY DISTRIBUTED	

Annex C

BUILDING DETAILS

RAO 01 - Recessed wall corner connection

RAO 05 - Wall corner connection

RPCV 01 - Roof wall connection with insulated gutter

RPCV 03 - Roof wall connection with gutter

RPCV 04 - Roof wall connection

RPCV 13 - Flat roof wall connection

RPCV 14 - Roof wall connection with insulated gutter

SPO 13 - Horizontal butt joint

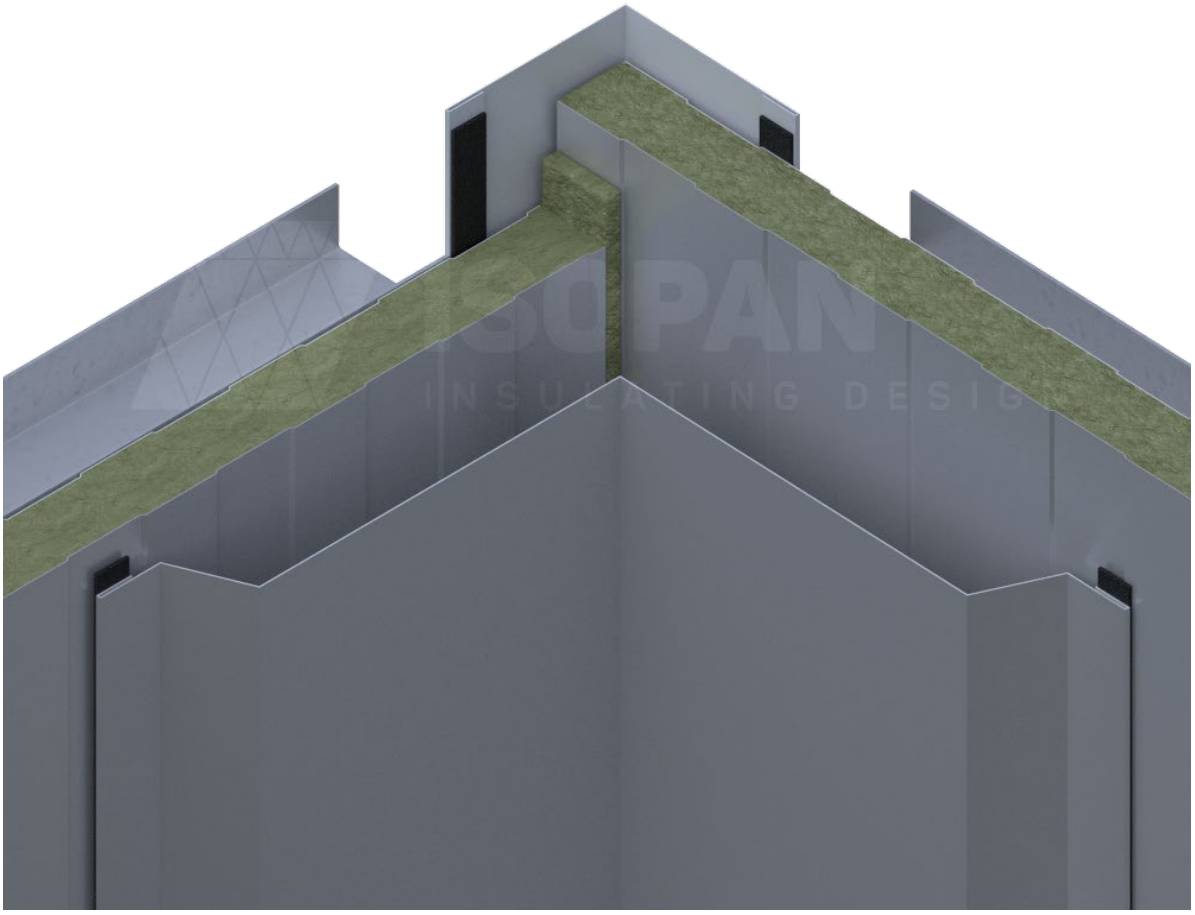
SPO 15 - Horizontal butt joint (for thermal expansion)

SPV 17 - Vertical butt joint

SPV 18 - Wall panel fastening in the event of thermal expansion

SPV 19 - Concrete base kerb wall panel connection

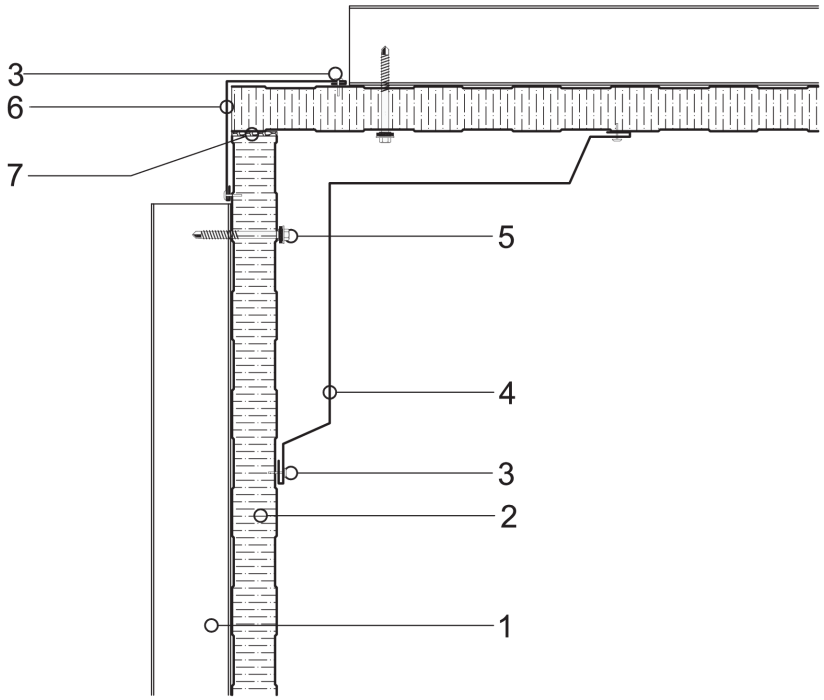
WALL CORNER CONNECTION – RECESSED



ISOPAN

RAO 01fw

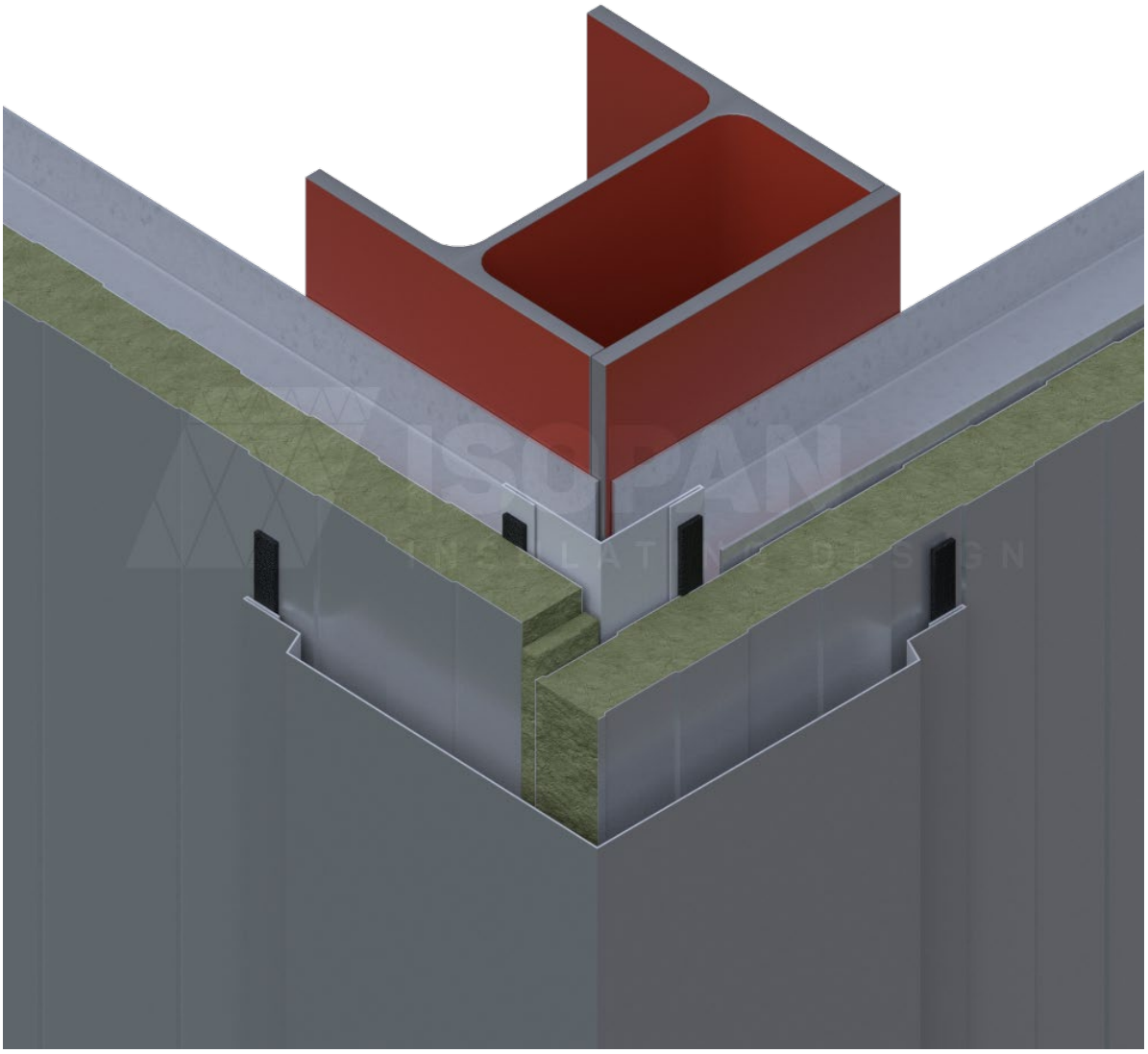
Type 1 wall angular connection: horizontal cross-section



