

**PIR**  
**SANDWICH**  
**PANELS**  
**TECHNICAL**  
**CATALOG**



**PIR PLUS wall panel**  
**PIR STANDARD wall panel**  
**PIR LIGHT wall panel**  
**PIR STANDARD roof panel**  
Sandwich panels with polyurethane core  
EN-2024-04-24

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**I. TECHNICAL INFORMATION CONCERNING ENCLOSURES  
MADE OF BALEXMETAL SANDWICH PANELS  
WITH A POLYURETHANE CORE**

## 1. GENERAL INFORMATION – ABOUT THE COMPANY

Balex Metal Sp. z o.o. is the leading manufacturer of steel construction materials in Poland. The Company's offer includes complete solutions as well as steel roofing and façade systems for housebuilding industry, commercial and agricultural construction.

The range of products is recognised by customers in Poland, Lithuania, Latvia, Estonia, Ukraine, Czech Republic, Slovakia, Germany, Denmark, Sweden and Norway. Consulting and sales services are provided through own network of regional branches, cooperating distributors and a team of professional sales advisors.

Its leading position in the market of manufacturing double-clad insulating core sandwich panels, the Balex Metal Company owes to its technologically advanced production lines purchased from the most renowned European companies, the team of employees with excellent qualifications as well as its special attention to quality.

## 2. BALEX METAL'S SANDWICH PANELS

Investors, architects, general contractors and construction companies performing investment projects are interested in commercially available, complete solutions. At the same time, they expect comprehensive deliveries of all necessary elements and construction materials included in the design. In order to meet these expectations, BALEX METAL included in its offer complete solutions of curtain walls and roof coverings.

The key elements of these solutions are wall and roof sandwich panels comprising two steel sheet skins bond with a structural-insulating core. The Balex Metal offer includes steel clad panels with two types of insulating core:

- sandwich panels with mineral wool core of fibres oriented perpendicularly to facing, marketed under the commercial name MW
- sandwich panels with a polyisocyanurate core designated as PIR and covered by the present catalogue

The basic type of wall sandwich panels are panels with visible fastening (designated as PIR STANDARD or PIR LIGHT), which are fastened through to the supporting structure with an exposed fastener. The other type of wall sandwich panels are panels with fasteners not visible on the façade (designated as PIR PLUS). A specially designed panel lock conceals points of fastening and makes them not visible on a finished façade.

Roof sandwich panels are characterized by very deep profiling of their exterior trapezoidal facing. This is related to carrying long-term loads, including snow and own weight accounting for creep.

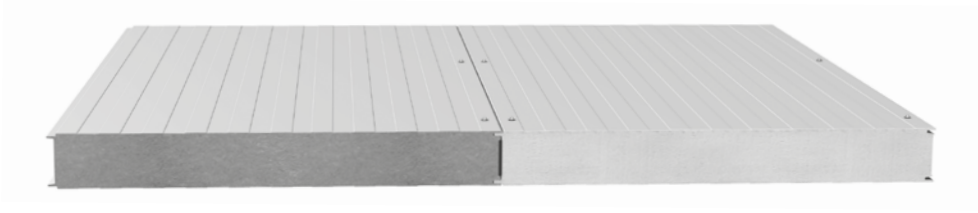
Besides sandwich panels, the offer also include a wide range of various elements, such as steel flashings, accessories (fasteners, screws, rivets), sealing materials, windows and doors adapted for fastening to sandwich panels, rooflights as well as systems of gutters and downpipes.

Compatibility is the feature distinguishing the BALEX's wall sandwich panels.

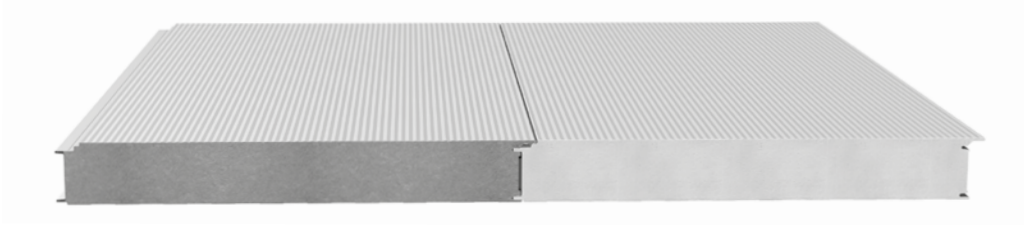
This feature is used when designing joints of fire separation walls with exterior walls of a structure. An example of this is a vertical arrangement joint of polyurethane core panels with mineral wool core panels. This way, achieved is a vertical strip in an exterior wall made of non-flammable material of demanded fire resistance at various fire zones.

When designing a joint of a flooring and a spandrel wall, which should be executed of non-combustible materials of appropriate fire resistance, it is appropriate to combine mineral wool core panel elements with panels of other core types.





**FIG. 1. A joint of the MW STANDARD and PIR STANDARD wall panels**



**FIG. 2. A joint of the MW PLUS and PIR PLUS wall panels**

### 3. PIR SANDWICH PANELS CONSTRUCTION

BALEX METAL company provides wide range of modern wall and roof panels with polyurethane core marked with PIR trade name.

PIR sandwich panels consist of two stainless steel facings and a construction and insulation core. The core is made of non-freon polyurethane foam, with density of 40 kg/m<sup>3</sup> or 37 kg/m<sup>3</sup> for PIR LIGHT panel (environmentally friendly due to the applied foaming agent) and it is responsible for transmitting shear stress, maintaining fixed distance between facing panels and ensuring high heat insulation values.

Sandwich panel's facings are made of S250GD steel metal sheet with thickness range from 0.40 mm to 0.70 mm and galvanized. Facing panels are responsible for transmitting normal stress and securing a particular facility against weather conditions. Stainless steel (1.4301) is also used for facings. Such construction of the panel makes it very light retaining its high capacity and rigidity at the same time and enables increasing the span of supports (purlins and girders).

The variety of facing profiles along with their wide colour scheme allows architects and users to shape the elevation of particular buildings retaining proportions between their aesthetic and functional values.

### 4. PIR SANDWICH PANELS PRODUCTION TECHNOLOGY

The production of PIR sandwich panels with a polyurethane core was started in spring 2004. Pentane is used as the foaming agent which makes the production process environmentally friendly i.e. not damaging the ozone layer. As a result the technological process of producing sandwich panels with polyurethane core consists in injection of mixed components forming rigid polyurethane foam between two continuously moving steel strips (with previously profiled longitudinal joints and the main profile) and applying sealing strip and aluminium foil into the longitudinal panel joint at the same time. High quality and fixed repeatability of technical parameters of PIR sandwich panels has been achieved due to the application of top class materials and continuous control of production.

### 5. PIR PANELS TYPES

**We provide five types of PIR panels:**

**PIR STANDARD wall panel** – standard wall panel with modular width (so called ,covering width') 1000 mm or 1100 mm enables quick assembly. Standard wall panel is fastened to the construction with the use of eyelet fasteners.



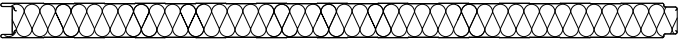

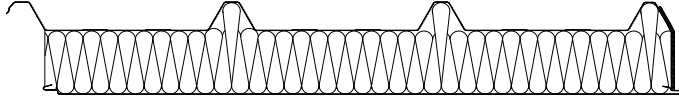
**PIR PLUS wall panel** – wall panel with concealed fastening, not visible from the elevation side with modular widths of 1050 mm and 1000 mm. The fastening concealed from the elevation side as well as different types of profilings: make the panels attractive in terms of both architecture and functionality.

**PIR STANDARD roof panel** – roof panel with the modular width of 1000 mm and trapezoidal profile of the external surface guarantees high load-bearing capacity while transferring operational loads as well as during assembly.

**PIR FROST** – thermoinsulated sandwich panel for cold storage applications with the modular width of 1000 mm or 1100 mm. Detailed information on this product is available in a separate technical catalogue.

**PIR LIGHT wall panel** – economical wall panel with a modular width of 1150 mm and a reduced core density.

**Table 2. Types of BALEX METAL sandwich panels**

Panel type	Panel thickness [mm]	Panel shape
1	2	3
PIR STANDARD wall panel	40 50 60 80 100 110 120 130	
PIR PLUS wall panel	60 80 100 120	
PIR LIGHT wall panel	50 60	
	80 100	
PIR STANDARD roof panel	40/85 60/105 80/125 100/145 120/165 160/205	

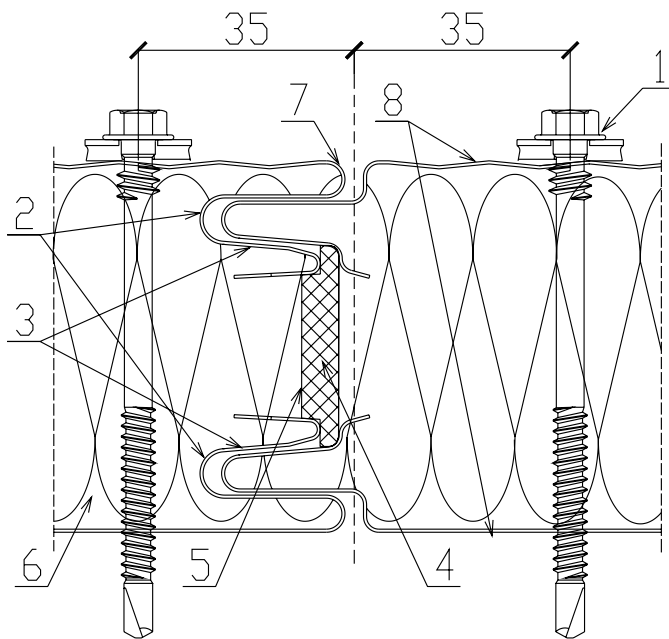
## 6. THE SCOPE OF PANEL APPLICATION

Sandwich panels are commonly used building material for light constructions of industrial halls, warehouses, sports and production halls, pavilions and commercial facilities, offices, social buildings, garages, workshops, administrative and public buildings, storehouses, freezers and cold stores (including food industry facilities). Wide colour palette and variety of profiling shapes make it possible to realize many construction projects. The panel's construction enables fast and easy assembly regardless of weather conditions in both vertical and horizontal arrangement. PIR STANDARD and PIR PLUS wall panels can also be applied on self-supporting suspended ceilings. The designer guided by the destination of a particular facility, operating conditions, possible influence of the internal environment as well as weather conditions decides on the kind and the arrangement of sandwich panels. Taking low heat-transfer coefficient into account PIR sandwich panels seem to be a perfect choice for heated buildings' elevations offering a possibility of complex and quick completion of the construction project. PIR panels are designed for low and normal temperatures. Fixed temperature on the panel's surface should not exceed + 60°C.

## 7. PIR PANELS CONTACT TYPES

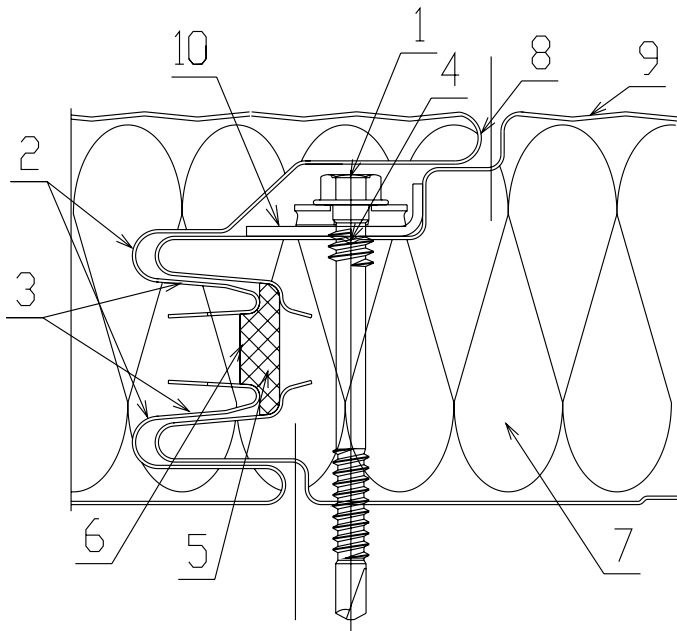
A new structural solution has been implemented in PIR sandwich panels. Unique shape of longitudinal joints with optimal proportion between the thickness of feather and the depth of the groove on both claddings on the internal and external side had considerable effect on increasing the fire resistance parameters of wall panels. This solution has been applied in both PIR STANDARD and PIR PLUS panels. The appropriate joint shape guarantees good thermal performance and leaktightness to rain waters, air and water vapour penetration. In the case of PIR STANDARD roof panel the lower cladding is factory-removed at one end of the panel together with the core as standard in order to facilitate joining panels lengthwise and the assembly of gutters.

## 8. PIR STANDARD WALL PANEL



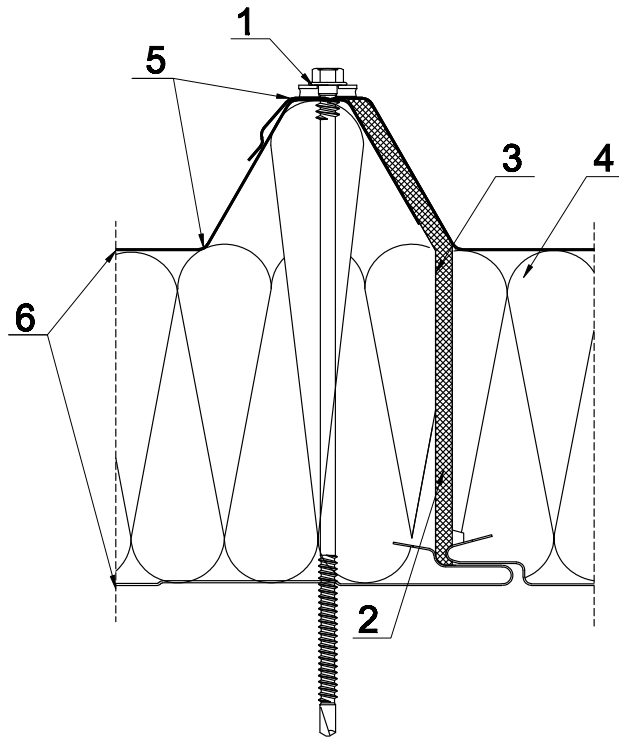
- 1) Joint fasteners
- 2) Unique both sided form of the panel joint in the shape of a double lock.
- 3) Conical inclination of the panel's internal joint surface facilitating assembly.
- 4) Continuous polyurethane sealing strip or polyurethane sealing strip laminated with aluminium foil and additionally covered with carbon fibre cloth applied in the production process, preventing water vapour penetration and retaining good thermal performance and increasing fire resistance.
- 5) Aluminium foil or aluminium foil laminated with high fire resistance material preventing water vapour penetration and gas diffusion in order to maintain a fixed heat-transfer coefficient and increasing fire resistance.
- 6) A core made of rigid polyurethane foam produced on the basis of environmentally and ozone layer friendly technology with the lowest heat-transfer coefficient in comparison with other thermal insulation materials.
- 7) A technology of profiling the shape of metal claddings retaining the integrity and durability of protection coatings.
- 8) Wide range of external cladding profiles meeting stiff architectural requirements.

## 9. PIR PLUS WALL PANEL



- 1) Concealed fasteners masked with especially shaped tongue of the external panel's cladding.
- 2) Unique both sided form of the panel joint in the shape of a double lock.
- 3) Conical inclination of the panel's internal joint surface facilitating assembly.
- 4) Longitudinal groove that facilitates the process of positioning joint fasteners.
- 5) Continuous polyurethane sealing strip or polyurethane sealing strip laminated with aluminium foil and additionally covered with carbon fibre cloth applied in the production process, preventing water vapour penetration and retaining good thermal performance and increasing fire resistance.
- 6) Aluminium foil or aluminium foil laminated with high fire resistance material preventing water vapour penetration and gas diffusion in order to maintain a fixed heat-transfer coefficient and increasing fire resistance.
- 7) A core made of rigid polyurethane foam produced on the basis of environmentally and ozone layer friendly technology with the lowest heat-transfer coefficient in comparison with other thermal insulation materials.
- 8) A technology of profiling the shape of metal claddings retaining the integrity and durability of protection coatings.
- 9) Wide range of external cladding profiles meeting stiff architectural requirements.
- 10) Steel ŁB 25 washers in the panel lock increasing the joint's load-bearing capacity.

## 10. PIR STANDARD ROOF PANEL



- 1) Joint fasteners.
- 2) Continuous polyurethane sealing strip additionally coated with aluminium foil, applied in the production process, preventing water vapour penetration and retaining good thermal performance.
- 3) Aluminium foil preventing water vapour penetration and gas diffusion in order to maintain a fixed heat-transfer coefficient.
- 4) A core made of rigid polyurethane foam produced on the basis of environmentally and ozone layer friendly technology with the lowest heat-transfer coefficient in comparison with other thermal insulation materials.
- 5) A technology of profiling the shape of metal claddings retaining the integrity and durability of protection coatings.
- 6) Trapezoidal profile of the external cladding increasing the load-bearing capacity of the roof panel.

## 11. BASIC TECHNICAL INFORMATION

Table 3. Technical information

Panel type	Panel thickness [mm]	Cladding thickness [mm]		Panel weight [kg/m <sup>2</sup> ]	Panel length L [m]	
		INT	EXT		min	max
1	2	3	4	5	6	7
PIR STANDARD wall panel	40	0,40*-0,70	0,50-0,70	10,3	2,00	18,00
	50			10,6		
	60			11,1		
	80			11,8		
	100			12,6		
	110			12,9		
	120			13,2		
	130			13,5		
PIR PLUS wall panel	60	0,40*-0,70	0,50-0,70	11,4	2,00	18,00
	80			12,1		
	100			12,9		
	120			13,8		
PIR LIGHT wall panel	50	0,40	0,40	8,3	2,50	18,00
	60			8,7		
	80			9,5		
	100			10,2		
PIR STANDARD roof panel	40/85	0,40*-0,70	0,50-0,70	10,8	2,50	16,00
	60/105			11,7		17,00
	80/125			12,5		18,00
	100/145			13,3		
	120/165			14,1		
	160/205			15,7		

\* For panels with flat cladding profiling minimal steel thickness = 0.50mm

Note: In the case of PIR panels thickness marking the first digit refers to the core's thickness and the second one to the total thickness of the panel

## 12. MATERIAL AND CLADDING COATINGS

### 12.1. Material

#### STEEL S250GD + ZINC

- steel with increased parameters, galvanized on both sides and permanently secured with anti-corrosion coating
- metal sheet thickness: 0,40 - 0,70
- coated with organic and metallic coatings

#### STAINLESS STEEL (1.4301)

- high-quality specialist austenitic steel with increased corrosion resistance
- metal sheet thickness: 0.50 mm
- material for food processing industry, warehousing and transport of food, cold stores, mushroom-growing cellars, agricultural facilities – could be approved for contact with food

## 12.2. Coatings

### PREMIUM offer

#### CESAR 55 - unequalled durability and vitality

- polyurethane coating with polyamid of overall thickness 55 µm
- extraordinary resistance for corrosion – up to RC5
- good resistance to intensive UV radiation – RUV4
- solution for standard, demanding and aggressive environments
- aesthetic and colour durability for the whole life cycle
- used for roof coverings, wall claddings, standard environments, as well as those aggressive and demanding: cold, humid, of high UV radiation, industrial and polluted
- colors are presented on the company's website

### Standard offer

#### SP Polyester Gloss

- for outdoor applications - coating thickness 25 µm: resistant to changing temperature and weather conditions, good corrosion resistance
- for indoor applications coating thickness 15 µm: indoor layers of walls and roofs
- colors are presented on the company's website

#### SP Polyester Mat

- coating thickness 35 µm
- for outdoor applications: resistant to changing temperature and weather conditions, good corrosion resistance
- perfectly suitable for roofs of commercial and industrial facilities
- colors are presented on the company's website

### Special orders offer:

#### PCV(F) „food safe“

- coating thickness 120 µm
- white foil
- special coating with increased hardness
- it can be applied in food processing facilities and cold stores, easily washable and resistant to the majority of cleaning agents.



### 13. FACING COLOUR SCHEME

Colour scheme according to the Balex Metal World of Colours palette

#### PREMIUM coating

CESAR 55 - polyurethane with polyamid: 7016, 8017, 9005, 9006, 9007, 9010

#### Organic coatings:

SP Polyester Gloss 25 µm: 9010, 8004, 8019, 6005, 9005, 3011, 7024, 7016, 7035, 6020, 3016, 1015, 3000, 6011, 9006, 5010, 1003, 9007, 9002, 7047, 7040, 7012, 5003, 6018, 8017

SP Polyester Mat 35 µm: 8620M, 9005M, 8637M, 3301M, 7591M, 7016M, 6490M

PVC(F) food safe 9010

#### Metallic coatings

Stainless steel

**Table 4. Classification of colours by relative brightness**

Symbol	Name	Group
9010	white	very bright
9002	grey-white	
7035	light-grey	
1015	ivory	
6011	reseda-green	bright
9006	silver-metallic	
9007	grey-aluminium	
1003	signal-yellow	
9005	black	dark
5010	signal-blue	
6005	dark-green	
6020	fir-green	
7024	graphite-grey	
7016	graphite	
8019	brown-grey	
8017	chocolate-brown	
8012	red-brown	
3016	coral-red	
3011	red	
3000	fiery red	

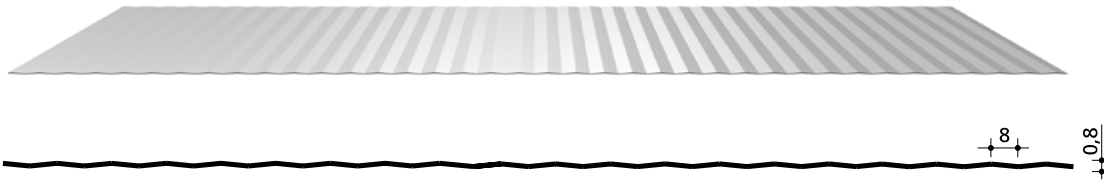
*Not all colors are available for thicknesses (0.4, 0.5, 0.6, 0.7).*

*For more information please contact the sales representative of Balex Metal.*

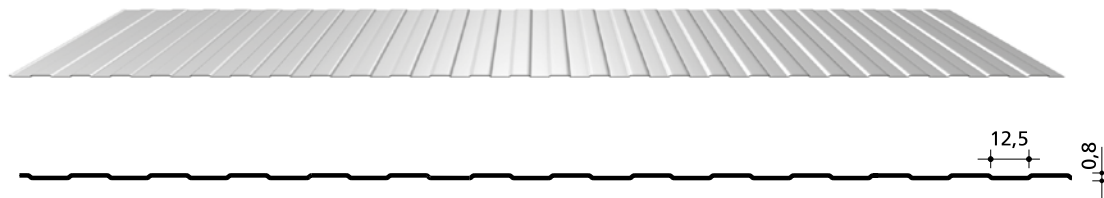
## 14. FACINGS PROFILING SCHEME

Sandwich panels with polyurethane core are distinguished by wide variety of available profiles, especially in the case of external elevation facing. Profile types:

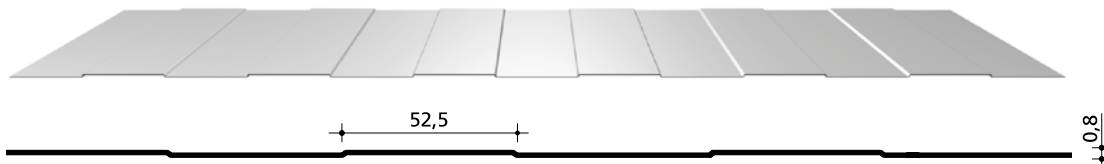
### M = MICROPROFILED



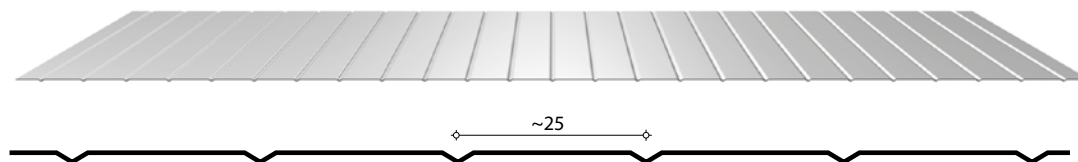
### S = SOFTLINE



### L = LINED



### R = GROOVED



### G = FLAT\*

\*For claddings of minimal thickness 0.50 mm

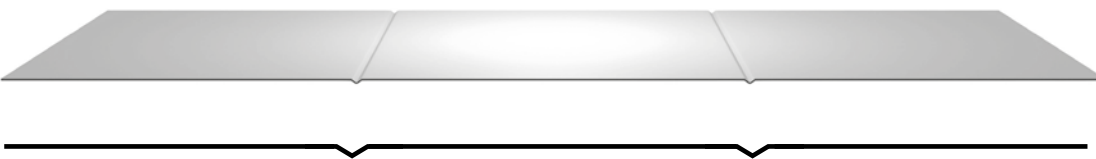
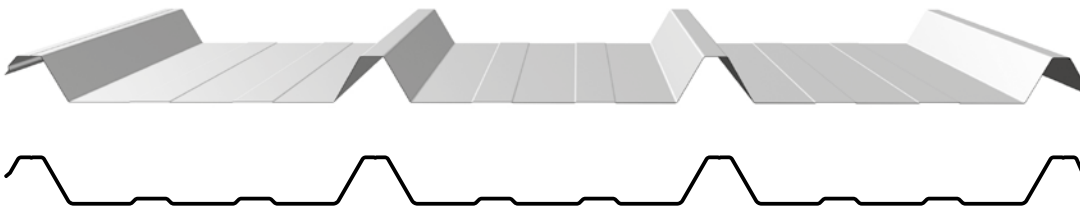


**1L = CLEARLINE\***

*\*For claddings thickness 0.50 - 0.60mm*


**2L = DOUBLE CLEARLINE\***

*\*For claddings thickness 0.50 - 0.60mm*


**T = TRAPEZOIDAL**


*\* 0.5 mm thickness for G/1L/2L profiling of outside cladding is available after signing the statement, which contains the acceptance of possibility of appearing visible deflection (within standard tolerance up to 0,6 mm/200 mm acc. to EN 14509). Stainless steel cladding not available.*

The table below includes possible combinations of profile types of external and internal facings for individual panel types.

**Table 5. Profile type combinations**

Panel type	External facing							Internal facing		
	M	S	L	R	G	1L	2L	T	L	G
PIR STANDARD wall panel	●		●		●	●	●		●	●
PIR PLUS 1000 wall panel	●	●	●		●	●	●		●	●
PIR PLUS 1050 wall panel	●	●	●	●	●	●	●		●	●
PIR STANDARD roof panel								●	●	●
PIR LIGHT wall panel			●*							

*Lined on the PIR LIGHT wall panel differs from the others due to the different width of the covering (1150 mm)*

## 15. STRENGTH ISSUES

1. The following assumptions were made in the process of designing the load-bearing capacity and rigidity tables for PIR sandwich panel application:
    - a) the load-bearing capacity limit is considered exceeded if real load exceeds the acceptable breaking load whose value has been calculated by means of dividing the breaking load obtained in the carried out strength tests by 2.
    - b) the usability limit which means rigidity in the case of sandwich panels is considered exceeded if the deflection of wall and roof panels under short-term load exceeds 1/200 of the span spread and 1/100 of the span spread taking long-term load into consideration.
  2. The scope of application of PIR panels regarding load-bearing capacity and rigidity should be in accordance with the attached tables. The values of acceptable loads indicated in the tables take the following into account:
    - a) the influence of heat load caused by the difference of temperatures between the external and internal cladding ( $t_{int} = 25^{\circ}\text{C}$  in summer and  $t_{int} = 20^{\circ}\text{C}$  in winter). For calculating heat loads was made an assumption of temperature's difference  $\Delta t = 50^{\circ}\text{C}$ .
    - b) the influence of long-term loads (in the case of roof panels)
    - c) the most unfavourable load combination
    - d) the increase in deflection in case of load acting towards the support, in the case of fastening panels with the use of two fasteners widthways.
  3. Maximum load values provided in the table should be compare with characteristic loads:
  4. Maximum loads provided in the tables have been specified for panels in **light** and **very light colours**. For checking the load capacity of dark coloured sandwich panles contact Balex Metal's design office.
  5. The tables contain the following profiles:
    - a) for wall plates: micro profiling on the outside and lining on the inside
    - b) for roof plates: trapezoidal on the outside and lining on the inside
- In order to specify permissible loads for other profile patterns please contact the design office of Balex Metal.
6. In order to establish acceptable loads for span spreads not included in the tables you can use interpolation.
  7. The tables give widths of supports for maximum loads. In other cases, the minimum width of intermediate supports is 60 mm, and edge supports 40 mm.
  8. The panel support span in edge zones should be reduced appropriately in relation to the value provided in the tables.
  9. Given values in the field of loads going from the support can be applied if the element to which a panel is fastened is not less than 1.50 mm thick.

**PIR STANDARD wall panel**
**Table 6. One span system: characteristic maximum load on panels in 0.5/0.4 claddings and micro-profiling / lining profile patters; support width [mm] in brackets**

Core thickness	Load impact direction	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																
		2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00
40	pressure	2,78 (45)	2,47 (45)	2,22 (45)	2,02 (45)	1,85 (45)	1,68 (45)	1,45 (41)	1,26 (40)	1,11 (40)	0,98 (40)	0,88 (40)	0,79 (40)	0,71 (40)	0,64 (40)	0,59 (40)	0,54 (40)	0,49 (40)
	suction	-2,16	-1,71	-1,38	-1,14	-0,96	-0,82	-0,71	-0,62	-0,54	-0,48	-0,43	-0,39	-0,35	-0,31	-0,28	-0,26	-0,24
50	pressure	3,37 (55)	2,99 (55)	2,69 (55)	2,45 (55)	2,24 (55)	2,07 (55)	1,82 (52)	1,58 (48)	1,39 (45)	1,23 (43)	1,1 (40)	0,99 (40)	0,89 (40)	0,81 (40)	0,74 (40)	0,67 (40)	0,62 (40)
	suction	-2,69	-2,13	-1,72	-1,42	-1,19	-1,02	-0,88	-0,76	-0,67	-0,6	-0,53	-0,48	-0,43	-0,39	-0,36	-0,32	-0,3
60	pressure	3,9 (63)	3,47 (63)	3,12 (63)	2,84 (64)	2,6 (63)	2,4 (63)	2,19 (62)	1,91 (58)	1,68 (55)	1,49 (52)	1,32 (48)	1,19 (46)	1,07 (44)	0,97 (42)	0,89 (40)	0,81 (40)	0,75 (40)
	suction	-3,21	-2,54	-2,05	-1,7	-1,42	-1,21	-1,05	-0,91	-0,8	-0,71	-0,63	-0,57	-0,51	-0,47	-0,42	-0,39	-0,36
80	pressure	4,82 (78)	4,29 (78)	3,86 (78)	3,51 (78)	3,21 (78)	2,97 (78)	2,75 (78)	2,56 (78)	2,25 (73)	1,99 (69)	1,77 (65)	1,59 (61)	1,44 (59)	1,3 (56)	1,19 (53)	1,08 (51)	1 (49)
	suction	-4,21	-3,33	-2,69	-2,23	-1,87	-1,59	-1,37	-1,19	-1,05	-0,93	-0,83	-0,75	-0,67	-0,61	-0,56	-0,51	-0,47
100	pressure	6,04 (98)	5,37 (98)	4,83 (98)	4,39 (98)	4,03 (98)	3,72 (98)	3,45 (98)	3,21 (98)	2,82 (92)	2,49 (86)	2,22 (81)	2 (77)	1,8 (73)	1,63 (70)	1,49 (67)	1,36 (64)	1,25 (61)
	suction	-5,17	-4,09	-3,31	-2,73	-2,3	-1,96	-1,69	-1,47	-1,29	-1,14	-1,02	-0,91	-0,83	-0,75	-0,68	-0,63	-0,57
110	pressure	6,64 (57)	5,9 (57)	5,31 (57)	4,83 (57)	4,43 (57)	4,08 (57)	3,79 (57)	3,54 (57)	3,13 (51)	2,78 (45)	2,48 (40)	2,22 (40)	1,97 (40)	1,75 (40)	1,57 (40)	1,4 (40)	1,26 (40)
	suction	-5,68	-4,48	-3,63	-3	-2,52	-2,15	-1,85	-1,61	-1,42	-1,25	-1,12	-0,99	-0,91	-0,83	-0,75	-0,69	-0,63
120	pressure	7,26 (117)	6,46 (117)	5,81 (117)	5,28 (118)	4,84 (118)	4,47 (118)	4,15 (118)	3,85 (117)	3,39 (110)	3 (103)	2,68 (98)	2,4 (93)	2,17 (88)	1,96 (84)	1,79 (80)	1,64 (77)	1,5 (73)
	suction	-6,08	-4,81	-3,89	-3,22	-2,7	-2,3	-1,98	-1,73	-1,52	-1,34	-1,2	-1,07	-0,97	-0,88	-0,8	-0,73	-0,68
130	pressure	7,2 (66)	6,4 (66)	5,76 (66)	5,24 (66)	4,8 (66)	4,43 (66)	4,12 (66)	3,84 (66)	3,6 (66)	3,25 (62)	2,89 (55)	2,6 (50)	2,34 (45)	2,12 (40)	1,94 (40)	1,77 (40)	1,63 (40)
	suction	-6,67	-5,27	-4,27	-3,53	-2,96	-2,52	-2,17	-1,89	-1,66	-1,47	-1,31	-1,18	-1,06	-0,97	-0,89	-0,81	-0,74

**Table 7. Multi span system: characteristic maximum load on panels in 0.5/0.4 claddings and micro-profiling / lining profile patters; support width [mm] in brackets**

Core thickness	Load impact direction	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																
		2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00
40	pressure	2,72 (44/88)	2 (40/73)	1,53 (40/62)	1,21 (40/60)	0,97 (40/60)	0,79 (40/60)	0,66 (40/60)	0,55 (40/60)	0,48 (40/60)	0,41 (40/60)	0,36 (40/60)	0,32 (40/60)	0,28 (40/60)	0,26 (40/60)	0,23 (40/60)	0,21 (40/60)	0,19 (40/60)
	suction	-2,16	-1,71	-1,38	-1,14	-0,96	-0,82	-0,71	-0,62	-0,54	-0,48	-0,43	-0,39	-0,35	-0,31	-0,28	-0,26	-0,24
50	pressure	3,36 (55/109)	2,55 (47/93)	1,93 (40/78)	1,51 (40/68)	1,19 (40/60)	0,96 (40/60)	0,79 (40/60)	0,66 (40/60)	0,56 (40/60)	0,48 (40/60)	0,42 (40/60)	0,37 (40/60)	0,33 (40/60)	0,29 (40/60)	0,26 (40/60)	0,24 (40/60)	0,22 (40/60)
	suction	-2,69	-2,13	-1,72	-1,42	-1,19	-1,02	-0,88	-0,76	-0,67	-0,60	-0,53	-0,48	-0,43	-0,39	-0,36	-0,33	-0,30
60	pressure	3,9 (63/126)	3,1 (57/113)	2,32 (47/94)	1,81 (41/81)	1,4 (40/68)	1,11 (40/60)	0,9 (40/60)	0,75 (40/60)	0,63 (40/60)	0,54 (40/60)	0,47 (40/60)	0,41 (40/60)	0,36 (40/60)	0,32 (40/60)	0,29 (40/60)	0,26 (40/60)	0,24 (40/60)
	suction	-3,21	-2,54	-2,05	-1,7	-1,42	-1,21	-1,05	-0,91	-0,80	-0,71	-0,63	-0,57	-0,51	-0,47	-0,42	-0,39	-0,36
80	pressure	4,82 (78/156)	4,17 (76/152)	3,07 (62/124)	2,32 (52/104)	1,75 (43/85)	1,35 (40/71)	1,07 (40/61)	0,87 (40/60)	0,72 (40/60)	0,61 (40/60)	0,52 (40/60)	0,45 (40/60)	0,39 (40/60)	0,34 (40/60)	0,3 (40/60)	0,27 (40/60)	0,24 (40/60)
	suction	-4,21	-3,33	-2,69	-2,23	-1,87	-1,59	-1,37	-1,19	-1,05	-0,93	-0,83	-0,75	-0,67	-0,61	-0,56	-0,51	-0,47
100	pressure	6,04 (98/196)	5,14 (94/187)	3,73 (76/151)	2,68 (60/120)	1,97 (48/96)	1,48 (40/78)	1,14 (40/65)	0,9 (40/60)	0,73 (40/60)	0,6 (40/60)	0,5 (40/60)	0,42 (40/60)	0,36 (40/60)	0,31 (40/60)	0,27 (40/60)	0,24 (40/60)	0,21 (40/60)
	suction	-5,17	-4,09	-3,31	-2,73	-2,3	-1,96	-1,69	-1,47	-1,29	-1,14	-1,02	-0,91	-0,83	-0,75	-0,68	-0,63	-0,57
110	pressure	6,64 (57/190)	5,9 (57/189)	4,49 (41/156)	3,34 (40/123)	2,4 (40/91)	1,78 (40/68)	1,34 (40/60)	1,04 (40/60)	0,88 (40/60)	0,71 (40/60)	0,58 (40/60)	0,49 (40/60)	0,41 (40/60)	0,35 (40/60)	0,3 (40/60)	0,26 (40/60)	0,22 (40/60)
	suction	-5,68	-4,48	-3,63	-3	-2,52	-2,15	-1,85	-1,61	-1,42	-1,25	-1,12	-0,99	-0,91	-0,83	-0,75	-0,69	-0,63
120	pressure	7,26 (118/235)	5,97 (109/217)	4,18 (85/169)	2,87 (64/128)	2,03 (50/99)	1,48 (40/78)	1,1 (40/63)	0,83 (40/60)	0,65 (40/60)	0,51 (40/60)	0,41 (40/60)	0,34 (40/60)	0,28 (40/60)	0,23 (40/60)	0,19 (40/60)	0,16 (40/60)	0,14 (40/60)
	suction	-6,08	-4,81	-3,89	-3,22	-2,7	-2,3	-1,98	-1,73	-1,52	-1,34	-1,2	-1,07	-0,97	-0,88	-0,8	-0,73	-0,68
130	pressure	7,2 (66/208)	6,4 (66/208)	5,61 (63/202)	4,12 (42/158)	3,01 (40/121)	2,19 (40/90)	1,64 (40/68)	1,24 (40/60)	0,99 (40/60)	0,82 (40/60)	0,66 (40/60)	0,54 (40/60)	0,45 (40/60)	0,37 (40/60)	0,31 (40/60)	0,27 (40/60)	0,23 (40/60)
	suction	-6,67	-5,27	-4,27	-3,53	-2,96	-2,52	-2,17	-1,89	-1,66	-1,47	-1,31	-1,18	-1,06	-0,97	-0,89	-0,81	-0,74

**PIR LIGHT wall panel**

**Table 8. 1-span system - maximum characteristic loads of wall sandwich panels with a PIR LIGHT polyurethane core with a 0.40/0.40 mm thick cladding and lining / lining profile; 40 mm outer support width**  
**Force direction - TO SUPPORT - FORCE**

		PIR LIGHT wall sandwich panel																											
Core thickness	Colours group	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75	8,00
50	I	4,52	3,76	3,22	2,82	2,50	2,14	1,76	1,48	1,26	1,08	0,90	0,75	0,62	0,52	0,44	0,37	0,31	0,25	0,20	0,16	0,12	0,10	0,07	0,05	0,04	0,00	0,00	0,00
	II	4,52	3,76	3,22	2,82	2,50	2,14	1,76	1,48	1,26	1,08	0,90	0,75	0,62	0,52	0,44	0,37	0,31	0,25	0,20	0,16	0,12	0,10	0,07	0,05	0,04	0,00	0,00	0,00
	III	4,52	3,76	3,22	2,82	2,50	2,14	1,76	1,48	1,26	1,08	0,90	0,75	0,62	0,52	0,44	0,37	0,31	0,25	0,20	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
60	I	5,41	4,51	3,87	3,38	3,01	2,59	2,14	1,80	1,53	1,32	1,15	1,01	0,90	0,79	0,67	0,58	0,50	0,43	0,37	0,32	0,28	0,23	0,19	0,16	0,13	0,11	0,09	0,07
	II	5,41	4,51	3,87	3,38	3,01	2,59	2,14	1,80	1,53	1,32	1,15	1,01	0,90	0,79	0,67	0,58	0,50	0,43	0,37	0,32	0,28	0,23	0,19	0,16	0,13	0,11	0,09	0,07
	III	5,41	4,51	3,87	3,38	3,01	2,59	2,14	1,80	1,53	1,32	1,15	1,01	0,90	0,79	0,67	0,58	0,50	0,43	0,37	0,32	0,28	0,23	0,19	0,16	0,00	0,00	0,00	0,00
80	I	5,91	4,92	4,22	3,69	3,28	2,95	2,68	2,45	2,08	1,80	1,56	1,37	1,22	1,08	0,98	0,89	0,80	0,73	0,67	0,61	0,56	0,50	0,44	0,39	0,35	0,31	0,28	0,25
	II	5,91	4,92	4,22	3,69	3,28	2,95	2,68	2,45	2,08	1,80	1,56	1,37	1,22	1,08	0,98	0,89	0,80	0,73	0,67	0,61	0,56	0,50	0,44	0,39	0,35	0,31	0,28	0,25
	III	5,91	4,92	4,22	3,69	3,28	2,95	2,68	2,45	2,08	1,80	1,56	1,37	1,22	1,08	0,98	0,89	0,80	0,73	0,67	0,61	0,56	0,50	0,44	0,39	0,35	0,31	0,28	0,25
100	I	6,40	5,34	4,57	4,00	3,56	3,20	2,91	2,67	2,46	2,28	1,99	1,75	1,55	1,38	1,24	1,12	1,01	0,93	0,85	0,78	0,72	0,67	0,62	0,57	0,53	0,50	0,47	0,43
	II	6,40	5,34	4,57	4,00	3,56	3,20	2,91	2,67	2,46	2,28	1,99	1,75	1,55	1,38	1,24	1,12	1,01	0,93	0,85	0,78	0,72	0,67	0,62	0,57	0,53	0,50	0,47	0,43
	III	6,40	5,34	4,57	4,00	3,56	3,20	2,91	2,67	2,46	2,28	1,99	1,75	1,55	1,38	1,24	1,12	1,01	0,93	0,85	0,78	0,72	0,67	0,62	0,57	0,53	0,50	0,47	0,43

**Table 9. 2-span system - maximum characteristic loads of wall sandwich panels with a PIR LIGHT polyurethane core with a 0.40/0.40 mm thick cladding and lining / lining profile; width of the outer prop 40 mm, width of the inner prop 60 mm**  
**Force direction - TO SUPPORT - FORCE**

		PIR LIGHT wall sandwich panel																											
Core thickness	Colours group	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75	8,00
50	I	4,18	3,48	2,98	2,61	2,32	1,87	1,46	1,17	0,99	0,83	0,70	0,59	0,51	0,44	0,39	0,34	0,31	0,28	0,25	0,23	0,21	0,19	0,17	0,16	0,15	0,14	0,13	0,12
	II	4,18	3,48	2,98	2,61	2,32	1,87	1,46	1,17	0,99	0,83	0,70	0,59	0,51	0,44	0,39	0,34	0,31	0,28	0,25	0,23	0,21	0,19	0,17	0,16	0,15	0,14	0,13	0,12
	III	4,18	3,48	2,98	2,61	2,32	1,87	1,46	1,17	0,99	0,83	0,70	0,59	0,51	0,44	0,39	0,34	0,31	0,28	0,25	0,23	0,21	0,19	0,17	0,16	0,15	0,14	0,13	0,12
60	I	4,42	3,69	3,16	2,76	2,46	2,21	1,83	1,46	1,20	0,99	0,86	0,73	0,63	0,54	0,48	0,42	0,37	0,33	0,30	0,27	0,25	0,23	0,21	0,19	0,18	0,16	0,15	0,14
	II	4,42	3,69	3,16	2,76	2,46	2,21	1,83	1,46	1,20	0,99	0,86	0,73	0,63	0,54	0,48	0,42	0,37	0,33	0,30	0,27	0,25	0,23	0,21	0,19	0,18	0,16	0,15	0,14
	III	4,42	3,69	3,16	2,76	2,46	2,21	1,83	1,46	1,20	0,99	0,86	0,73	0,63	0,54	0,48	0,42	0,37	0,33	0,30	0,27	0,25	0,23	0,21	0,19	0,18	0,16	0,15	0,14
80	I	4,92	4,10	3,51	3,07	2,73	2,46	2,23	2,05	1,66	1,38	1,15	0,99	0,85	0,73	0,64	0,56	0,49	0,44	0,39	0,36	0,32	0,29	0,27	0,25	0,23	0,21	0,19	0,18
	II	4,92	4,10	3,51	3,07	2,73	2,46	2,23	2,05	1,66	1,38	1,15	0,99	0,85	0,73	0,64	0,56	0,49	0,44	0,39	0,36	0,32	0,29	0,27	0,25	0,23	0,21	0,19	0,18
	III	4,92	4,10	3,51	3,07	2,73	2,46	2,23	2,05	1,66	1,38	1,15	0,99	0,85	0,73	0,64	0,56	0,49	0,44	0,39	0,36	0,32	0,29	0,27	0,25	0,23	0,21	0,19	0,18
100	I	5,41	4,51	3,87	3,38	3,01	2,70	2,46	2,25	2,08	1,77	1,48	1,23	1,03	0,92	0,79	0,69	0,61	0,54	0,48	0,43	0,39	0,35	0,32	0,29	0,27	0,25	0,23	0,21
	II	5,41	4,51	3,87	3,38	3,01	2,70	2,46	2,25	2,08	1,77	1,48	1,23	1,03	0,92	0,79	0,69	0,61	0,54	0,48	0,43	0,39	0,35	0,32	0,29	0,27	0,25	0,23	0,21
	III	5,41	4,51	3,87	3,38	3,01	2,70	2,46	2,25	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

