

TECHNICAL DETAILS CATALOGUE

Thermal insulating **roof panels**



Chapter 1.	Technical characteristics of panels. Computing hypotheses	page.5
Chapter 2.	Loadbearing capacities of panels	page.14
Chapter 3.	Technical details for panels assembly	page.22

Chapters 1 and 2

Chapters 1 and 2 of this technical catalogue were carried out in collaboration with Technical University of Cluj Napoca, Faculty of Construction - Structures Department, under a research contract.

Chapter 1 presents the hypotheses on which the calculation has been made and the static systems analyzed.

Chapter 2 contains tables with loadbearing capacities depending on maximum spans allowed for roof sandwich panels with 3 and 5 ribs.

Chapter 3

Chapter 3 was developed by the Design Department of the companyPlastsistem.

Chapter 3 contains details of assembling the roof panels.

Loading tables

Load tables refer solely to the types of polyurethane foam panels with 3 and 5 ribs, produced by our company. The tables present load bearing capacities of panels analyzed according the types and sizes of the manufactured sections and the related physical and mechanical characteristics. The calculations were carried out according the standard EN 14509: 2013 - Appendix E " Self-supporting insulated panels, with two metal faces", regulating the design of sub-assemblies made from sandwich panels.

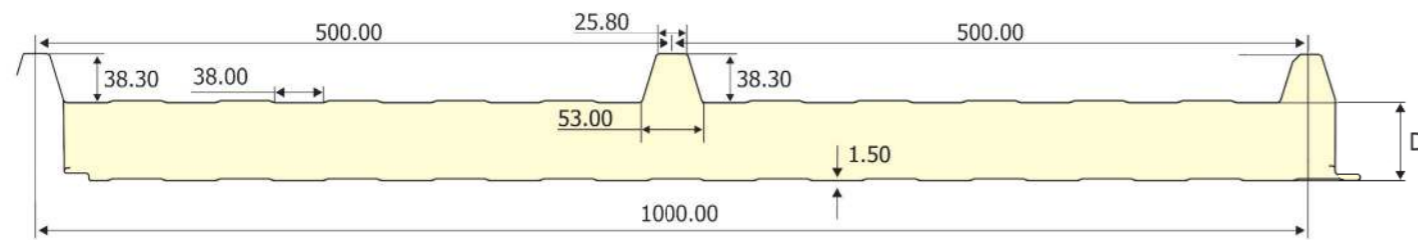
Chapter 1

TECHNICAL CHARACTERISTICS OF PANELS. COMPUTING HYPOTHESES

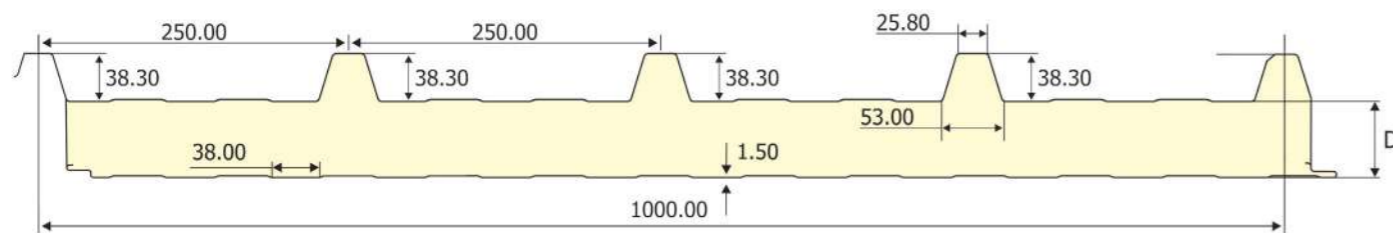
Technical characteristics of panels

THICKNESS

The analysis considered the types of thermal insulating panels included in Plastsistem's portfolio, having the geometrical characteristics listed below.



Type. 1: Transversal 3 ribs panel - ISOAC 3
Thicknesses: D=30,40,50,60,80,100,120 mm



Type. 2: Transversal 5 ribs panel - ISOAC 5
Thicknesses: D=30,40,50,60,80,100,120 mm

Characteristics

Materials / Thicknesses / Hypotesis

Steel qualities considered in the calculation are according to EN 10346: 2009 "Continuously hot-dip coated steel flat products - Technical delivery conditions". The analyzed thermal insulating panels have the following typo dimensions:

· exterior steel sheet made of prepainted galvanized steel S250GD+Z180 with corrosion protection by hot galvanizing, of thickness	25µm, thickness of the steel sheet 0.45 mm
· interior steel sheet made of prepainted galvanized steel S220GD+Z100 with corrosion protection by hot galvanizing, of thickness	15µm, thickness of the steel sheet 0.40 mm
· thickness of panel (polyurethane foam core)	30-40-50-60-80-100-120 mm

Characteristics of the steel used for the exterior face, with reference to steel grade S250GD + Z180, are as follow:

· yield strength	$f_y = 250 \text{ N/mm}^2$;
· thermal expansion coefficient	$\alpha_{Ti} = 1.20 \times 10^{-5} / ^\circ\text{C}$
· elasticity modulus	$E = 210000 \text{ N/mm}^2$

Characteristics of the steel used for the interior face, with reference to steel grade S220GD + Z100, are as follow:

· yield strength	$f_y = 220 \text{ N/mm}^2$
· thermal expansion coefficient	$\alpha_{Ti} = 1.20 \times 10^{-5} / ^\circ\text{C}$
· elasticity modulus	$E = 210000 \text{ N/mm}^2$

The characteristics of the foam forming the core of the panel and the bending effort of the faces, obtained from the laboratory tests were used in determining the load bearing capacity of the panels.

Types of panels, for which loadbearing capacity tables were drafted:

· thickness of transversal panels with 3 and 5 ribs	30-40-50-60-80-100-120 mm
· maximum manufacturing length	L max = 13,50 m

Drafting the tables referring to capable loads of thermal insulating sandwich panels

Computing hypothesis

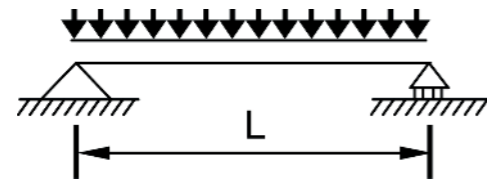
Thermal insulating panels are most often used as the outer enclosures. Following the arrangement on the roof purlins or wall rulers, simply supported or continuously supported static schemes may result. Therefore static schemes were analyzed, on simply supported beam or continuous beam with two spans.

The calculation model to determine the loadbearing capacity of sandwich panels has considered the following hypotheses:

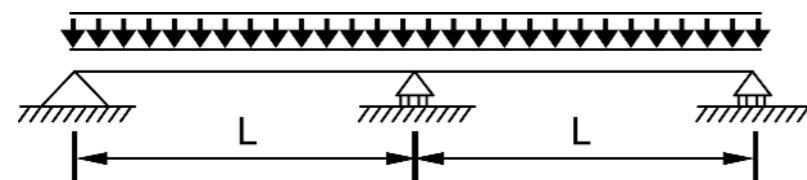
- load is uniformly distributed over the entire length of the panel;
- load may come from its own weight combined with the action of snow loads (pressure);
- load may come from its own weight combined with the action of wind load (suction);
- according to EN 14509: 2013, the exterior face color can affect the loadbearing capacity (additional effort from differentiated / prevented expansions and contractions, overlapping the efforts resulted from suction and pressure), so analysis was done for three distinct color groups;
- According to EN 14509: 2013, the loadbearing capacity of the panel is affected by the effect of creep, so when sizing the panels we considered both long and short-term effects;
- Temperature gradient between the faces of the panel was considered:

- o $\Delta t=40^{\circ}\text{C}$ for color group I
- o $\Delta t=45^{\circ}\text{C}$ for color group II
- o $\Delta t=60^{\circ}\text{C}$ for color group III

Thus, we analyzed two types of static systems, each with two load cases (gravitational from snow and wind suction):



Static system No. 1: Simply supported beam



Static system No. 2: Continuous beam over two spans

Drafting the tables referring to capable loads of thermal insulating sandwich panels

Computing hypothesis

Depending on the color of the thermal insulating panels considered project, 3 cases of sizing are to be considered in the loadbearing capacities tables:

o $\Delta t=40^{\circ}\text{C}$ for color group I

presents the loadbearing capacity with its allowable span, specified in meters (capacity in kN / m^2 - computing value is obtained by multiplying the characteristic value with the safety coefficient) for very light colors. This group may include colors as RAL 1015, 1016, 1018, 6019, 7035, 9001, 9002, 9010.

o $\Delta t=45^{\circ}\text{C}$ for color group II

presents the loadbearing capacity with its allowable span, specified in meters (capacity in kN / m^2 - computing value is obtained by multiplying the characteristic value with the safety coefficient) for light colors. This group may include colors as RAL 1001, 1002, 1003, 1004, 1014, 1017, 1019, 1021, 1023, 1035, 2000, 2003, 2004, 2008, 2009, 2011, 5012, 5018, 5024, 6018, 6021, 6033, 7000, 7004, 7032, 7037, 7040, 7042, 7045, 7046, 9006, 9022.

o $\Delta t=60^{\circ}\text{C}$ for color group III

presents the loadbearing capacity with its allowable span, specified in meters (capacity in kN / m^2 - computing value is obtained by multiplying the characteristic value with the safety coefficient) for dark colors. This group may include colors as RAL 3000, 3002, 3003, 3005, 3009, 3011, 3013, 3020, 5002, 5005, 5007, 5009, 5010, 5011, 5012, 5014, 5017, 5022, 6000, 6003, 6005, 6011, 6020, 6024, 6029, 7011, 7012, 7015, 7016, 7021, 7022, 7024, 8004, 8016, 8017, 8023, 9005, 9007.

According to EN 14509: 2013 the permissible limit value for deformation was considered $L / 200$ for short-term load and $L / 100$ for long-term loads.

Example of selecting

Computing values

the appropriate panel for an assessed load in roof panels

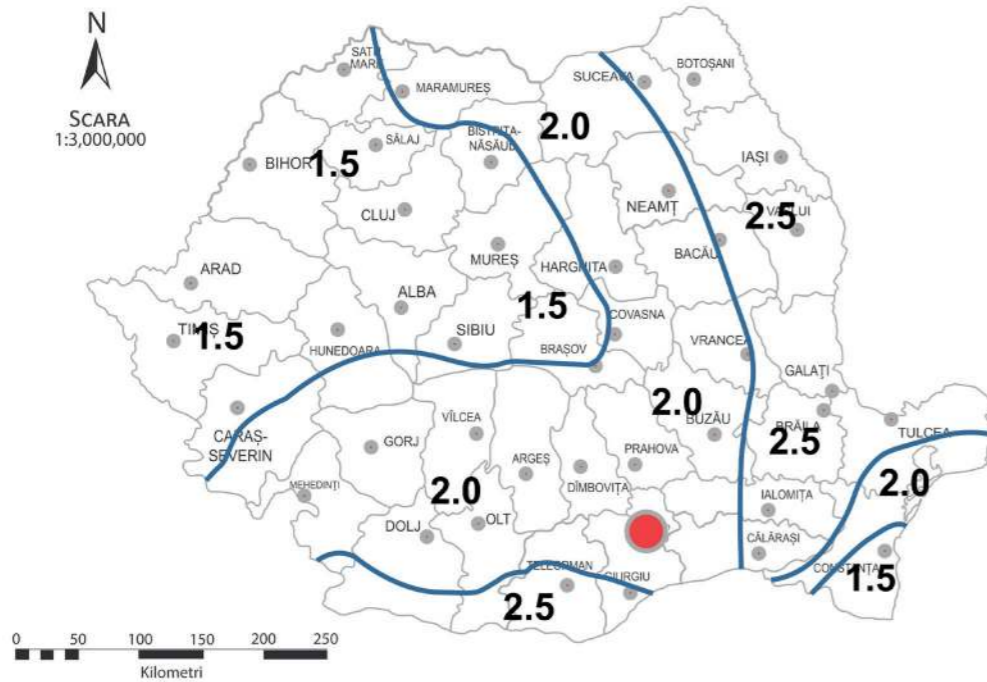
Input:

It is exemplified the selection of the appropriate panel, considering the distributed snow load (according to norm CR 1-1-3-2012).

a) The characteristic value of snow load on the roof is determined by the relation:

$$S_k = \mu_i \times C_e \times C_t \times S_{0,k}$$

- geographical location of the construction: Bucharest: $S_{0,k} = 2 \text{ kN / m}^2$ (back to 50 years according to the figure below)
- $C_e = 1.0$ (exposure coefficient) it was taken into the consideration the case of partial exposure, for the uncrowded areas
- $C_t = 1.0$ (thermal coefficient)
- μ_i .shape coefficient, considering the snow crowding in the attic area



The zoning of characteristic values of the snow load on the ground S_k - kN/m² for altitudes $A \leq 1000\text{m}$
Note: For altitudes $A > 1000\text{m}$, the value S_k shall be determined using relations from CR 1-1-3-2012

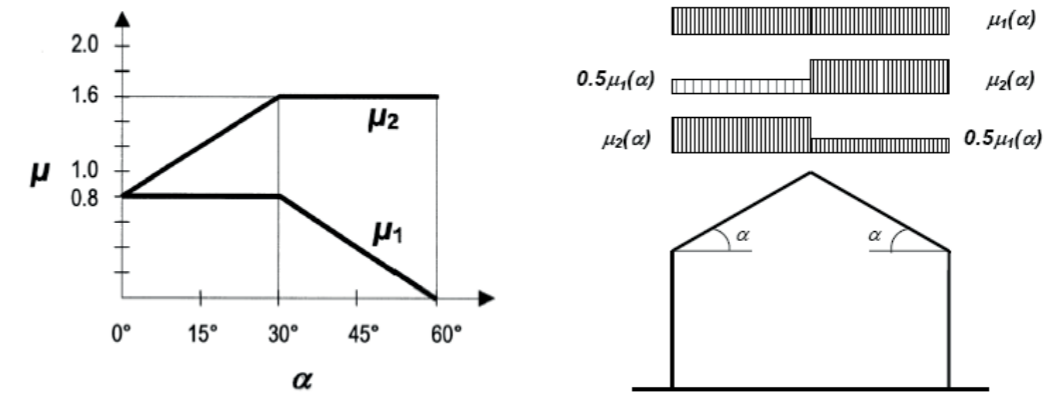
The Value of μ_1 coefficient (shape coefficient) for a hall's roof shall be 0,8.

Roof slope, α	$0^\circ \leq \alpha \leq 30^\circ$	$30^\circ < \alpha < 60^\circ$	$\alpha \geq 60^\circ$
μ_1	0,8	$0,8 (60-\alpha)/30$	0,0
μ_2	$0,8+0,8 \alpha/30$	1,6	-

Example of selecting

Computing values

the appropriate panel for an assessed load in roof panels



Load coefficients for final limit state (SLU) and serviceability limit state (SLS) are as follow:

- $n = 1.50$ - final limit state of resistance and stability, under the action of fundamental grouping
- $n = 1.00$ - serviceability limit state, under the action of total serviceability loads

According to the above, this results in a characteristic load for a building enclosure in Bucharest, subjected to the action of snow on the roof panels:

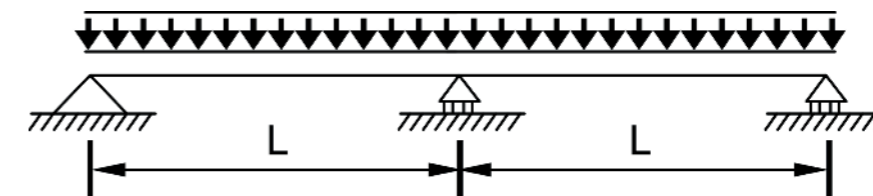
$S_k = 0,8 \times 2 = 1,60 \text{ kN/m}^2$ respectively the computing value $S_d = 0,8 \times 2 \times 1,5 = 2,40 \text{ kN/m}^2$. The self-weight of panel shall not be added, due to the fact that when drafting the loadbearing capacities tables, we have considered the self-weights for each type of panels, depending on the actual panel thickness.

When determining the loadbearing capacity of the panels, load coefficients were taken into account for the specific load types analyzed (permanent load from self-weight with safety coefficient $\gamma_G = 1,35$ and snow load, with $\gamma_Q = 1,5$), thus the tables assessed shall identify the allowed span with the allowed snow load, without multiplying it by the coefficient $\gamma_Q = 1,5$, if the given values are the characteristic ones, or by multiplying it with the coefficient $\gamma_Q = 1,5$, if the given values are the computing ones.

Selecting the appropriate panel according the assessed tables should be as follows:

Step 1

Select the type, thickness of insulation and static scheme of the desired panel. Assuming we choose a 60 mm thick panel, having 3 ribs, on its width supported on at least two spans, we shall identify the table referring to the type and thickness of the desired panel.



