

IZOLITE BOARDS

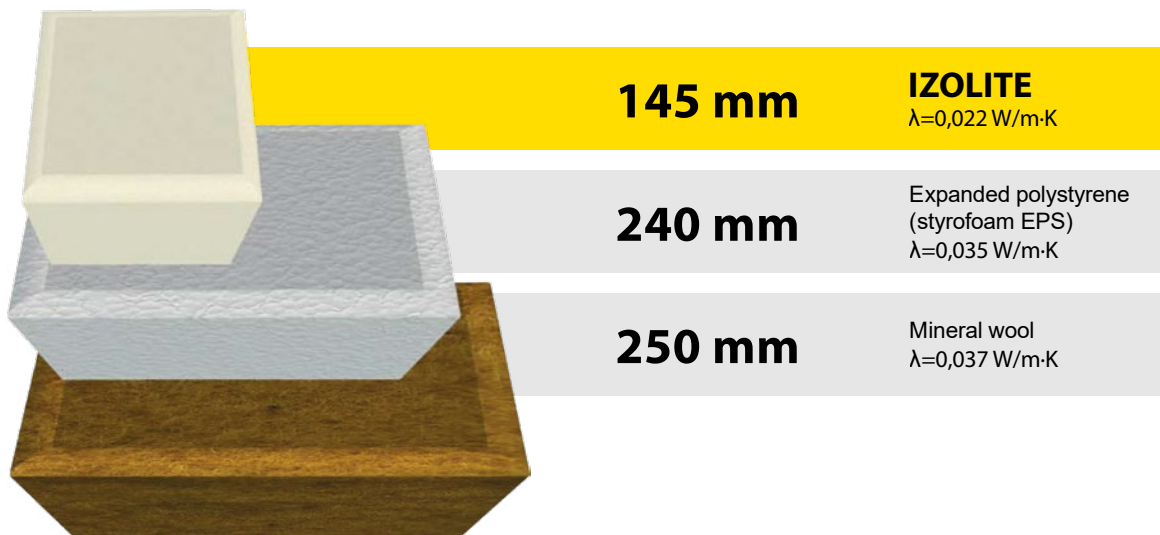


LEARN HOW TO BUILD A ROOF RESISTANT
TO THE CHALLENGES OF THE HARD CLIMATE

FLAT ROOFS

ADVANTAGES OF IZOLITE BOARDS IN FLAT ROOF INSULATION

Unmatched energy efficiency



Insulation coefficient of the roof partition $U=0.15$ W/m²·K

The result of the extremely high energy efficiency of the IZOLITE board material is:

- Possible reduction of the thickness of the insulation layer - important when insulating existing roofs limited by parapets, gutters, etc.
- Reducing the thickness of the insulation and the low weight of the panels (low material density of 30 kg/m³) - the lower weight of the entire cover reduces the cost of the steel supporting structure by up to 20%!

Compare thermal insulators

Technical requirements for a flat roof partition (according to the polish law)

Technical requirements for flat roof partitions for buildings with an internal temperature > 16°C		IZOLITE ($\lambda=0,022$ W/m·K; density = 30 kg/m ³)				Mineral wool ($\lambda=0,037$ W/m·K; density = 130 kg/m ³)			
		Thickness [mm]	U [W/m ² ·K]	R [m ² ·K/W]	Weight kg/m ²	Thickness [mm]	U [W/m ² ·K]	R [m ² ·K/W]	Weight kg/m ²
For general, production, warehouse and economic construction	Required U _{max}								
from January 1, 2017*	0,18	120	0,18	5,45	3,60	210	0,18	5,68	27,3
from January 1, 2021*	0,15	145	0,15	6,60	4,35	250	0,15	6,76	32,5

* Required insulation coefficients for 2017, 2021 according to the polish Regulation of the Minister of Infrastructure and Development of July 5, 2013.

Technical loads



The weight of thermal insulation material in the case of mineral wool for the required heat transfer parameters for a flat roof is eight times greater than the material used for the production of IZOLITE boards that meets the same thermal insulation requirements!

This is due to both much better thermal insulation properties of IZOLITE boards, which affects the amount of material needed for insulation (thinner PIR material has the same insulation properties as mineral wool) and a large difference in the density of both materials (30 kg/m³ of IZOLITE board compared to 130 kg/m³ of mineral wool).

Significantly lower weight of IZOLITE boards compared to competitive mineral wool materials means that the entire building structure has lower load-bearing capacity requirements, and thus it is possible to significantly reduce construction costs - up to 20%!

ECOLOGY

The **IZOLITE PANEL** is a modern and environment friendly material with exceptional thermal insulation properties.

Multi-factor, standardized LCA (Life Cycle Assessment) analyzes have shown that PIR foams are a material whose environmental costs, calculated from production, through routine use, to final disposal, are among the lowest in the group of construction thermal insulation materials.

They consume the least natural fossil resources ADP - Abiotic Depletion Potential (Depletion of Natural Resources) and are the most modifiable through the use of ecological renewable raw materials (plants).

They are completely free of compounds that destroy the ozone layer ODP - Ozone Depletion Potential.

They can be recycled and largely reused. It does not contain any elements, inclusions, fibers that could cause throat, eye or skin irritation.



High pressure resistance - 150 kPa (15 tons/m²)

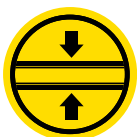
More than twice the pressure resistance of previously used fibrous insulation materials means:

No risk of mechanical damage to the surface - allows you to move under the roof without the risk of damage, e.g. for maintenance or snow removal.



Low water absorption

- less than or equal to 2%;
- resistance to fungi, molds, microbes, rodents.