**Table 10. 3-span system - maximum characteristic loads of wall sandwich panels with a PIR LIGHT polyurethane core with a 0.40/0.40 mm thick cladding and lining/lining profile; width of the outer prop 40 mm, width of the inner prop 60 mm**  
**Force direction - TO SUPPORT - FORCE**

		PIR LIGHT wall sandwich panel																											
Core thickness	Colours group	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75	8,00
50	I	4,18	3,48	2,98	2,61	2,32	2,09	1,75	1,44	1,21	1,03	0,91	0,79	0,69	0,62	0,55	0,49	0,45	0,40	0,37	0,34	0,31	0,29	0,26	0,24	0,23	0,21	0,20	0,19
	II	4,18	3,48	2,98	2,61	2,32	2,09	1,75	1,44	1,21	1,03	0,91	0,79	0,69	0,62	0,55	0,49	0,45	0,40	0,37	0,34	0,31	0,29	0,26	0,24	0,23	0,21	0,20	0,19
	III	4,18	3,48	2,98	2,61	2,32	2,09	1,75	1,44	1,21	1,03	0,91	0,79	0,69	0,62	0,55	0,49	0,45	0,40	0,37	0,34	0,31	0,29	0,26	0,24	0,23	0,21	0,20	0,19
60	I	4,42	3,69	3,16	2,76	2,46	2,21	2,01	1,75	1,46	1,24	1,07	0,95	0,83	0,74	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,34	0,32	0,29	0,27	0,25	0,24	0,20
	II	4,42	3,69	3,16	2,76	2,46	2,21	2,01	1,75	1,46	1,24	1,07	0,95	0,83	0,74	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,34	0,32	0,29	0,27	0,25	0,24	0,20
	III	4,42	3,69	3,16	2,76	2,46	2,21	2,01	1,75	1,46	1,24	1,07	0,95	0,83	0,74	0,66	0,59	0,53	0,48	0,44	0,40	0,37	0,34	0,32	0,29	0,27	0,25	0,24	0,20
80	I	4,92	4,10	3,51	3,07	2,73	2,46	2,23	2,05	1,89	1,65	1,42	1,23	1,08	0,97	0,87	0,78	0,70	0,63	0,58	0,53	0,48	0,45	0,41	0,38	0,36	0,33	0,31	0,29
	II	4,92	4,10	3,51	3,07	2,73	2,46	2,23	2,05	1,89	1,65	1,42	1,23	1,08	0,97	0,87	0,78	0,70	0,63	0,58	0,53	0,48	0,45	0,41	0,38	0,36	0,33	0,31	0,29
	III	4,92	4,10	3,51	3,07	2,73	2,46	2,23	2,05	1,89	1,65	1,42	1,23	1,08	0,97	0,87	0,78	0,70	0,63	0,58	0,53	0,48	0,45	0,41	0,38	0,36	0,33	0,31	0,29
100	I	5,41	4,51	3,87	3,38	3,01	2,70	2,46	2,25	2,08	1,93	1,75	1,52	1,33	1,17	1,04	0,95	0,85	0,77	0,70	0,64	0,59	0,54	0,50	0,46	0,43	0,40	0,38	0,35
	II	5,41	4,51	3,87	3,38	3,01	2,70	2,46	2,25	2,08	1,93	1,75	1,52	1,33	1,17	1,04	0,95	0,85	0,77	0,70	0,64	0,59	0,54	0,50	0,46	0,43	0,40	0,38	0,35
	III	5,41	4,51	3,87	3,38	3,01	2,70	2,46	2,25	2,08	1,93	1,75	1,52	1,33	1,17	1,04	0,95	0,85	0,77	0,70	0,64	0,59	0,54	0,50	0,46	0,43	0,40	0,38	0,35

**PIR LIGHT wall panel**

**Table 11. 1-span system - maximum characteristic loads of wall sandwich panels with a PIR LIGHT polyurethane core with a 0.40/0.40 mm thick cladding and lining/lining profile; 40 mm outer support width**  
**Force direction - FROM THE SUPPORT - SUCTION**

		PIR LIGHT wall sandwich panel																											
Core thickness	Colours group	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75	8,00
50	I	-4,52	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,32	-0,27	-0,24	-0,21	-0,18	-0,16	-0,14	-0,12	-0,10	-0,08	-0,07
	II	-4,52	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,44	-0,37	-0,31	-0,25	-0,20	-0,16	-0,12	-0,10	-0,07	-0,05	-0,04	0,00	0,00	0,00
	III	-4,52	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,58	-0,43	-0,32	-0,23	-0,16	-0,10	-0,06	-0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
60	I	-5,44	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,34	-0,31	-0,27	-0,25	-0,22	-0,20	-0,18	-0,16	-0,12
	II	-5,44	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,32	-0,28	-0,23	-0,19	-0,16	-0,13	-0,11	-0,09	-0,07
	III	-5,44	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,42	-0,33	-0,25	-0,19	-0,14	-0,10	-0,06	-0,03	-0,01	0,00	0,00	0,00	0,00
80	I	-6,73	-5,61	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,99	-0,88	-0,79	-0,70	-0,64	-0,58	-0,52	-0,48	-0,44	-0,41	-0,37	-0,35	-0,32	-0,30	-0,28	-0,26	-0,25
	II	-6,73	-5,61	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,99	-0,88	-0,79	-0,70	-0,64	-0,58	-0,52	-0,48	-0,44	-0,41	-0,37	-0,35	-0,32	-0,30	-0,28	-0,26	-0,25
	III	-6,73	-5,61	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,99	-0,88	-0,79	-0,70	-0,64	-0,58	-0,52	-0,48	-0,44	-0,41	-0,37	-0,32	-0,26	-0,21	-0,17	-0,14	-0,11
100	I	-8,43	-7,03	-6,02	-4,86	-3,84	-3,11	-2,57	-2,16	-1,84	-1,58	-1,38	-1,21	-1,07	-0,97	-0,87	-0,78	-0,71	-0,64	-0,59	-0,54	-0,50	-0,46	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30
	II	-8,43	-7,03	-6,02	-4,86	-3,84	-3,11	-2,57	-2,16	-1,84	-1,58	-1,38	-1,21	-1,07	-0,97	-0,87	-0,78	-0,71	-0,64	-0,59	-0,54	-0,50	-0,46	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30
	III	-8,43	-7,03	-6,02	-4,86	-3,84	-3,11	-2,57	-2,16	-1,84	-1,58	-1,38	-1,21	-1,07	-0,97	-0,87	-0,78	-0,71	-0,64	-0,59	-0,54	-0,50	-0,46	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30

**Table 12. 2-span system - maximum characteristic loads of wall sandwich panels with a PIR LIGHT polyurethane core with a 0.40/0.40 mm thick cladding and lining/lining profile; width of the outer prop 40 mm, width of the inner prop 60 mm**  
**Force direction - FROM THE SUPPORT - SUCTION**

		PIR LIGHT wall sandwich panel																											
Core thickness	Colours group	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75	8,00
50	I	-4,51	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,34	-0,31	-0,28	-0,26	-0,24	-0,22	-0,20	-0,19	-0,18	-0,17	-0,16
	II	-4,51	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,34	-0,31	-0,28	-0,26	-0,24	-0,22	-0,20	-0,19	-0,18	-0,17	-0,16
	III	-4,51	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,33	-0,30	-0,27	-0,24	-0,22	-0,21	-0,19	-0,17	-0,16	-0,15	-0,14
60	I	-5,44	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,34	-0,31	-0,29	-0,27	-0,25	-0,23	-0,21	-0,20	-0,19
	II	-5,44	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,34	-0,31	-0,29	-0,27	-0,25	-0,23	-0,21	-0,20	-0,19
	III	-5,44	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,82	-0,69	-0,58	-0,50	-0,43	-0,38	-0,34	-0,30	-0,27	-0,24	-0,22	-0,20	-0,18	-0,17	-0,15	-0,14	-0,13	-0,12
80	I	-6,72	-5,60	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,98	-0,88	-0,79	-0,70	-0,64	-0,58	-0,52	-0,48	-0,44	-0,41	-0,37	-0,35	-0,32	-0,30	-0,28	-0,26	-0,25
	II	-6,72	-5,60	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,98	-0,88	-0,77	-0,67	-0,59	-0,52	-0,46	-0,42	-0,38	-0,34	-0,31	-0,28	-0,26	-0,24	-0,22	-0,21	-0,19
	III	-6,72	-5,60	-4,80	-3,96	-3,13	-2,41	-1,64	-1,15	-0,91	-0,69	-0,53	-0,41	-0,33	-0,27	-0,22	-0,18	-0,15	-0,13	-0,11	-0,09	-0,08	-0,07	-0,06	-0,05	-0,05	-0,04	-0,04	-0,03
100	I	-8,42	-7,02	-6,02	-4,86	-3,84	-3,11	-2,57	-2,16	-1,82	-1,49	-1,25	-1,06	-0,93	-0,81	-0,71	-0,63	-0,56	-0,50	-0,45	-0,41	-0,37	-0,33	-0,31	-0,28	-0,26	-0,24	-0,22	-0,21
	II	-8,42	-7,02	-6,02	-4,86	-3,84	-3,11	-2,31	-1,67	-1,24	-1,49	-0,79	-0,63	-0,52	-0,43	-0,36	-0,30	-0,26	-0,22	-0,19	-0,17	-0,15	-0,13	-0,12	-0,11	-0,10	-0,09	-0,08	-0,07
	III	-8,42	-7,02	-6,02	-4,48	-2,36	-1,21	-0,70	-0,33	-0,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

**Table 13. 3-span system - maximum characteristic loads of wall sandwich panels with a PIR LIGHT polyurethane core with a 0.40/0.40 mm thick cladding and lining/lining profile; width of the outer prop 40 mm, width of the inner prop 60 mm**  
**Force direction - FROM THE SUPPORT - SUCTION**

		PIR LIGHT wall sandwich panel																											
Core thickness	Colours group	Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00	6,25	6,50	6,75	7,00	7,25	7,50	7,75	8,00
50	I	-4,51	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,33	-0,31	-0,28	-0,26	-0,24	-0,22	-0,20	-0,19	-0,18	-0,17	-0,16
	II	-4,51	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,33	-0,31	-0,28	-0,26	-0,24	-0,22	-0,20	-0,19	-0,18	-0,17	-0,16
	III	-4,51	-3,76	-3,22	-2,54	-2,01	-1,62	-1,34	-1,13	-0,97	-0,83	-0,73	-0,64	-0,56	-0,50	-0,45	-0,41	-0,37	-0,33	-0,31	-0,28	-0,26	-0,24	-0,22	-0,20	-0,19	-0,18	-0,17	-0,16
60	I	-5,43	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,34	-0,31	-0,29	-0,27	-0,25	-0,23	-0,21	-0,20	-0,19
	II	-5,43	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,34	-0,31	-0,29	-0,27	-0,25	-0,23	-0,21	-0,20	-0,19
	III	-5,43	-4,53	-3,88	-3,04	-2,40	-1,94	-1,61	-1,35	-1,15	-0,99	-0,87	-0,76	-0,68	-0,60	-0,54	-0,49	-0,44	-0,40	-0,37	-0,34	-0,31	-0,29	-0,27	-0,25	-0,23	-0,21	-0,20	-0,19
80	I	-6,72	-5,60	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,98	-0,88	-0,79	-0,70	-0,64	-0,58	-0,52	-0,48	-0,44	-0,41	-0,37	-0,35	-0,32	-0,30	-0,28	-0,26	-0,25
	II	-6,72	-5,60	-4,80	-3,96	-3,13	-2,53	-2,09	-1,76	-1,50	-1,29	-1,12	-0,98	-0,88	-0,79	-0,70	-0,64	-0,58	-0,52	-0,48	-0,44	-0,41	-0,37	-0,35	-0,32	-0,30	-0,28	-0,26	-0,25
	III	-6,72	-5,60	-4,80	-3,96	-3,13	-2,53	-2,09	-1,65	-1,33	-1,09	-0,98	-0,83	-0,72	-0,63	-0,55	-0,49	-0,44	-0,39	-0,35	-0,32	-0,29	-0,27	-0,25	-0,23	-0,21	-0,20	-0,18	-0,17
100	I	-8,42	-7,02	-6,02	-4,86	-3,84	-3,11	-2,57	-2,16	-1,84	-1,58	-1,38	-1,21	-1,07	-0,97	-0,87	-0,78	-0,71	-0,64	-0,59	-0,54	-0,50	-0,46	-0,42	-0,39	-0,36	-0,34	-0,32	-0,30
	II	-8,42	-7,02	-6,02	-4,86	-3,84	-3,11	-2,55	-2,00	-1,61	-1,33	-1,11	-1,21	-0,86	-0,75	-0,66	-0,58	-0,52	-0,47	-0,42	-0,39	-0,35	-0,32	-0,30	-0,27	-0,25	-0,23	-0,22	-0,20
	III	-8,42	-7,02	-5,69	-3,27	-1,98	-1,25	-0,95	-0,66	-0,47	-0,35	-0,26	-0,20	-0,15	-0,12	-0,09	-0,07	-0,06	-0,05	-0,04	-0,03	-0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00



**Roof sandwich panels PIR STANDARD**

**1-span system - maximum characteristic loads for PIR STANDARD PIR-R sandwich panel with a polyurethane core, in claddings of 0,50/0,40 mm and profile types: T/L; 40mm outer support width.  
Force direction - TO SUPPORT - FORCE**

Core thickness [mm]	Colours group	Roof sandwich panel PIR STANDARD PIR-R																											
		Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00					
40/85	I	10,48	6,90	4,11	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,34	0,25	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
	II	10,48	6,90	4,11	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,34	0,25	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
	III	10,48	6,90	4,11	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,34	0,25	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
60/105	I	8,85	5,87	4,38	3,26	2,50	2,03	1,69	1,45	1,25	1,10	0,98	0,87	0,78	0,70	0,63	0,55	0,45	0,36	0,28	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
	II	8,85	5,87	4,38	3,26	2,50	2,03	1,69	1,45	1,25	1,10	0,98	0,87	0,78	0,70	0,63	0,55	0,45	0,36	0,28	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
	III	8,85	5,87	4,38	3,26	2,50	2,03	1,69	1,45	1,25	1,10	0,98	0,87	0,78	0,70	0,63	0,55	0,45	0,36	0,28	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
80/125	I	9,65	6,40	4,78	3,75	2,98	2,48	2,13	1,86	1,64	1,47	1,31	1,16	1,05	0,96	0,88	0,81	0,74	0,65	0,54	0,45	0,37	0,31	0,25					
	II	9,65	6,40	4,78	3,75	2,98	2,48	2,13	1,86	1,64	1,47	1,31	1,16	1,05	0,96	0,88	0,81	0,74	0,65	0,54	0,45	0,37	0,31	0,25					
	III	9,65	6,40	4,78	3,75	2,98	2,48	2,13	1,86	1,64	1,47	1,31	1,16	1,05	0,96	0,88	0,81	0,74	0,65	0,54	0,45	0,37	0,31	0,25					
100/145	I	9,65	6,40	4,77	3,79	3,14	2,68	2,33	2,06	1,84	1,66	1,51	1,37	1,24	1,13	1,03	0,96	0,89	0,83	0,77	0,72	0,62	0,53	0,45					
	II	9,65	6,40	4,77	3,79	3,14	2,68	2,33	2,06	1,84	1,66	1,51	1,37	1,24	1,13	1,03	0,96	0,89	0,83	0,77	0,72	0,62	0,53	0,45					
	III	9,65	6,40	4,77	3,79	3,14	2,68	2,33	2,06	1,84	1,66	1,51	1,37	1,24	1,13	1,03	0,96	0,89	0,83	0,77	0,72	0,62	0,53	0,45					
120/165	I	9,64	6,39	4,76	3,79	3,13	2,67	2,32	1,96	1,68	1,47	1,30	1,16	1,05	0,96	0,88	0,81	0,75	0,70	0,65	0,61	0,57	0,54	0,51					
	II	9,64	6,39	4,76	3,79	3,13	2,67	2,32	1,96	1,68	1,47	1,30	1,16	1,05	0,96	0,88	0,81	0,75	0,70	0,65	0,61	0,57	0,54	0,51					
	III	9,64	6,39	4,76	3,79	3,13	2,67	2,32	1,96	1,68	1,47	1,30	1,16	1,05	0,96	0,88	0,81	0,75	0,70	0,65	0,61	0,57	0,54	0,51					
160/205	I	9,63	6,37	4,75	3,77	3,12	2,65	2,31	2,03	1,82	1,64	1,49	1,37	1,26	1,17	1,08	1,01	0,96	0,90	0,85	0,80	0,75	0,71	0,67					
	II	9,63	6,37	4,75	3,77	3,12	2,65	2,31	2,03	1,82	1,64	1,49	1,37	1,26	1,17	1,08	1,01	0,96	0,90	0,85	0,80	0,75	0,71	0,67					
	III	9,63	6,37	4,75	3,77	3,12	2,65	2,31	2,03	1,82	1,64	1,49	1,37	1,26	1,17	1,08	1,01	0,96	0,90	0,85	0,80	0,75	0,71	0,67					

**2-span system - maximum characteristic loads for PIR STANDARD PIR-R sandwich panel with a polyurethane core, in claddings of 0,50/0,40 mm and profile types: T/L; 40mm outer support width, 60mm inner support width.  
Force direction - TO SUPPORT - FORCE**

Core thickness [mm]	Colours group	Roof sandwich panel PIR STANDARD PIR-R																											
		Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00					
40/85	I	7,84	5,20	3,88	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,39	0,35	0,31	0,27	0,24	0,22	0,19	0,17	0,15					
	II	7,84	5,20	3,88	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,39	0,35	0,31	0,27	0,24	0,22	0,19	0,17	0,15					
	III	7,84	5,20	3,88	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,39	0,35	0,31	0,27	0,24	0,22	0,19	0,17	0,15					
60/105	I	6,61	4,38	3,26	2,59	2,14	1,82	1,58	1,34	1,10	0,94	0,80	0,69	0,61	0,53	0,47	0,42	0,37	0,33	0,30	0,27	0,00	0,22	0,20					
	II	6,61	4,38	3,26	2,59	2,14	1,82	1,58	1,34	1,10	0,94	0,80	0,69	0,61	0,53	0,47	0,42	0,37	0,33	0,30	0,27	0,00	0,22	0,20					
	III	6,61	4,38	3,26	2,59	2,14	1,82	1,58	1,34	1,10	0,94	0,80	0,69	0,61	0,53	0,47	0,42	0,37	0,33	0,30	0,27	0,00	0,22	0,20					
80/125	I	7,22	4,78	3,56	2,82	2,33	1,99	1,72	1,46	1,21	1,03	0,90	0,78	0,69	0,61	0,54	0,48	0,43	0,39	0,35	0,32	0,29	0,27	0,24					
	II	7,22	4,78	3,56	2,82	2,33	1,99	1,72	1,46	1,21	1,03	0,90	0,78	0,69	0,61	0,54	0,48	0,43	0,39	0,35	0,32	0,29	0,27	0,24					
	III	7,22	4,78	3,56	2,82	2,33	1,99	1,72	1,46	1,21	1,03	0,90	0,78	0,69	0,61	0,54	0,48	0,43	0,39	0,35	0,32	0,29	0,27	0,24					
100/145	I	7,21	4,77	3,55	2,82	2,33	1,98	1,72	1,51	1,32	1,13	0,99	0,86	0,76	0,68	0,60	0,54	0,49	0,44	0,40	0,37	0,34	0,31	0,28					
	II	7,21	4,77	3,55	2,82	2,33	1,98	1,72	1,51	1,32	1,13	0,99	0,86	0,76	0,68	0,60	0,54	0,49	0,44	0,40	0,37	0,34	0,31	0,28					
	III	7,21	4,77	3,55	2,82	2,33	1,98	1,72	1,51	1,32	1,13	0,99	0,86	0,76	0,68	0,60	0,54	0,49	0,44	0,40	0,37	0,34	0,31	0,28					
120/165	I	7,20	4,76	3,54	2,81	2,32	1,97	1,71	1,51	1,34	1,20	1,04	0,93	0,82	0,73	0,65	0,59	0,53	0,48	0,44	0,40	0,37	0,34	0,31					
	II	7,20	4,76	3,54	2,81	2,32	1,97	1,71	1,51	1,34	1,20	1,04	0,93	0,82	0,73	0,65	0,59	0,53	0,48	0,44	0,40	0,37	0,34	0,31					
	III	7,20	4,76	3,54	2,81	2,32	1,97	1,71	1,51	1,34	1,20	1,04	0,93	0,82	0,73	0,65	0,59	0,53	0,48	0,44	0,40	0,37	0,34	0,31					
160/205	I	7,19	4,75	3,53	2,79	2,31	1,96	1,69	1,49	1,33	1,19	1,08	0,99	0,92	0,82	0,74	0,67	0,61	0,55	0,50	0,46	0,42	0,39	0,36					
	II	7,19	4,75	3,53	2,79	2,31	1,96	1,69	1,49	1,33	1,19	1,08	0,99	0,92	0,82	0,74	0,67	0,61	0,55	0,50	0,46	0,42	0,39	0,36					
	III	7,19	4,75	3,53	2,79	2,31	1,96	1,69	1,49	1,33	1,19	1,08	0,99	0,92	0,82	0,74	0,67	0,61	0,55	0,50	0,46	0,42	0,39	0,36					

**3-span system - maximum characteristic loads for PIR STANDARD PIR-R sandwich panel with a polyurethane core, in claddings of 0,50/0,40 mm and profile types: T/L; 40mm outer support width, 60mm inner support width.  
Force direction - TO SUPPORT - FORCE**

Core thickness [mm]	Colours group	Roof sandwich panel PIR STANDARD PIR-R																											
		Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00					
40/85	I	7,84	5,20	3,88	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,39	0,35	0,31	0,27	0,24	0,22	0,19	0,17	0,15					
	II	7,84	5,20	3,88	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,39	0,35	0,31	0,27	0,24	0,22	0,19	0,17	0,15					
	III	7,84	5,20	3,88	2,79	2,06	1,60	1,29	1,07	0,92	0,78	0,67	0,59	0,51	0,45	0,39	0,35	0,31	0,27	0,24	0,22	0,19	0,17	0,15					
60/105	I	6,61	4,38	3,26	2,59	2,14	1,82	1,58	1,39	1,24	1,10	0,98	0,87	0,78	0,69	0,61	0,55	0,49	0,45	0,40	0,37	0,34	0,31	0,28					
	II	6,61	4,38	3,26	2,59	2,14	1,82	1,58	1,39	1,24	1,10	0,98	0,87	0,78	0,69	0,61	0,55	0,49	0,45	0,40	0,37	0,34	0,31	0,28					
	III	6,61	4,38	3,26	2,59	2,14	1,82	1,58	1,39	1,24	1,10	0,98	0,87	0,78	0,69	0,61	0,55	0,49	0,45	0,40	0,37	0,34	0,31	0,28					
80/125	I	7,22	4,78	3,56	2,82	2,33	1,99	1,72	1,52	1,36	1,22	1,10	0,97	0,86	0,77	0,69	0,62	0,56	0,51	0,46	0,43	0,39	0,36	0,33					
	II	7,22	4,78	3,56	2,82	2,33	1,99	1,72	1,52	1,36	1,22	1,10	0,97	0,86	0,77	0,69	0,62	0,56	0,51	0,46	0,43	0,39	0,36	0,33					
	III	7,22	4,78	3,56	2,82	2,33	1,99	1,72	1,52	1,36	1,22	1,10	0,97	0,86	0,77	0													



**1-span system - maximum characteristic loads for PIR STANDARD PIR-R sandwich panel with a polyurethane core, in claddings of 0,50/0,40 mm and profile types: T/L; 40mm outer support width.**

**Force direction - FROM THE SUPPORT - SUCTION**

Core thickness [mm]	Colours group	Roof sandwich panel PIR STANDARD PIR-R																											
		Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00					
40/85	I	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,00	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00		
	II	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,00	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00		
	III	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,00	-0,87	-0,63	-0,43	-0,29	-0,19	-0,11	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00		
60/105	I	-17,07	-8,56	-5,51	-4,03	-3,17	-2,61	-2,20	-1,89	-1,65	-1,45	-1,28	-1,15	-1,03	-0,95	-0,86	-0,78	-0,72	-0,66	-0,59	0,00	0,00	0,00	0,00	0,00	0,00	0,00		
	II	-17,07	-8,56	-5,51	-4,03	-3,17	-2,61	-2,20	-1,89	-1,65	-1,45	-1,28	-1,15	-1,03	-0,95	-0,86	-0,77	-0,67	-0,58	-0,51	0,00	0,00	0,00	0,00	0,00	0,00	0,00		
	III	-17,07	-8,56	-5,51	-4,03	-3,17	-2,61	-2,20	-1,89	-1,65	-1,45	-1,28	-1,15	-1,03	-0,79	-0,60	-0,46	-0,35	-0,26	-0,19	0,00	0,00	0,00	0,00	0,00	0,00	0,00		
80/125	I	-17,98	-9,44	-6,37	-4,85	-3,95	-3,34	-2,88	-2,52	-2,23	-1,98	-1,77	-1,59	-1,44	-1,31	-1,19	-1,09	-0,96	-0,93	-0,86	-0,78	-0,70	-0,62	-0,56	-0,50	-0,44	-0,38		
	II	-17,98	-9,44	-6,37	-4,85	-3,95	-3,34	-2,88	-2,52	-2,23	-1,98	-1,77	-1,59	-1,44	-1,31	-1,19	-1,09	-0,96	-0,89	-0,78	-0,70	-0,62	-0,56	-0,50	-0,44	-0,38	-0,32		
	III	-17,98	-9,44	-6,37	-4,85	-3,95	-3,34	-2,88	-2,52	-2,23	-1,98	-1,77	-1,59	-1,44	-1,31	-1,19	-1,09	-0,96	-0,83	-0,63	-0,52	-0,42	-0,34	-0,28	-0,23	-0,18	-0,13		
100/145	I	-18,90	-10,34	-7,24	-5,70	-4,76	-4,10	-3,60	-3,19	-2,84	-2,55	-2,30	-2,08	-1,88	-1,71	-1,52	-1,35	-1,21	-1,09	-1,06	-0,91	-0,83	-0,77	-0,71	-0,65	-0,59	-0,54		
	II	-18,90	-10,34	-7,24	-5,70	-4,76	-4,10	-3,60	-3,19	-2,84	-2,55	-2,30	-2,08	-1,88	-1,71	-1,52	-1,35	-1,21	-1,09	-1,06	-0,91	-0,83	-0,77	-0,71	-0,65	-0,59	-0,54		
	III	-18,89	-10,34	-7,24	-5,70	-4,76	-4,10	-3,60	-3,19	-2,84	-2,55	-2,30	-2,08	-1,88	-1,71	-1,52	-1,35	-1,21	-1,06	-0,94	-0,79	-0,67	-0,57	-0,49	-0,42	-0,35	-0,29		
120/165	I	-19,66	-11,10	-8,00	-6,44	-5,48	-4,80	-4,26	-3,81	-3,43	-3,10	-2,80	-2,55	-2,22	-1,94	-1,71	-1,51	-1,36	-1,22	-1,11	-1,01	-0,94	-0,86	-0,80	-0,74	-0,68	-0,62		
	II	-19,66	-11,10	-8,00	-6,44	-5,48	-4,80	-4,26	-3,81	-3,43	-3,10	-2,80	-2,55	-2,22	-1,94	-1,71	-1,51	-1,36	-1,22	-1,11	-1,01	-0,94	-0,86	-0,80	-0,74	-0,68	-0,62		
	III	-19,66	-11,10	-8,00	-6,44	-5,48	-4,80	-4,26	-3,81	-3,43	-3,10	-2,80	-2,55	-2,22	-1,94	-1,71	-1,51	-1,36	-1,22	-1,11	-1,01	-0,94	-0,86	-0,80	-0,74	-0,68	-0,62		
160/205	I	-21,00	-12,45	-9,34	-7,78	-6,80	-6,08	-5,49	-4,99	-4,55	-4,15	-3,55	-3,01	-2,60	-2,26	-1,99	-1,77	-1,58	-1,43	-1,30	-1,18	-1,08	-1,00	-0,93	-0,86	-0,80	-0,74		
	II	-21,00	-12,45	-9,34	-7,78	-6,80	-6,08	-5,49	-4,99	-4,55	-4,15	-3,55	-3,01	-2,60	-2,26	-1,99	-1,77	-1,58	-1,43	-1,30	-1,18	-1,08	-1,00	-0,93	-0,86	-0,80	-0,74		
	III	-21,00	-12,45	-9,34	-7,78	-6,80	-6,08	-5,49	-4,99	-4,55	-4,15	-3,55	-3,01	-2,60	-2,26	-1,99	-1,77	-1,58	-1,43	-1,30	-1,18	-1,08	-1,00	-0,93	-0,86	-0,80	-0,74		

**2-span system - maximum characteristic loads for PIR STANDARD PIR-R sandwich panel with a polyurethane core, in claddings of 0,50/0,40 mm and profile types: T/L; 40mm outer support width, 60mm inner support width.**

**Force direction - FROM THE SUPPORT - SUCTION**

Core thickness [mm]	Colours group	Roof sandwich panel PIR STANDARD PIR-R																											
		Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00					
40/85	I	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,01	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	-0,47	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24		
	II	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,01	-0,99	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	-0,47	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24	
	III	-16,24	-7,74	-4,72	-3,28	-2,47	-1,86	-1,47	-1,20	-1,01	-0,88	-0,77	-0,68	-0,61	-0,56	-0,51	-0,47	-0,44	-0,41	-0,38	-0,36	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24		
60/105	I	-17,08	-8,56	-5,51	-4,03	-3,16	-2,45	-1,98	-1,65	-1,40	-1,22	-1,08	-0,97	-0,88	-0,80	-0,73	-0,68	-0,63	-0,58	-0,55	-0,52	-0,49	-0,46	-0,44	-0,42	-0,40	-0,38		
	II	-17,08	-8,56	-5,51	-4,03	-2,99	-2,30	-1,85	-1,53	-1,30	-1,13	-1,08	-0,90	-0,81	-0,74	-0,68	-0,63	-0,58	-0,54	-0,51	-0,48	0,00	-0,43	-0,41	-0,39	-0,37	-0,35		
	III	-17,08	-8,56	-5,51	-3,84	-2,74	-2,08	-1,65	-1,36	-1,15	-1,00	-0,89	-0,79	-0,72	-0,65	-0,60	-0,56	-0,52	-0,48	-0,45	-0,43	-0,41	-0,39	-0,37	-0,35	-0,33	-0,31		
80/125	I	-17,98	-9,44	-6,37	-4,64	-3,44	-2,70	-2,20	-1,84	-1,58	-1,38	-1,22	-1,09	-0,90	-0,92	-0,84	-0,78	-0,72	-0,68	-0,64	-0,60	-0,57	-0,54	-0,51	-0,48	-0,45	-0,43		
	II	-17,98	-9,44	-6,37	-4,45	-3,27	-2,54	-2,06	-1,72	-1,47	-1,28	-1,13	-1,01	-0,93	-0,85	-0,78	-0,72	-0,67	-0,63	-0,59	-0,56	-0,53	-0,50	-0,48	-0,46	-0,44	-0,42		
	III	-17,98	-9,44	-6,24	-4,15	-3,00	-2,30	-1,84	-1,53	-1,30	-1,12	-1,00	-0,90	-0,82	-0,75	-0,69	-0,64	-0,59	-0,56	-0,52	-0,50	-0,47	-0,45	-0,43	-0,41	-0,39	-0,37		
100/145	I	-18,89	-10,34	-7,14	-4,95	-3,72	-2,94	-2,41	-2,03	-1,75	-1,53	-1,36	-1,22	-1,11	-1,01	-0,94	-0,87	-0,81	-0,76	-0,72	-0,68	-0,64	-0,61	-0,58	-0,55	-0,53	-0,51		
	II	-18,89	-10,34	-6,92	-4,76	-3,54	-2,77	-2,26	-1,89	-1,62	-1,42	-1,26	-1,13	-1,02	-0,95	-0,87	-0,81	-0,76	-0,71	-0,67	-0,63	-0,60	-0,57	-0,54	-0,52	-0,50	-0,48		
	III	-18,90	-10,34	-6,60	-4,46	-3,26	-2,52	-2,03	-1,69	-1,44	-1,25	-1,10	-1,00	-0,91	-0,83	-0,77	-0,71	-0,67	-0,63	-0,59	-0,56	-0,53	-0,50	-0,48	-0,46	-0,44	-0,42		
120/165	I	-19,65	-11,10	-7,43	-5,22	-3,95	-3,14	-2,59	-2,19	-1,89	-1,66	-1,47	-1,33	-1,20	-1,10	-1,02	-0,95	-0,89	-0,83	-0,78	-0,74	-0,70	-0,67	-0,64	-0,62	-0,60	-0,58		
	II	-19,65	-11,10	-7,23	-5,02	-3,77	-2,97	-2,43	-2,05	-1,76	-1,54	-1,37	-1,23	-1,11	-1,02	-0,95	-0,88	-0,83	-0,77	-0,73	-0,69	-0,65	-0,62	-0,59	-0,57	-0,55	-0,53		
	III	-19,66	-11,10	-6,92	-4,73	-3,49	-2,72	-2,20	-1,83	-1,57	-1,36	-1,20	-1,08	-0,99	-0,91	-0,84	-0,78	-0,73	-0,68	-0,64	-0,61	-0,58	-0,55	-0,53	-0,51	-0,49	-0,47		
160/205	I	-20,99	-12,45	-7,94	-5,67	-4,35	-3,49	-2,90	-2,46	-2,14	-1,88	-1,68	-1,51	-1,38	-1,26	-1,16	-1,08	-1,01	-0,96	-0,90	-0,85	-0,81	-0,77	-0,74	-0,71	-0,68	-0,65		
	II	-20,99	-12,40	-7,75	-5,48	-4,17	-3,33	-2,74	-2,32	-2,00	-1,76	-1,56	-1,40	-1,28	-1,17	-1,08	-1,00	-0,95	-0,89	-0,84	-0,79	-0,75	-0,72	-0,69	-0,66	-0,63	-0,60		
	III	-20,99	-12,11	-7,46	-5,20	-3,91	-3,08	-2,51	-2,10	-1,80	-1,57	-1,39	-1,24	-1,13	-1,03	-0,96	-0,90	-0,84	-0,79	-0,74	-0,70	-0,67	-0,64	-0,61	-0,58	-0,55	-0,53		

**3-span system - maximum characteristic loads for PIR STANDARD PIR-R sandwich panel with a polyurethane core, in claddings of 0,50/0,40 mm and profile types: T/L; 40mm outer support width, 60mm inner support width.**

**Force direction - FROM THE SUPPORT - SUCTION**

Core thickness [mm]	Colours group	Roof sandwich panel PIR STANDARD PIR-R																											
		Characteristic maximum load [kN/m <sup>2</sup> ] at the given span [m]																											
		0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,25	3,50	3,75	4,00	4,25	4,50	4,75	5,00	5,25	5,50	5,75	6,00					
40/85	I	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,00	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	-0,47	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24		
	II	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,00	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	-0,47	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24		
	III	-16,24	-7,74	-4,72	-3,28	-2,47	-1,95	-1,59	-1,33	-1,14	-1,00	-0,87	-0,77	-0,69	-0,62	-0,56	-0,51	-0,47	-0,43	-0,40	-0,37	-0,34	-0,32	-0,30	-0,28	-0,26	-0,24		
60/105	I	-17,07	-8,56	-5,51	-4,03	-3,17	-2,61	-2,20	-1,89	-1,65	-1,45	-1,28	-1,15	-1,03	-0,95	-0,86	-0,78	-0,72	-0,66	-0,61	-0,57	-0,53	-0,49	-0,46	-0,44	-0,42	-0,40		
	II	-17,08	-8,56	-5,51	-4,03	-3,17	-2,61	-2,20	-1,89	-1,61	-1,41	-1,24	-1,11	-1,01	-0,93	-0,85	-0,78	-0,72	-0,66	-0,61	-0,57	-0,53	-0,49	-0,46	-0,44	-0,42	-0,40		
	III	-17,07	-8,56	-5,51	-4,03	-3,17	-2,60	-2,10	-1,75	-1,49	-1,30	-1,15	-1,03	-0,94	-0,86	-0,79	-0,73	-0,68	-0,64	-0,60	-0,56	-0,53	-0,49	-0,46	-0,44	-0,42	-0,40		
80/125	I	-17,97	-9,44	-6,37	-4,85	-3,95	-3,15	-2,58	-2,17	-1,87	-1,64	-1,46	-1,31	-1,19	-1,09	-0,97	-0,94	-0,87	-0,82	-0,77	-0,72	-0,68	-0,65	-0,61	-0,58	-0,55	-0,53		
	II																												

## 16. THERMAL PERFORMANCE

PIR STANDARD, PIR PLUS & PIR LIGHT wall sandwich panels and PIR STANDARD roof sandwich panels are distinguished by good thermal performance parameters. Tests and calculations carried out in the Building Research Institute in the Department of Thermal Physics in Warsaw aimed at determining the thermal conductivity coefficient of polyurethane foam forming the panel's insulating core and the partition heat-transfer coefficient proved high the quality as well as high replicability of PIR panel parameters achieved due to the application of top class materials and continuous control of all production stages.

The design thermal conductivity coefficient (used for designing purposes and corresponding to the conditions of material application) reaches  $\lambda_0 = 0.022$  W/mK in relation to the average partition's temperature of 10°C.

Calculation of values of heat-transfer coefficients  $U_c$  was carried out taking linear thermal bridges occurring in the panels' joints as well as spot thermal bridges occurring in the place of fastening panels to the load-bearing structure with the use of fasteners into consideration.

The values of heat-transfer coefficients  $U_c$  of a partition made of PIR wall and roof panels are provided in the table below.

Tabela 16. The values of  $U_c$  partition's heat-transfer coefficient

Panel type	Core thickness [mm]	$U_c$ [W/m <sup>2</sup> K]
PIR STANDARD wall panel	40	0,59
	50	0,45
	60	0,36
	80	0,27
	100	0,22
	110	0,20
	120	0,19
	130	0,17
PIR PLUS wall panel	60	0,39
	80	0,28
	100	0,22
	120	0,19
PIR LIGHT wall panel	50	0,48
	60	0,37
	80	0,28
	100	0,22
PIR STANDARD roof panel	40/85	0,54
	60/105	0,35
	80/125	0,27
	100/145	0,21
	120/165	0,18
	160/205	0,14

## 17. FIRE SAFETY

As building components of determined fire resistance class, PIR sandwich panels with polyurethane core must meet the fire safety and suppression requirements set out in the law.

External walls and roofs of buildings are subject to fire safety classifications in the following fields:

- fire resistance
- fire spreading level

PIR sandwich panels are classified as a FR product – fire resisting – in accordance with the standards: PN-90/B-02867 and PN-EN 02872:1996.

**Table 17. Fire classification for wall sandwich panels PIR STANDARD, PIR PLUS & PIR LIGHT**

Panel type	Core thickness [mm]	Fire resistance	Reaction to fire	External fire performance
		parameter		
PIR STANDARD wall panel	40-80	-	B-s1,d0	FR
	100-130	up to EI 15		
PIR PLUS wall panel	60	-	B-s2,d0	
	80-120	up to EI 15		
PIR LIGHT wall panel	50-100	-		

The B-s2,d0 classification allows for end applications of PIR panels as both ceilings and enclosure walls in accordance with technical conditions specified for buildings and their placement and as for “non-ignitable, non-dripping and non-falling off when exposed to fire” products and “fire retardant” construction elements in accordance with the polish law.

**Table 18. Fire classification for roof sandwich panels PIR STANDARD**

Panel type	Core thickness [mm]	Fire resistance	Reaction to fire	Roof resistance to external fire
		Parametr		
PIR STANDARD roof panel	40-80	-	B-s2,d0	$B_{ROOF}(t_1), B_{ROOF}(t_2), B_{ROOF}(t_3)$
	100-160	up to REI 30, up to RE 60	B-s1,d0	

*Fire classifications remain valid for roofs with a slope of up to 20 degrees*

## 18. CORROSION RESISTANCE

Corrosion classes and examples of typical environments according to the PN-EN ISO 12944-2 standard.

C1 corrosion class

- indoors – heated buildings with a clean atmosphere e.g. offices, shops, schools and hotels.

C2 corrosion class

- outdoors – slightly polluted atmosphere, mainly countryside

- indoors – not heated buildings with a possibility of condensation e.g. warehouses, sports halls.

C3 corrosion class

- outdoors – urban and industrial atmospheres, medium pollution with sulphur oxide (IV), coastal area with low salinity

- indoors – production rooms with high humidity and certain level of air pollution e.g. food industrial facilities, laundries, breweries, dairies.

C4 corrosion class

- outdoors – industrial areas, coastal area with medium salinity

- indoors – chemical plants, swimming pools, shipyards and yacht yards.

C5 corrosion class

- outdoors - industrial areas with high humidity and aggressive atmosphere

- indoors - buildings or areas with almost permanent condensation and with high pollution

The table below shows the relevant corrosion resistance categories depending on the coating used.

**Table 19. Corrosion resistance classes.**

Coating	SP15	SP25	SP35 MAT	CESAR 55	PVC(F) FoodSafe	1.4301
<b>Metallic coating</b>	min Z225 or equal (alloy coatings)					
<b>Corrosion resistance class (external) RC</b>	–	RC3	RC4	RC5*	–	RC5* **
<b>Corrosion resistance class (internal) AC</b>	CPI2	AC2	do AC4*	do AC5*	do CPI5*	do AC5*

\* Confirmation of the corrosion resistance class RC/AC by the steel supplier after analyzing the environmental questionnaire only (via the Quality Department)

\*\* Transport, assembly, cleaning, maintenance in accordance with Balex Metal recommendations

## 19. SOUND INSULATION

PIR sandwich panels regardless of their type (wall and roof) as well as the core thickness are distinguished by the following sound reduction indexes:

$$R_W \geq 25 \text{ dB} \quad R_{A1} \geq 23 \text{ dB} \quad R_{A2} \geq 21 \text{ dB}$$

$R_W$  - specific sound reduction/insulation index,

$R_{A1}$  - specific sound insulation rating index (specified in relation to noise with "flat" spectrum),

$R_{A2}$  - specific sound insulation rating index (specified in relation to noise with "low-frequency" spectrum).

Requirements concerning noise reduction performance of partitions in construction industry are determined by the PN-B-02151-3:1999 standard. For cases not covered by the standard and especially in industrial buildings the requirements regarding enclosures and internal partitions should be settled individually.

Taking the acoustic properties of PIR sandwich panels (specified above with the mentioned indexes) into consideration it can be assumed that PIR sandwich panels from the acoustic point of view can be applied in the following kinds of buildings:

- walls and roofs of industrial and sports halls, production and warehousing facilities, for constructing commercial, service and gastronomic pavilions, construction site back-up facilities, administration and social buildings if the requirements concerning sound insulation appropriate for a specific partition do not exceed the ones specified above or meet individually settled acoustic requirements.
- for construction of buildings that do not have to meet any acoustic requirements.

## 20. FASTENERS

The PIR sandwich panels are fastened to supporting steel structures with self-drilling fasteners. This way, the need for pre-drilling a pilot is eliminated. Moreover, the self-drilling fasteners improve the reliability of fastening and limit the number of tools used. In the case of self-drilling fasteners, the drilling bit is always new, because the fasteners are intended for one-time application - this improves the durability of fastening.

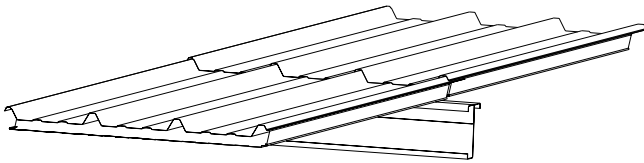
The self-drilling fasteners are intended for fastening sandwich panels to steel structures of maximum wall thickness of 12 mm. The fasteners are made of hardened carbon steel with surface corrosion protection. All fasteners are equipped with washers with cured EPDM. Application of EPDM improves the durability and tightness of joints.

Used fasteners:

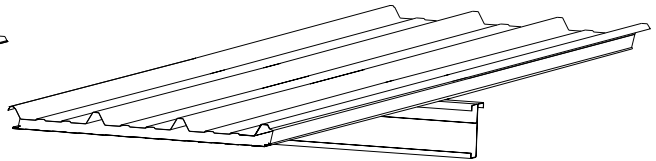
- a fastener of drilling ability up to 6 mm, intended for cold-formed steel bases
- a fastener of drilling ability up to 12 mm, intended for hot-rolled steel bases
- a fastener of drilling ability up to 16 mm, intended for hot-rolled steel bases
- A fastener for wood and concrete – intended for direct assembly in a wooden or concrete base. Before assembly, it is recommended to pre-drill the sandwich panel facing with a 5 mm drill. In the case of concrete base, it is necessary to pre-drill a hole of 5 mm diameter with a concrete drill.
- Self-drilling fastener – intended for steel bases of thickness over 12 mm. Before the assembly it is necessary to pre-drill the sandwich panel and in the steel structure with a 5.8 mm drill.