Static scheme of roof panel

Chapter 2

LOAD BEARING CAPACITIES OF PANELS

Loadbearing capacities of panels ISOAC 3

Panel type ISOAC3		General data		Load bearing capacities calculated by:																							
Plastsistem panel 30 mm with 3 ribs		D=68.3 mm																									
Exterior face S250 GD+Z180, Interior face S220GD+Z100		t _{nom,1} =0.45 mm																									
Panel with one span		t _{nom,2} =0.40 mm																									
Color group		Computing values, snow load [kN/m ²]																									
		Allowed distance between supports (m)																									
I	3,44	3,44	2,46	1,93	1,62	1,42	1,28	1,17	1,09	1,02	0,96	0,91	0,87	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,67						
II	3,44	3,44	2,46	1,93	1,62	1,42	1,28	1,17	1,09	1,02	0,96	0,91	0,87	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,67						
III	3,16	3,16	2,46	1,93	1,62	1,42	1,28	1,17	1,09	1,02	0,96	0,91	0,87	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,67						
Color group		Computing values, wind load under suction [kN/m ²]																									
		Allowed distance between supports (m)																									
I	3,44	3,44	3,31	2,55	2,12	1,84	1,63	1,48	1,36	1,26	1,18	1,12	1,06	1,01	0,97	0,93	0,90	0,86	0,84	0,81	0,79						
II	3,44	3,44	3,09	2,55	2,12	1,84	1,63	1,48	1,36	1,26	1,18	1,12	1,06	1,01	0,97	0,93	0,90	0,86	0,84	0,81	0,79						
III	3,16	2,80	2,58	2,42	2,12	1,84	1,63	1,48	1,36	1,26	1,18	1,12	1,06	1,01	0,97	0,93	0,90	0,86	0,84	0,81	0,79						
Panel with two spans		Computing values, snow load [kN/m ²]																									
		Allowed distance between supports (m)																									
I	7,16	3,62	2,46	1,93	1,62	1,42	1,28	1,17	1,09	1,02	0,96	0,91	0,87	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,67						
II	7,16	3,62	2,46	1,93	1,62	1,42	1,28	1,17	1,09	1,02	0,96	0,91	0,87	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,67						
III	7,16	3,62	2,46	1,93	1,62	1,42	1,28	1,17	1,09	1,02	0,96	0,91	0,87	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,67						
Color group		Computing values, wind load under suction [kN/m ²]																									
		Allowed distance between supports (m)																									
I	7,16	5,15	3,11	2,38	1,99	1,74	1,57	1,44	1,34	1,26	1,18	1,12	1,06	1,01	0,97	0,93	0,90	0,86	0,84	0,81	0,79						
II	7,16	4,82	2,87	2,21	1,86	1,65	1,49	1,38	1,29	1,22	1,16	1,11	1,06	1,01	0,97	0,93	0,90	0,86	0,84	0,81	0,79						
III	7,16	3,26	2,13	1,80	1,62	1,50	1,39	1,29	1,22	1,16	1,10	1,06	1,02	0,99	0,96	0,93	0,90	0,86	0,84	0,81	0,79						

Note:

- Panel's orientation is with its ribs upwards, the exterior ribbed face is made of steel sheet S250 GD+Z180-0.45 mm, interior face which stands on wedges is made of steel sheet S220 GD+Z100
- Computing values include safety factor $\gamma_{af}=1.50$
- The arrow condition, under which the permissible limit spans were determined, is according to EN 14509/2013: L/200 for short term loading and L/100 long term loading

Panel type ISOAC3		General data		Load bearing capacities calculated by:																							
Plastsistem panel 40 mm with 3 ribs		D=78.3 mm																									
Exterior face S250 GD+Z180, Interior face S220GD+Z100		t _{nom,1} =0.45 mm																									
Panel with one span		t _{nom,2} =0.40 mm																									
Color group		Computing values, snow load [kN/m ²]																									
		Allowed distance between supports (m)																									
I	3,93	3,93	2,93	2,23	1,83	1,57	1,39	1,26	1,16	1,08	1,01	0,96	0,91	0,87	0,83	0,80	0,77	0,75	0,72	0,70	0,69						
II	3,93	3,93	2,93	2,23	1,83	1,57	1,39	1,26	1,16	1,08	1,01	0,96	0,91	0,87	0,83	0,80	0,77	0,75	0,72	0,70	0,69						
III	3,66	3,66	2,93	2,23	1,83	1,57	1,39	1,26	1,16	1,08	1,01	0,96	0,91	0,87	0,83	0,80	0,77	0,75	0,72	0,70	0,69						
Color group		Computing values, wind load under suction [kN/m ²]																									
		Allowed distance between supports (m)																									
I	3,93	3,93	3,93	3,14	2,58	2,21	1,94	1,73	1,57	1,44	1,33	1,25	1,17	1,11	1,06	1,01	0,97	0,93	0,90	0,86	0,84						
II	3,93	3,93	3,55	3,14	2,58	2,21	1,94	1,73	1,57	1,44	1,33	1,25	1,17	1,11	1,06	1,01	0,97	0,93	0,90	0,86	0,84						
III	3,66	3,20	2,93	2,73	2,58	2,21	1,94	1,73	1,57	1,44	1,33	1,25	1,17	1,11	1,06	1,01	0,97	0,93	0,90	0,86	0,84						
Panel with two spans		Computing values, snow load [kN/m ²]																									
		Allowed distance between supports (m)																									
I	8,11	4,36	2,93	2,23	1,83	1,57	1,39	1,26	1,16	1,08	1,01	0,96	0,91	0,87	0,83	0,80	0,77	0,75	0,72	0,70	0,69						
II	8,11	4,36	2,93	2,23	1,83	1,57	1,39	1,26	1,16	1,08	1,01	0,96	0,91	0,87	0,83	0,80	0,77	0,75	0,72	0,70	0,69						
III	8,11	4,36	2,93	2,23	1,83	1,57	1,39	1,26	1,16	1,08	1,01	0,96	0,91	0,87	0,83	0,80	0,77	0,75	0,72	0,70	0,69						
Color group		Computing values, wind load under suction [kN/m ²]																									
		Allowed distance between supports (m)																									
I	8,11	5,93	3,40	2,55	2,11	1,83	1,64	1,50	1,39	1,30	1,23	1,17	1,12	1,07	1,03	0,99	0,96	0,93	0,90	0,86	0,84						
II	8,11	5,43	3,11	2,35	1,96	1,72	1,55	1,43	1,33	1,25	1,19	1,13	1,08	1,04	1,00	0,97	0,94	0,91	0,89	0,86	0,84						
III	8,11	3,44	2,18	1,84	1,65	1,53	1,43	1,33	1,25	1,18	1,12	1,08	1,04	1,00	0,97	0,94	0,91	0,89	0,87	0,85	0,83						

Note:

- Panel's orientation is with its ribs upwards, the exterior ribbed face is made of steel sheet S250 GD+Z180-0.45 mm, interior face which stands on wedges is made of steel sheet S220 GD+Z100
- Computing values include safety factor $\gamma_{af}=1.50$
- The arrow condition, under which the permissible limit spans were determined, is according to EN 14509/2013: L/200 for short term loading and L/100 long term loading

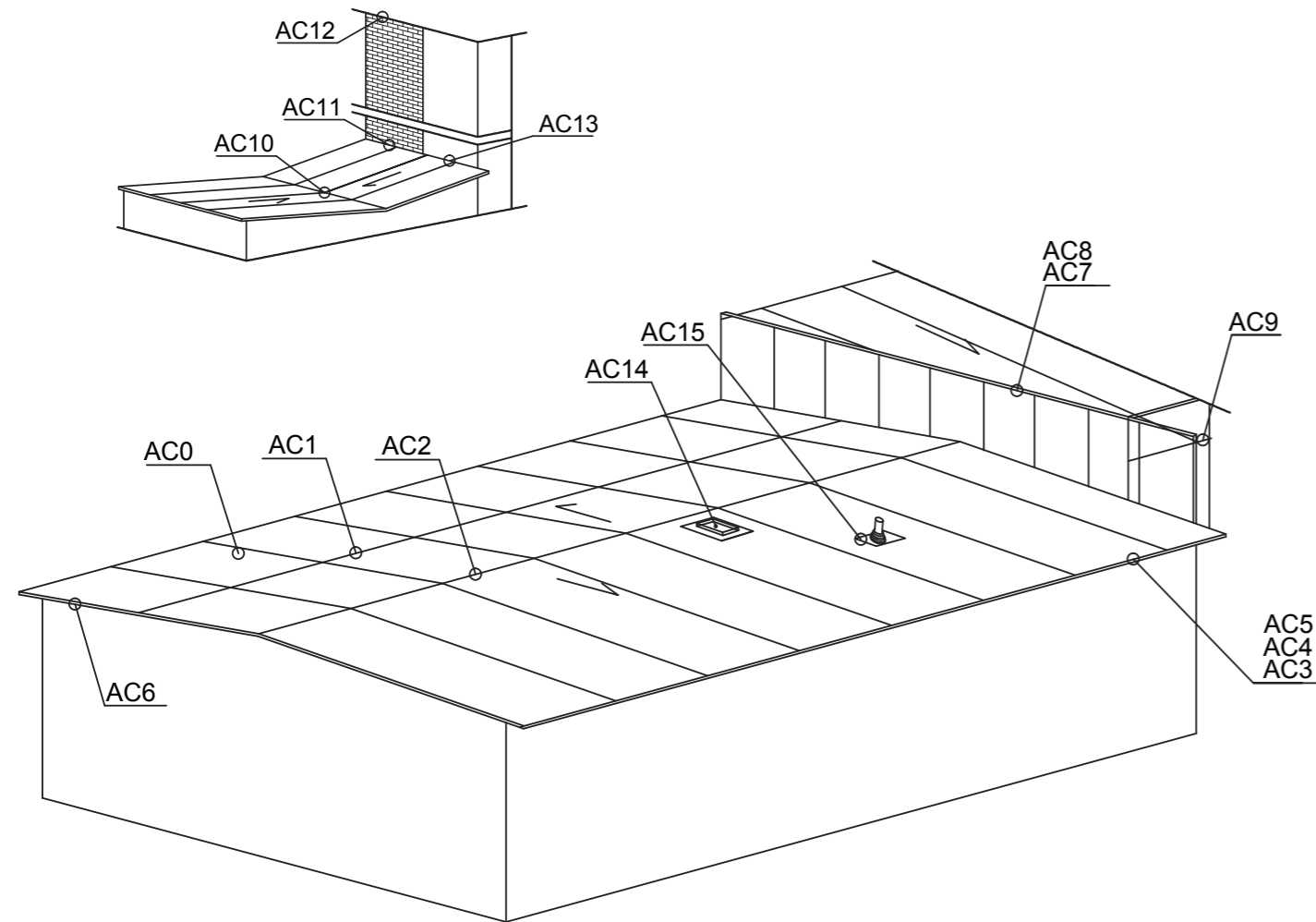
Chapter 3

TECHNICAL DETAILS OF PANELS' ASSEMBLY

1. Technical details roof panels

ISOAC 3 / ISOAC 5

1.1. 3D View	Presentation of details	page24
1.2. Detail AC0	Fixing details - ISOAC	page25
1.3. Detail AC1	Detail - overlapping thermal insulating panels	page26
1.4. Detail AC2	Detail - crest - version 1 and version 2	page27
1.5. Detail AC3	Detail - overhanging eaves	page31
1.6. Detail AC4	Detail - eaves	page34
1.7. Detail AC5	Detail - eaves with self-supporting gutter	page36
1.8. Detail AC6	Detail - fascia board	page38
1.9. Detail AC7	Detail - attic with no secondary structure	page42
1.10. Detail AC8	Detail - attic with secondary structure - version 1 and 2	page44
1.11. Detail AC9	Detail - interior gutter made of thermal insulating panels	page48
1.12. Detail AC10	Detail - roof valley gutter made of thermal insulating panels	page49
1.13. Detail AC11	Detail - joint of ISOAC3 / ISOAC5 to brick wall	page51
1.14. Detail AC12	Detail - fire resistant wall 180°	page53
1.15. Detail AC13	Detail - joint of roof to high ISOPER wall	page56
1.16. Detail AC14	Detail -ISOAC assembly - smoke evacuation trapdoor	page58
1.17. Detail AC15	Detail - assembly of fluids extractor	page63

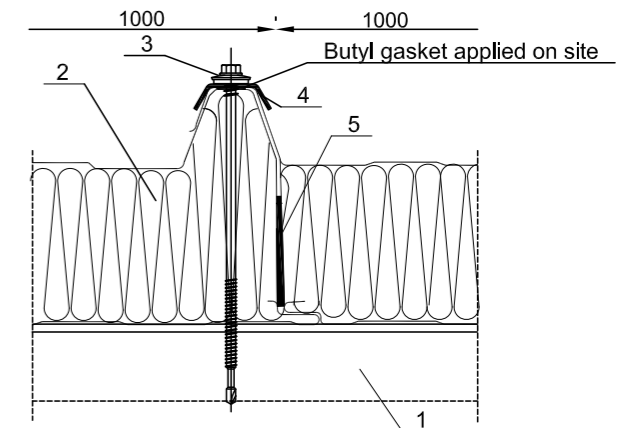


KEY

- AC0 Fixing details - ISOAC
- AC1 Detail - overlapping thermal insulating panels
- AC2 Detail - crest - version 1 and version 2
- AC3 Detail - overhanging eaves
- AC4 Detail - eaves
- AC5 Detail - eaves with self-supporting gutter
- AC6 Detail - fascia board
- AC7 Detail - attic with no secondary structure
- AC8 Detail - attic with secondary structure - version 1 and 2
- AC9 Detail - interior gutter made of thermal insulating panels
- AC10 Detail - roof valley gutter made of thermal insulating panels
- AC11 Detail - joint of ISOAC3 / ISOAC5 to brick wall
- AC12 Detail - fire resistant wall 180'
- AC13 Detail - joint of roof to high ISOPER wall
- AC14 Detail - ISOAC assembly of smoke evacuation trapdoor
- AC15 Detail - assembly of fluids extractor

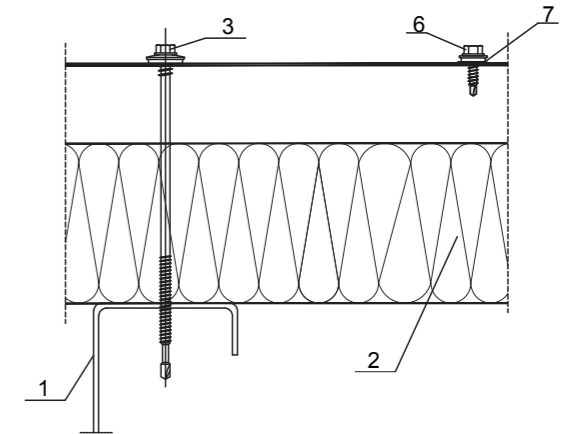
SECTION A-A

A. Cross section parallel with crest
(detail for fixing panels to wedge)



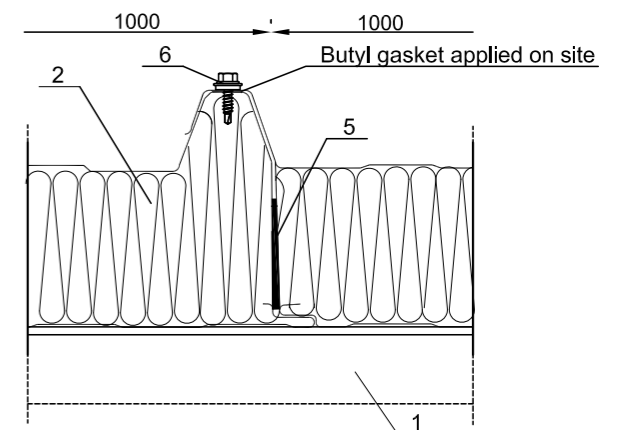
SECTION B-B

B. Section perpendicular to crest,
(along the slope).



SECTION C-C

C. Detail for stitching
thermal insulating panels



KEY

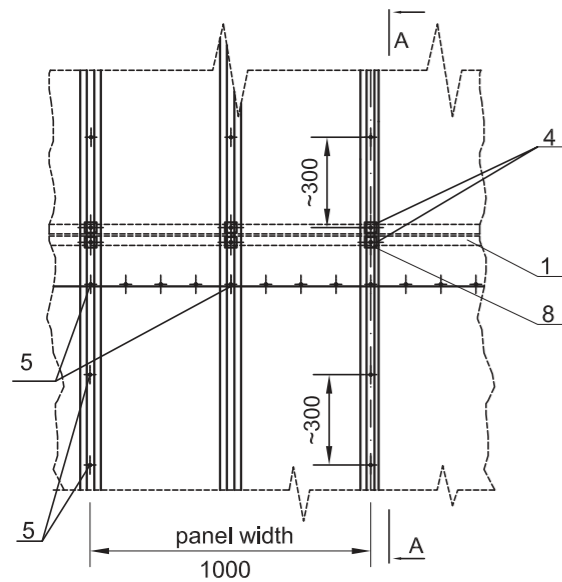
- 1. Support structure/wedge for thermal insulating panel
- 2. ISOAC3 / ISOAC5 thermal insulating roof panel
- 3. Screw for fixing the thermal insulating panel on the support structure
- 4. Metal cap with gasket
- 5. Sealing gasket
- 6. Screw for panel stitching - shall be fixed onto the free rib of the panel, 300mm spaced apart
- 7. Self-adhesive sealing tape PE 2x20

Detail AC1

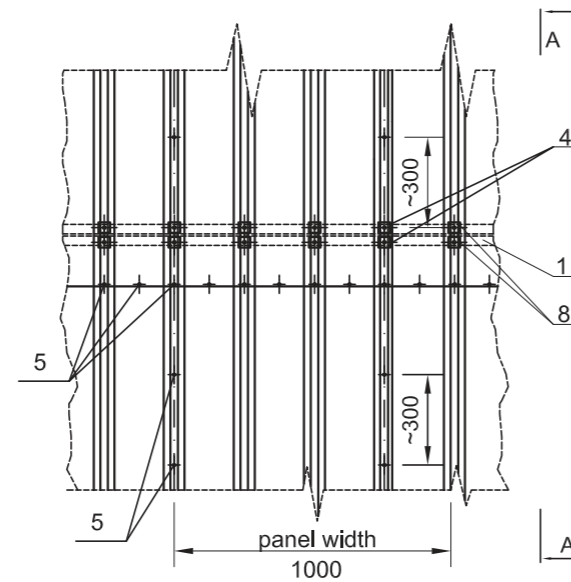
AC1

Detail for overlapping thermal insulating panels

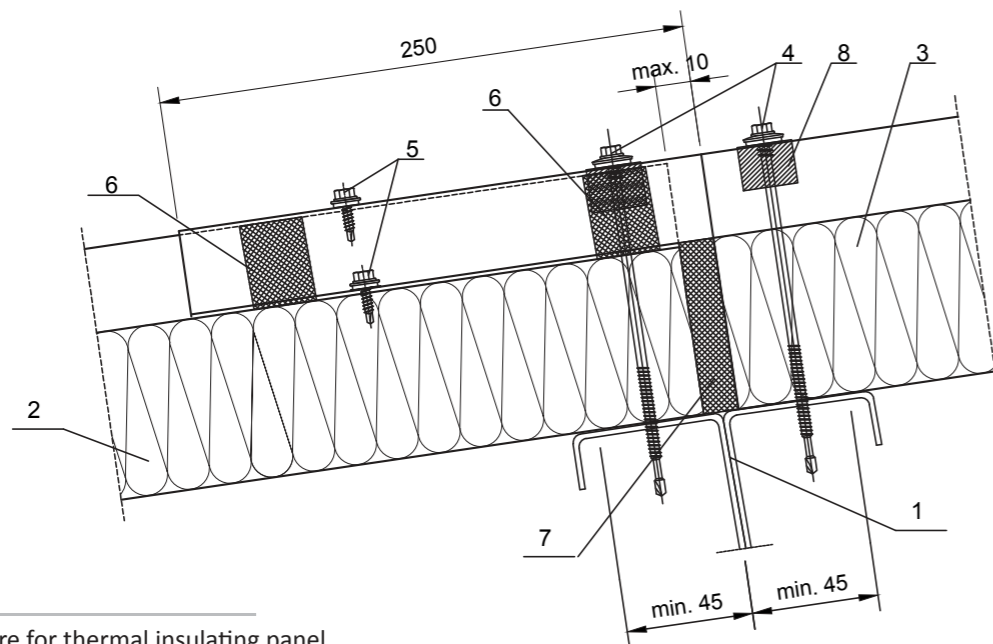
ISOAC 3



ISOAC 5



SECTION A-A



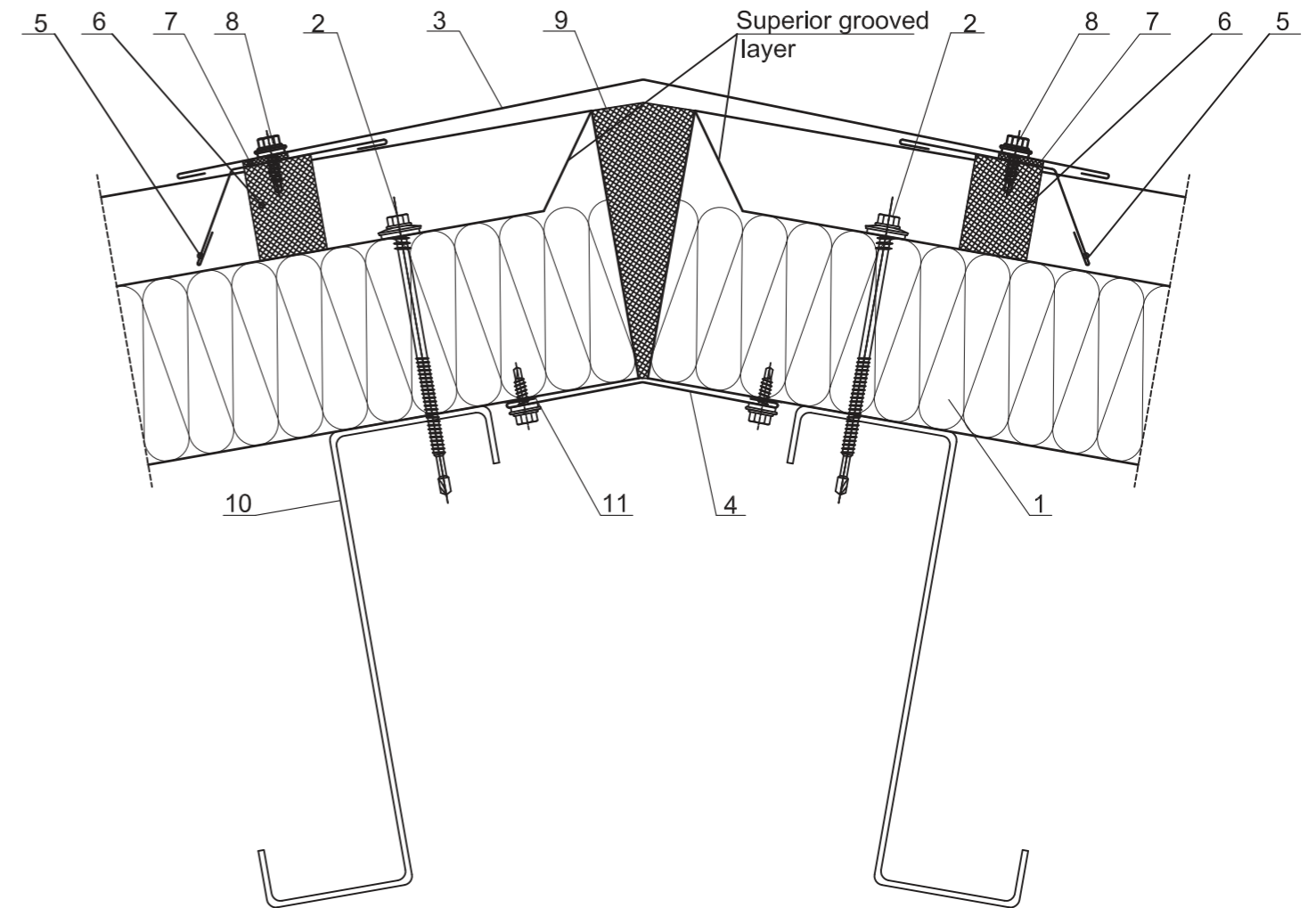
KEY

1. Support structure for thermal insulating panel
2. ISOAC3 / ISOAC5 thermal insulating roof panel
3. ISOAC3 / ISOAC5 thermal insulating roof panel whose core and interior face shall be trimmed off over a distance of 250mm
1. Screw for fixing the thermal insulating panel on the support structure
2. Screw for panel stitching
3. Self-adhesive sealing tape PU 4x20
4. Polyurethane foam
5. Metal cap with gasket