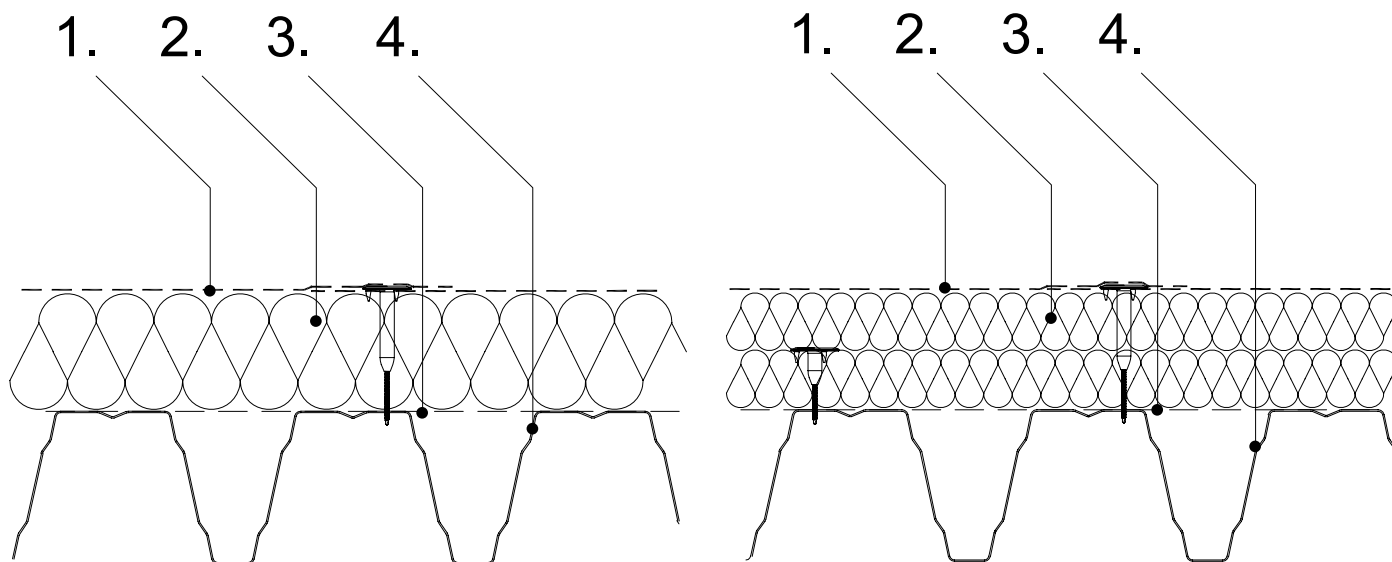


Easy assembly

- ease of processing;
- excellent cooperation with various types of steam- and hydro- membranes and other finishing materials;
- low risk of developing so-called assembly defects.

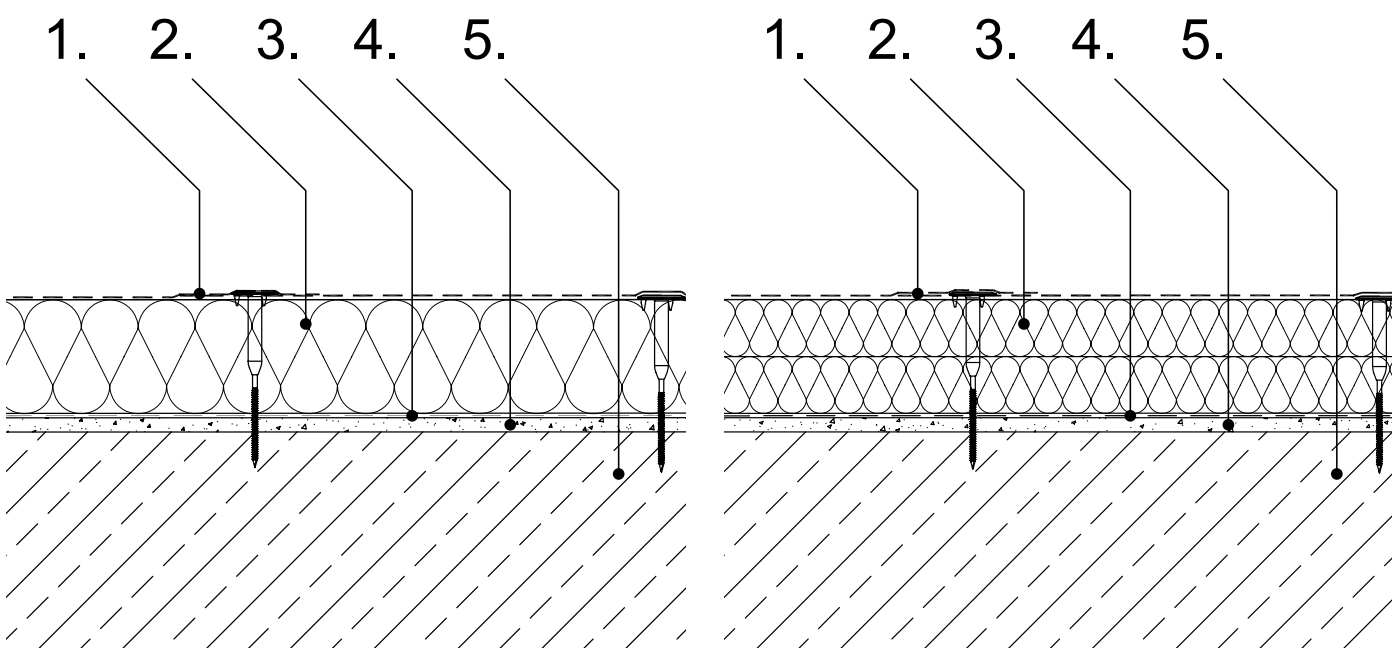
APPLICATION

Modern thermal insulation of a flat roof on a trapezoidal sheet



1. Waterproofing, 2. IZOLITE thermal insulation board, 3. Vapor barrier, 4. Trapezoidal sheet - load-bearing substrate

Modern thermal insulation of a flat roof on a concrete ceiling



1. Waterproofing, 2. IZOLITE thermal insulation board, 3. Vapor barrier, 4. Sloping layers, 5. Reinforced concrete base - load-bearing base

IZOLITE BOARDS

TECHNICAL INFORMATIONS

Material

The **IZOLITE** is a hard polyisocyanurate (PIR) thermal insulation board, 100% CFC-free (does not contain CFCs and HCFCs).