## 21. FASTENING ROOF PANELS LENGTHWISE

Recommended roof pitch for PIR STANDARD roof panels is:

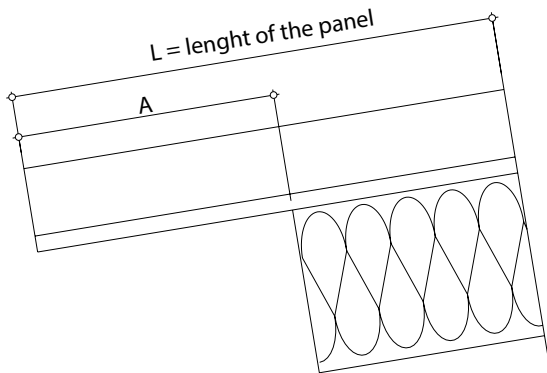


>7 % - for panels joined lengthwise  
or with roof skylights



> 5% - for continuous panels without  
roof skylights

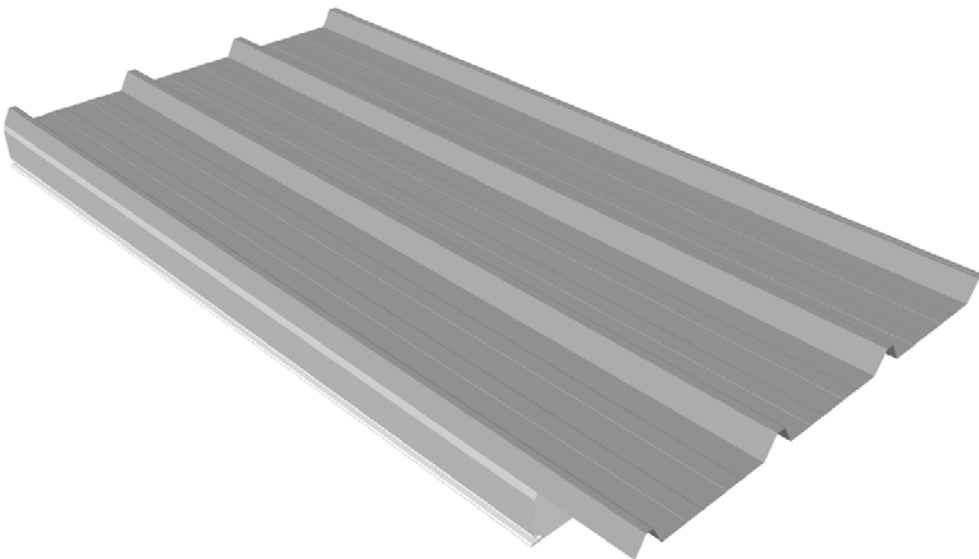
PIR STANDARD roof panels have endings formed at the production stage that facilitate gutter assembly next to the eaves or joining panels lengthwise.



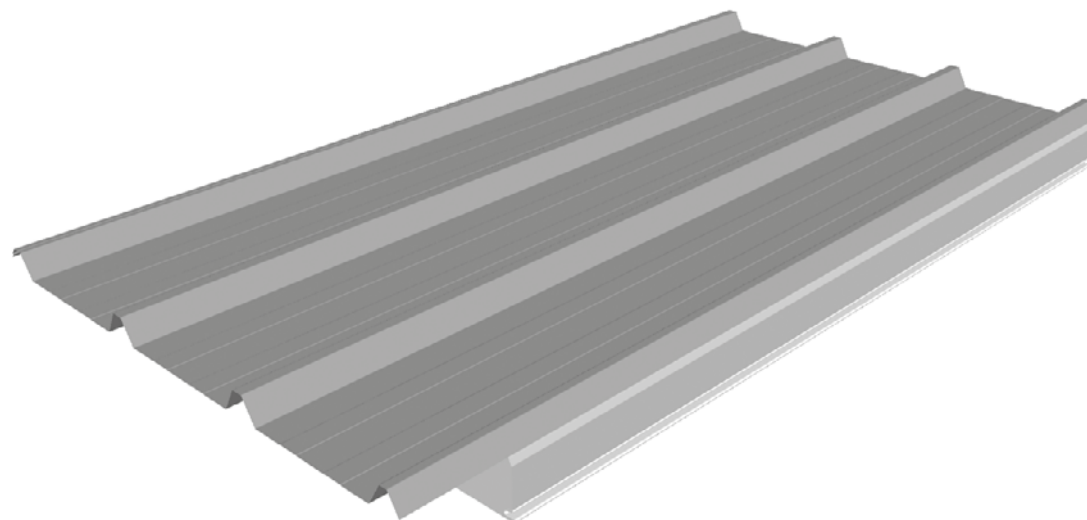
A - overlap:

- standard 50 mm next to the eaves
- standard 200 mm next to the overlap
- max. 300 mm next to the overlap
- min. 10mm without any overlap

PIR STANDARD roof panel is produced as a RIGHT option as a standard. LEFT option is produced on the customers demand.



**RIGHT panel**



**LEFT panel**

## 22. GENERAL GUIDELINES ON ASSEMBLY

Before starting assembly it is recommended that one should verify the carrying construction in terms of precision of performance and its accordance with the design.

PIR sandwich panels are protected against contamination and damaging by protective film, with which the cladding is covered during the production process. After unpacking the set of panels, the protective film must be removed to avoid its permanent binding with protective varnish of lining sheets.

In the case of symmetrical sandwich panels in order to avoid mistakes during assembly aluminium foil placed in the longitudinal panel joint in the production process is additionally marked, apart from the BALEX METAL company's logo, with an arrow with the inscription 'external side' – fig. 1

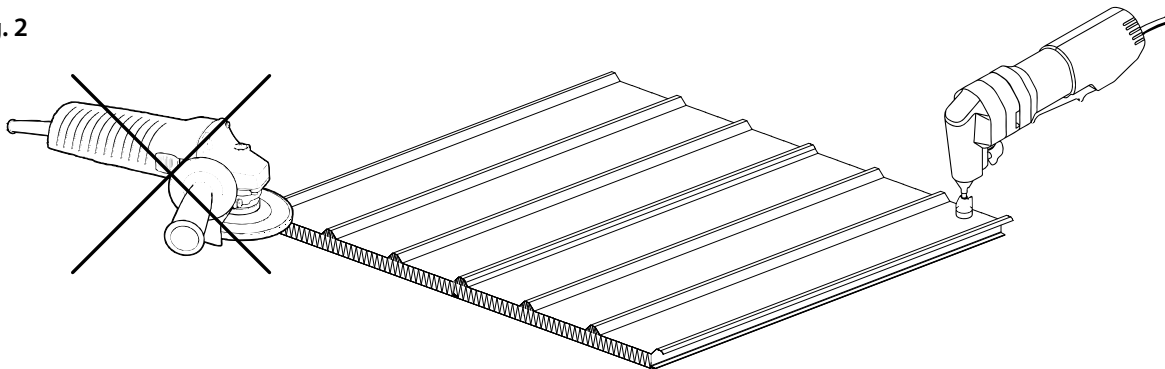
Fig. 1



In order to prevent colour coating from being damaged it is recommended to cut panels and flashings on stands covered with soft material e.g. felt, polystyrene foam.

Use circular saws with fine-toothed blades for cutting the panels, and manual scissors for sheet cutting. It is forbidden to use angle grinders and other tools heating up claddings in the process of cutting – it can lead to damaging anti-corrosion coating – fig. 2

Fig. 2





It is recommended to fasten sandwich panels with the use of appropriate fasteners depending on the type of supporting structure and the panel core thickness. The types of fastening elements and all markings are provided in the FASTENER chapter.

It is recommended to use hardened galvanized carbon steel self-drilling fasteners for fastening sandwich panels to a steel construction that is less than 12 mm thick. All fasteners are equipped with a washer with a cured EPDM which ensures many years of operation retaining the flexibility of the sealing element.

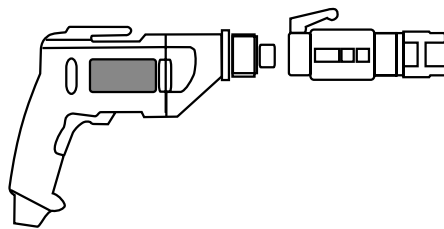
In the case of steel base (thickness >12 mm) or wooden base the application of special self-tapping fasteners with appropriately formed screw thread profile is recommended.

In the case of concrete base the application of special fasteners with universal sleeve anchor element or self-tapping fasteners with appropriately formed screw thread.

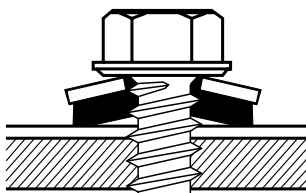
For screwing fasteners the application of electrical tools is recommended. Screwdrivers should be equipped with an appropriate head for driving long fasteners and a depth limiter fig.3 That guarantees appropriate assembly i.e. maintaining perpendicular location of a particular fastener in relation to a panel, minimised risk of damaging panels' surface and tightness of the fastening fig. 4. It is possible to use universal screwdrivers with standard short heads. However tools of this type should be equipped with a fastener depth limiter. Optimal parameters of electric tools for sandwich panel assembly are provided in the list below.

- power: 600 - 750 W
- rotation: 1500 - 2000 rpm
- torque: 600 - 700 Ncm

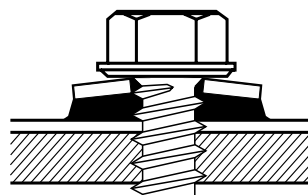
**Fig. 3**



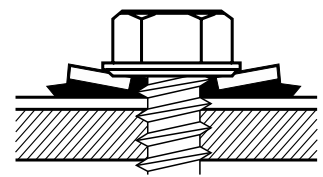
**Fig. 4**



**too weak (not tightened)**



**appropriate**



**too tight**

#### **Sample assembly of PIR STANDARD roof panel:**

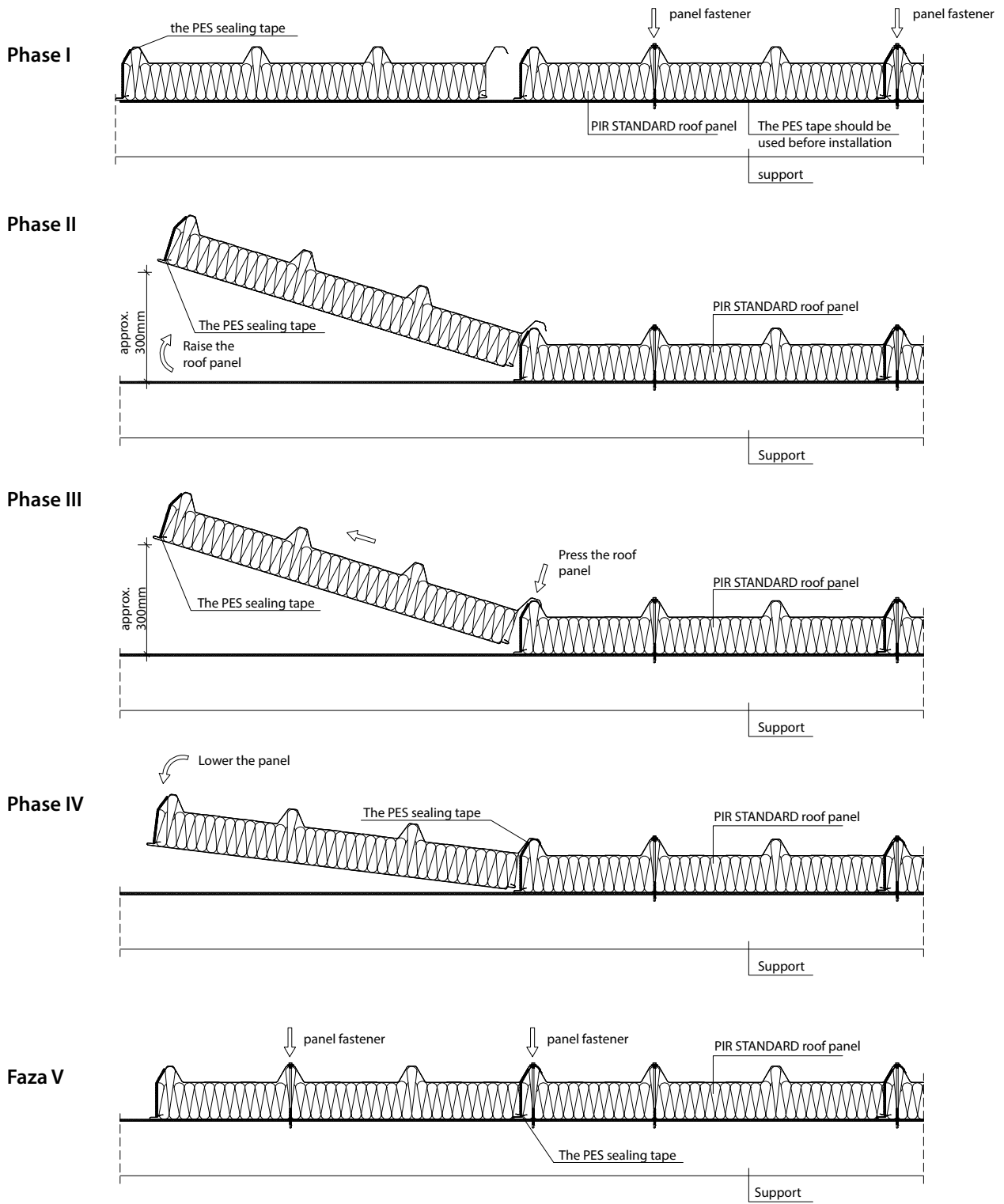
**PHASE I** - preparation of next panel for installation. It is necessary to ensure that adjacent panel is installed properly and the load carrying structure is equipped with the recommended PES tape

**PHASE II** - rising the edge of the panel approximately 30 cm (expanded polystyrene pads can be used for stabilization of angular placement of the panel)

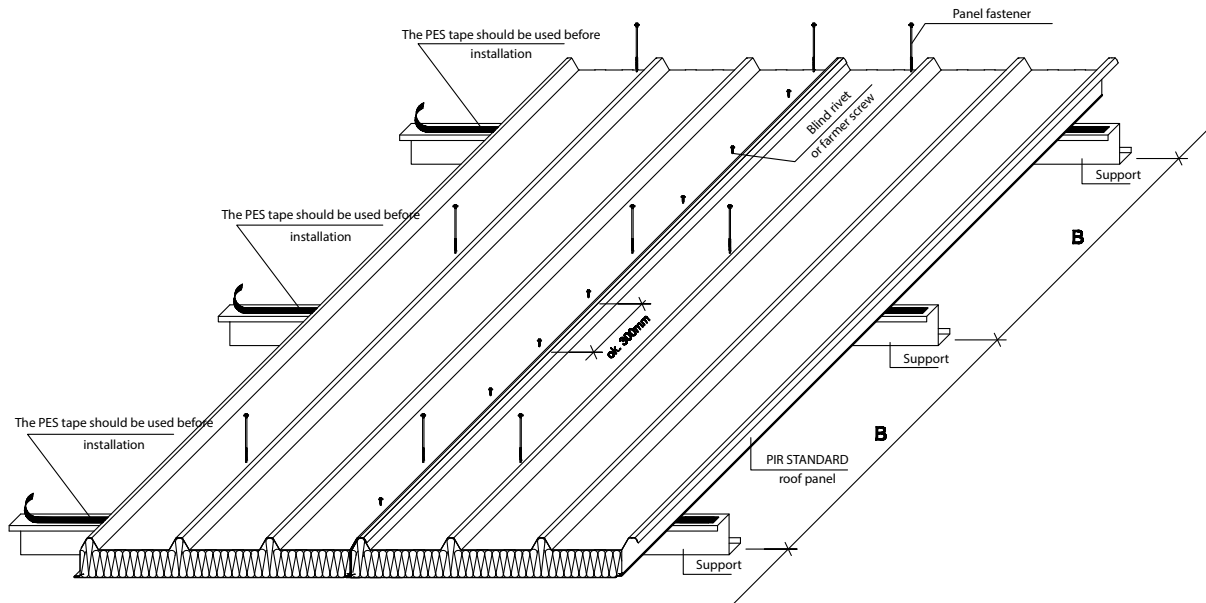
**PHASE III** - the stabilized panel must be pressed at the joint (as shown on the drawing)

**PHASE IV** - gradual lowering of the panel

**PHASE V** - installation of fasteners to the load-carrying structure and execution of the longitudinal joint (with farmer screws or tight rivets)



## Fastening PIR STANDARD roof panels to the roof construction.



### Note!

During installation of panels longer than 8 m, the assembly crew should consist of at least 2 persons

After finishing cutting and drilling you should carefully remove all steel waste and filings that can cause discolouration of the surface of a cladding. The whole enclosure should be sealed with the use of appropriate tapes and sealing foams. All damages to varnish of screening metal sheet panels caused during assembly should be secured with touch up varnish.

## 23. GUIDELINES ON TRANSPORT

### Recommended means of transport and its technical conditions:

Lorries with an open load-carrying body or an open trailer enabling loading long panels (up to 13.60 running metres) from both sides of a car constitute the basic means of transport for sandwich panels.

### The following technical conditions are recommended for vehicles for transporting sandwich panels:

- load-carrying body with canvas cover ("CURTAIN" type)
- load-carrying body longer than transported panels (a package of panels should be placed on the platform in its entire length)
- transport belts holding the load should be placed on a package of panels on each support (belt tension can deform panels)

### **Unloading, transport:**

During loading and unloading extreme caution should be kept, one should avoid point supports as it may lead to damaging the facing of the lowest panel. In order to avoid this problem you should distribute the load over a greater surface area. You should also pay attention not to drag one panel along another one not to scratch it.

### **Panel storage:**

Sandwich panels should be stored on ground beams, not less than 250 mm over the ground. It is allowed to store two packages placed one on another at the most. It is recommended to store panels in airy rooms, at normal temperature, far away from acids, lye, salts and other corrosive substances. Storing uncovered panels is unacceptable. In case of storing panels under canvas cover for a short period of time (a fortnight at the most) you should ensure free air flow. If storing period is longer than 2 weeks panels should be placed in a well ventilated room and left uncovered as well as provided with free access to air in order for all layers to be ventilated. Not observing these recommendations can lead to coating decolouration, so called "white rust", permanent core damage as well as loss of guarantee.

### **Slight repairs and maintenance:**

All damage to coating caused during transport or assembly should be covered with touch up paint. Maintenance of sandwich panels consists in performing regular inspections and securing potential damages. During inspection close attention should be paid to uncovered edges and joints.

### **Remarks concerning usage:**

Wall sandwich panels with dark claddings are characterized by high heat absorption capacity which can cause local deformation of claddings' surface in the period of high air temperatures. As a result allow for panels' thermal motion and apply panels of limited length. This effect does not have any influence on the properties of sandwich panels but the producer warns that clients purchase wall panels in those colours on their own responsibility and do not have rights to claim against the producer due to this fact. The appearance of local deformations in roof panels practically does not appear.

Pursuant to the EN 14509 standard, it is assumed that sheets in dark colours heat to the temperature of 80°C. Therefore, Balex Metal shall not be responsible for any damages caused by high temperature, which may result in changing the position of the cladding in some places. Dark colours are defined in Item E.33 of the EN14509 standard.

## **24. CERTIFICATION DOCUMENTS**

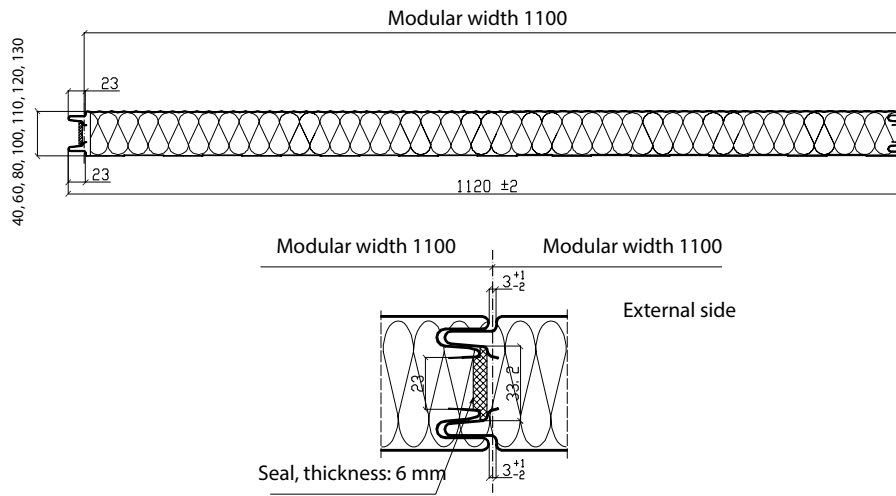
The current certification documents are available at [www.balex.eu](http://www.balex.eu).

**II. DETAILED HOUSING SOLUTIONS MADE OF  
SANDWICH PANELS WITH A POLYURETHANE CORE:  
PIR STANDARD/PIR PLUS WALL PANELS &  
PIR STANDARD ROOF PANELS**

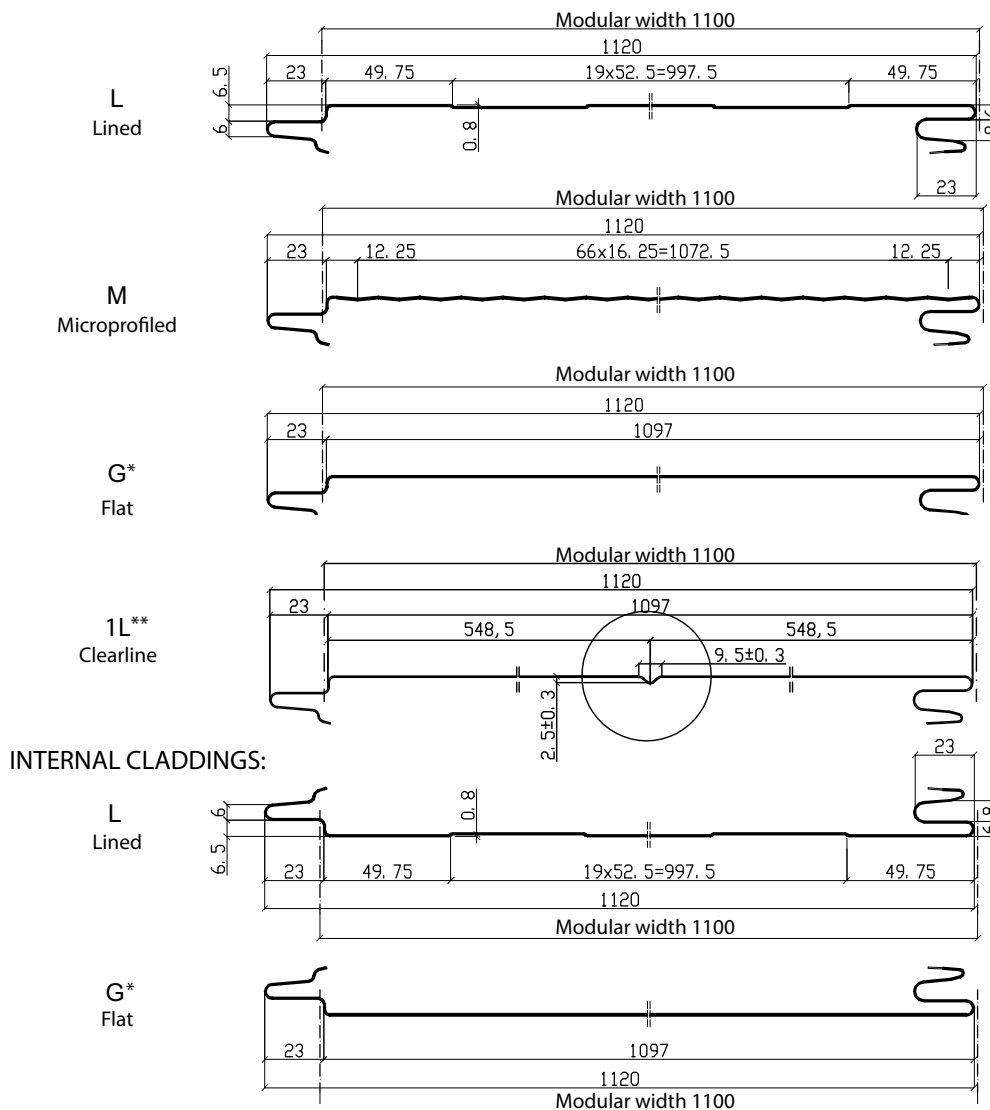
# 1. PIR STANDARD wall panel

## 1.1. ST01

### PIR STANDARD wall panel - joint, profile types



PROFILE TYPE  
EXTERNAL CLADDINGS:

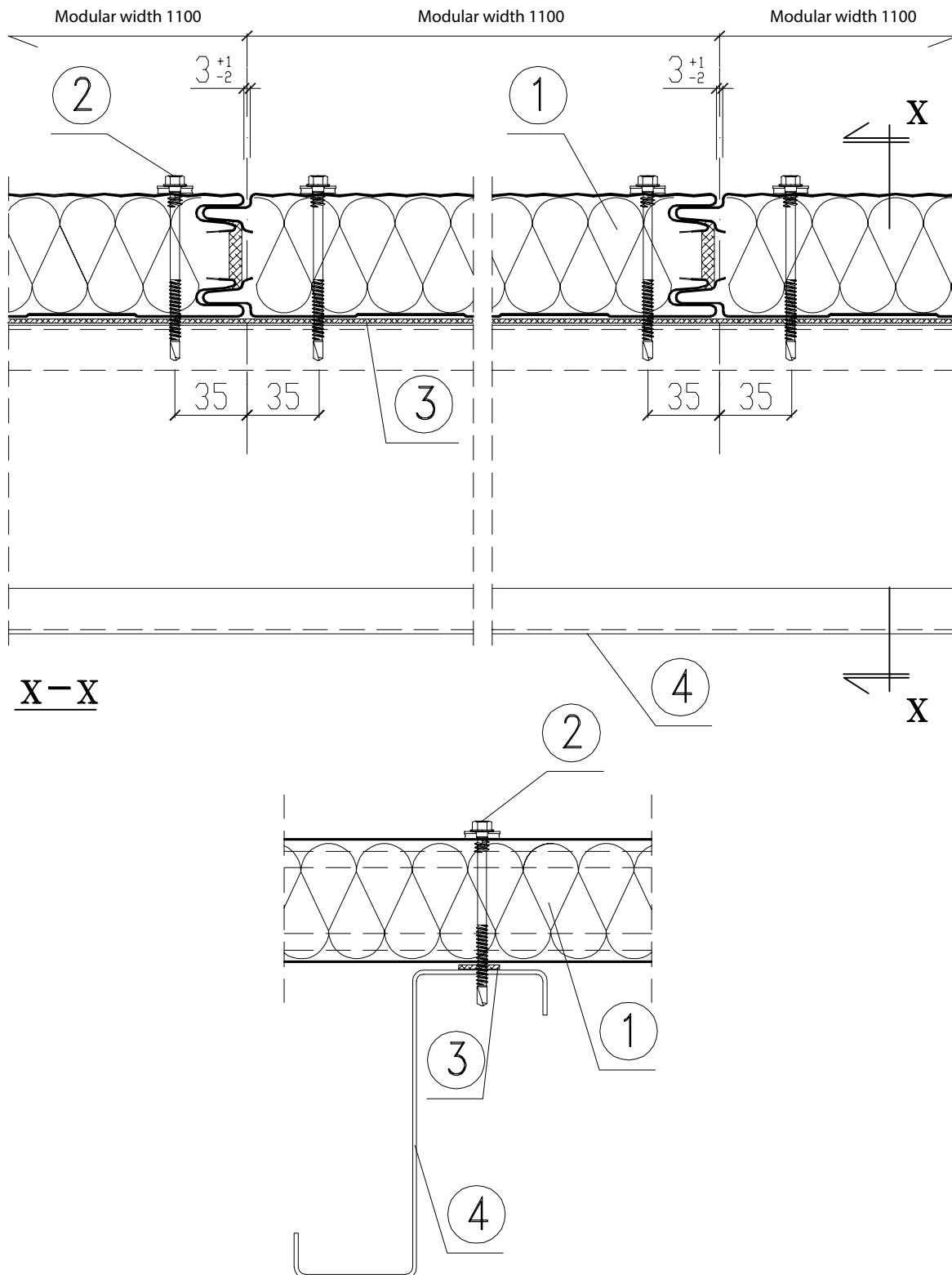


\* Profiling available only for minimum 0,50mm panel thickness,

\*\* Profiling available for 0,50mm and 0,60mm panel thickness (production only at the production plant in Bolszewo)

## 1.2. ST02

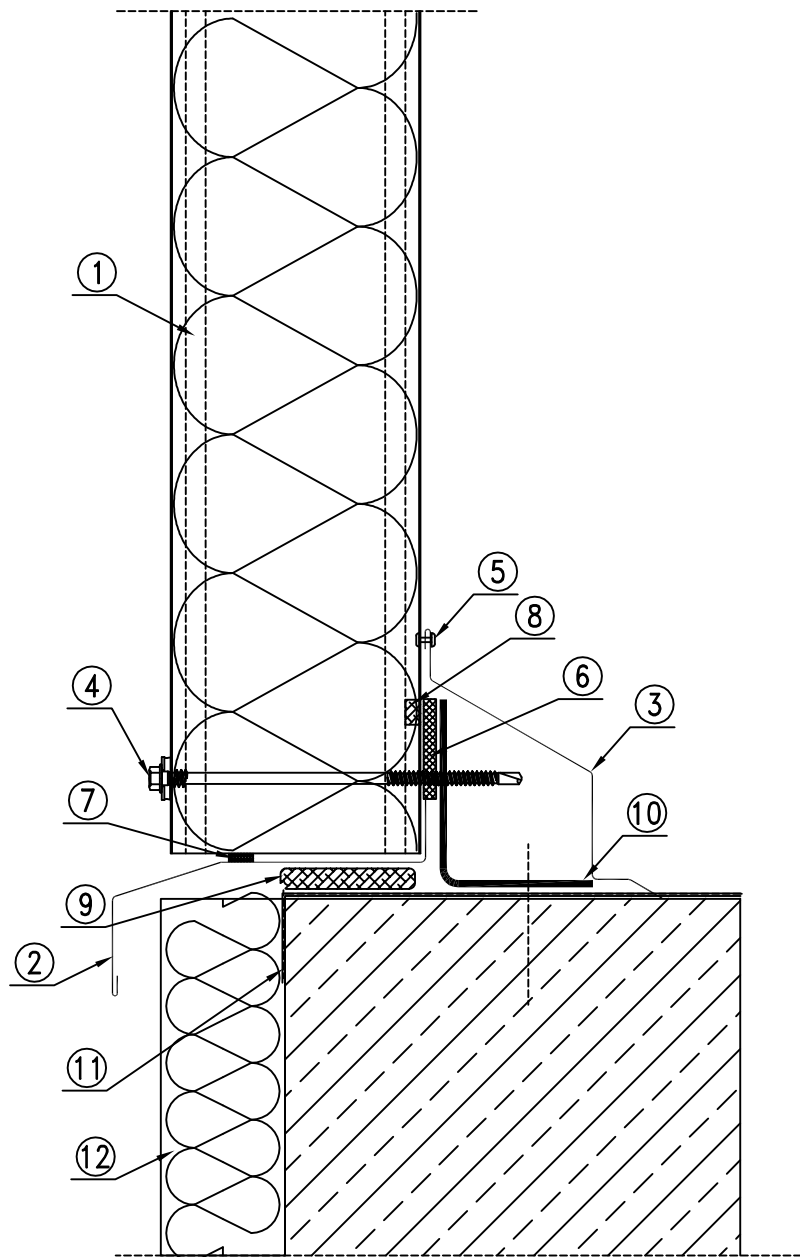
### Fastening panel - vertical arrangement of panels



1. PIR STANDARD wall panel
2. Fastener for fastening sandwich panels: LB 1 - LB 5
3. PES 3x20 self-adhesive sealing tape (recommended)
4. Steel transom: cold-bent or hot-rolled, wooden etc. acc. to the construction design

### 1.3. ST03

#### Basing panels on a ground beam or foundation – vertical arrangement of panels

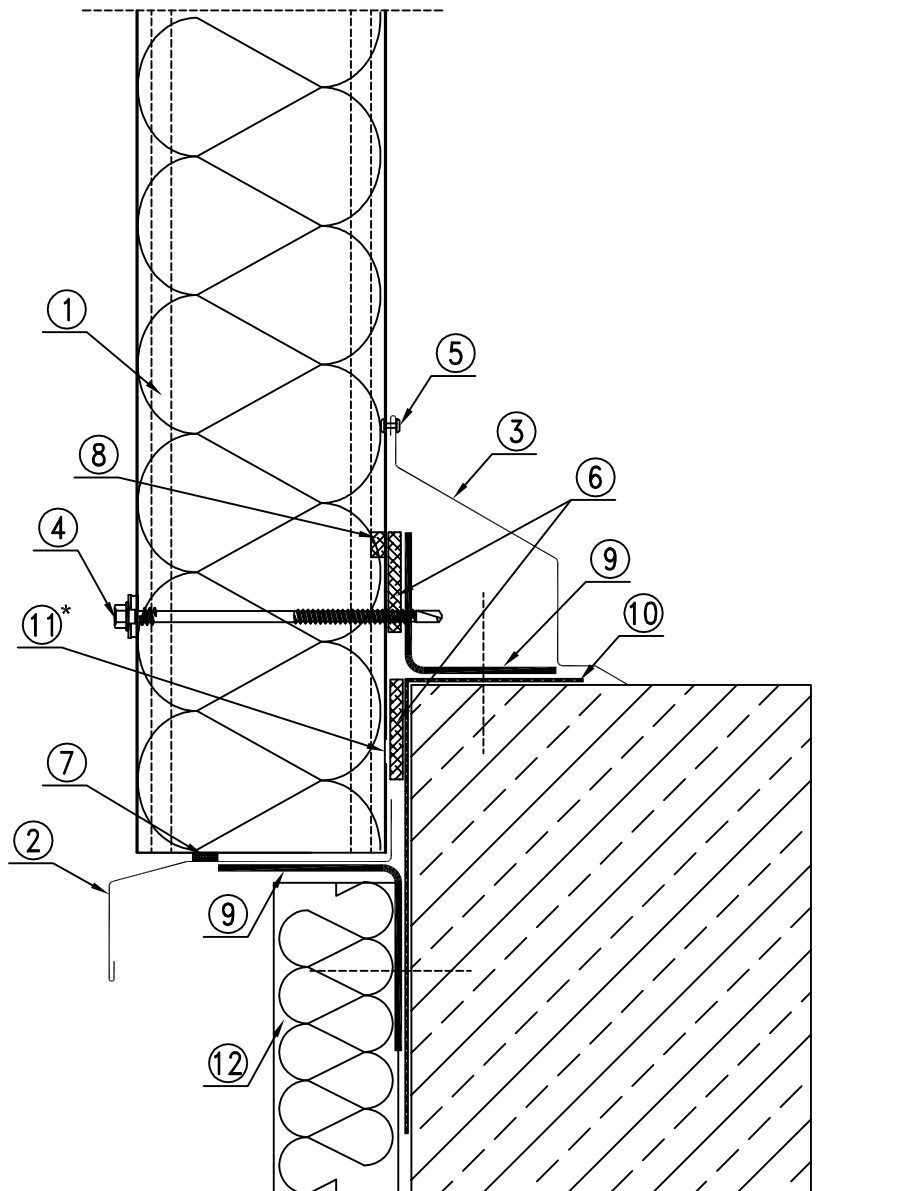


1. PIR STANDARD wall panel
2. OBR 100 flashing
3. OBR 101 flashing
4. LB 1 or LB 2 fastener for fastening PIR panels
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
6. PUS 5x40 self-adhesive sealing tape
7. Butyl sealing tape (recommended)
8. Sealing compound in the panel contact area
9. Impregnated polyurethane gasket 20 mm thick
10. Angle acc. to the construction design
11. Damp insulation acc. to the architecture design
12. Foundation thermal insulation + plastering according to the architectural design



#### 1.4. ST04

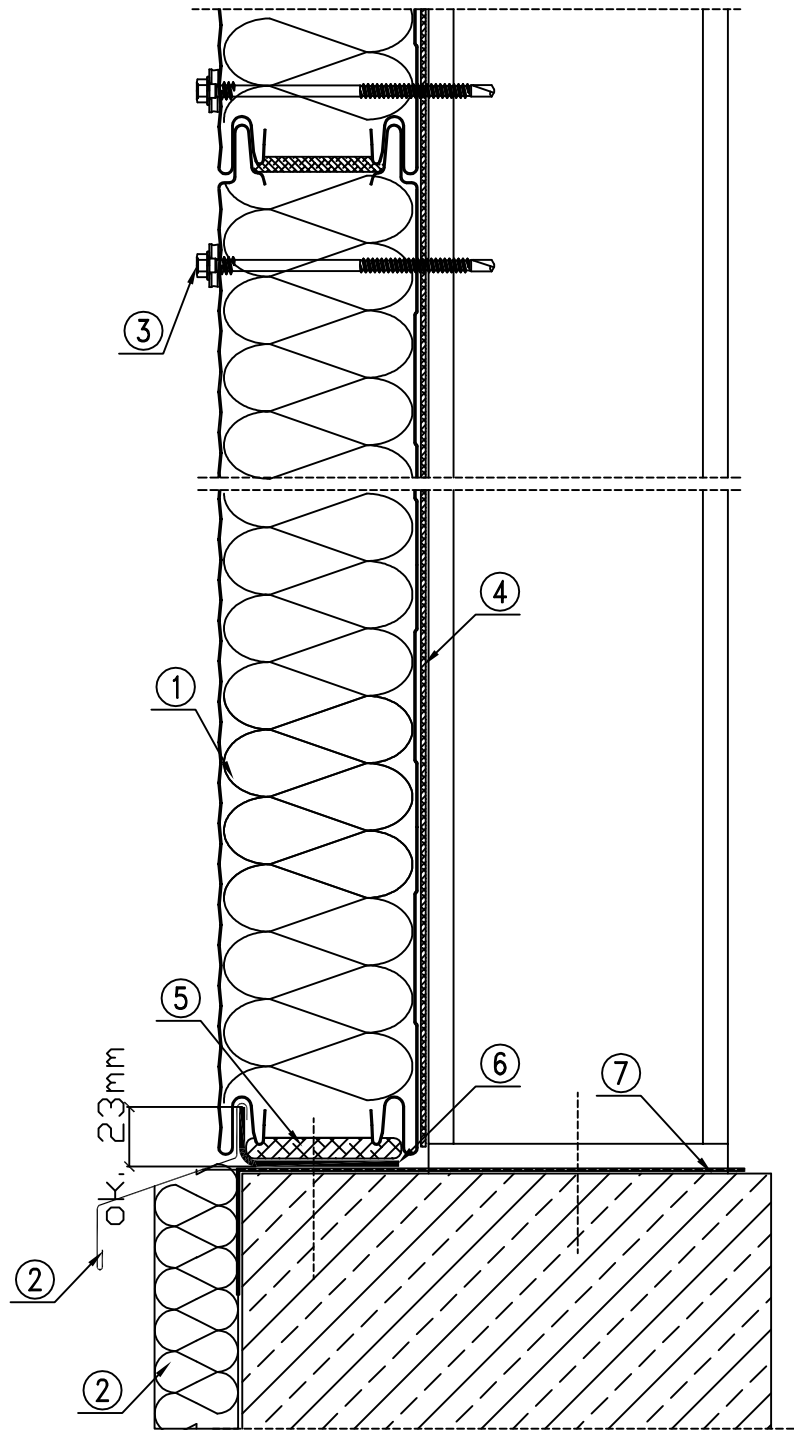
Supporting panels below the upper level of the ground beam or foundation  
 - vertical arrangement of panels



1. PIR STANDARD wall panel
  2. OBR 100 flashing
  3. OBR 101 flashing
  4. LB 1 or LB 2 fastener for fastening PIR panels
  5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
  6. PUS 5x40 self-adhesive sealing tape
  7. Butyl sealing tape (recommended)
  8. Sealing compound in the panel joint area
  9. Angle acc. to the construction design
  10. Dampproof insulation acc. to the architecture design
  11. Cladding with a 10 mm wide gap (throat distance of the support max 300 mm)
  12. Foundation thermal insulation + plastering according to the architectural design
- \* recommended to improve thermal insulation efficiency

## 1.5. ST05

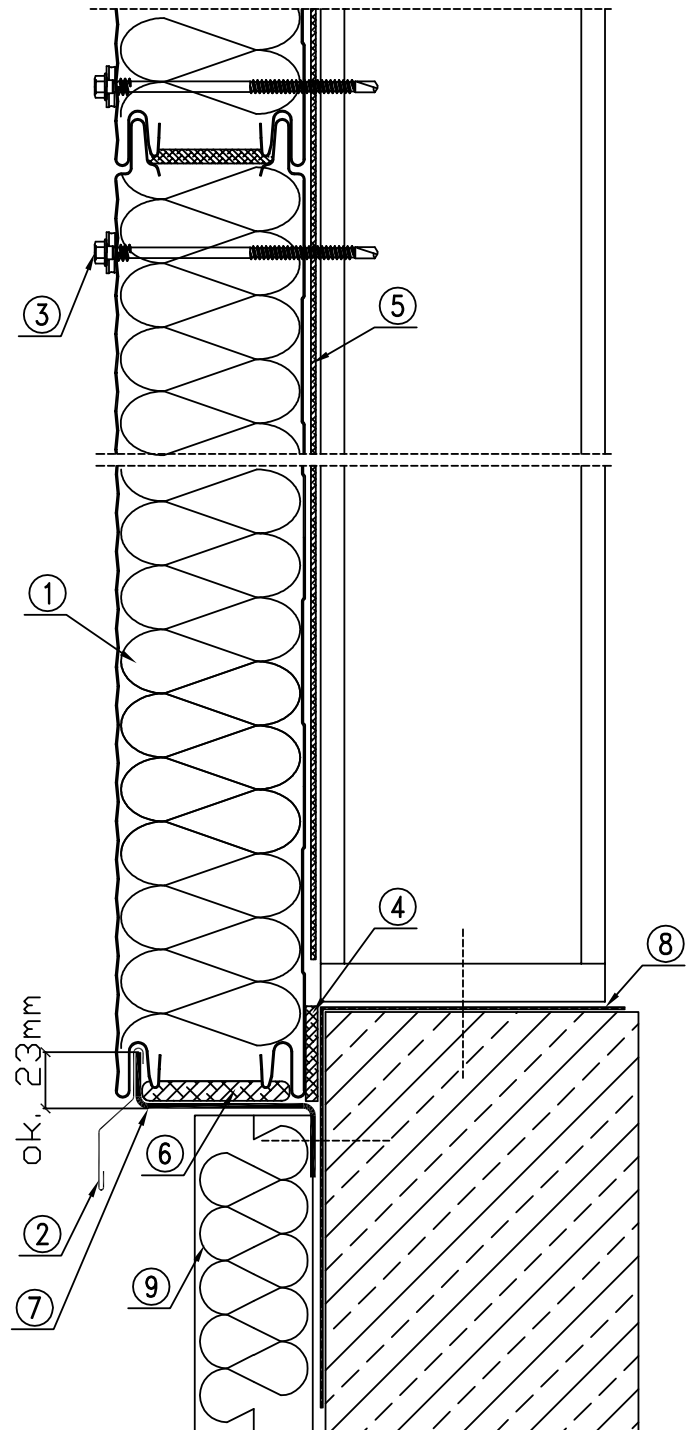
### Basing panels on a ground beam or foundation - horizontal arrangement of panels



1. PIR STANDARD wall panel
2. Individual flashing
3. LB1-LB5 fasteners for PIR panels
4. PES 3X20 adhesive sealing tape (recommended)
5. Impregnated polyurethane gasket, 20 mm thickness
6. Z-bar acc. to the construction design
7. Dampproof insulation acc. to the architecture design
8. Thermal insulation + plastering according to the architectural design

### 1.6. ST06

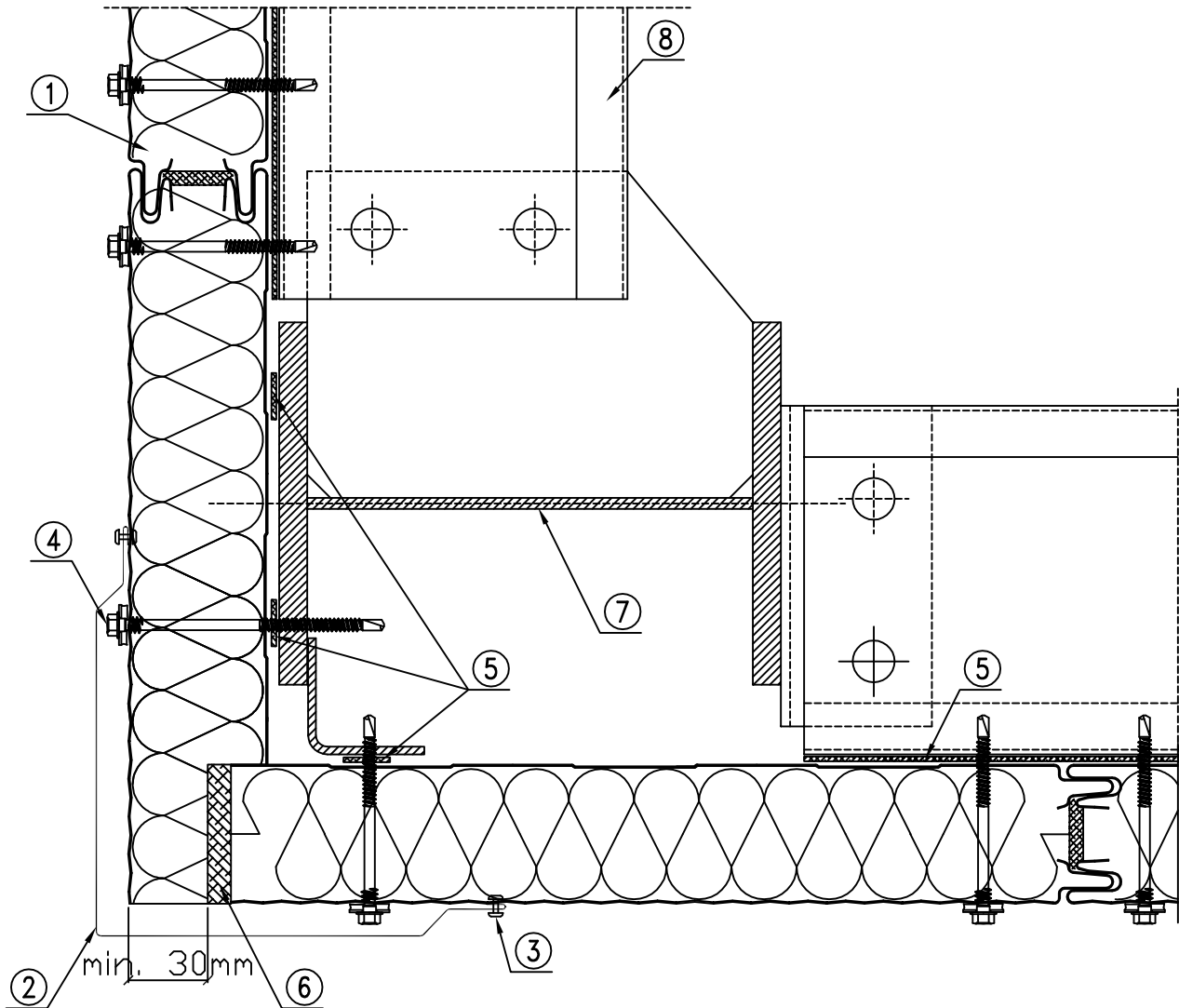
Supporting panels below the upper level of the ground beam or foundation  
 - horizontal arrangement of panels