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

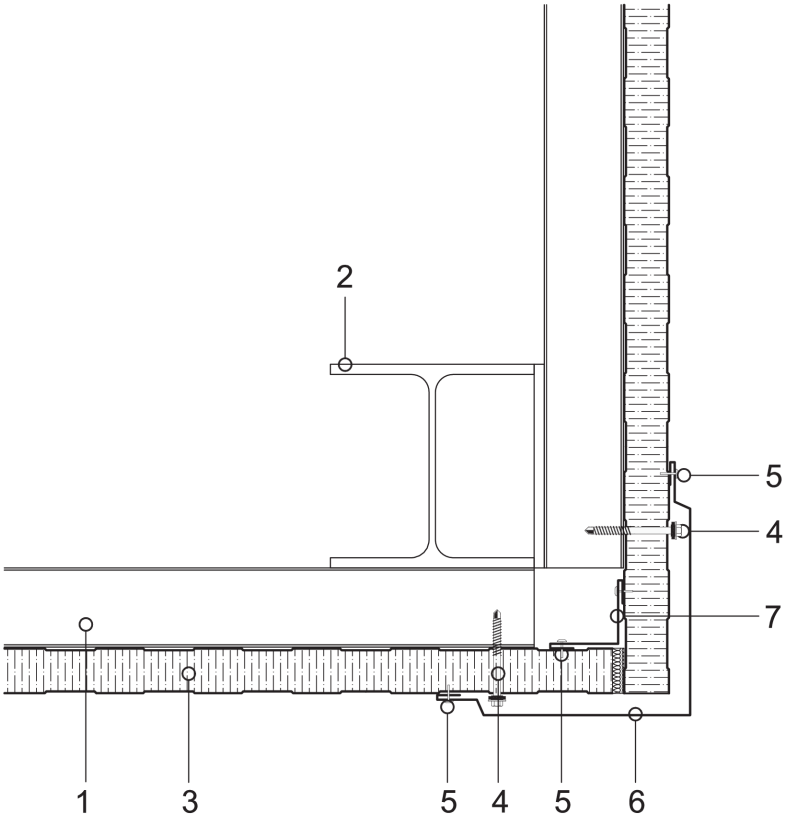
Key	
1	Steel structure
2	ISOPAN mineral wool wall panel
3	Rivet
4	External side corner connection metal sheet
5	Panel fastening screw
6	Internal side corner connection metal sheet
7	Polyurethane foam or mineral wool insulating material

WALL CORNER CONNECTION



ISOPAN RAO 05fw

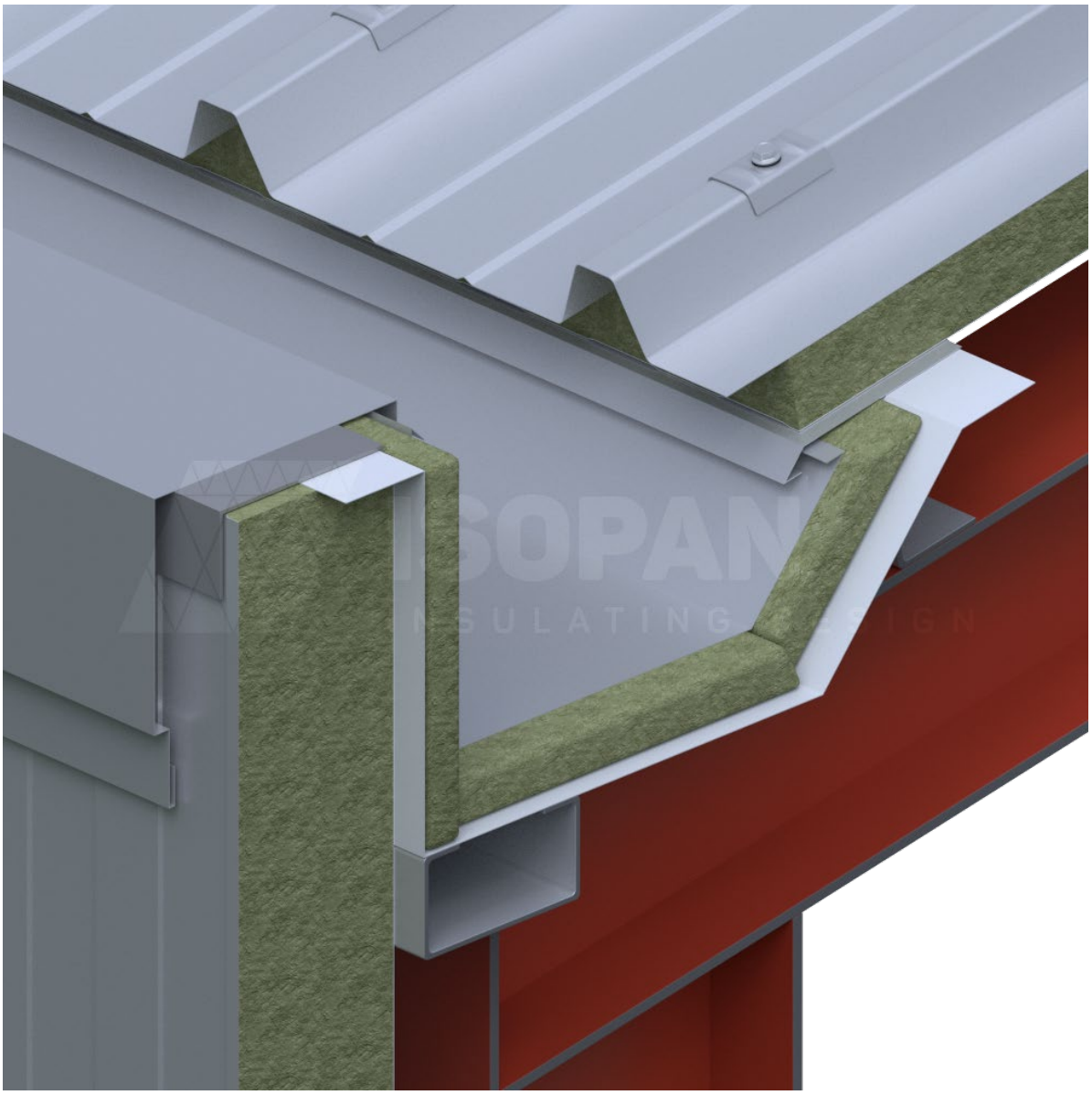
Type 5 wall angular connection: horizontal cross-section



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

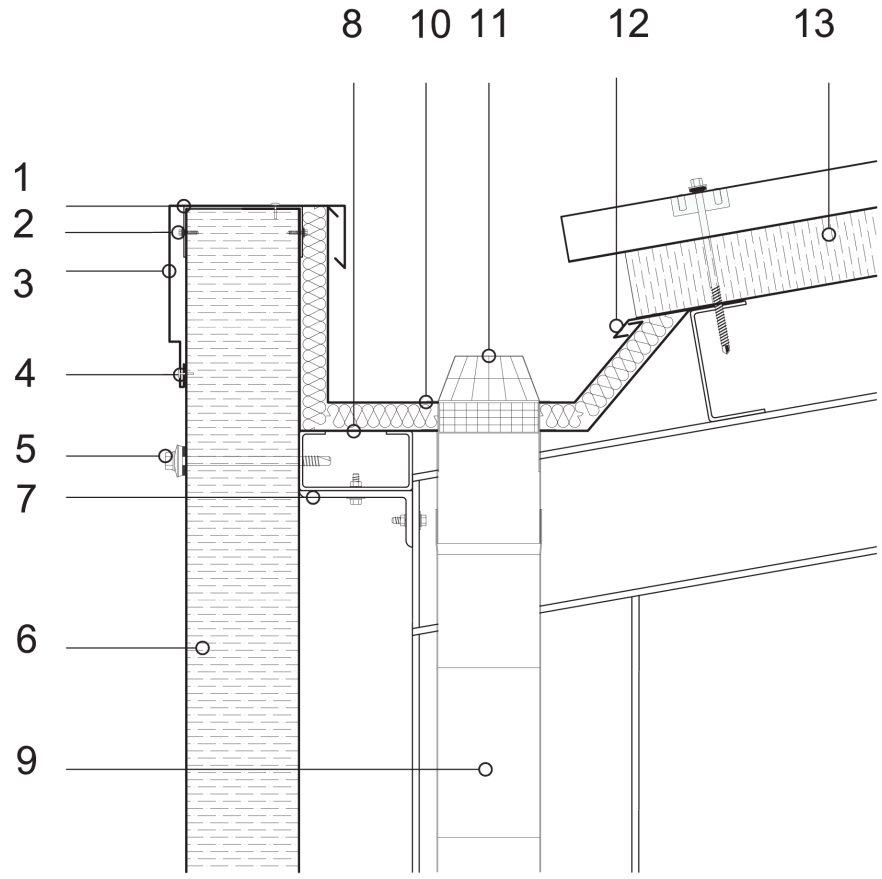
Key	
1	Steel structure
2	HEA profile
3	ISOPAN mineral wool wall panel
4	Panel fastening screw
5	Rivet
6	External side corner connection metal sheet
7	Internal side corner connection metal sheet