Detail AC2

AC2 - 1

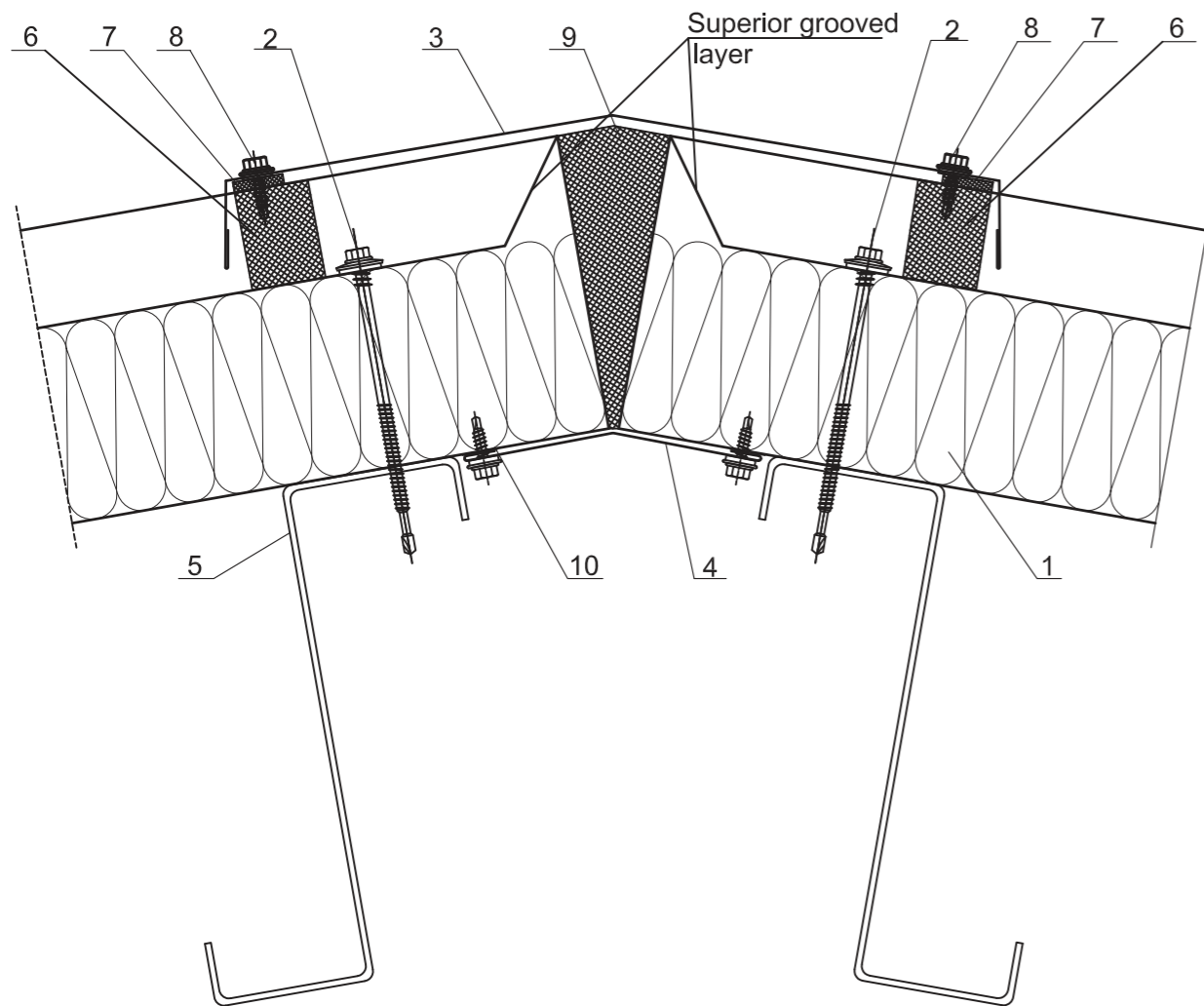
Detail crest - VERSION 1



KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Screw for fixing the thermal insulating panel on the support structure
3. Flashing - for exterior concealing of the crest, O1ac
4. Flashing - for interior concealing of the crest, O2ac
5. Flashing - for sealing the crest, O4ac/O5ac
6. Sealing sponge following the panel's rib
7. Self-adhesive sealing tape PU 3x15
8. Screw for fixing the concealing flashing
9. Polyurethane foam - insulation to be applied on site
10. Support structure for thermal insulating panel
11. Self-adhesive sealing tape PE 2x20

Detail crest - VERSION 2

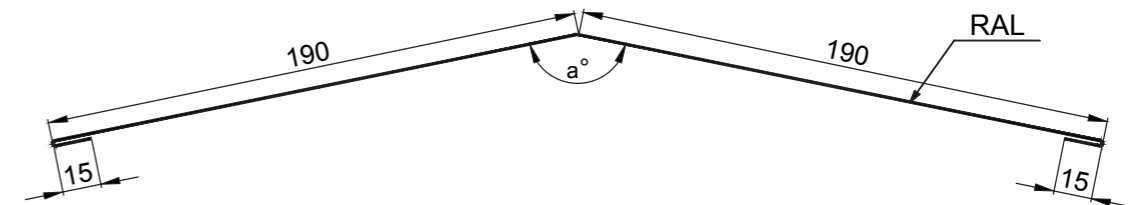


KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Screw for fixing the thermal insulating panel on the support structure
3. Flashing - for exterior concealing of the crest, 03ac
4. Flashing - for interior concealing of the crest, 02ac
5. Support structure for thermal insulating panel
6. Sealing sponge following the panel's rib
7. Self-adhesive sealing tape PU 3x15
8. Screw for fixing the concealing flashing
9. Polyurethane foam
10. Self-adhesive sealing tape PE 2x20

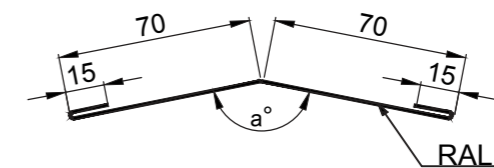
01ac - flashing - exterior concealing of the crest

Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 410mm
 a° = shall be determined based on roof slope ($180^\circ - 2 * p^\circ$)
 p° = roof slope



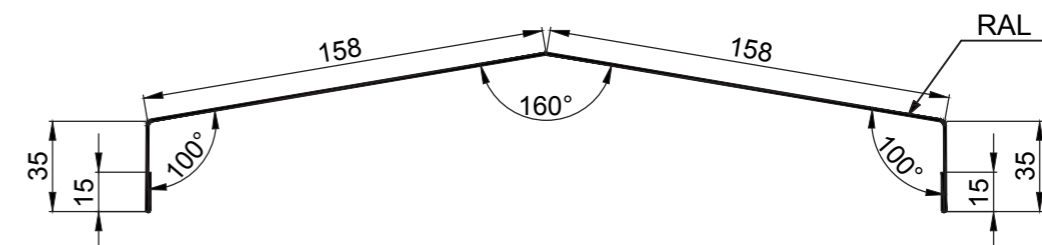
02ac - flashing - interior concealing of the crest

Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 170mm
 a° = shall be determined based on roof slope ($180^\circ - 2 * p^\circ$)
 p° = roof slope



03ac - flashing - exterior concealing of the crest

Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 416mm
 Note: The flashing follows the panel's rib and shall be trimmed off on site

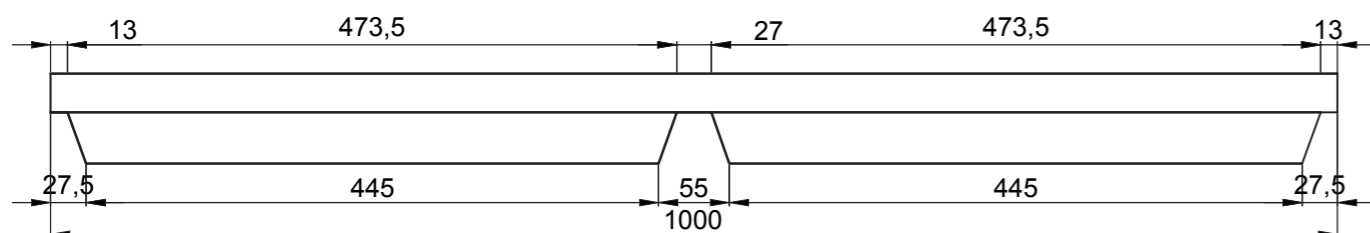
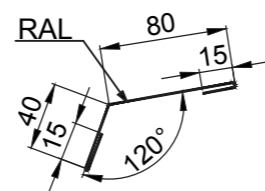


Detail AC2 / Flashings

AC2 - 4

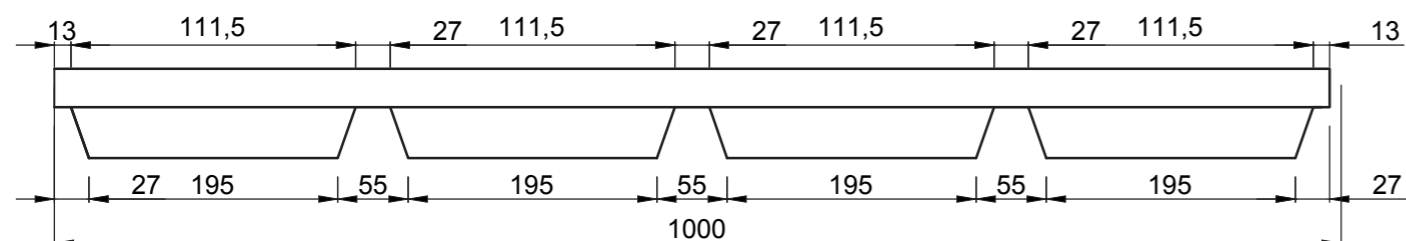
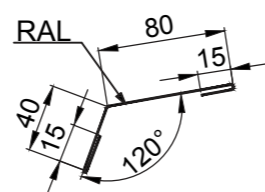
04ac - flashing - for sealing the crest - ISOAC3

Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 1000mm
 Unfolded width: 150mm
 $a^\circ = 120^\circ$



05ac - flashing - for sealing the crest - ISOAC5

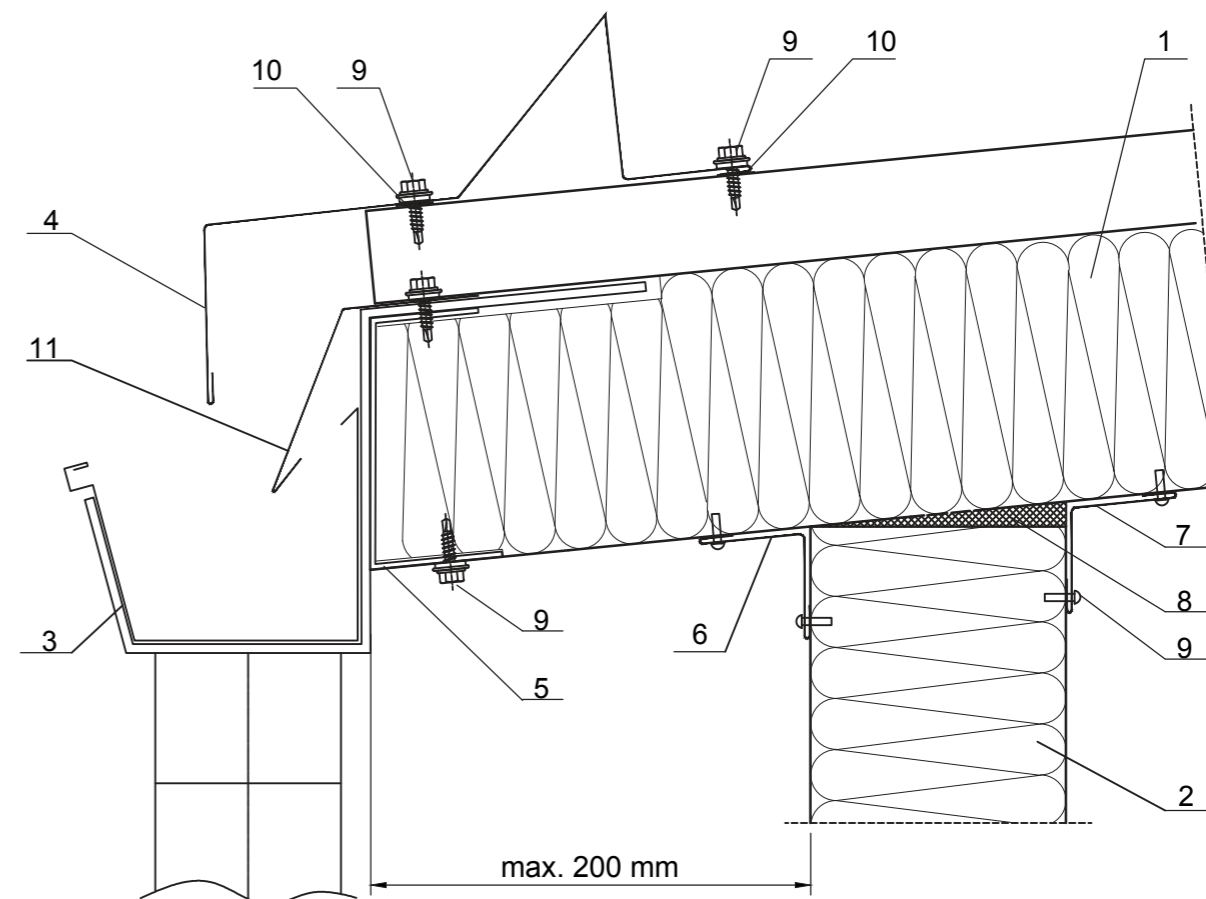
Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 1000mm
 Unfolded width: 150mm
 $a^\circ = 120^\circ$



Detail AC3

AC3 -1

Detail - overhanging eaves



KEY

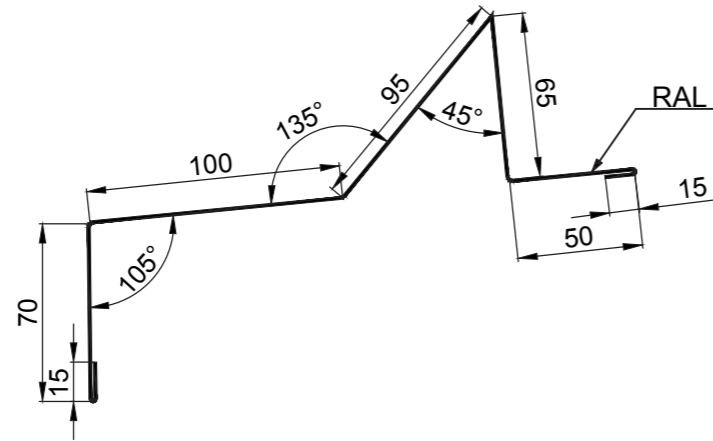
1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. ISOPERn - thermal insulating wall panel
3. Rainwater system
4. Flashing - gutter dripper, 05ac
5. Flashing - bordering the thermal insulating panel, 06ac
6. Flashing - for concealing the exterior joint ISOAC-ISOPER, 07ac
7. Flashing - for concealing the interior joint ISOAC-ISOPER, 08ac
8. Polyurethane foam
9. Screw for fixing the concealing flashing
10. Self-adhesive sealing tape PE 2x20
11. Flashing - gutter dripper, 09ac

Detail AC3 / Flashings

AC3 - 2

05ac - flashing - gutter dripper

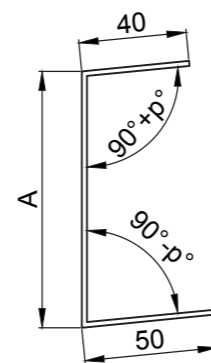
Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 410mm



06ac - flashing - bordering thermal insulating panel

Material: Galvanized steel sheet
 Thickness: 1.50mm
 p° = roof slope

Panel thickness A (mm)	Unfolded width (mm)
30	115
40	125
50	135
60	145
80	165
100	185
120	205

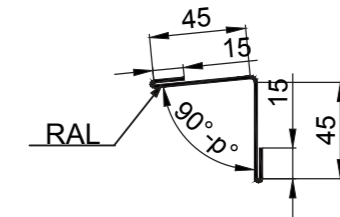


Detail AC3 / Flashings

AC3 - 3

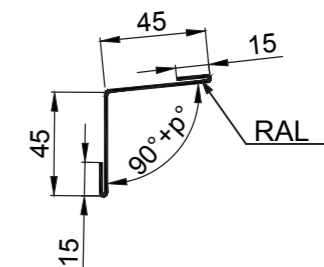
07ac - flashing - for concealing the exterior joint ISOAC-ISOPER