1. PIR STANDARD wall panel
2. OBR 102 flashing or individual flashing
3. LB 1- LB 5 fasteners for PIR panels
4. PUS 5x40 self-adhesive sealing tape
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Impregnated polyurethane gasket 20 mm thick
7. Z-bar acc. to the construction design
8. Dampproof insulation acc. to the architecture design
9. Thermal insulation + plastering according to the architectural design

## 1.7. ST07

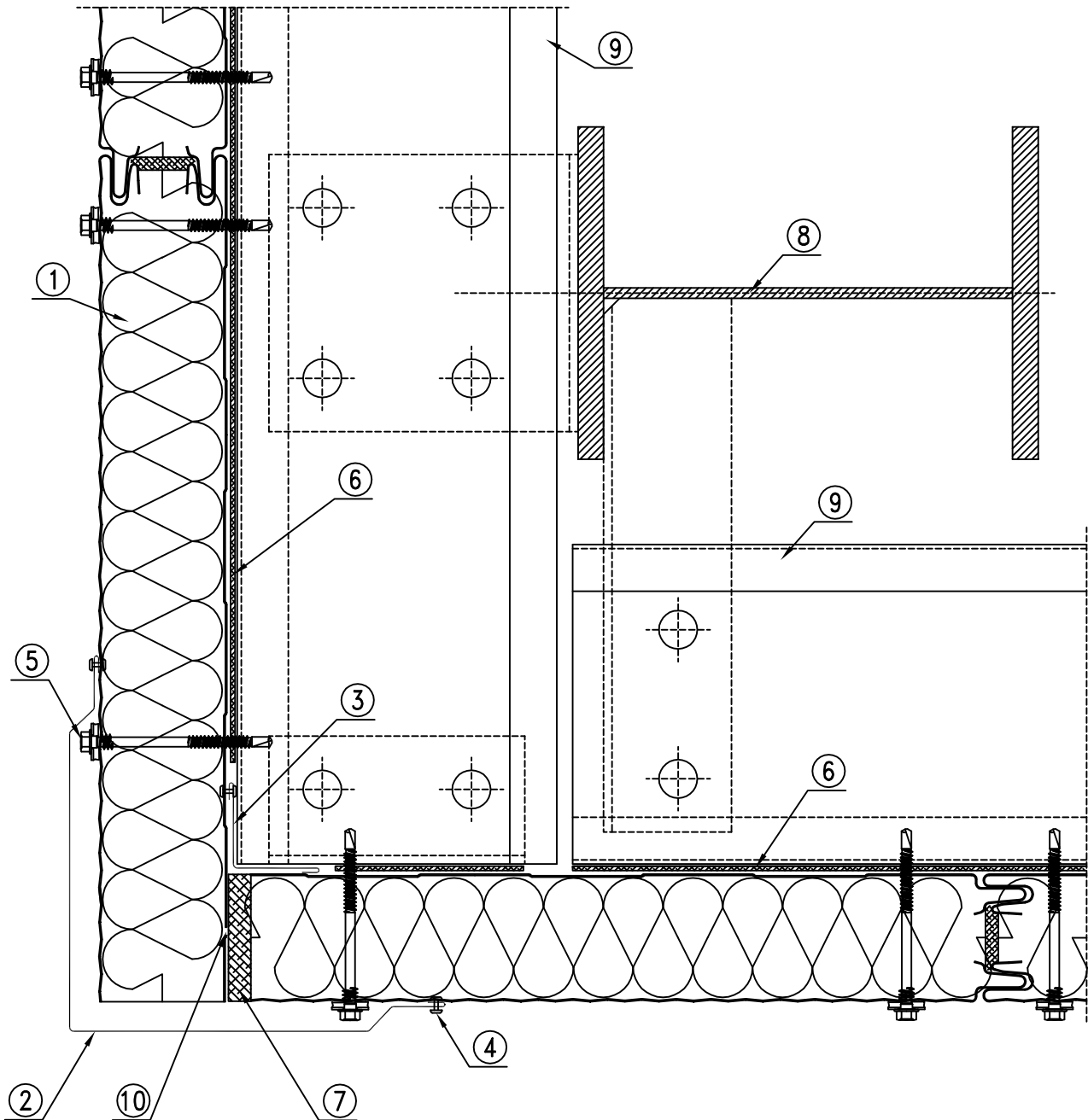
### Joining panels in the corner - vertical arrangement of panels – option I



1. PIR STANDARD wall panel
2. OBR 103 flashing
3. LB6 self-drilling fastener or AL/Fe blind rivet every 300 mm
4. LB 1- LB 5 fasteners for PIR panels
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Assembly foam or polyurethane expansion gasket
7. Steel, reinforced concrete, wooden column + angle acc. to the construction design
8. Transom acc. to the construction design

### 1.8. ST08

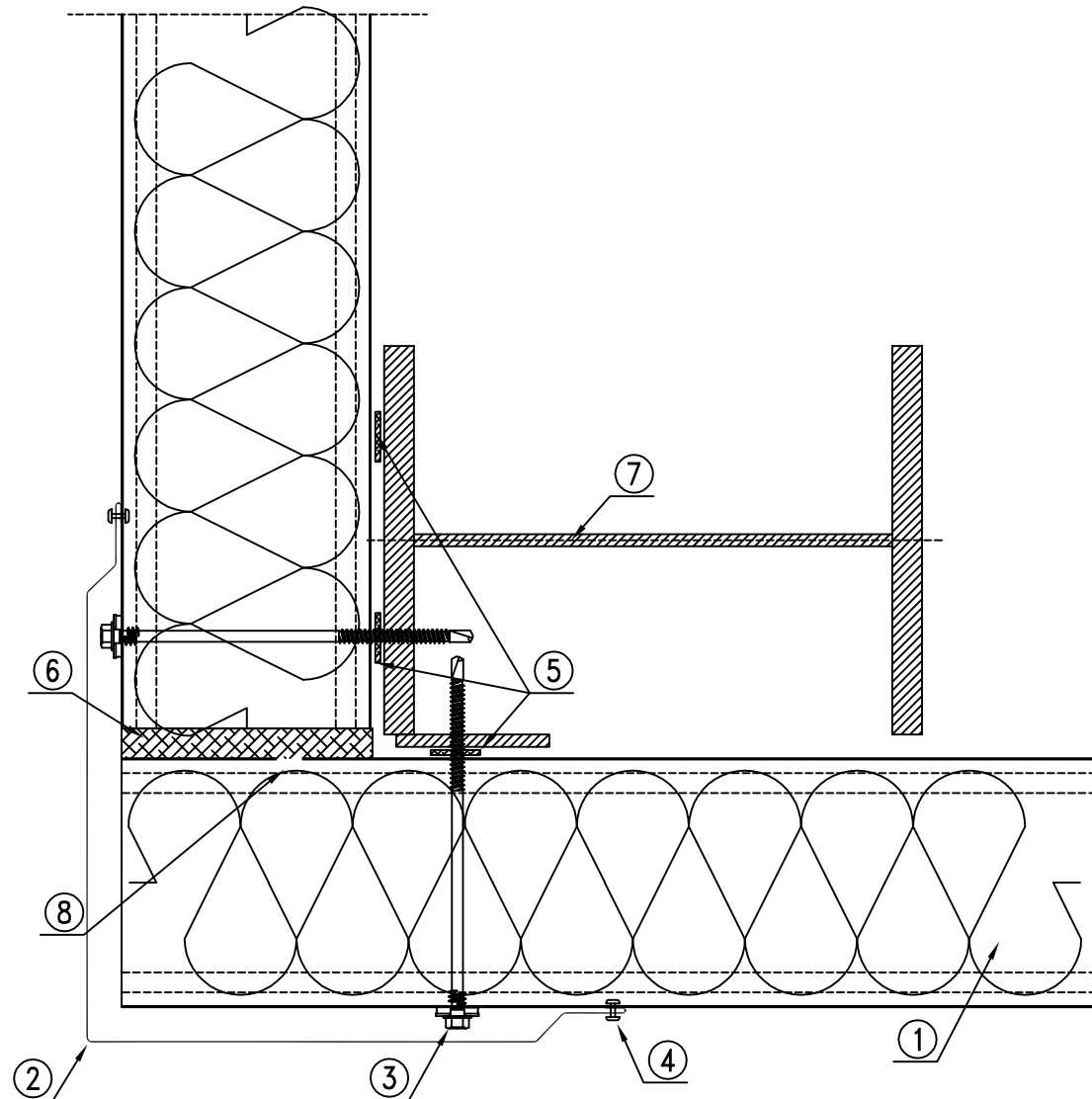
#### Joining panels in the corner - vertical arrangement of panels – option II



1. PIR STANDARD wall panel
2. OBR 103 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. LB 1- LB 5 fasteners for PIR panels
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Assembly foam or polyurethane gasket
8. Steel, reinforced concrete, wooden column acc. to the construction design
9. Transom acc. to the construction design
10. Cladding with a 10 mm wide gap at increased thermal performance requirements

## 1.9. ST09

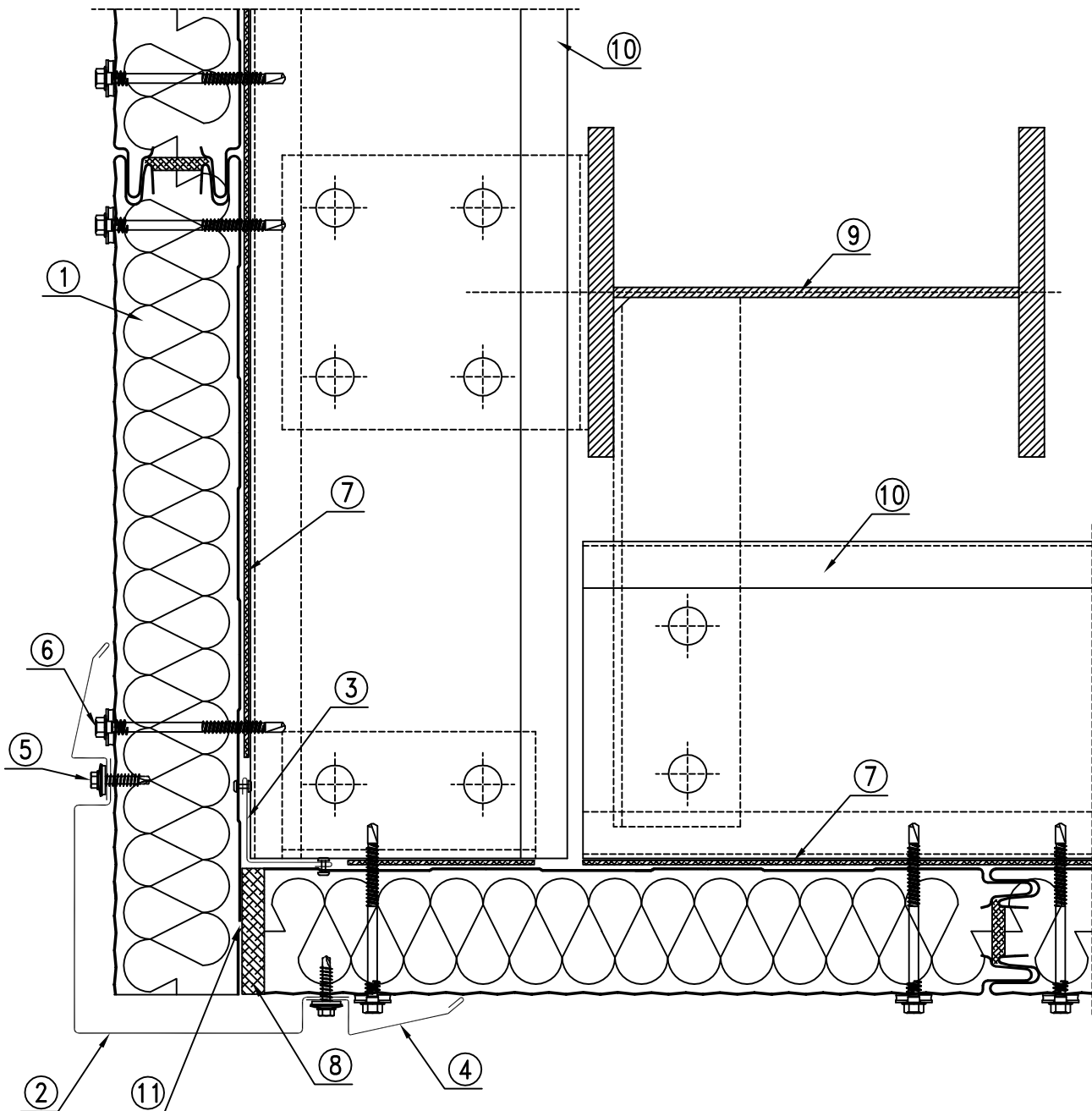
### Joining panels in the corner - horizontal arrangement of panels



1. PIR STANDARD wall panel
2. OBR 103 flashing or individual flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Assembly foam or polyurethane expansion gasket
7. Steel, reinforced concrete, wooden column + flat bar acc. to the construction design
8. Cladding with a 10 mm wide gap at increased thermal performance requirements

### 1.10. ST09/1

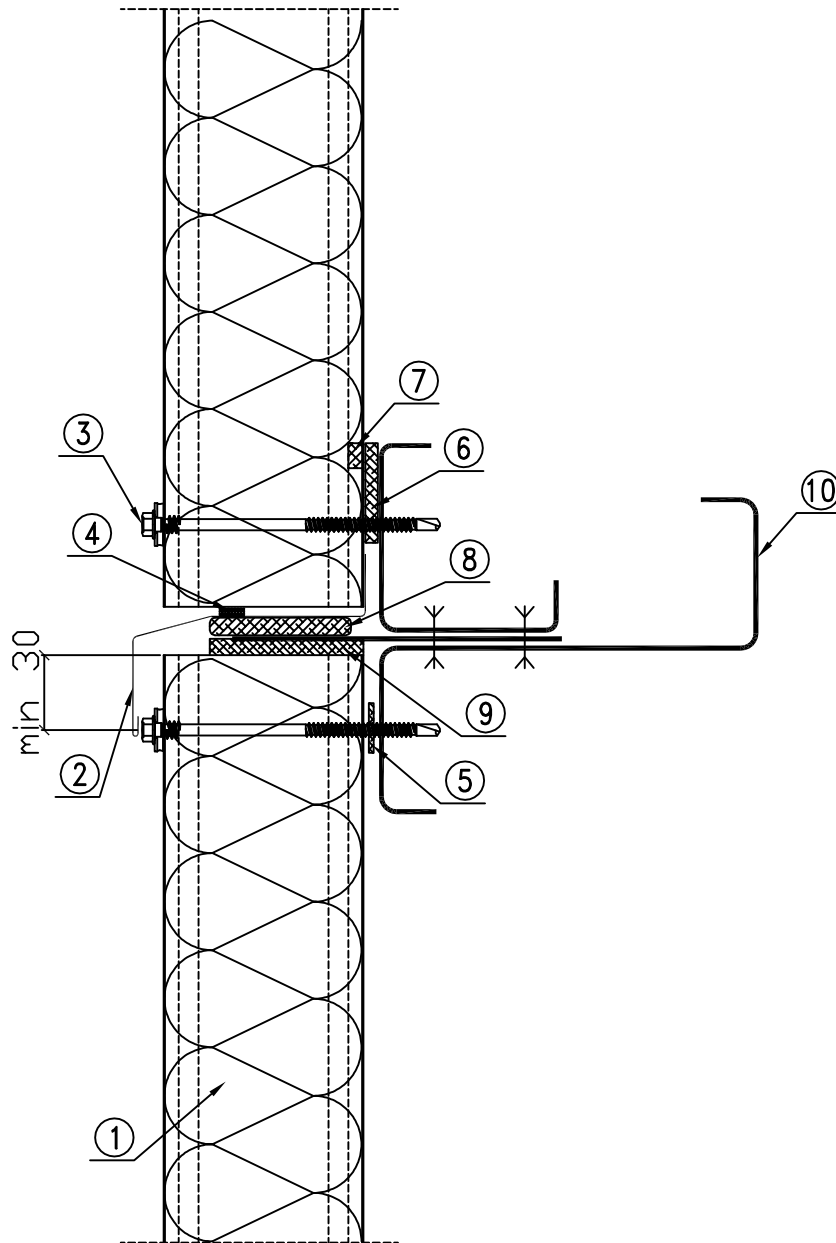
#### Joining panels in the corner – vertical or horizontal arrangement of panels



1. PIR STANDARD wall panel
2. OBR 113 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. OBR 111 flashing or individual flashing
5. LB 6 self-drilling fastener every 300 mm
6. LB 1- LB 5 fasteners for fastening PIR panels
7. PES 3x20 self-adhesive sealing tape (recommended)
8. Assembly foam or polyurethane expansion gasket
9. Steel, reinforced concrete, wooden column acc. to the construction design
10. Transom acc. to the construction design
11. Cladding with a 10 mm wide gap at increased thermal performance requirements

### 1.11. ST10

#### Joining panels lengthwise – vertical arrangement of panels

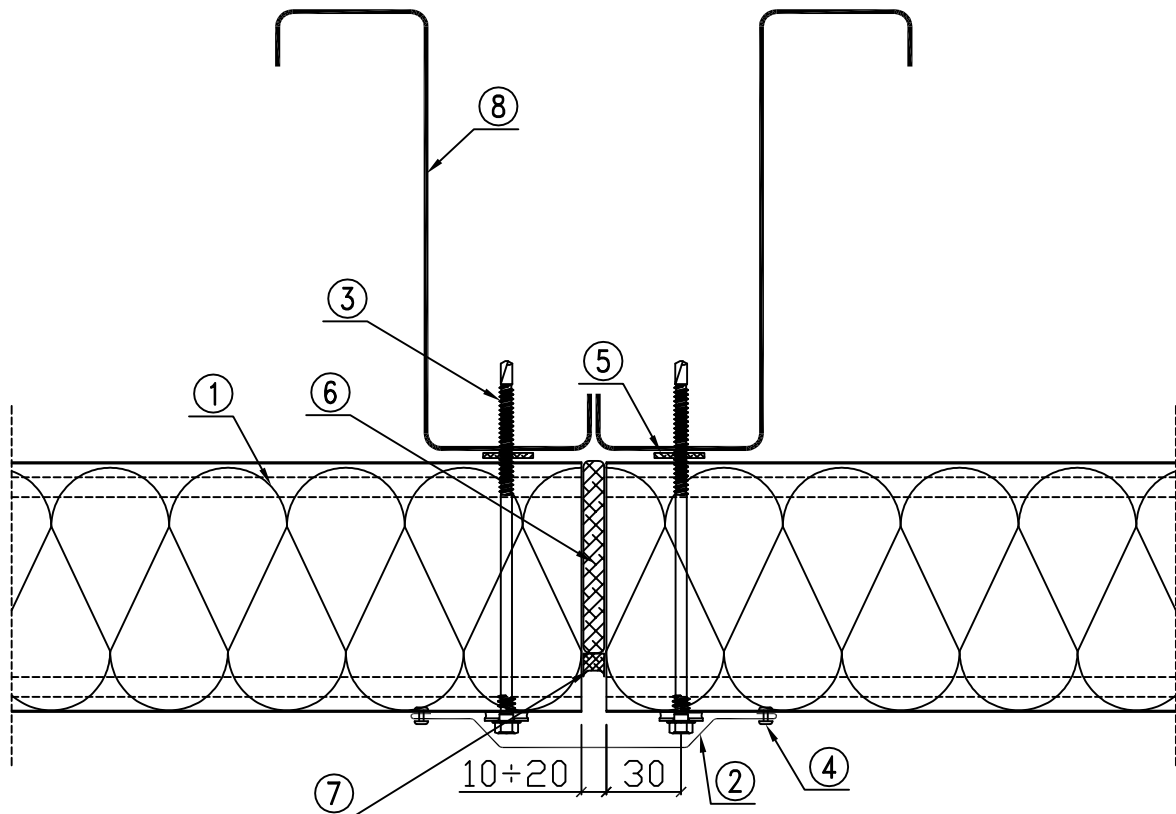


1. PIR STANDARD wall panel
2. OBR 100 flashing or individual flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. Butyl sealing tape (recommended)
5. PES 3x20 self-adhesive sealing tape (recommended)
6. PUS 5x40 self-adhesive sealing tape
7. Sealing compound in the panel joint area
8. Impregnated polyurethane gasket 20 mm thick
9. Assembly foam
10. Transom + Z-bar and flat bar acc. to the construction design



## 1.12. ST11/1

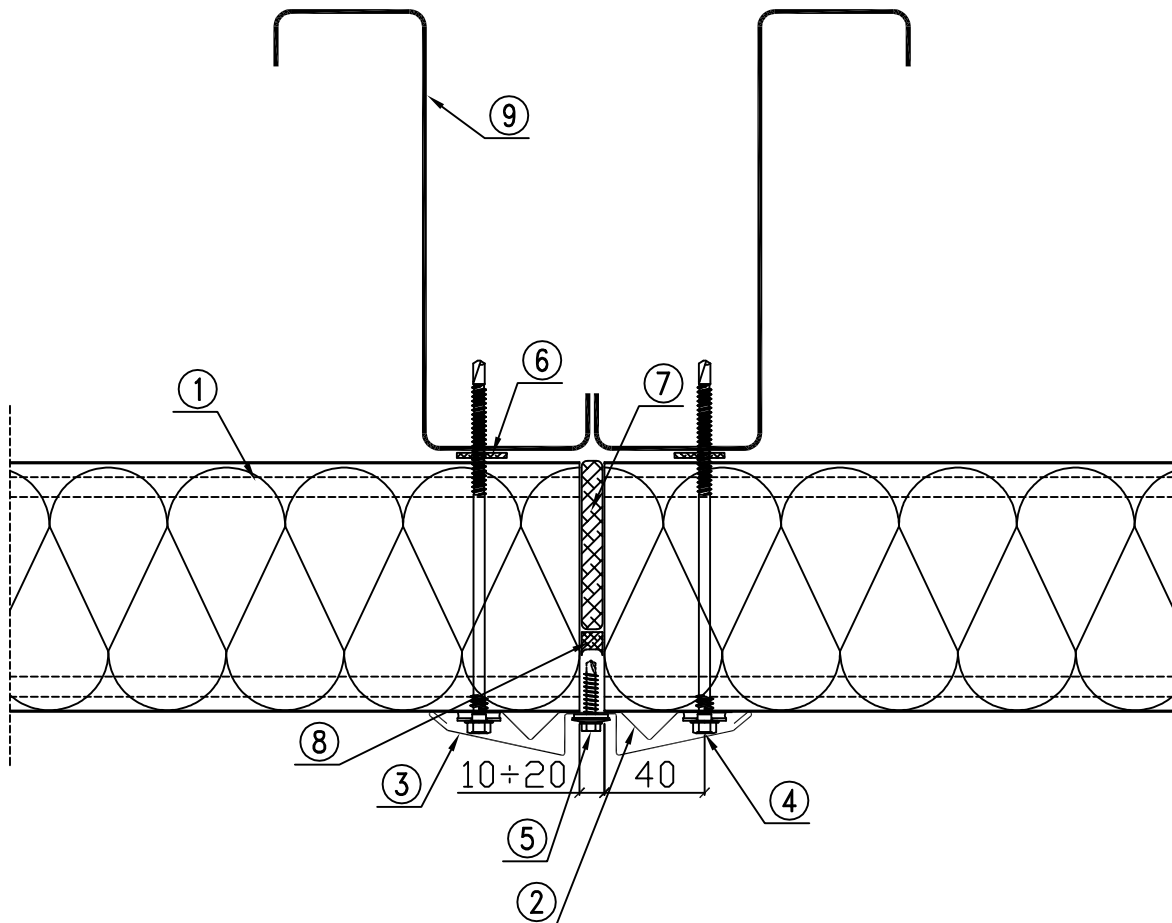
### Fastening panel to the end support - vertical arrangement of panels – option I



1. PIR STANDARD wall panel
2. OBR 105 flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Impregnated polyurethane gasket or assembly foam
7. Impregnated polyurethane expansive tape 10x4 (recommended)
8. Bearing post according to the construction design

### 1.13. ST11/2

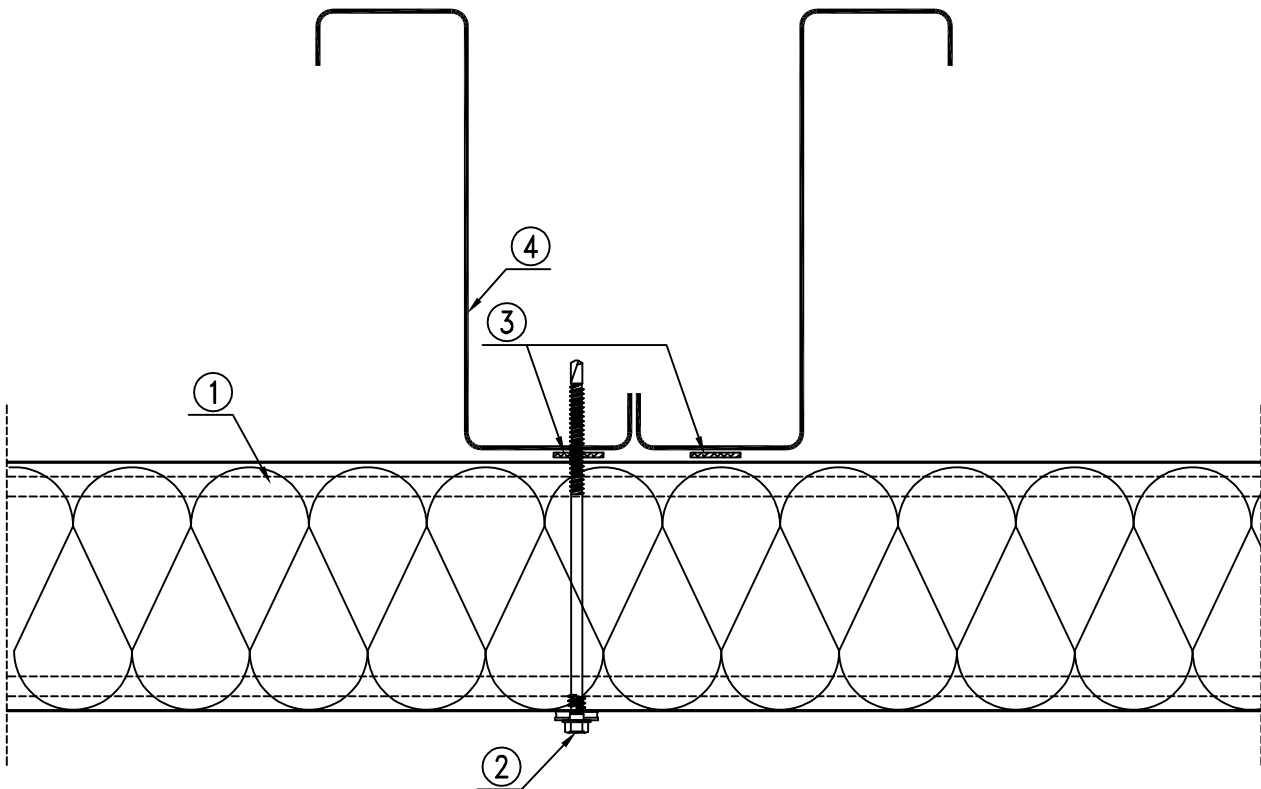
#### Fastening panel to the end support – horizontal arrangement of panels – option II



1. PIR STANDARD wall panel
2. OBR 110 flashing (holes for fasteners item 4 should be made during assembly)
3. OBR 111 flashing
4. LB 1- LB 5 fasteners for fastening PIR panels
5. LB 6 self-drilling fastener every 300 mm
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Impregnated polyurethane expansion gasket or assembly foam
8. Illmod expansion gasket (recommended)
9. Bearing post according to the structural design

### 1.14. ST12

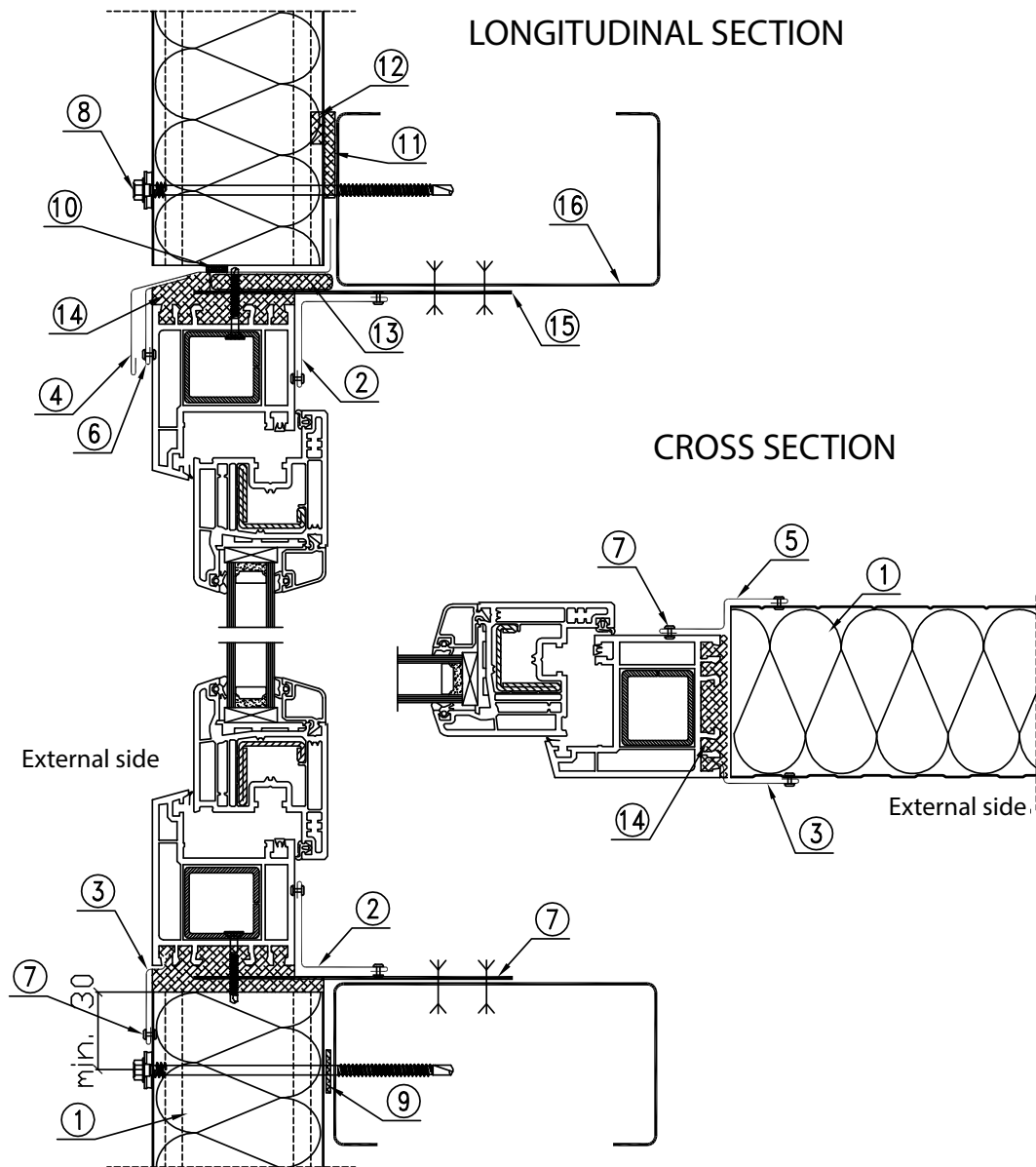
#### Fastening panel to the in-between support – horizontal arrangement of panels



1. PIR STANDARD wall panel
2. LB 1- LB 5 fasteners for fastening PIR panels
3. PES 3x20 self-adhesive sealing tape (recommended)
4. Bearing post according to the structural design

## 1.15. ST13

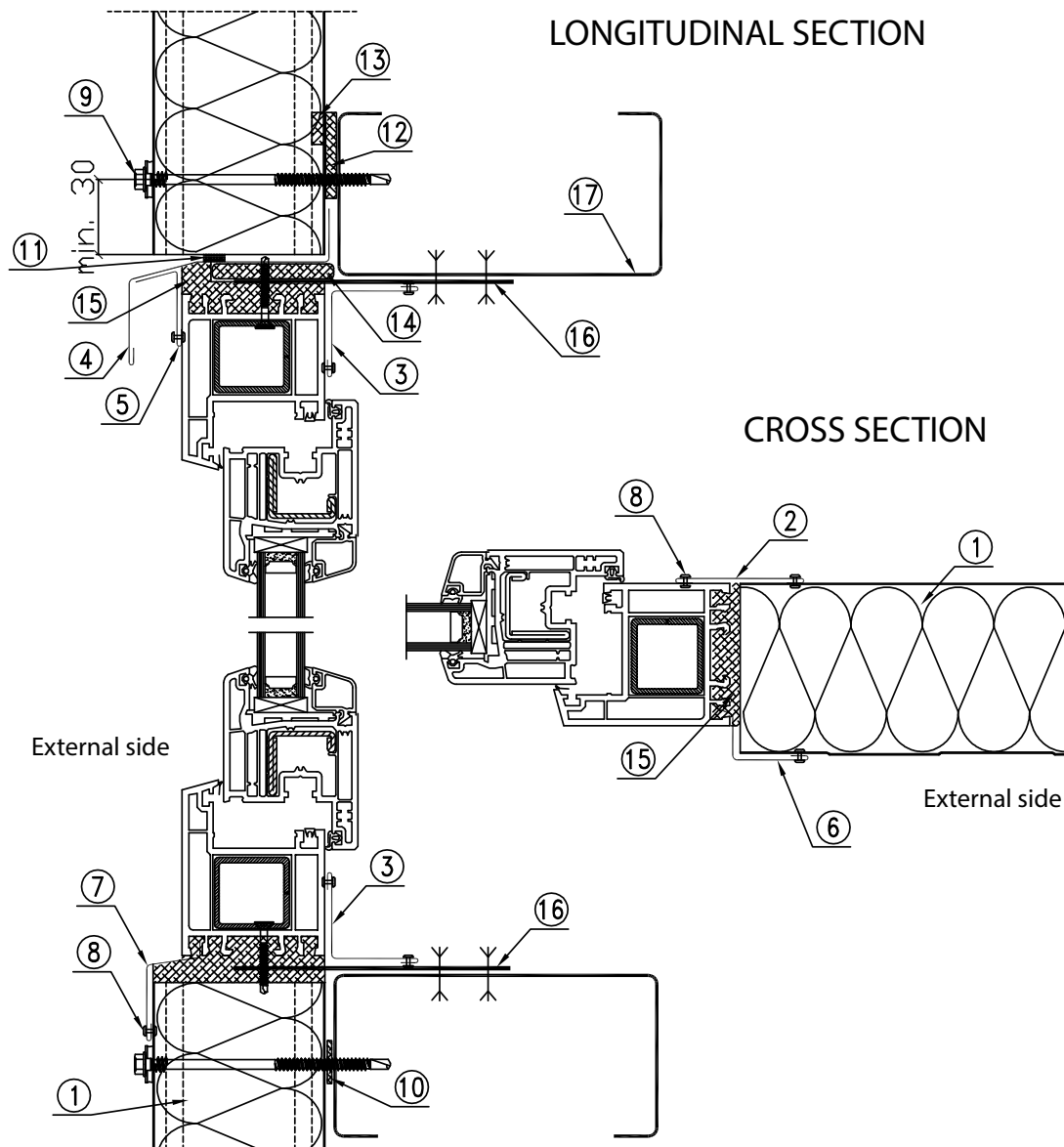
### Joining panels with window strip – vertical arrangement of panels – option I



1. PIR STANDARD wall panel
2. OBR 104 flashing or individual flashing
3. OBR 106 flashing or individual flashing
4. OBR 100 flashing or individual flashing
5. Individual flashing
6. Individual flashing
7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
8. LB 1- LB 5 fasteners for fastening PIR panels
9. PES 3x20 self-adhesive sealing tape (recommended)
10. Butyl sealing tape (recommended)
11. PUS 5x40 self-adhesive sealing tape
12. Sealing compound in the panel joint area
13. Impregnated polyurethane gasket 10 mm thick
14. Assembly foam
15. Flat bar for fastening a window
16. Bearing lock acc. to the construction design

### 1.16. ST14

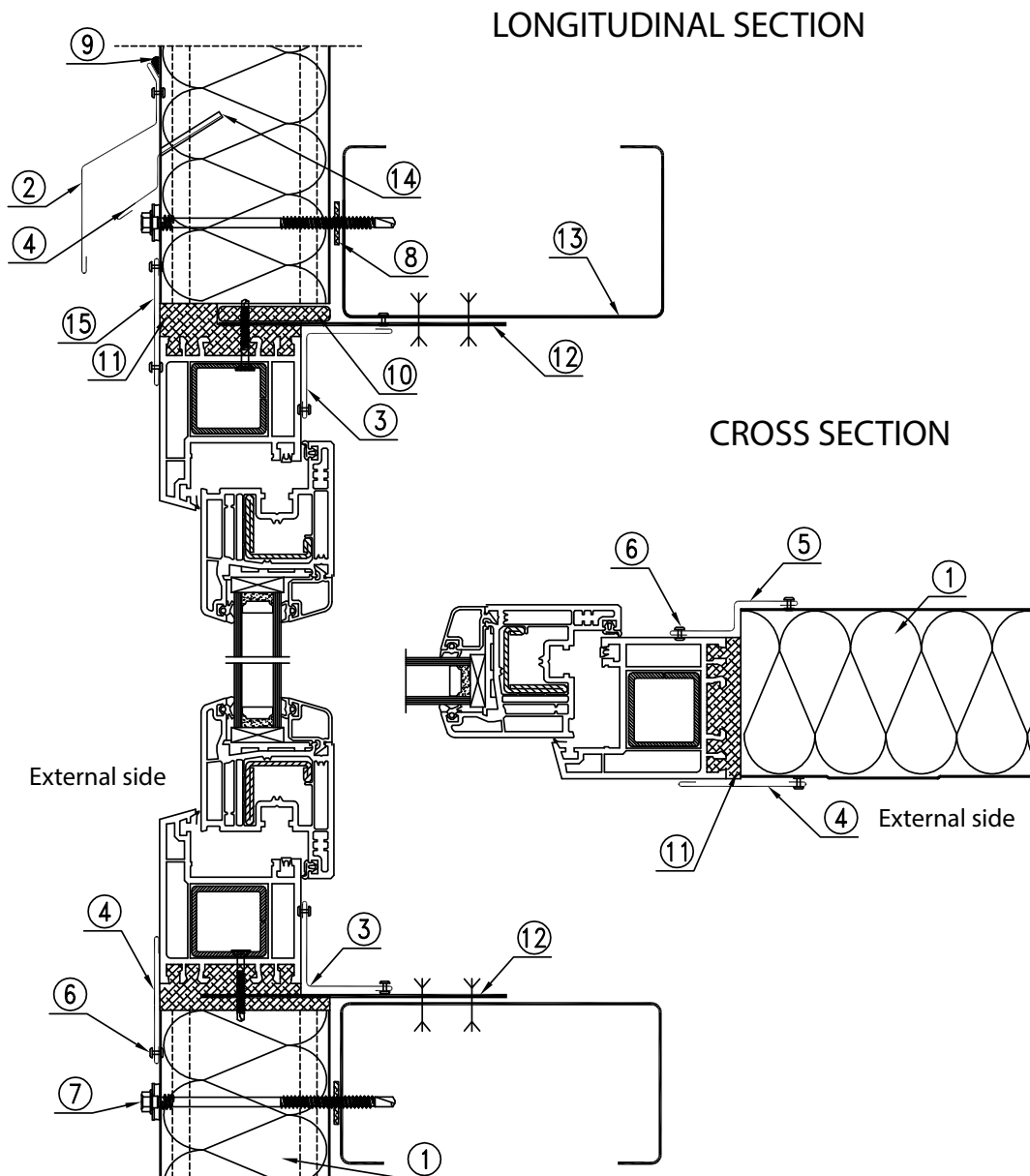
#### Joining panels with window strip – vertical arrangement of panels – option II



1. PIR STANDARD wall panel
2. OBR 106 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. OBR 100 flashing or individual flashing
5. Individual flashing
6. Individual flashing
7. Individual flashing
8. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
9. LB 1- LB 5 fasteners for fastening PIR panels
10. PES 3x20 self-adhesive sealing tape (recommended)
11. Butyl sealing tape (recommended)
12. PUS 5x40 self-adhesive sealing tape
13. Sealing compound in the panel joint area
14. Impregnated polyurethane gasket 10 mm thick
15. Assembly foam
16. Flat bar for fastening a window
17. Bearing lock acc. to the construction design

## 1.17. ST15

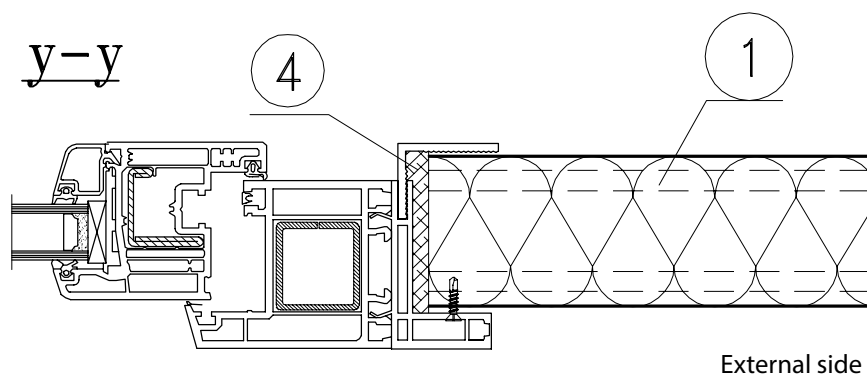
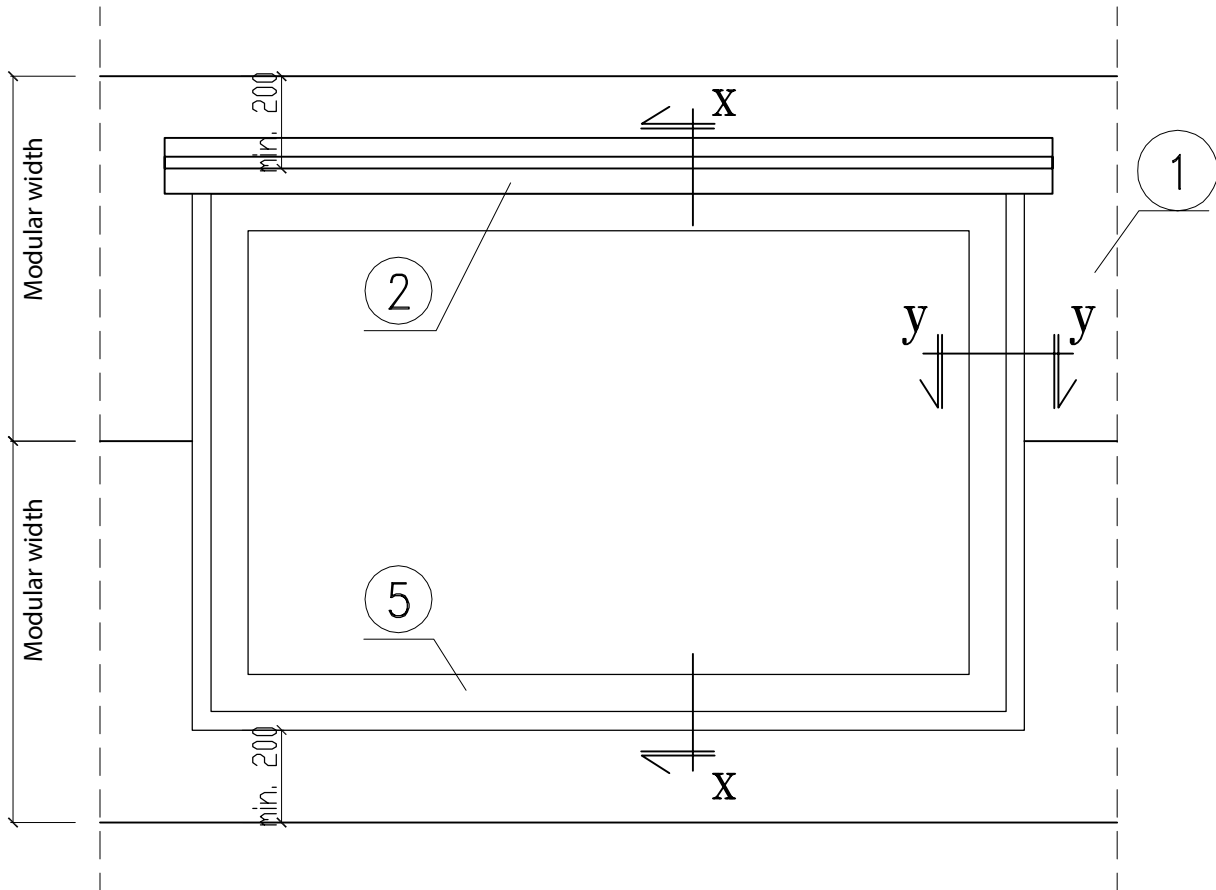
### Joining panels with window strip – vertical arrangement of panels – option III