PIR is produced as a result of the foaming reaction of liquid ingredients (mainly organic from the group of polyols and isocyanides) with the addition of an active foaming agent. This set is fed continuously between two linings that limit the foamed volume.

Optimization of thermal insulation effects consists in the appropriate selection of

organic ingredients, necessary chemical additives and a fully ecological frother. As a result of these processes, a small-cell structure is formed, containing over 90% of closed cells and filled with gas with very low thermal conductivity. This construction ensures good strength parameters and exceptional thermal insulation of the material - much better compared to mineral wool and polystyrene.

Technical parameters

- according to the PN-EN 13165 standard
- Thermal conductivity coefficient (aging λ_D)
 $\lambda_D = 0.022$ [W/m·K] (for thicknesses from 100 mm)
or $\lambda_D = 0.023$ [W/m·K] (for thicknesses below 100 mm)
- Bulk density: **30 kg/m³**
- Compressive strength **150 kPa**
(at 10% deformation)
- Water absorption $\leq 2\%$
- Tensile strength TR70 (for thicknesses up to 160 mm) or TR40 (for thicknesses over 160 mm)
- Resistance to water vapor penetration:
 $\mu = 50-100$
- Reaction to fire **Euroclass E**
- Multi-layer, gas-tight cladding with aluminum

Dimensions

- Overall width: **1200 mm**
- Modular width (cover): **1200 mm** (straight BASIC), **1185 mm** (TOP lock with overlap), **1190 mm** (MASTER tongue and groove)
- Standard lengths, overall: **2400 mm**
(modular lengths: **2400 mm** - BASIC, **2385 mm** - TOP, **2390 mm** MASTER)
- Non-standard lengths, total:
2400 mm - max 5000 mm
- Available panel thicknesses:
30, 40, 50, 60, 80, 90, 100, 110, 120, 125, 140, 145, 150, 160, 180, 200 mm

Fire resistance

In the group of foamed polyurethanes, rigid PIR (polyisocyanurate) foam boards with aluminized cladding are characterized by relatively the high fire resistance. A specially composed material recipe significantly increases the ignition temperature and the temperature range of routine applications, making these boards more fire resistant than EPS and XPS.

IZOLITE panels in roof systems covered with PVC membrane or heat-welded roofing felt have been tested for fire resistance by the FIRES Testing Laboratory and obtained the REI 30 class, regardless of whether the load-bearing layer is a trapezoidal steel sheet or reinforced concrete elements.

The tested systems used only IZOLITE boards as thermal insulation, without additional fire protection layers, e.g. made of mineral wool.

The IZOLITE has the European classification of reaction to fire Euroclass E.



The char on the PIR plate insulates and separates from further fire penetration

In direct contact with fire, black carbon forms spontaneously on the panel surface, which cuts off further fire access to the inside and at the same time increases the fire resistance of the system (separates the material from further penetration by fire).

FLAT ROOF INSULATION

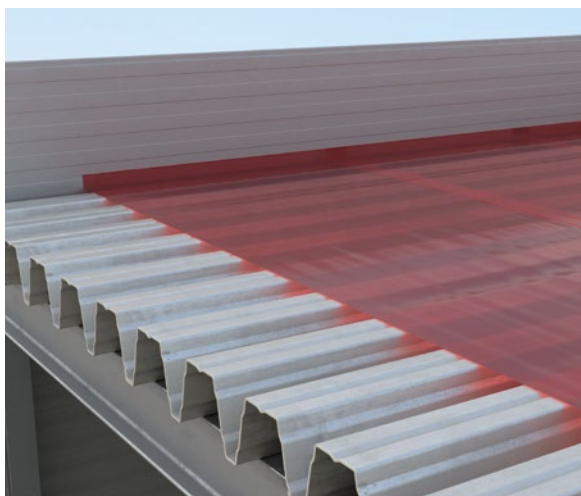
IZOLITE boards - thanks to their exceptional energy efficiency and low weight as well as ease of application - are perfect for thermal insulation of flat roofs made of trapezoidal sheet or concrete. They meet the requirements of thermal insulation of the roof with a relatively smaller thickness compared to other materials.

	d [mm] panel thickness	U [W/m ² ·K] insulation coefficient	R [m ² ·K/W] thermal resistance
λ = 0,023 W/m·K	30	0,77	1,30
	40	0,57	1,75
	50	0,45	2,20
	60	0,38	2,60
	80	0,29	3,50
	90	0,26	3,90
λ = 0,022 W/m·K	100	0,22	4,55
	110	0,20	5,00
	120	0,18	5,45
	125	0,18	5,65
	140	0,16	6,35
	145	0,15	6,60
	150	0,15	6,80
	160	0,14	7,25
	180	0,12	8,20
	200	0,11	9,10

Executive guidelines

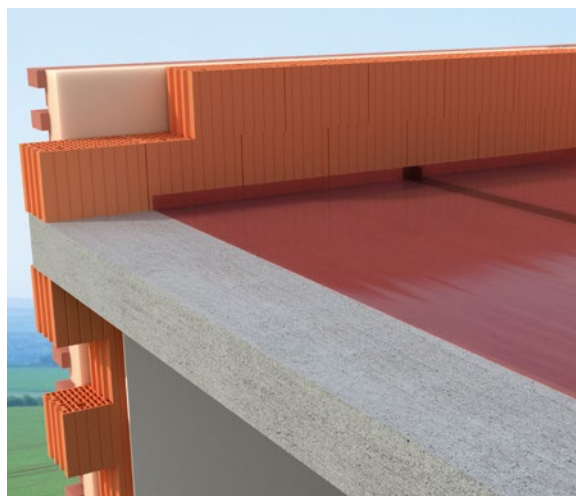
During the assembly of Balex Metal products it is crucial to follow all the general safety conditions and the rules included in this instruction, to avoid dangerous situations. Before the start, the introduction training have to be done and confirmed by signature of a worker. All the actions have to be done by the workers with valid medical report about no contraindications to do their job and under the supervision of authorized person. Particular attention should be paid to difficult weather conditions and protection against falls from heights (protective barriers, safety harnesses). It is essential to use personal protective equipment appropriately for the type of threat or exposure.