ROOF WALL CONNECTION WITH INSULATED GUTTER



ISOPAN RPCV 01fw

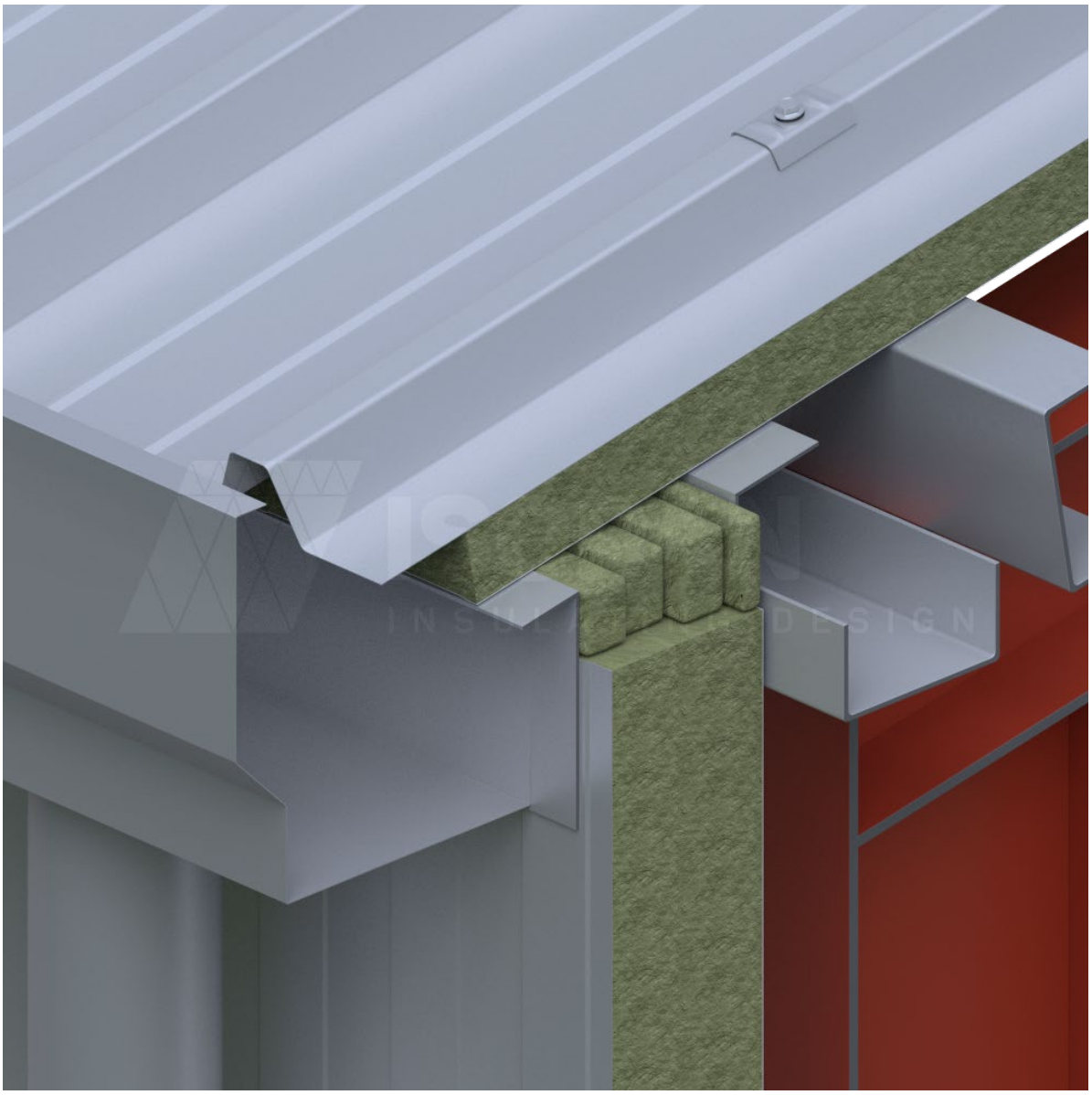
Roof wall connection with insulated gutter



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

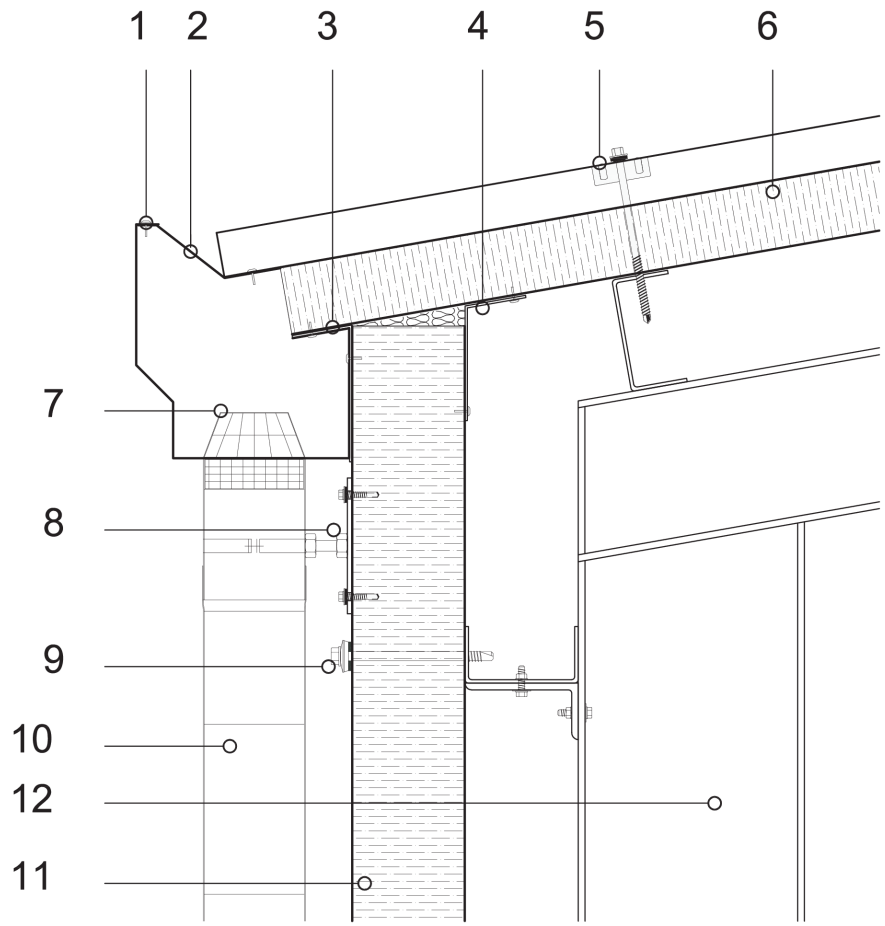
Key			
1	Head closing metal sheet	11	Leaf screen
2	Fastening screw	12	Drip edge metal sheet
3	Protective metal sheet	13	ISOPAN rock wool roof panel
4	Rivet		
5	Through fastening screw		
6	ISOPAN rock wool wall panel		
7	Steel load-bearing structure		
8	Eaves metal sheet		
9	Drainpipe		
10	Gutter		

