termPIR®
insulation boards

Insulation boards from Gór-Stal

termPIR® INSULATION BOARDS

INSTRUCTIONS FOR ASSEMBLY OF A CAVITY WALL

Tools for assembly

TOOLS HELPFUL FOR INSTALLING AND PROCESSING THE termPIR® INSULATION BOARDS

- a fine-toothed panel saw;
- a wallpaper knife with snap-off blades or a knife for cutting insulation;
- a low-pressure polyurethane foam gun;
- a foam and gun cleaner;
- a spirit level, a plaster patch;
- a brick hammer;
- a chisel;
- a putty knife;
- a brick trowel and a small trowel for grouting (caulking trowel);
- a silicone gun, silicone;
- a brush;
- a pliers;
- a wire brush;
- a rolled-up measuring tape or a folding meter stick and a bevel square (bevel gauge);
- a marker, a pencil;
- safety glasses and gloves;
- a drill, drillers;
- a bucket, a construction tray;
- a stirrer;
- a waste container.

PRODUCTS, MATERIALS NEEDED FOR ASSEMBLY

- termPIR® AL, termPIR® MAX 19 AL insulation boards, optionally termPIR® WS
- Self-adhesive aluminium tape for termPIR boards;
- system anchors and grilles for assembly and ventilation of a three-layer wall;
- mortar for engineering bricks in this case;
- facing brick (clinker);
- horizontal insulation foil for foundations.

Photo 01

SEQUENCE OF WORKS WHEN ERECTING A CAVITY WALL

We can use materials to build a structural (load-bearing) wall such as:

- hollow bricks;
- cellular concrete blocks;
- expanded clay aggregate concrete;
- silicates, etc.

We can build a three-layer wall in two ways:

- in one step: we build all three layers at once,
- in two stages: first we brick the load-bearing (structural) wall and only then we lay the insulation boards and erect a curtain wall (façade wall) (Photo 01). This method is also used for wall renovations, replacement ofinsulation or insulation of old buildings.

Important:
Such a wall requires a suciently wide foundation on which the external wall will also rest. The façade wall can also be supported on special stainless steel wall brackets, which transfer the façade loads directly to the loadbearing wall. The external wall is not a separate structure, it must be connected to the load-bearing wall with anchors. The structural part of the building cannot be supported on it.

Instructions for assembly of a cavity wall

PREPARATION OF THE LOAD-BEARING WALL FOR THE INSTALLATION OF termPIR® INSULATION BOARDS

Before starting to install the insulation boards:

- level the wall surface and increase the adhesion of the substrate by rubbing it with a wire brush or by scraping it with a putty knife (Photo 02);
- remove dirt and unevenness that may reduce the adhesion of the mounting foam to the substrate (e.g. greasy stains, dust, old insulation, loose plaster, peeling paint and moss on old walls) (Photo 03, Photo 04);
- cut off old fixings (wires, anchors) (Photo 05);
- seal larger cavities with plaster mortar;
- remove old flashings;
- check the evenness (linearity) of the surface and take into account possible deviations from the vertical (Picture 06);

Photo 02

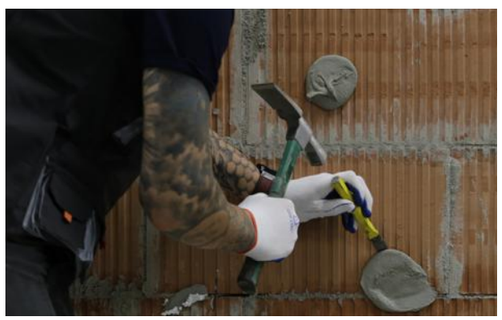


Photo 03

Photo 04

Photo 05

Photo 06

It is recommended to:

- prepare in advance the installations and any fixings of other elements of the building's finishing which will be covered by insulation;
- adequately hide all protruding elements in the load-bearing wall, without reducing the thickness of insulation;
- install the roller shutters and insulate them accordingly, following the guidelines of the manufacturers of these products;
- during renovations, pay attention to the technical condition of the load-bearing wall (scratches, cracks, etc.), assess its external surface and map all the installations in the building's documentation that we should be careful about during further works;
- evaluate and possibly replace the old woodwork with new one;
- check the lintels.

Important:
All concerns regarding the technical condition of the load-bearing wall and foundations should be consulted with an experienced construction expert to avoid further damage that could affect the aesthetics, thermal performance or even safety.

Instructions for assembly of a cavity wall

IMPLEMENTATION OF HORIZONTAL [DPM] DAMP PROOF MEMBRANE

For horizontal insulation of the foundation on which the insulation boards and the façade wall are to be based, we can use DPM made of polyethylene, PVC or EPDM, and membrane with a bitumen layer, tar paper, etc. (Photo 07). If the insulation of the foundations is partial or damaged, apply strips of an appropriate width with an overlap of at least 5 cm (Photo 08), folding over the load-bearing wall and mounting on silicone (Photo 09).
Special attention should be paid to the insulation performed in places such as corners which should be protected additionally while avoiding unnecessary cutting of the insulation strips (Photo 10).