1. Substrate preparation



The panels are placed on a load-bearing substrate covered with a layer of vapor barrier. The substrate should be flat and dry, and any impurities left during construction works (e.g. screws, nails, metal filings) should be removed before starting the installation.

2. Cutting the boards



Depending on the shape and complexity of the roof, **IZOLITE** boards can be cut using commonly available tools, such as jigsaws, wood or metal saws, sharp knives, etc.

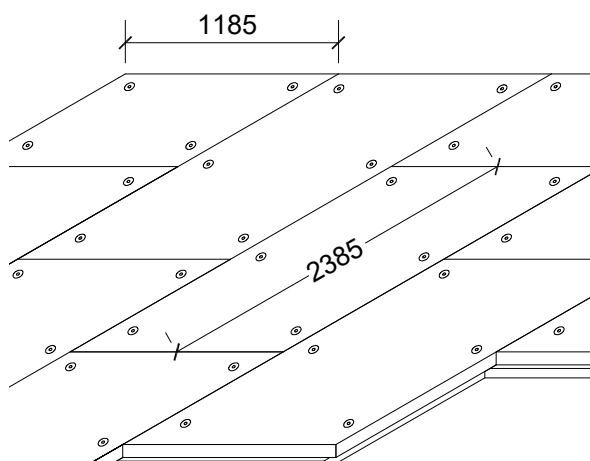
3. Laying the boards

IZOLITE panels are placed on a layer of vapor barrier, e.g. PE foil or vapor barrier paper. On the substrate made of trapezoidal sheets, place them with the long side perpendicular to the folds of the sheet - this will simplify the installation of the pins to the folds of the trapezoid.

When laying, special care should be taken to avoid gaps in the thermal insulation layer. Possible discontinuities can be filled with low-pressure polyurethane foam.

IZOLITE boards can be laid in one or two layers. In both cases, a staggered pattern should be maintained in order to avoid overlapping of board joints in both layers.

Scheme of the "staggered" system for one layer of IZOLITE thermal insulation boards with the location of fasteners



4. Boards fixing

The boards are fixed using a set: telescopic connector (sleeve) + appropriate screw. The minimum number of fasteners used to fix thermal insulation boards to the substrate is 2 pieces per 1 m² (6 pieces for a 1200 x 2400 mm board). Fasten the connectors according to the diagram. It is not allowed to fasten more than one panel with one fastener.



Selection of IZOLITE board fixings depending on insulation thickness

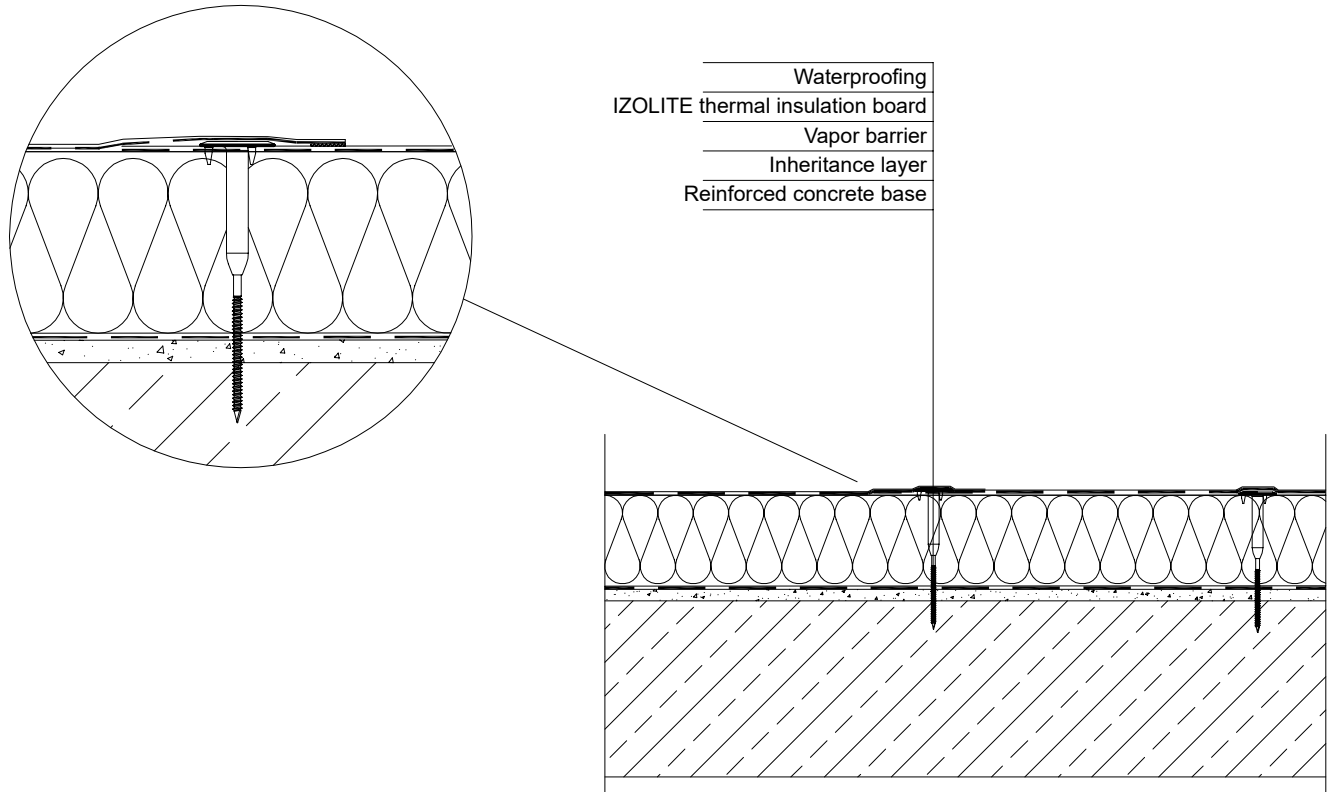
IZOLITE panel thickness [mm]	Sleeve R45 + screw PS4.8 [mm]
80	60+60
100	80+60
120	100+60
140	120+60
150	120+80
160	120+90