1. PIR STANDARD wall panel
2. OBR 107 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. Individual flashing (cut a groove in foam)
5. Individual flashing
6. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
7. LB 1- LB 5 fasteners for fastening PIR panels
8. PES 3x20 self-adhesive sealing tape (recommended)
9. Butyl sealing tape (recommended)
10. Impregnated polyurethane gasket 10 mm thick
11. Assembly foam
12. Flat bar for fastening a window
13. Bearing lock acc. to the construction design
14. Indent at panel joint
15. Individual flashing

### 1.18. ST16/1

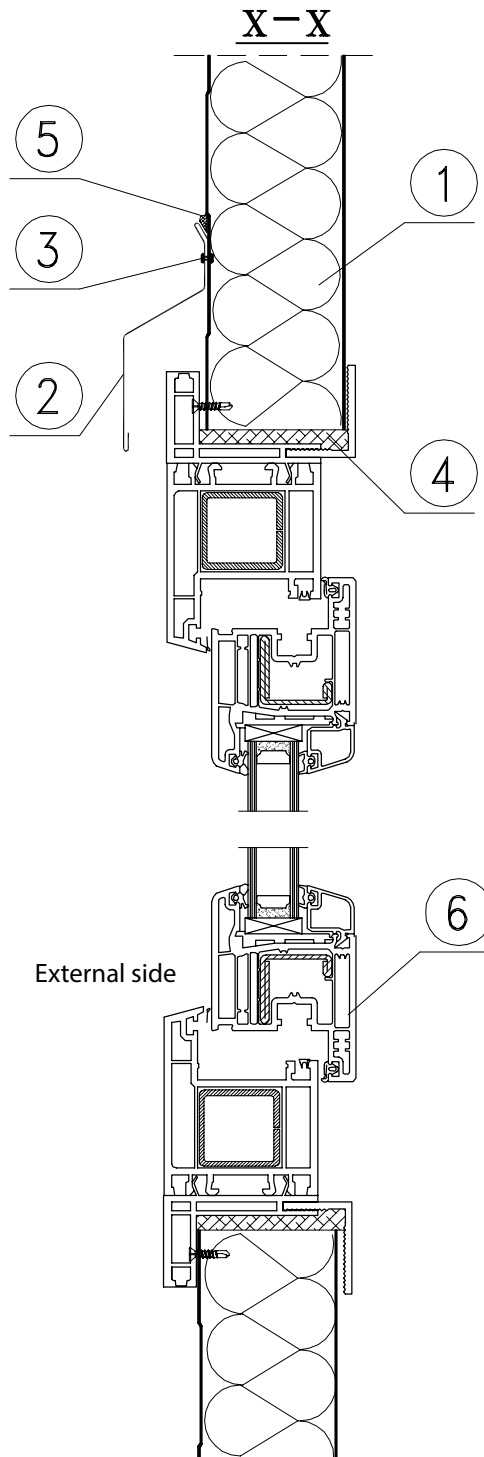
#### Joining panels with PVC windows – vertical or horizontal arrangement of panels



- 1. PIR STANDARD wall panel
- 2. OBR 107 flashing
- 4. Impregnated polyurethane gasket or assembly foam
- 5. PVC window

## 1.19. ST16/2

### Joining panels with PVC windows – vertical or horizontal arrangement of panels

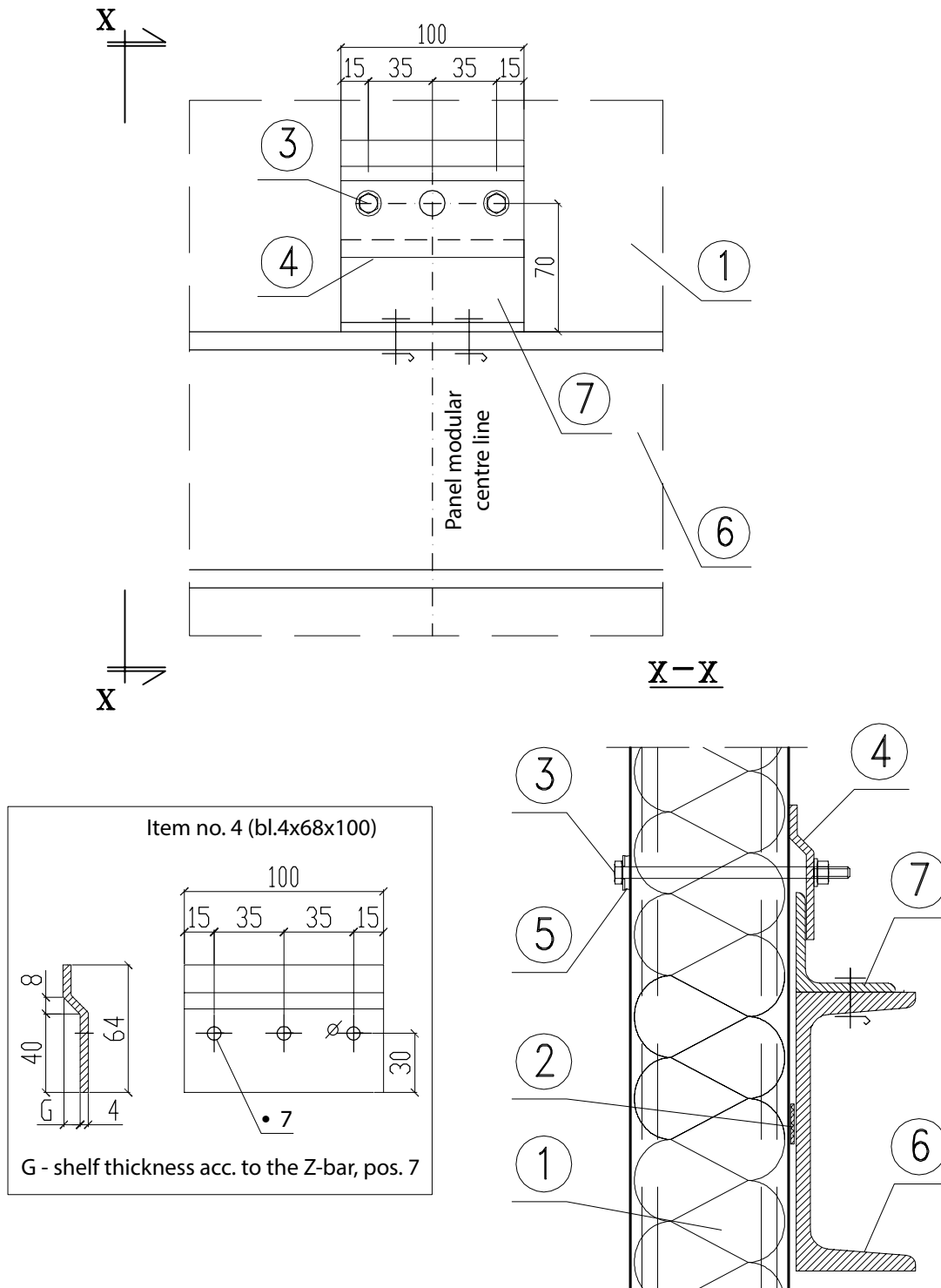


1. PIR STANDARD wall panel
2. OBR 107 flashing
3. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
4. Impregnated polyurethane gasket or assembly foam
5. Sealing compound
6. PVC window



### 1.20. ST17

#### Fastening panel – sliding joint – vertical arrangement of panels

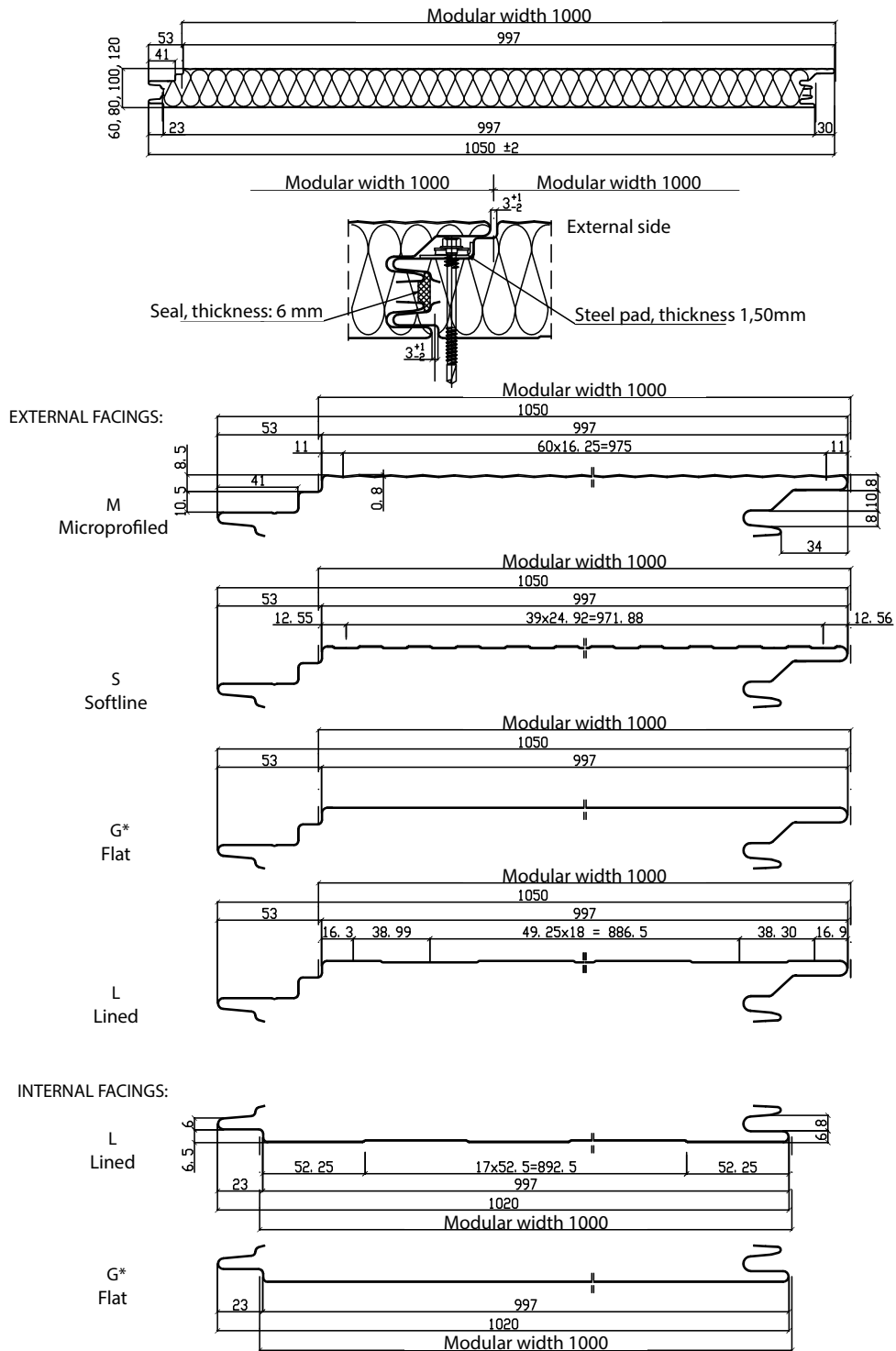


1. PIR STANDARD wall panel
2. PES 3x20 self-adhesive sealing tape (recommended)
3. M6 screw with a self-locking nut
4. Steel washer (sheet 4x68x100) - individual
5. Washer with cured EPDM (recommended T19/3/6,7 SFS)
6. Transom acc. to the construction design
7. Angle acc. to the construction design

## 2. PIR PLUS WALL PANELS

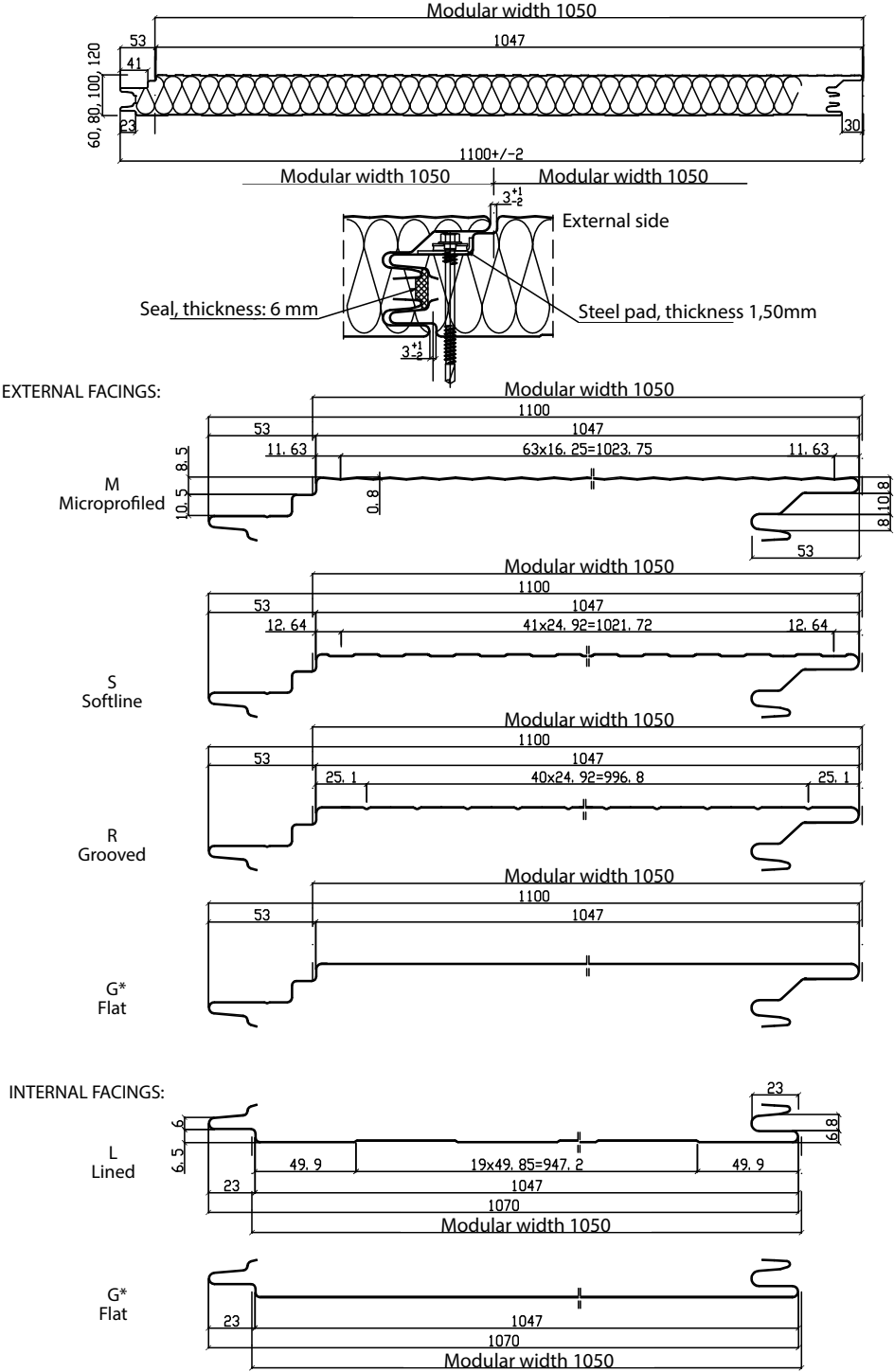
### 2.1. PL01

#### PIR PLUS 1000 wall panels - joint, profile types



\* Profiling available only for minimum 0.50 mm panel thickness

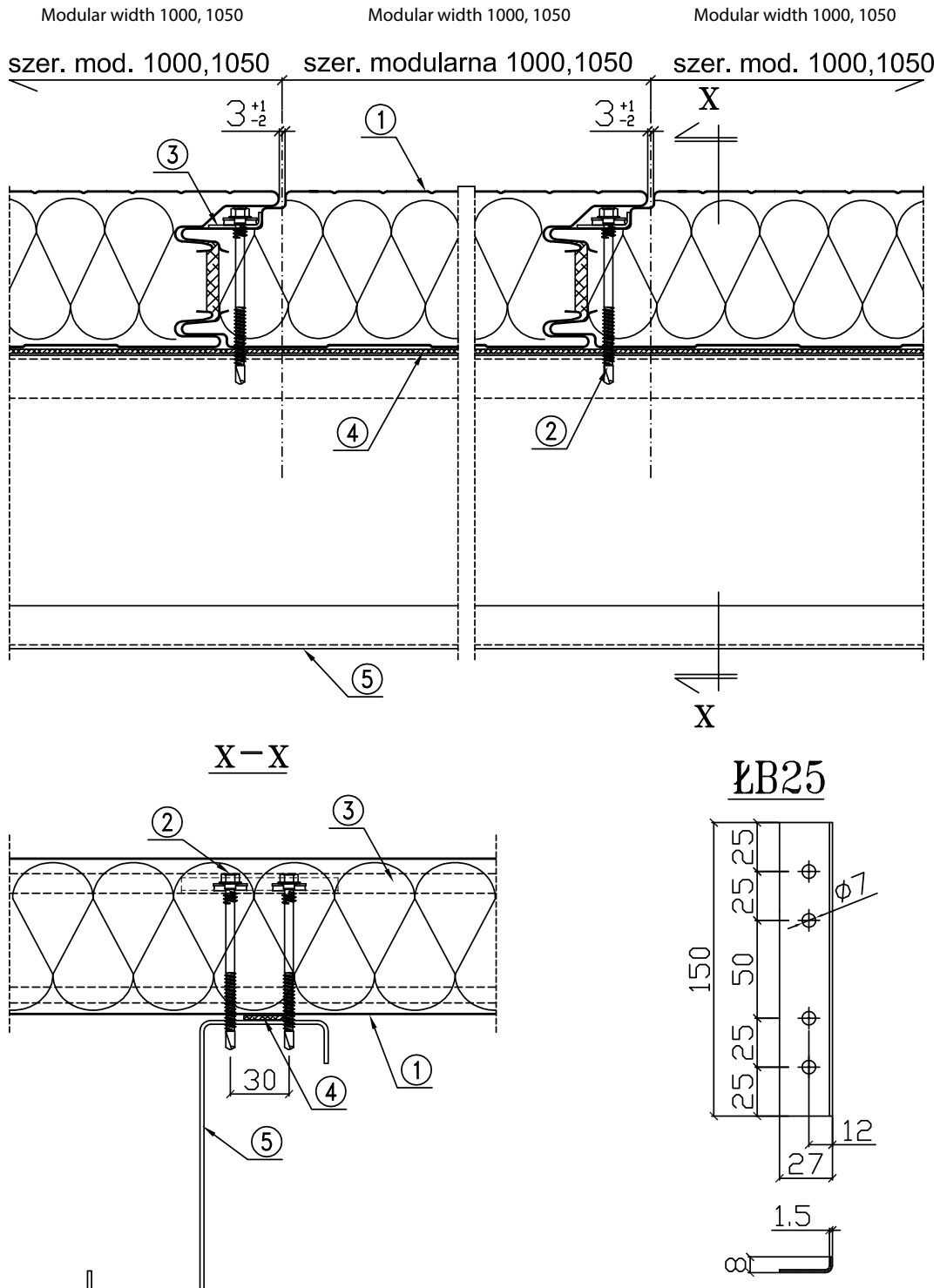
2.2. PL02  
 PIR PLUS 1050 wall panels - joint, profile types



\* Profiling available only for minimum 0,50 mm panel thickness

### 2.3. PL03

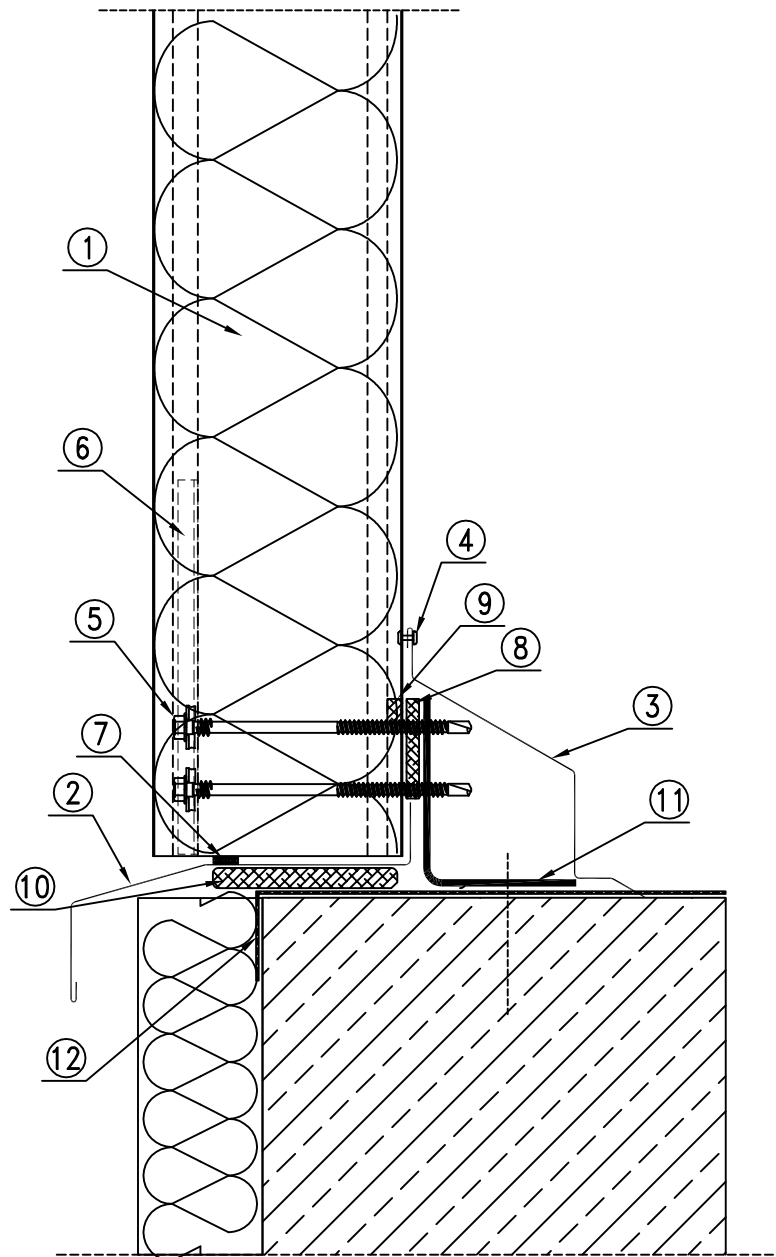
#### Fastening panels – vertical arrangement of panels



1. PIR PLUS wall panel
2. LB 1- LB 5 fasteners for fastening PIR panels
3. LB25 or LB 30 system steel washer
4. PES 3x20 self-adhesive sealing tape (recommended)
5. Bearing lock acc. to the construction design

## 2.4. PL04

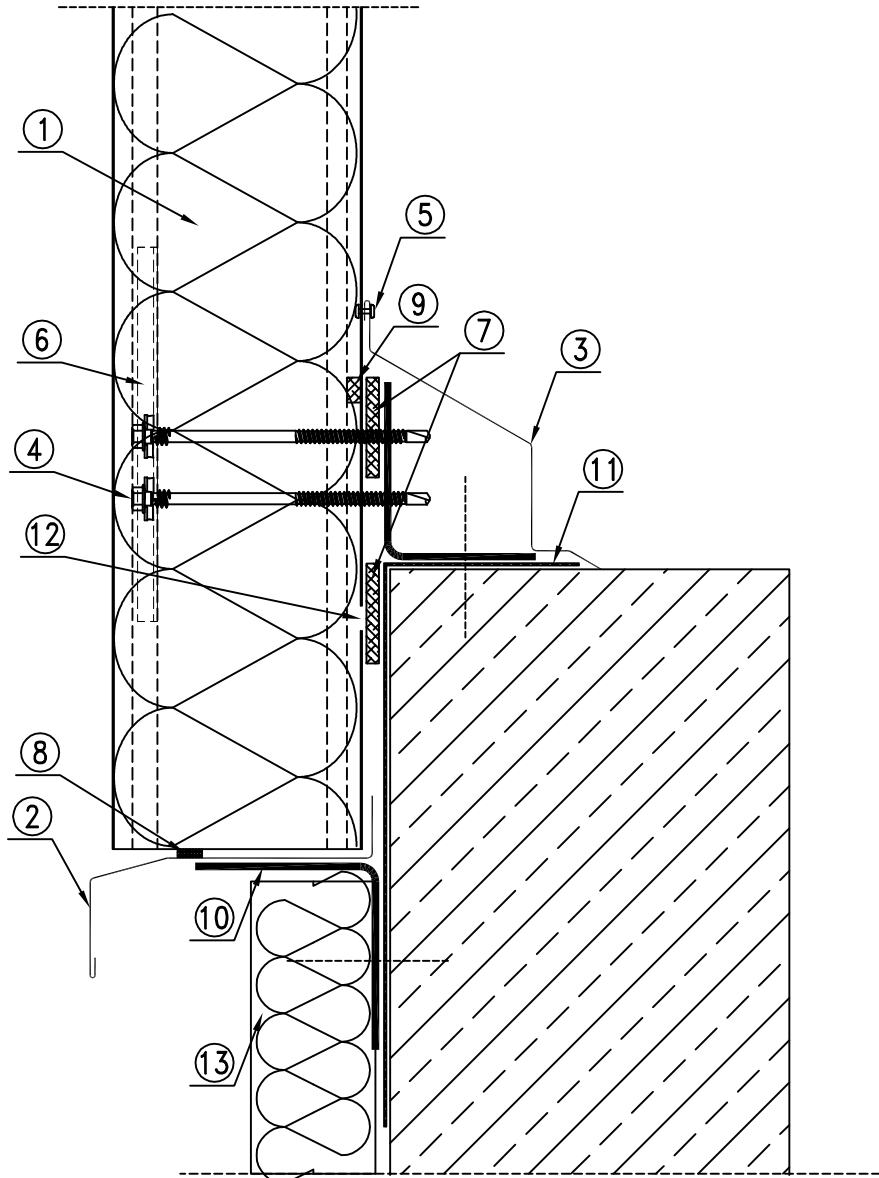
### Basing panels on a ground beam or foundation - vertical arrangement of panels



1. PIR PLUS wall panel
2. OBR 100 flashing or individual flashing
3. OBR 101 flashing or individual flashing
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. LB 1 or LB 2 fastener for fastening PIR panels
6. LB 25 steel washer under fasteners
7. Butyl sealing tape (recommended)
8. PUS 5x40 self-adhesive sealing tape
9. Sealing compound in the panel joint area
10. Impregnated polyurethane gasket 20 mm thick
11. Angle acc. to the construction design
12. Dampproof insulation according to the architectural design
13. Thermal insulation + plastering according to the architectural design

## 2.5. PL05

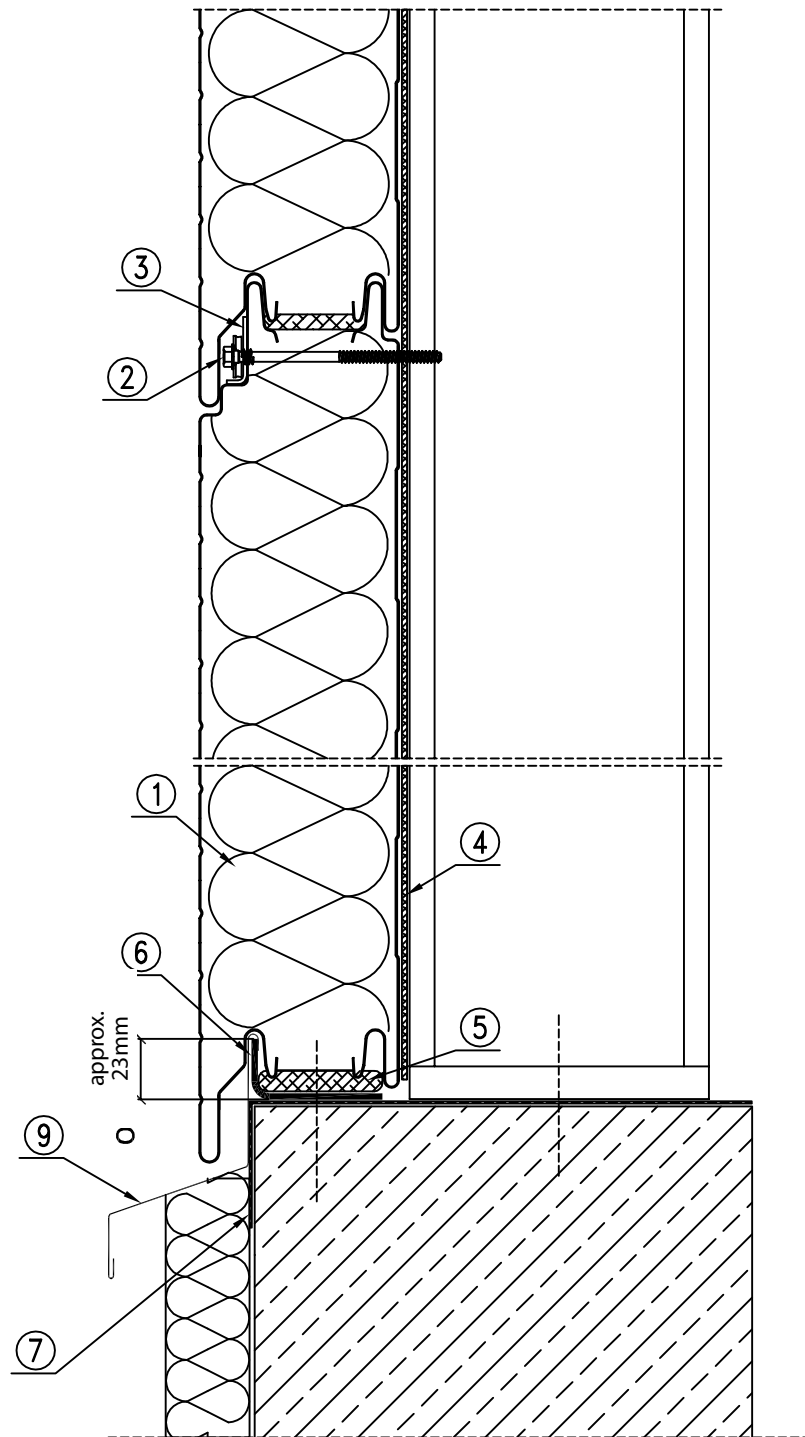
### Supporting panels below the upper level of the ground beam or foundation - vertical arrangement of panels



1. PIR PLUS wall panel
2. OBR 100 flashing or individual flashing
3. OBR 101 flashing or individual flashing
4. LB 1 or LB 2 fastener for fastening PIR panels
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
6. LB 25 steel washer under fasteners
7. PUS 5x40 self-adhesive sealing tape
8. Butyl sealing tape (recommended)
9. Sealing compound in the panel joint area
10. Angle acc. to the construction design
11. Dampproof insulation according to the architectural design
12. Cladding with a 10 mm wide gap at increased thermal performance requirements
13. Thermal insulation + plastering according to the architectural design

## 2.6. PL06

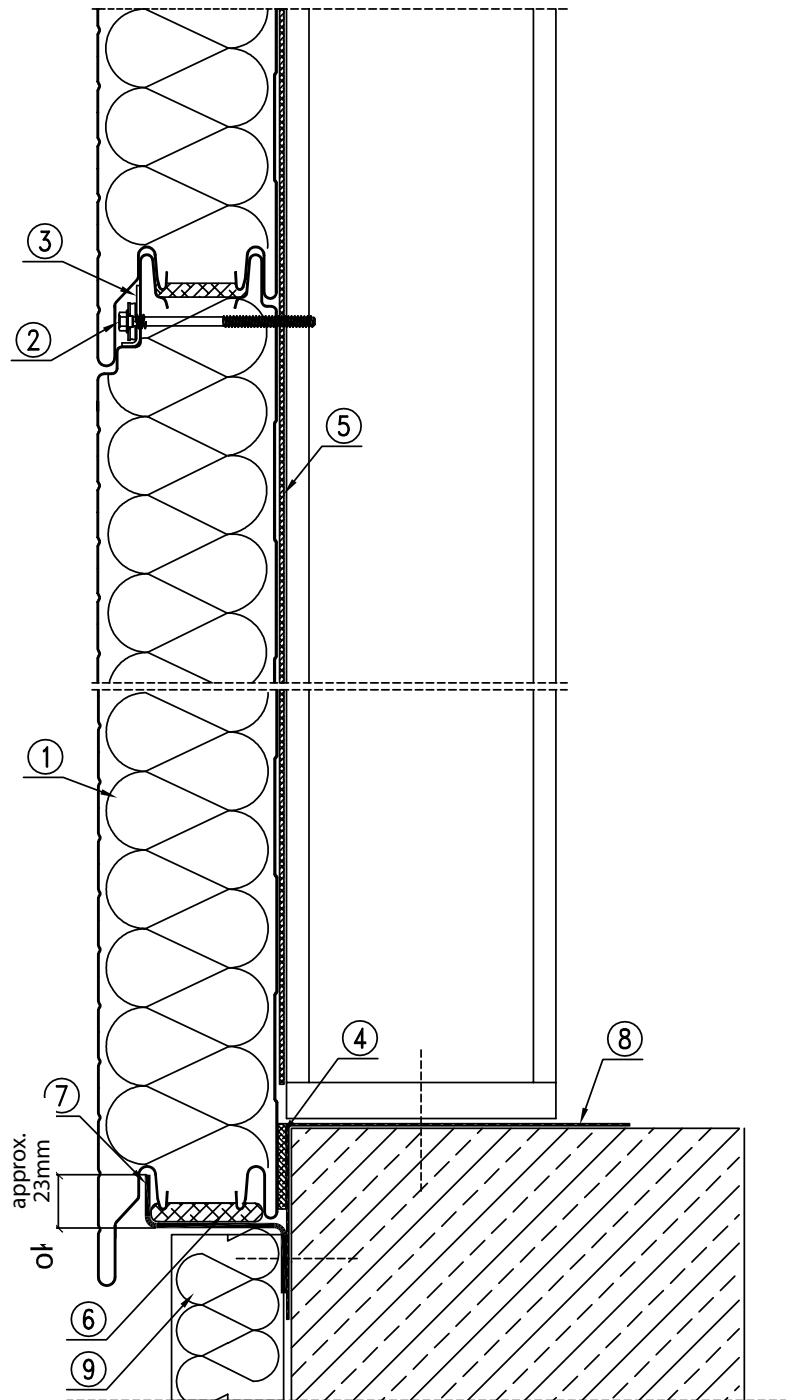
### Supporting panels below the upper level of the ground beam or foundation - horizontal arrangement of panels



1. PIR PLUS wall panel
2. LB 1- LB 5 fasteners for fastening PIR panels
3. LB 25 steel washer under fasteners
4. PES 3x20 self-adhesive sealing tape (recommended)
5. Impregnated polyurethane gasket 20 mm thick
6. Angle acc. to the construction design
7. Dampproof insulation according to the architectural design
8. Thermal insulation + plastering according to the architectural design
9. Individual flashing

## 2.7. PL07

### Supporting panels below the upper level of the ground beam or foundation - horizontal arrangement of panels

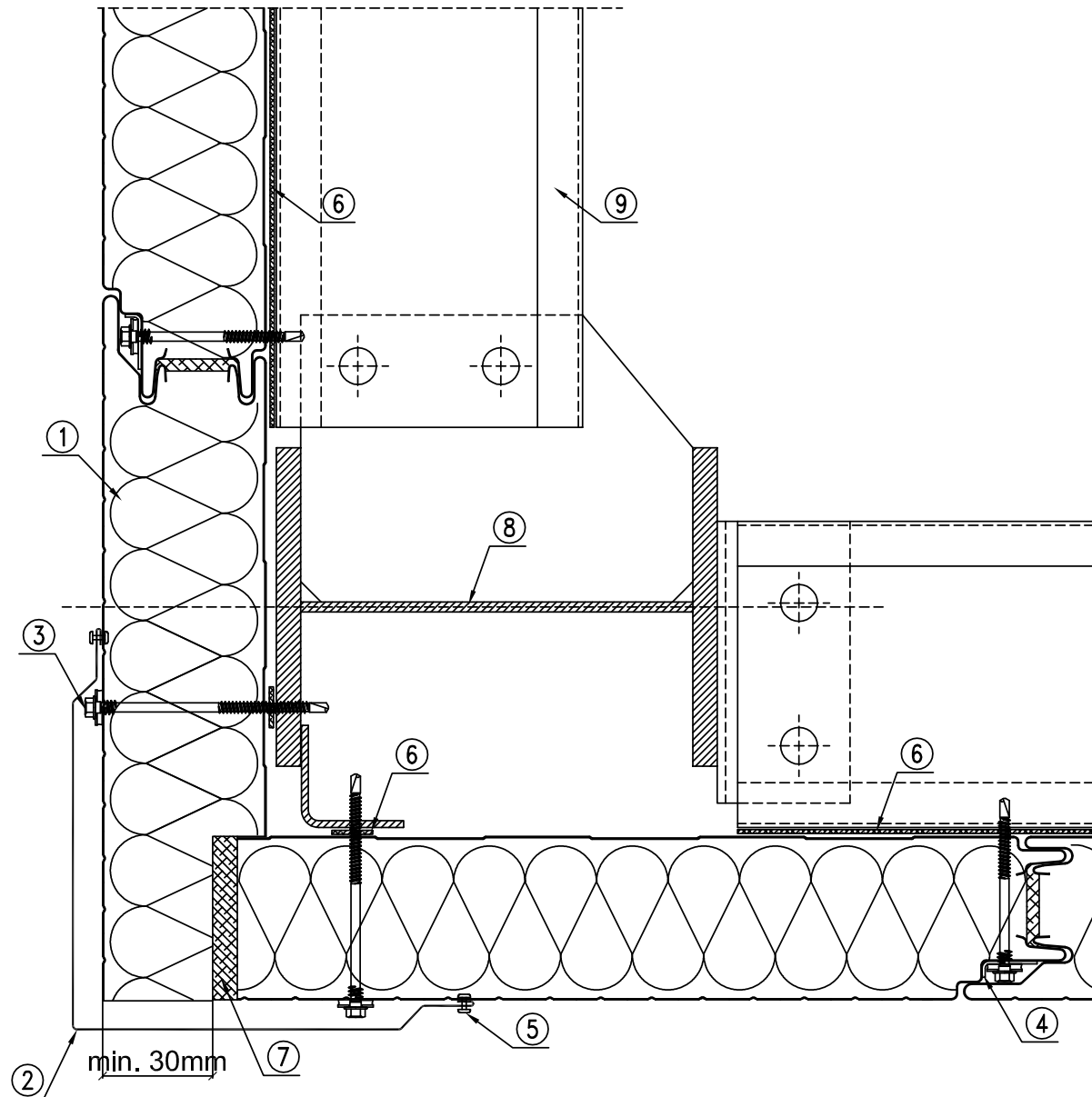


1. PIR PLUS wall panel
2. LB 1- LB 5 fasteners for fastening PIR panels
3. LB 25 steel washer under fasteners
4. PUS 5x40 self-adhesive sealing tape
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Impregnated polyurethane gasket 20 mm thick
7. Z-bar acc. to the construction design
8. Dampproof insulation acc. to the architecture design
9. Thermal insulation + plastering according to the architectural design



## 2.8. PL08

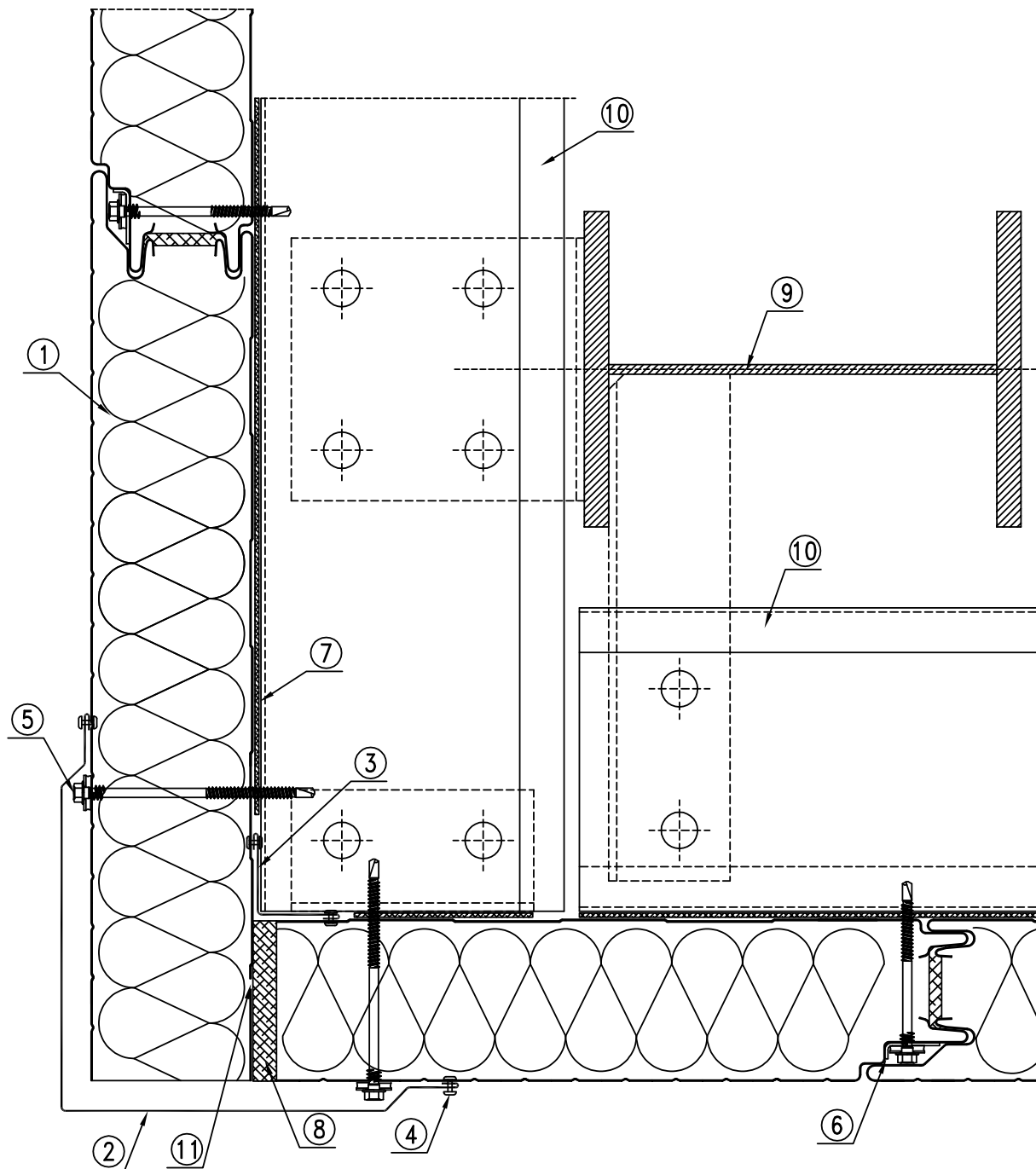
### Joining panels in the corner - vertical arrangement of panels – option I



1. PIR PLUS wall panel
2. OBR 103 flashing or individual flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. LB 25 or LB 30 steel washer under fasteners
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Assembly foam or polyurethane expansion gasket
8. Bearing column + Z-bar acc. to the construction design
9. Transom acc. to the construction design

## 2.9. PL09

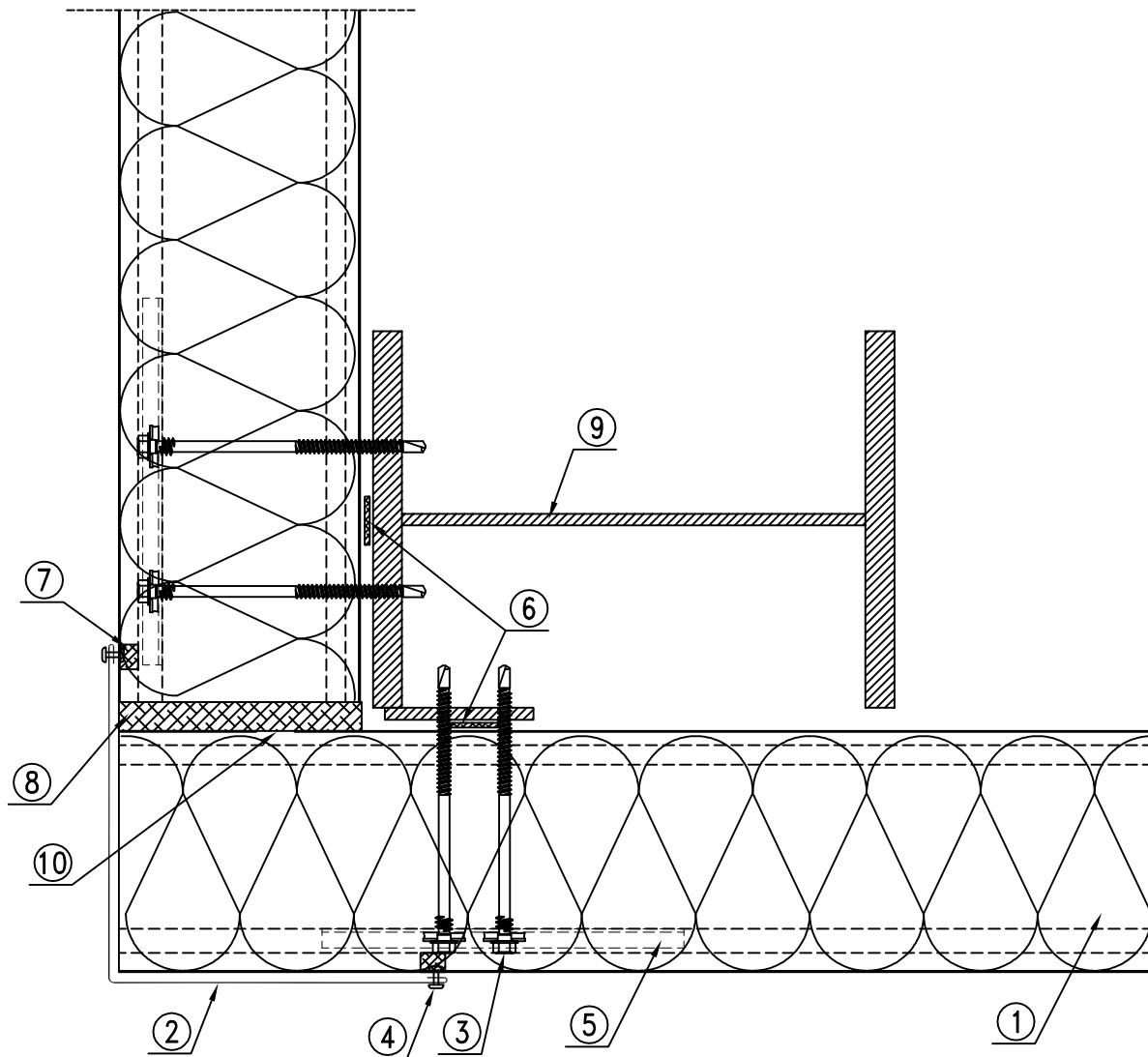
### Joining panels in the corner - vertical arrangement of panels – option II