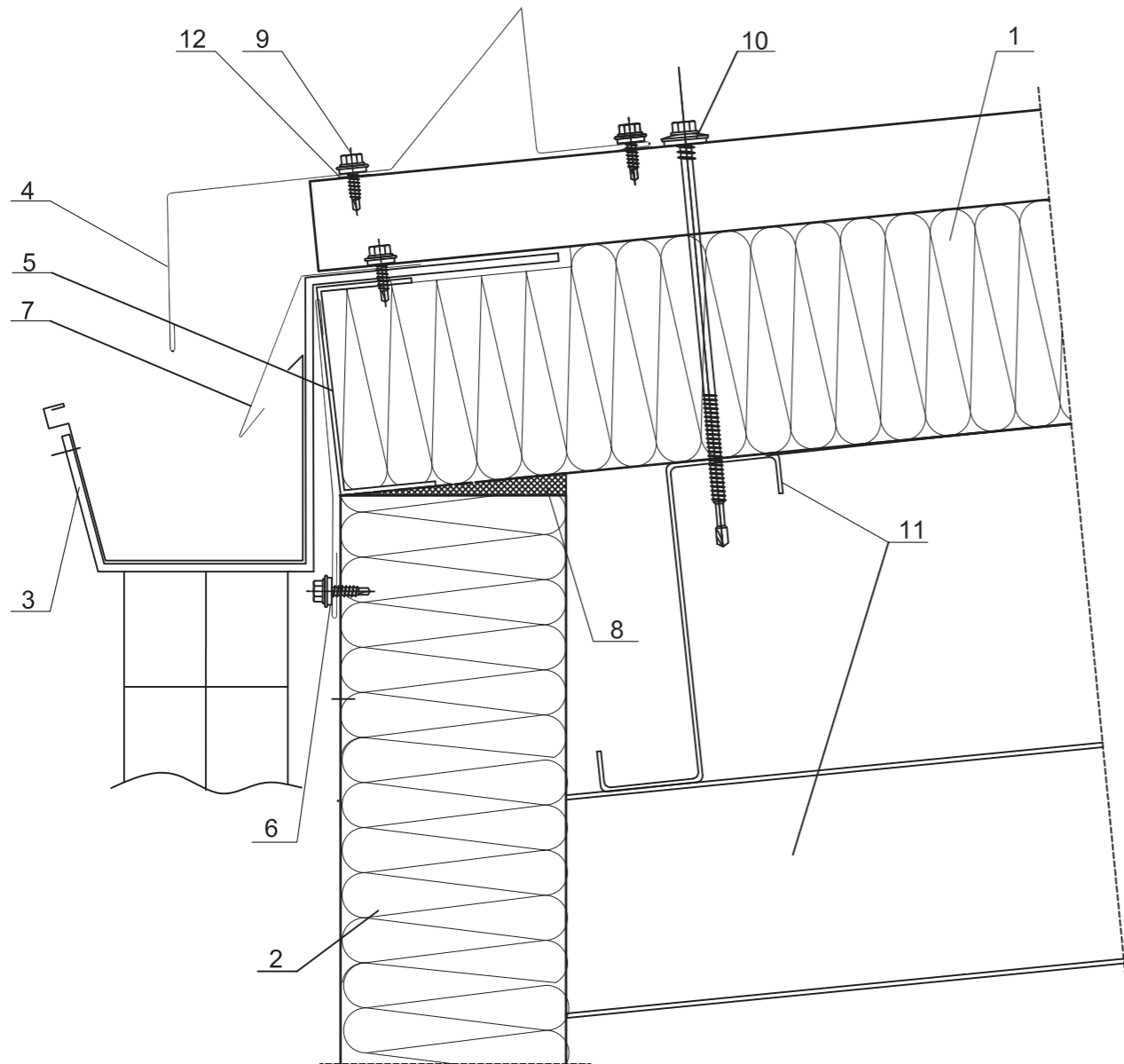
Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 120mm
 p° = roof slope



08ac - flashing - for concealing the interior joint ISOAC-ISOPER

Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 120mm
 p° = roof slope



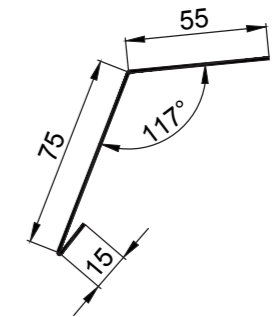


KEY

- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. ISOPER - thermal insulating wall panel
- 3. Rainwater system
- 4. Flashing - gutter pitcher, 05ac-see AC2
- 5. Flashing - bordering the thermal insulating panel, 06ac - see AC2
- 6. Flashing - for concealing the bordering, 10ac
- 7. Flashing - gutter dripper, 09ac
- 8. Polyurethane foam
- 9. Screw for fixing the concealing flashing
- 10. Screw for fixing the panel to the support structure
- 11. Support structure
- 12. Self-adhesive sealing tape PE 2x20

09ac - flashing - gutter dripper

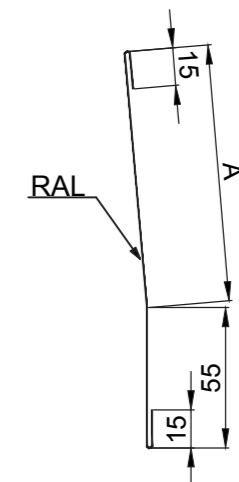
Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm
 Unfolded width: 145mm



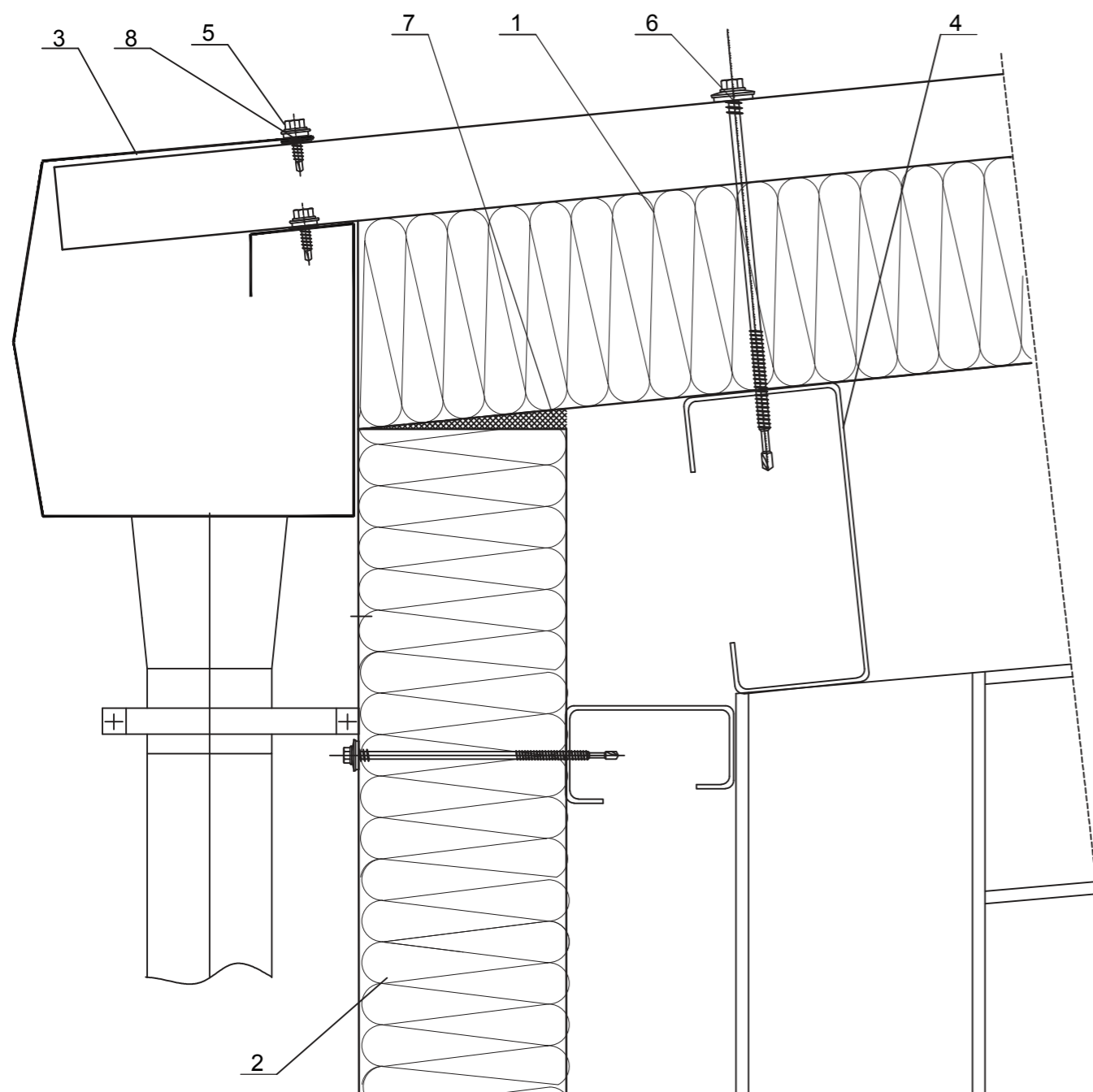
10ac - flashing - concealing the bordering of thermal insulating panels

Material: Prepainted galvanized steel sheet
 Thickness: 0.50mm
 Length: 2000-6000mm

Panel thickness (mm)	A (mm)	Unfolded width (mm)
30	30	115
40	40	125
50	50	135
60	60	145
80	80	165
100	100	185
120	120	205



Detail eaves with self-supporting gutter



KEY

- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. ISOPER - thermal insulating wall panel
- 3. Rainwater system - self-supporting rectangular gutter, 14ac
- 4. Support structure
- 5. Screw for fixing the concealing flashing
- 6. Screw for fixing the panel to the support structure
- 7. Polyurethane foam
- 8. Self-adhesive sealing tape PE 2x20

14ac - Self-supporting rectangular gutter

Material: Prepainted galvanized steel sheet

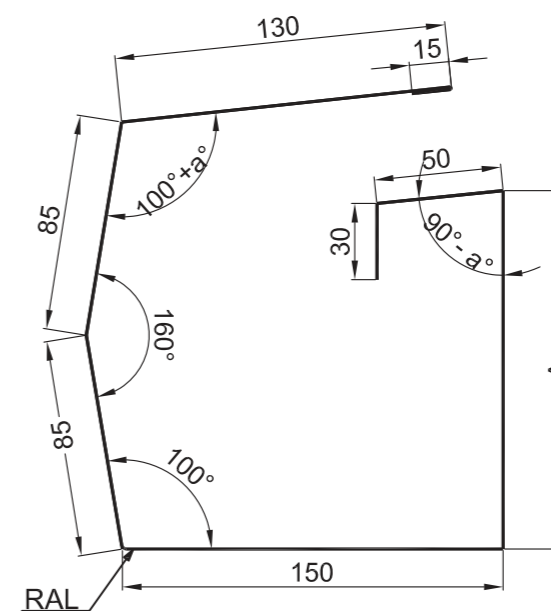
Thickness: 0.50mm

Length: 2000-6000mm

Unfolded width: 545 + A mm

Note:

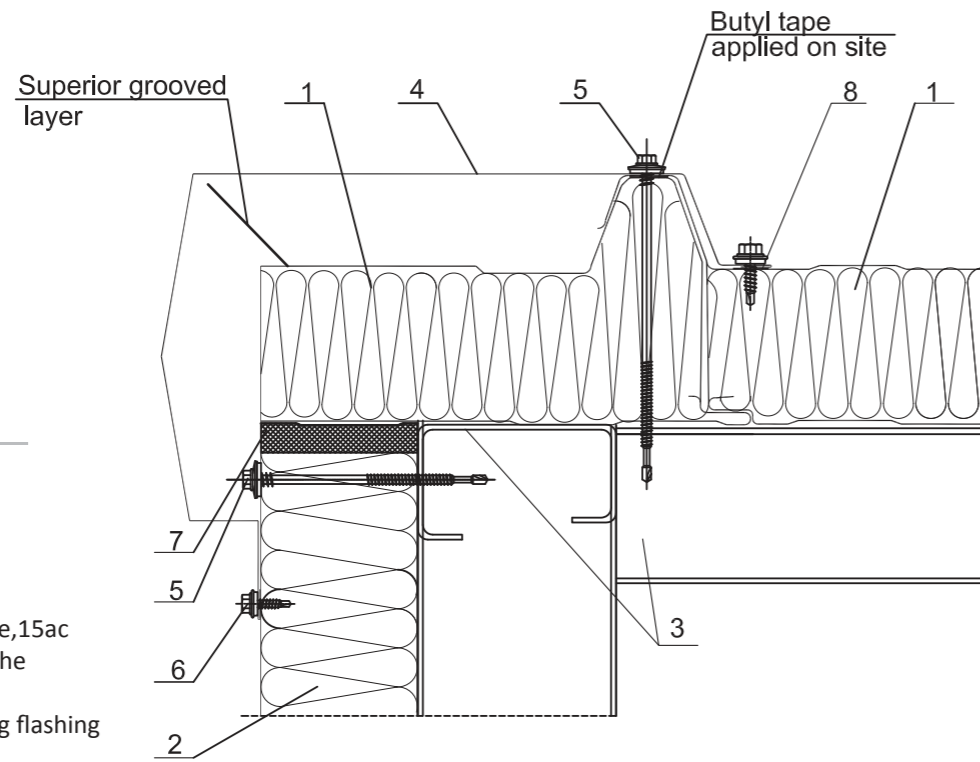
- 1. a° = roof slope
- 2. Dimension of A shall be settled by measurements depending on roof slope, a°



Detail AC6 / Detail of fascia board

AC6 - 1

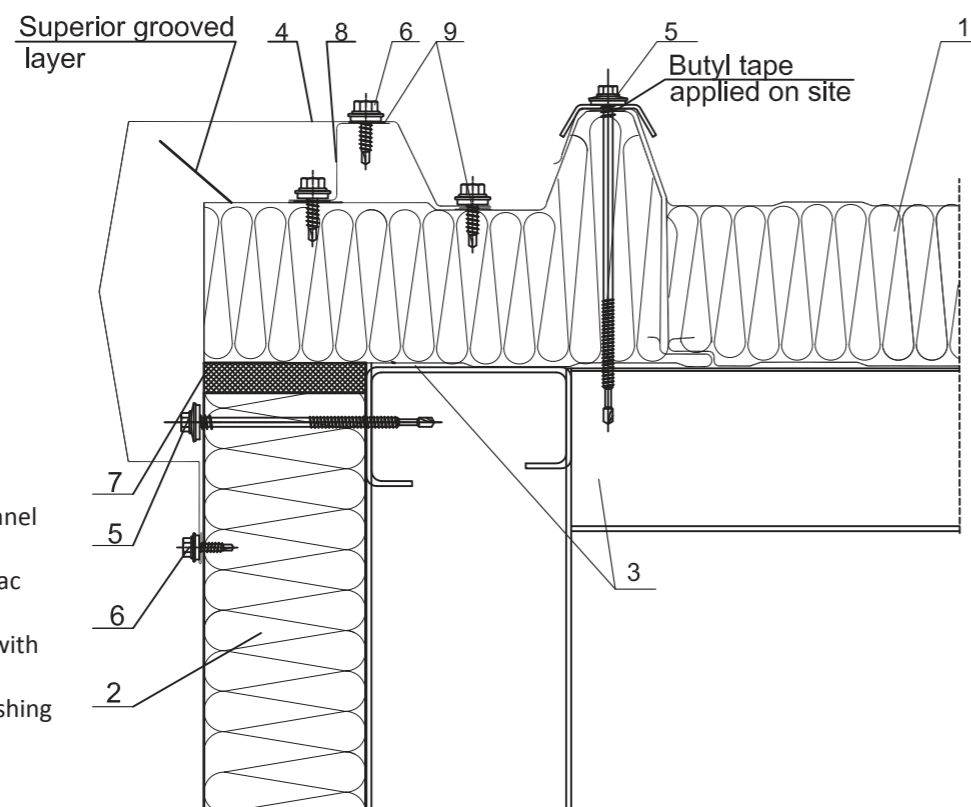
Version .1



KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. ISOPER - thermal insulating wall panel
3. Support structure
4. Flashing - concealing the gable,15ac
5. Screw for fixing the panel to the support structure
6. Screw for fixing the concealing flashing
7. Polyurethane foam
8. Butyl tape 2 x 8

Version .2



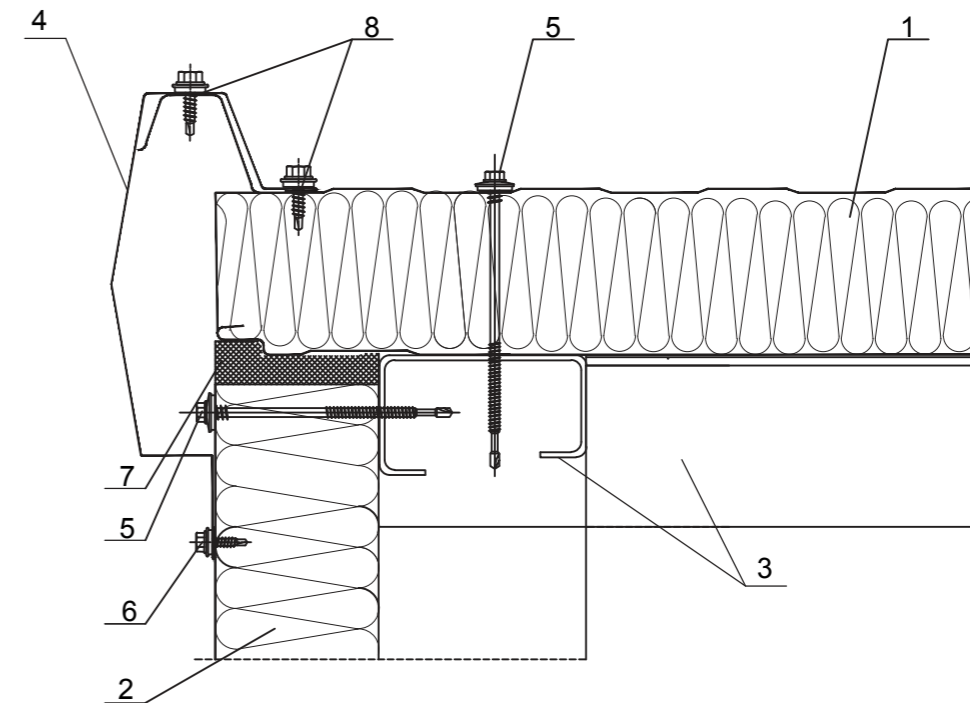
KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. ISOPER - thermal insulating wall panel
3. Support structure
4. Flashing - concealing the gable,16ac
5. Screw for fixing the panel to the support structure and metal cap with sealing gasket
6. Screw for fixing the concealing flashing
7. Polyurethane foam
8. Flashing - Z type support, 17ac
9. Butyl tape 2 x 8

Detail AC6 / Detail of fascia board

AC6 - 2

Version .3



KEY

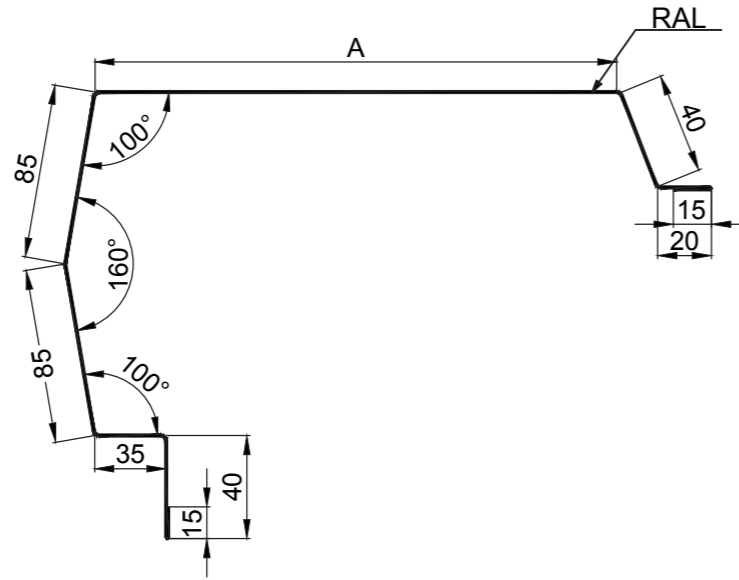
1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. ISOPER - thermal insulating wall panel
3. Support structure
4. Flashing - concealing the gable,16'ac
5. Screw for fixing the panel to the support structure
6. Screw for fixing the concealing flashing
7. Polyurethane foam
8. Butyl tape 2 x 8