5. Waterproofing

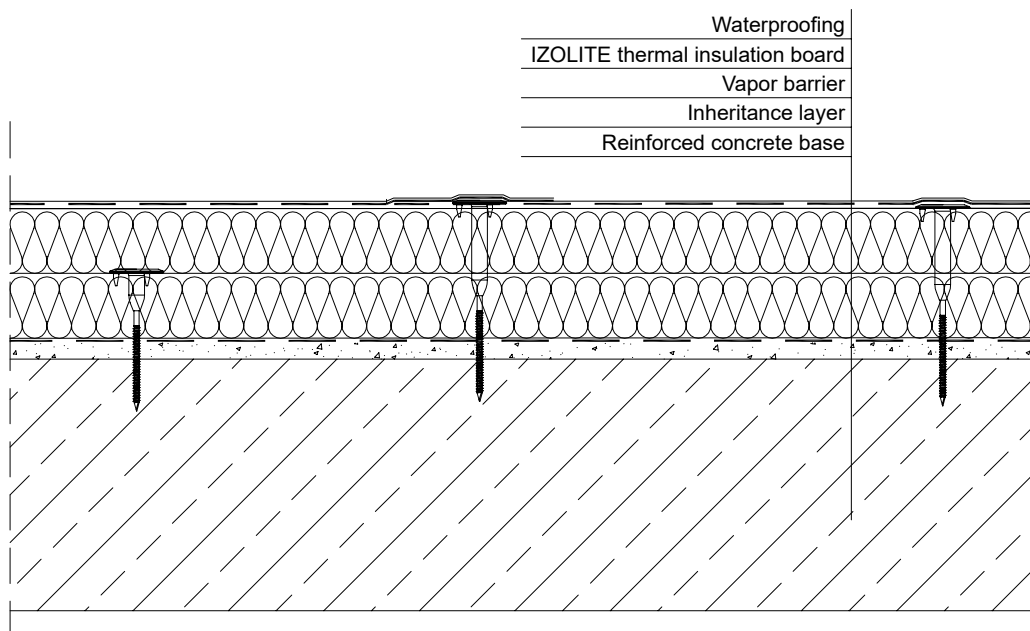
The fixed thermal insulation made of IZOLITE boards is covered with a layer of waterproofing. Roof waterproofing in the form of membranes made of PVC, TPO/FPO, EPDM or bituminous roofing felt is attached to the substrate with mechanical fasteners according to the recommendations of the waterproofing manufacturer.

INSTALLATION DETAILS OF THERMAL INSULATION OF IZOLITE BOARDS ON A FLAT ROOF

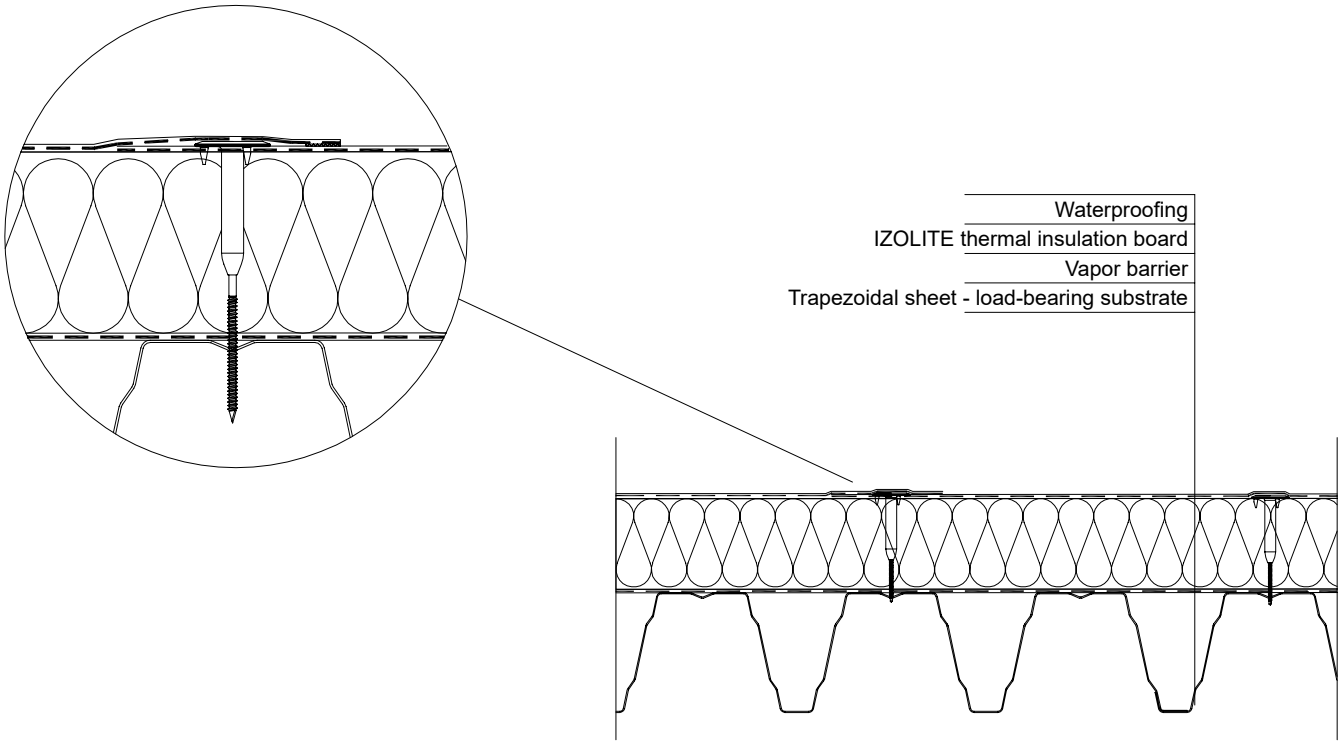
IZOLITE boards on a flat roof, on a concrete base - single-layer arrangement