1. PIR PLUS wall panel
2. OBR 103 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. LB 1- LB 5 fasteners for fastening PIR panels
6. LB 25 or LB 30 steel washer under fasteners
7. PES 3x20 self-adhesive sealing tape (recommended)
8. Assembly foam or polyurethane expansion gasket
9. Steel, reinforced concrete, wooden column acc. to the construction design
10. Transom acc. to the construction design
11. Cladding with a 10 mm wide gap (recommended to improve thermal insulation efficiency)

## 2.10. PL10

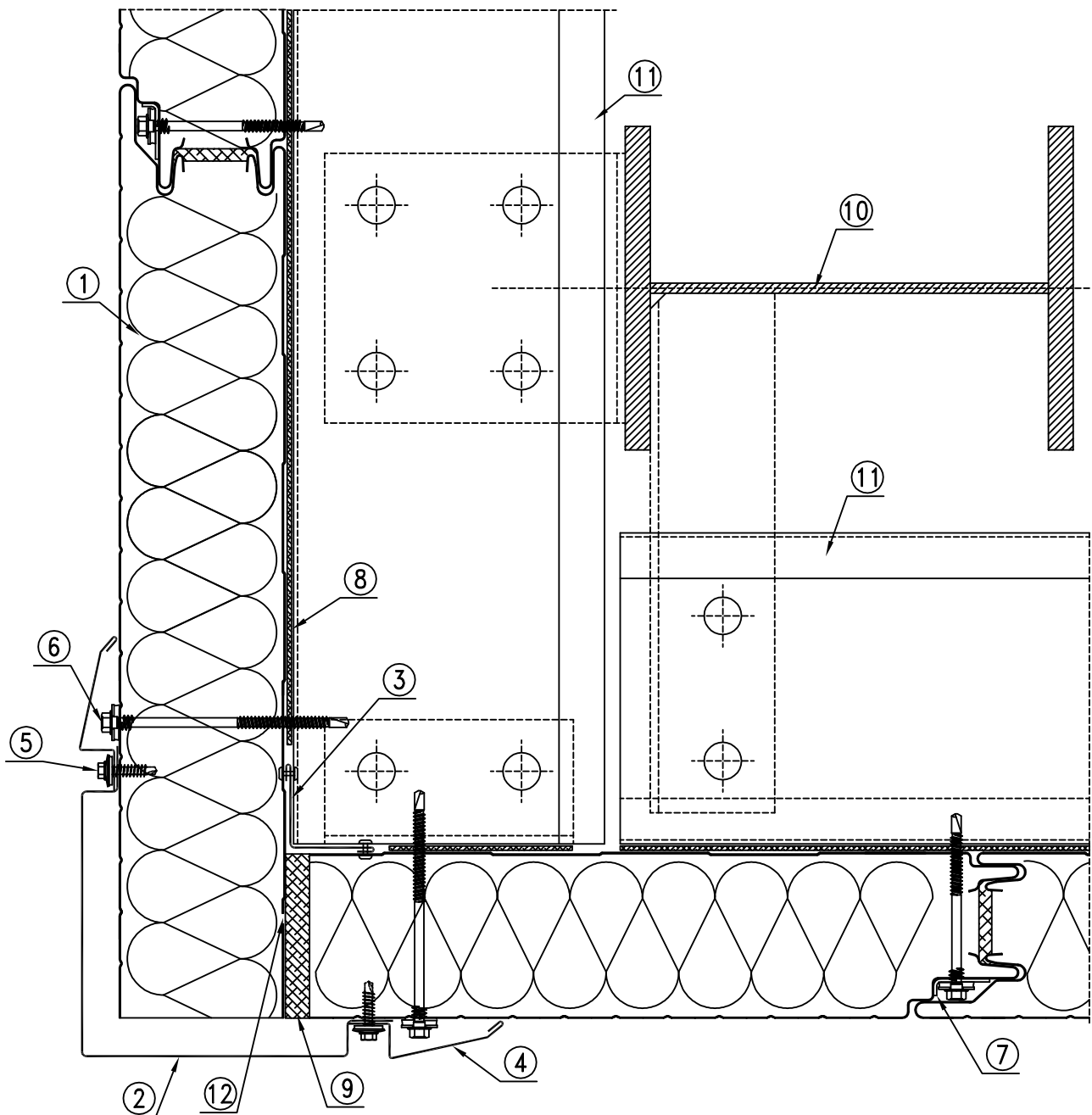
### Joining panels in the corner - horizontal arrangement of panels



1. PIR PLUS wall panel
2. OBR 105 or OBR 109 flashing or individual flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. LB 25 steel washer under fasteners
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Sealing compound in the panel joint area
8. Assembly foam or impregnated polyurethane expansion gasket
9. Bearing column + flat bar acc. to the construction design
10. Cladding with a 10 mm wide gap (recommended to improve thermal insulation efficiency)

## 2.11. PL10/1

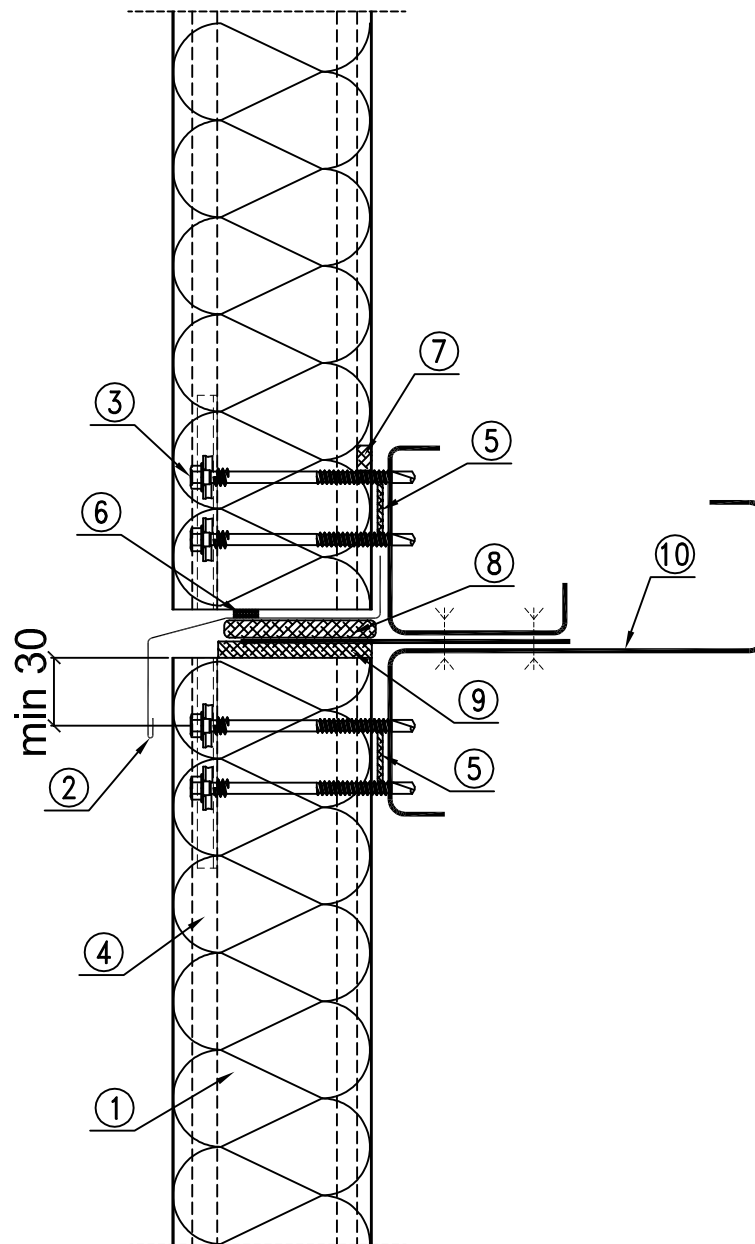
### Joining panels in the corner – vertical or horizontal arrangement of panels



1. PIR PLUS wall panel
2. OBR 113 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. OBR 111 flashing or individual flashing
5. LB 6 self-drilling fastener every 300 mm
6. LB 1- LB 5 fasteners for fastening PIR panels
7. LB 25 steel washer under fasteners
8. PES 3x20 self-adhesive sealing tape (recommended)
9. Assembly foam or polyurethane expansion gasket
10. Bearing post acc. to the construction design
11. Transom acc. to the construction design
12. Cladding with a 10 mm wide gap (recommended to improve thermal insulation efficiency)

## 2.12. PL11

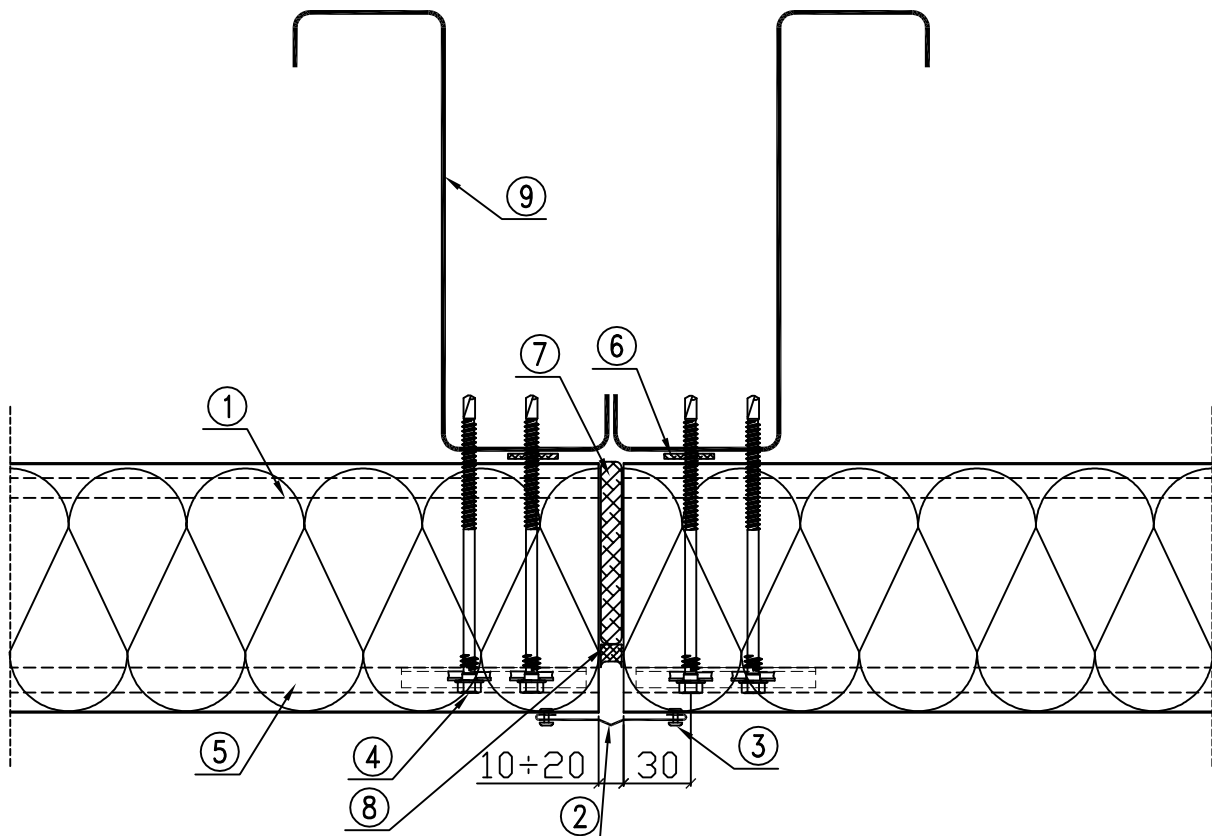
### Joining panels lengthwise – vertical arrangement of panels



1. PIR PLUS wall panel
2. OBR 100 flashing or individual flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. LB 25 steel washer under fasteners
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Butyl sealing tape (recommended)
7. PUS 5x40 self-adhesive sealing tape
8. Sealing compound in the panel joint area
9. Impregnated polyurethane gasket 20 mm thick
10. Assembly foam

## 2.13. PL12/1

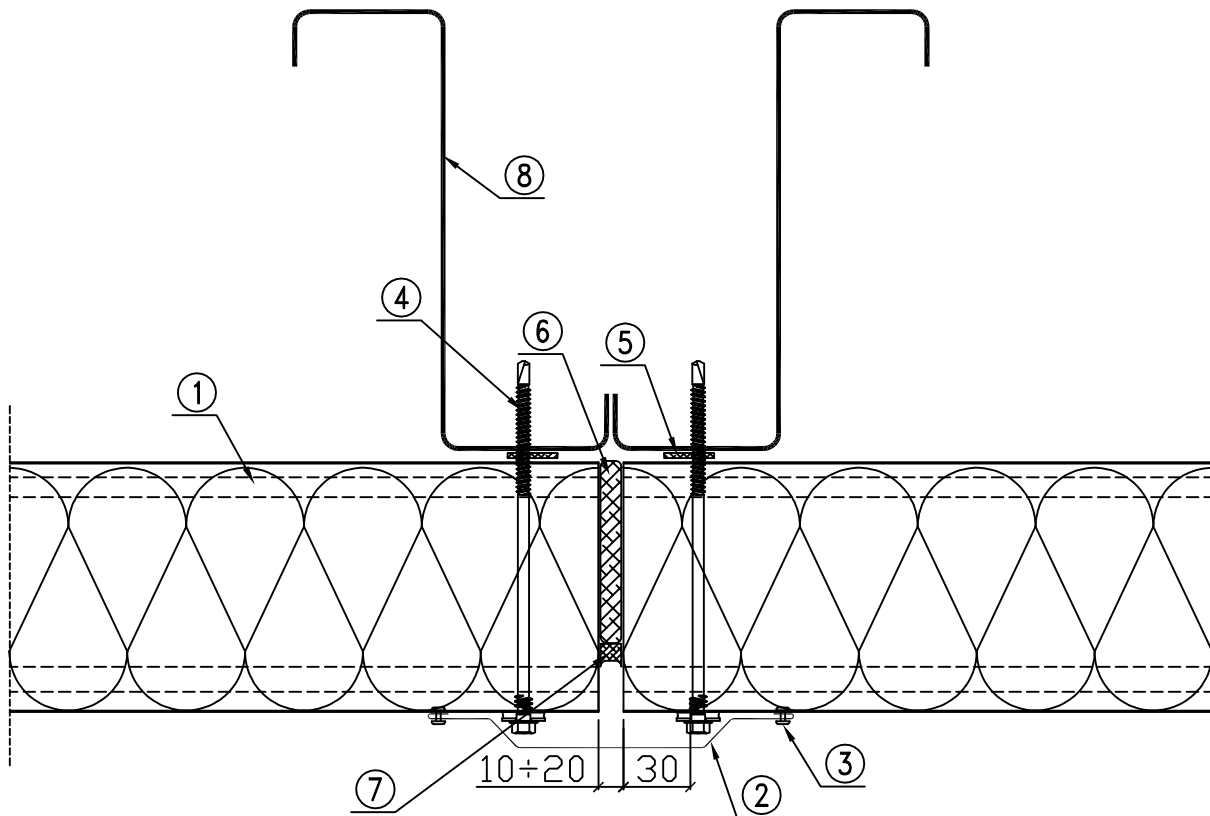
### Fastening panel to the end support – horizontal arrangement of panels – option I



1. PIR PLUS wall panel
2. OBR 106 flashing or individual flashing
3. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
4. LB 1- LB 5 fasteners for fastening PIR panels
5. LB 25 steel washer under fasteners
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Impregnated polyurethane expansion gasket or assembly foam
8. Impregnated polyurethane expansive tape 10x4 (20)
9. Bearing post acc. to the construction design

## 2.14. PL12/2

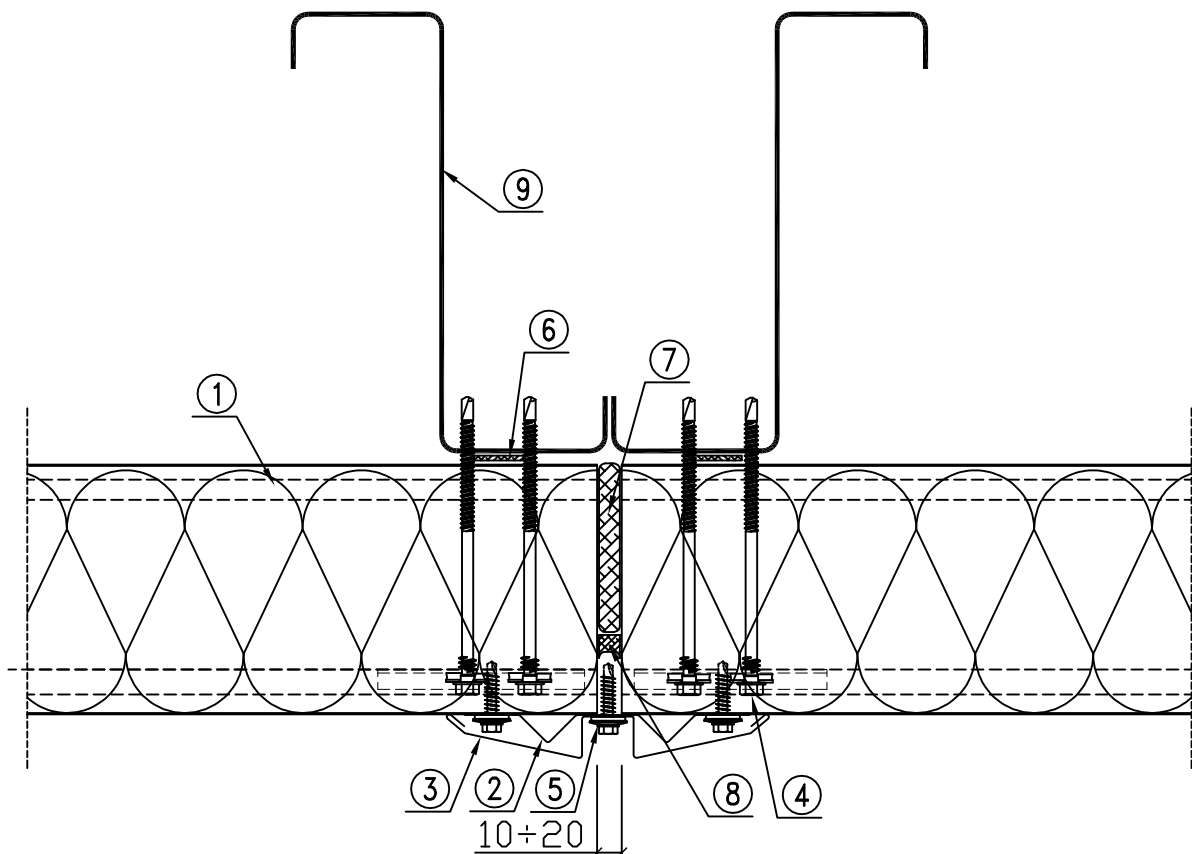
### Fastening panel to the end support – horizontal arrangement of panels – option II



1. PIR PLUS wall panel
2. OBR 105 flashing or individual flashing
3. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
4. LB 1- LB 5 fasteners for fastening PIR panels
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Impregnated polyurethane expansion gasket or assembly foam
7. Impregnated polyurethane expansive tape 10x4 (20)
8. Bearing post acc. to the construction design

## 2.15. PL12/3

### Fastening panel to the end support – horizontal arrangement of panels – option III

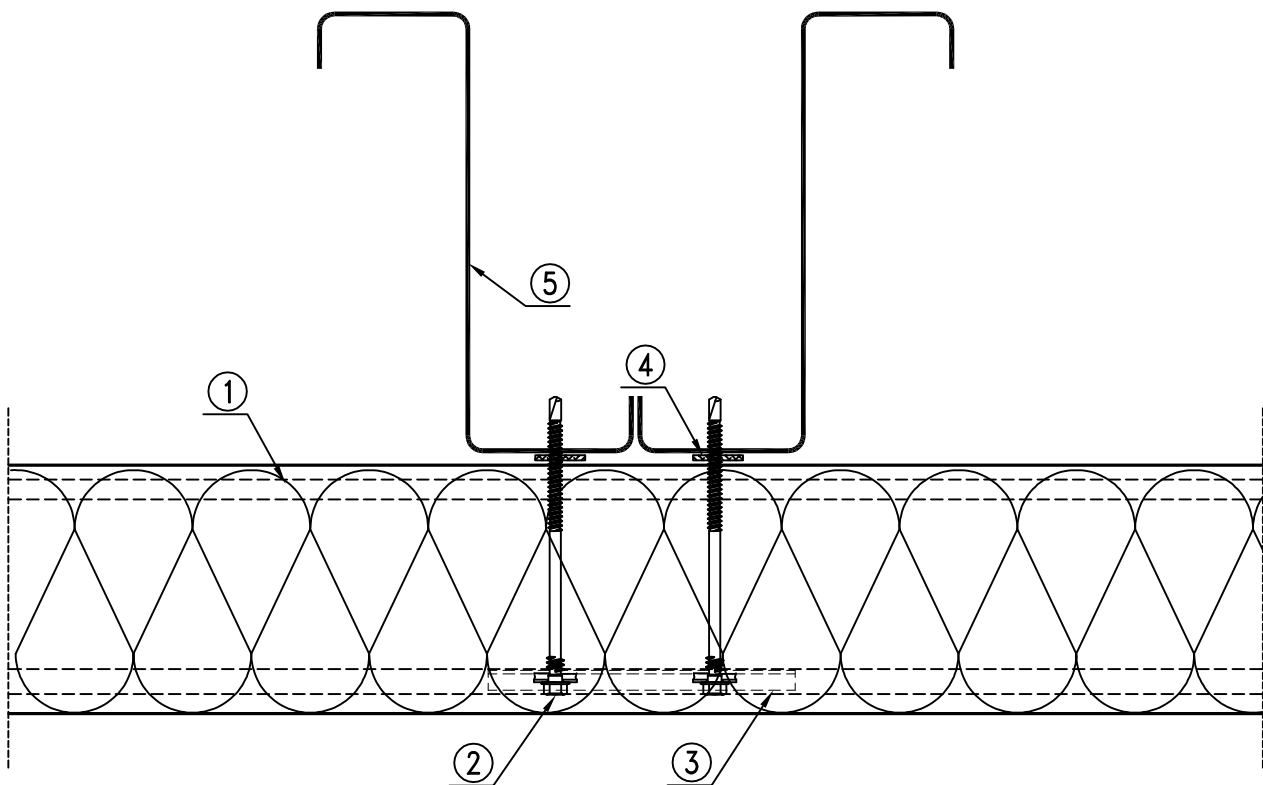


1. PIR PLUS wall panel
2. OBR 110 flashing or individual flashing
3. OBR 110 flashing or individual flashing
4. LB 1- LB 5 fasteners for fastening PIR panels
5. LB 6 self-drilling fastener every 300 mm
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Impregnated polyurethane expansion gasket or assembly foam
8. Impregnated polyurethane expansive tape 10x4 (20)
9. Bearing post acc. to the construction design



## 2.16. PL13

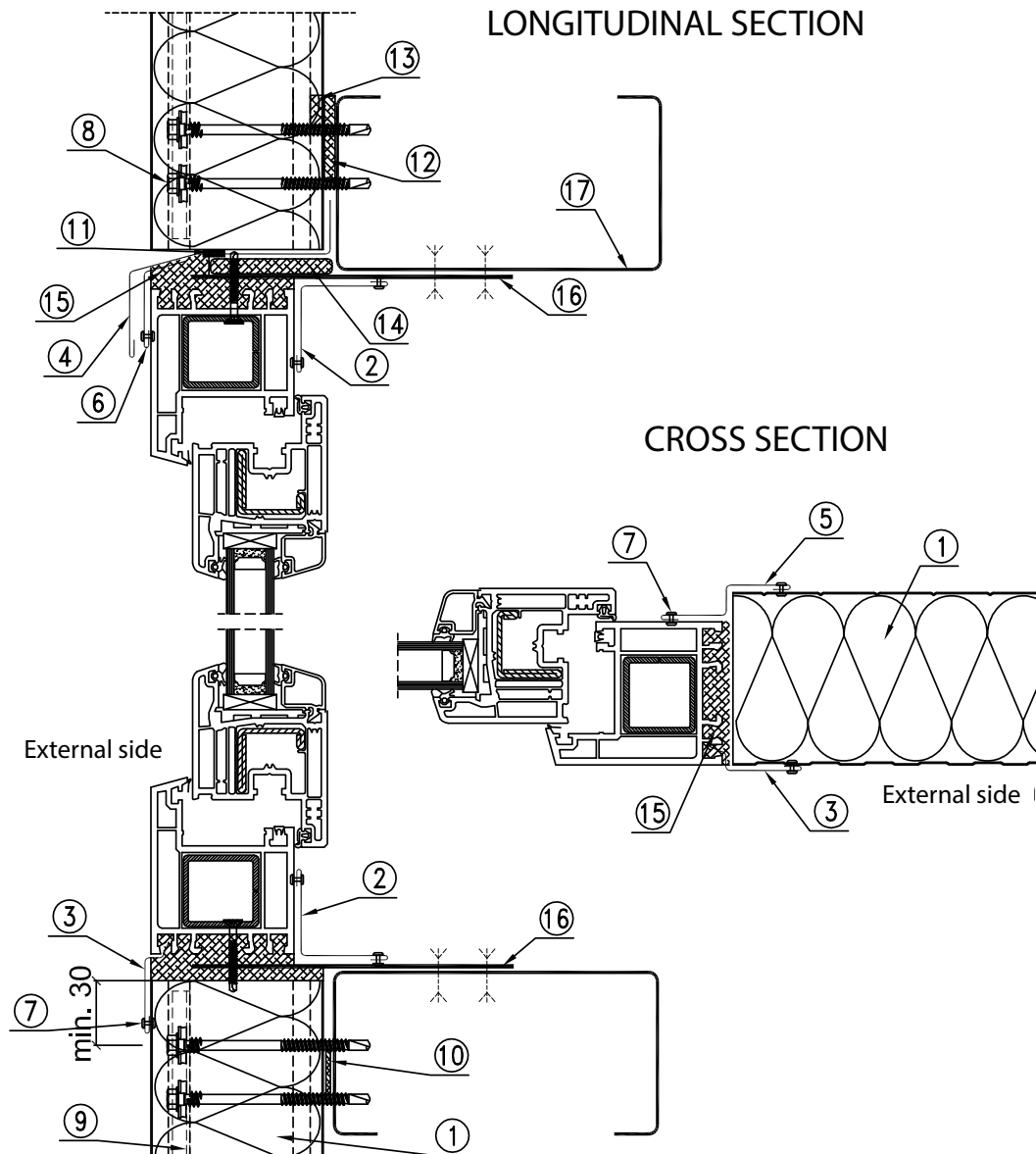
### Fastening panel to the in-between support – horizontal arrangement of panels



1. PIR PLUS wall panel
2. LB 1- LB 5 fasteners for fastening BALEX THERM panels
3. LB 25 steel washer under fasteners
4. PES 3x20 self-adhesive sealing tape (recommended)
5. Bearing post acc. to the construction design

## 2.17. PL14

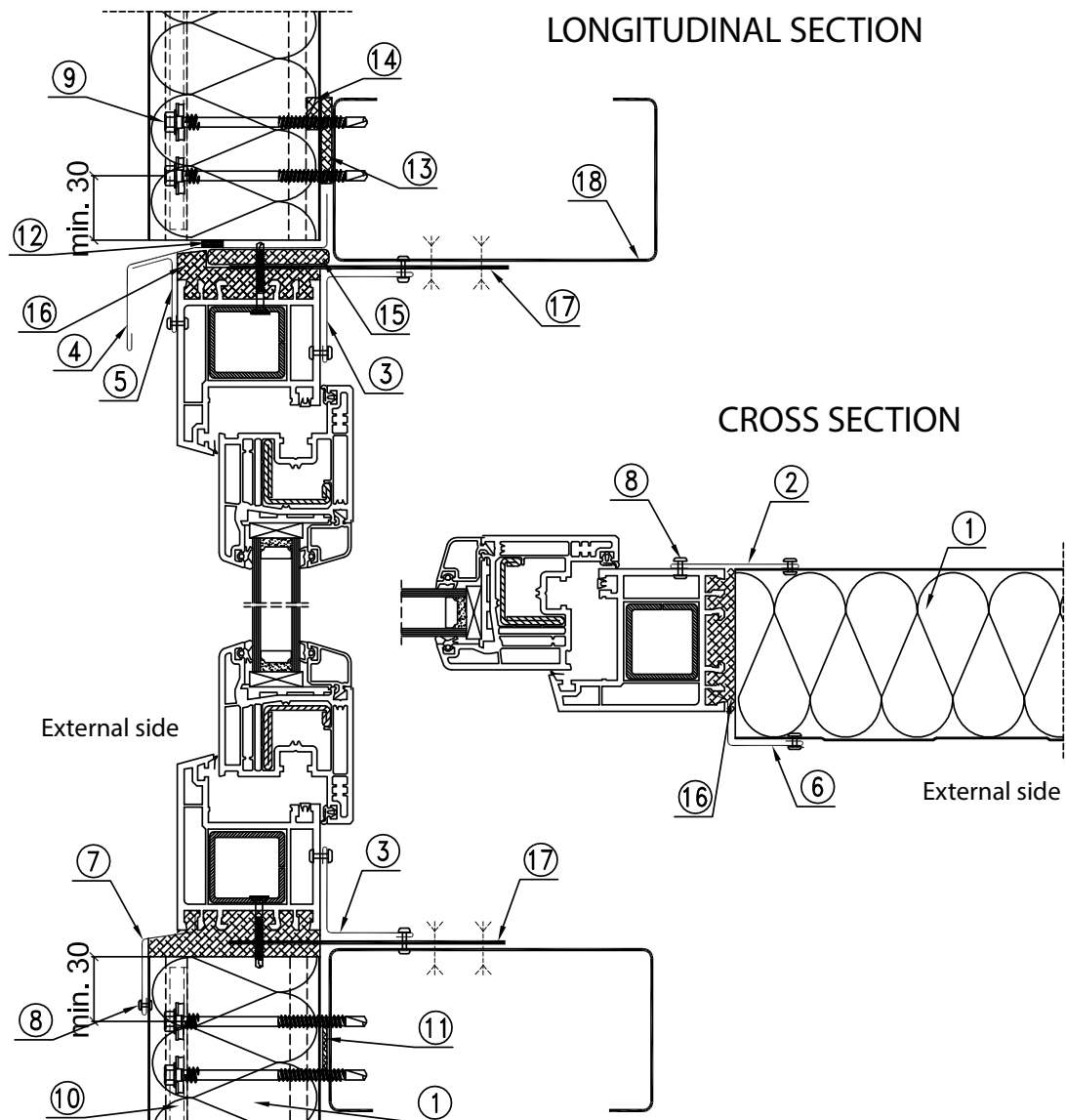
### Joining panels with window strip – vertical arrangement of panels – option I



1. PIR PLUS wall panel
2. OBR 104 flashing or individual flashing
3. OBR 106 flashing or individual flashing
4. OBR 100 flashing or individual flashing
5. Individual flashing
6. Individual flashing
7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
8. LB 1- LB 5 fasteners for fastening PIR panels
9. LB 25 steel washer under fasteners
10. PES 3x20 self-adhesive sealing tape (recommended)
11. Butyl sealing tape (recommended)
12. PUS 5x40 self-adhesive sealing tape
13. Sealing compound in the panel joint area
14. Impregnated polyurethane gasket 10 mm thick
15. Assembly foam
16. Flat bar for fastening a window
17. Bearing lock acc. to the construction design

## 2.18. PL15

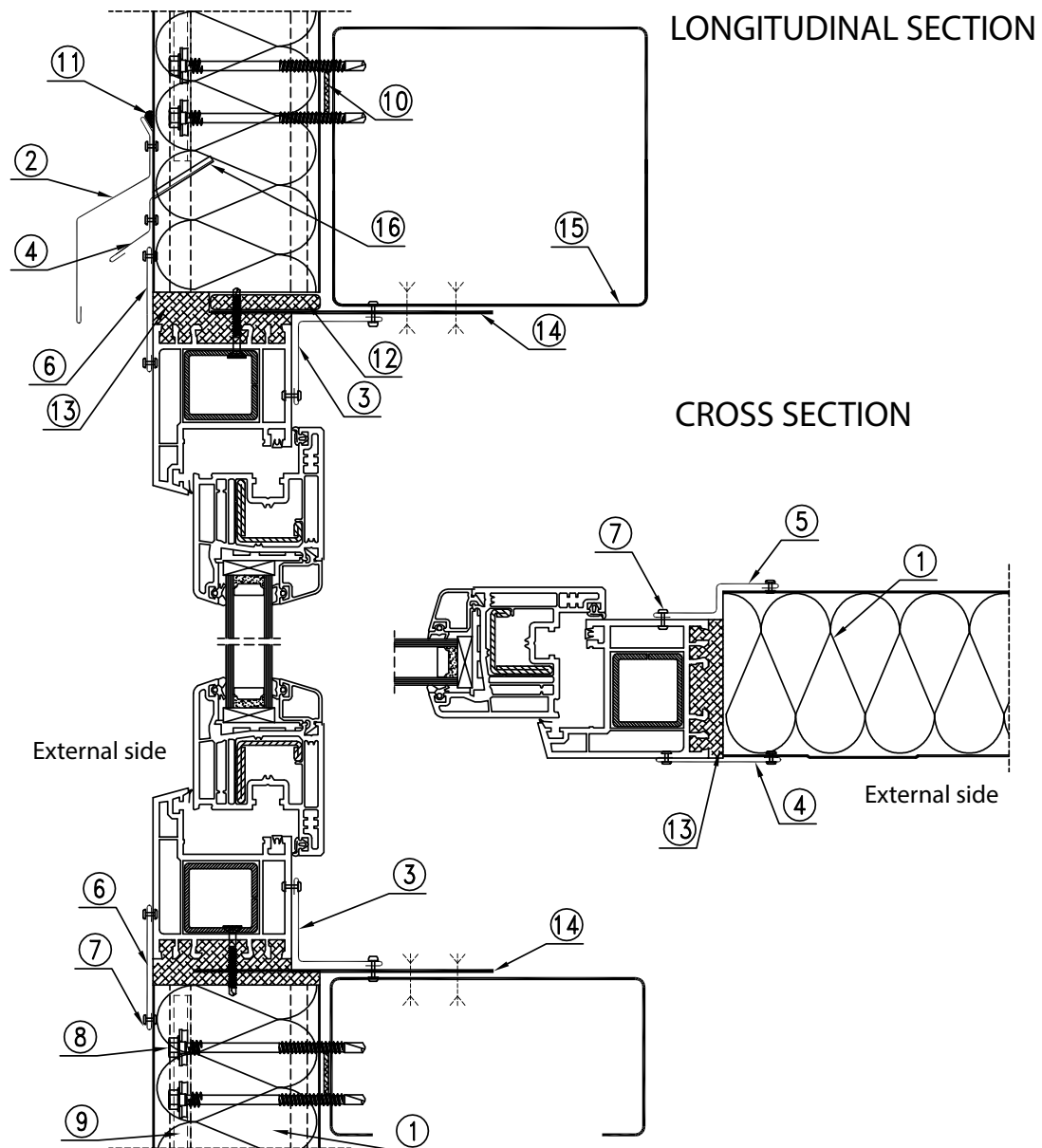
### Joining panels with window strip – vertical arrangement of panels – option II



1. PIR PLUS wall panel
2. OBR 106 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. OBR 100 flashing or individual flashing
5. Individual flashing
6. Individual flashing
7. Individual flashing
8. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
9. LB 1- LB 5 fasteners for fastening PIR panels
10. LB 25 steel washer under fasteners
11. PES 3x20 self-adhesive sealing tape (recommended)
12. Butyl sealing tape (recommended)
13. PUS 5x40 self-adhesive sealing tape
14. Sealing compound in the panel joint area
15. Impregnated polyurethane gasket 10 mm thick or assembly foam
16. Assembly foam
17. Flat bar for fastening a window
18. Bearing lock acc. to the construction design

## 2.19. PL16

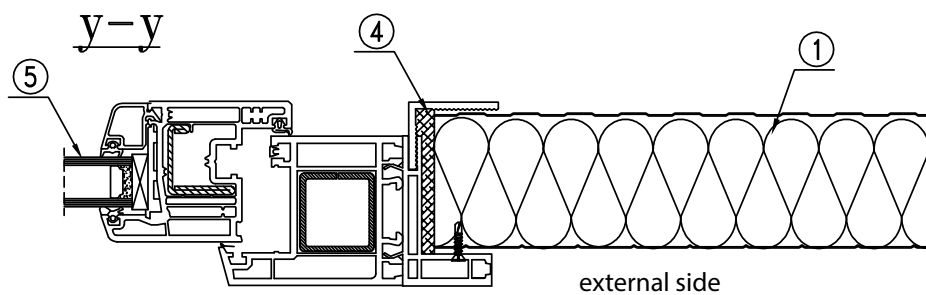
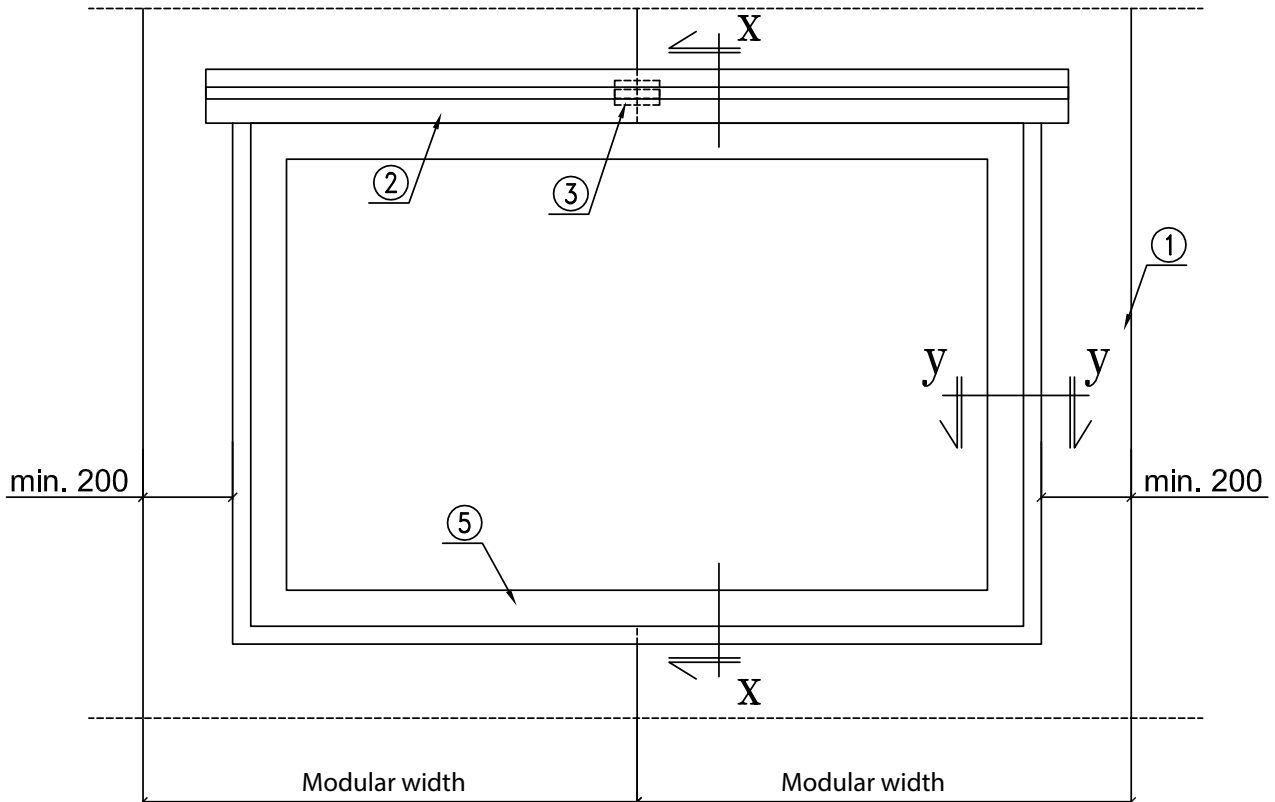
### Joining panels with window strip – vertical arrangement of panels – option III



1. PIR PLUS wall panel
2. OBR 107 flashing or individual flashing
3. OBR 104 flashing or individual flashing
4. Individual flashing
5. Individual flashing
6. Individual flashing
7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
8. LB 1- LB 5 fasteners for fastening PIR panels
9. LB 25 steel pad under fasteners
10. PES 3x20 self-adhesive sealing tape (recommended)
11. Butyl sealing tape (recommended)
12. Impregnated polyurethane gasket 10 mm thick
13. Assembly foam
14. Flat bar for fastening a window
15. Bearing lock acc. to the construction design
16. Groove at panel joint

## 2.20. PL17/1

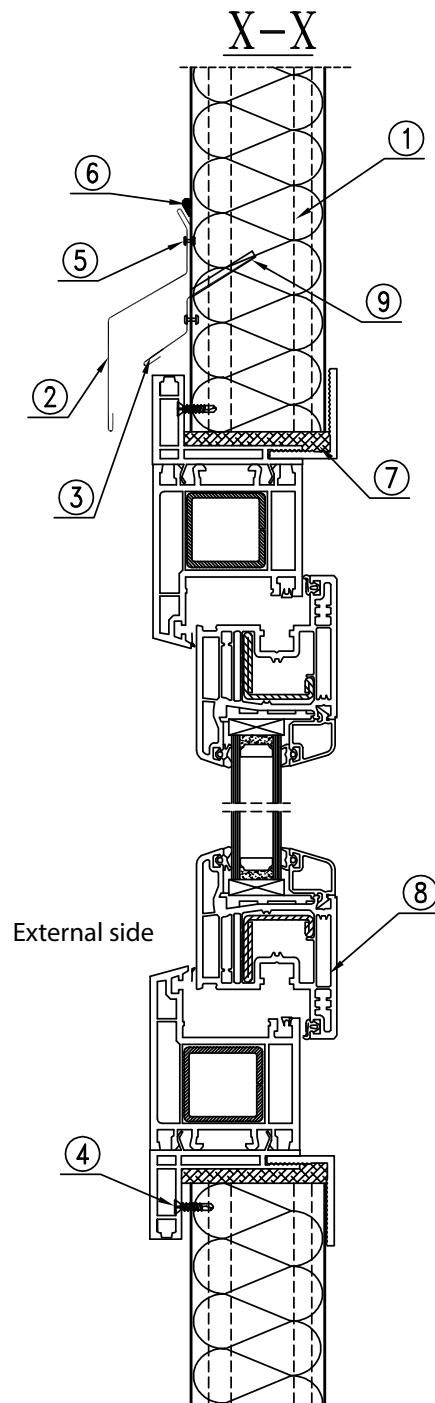
### Joining panels with PVC windows – vertical or horizontal arrangement of panels



1. PIR PLUS wall panel
2. OBR 107 flashing
3. OBR 108 flashing (in the panel joint area – for the vertical arrangement of panels only)
4. Assembly foam or polyurethane gasket
5. PVC window

## 2.21. PL17/2

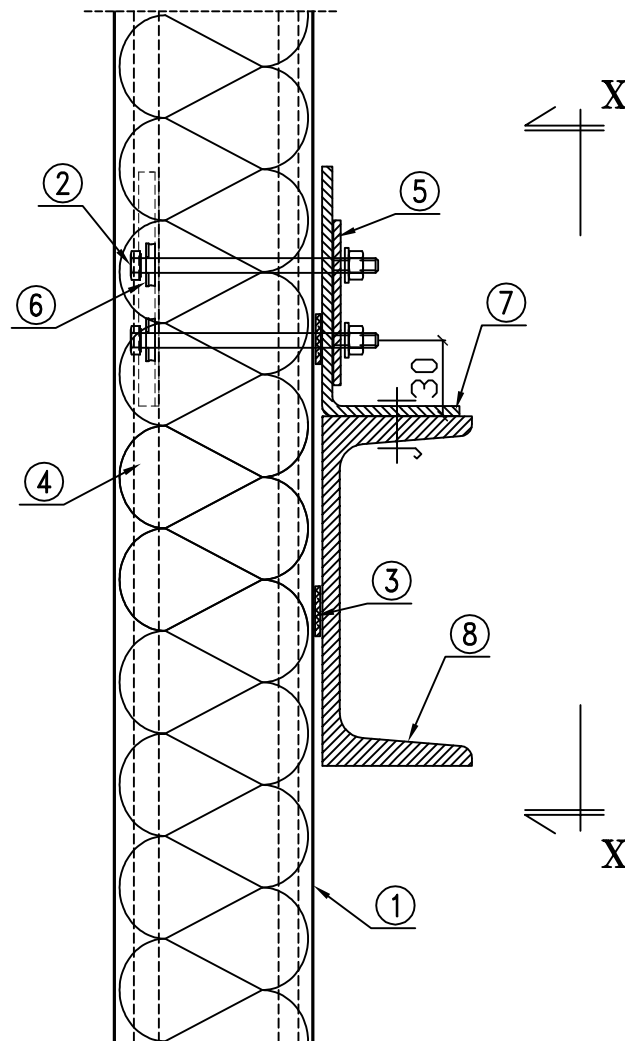
### Joining panels with PVC windows – vertical or horizontal arrangement of panels