ROOF WALL CONNECTION WITH GUTTER



ISOPAN RPCV 03fw

Type 1 roof wall connection with gutter

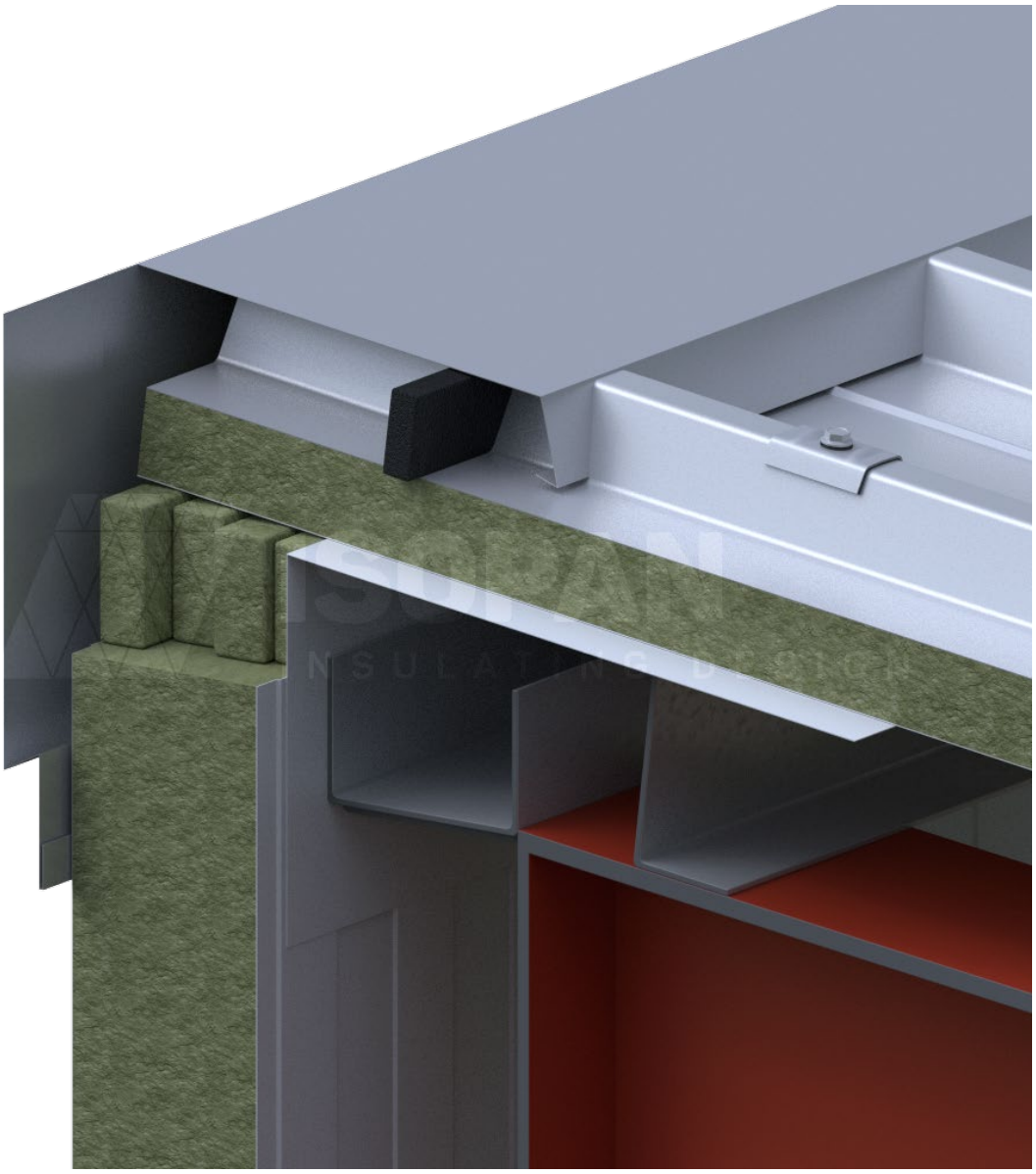


The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key

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

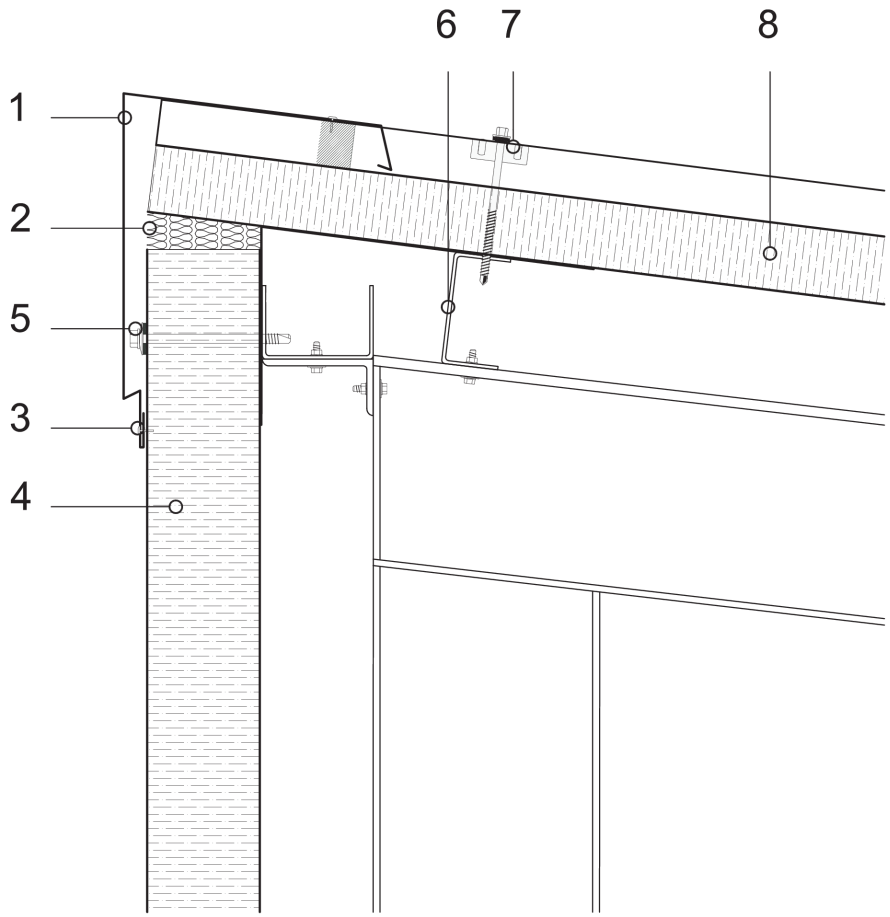
ROOF WALL CONNECTION



ISOPAN

RPCV 04fw

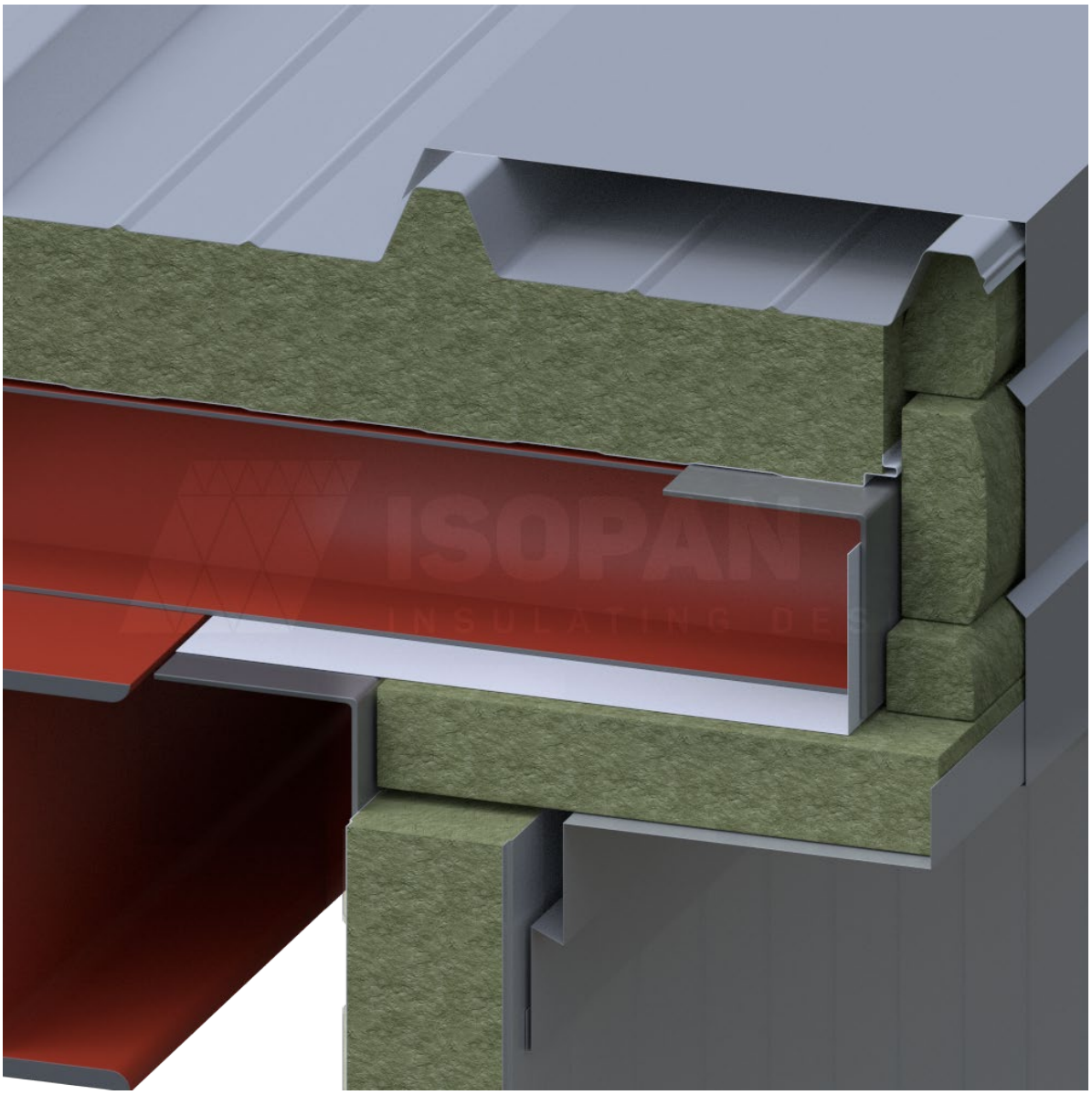
Type 1 roof wall connection



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

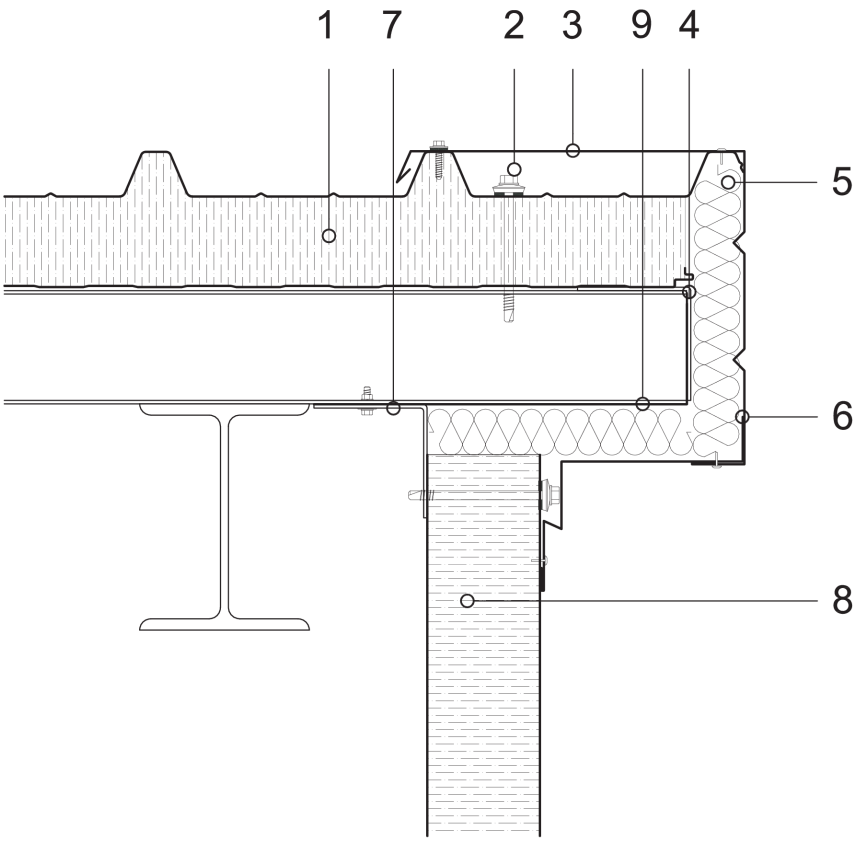
Key	
1	Closing metal sheet
2	Polyurethane foam insulating material
3	Rivet
4	ISOPAN mineral wool wall panel