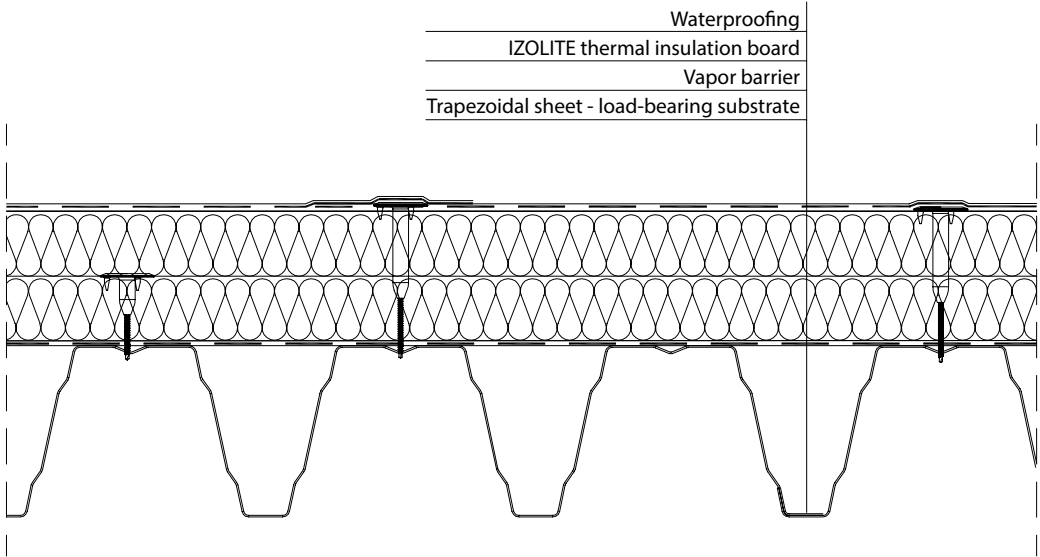
IZOLITE boards on a flat roof, on a concrete base - two-layer system



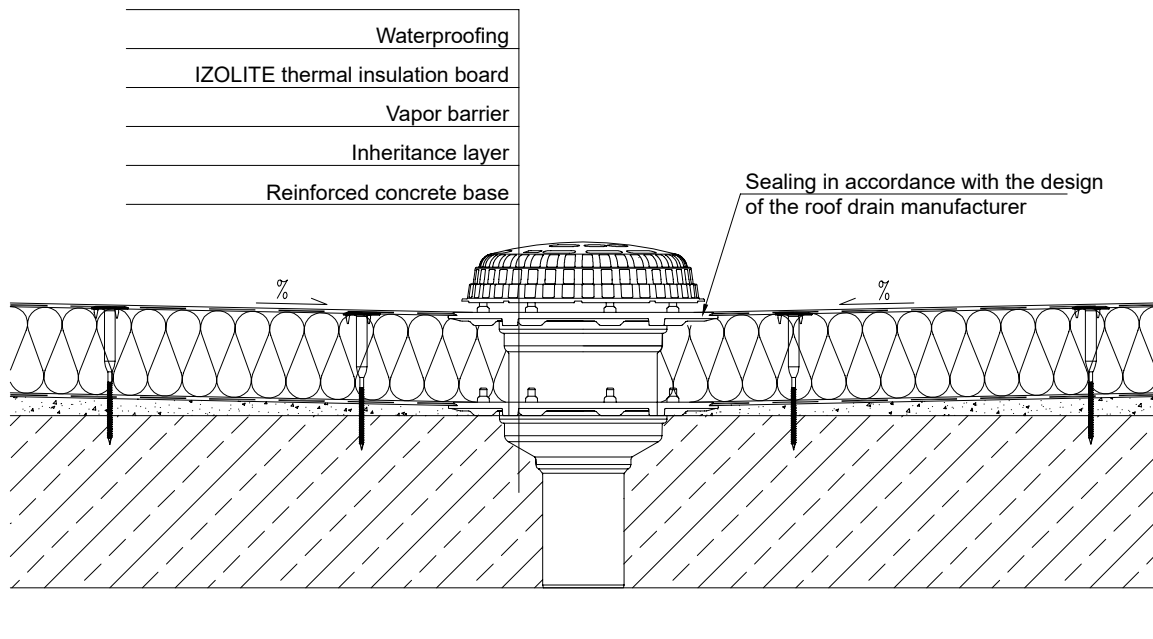
**IZOLITE boards on a flat roof, on a sheet metal base
trapezoidal - single-layer system**



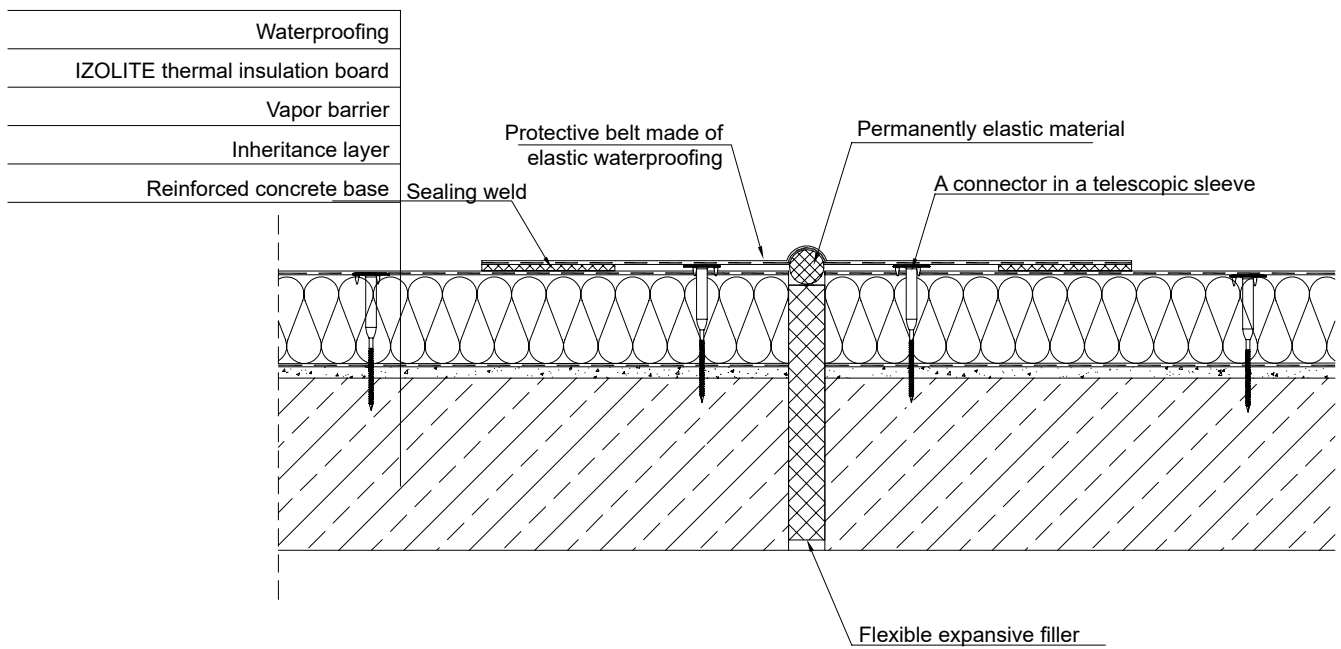
**IZOLITE boards on a flat roof, on a sheet metal base
trapezoidal - two-layer system**