1. PIR PLUS wall panel
2. OBR 107 flashing
3. Individual flashing (in the panel joint area – for the vertical arrangement of panels only)
4. Self-drilling fastener for fastening a window every 300 mm
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
6. Sealing compound
8. PVC window
9. Groove in the panel joint area under OBR 110 flashing (for the vertical arrangement of panels only)

## 2.22. PL18/1

### Fastening panel – sliding joint – vertical arrangement of panels

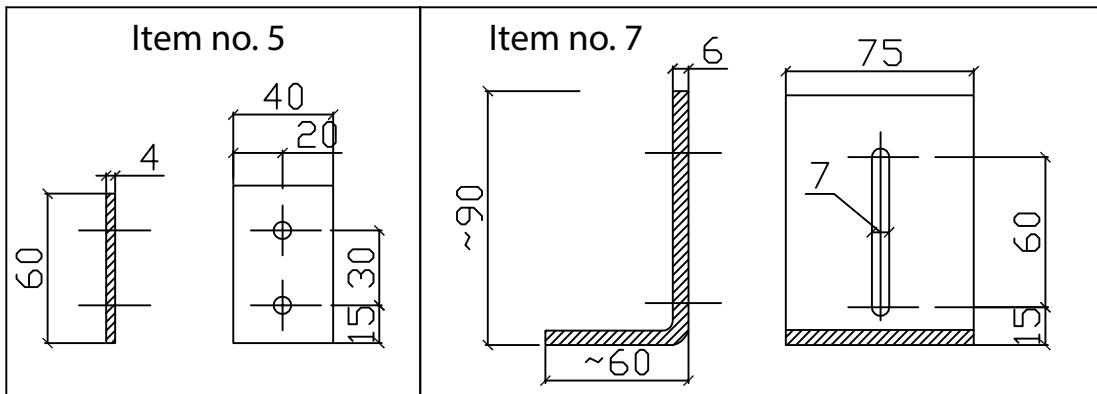
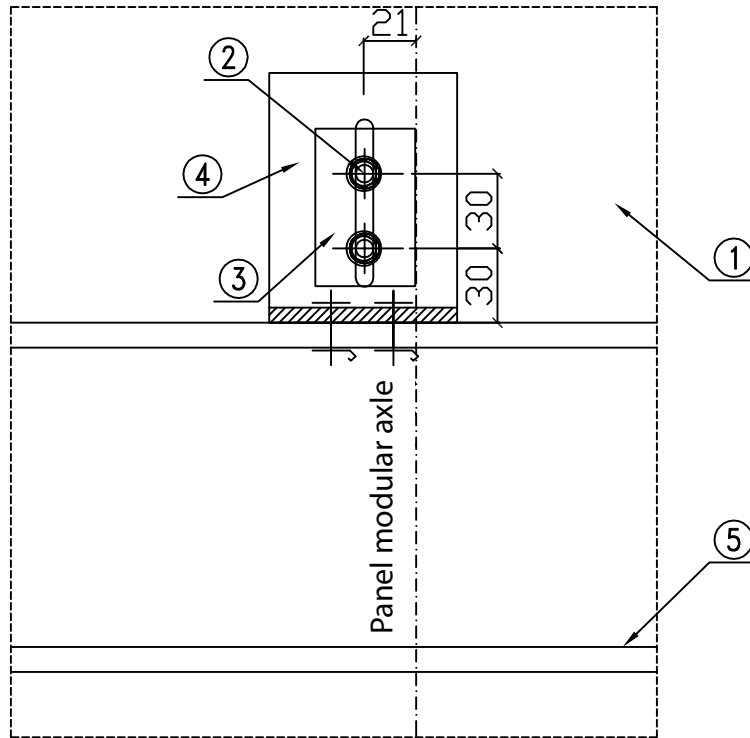


1. PIR PLUS wall panel
2. M 6 screw with a self-locking nut
3. PES 3x20 self-adhesive sealing tape (recommended) – sound insulation
4. LB 25 system steel pad
5. Steel washer - individual
6. Washer with cured EPDM (recommended T19/3/6,7 by SFS)
7. Angle acc. to the construction design
8. Transom acc. to the construction design

2.23. PL18/2

Fastening panel – sliding joint – vertical arrangement of panels – X-X section

X-X



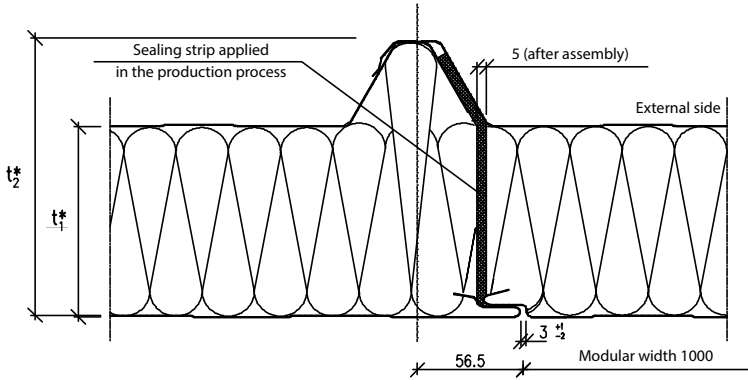
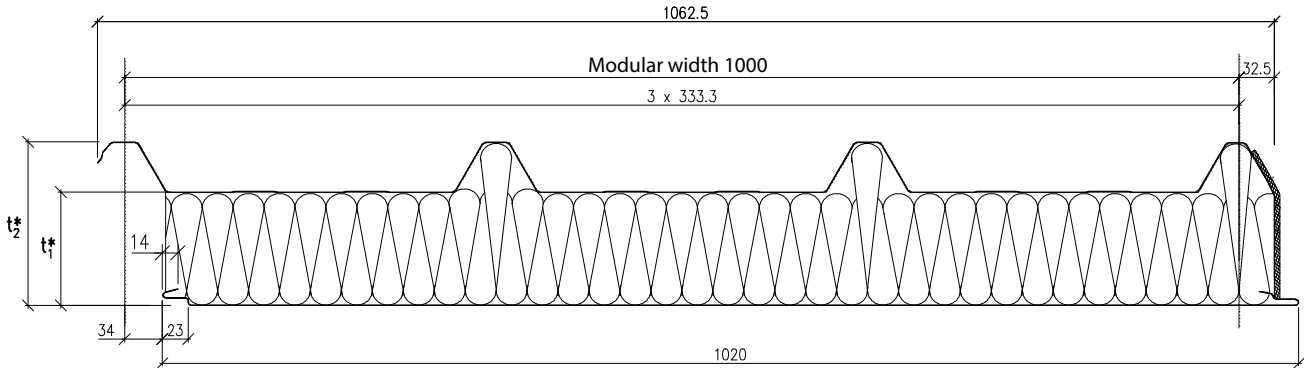
- 1. PIR PLUS wall panel
- 2. M 6 screw with a self-locking nut
- 5. Steel washer - individual
- 7. Angle acc. to the construction design
- 8. Transom acc. to the construction design



### 3. PIR STANDARD ROOF PANELS

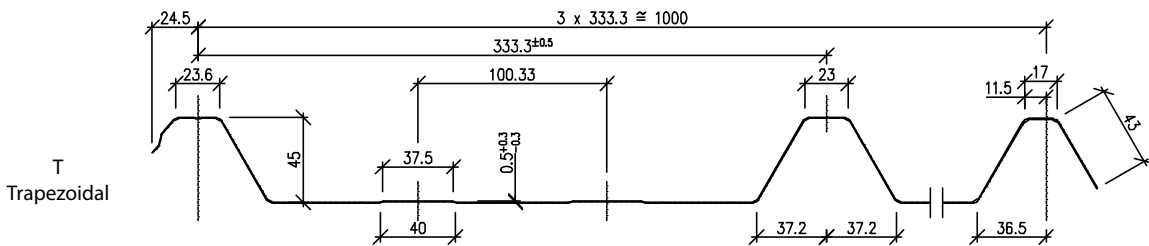
#### 3.1. R01

#### PIR STANDARD roof panels- joint, profile type

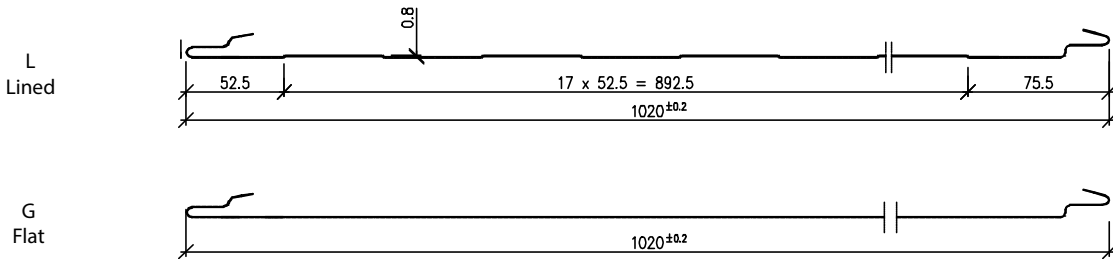


\* $t_1/t_2 = 40/85, 60/105, 80/125, 100/145, 120/165, 160/205$  mm

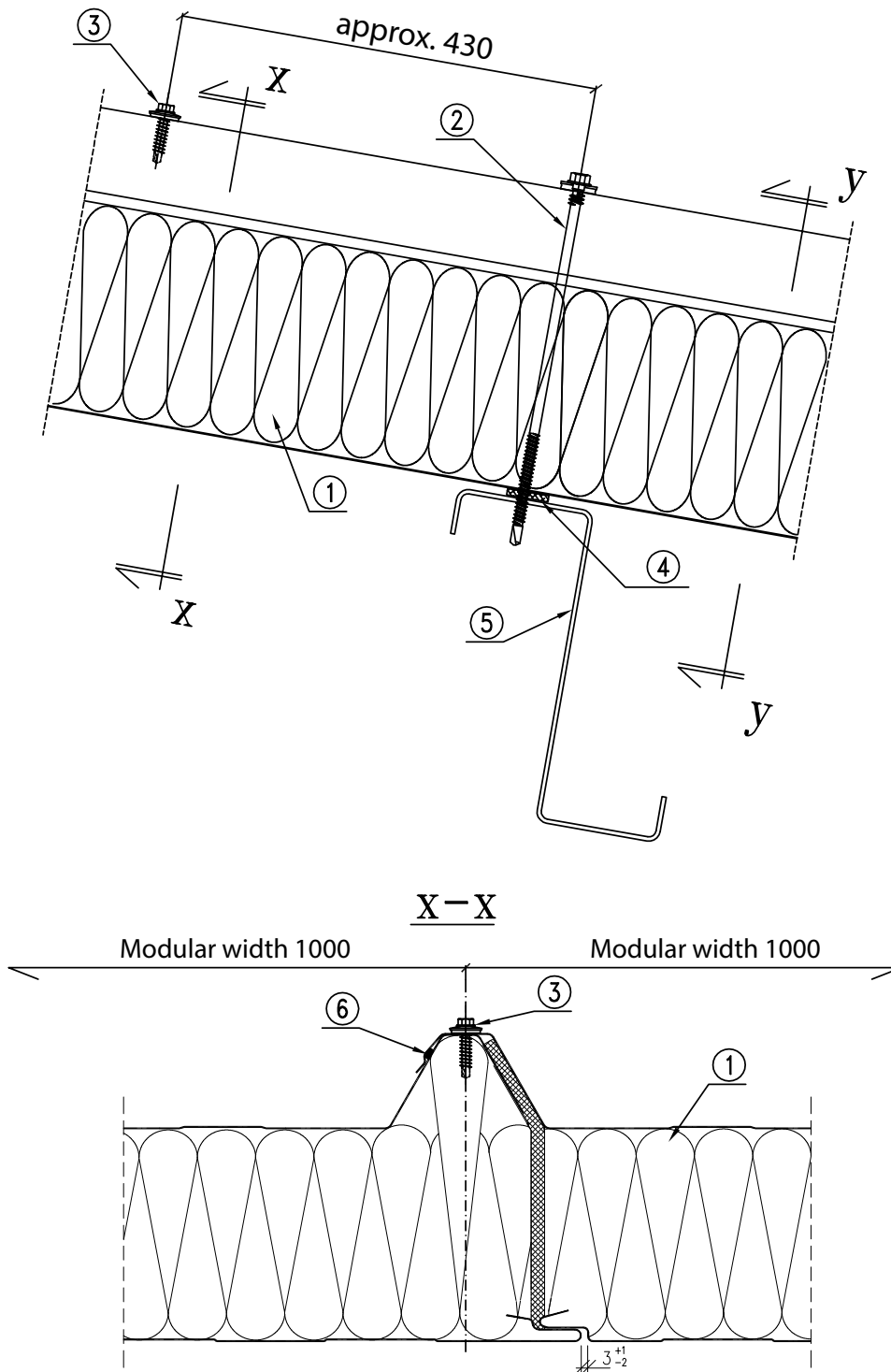
#### EXTERNAL FACINGS:



#### INTERNAL FACINGS:



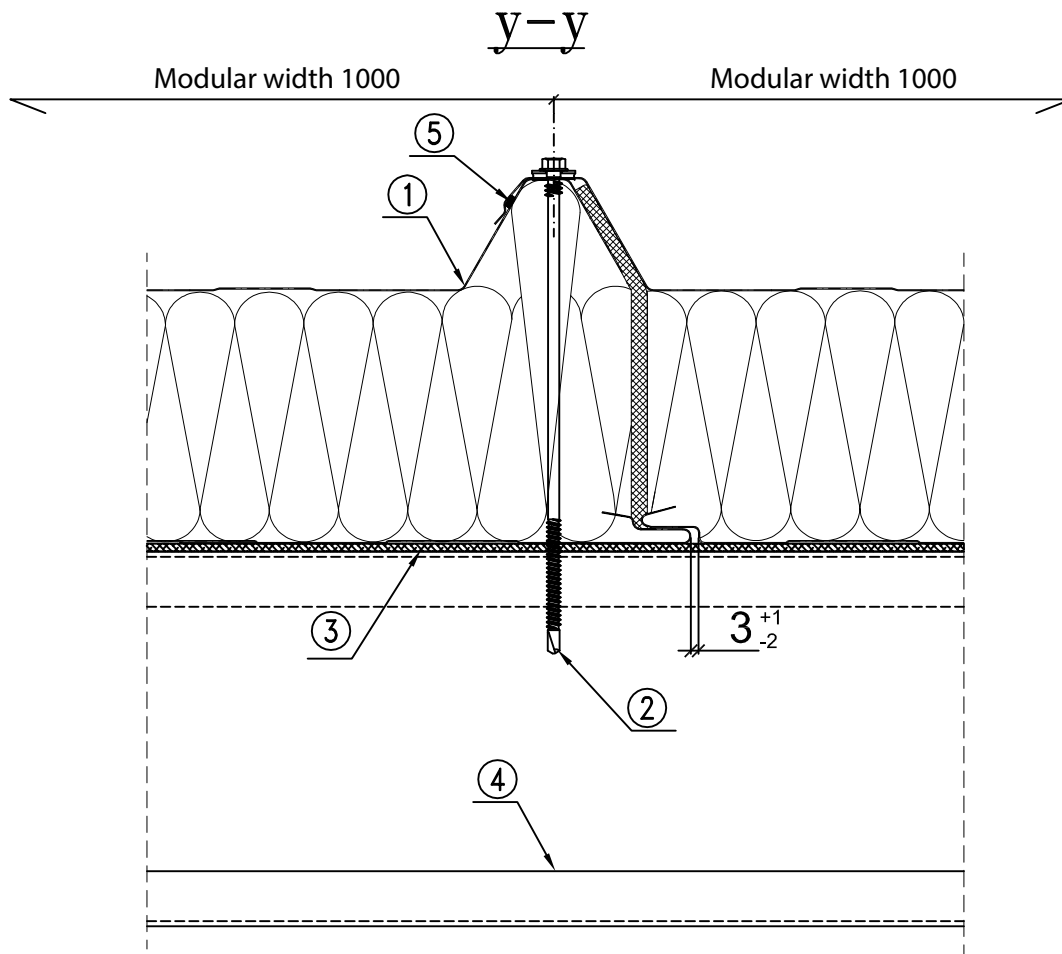
3.2. R02/1  
Fastening panel to a steel purlin



1. PIR STANDARD roof panel
2. Connector fixing the panel to LB1 - LB5 purlins
3. LB6 self-drilling connector or AL/Fe one-side tight rivet approx.. every 430 mm
4. PES 3x20 adhesive sealing tape (recommended)
5. Bearing purlin according to the structural design
6. Butyl mass or tape

### 3.3. R02/2

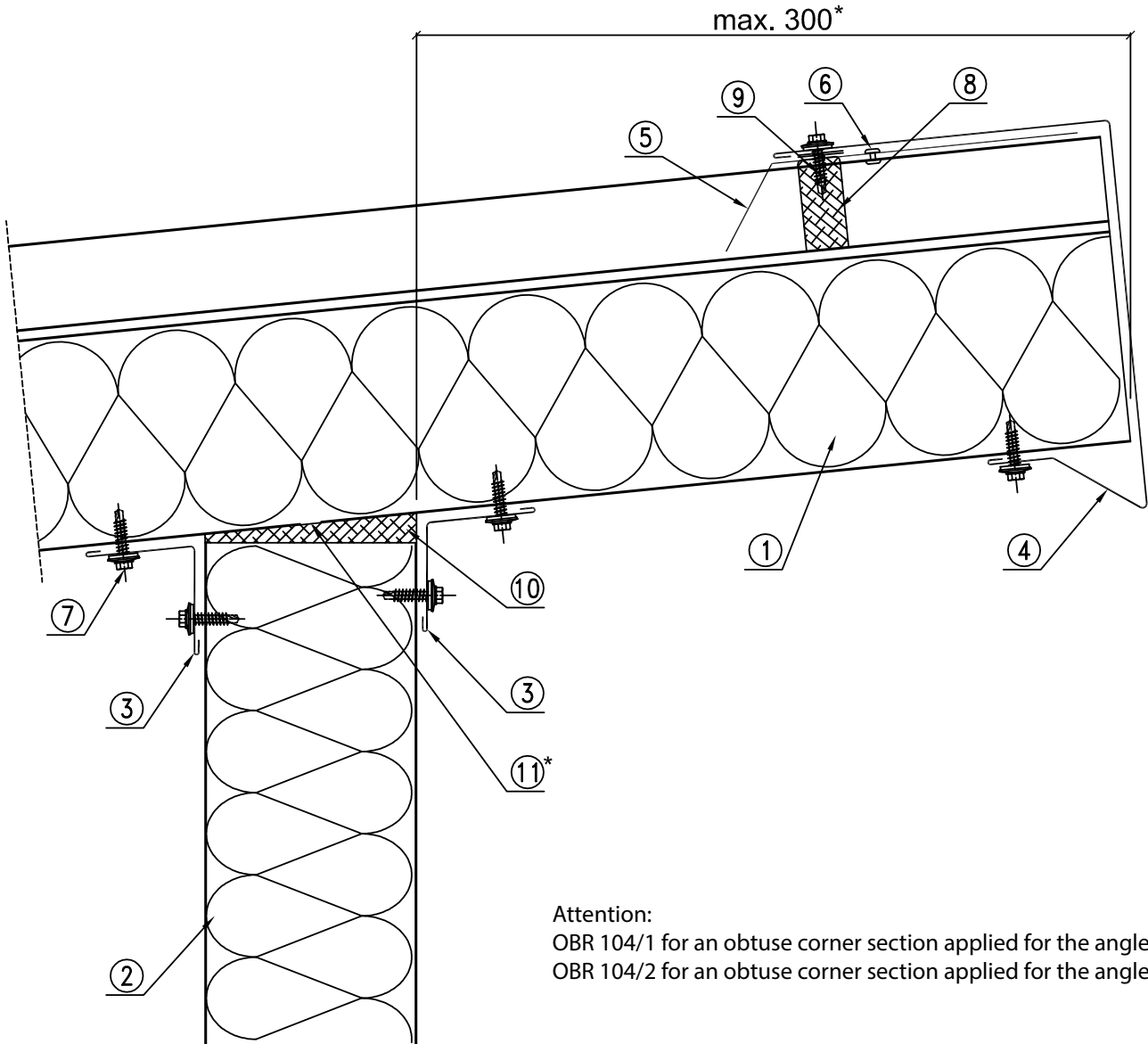
#### Fastening panel to a steel purlin – Y-Y section



1. PIR STANDARD roof panel
2. LB 1- LB 5 fasteners for fastening panels to purlins
3. PES 3x20 self-adhesive sealing tape (recommended)
4. Bearing purlin acc. to the construction design
5. Butyl mass or tape

### 3.4. R03

#### Panel ending for a monopitch roof

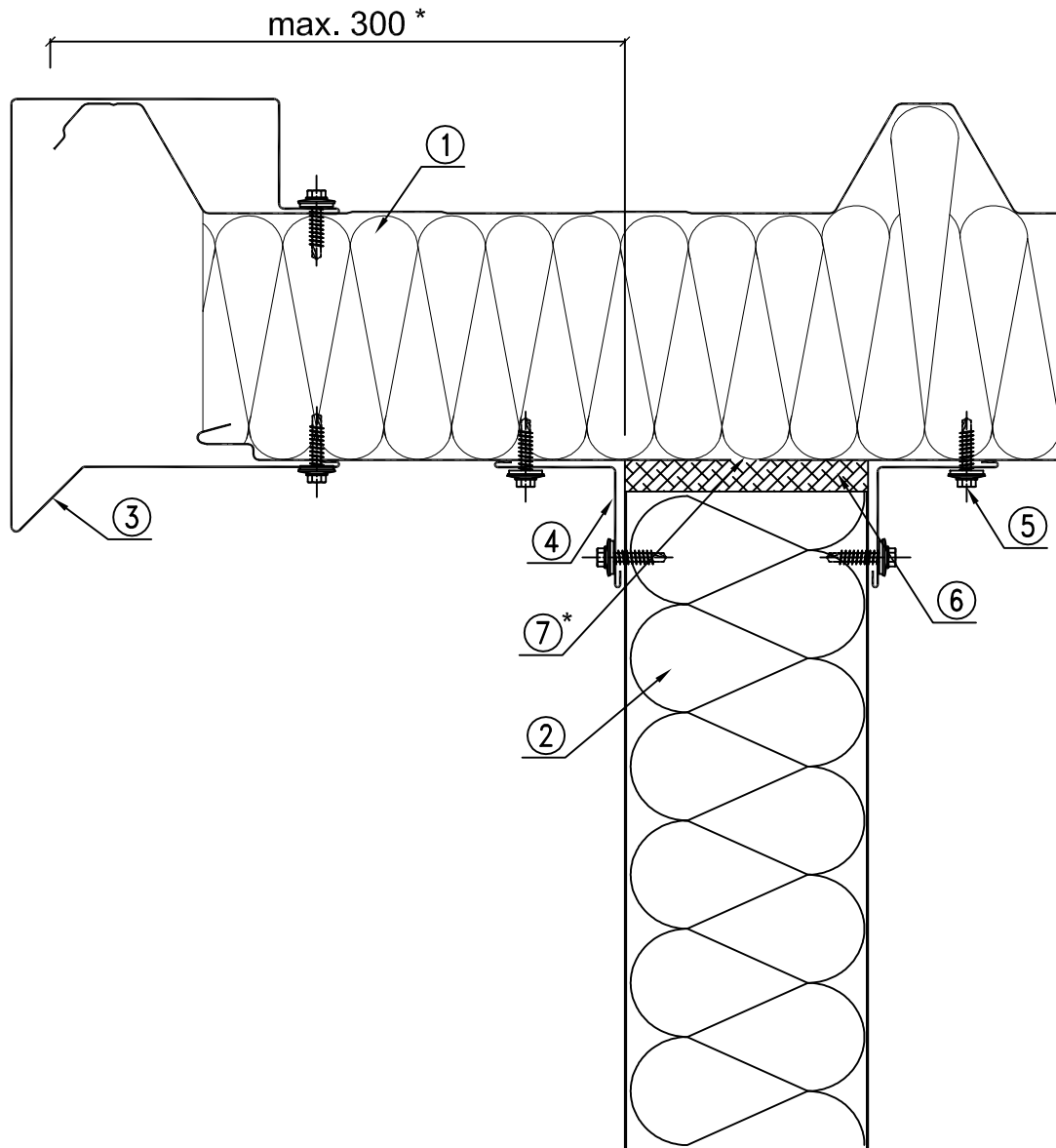


**Attention:**

OBR 104/1 for an obtuse corner section applied for the angle of 6°  
OBR 104/2 for an obtuse corner section applied for the angle of 22°

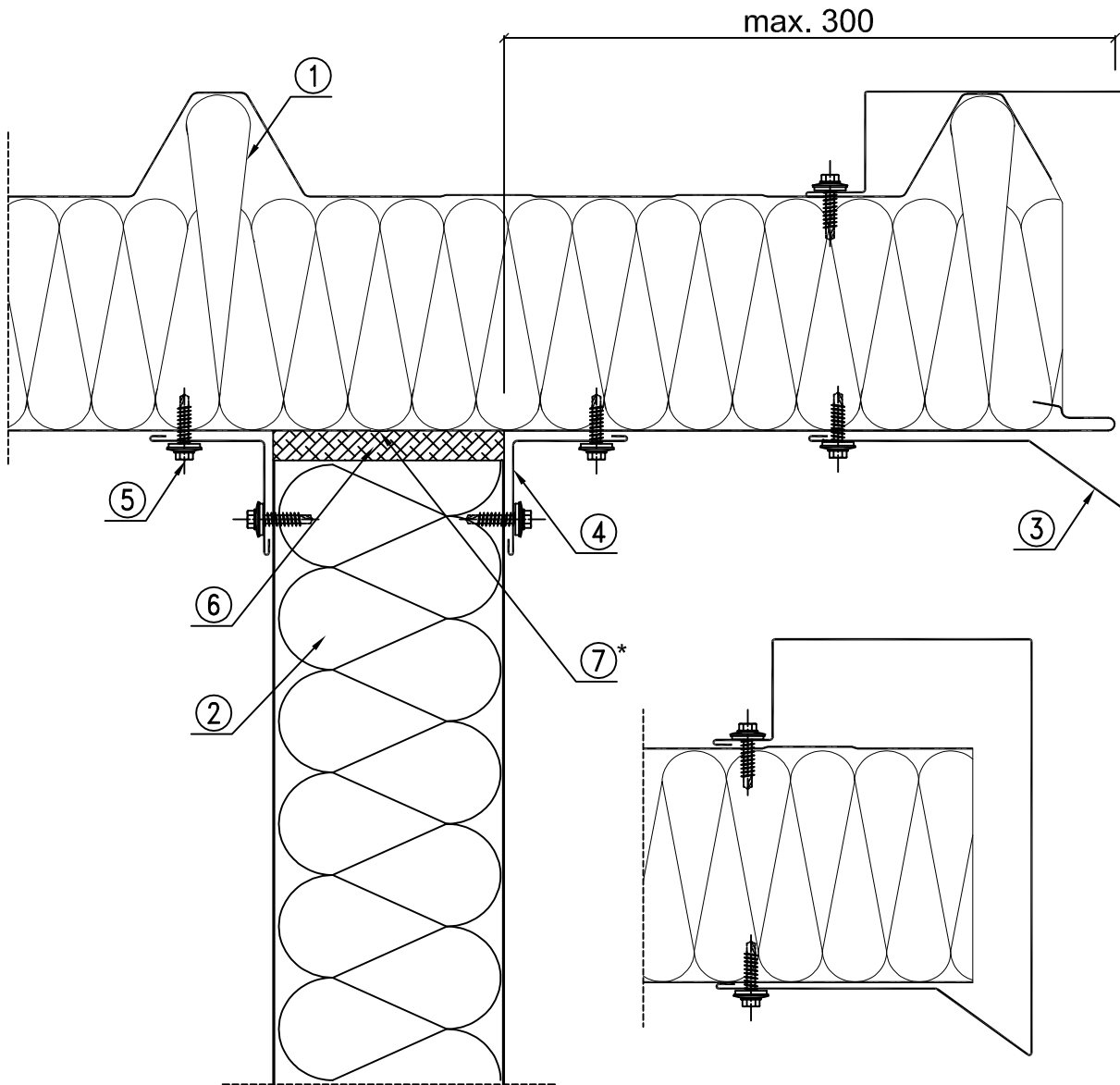
1. PIR STANDARD roof panel
2. PIR STANDARD or PIR PLUS wall panel
3. OBR 104 flashing or individual flashing
4. OBR 200 flashing or individual flashing
5. OBR 210 flashing or individual flashing
6. AL/Fe assembly blind rivet between sinusoid tops every 1000 mm
7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
8. TUN 45 sealing tape
9. Butyl sealing tape (recommended)
10. Assembly foam or polyurethane expansion gasket
11. Cladding with a 10 mm wide gap (throat distance of the support max 300 mm)  
\*recommended to improve thermal insulation efficiency

### 3.5. R04/1 Gable-end roof edge



1. PIR STANDARD roof panel
  2. PIR STANDARD or PIR PLUS wall panel
  3. OBR 202 flashing or individual flashing
  4. OBR 104 flashing or individual flashing
  5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
  6. Assembly foam or polyurethane expansion gasket
  7. Cladding with a 10 mm wide gap (throat distance of the support max 300 mm)
- \*recommended to improve thermal insulation efficiency

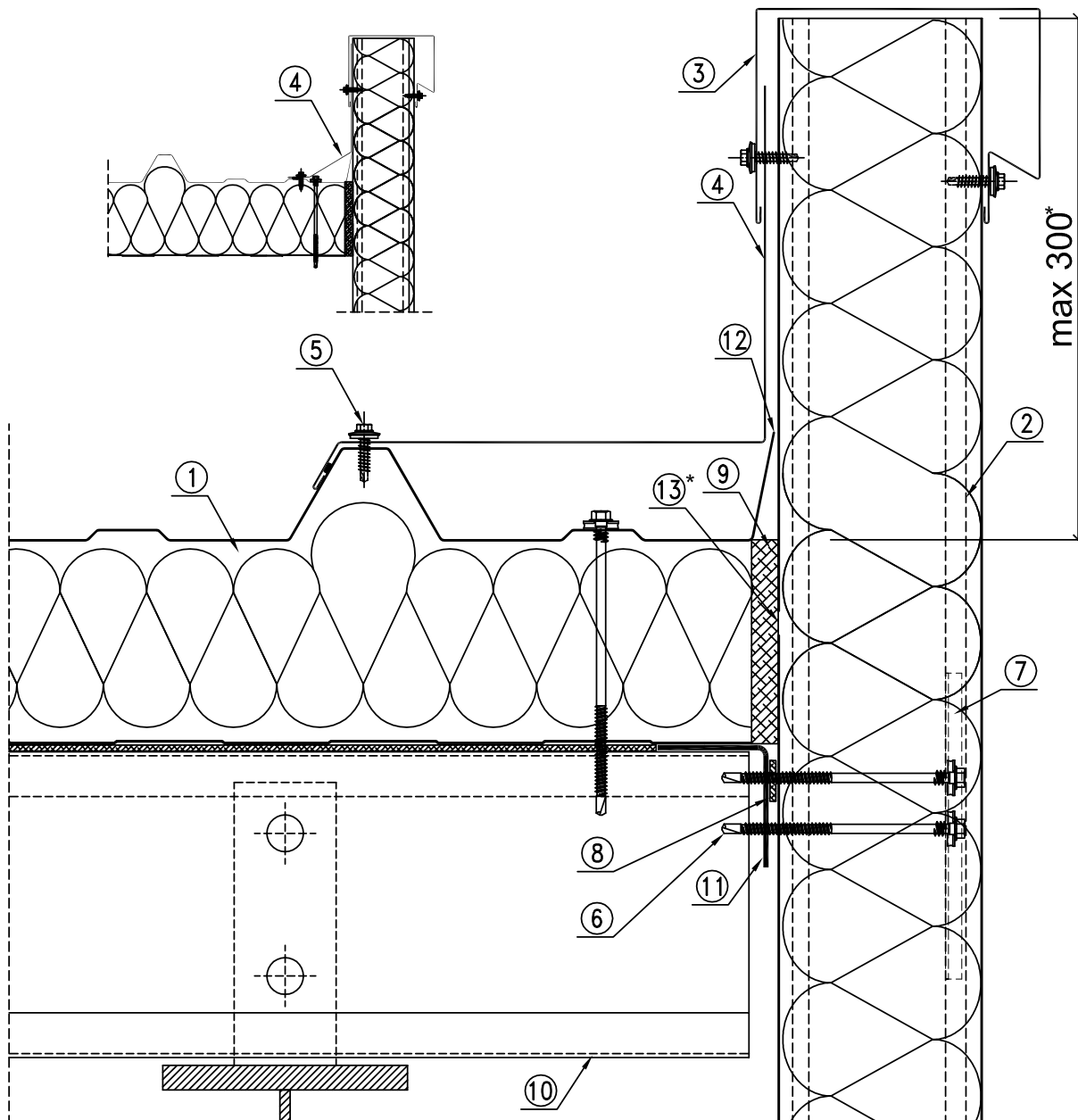
3.6. R04/2  
Gable-end roof edge



1. PIR STANDARD roof panel
  2. PIR STANDARD or PIR PLUS wall panel
  3. OBR 202 flashing or individual flashing
  4. OBR 104 flashing or individual flashing
  5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
  6. Impregnated assembly foam or polyurethane expansion gasket
  7. Facing with a 10 mm wide gap (throat distance of the support max 300 mm)
- \*recommended to improve thermal insulation efficiency

### 3.7. R05

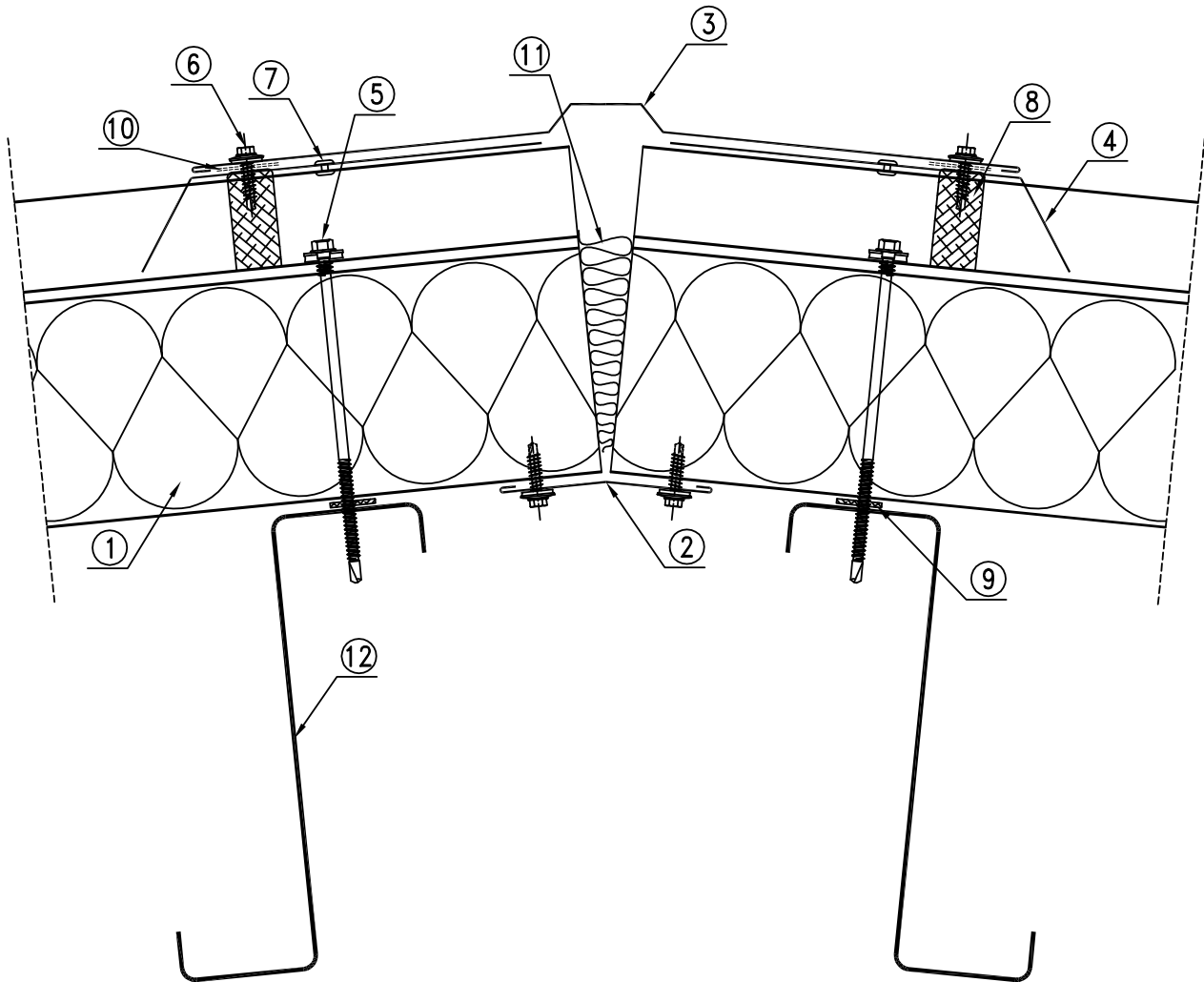
#### Joint of panels with a wall panel by the attic



1. PIR STANDARD roof panel
  2. PIR STANDARD or PIR PLUS wall panel
  3. OBR 112 flashing or individual flashing
  4. Individual flashing
  5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
  6. LB 1- LB 5 fasteners for fastening PIR panels
  7. LB 25 steel washer under fasteners
  8. PES 3x20 self-adhesive sealing tape (recommended)
  9. Impregnated assembly foam or polyurethane expansion gasket
  10. Purlin acc. to the construction design
  11. Angle fastened to a purlin acc. to the construction design
  12. Bent out upper cladding
  13. Facing with a 10 mm wide gap (throat distance of the support max 300 mm)
- \*recommended to improve thermal insulation efficiency

### 3.8. R06

#### Joint of panels at the roof ridge

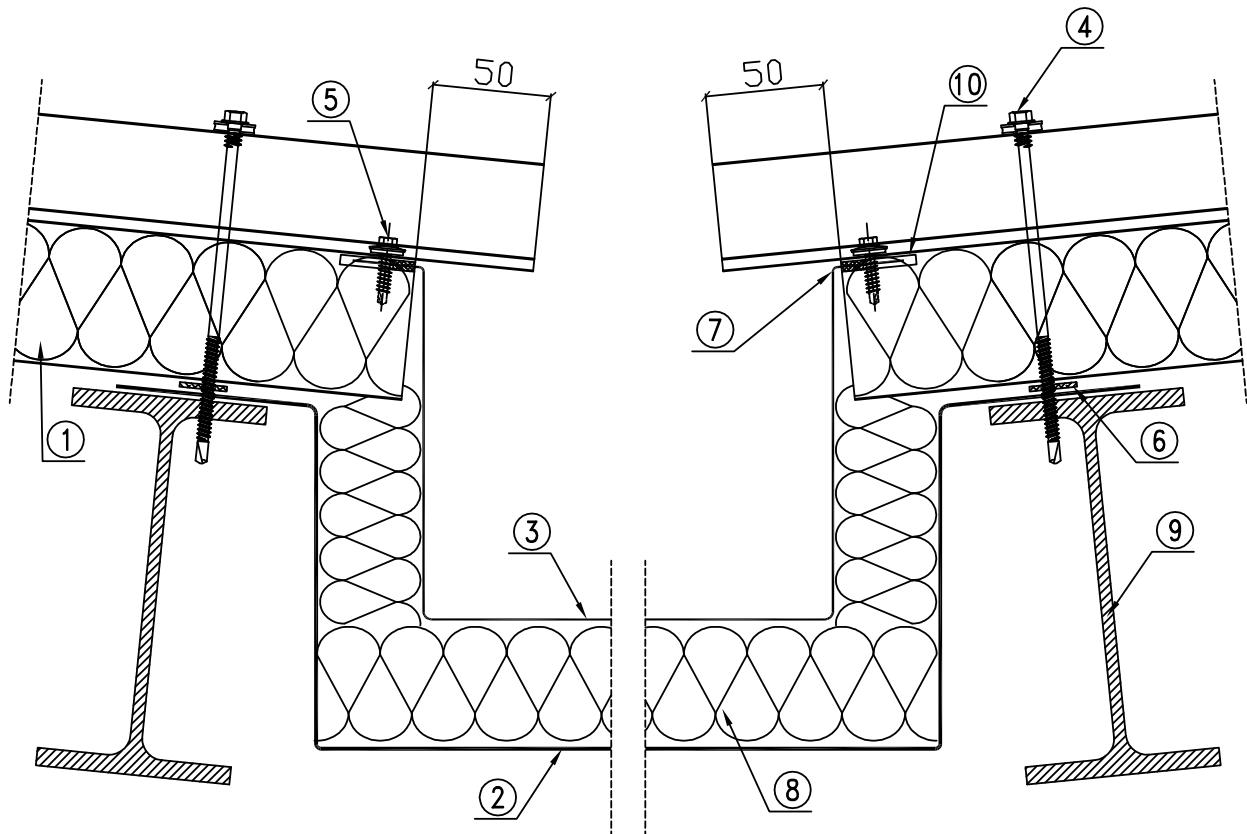


1. PIR STANDARD roof panel
2. OBR 104 flashing or individual flashing
3. OBR 52 or OBR 205 flashing or individual flashing
4. OBR 201 flashing or individual flashing
5. LB 1- LB 5 fasteners for fastening PIR panels
6. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
7. AL/Fe assembly blind rivet every 1000 mm
8. TUN 45 sealing tape
9. PES 3x20 self-adhesive sealing tape (recommended)
10. Butyl sealing tape (a tight rivet on the external roof cladding)
11. Thermal insulation material, impregnated polyurethane expansion gasket or assembly foam
12. Bearing purlin acc. to the construction design



### 3.9. R07

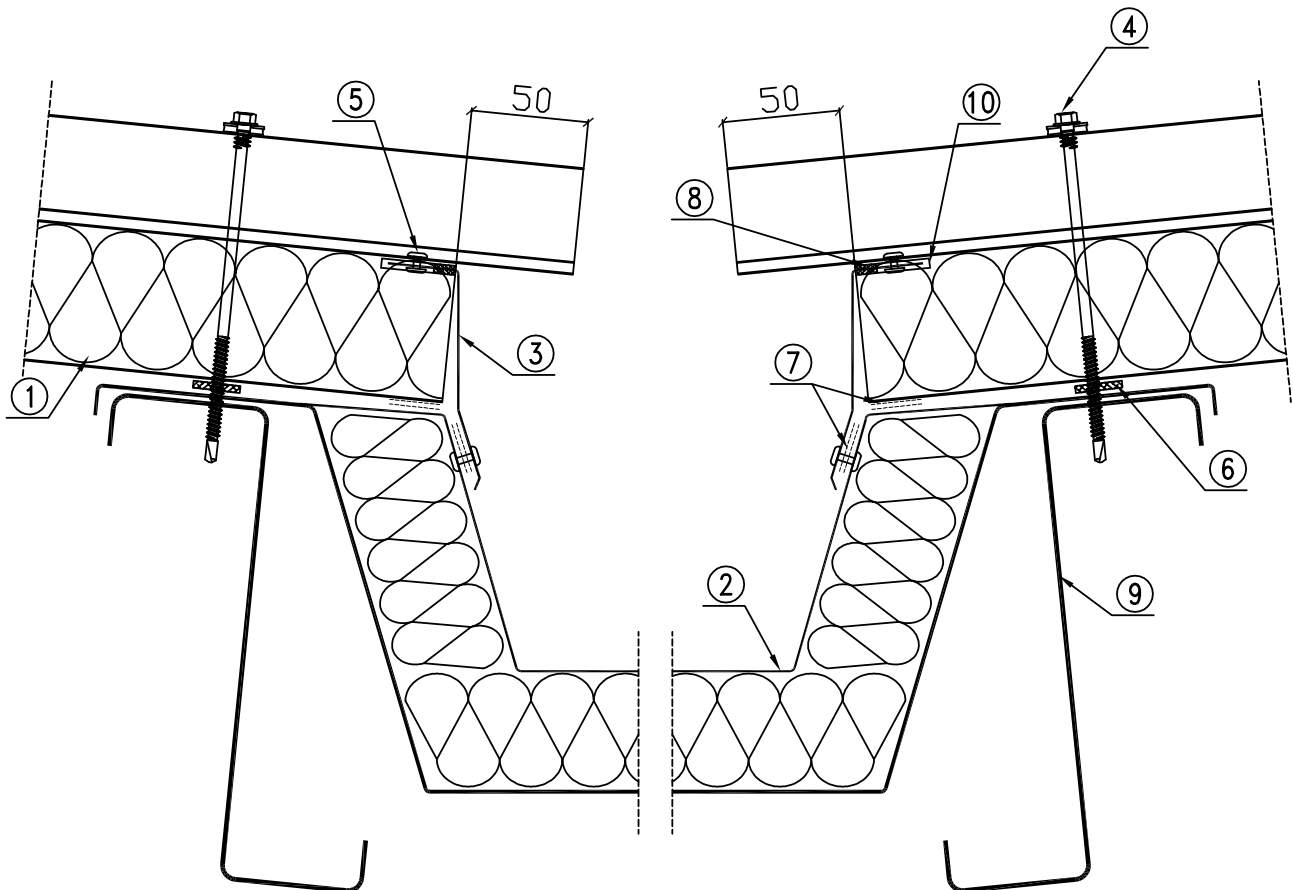
#### Joint of panels with an internal gutter