5	Through fastening screw
6	Secondary steel structure
7	Roof - metal sheet through fastening screw
8	ISOPAN mineral wool roof panel

FLAT ROOF WALL CONNECTION



ISOPAN RPCV 13fw

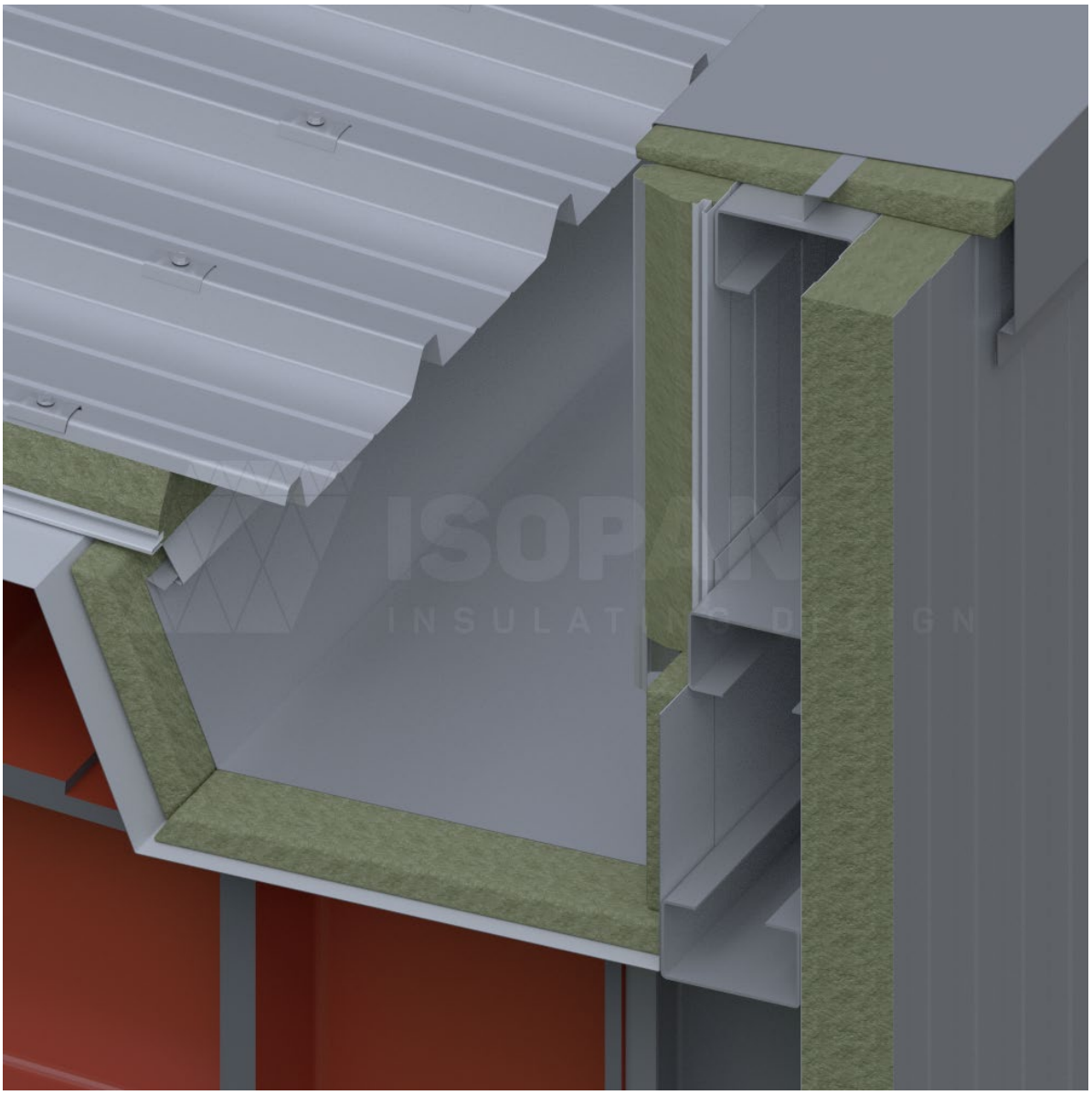
Roof wall side connection



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

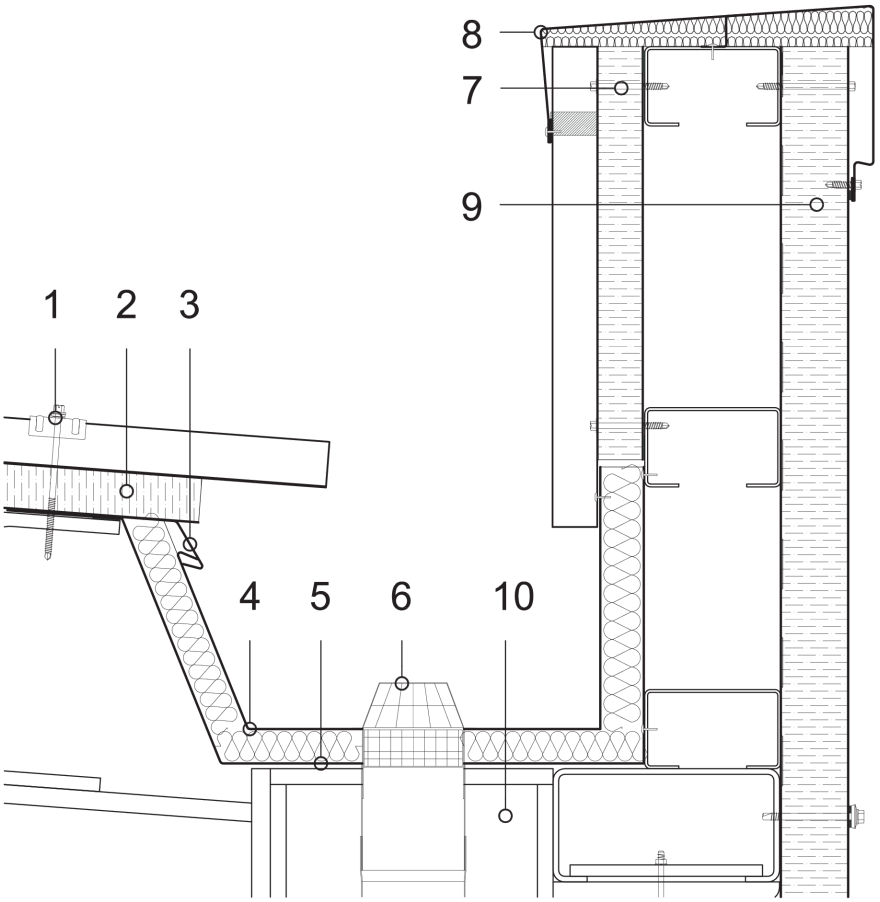
Key	
1	ISOPAN mineral wool roof panel
2	Roof panel fastening screw
3	Protective metal sheet
4	L-shaped closing metal sheet
5	Mineral wool insulating material
6	Protective metal sheet
7	Internal closing metal sheet
8	ISOPAN mineral wool wall panel
9	L-shaped closing metal sheet