Detail AC6 / Flashings

AC6 - 3

15ac - flashing - concealing the gable

Material: Prepainted galvanized steel sheet
Thickness: 0.50mm
Length: 2000-6000mm
Unfolded width: 315 + A mm
Note:
Dimension of A shall be settled by measurements on site

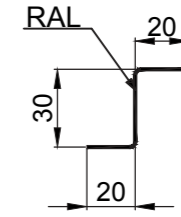


Detail AC6 / Flashings

AC6 - 4

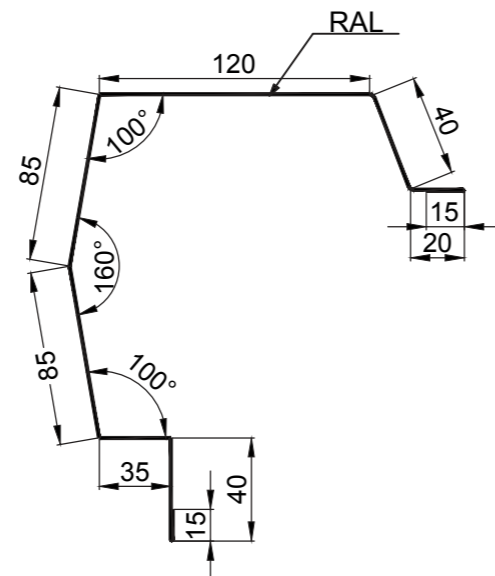
17ac - flashing - Z type support

Material: Prepainted galvanized steel sheet
Thickness: 0.50mm
Length: 2000-6000mm
Unfolded width: 70 mm



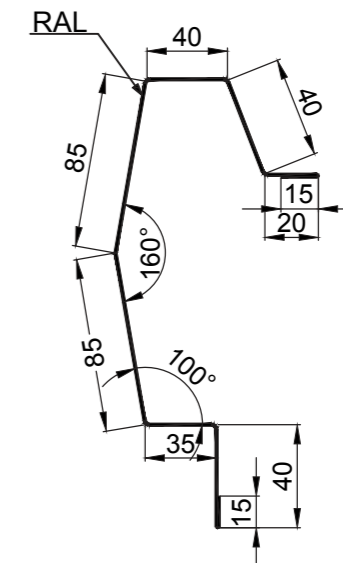
16ac - flashing - concealing the gable

Material: Prepainted galvanized steel sheet
Thickness: 0.50mm
Length: 2000-6000mm
Unfolded width: 435 mm

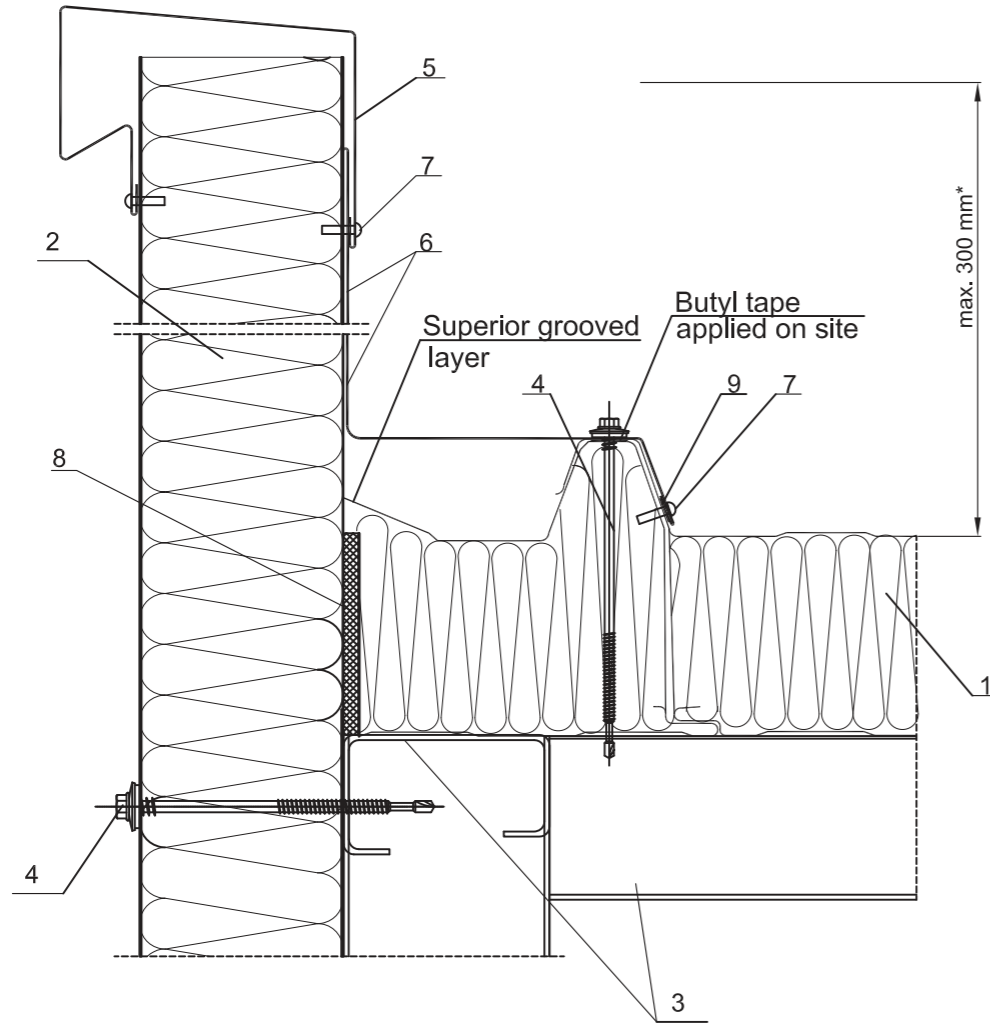


16'ac - flashing - concealing the gable

Material: Prepainted galvanized steel sheet
Thickness: 0.50mm
Length: 2000-6000mm
Unfolded width: 375 mm



Detail of attic with no secondary structure



KEY

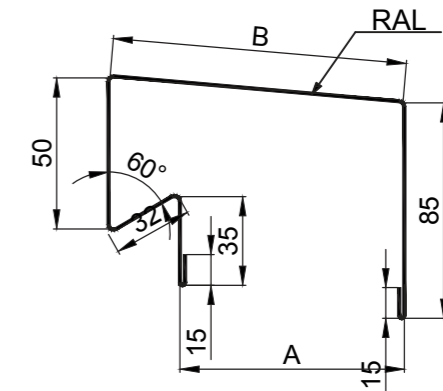
- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. ISOPER - thermal insulating wall panel
- 3. Support structure
- 4. Screw for fixing the panel to the support structure and metal cap with sealing gasket
- 5. Flashing - concealing the cover of attic, 18ac
- 6. Flashing - concealing the gap between ISOAC3-ISOPER, 19ac
- 7. Screw / rivet for fixing the concealing flashing
- 8. Polyurethane foam
- 9. Self-adhesive sealing tape type PE 2x20

*for structures where the height of attic is < 300mm

18ac - flashing - concealing the cover of attic

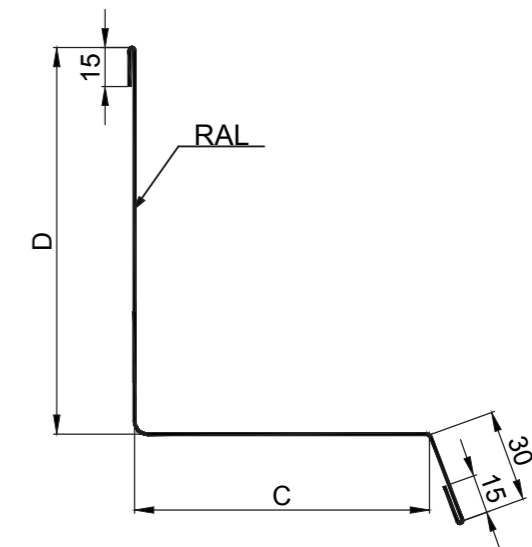
Material: Prepainted galvanized steel sheet
Thickness: 0.50mm

Panel thickness (mm)	B (mm)	Unfolded width (mm)
30	62	262
40	72	272
50	82	282
60	92	292
80	112	312
100	132	332
120	152	352

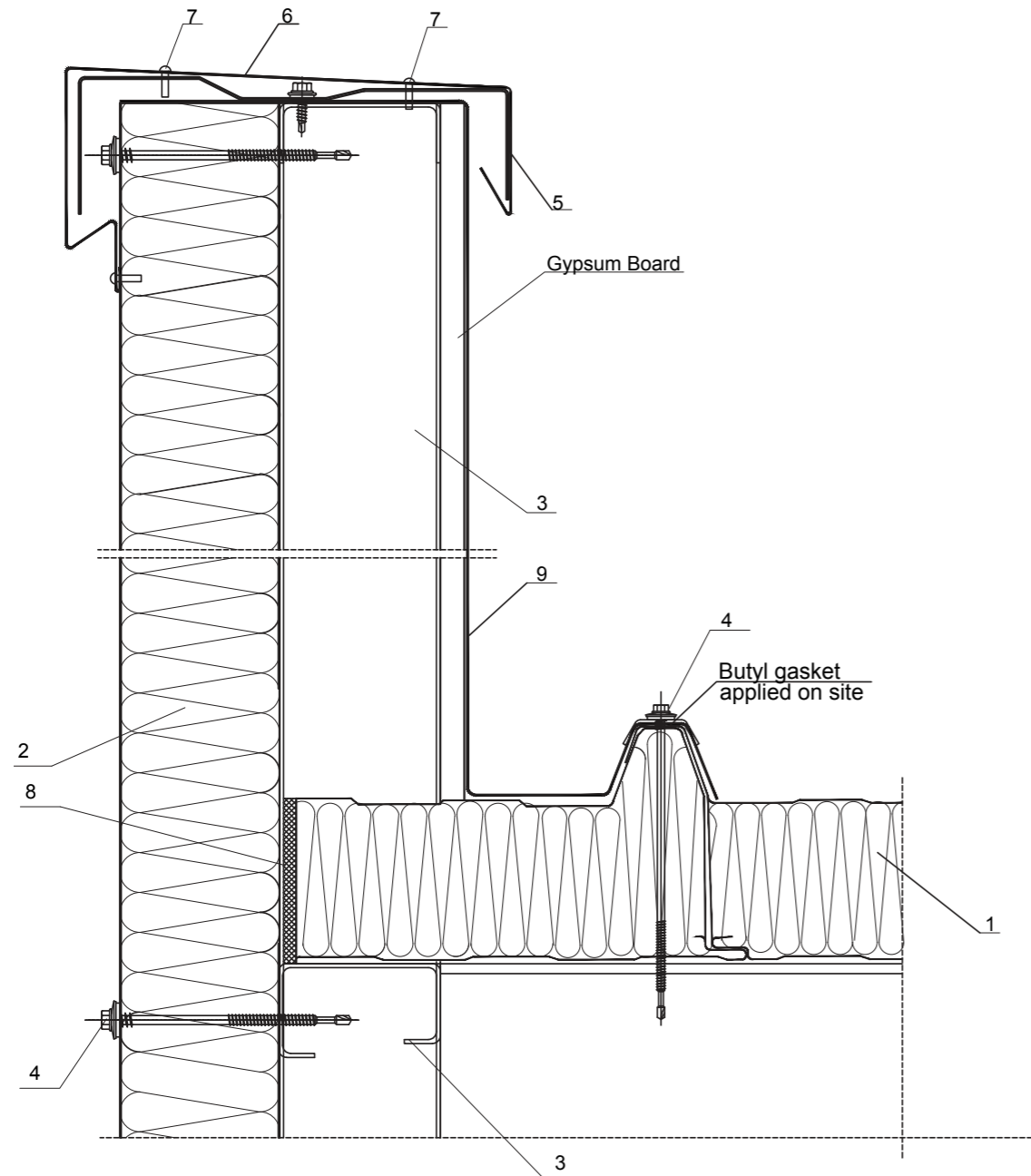


19ac - flashing - concealing the gap between ISOAC3-ISOPER

Material: Prepainted galvanized steel sheet
Thickness: 0.50mm
Length: 2000-6000mm
Unfolded width: shall be settled by measurements on site



Detail of attic with secondary structure - VERSION 1



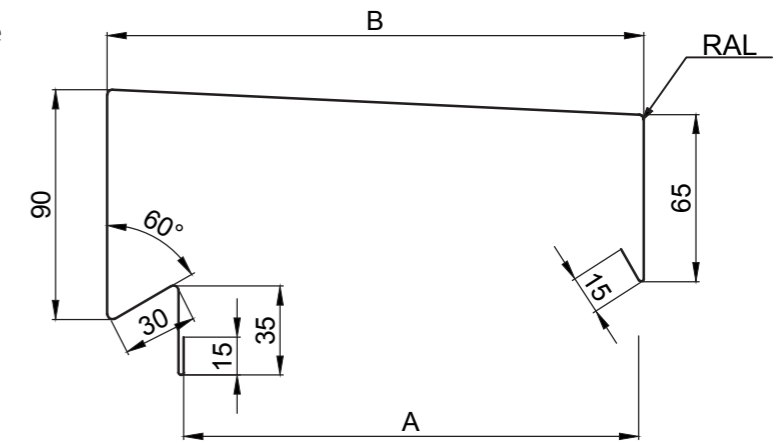
KEY

- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. ISOPER - thermal insulating wall panel
- 3. Support structure
- 4. Screw for fixing the panel to the support structure and metal cap with sealing gasket
- 5. Flashing - concealing the cover of attic, 20ac
- 6. Flashing - clamping the cover of the attic, 21ac
- 7. Screw / rivet for fixing the concealing flashing
- 8. Polyurethane foam
- 9. PVC Membrane

*for structures where the height of attic is > 300mm

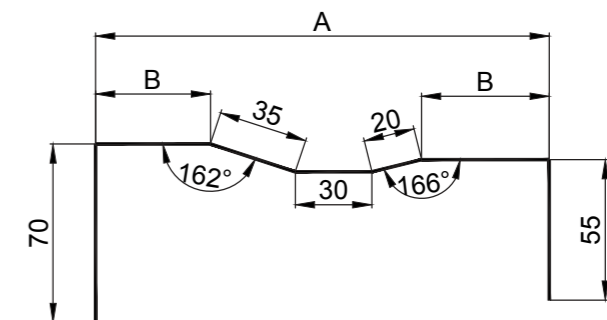
20ac - flashing - concealing the cover of attic

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: B+250mm
 Note: Dimension of B shall be measured on site

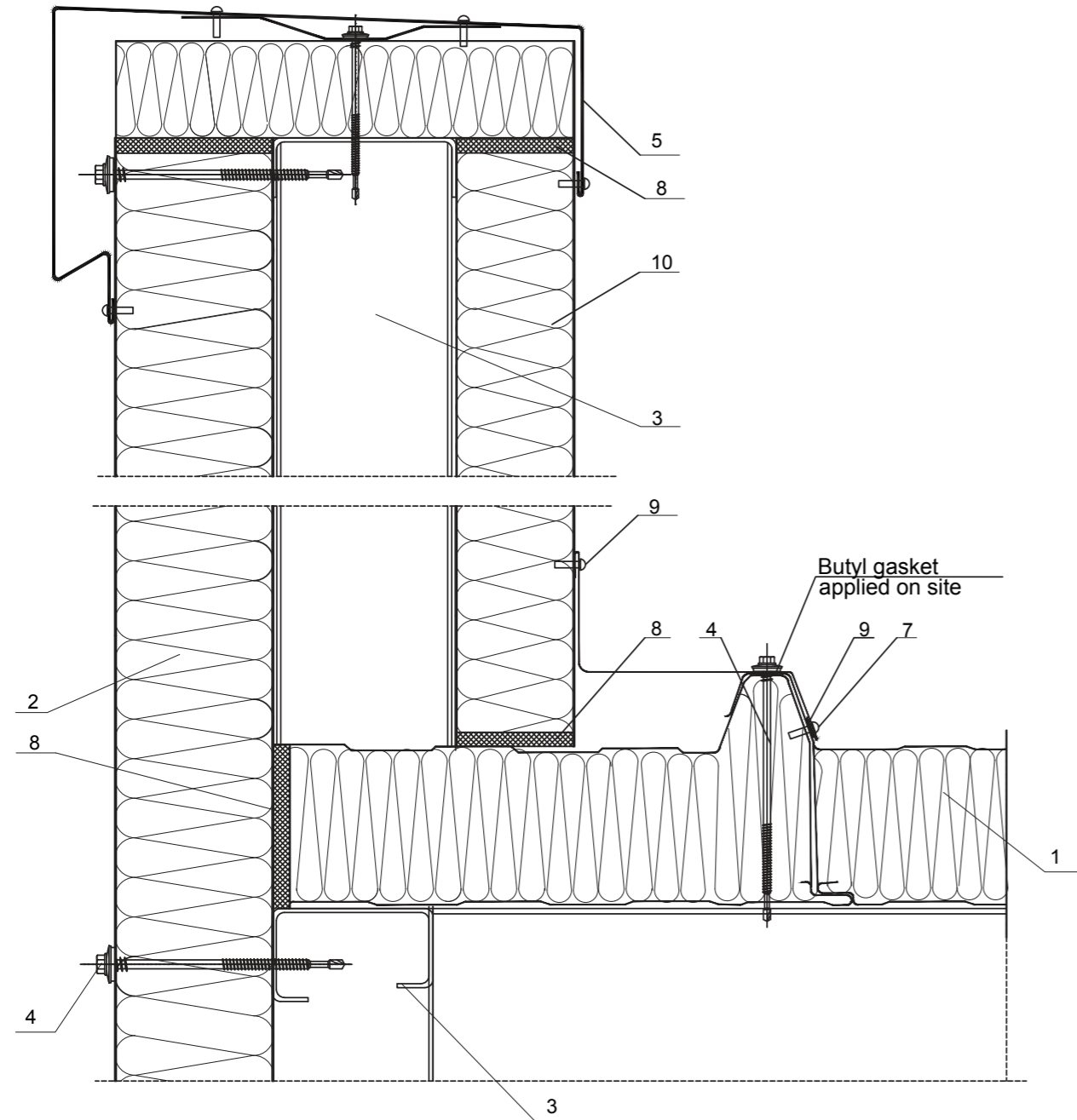


21ac - flashing - clamping the cover of the attic

Material: Galvanized steel sheet
 Length: 3000mm
 Thickness: 1.50mm-2.50 mm
 Unfolded width: 2 x B + 210 mm
 Note: Dimension of A shall be measured on site



Detail of attic with secondary structure - VERSION 2



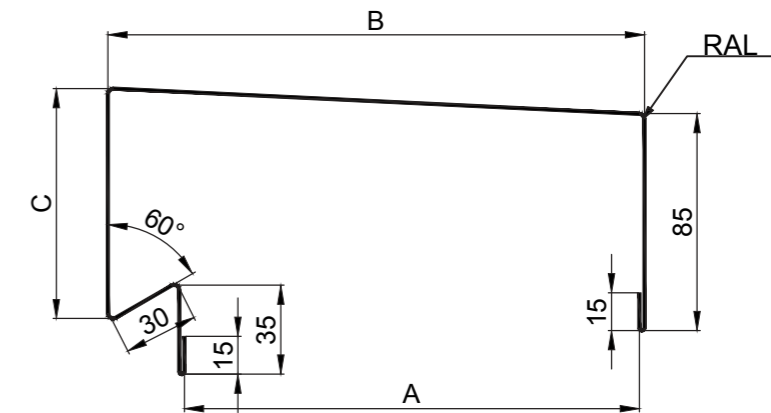
KEY

- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. ISOPER - thermal insulating wall panel
- 3. Support structure
- 4. Screw for fixing the panel to the support structure and metal cap with sealing gasket
- 5. Flashing - concealing the cover of attic, 20'ac
- 6. Flashing - clamping the cover of the attic, 21'ac
- 7. Screw / rivet for fixing the concealing flashing
- 8. Polyurethane foam
- 9. Flashing - concealing the gap between ISOAC3-ISOPER, 19ac
- 10. Thermal insulating panel for insulation of the attic