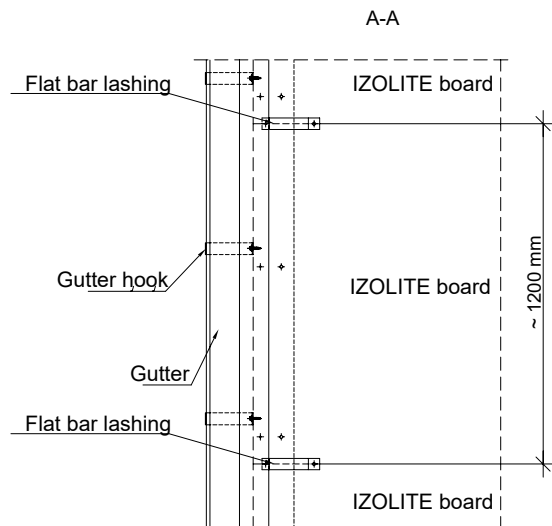
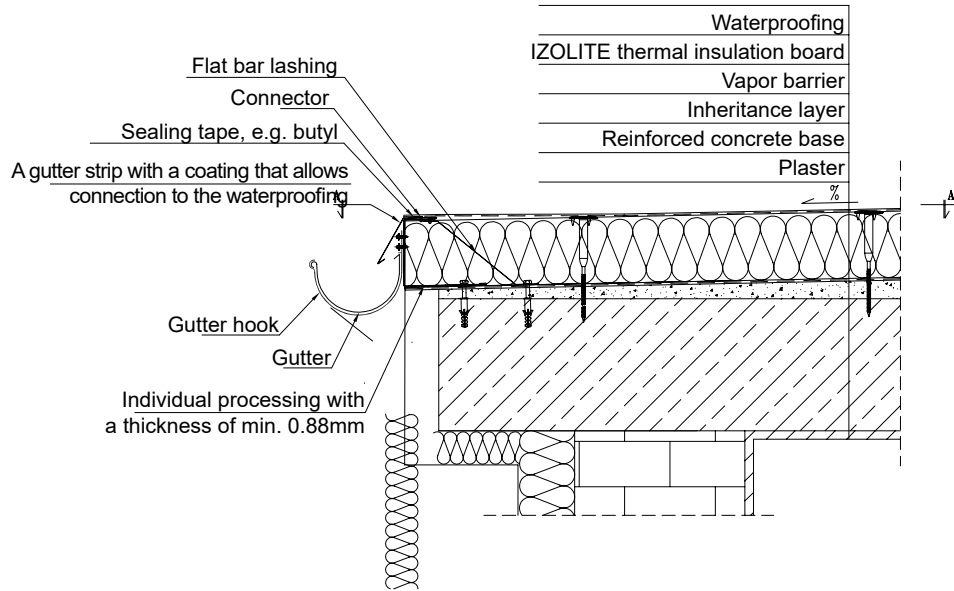
Roof drainage detail