1. PIR STANDARD roof panel with undercut core
2. Internal profile of gutter (acc. to a separate, individual architectural specification)
3. External profile of gutter (acc. to a separate, individual architectural specification)
4. LB 1- LB 5 fasteners for fastening PIR panels
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Butyl sealing tape (recommended)
8. Gutter heat-insulating material
9. Bearing purlin acc. to the construction design
10. Panel core cut to the depth of approx. 30 mm

### 3.10. R08

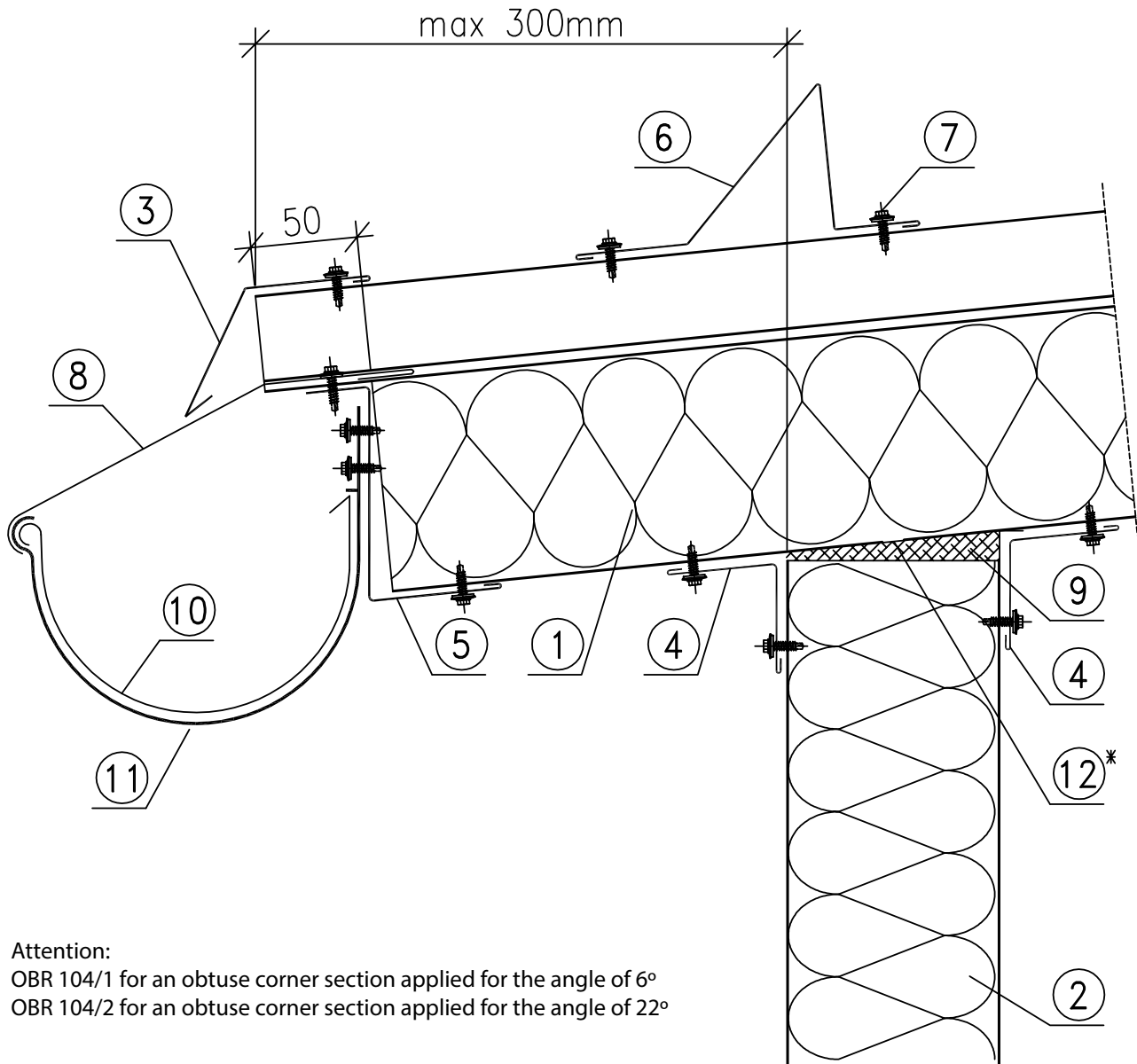
#### Joint of panels with a prefabricated internal gutter



1. PIR STANDARD roof panel with undercut core
2. Gutter trough, prefabricated according to a separate individual architectural specification (with inclination)
3. Individual flashing
4. LB 1- LB 5 fasteners for fastening PIR panels
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
6. PES 3x20 self-adhesive sealing tape (recommended)
7. Butyl sealing tape
8. Butyl tape or mass
9. Bearing purlin according to the structural design
10. Panel core cut to the depth of approx. 30 mm

### 3.11. R09/1

#### Joint of panels with a wall panel in the eaves



**Attention:**

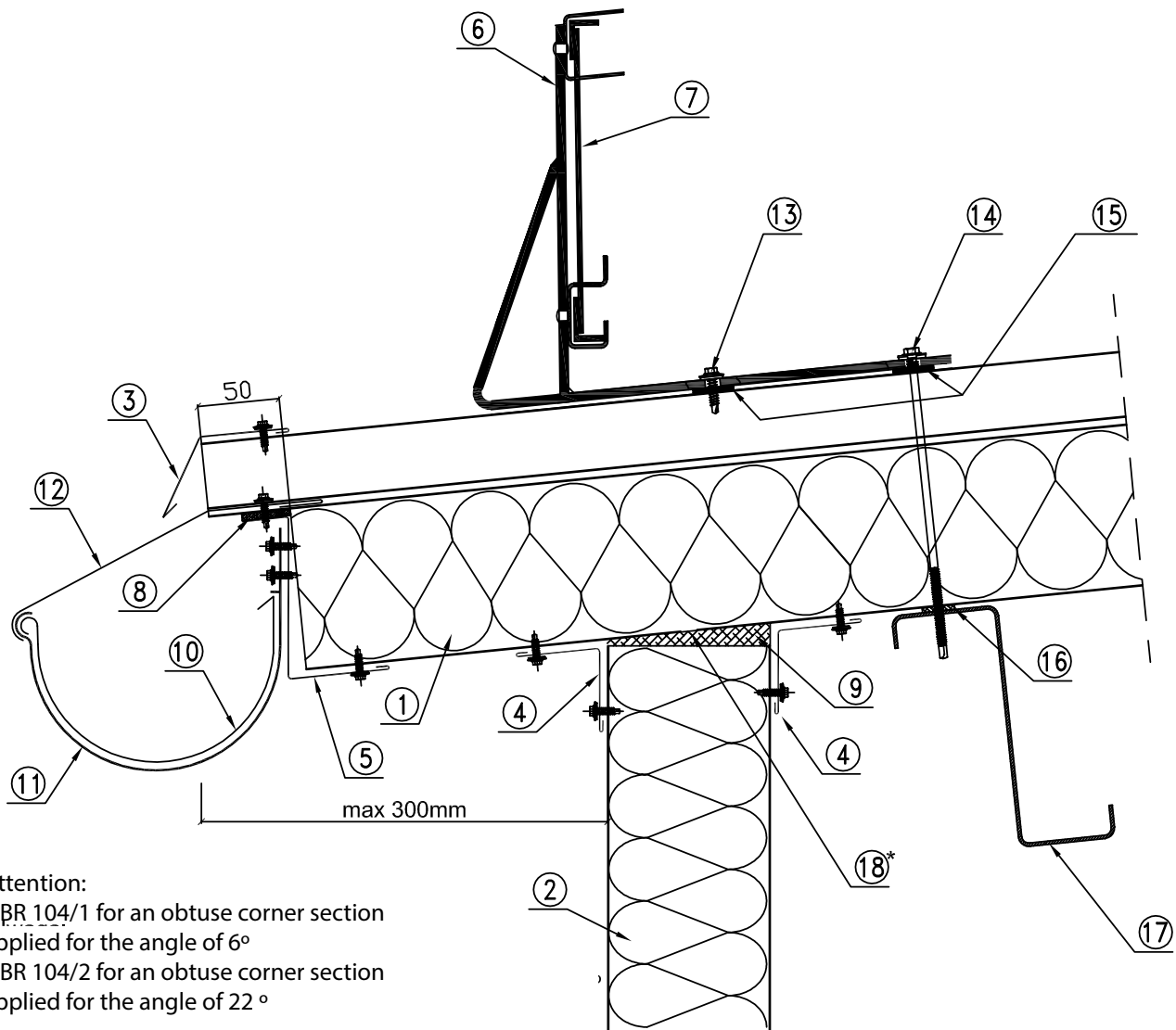
OBR 104/1 for an obtuse corner section applied for the angle of 6°

OBR 104/2 for an obtuse corner section applied for the angle of 22°

1. PIR STANDARD roof panel with undercut core
  2. PIR STANDARD or PIR PLUS wall panel
  3. OBR 203 flashing or individual flashing
  4. OBR 104 flashing or individual flashing
  5. OBR 62 flashing or individual flashing
  6. OBR 204 flashing – snow guard or individual flashing
  7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
  8. Gutter holder
  9. Impregnated assembly foam or polyurethane expansion gasket
  10. Gutter acc. to the architecture design (with a slope)
  11. Gutter hook
  12. Cladding interrupted at approx. 10 mm thickness (max 300 mm bracket range)
- \*refers to increased thermal performance requirements

### 3.12. R09/2

#### Joint of a roof panel with a wall panel in the eaves with a snow guard



**Attention:**

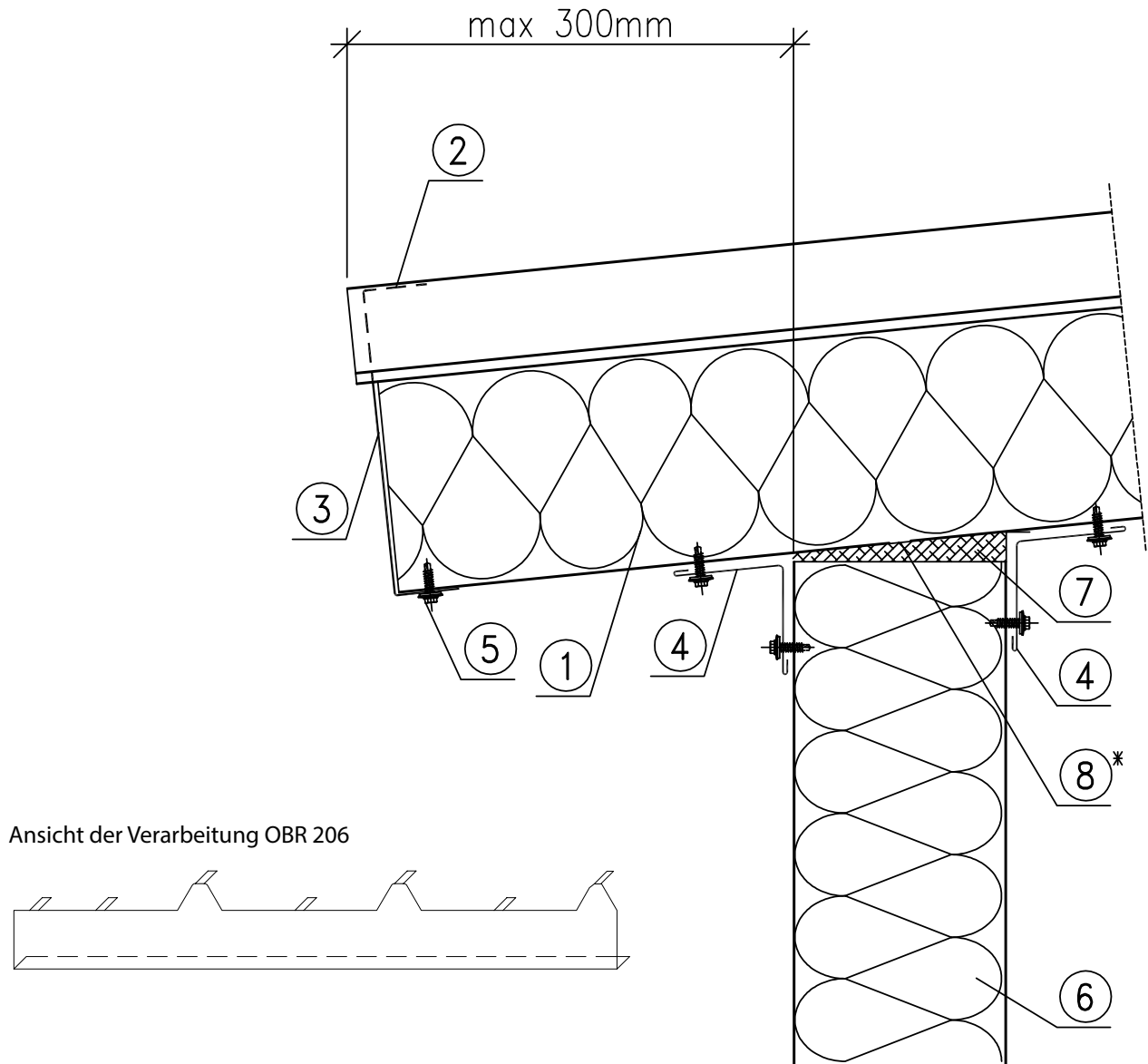
QBR 104/1 for an obtuse corner section applied for the angle of 6°

OBR 104/2 for an obtuse corner section applied for the angle of 22°

1. PIR STANDARD roof panel with undercut core
  2. PIR STANDARD or PIR PLUS wall panel
  3. OBR 203 flashing or individual flashing
  4. OBR 104 flashing or individual flashing
  5. OBR 62 flashing or individual flashing
  6. Guard support for the WPT trapezium (3 pieces per each guard)
  7. Snow guard PP L=2000 mm
  8. Butyl sealing tape or mass
  9. Impregnated polyurethane expansion gasket or assembly foam
  10. Gutter acc. to the architectural design (with pitch)
  11. Gutter hook
  12. Gutter bracket
  13. Self-drilling screw 4.80 x 20 mm
  14. LB 1 – LB 5 fasteners for fastening PIR panels
  15. Butyl tape or mass
  16. PES 3x20 self-adhesive sealing tape
  17. Bearing purlin according to the structural design
  18. Cladding with a 10 mm wide gap (throat distance of the support max 300 mm)
- \*recommended to improve thermal insulation efficiency

### 3.13. R09/3

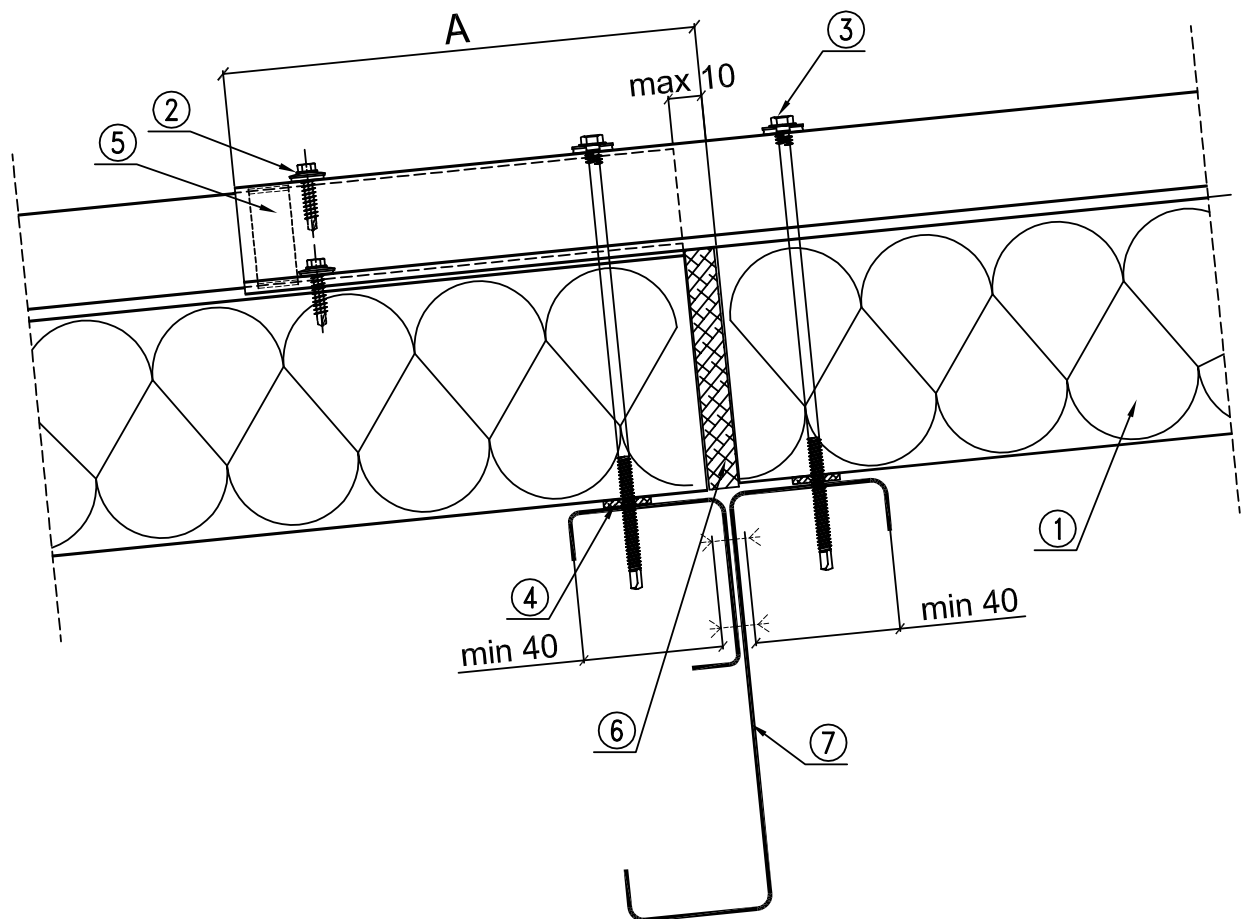
#### Finishing a panel in eaves with OBR 206 flashing



1. PIR STANDARD roof panel
  2. OBR 206 flashing inserted between the core and the external cladding
  3. OBR 206 flashing
  4. OBR 104 flashing or individual flashing
  5. Self-drilling fastener LB6 or blind Al/Fe rivet, approx. every 300 mm (tight rivet on external face of cladding)
  6. PIR STANDARD or PIR PLUS wall panel
  7. Assembly foam or polyurethane seal
  8. Ripped cladding, approx. 10 mm wide (support outreach of max. 300 mm)
- \*recommended to improve thermal insulation efficiency

### 3.14. R10/1

#### Joining panels lengthwise ( $L > 18$ m)

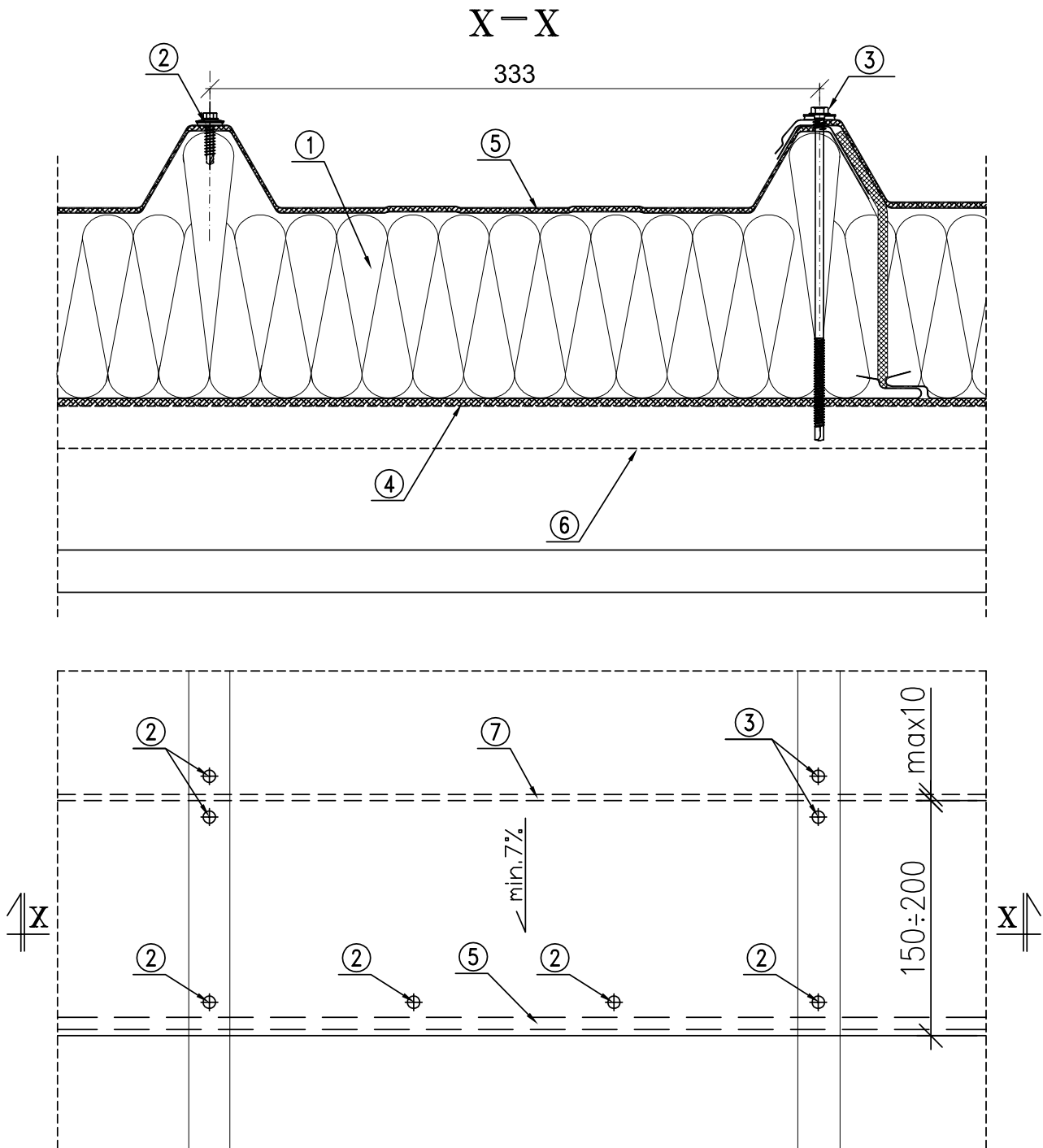


1. PIR STANDARD roof panel with undercut core
2. LB 6 self-drilling fastener or AL/Fe blind rivet in every upper wave
3. LB 1- LB 5 fasteners for fastening PIR panels
4. PES 3x20 self-adhesive sealing tape (recommended)
5. Butyl sealing tape or mass
6. Impregnated polyurethane expansion gasket or assembly foam
7. Bearing purlin acc. to the construction design

#### Attention !

- Standard  $A=50$  mm next to the eaves
- Standard  $A=150$  mm next to the overlap
- max.  $A=200$  mm next to the overlap
- min.  $A=10$  mm without any overlap

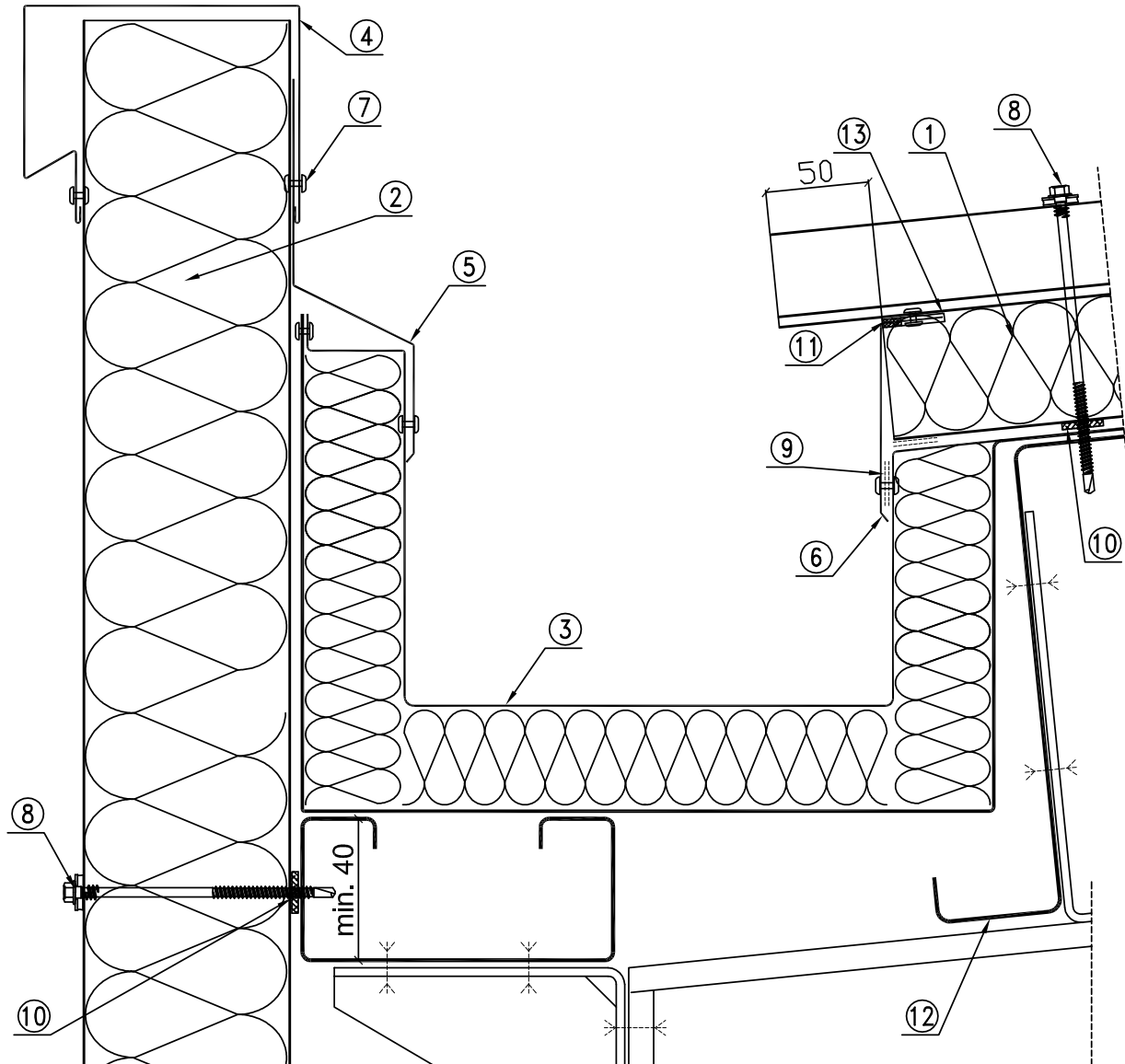
3.15. R10/2  
 Joining panels lengthwise (L > 18 m)



1. PIR STANDARD roof panel with undercut core
2. LB 6 self-drilling fastener or AL/Fe blind rivet in every upper wave
3. LB 1- LB 5 fasteners for fastening PIR panels
4. PES 3x20 self-adhesive sealing tape (recommended)
5. Butyl sealing tape or mass
6. Bearing purlin acc. to the construction design
7. Impregnated expansion polyurethane gasket or mounting tape

### 3.16. R11

#### Joint of panels with a prefabricated gutter by the attic

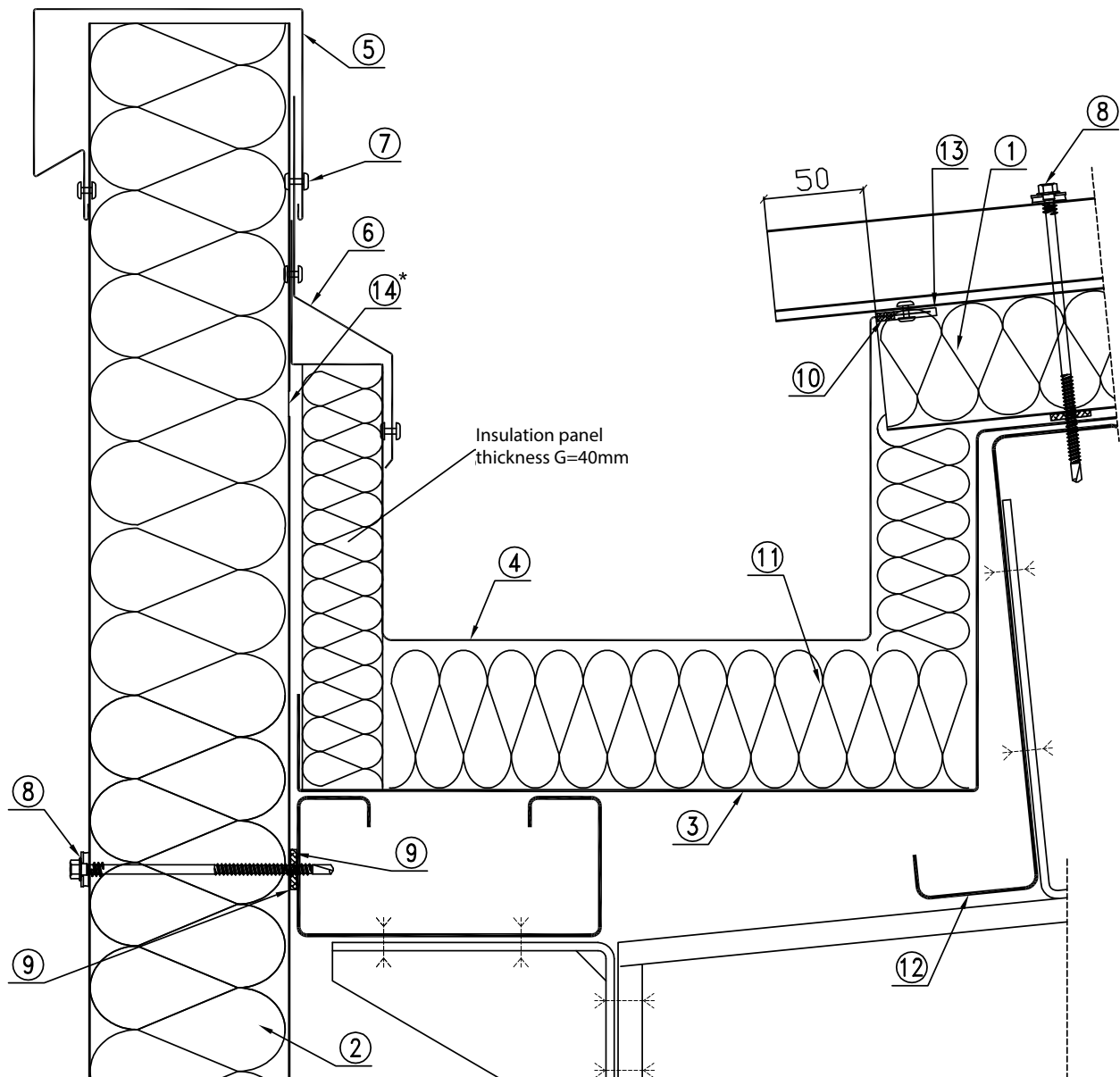


1. PIR STANDARD roof panel with undercut core
2. PIR STANDARD or PIR PLUS wall panel
3. Prefabricated gutter acc. to the architecture design (with a slope)
4. OBR 112 flashing or individual flashing
5. Individual flashing
6. Individual flashing
7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof and gutter cladding)
8. LB 1- LB 5 fasteners for fastening PIR panels
9. Butyl tape or mass
10. PES 3x20 self-adhesive sealing tape (recommended)
11. Butyl sealing compound (recommended)
12. Bearing purlin acc. to the construction design
13. Panel core cut to the depth of approx. 30 mm



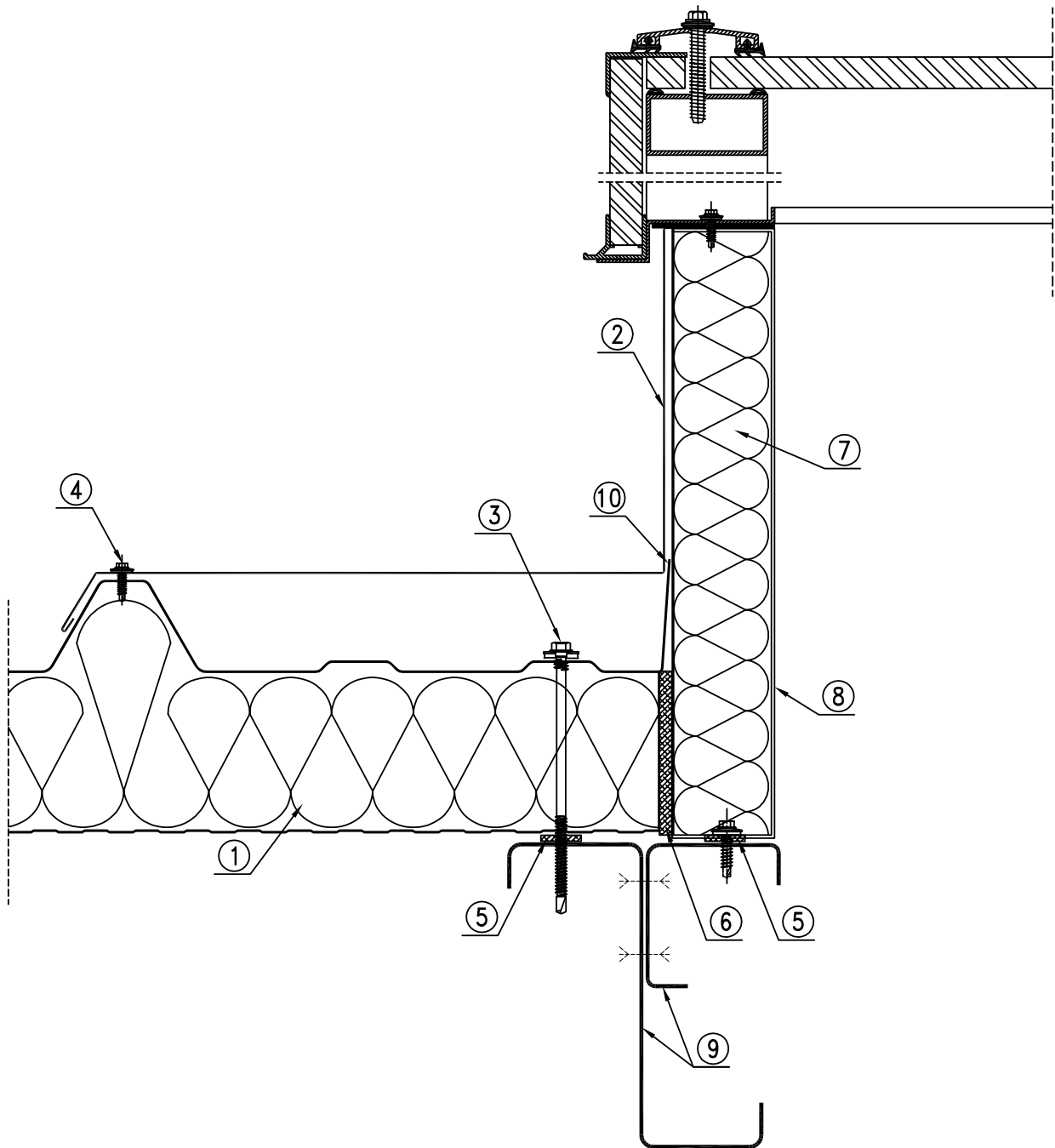
### 3.17. R12

#### Joint of panels with an internal gutter by the attic



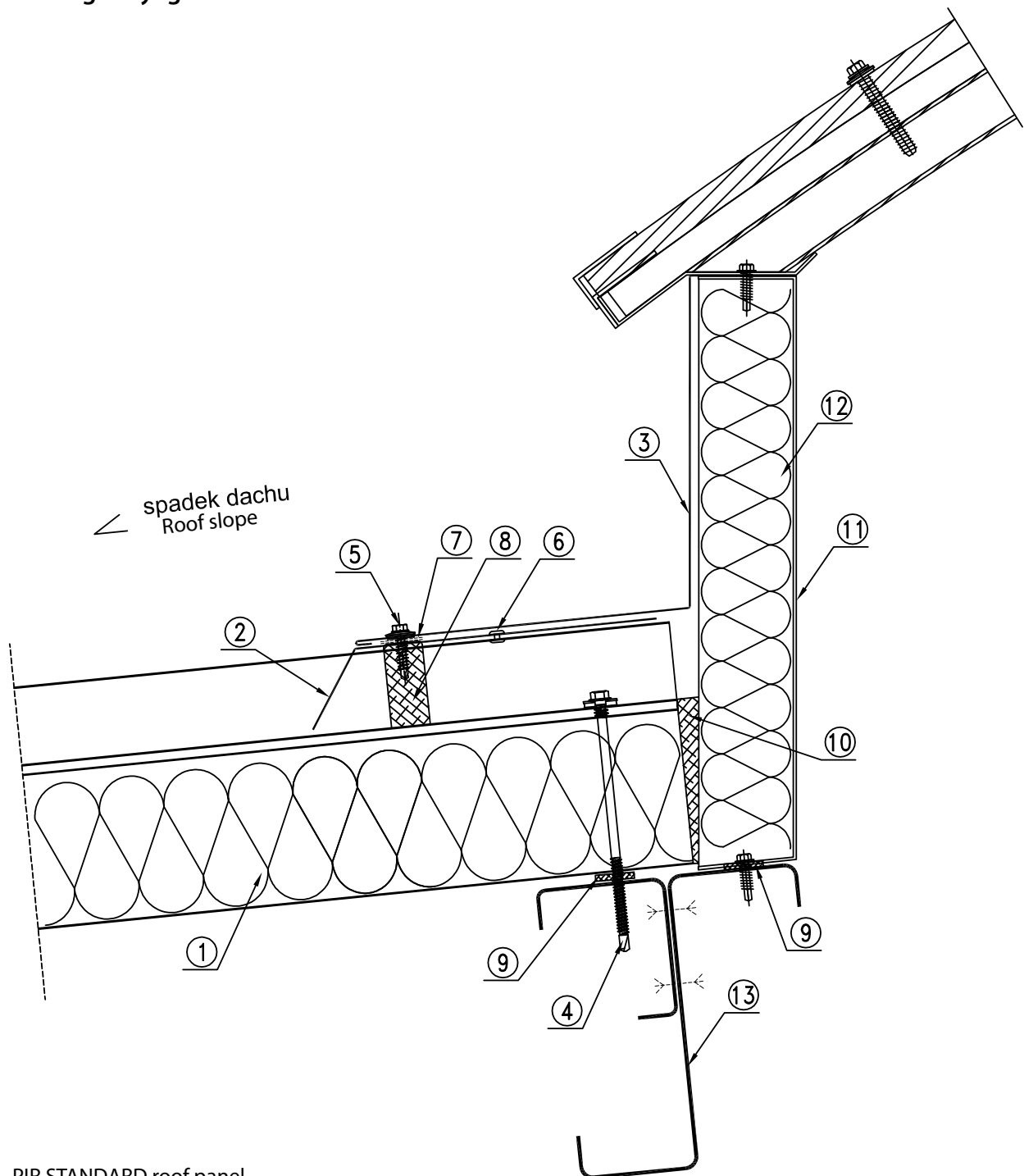
1. PIR STANDARD roof panel with undercut core
  2. PIR STANDARD or PIR PLUS wall panel
  3. Internal profile of gutter trough according to a separate specification
  4. External profile of gutter trough according to a separate specification
  5. OBR 112 flashing or individual flashing
  6. Individual flashing
  7. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof and gutter cladding)
  8. LB 1- LB 5 fasteners for fastening PIR panels
  9. PES 3x20 self-adhesive sealing tape (recommended)
  10. Butyl sealing compound (recommended)
  11. Gutter heat-insulating material (e.g. THERMANO, mineral wool, etc.)
  12. Bearing purlin according to the construction design
  13. Panel core cut to the depth of approx. 30 mm
  14. Cladding with a 10 mm wide gap (throat distance of the support max 300 mm)
- \*refers to increased thermal performance requirements

**3.18. R13**  
**Roof ridge skylight – longitudinal section**



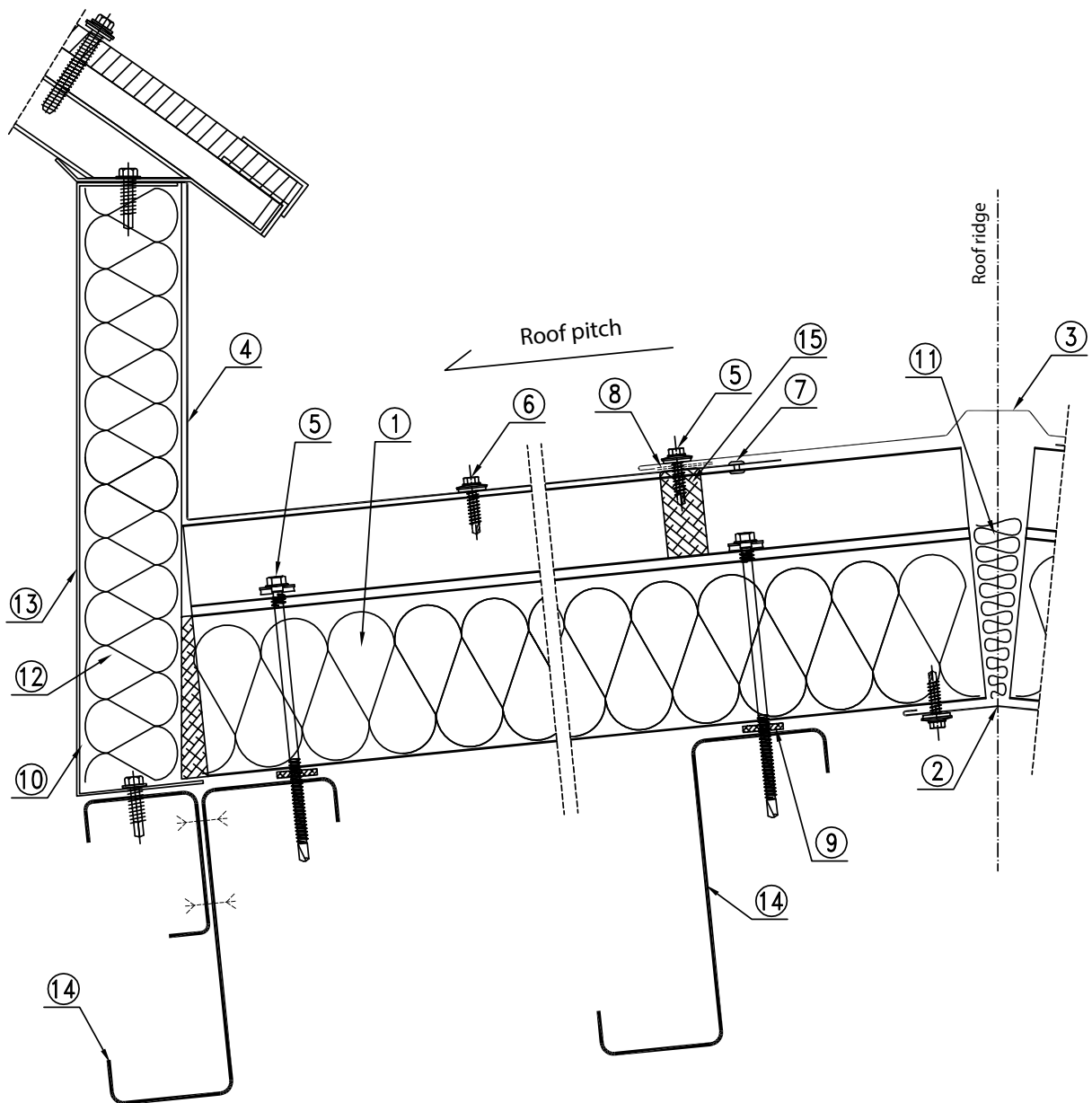
1. PIR STANDARD roof panel
2. Individual flashing
3. LB 1- LB 5 fasteners for fastening PIR panels
4. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm
5. PES 3x20 self-adhesive sealing tape (recommended)
6. Assembly foam or polyurethane expansion gasket
7. Skylight heat-insulating material (e.g. THERMANO, mineral wool, etc.)
8. Skylight base according to a separate specification of skylight manufacturer
9. Bearing purlin according to the structural design + bevel
10. Bent out upper cladding
11. Skylight elements according to a separate specification of skylight manufacturer

### 3.19. R14 Roof ridge skylight – cross section



1. PIR STANDARD roof panel
2. OBR 201 flashing or individual flashing
3. Skylight planking
4. LB 1- LB 5 fasteners for fastening PIR panels
5. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
6. AL/Fe assembly blind rivet approx. every 1000 mm
7. Butyl tape or mass
8. TUN 45 sealing tape
9. PES 3x20 self-adhesive sealing tape (recommended)
10. Assembly foam or polyurethane gasket
11. Skylight base according to a separate specification of skylight manufacturer
12. Skylight heat-insulating material (e.g. THERMANO, mineral wool, etc.)
13. Bearing purlin according to the structural design

### 3.20. R15 Roof ridge skylight – cross section



1. PIR STANDARD roof panel
2. OBR 104 flashing
3. OBR 52 or OBR 205 flashing
4. Individual flashing – drawn to the roof ridge
5. LB 1- LB 5 fasteners for fastening PIR panels
6. LB 6 self-drilling fastener or AL/Fe blind rivet every 300 mm (a tight rivet on the external roof cladding)
7. AL/Fe blind rivet approx. every 1000 mm
8. Butyl tape or mass
9. PES 3x20 self-adhesive sealing tape (recommended)
10. Assembly foam or polyurethane gasket
11. Heat-insulating material or assembly foam
12. Skylight heat-insulating material (e.g. THERMANO, mineral wool, etc.)
13. Skylight base according to a separate specification of skylight manufacturer
14. Bearing purlin according to the structural design
15. TUN 45 sealing tape



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