ROOF WALL CONNECTION WITH INSULATED GUTTER



ISOPAN RPCV 14fw

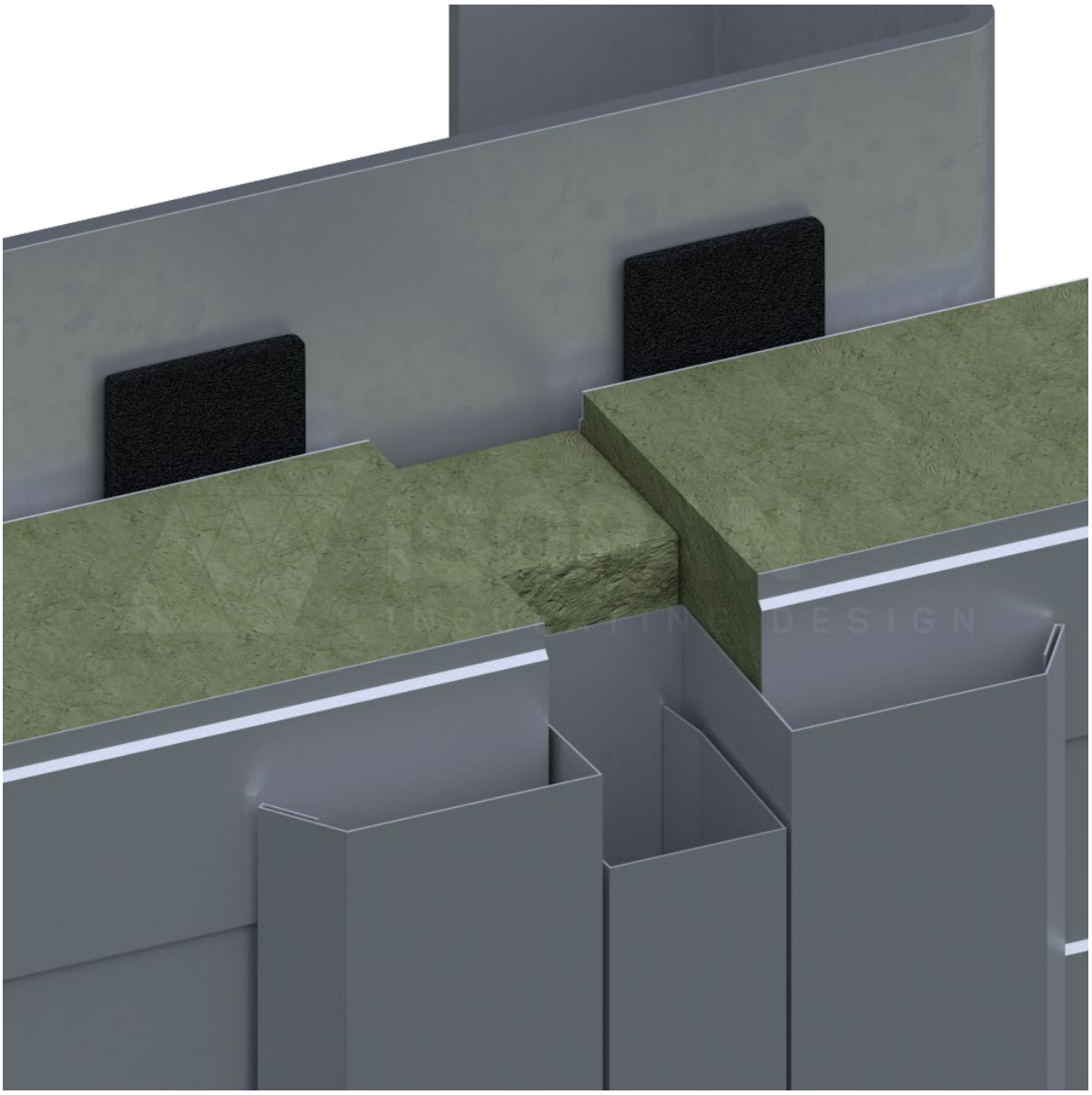
Type 4 roof wall connection with insulated gutter



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

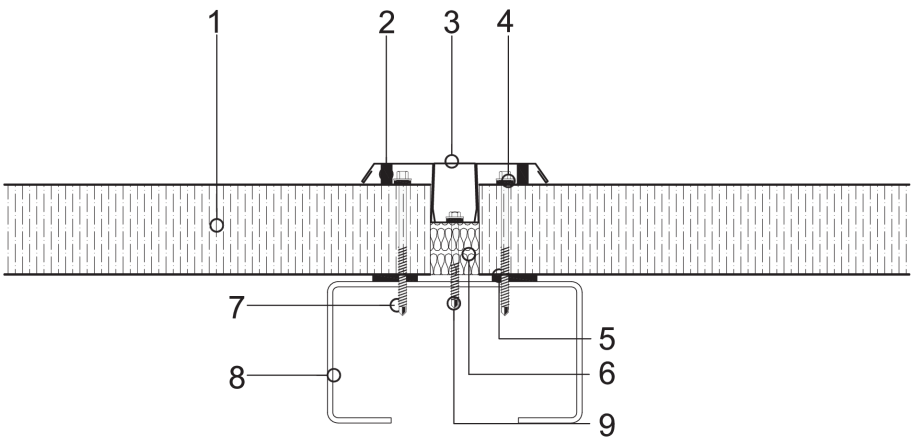
Key	
1	Roof panel fastening unit
2	ISOPAN mineral wool roof panel
3	Drip edge metal sheet
4	Gutter metal sheet
5	Eaves metal sheet
6	Leaf screen
7	Through fastening screw
8	Railing protection metal sheet
9	ISOPAN mineral wool wall panel
10	Main steel structure

HORIZONTAL BUTT JOINT



ISOPAN SPO 13fw

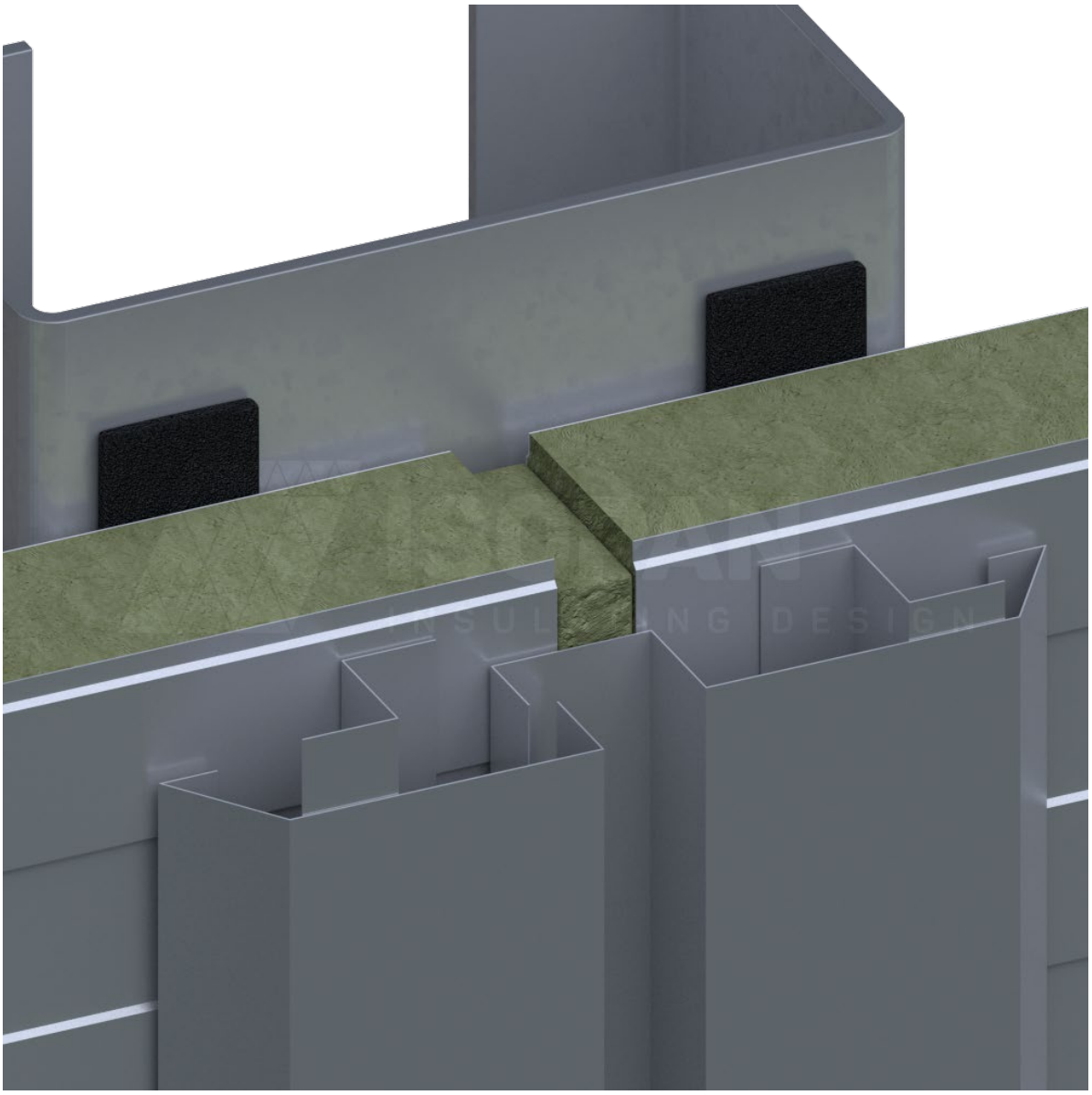
Type 3 horizontal joint between wall panels