*for structures where the height of attic is > 300mm

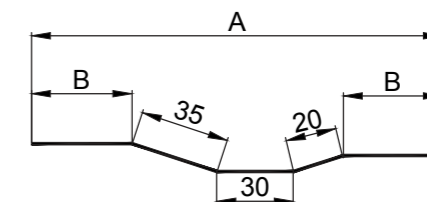
20'ac - flashing - concealing the cover of attic

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Note: Dimension of B, C shall be measured on site



21'ac - flashing - clamping the cover of the attic

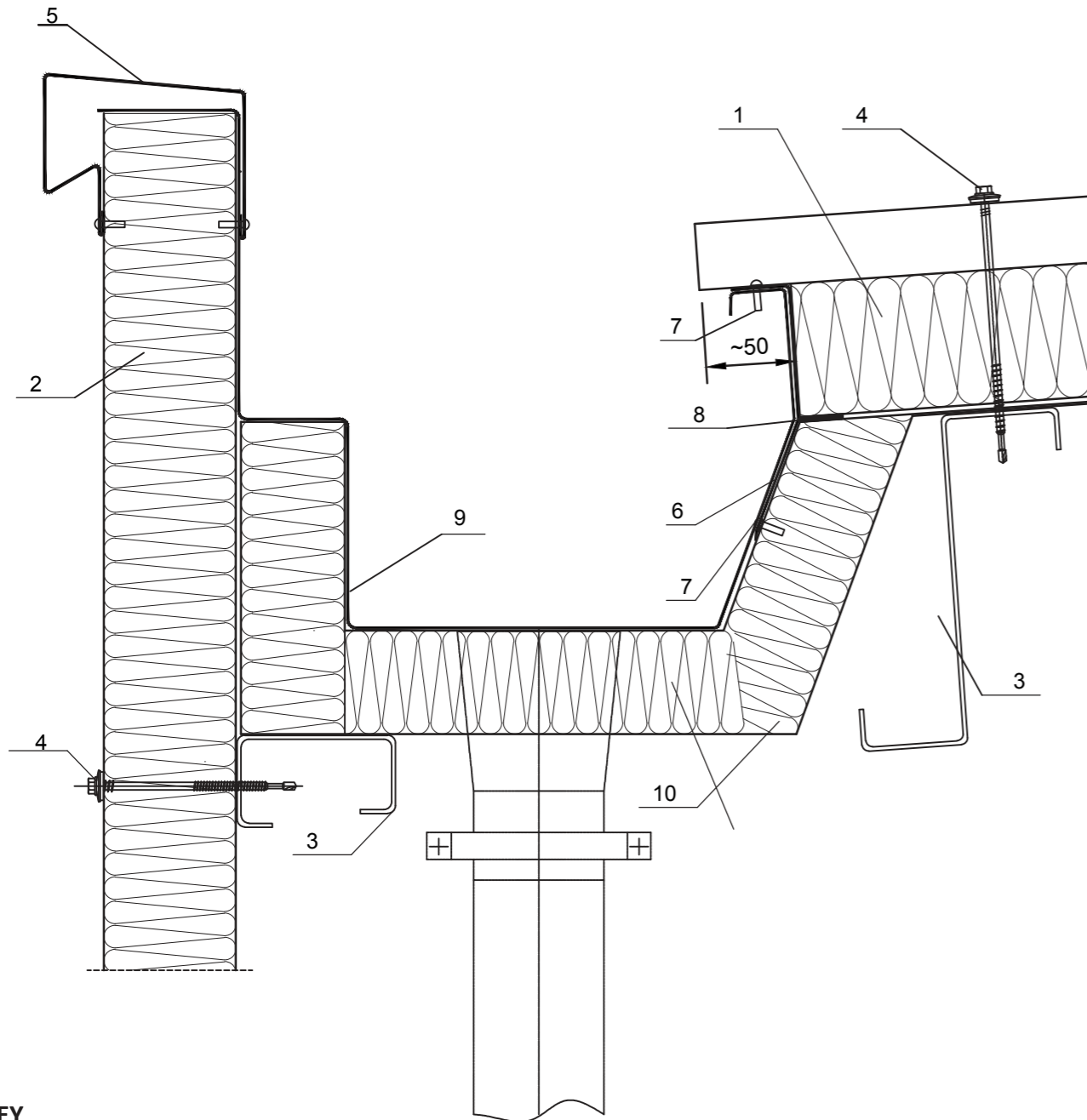
Material: Galvanized steel sheet
 Length: 3000mm
 Thickness: 1.50mm-2.50 mm
 Unfolded width: $2 \times B + 85$ mm
 Note: Dimension of A shall be measured on site



Detail AC9

AC9

Detail of interior gutter made of thermal insulating panels



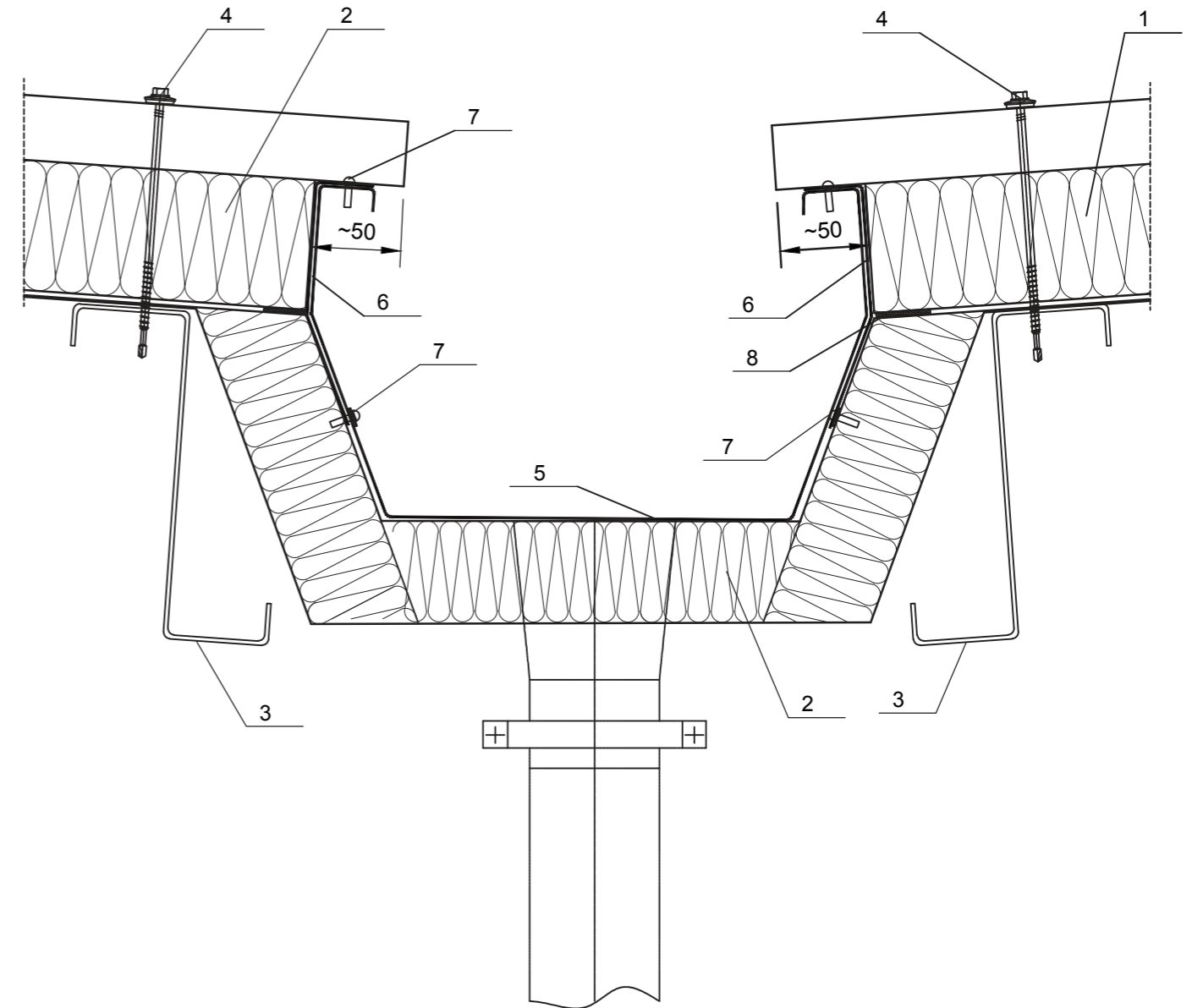
KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. ISOPER - thermal insulating wall panel
3. Support structure
4. Screw for fixing the panel to the support structure
5. Flashing - concealing the cover of attic, 18ac
6. Flashing - bordering ISOAC, 22ac
7. Screw / rivet for fixing the concealing flashing
8. Butyl mastic
9. PVC Membrane
10. Interior gutter made of thermal insulating panels type ISOPER

Detail AC10

AC10 - 1

Detail of roof valley gutter made of thermal insulating panels



KEY

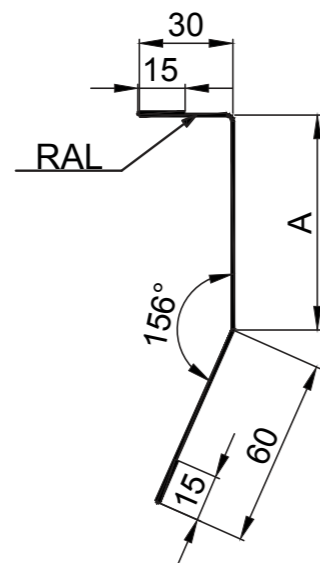
1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Roof valley gutter made of thermal insulating panels type ISOPER
3. Support structure
4. Screw for fixing the panel to the support structure
5. PVC Membrane
6. Flashing - bordering the ISOAC, 22ac
7. Screw / rivet for fixing the concealing flashing
8. Butyl mastic

Detail AC10 / Flashings

AC10 - 2

22ac - flashing - bordering the panel

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm

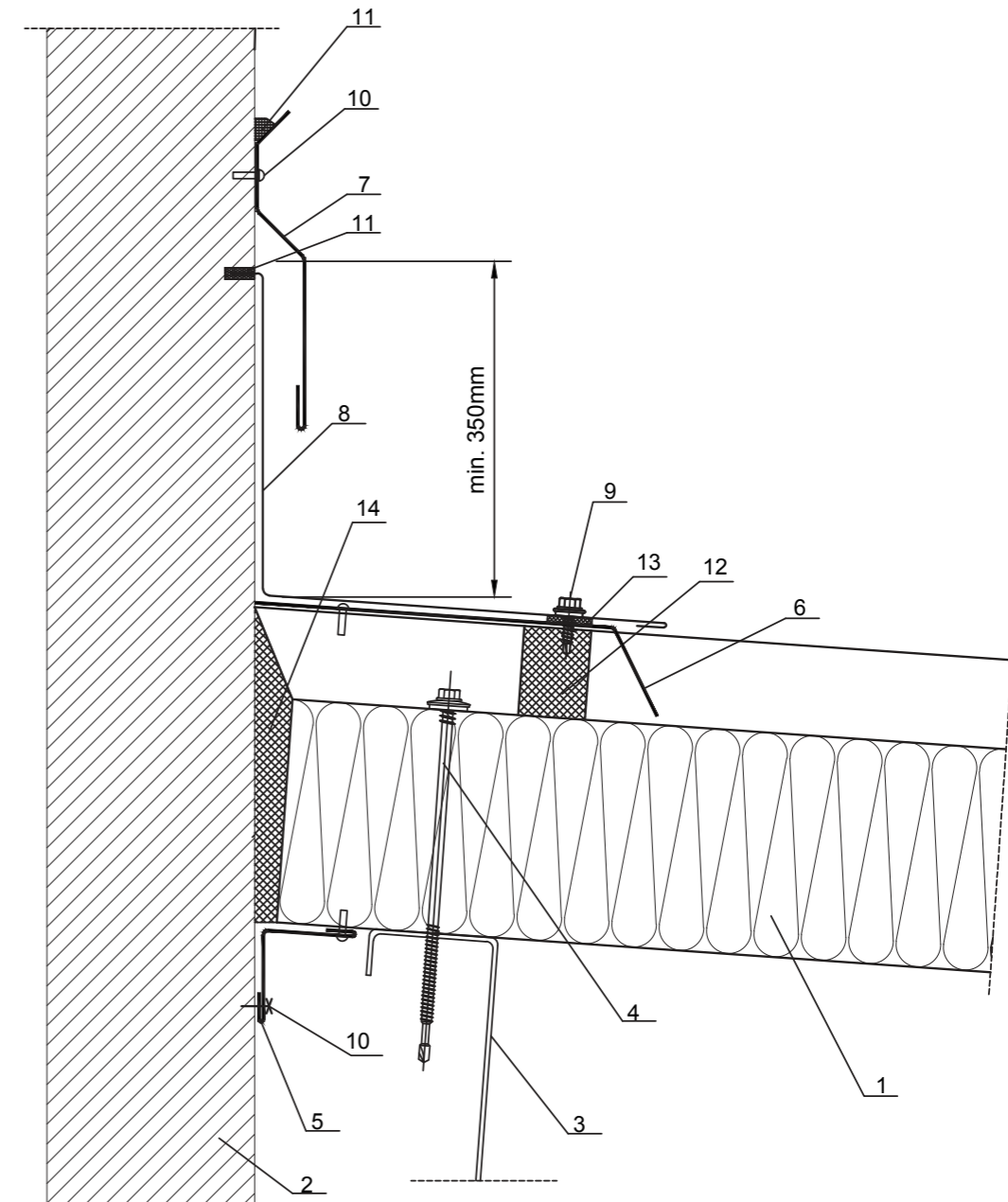


Panel thickness A (mm)	Unfolded width (mm)
30	150
40	160
50	170
60	180
80	200
100	220
120	240

Detail AC11

AC11 - 1

Detail of joining ISOAC3 / ISOAC5 roof to the brick wall



KEY

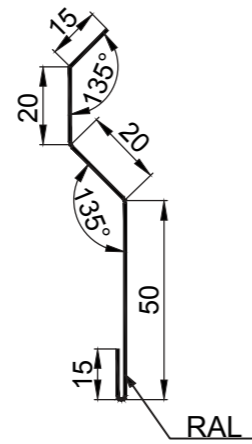
1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Brick wall
3. Support structure
4. Screw for fixing the panel to the support structure
5. Flashing - for concealing the interior joint, 07ac
6. Flashing - for sealing the crest, 04ac/05ac
7. Flashing - dripper, 23ac
8. Flashing - for concealing the exterior joint gap, 24ac
9. Screw / rivet for fixing the concealing flashing (shall be fixed on each rib)
10. Screw for fixing the concealing flashing to concrete
11. Butyl mastic
12. Sealing sponge following the panel rib
13. Self-adhesive sealing tape 3x15 PU
14. Polyurethane foam

Detail AC11 / Flashings

AC11 - 2

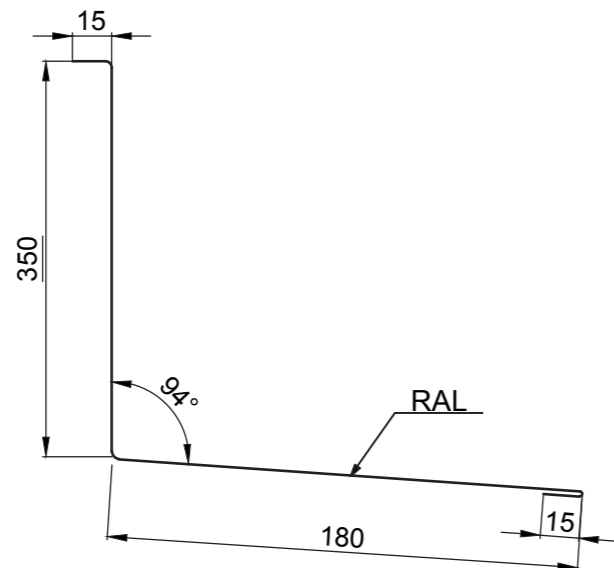
23ac - flashing - dripper for thermal insulating panel

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: 120mm



24ac. - Flashing - for concealing the exterior joint gap between ISOAC panel and brick wall

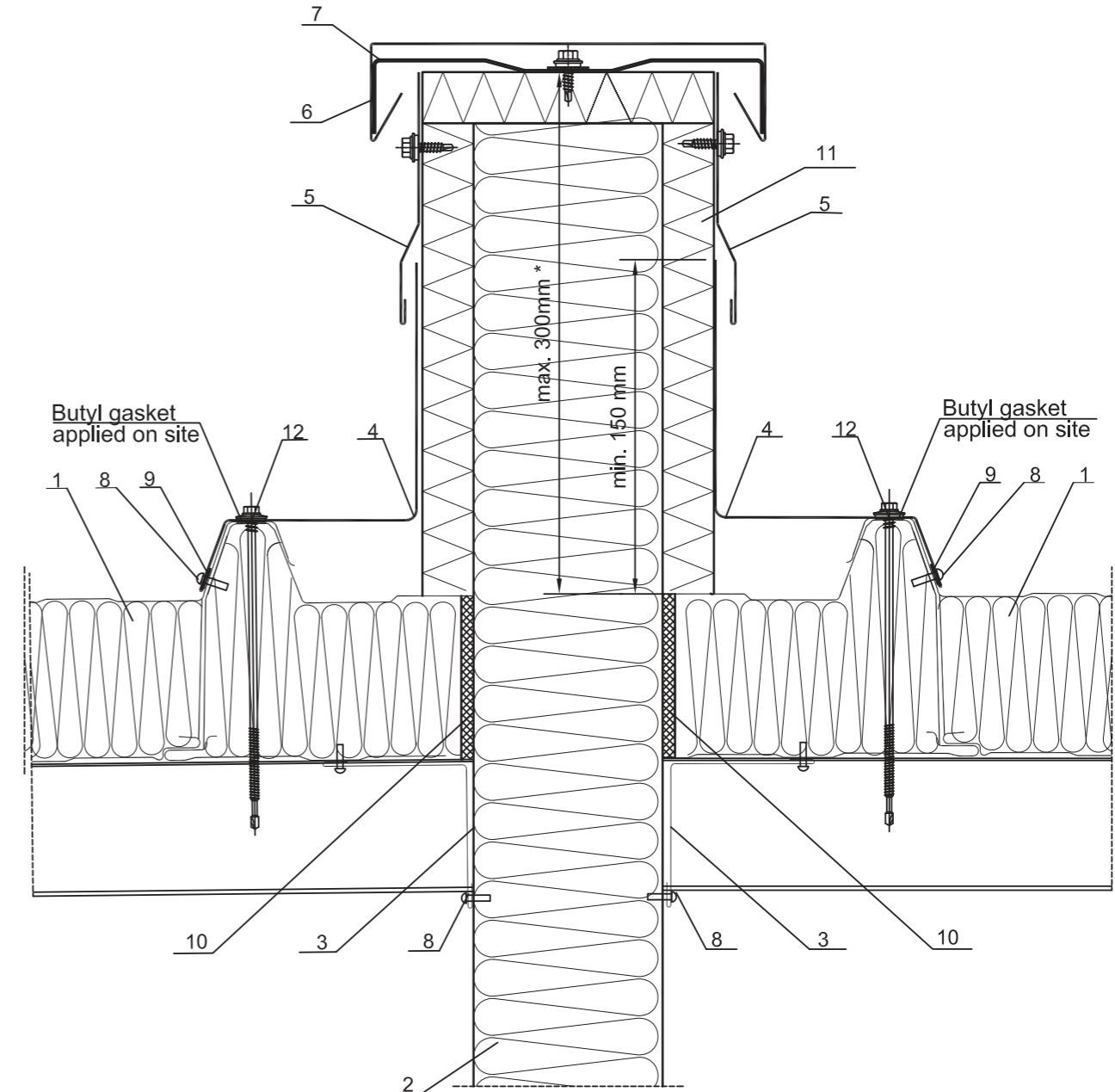
Material: Tablă zincată prevopsită
 Lungime: 2000-6000mm
 Grosime: 0.50mm
 Unfolded width: 560mm