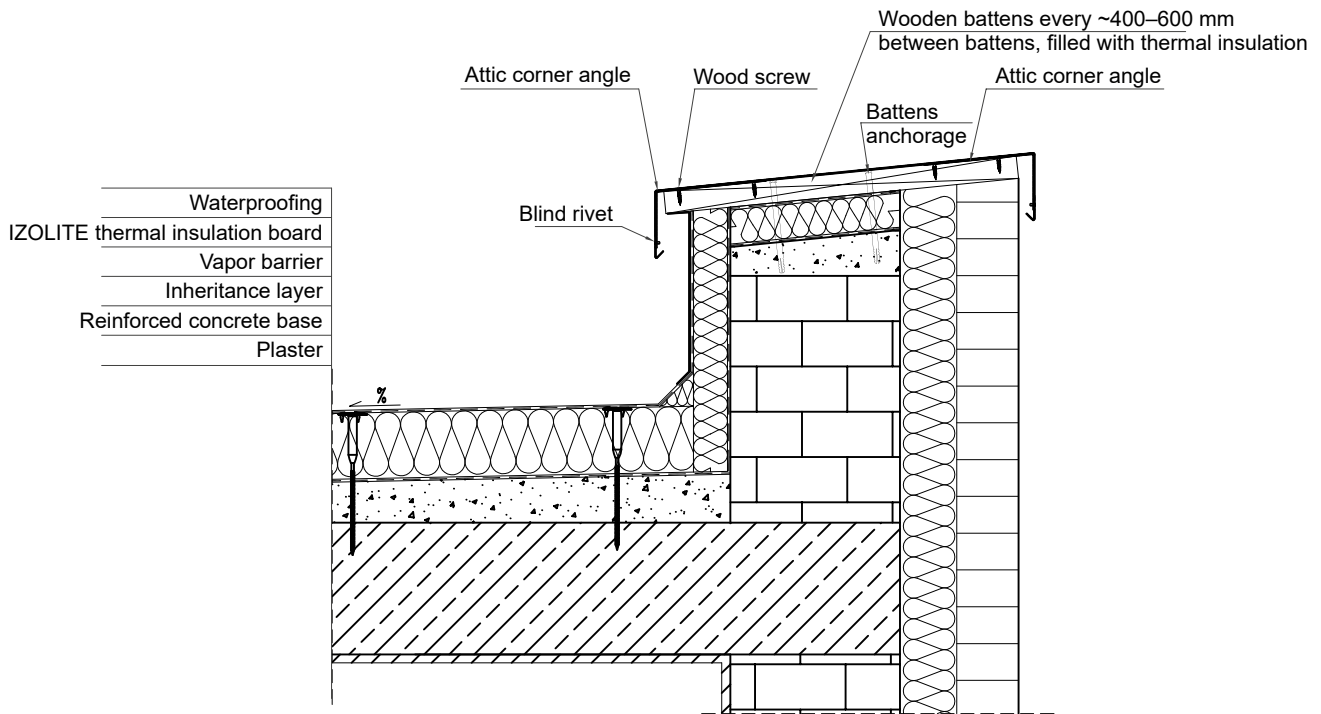
Roof expansion joint detail



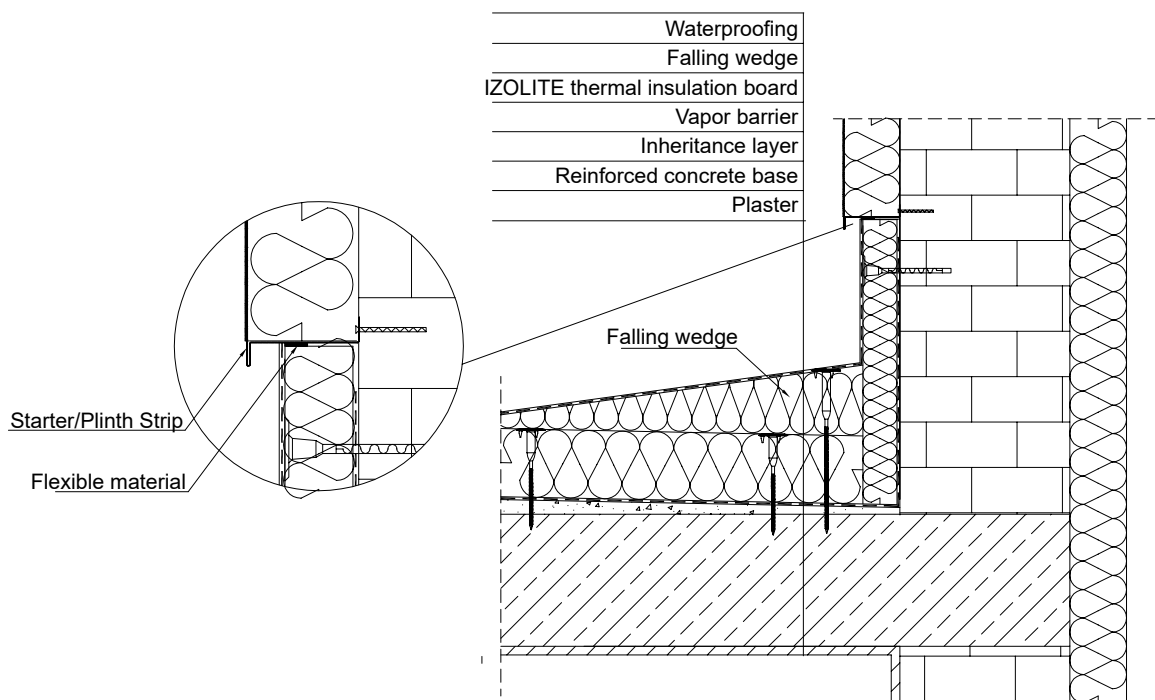
Detail of roof drainage - drainage of water to the gutter



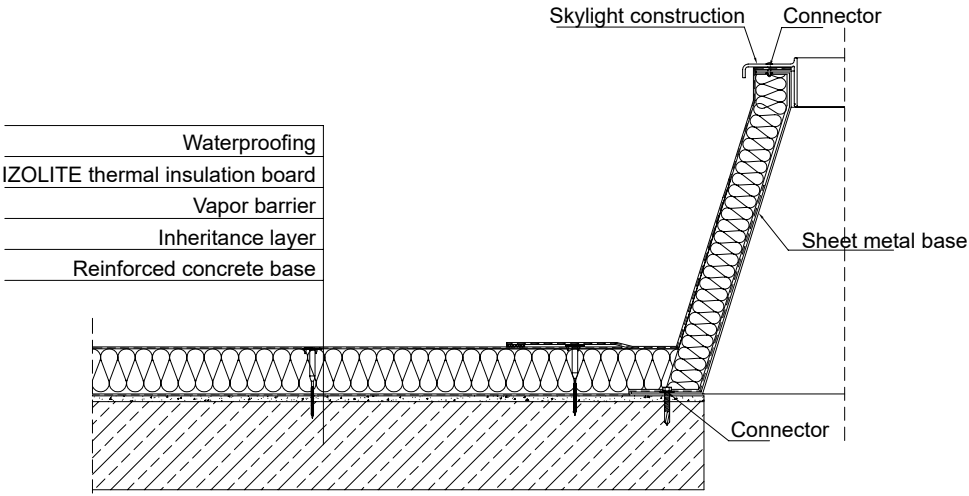
Low attic insulation detail



Detail of insulation of a low parapet or adjacent wall



Roof skylight support detail



IZOLITE BOARDS

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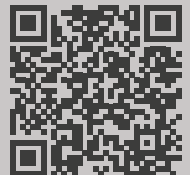
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EN-2023-10-16

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