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

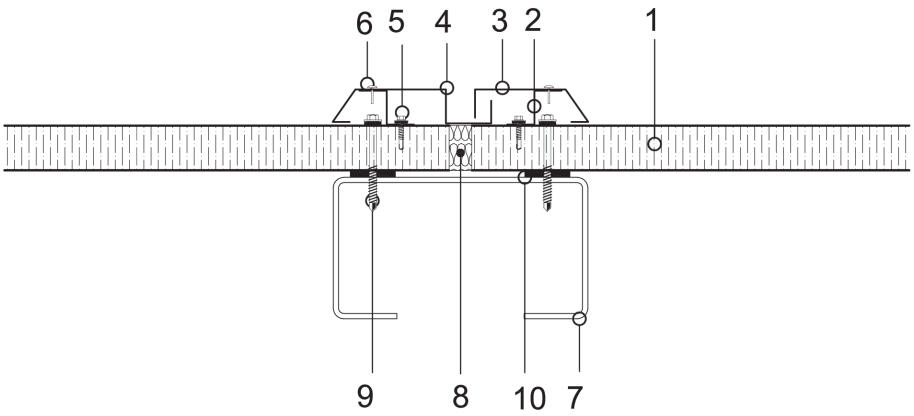
Key	
1	ISOPAN mineral wool wall panel
2	Joint connection metal sheet
3	Screw covering metal sheet
4	Rivet
5	EPDM rubber gasket
6	Mineral wool insulating material
7	Panel fastening screws
8	Steel face
9	Metal sheet fastening screw

HORIZONTAL BUTT JOINT (FOR THERMAL EXPANSION)



ISOPAN SPO 15fw

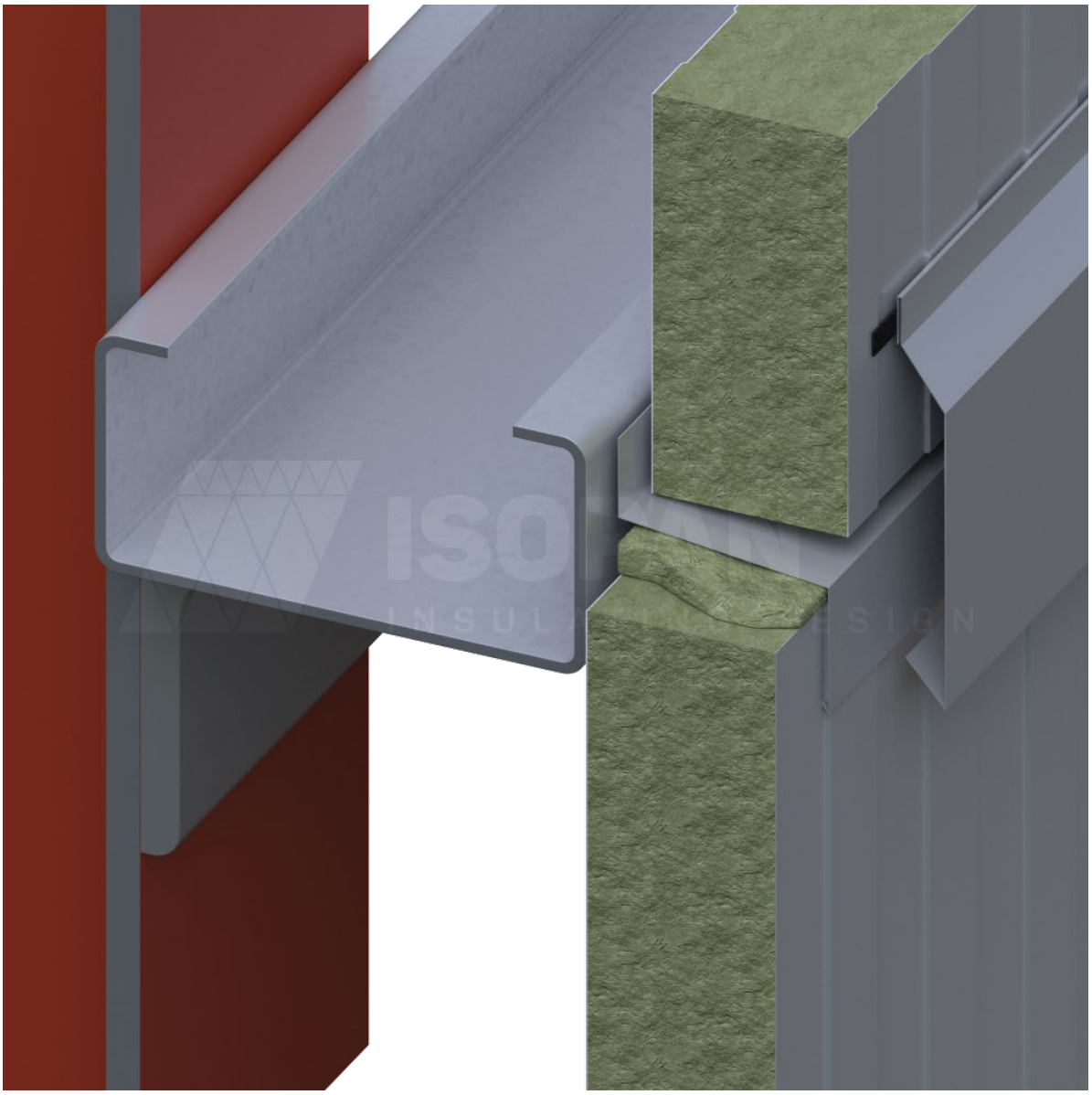
Type 5 horizontal joint between wall panels



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

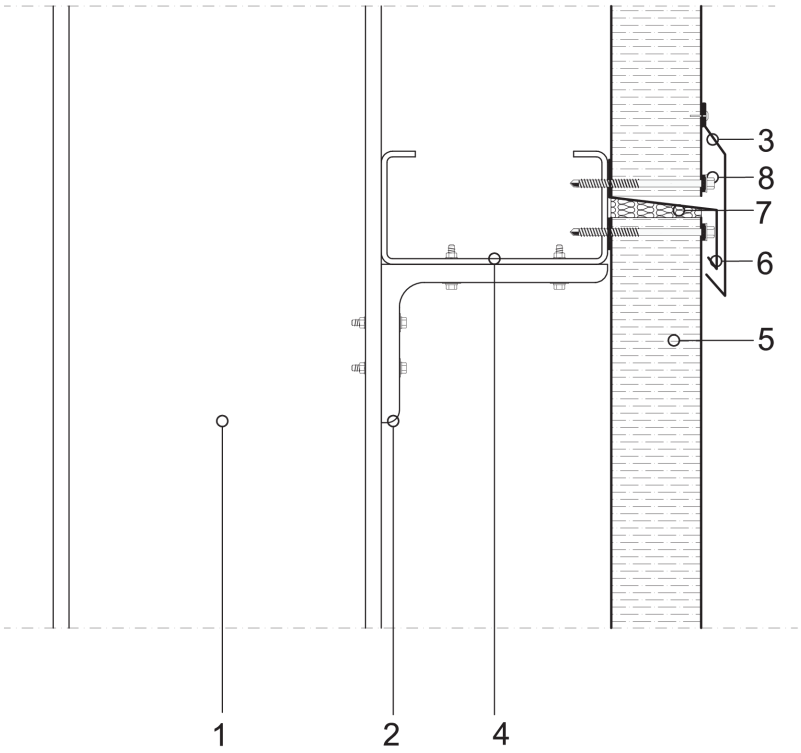
Key	
1	ISOPAN mineral wool wall panel
2	Support metal sheet
3	Joint connection metal sheet
4	Joint connection metal sheet
5	Metal sheet fastening screw
6	Rivet
7	Steel face
8	Mineral wool insulating material
9	Panel fastening screw
10	EPDM rubber gasket