Detail AC12

AC12 - 1

Detail of 180' fire resistant wall



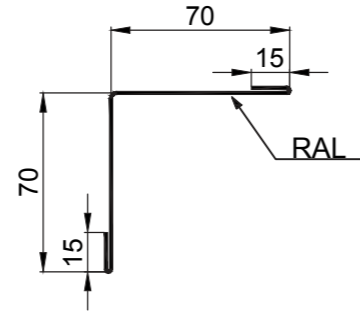
KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Thermal insulating panel / brick wall - 180' fire resistant
3. Flashing - concealing the interior corner of the roof - fire resistance wall, 25ac
4. Flashing -concealing the exterior corner of the roof - fire resistance wall, 26ac
5. Flashing -concealing the dripper, 27ac
6. Flashing - concealing the cover of attic, 28ac
7. Flashing - supporting (clamping) the cover of attic, 29ac
8. Screw / rivet for fixing the concealing flashing
9. Self-adhesive sealing tape type PE 2x20
10. Polyurethane foam
11. Thermal insulating wall panel or drywall boards
12. Screw for fixing the panel to the support structure

*for structures where the height of attic made of fire resistant wall is < 300mm

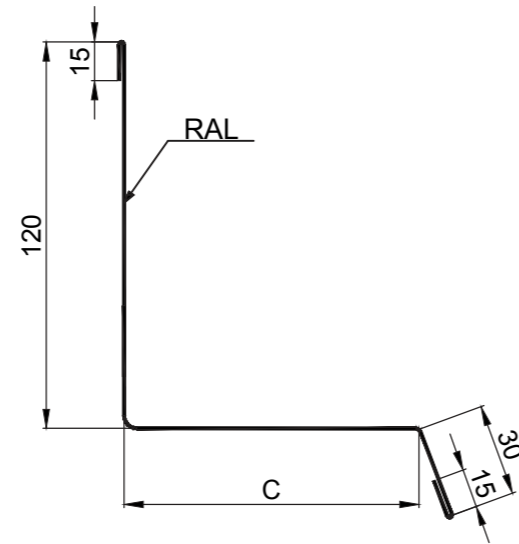
25ac - flashing - concealing the interior corner of the roof panel - fire resistant wall panel

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: 170mm



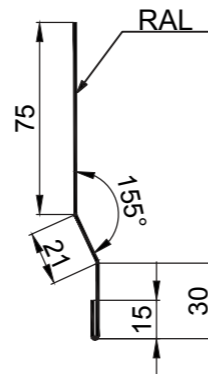
26ac - flashing - concealing the exterior corner of the roof panel - fire resistant wall panel

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: shall be settled by measurements on site



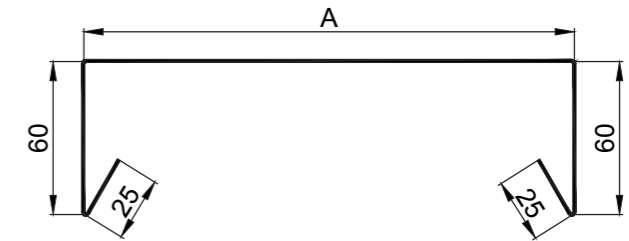
27ac - flashing - concealing the dripper

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: 141 mm



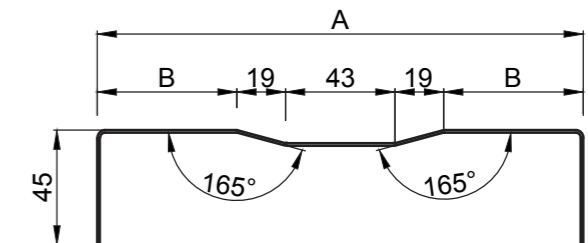
28ac - flashing - covering the attic of thermal insulating panel

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: A + 170 mm
 Note: Dimension of A shall be settled by measurements on site

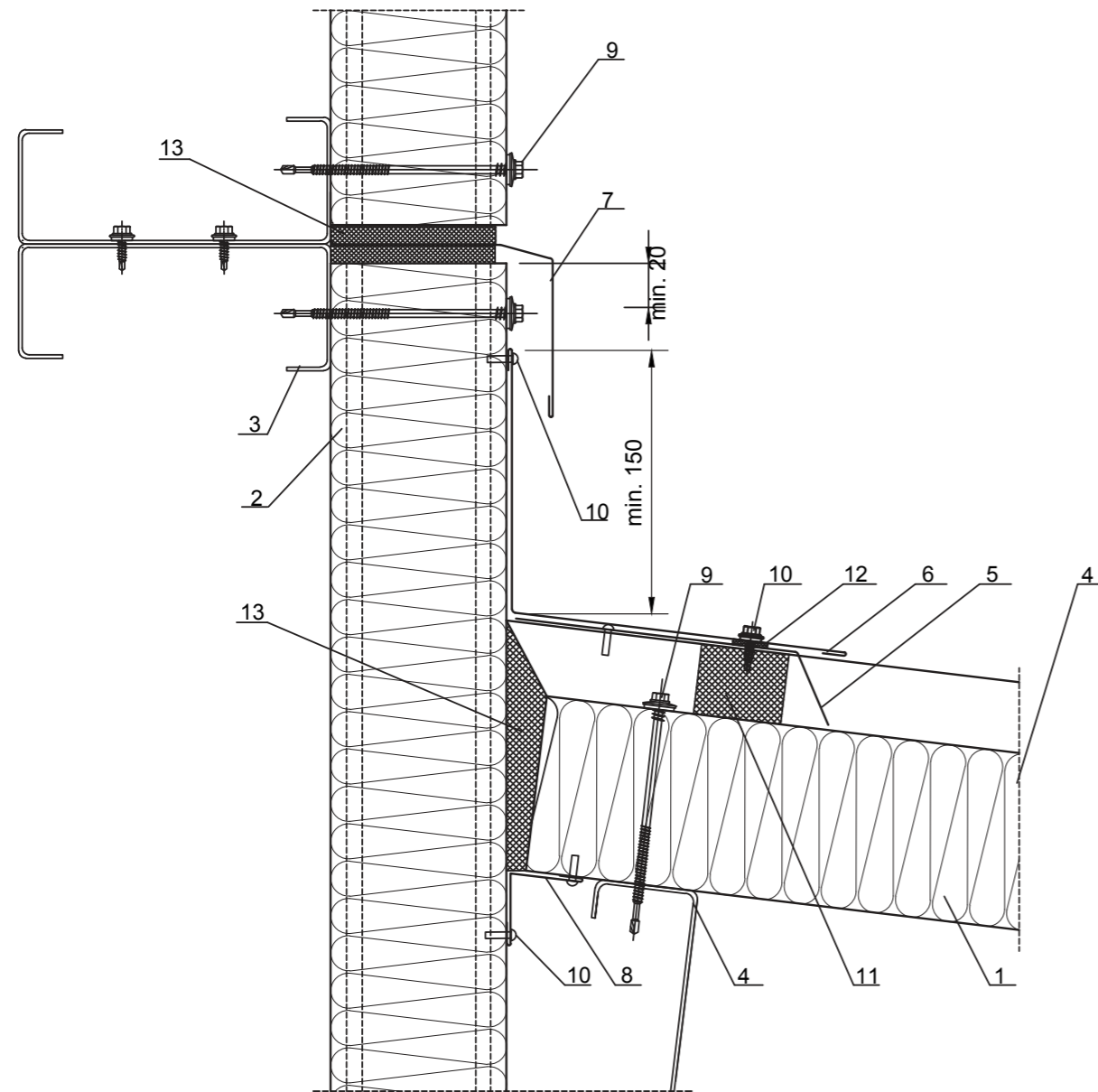


29ac - flashing - supporting (clamping) the cover of attic

Material: Galvanized steel sheet
 Thickness: 1.50mm - 2.50mm
 Note: Dimension of A shall be measured on site



Detail of joining roof-high wall type ISOPER

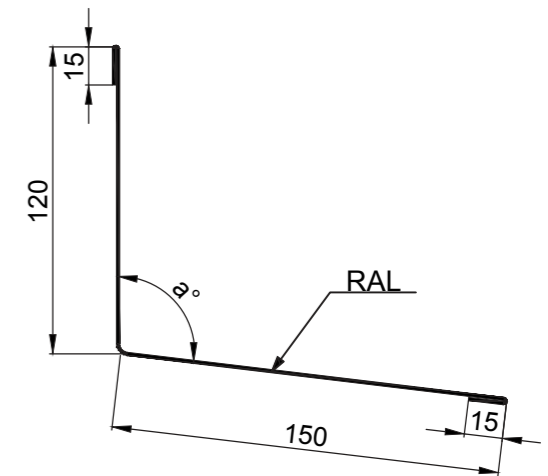


KEY

- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. ISOPER - Thermal insulating wall panel
- 3. Support structure for thermal insulating panel - rulers type C Plastsistem
- 4. Support structure for thermal insulating panel - wedges type Z Plastsistem
- 5. Flashing - for sealing the crest, 04ac/05ac
- 6. Flashing -concealing the exterior corner wall- roof, 30ac
- 7. Flashing -concealing the dripper, 31ac
- 8. Flashing -concealing the interior corner wall- roof, 32ac
- 9. Screw for fixing the panel to the support structure
- 10. Screw / rivet for fixing the concealing flashing
- 11. Sealing sponge following the panel rib
- 12. Self-adhesive sealing tape type PE 2x20
- 13. Polyurethane foam

30ac - flashing - concealing the exterior corner wall- roof

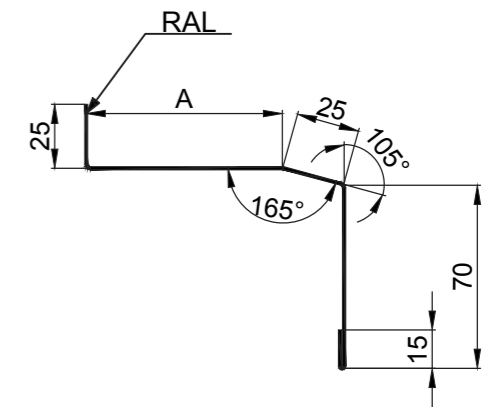
Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: 300 mm
 Angle a° shall be determined based on the roof slope



31ac - flashing - concealing the dripper of thermal insulating panel

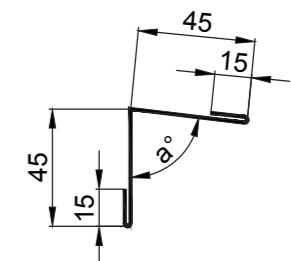
Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: according to table

Panel thickness (mm)	A(mm)	Unfolded width(mm)
30	25	140
40	35	150
50	45	160
60	55	170
80	75	190
100	95	210
120	115	230

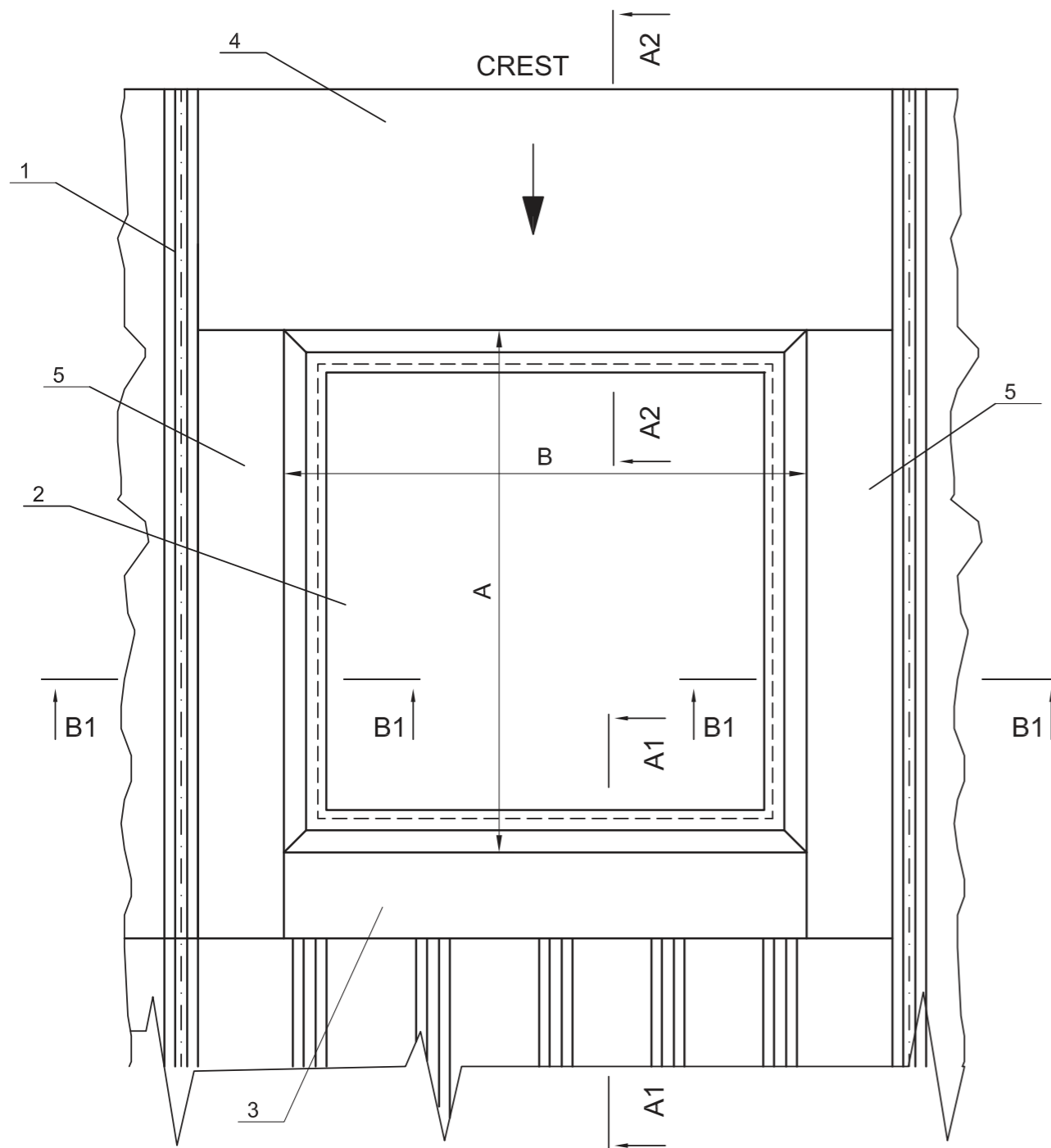


32ac - flashing - concealing the interior corner wall- roof

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: 120 mm
 Angle a° shall be determined based on the roof slope



Detail of joining ISOAC smoke evacuation trapdoor



KEY

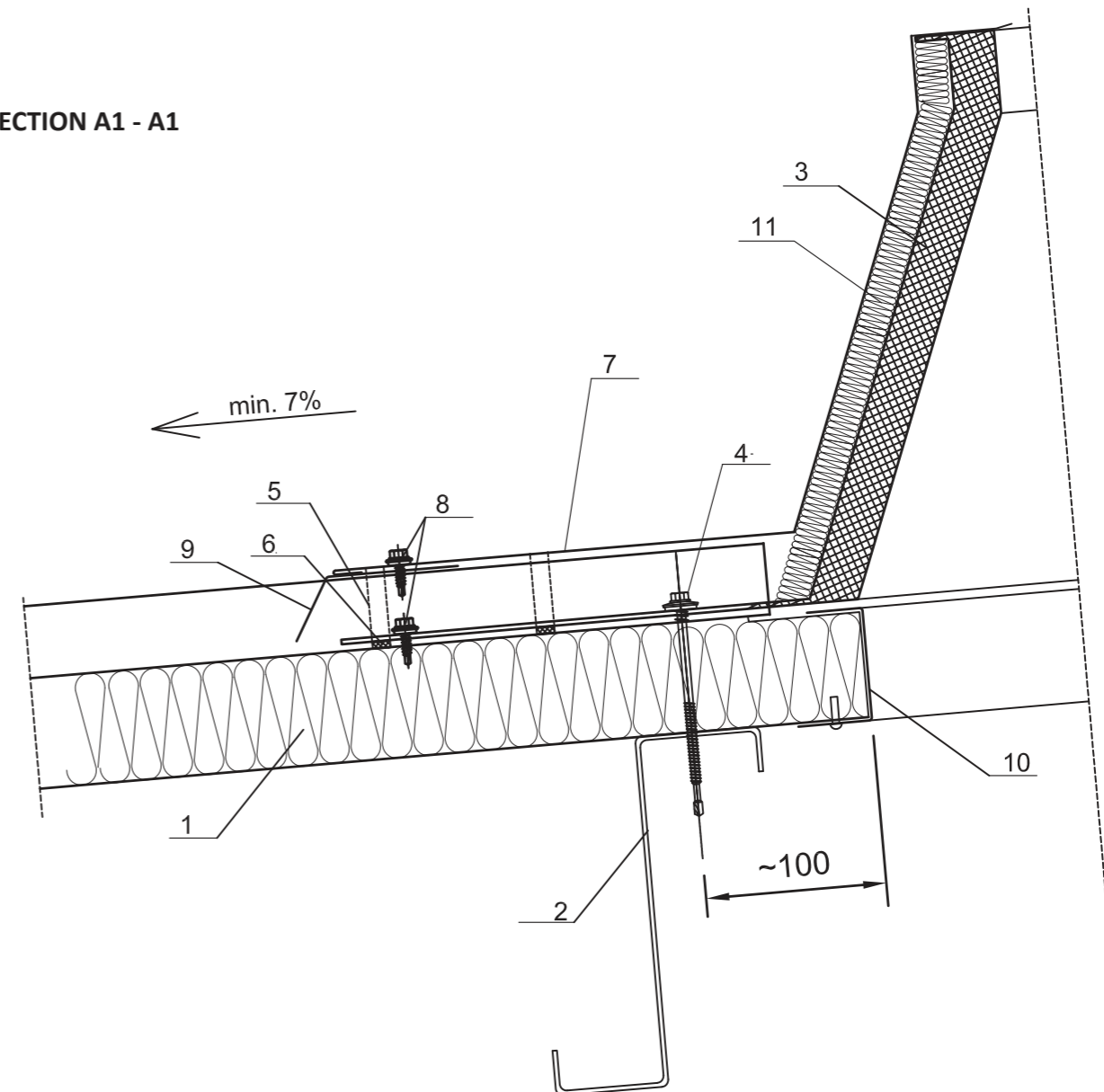
1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Smoke evacuation trapdoor having the dimensions A x B
3. Flashing - concealing the socle of smoke evacuation trapdoor, 33ac
4. Flashing - concealing the socle of smoke evacuation trapdoor, 34ac
5. Flashing - concealing the socle of smoke evacuation trapdoor, 35ac

NOTE:

For smoke evacuation trapdoors with automatic opening, to avoid its damage when opening, it is recommended that the height of the socle of smoke evacuation trapdoor to be at least 300mm above the roof.

SECTION A1-A1

SECTION A1 - A1

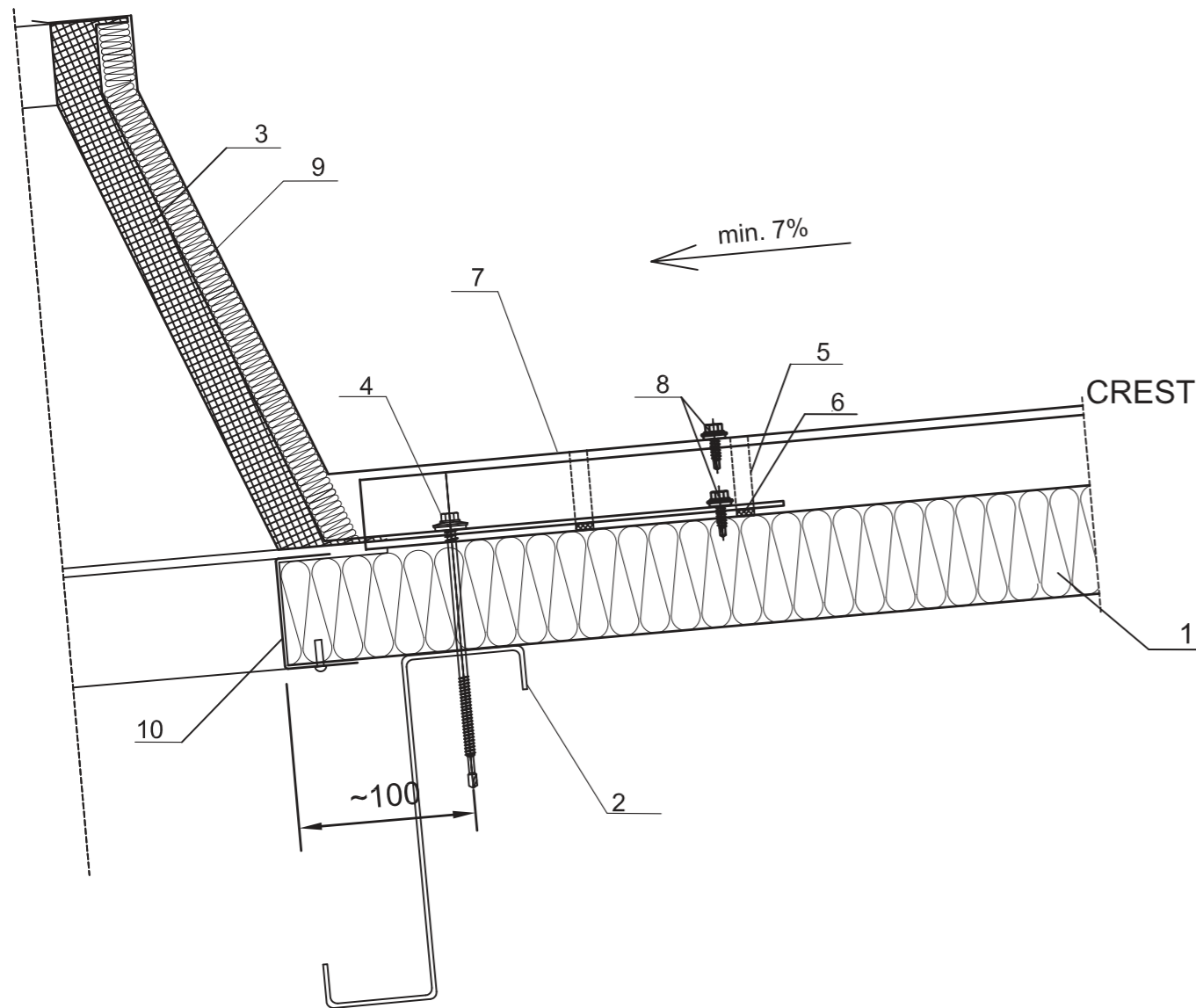


KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Support structure for thermal insulating panel
3. Smoke evacuation trapdoor
4. Screw for fixing the panel to the support structure
5. Self-adhesive sealing tape type 4x20 PU
6. Butyl mastic
7. Flashing -concealing the socle of smoke evacuation trapdoor, 33ac
8. Screw / rivet for fixing the concealing flashing
9. Flashing - for sealing the crest, 04ac/05ac
10. Flashing - for bordering the gap of smoke evacuation trapdoor, 36ac
11. Mineral wool - for insulating the socle of smoke evacuation trapdoor

SECTION A2-A2

SECTION A2 - A2

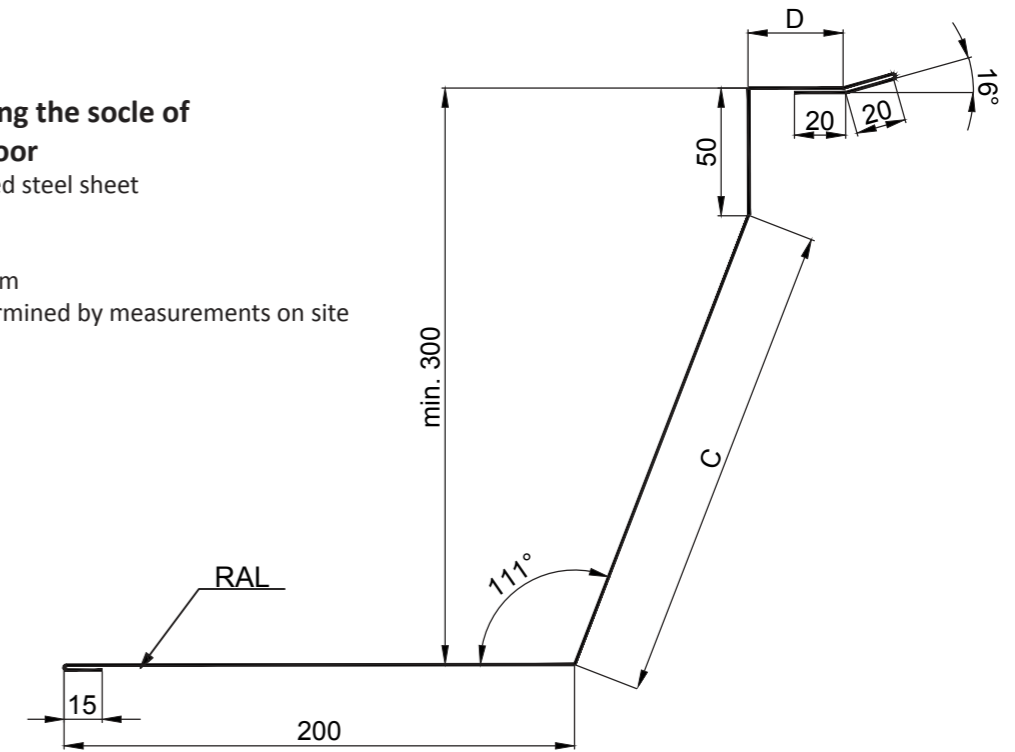


KEY

- 1. ISOAC3 / ISOAC5 thermal insulating roof panel
- 2. Support structure for thermal insulating panel
- 3. Smoke evacuation trapdoor
- 4. Screw for fixing the panel to the support structure
- 5. Self-adhesive sealing tape type 4x20 PU
- 6. Butyl mastic
- 7. Flashing -concealing the socle of smoke evacuation trapdoor, 34ac
- 8. Screw / rivet for fixing the concealing flashing
- 9. Mineral wool - for insulating the socle of smoke evacuation trapdoor
- 10. Flashing - for bordering the gap of smoke evacuation trapdoor, 36ac

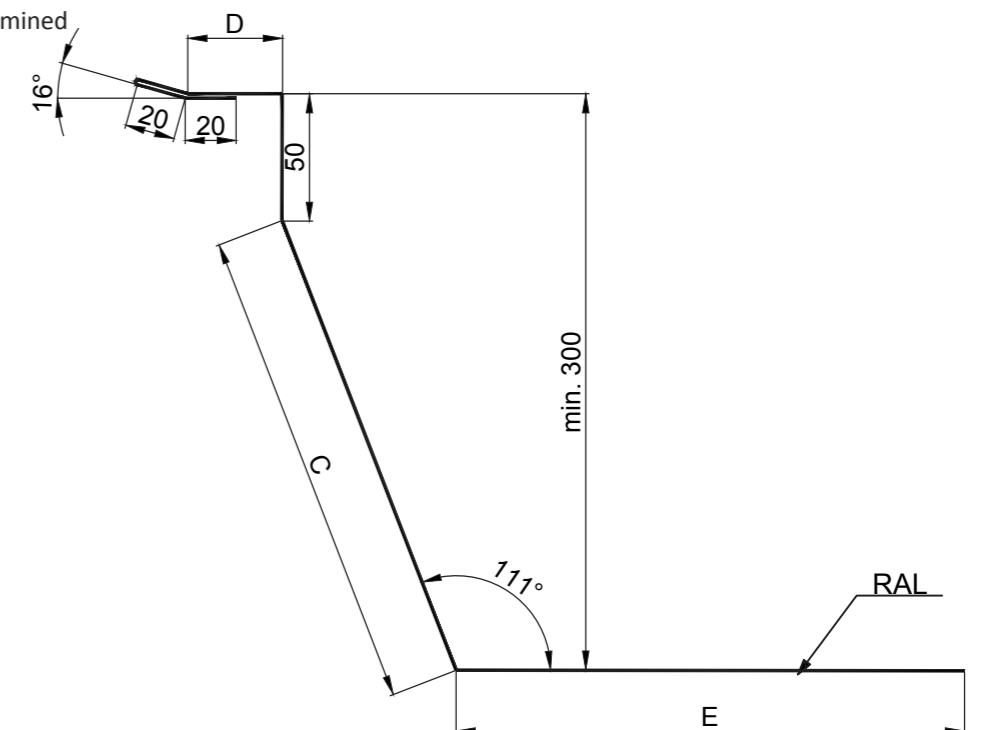
33ac - flashing - concealing the socle of smoke evacuation trapdoor

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: C + D + 325 mm
 Dimensions C, D shall be determined by measurements on site



34ac - flashing - concealing the socle of smoke evacuation trapdoor

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: C + D + E + 110 mm
 Dimensions C, D, E shall be determined by measurements on site

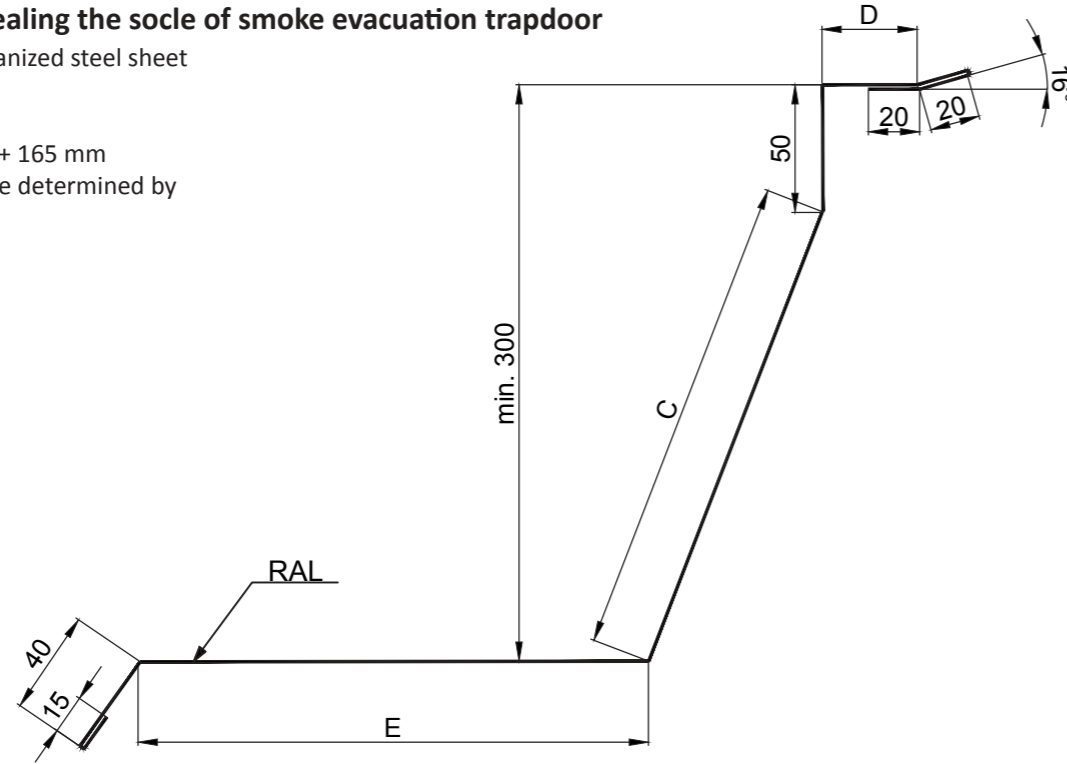


Detail AC14 / Flashings

AC14 - 5

35ac - flashing -concealing the socle of smoke evacuation trapdoor

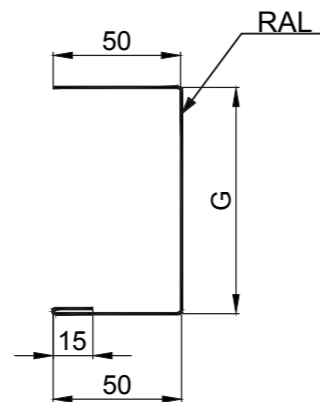
Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm
 Unfolded width: C +D + E + 165 mm
 Dimensions C, D, E shall be determined by measurements on site



36ac - flashing - for bordering the gap of smoke evacuation trapdoor

Material: Prepainted galvanized steel sheet
 Length: 2000-6000mm
 Thickness: 0.50mm

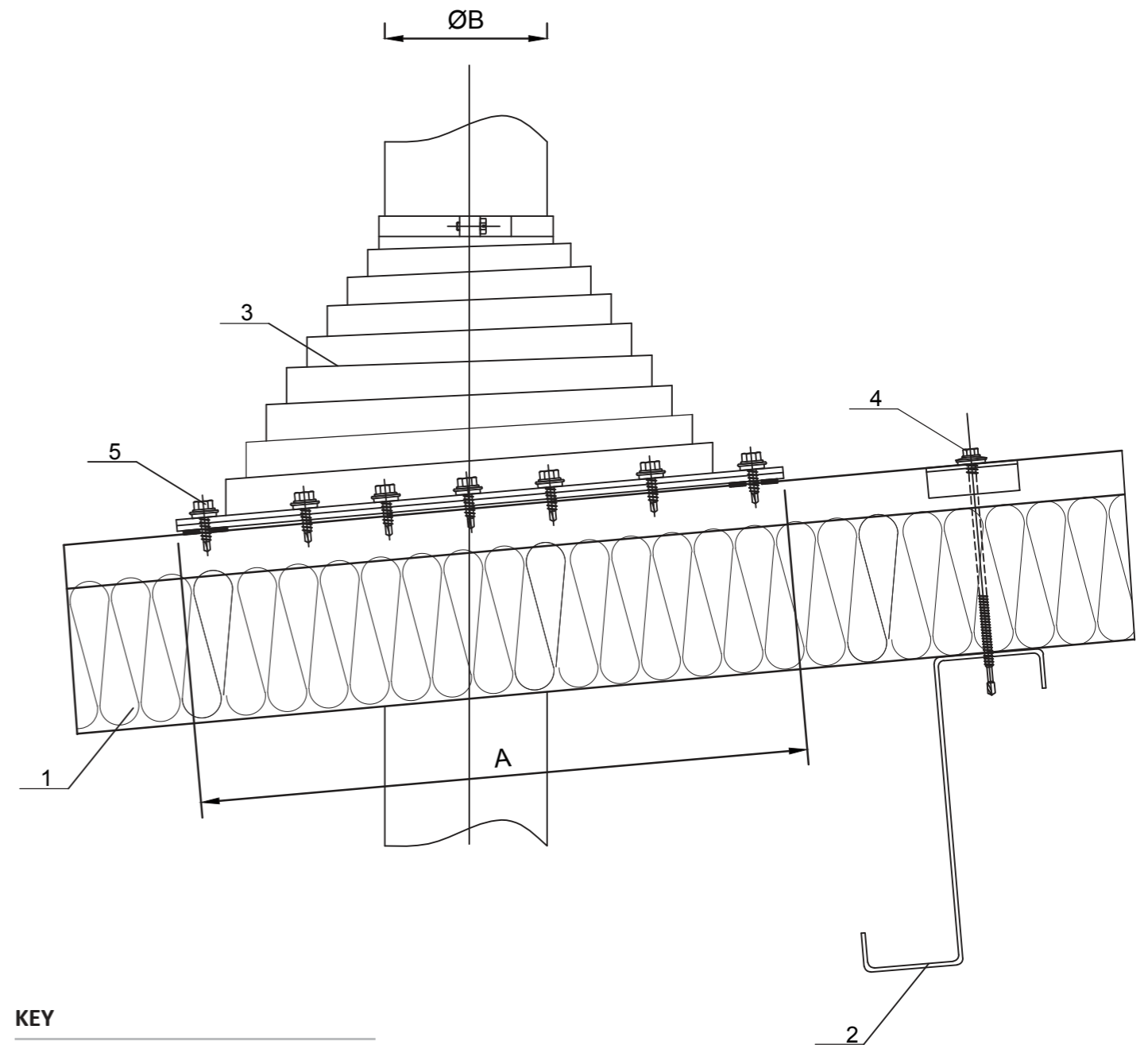
Panel thickness G (mm)	Unfolded width (mm)
30	150
40	160
50	170
60	180
80	200
100	220
120	240



Detail AC15

AC15

Detail - assembly of fluids extractor



KEY

1. ISOAC3 / ISOAC5 thermal insulating roof panel
2. Support structure for thermal insulating panel
3. Fluids extractor
4. Screw for fixing the panel to the support structure
5. Self-drilling screw for fixing the securing sleeves of the fluids extractor

Note:
 For installing the extractor we need sealant, the tube that pierces the panel.
 For the optimal choice of sleeves, please contact the technical department.

THERMAL INSULATING WALL PANELS CERTIFICATION

Classification regarding fire characteristics (PIR core)

Classification : Fire resistance

ISOPERnRF	D = 50 și 60 mm	EI 20 E 90
ISOPERnRF	D = 80, 100, 120 mm	EI 30 E 30
ISOFRIGRF	D = 150, 200 mm	EI 30 E 30
ISOPeRnRF	D = 80, 100 mm	EI 30 E 60
ISOAC3RF	D = 50 și 60 mm	REI 20 RE 30
ISOAC3RF	D = 80, 100, 120 mm	REI 30 RE 30
ISOAC5RF	D = 50 și 60 mm	REI 15 RE 30
ISOAC5RF	D = 80, 100, 120 mm	REI 30 RE 60

Classification : Fire reaction

ISOPERnRF	[30-200 mm]	B-S2, d0
ISOPeRnRF	[40-100 mm]	B-S2, d0
ISOAC3RF	[30-120 mm]	B-S2, d0
ISOAC5RF	[30-120 mm]	B-S2, d0

Classification regarding fire characteristics (PUR core)

Classification : Fire reaction

ISOPERn	[30-200 mm]	D-S3, d0
ISOPeRn	[40-100 mm]	D-S3, d0
ISOAC3	[30-120 mm]	D-S3, d0
ISOAC5	[30-120 mm]	D-S3, d0

Density 35-40 kg/m³

Other tests performed

Airborn sound insulation

ISOPERn	40 - RW (C;Ctr) = 28 (-3;-4) dB
ISOAC5	80 - RW (C;Ctr) = 27 (-2;-5) dB

- E - Integrity (fire tightness)
- I - Insulation (thermal insulation to fire)
- R - load bearing capacity

* For double sided metal faced panels and galvanized profiles types Z, C, U and Σ, CE label is applied.



The company's activity is carried out according the Integrated Management System, Quality - Environment, Health and Operational Safety in accordance with European standards. The system is certified by SGS



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