VERTICAL BUTT JOINT



ISOPAN SPV 17fw

Type 6 steel structure panel hooking



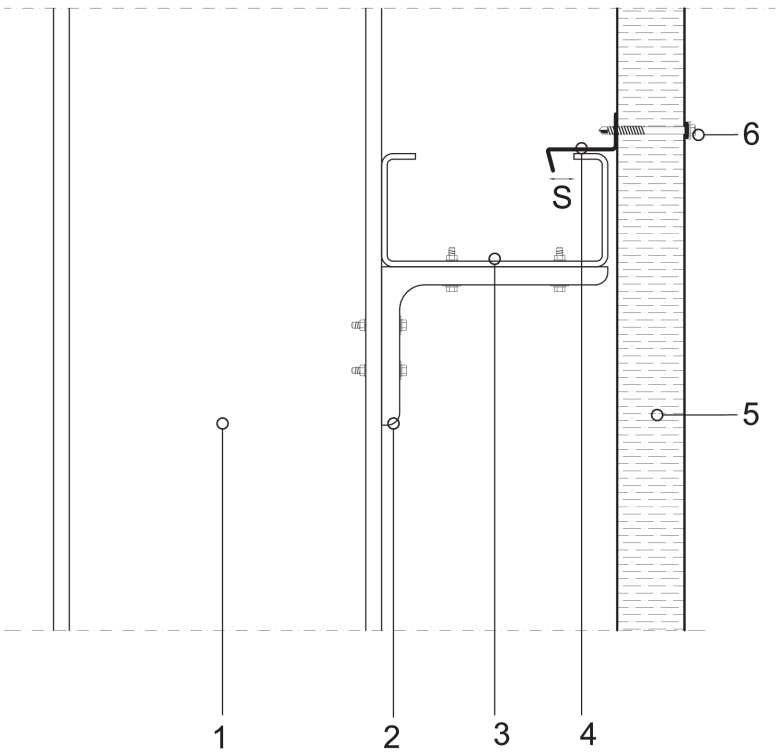
The designer is responsible for assessing the need to insert additional gasket and/or closing elements, even when not indicated in the drawing details.

Key	
1	Steel load-bearing structure
2	L-shaped profile
3	Joint protection metal sheet
4	C-shaped press-formed profile
5	ISOPAN mineral wool wall panel
6	Drip edge metal sheet
7	Mineral wool insulating material
8	Panel fastening screw

WALL PANEL FASTENING IN THE EVENT OF THERMAL EXPANSION

ISOPAN SPV 18fw

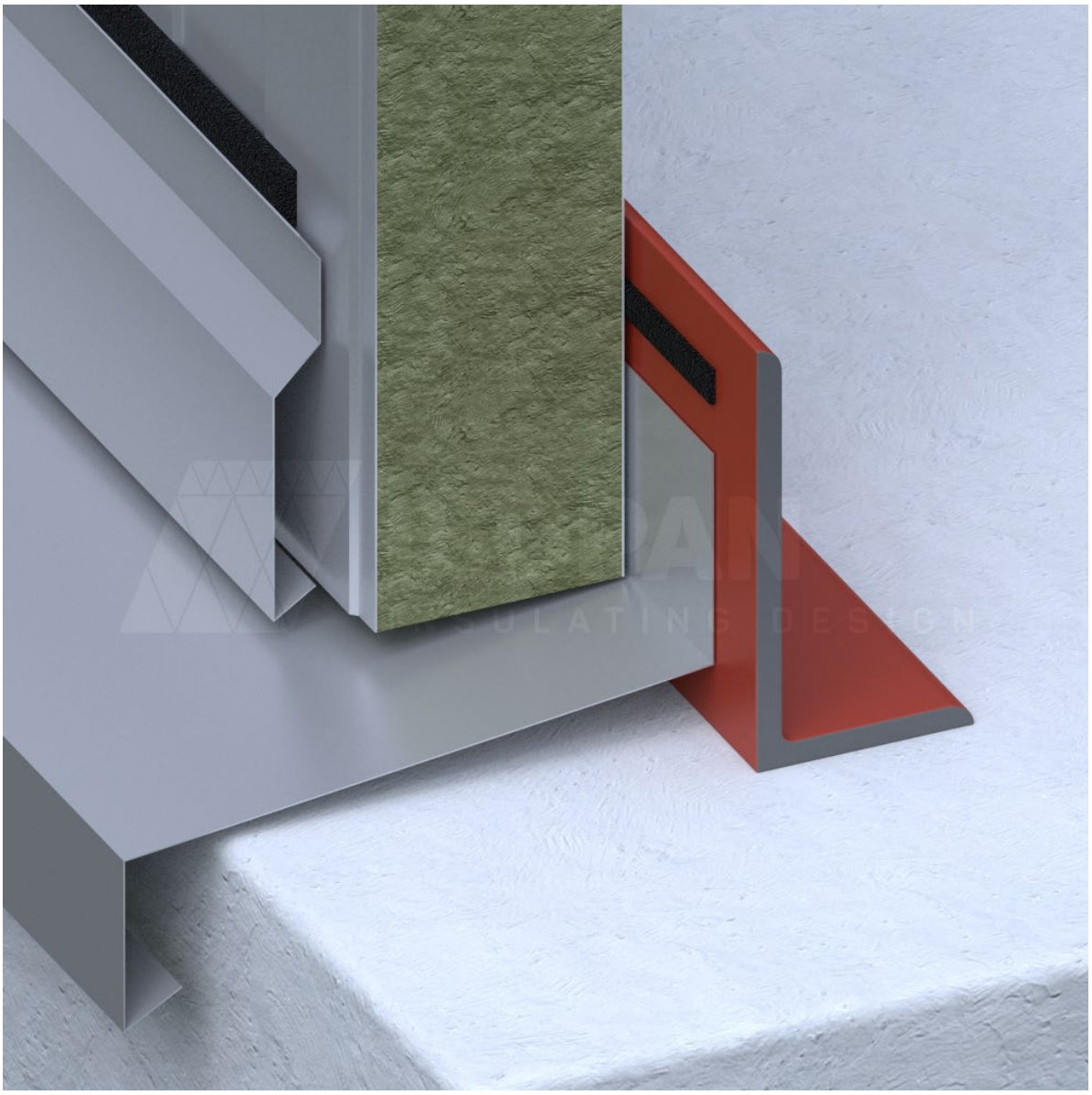
Wall panel fastening in the event of thermal expansion



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

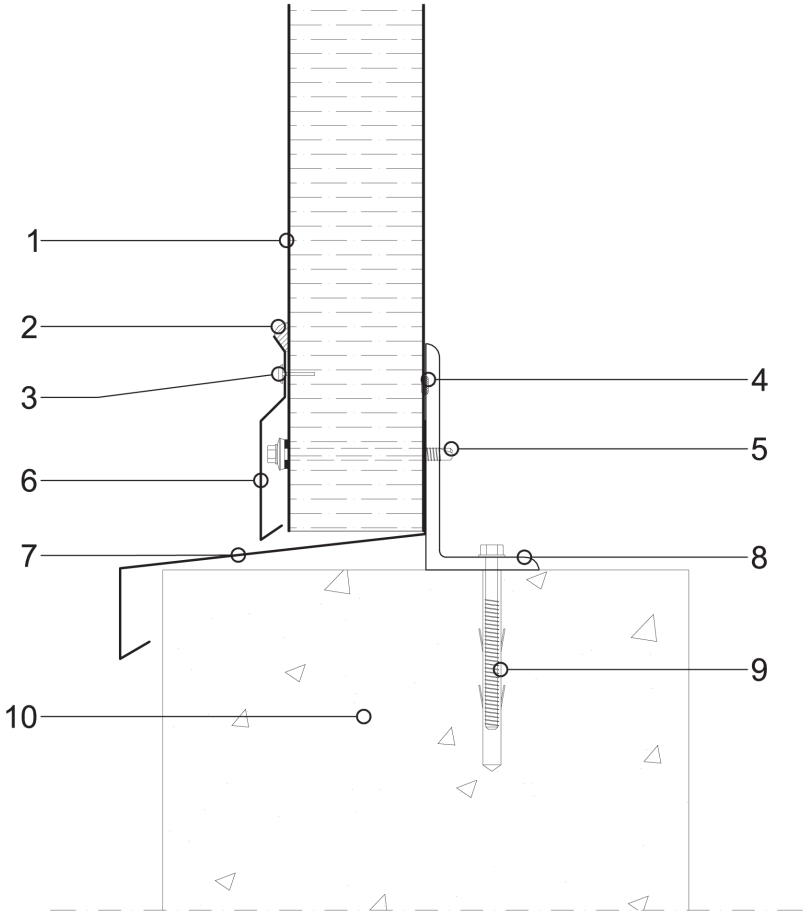
Key	
1	Steel load-bearing structure
2	L-shaped profile
3	Steel C-shaped profile for intermediate support
4	Block profile
5	ISOPAN mineral wool wall panel
6	Fastening screw
S	Compensation clearance for thermal expansion

CONCRETE BASE KERB WALL PANEL CONNECTION



ISOPAN SPV 19fw

Type 7 wall panel hooking to concrete structure



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 mineral wool wall panel
2	Silicone gasket
3	Rivet
4	Adhesive gasket
5	Panel fastening unit
6	Fastening protective tinwork
7	Drip edge tinwork
8	Steel standard L-shaped profile
9	Steel L-shaped face fastening screw
10	Concrete wall

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