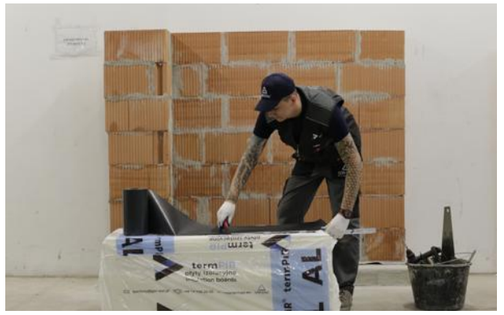


Photo 07

Photo 08

Photo 09

Photo 10

STAGE 1: CUTTING AND PROCESSING OF termPIR® INSULATION BOARDS

To make an appropriate thermal insulation of the load-bearing wall, we use termPIR® insulation boards, choosing the insulation thickness according to the design and energy eciency class of the building.
Cutting and processing of termPIR® insulation boards does not require any special tools. By cutting the boards, we can freely form its dimensions to match the shape of the wall.

The following tools can be used for cutting and processing the boards:

- a saw (Photo 11);
- a knife with a retractable blade called a wallpaper knife (Photo 12);
- a knife for cutting insulation materials (Photo 13);
- fine-toothed reciprocating saws (Photo 14);
- jigsaws;
- grinders and trowels with sandpaper for surface grinding, etc.

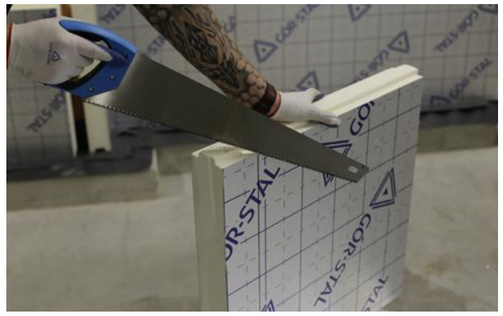


Photo 11

Photo 12

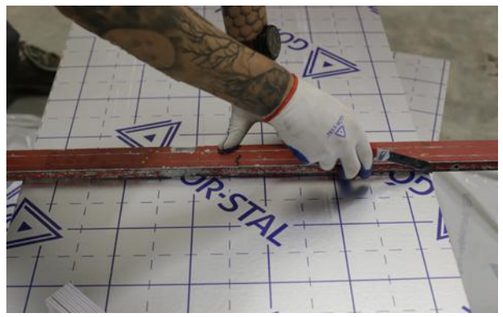


Photo 13

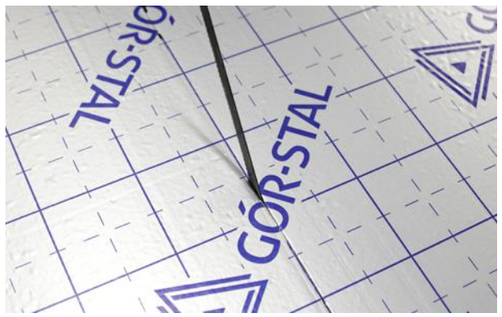


Photo 14

Important:
After finishing the processing of the insulation boards, the surface must be cleaned of dust in order to achieve better adhesion of the mounting foam and sealing tape. Avoid oiling the boards and tearing the cladding during cutting. Use protective goggles during the work

STAGE 2: INSTALLATION OF termPIR® INSULATION BOARDS

Before installing the termPIR® insulation boards, the foundation plane must be checked with a spirit level and any unevenness or drops must be levelled with mortar.
At this stage, high accuracy in mounting the boards is required, and any errors will make work difficult at a later stage (Photo 15).

Photo 15

For better adhesion, we can moisten the substrate with water. We can apply the foam on the surface of the boards either as single points (five per sqm) (Photo 16) or by circular distribution along the edge of the board, and additionally applying foam in the middle in two or three places (Photo 17).

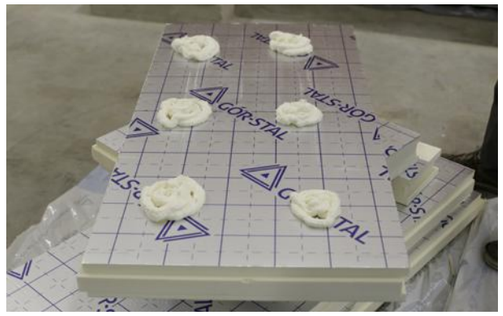


Photo 16

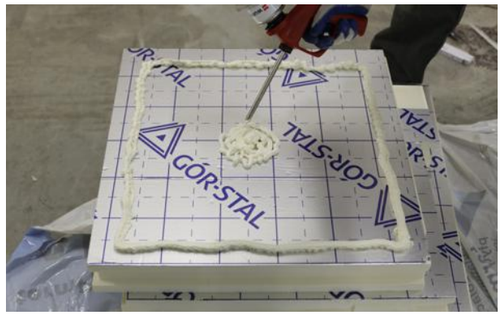


Photo 17

If the connection of two boards requires matching, changing length or angle, we can do it in two ways with the appropriate tools (see page 2):

- In the first method, the insulation breaking angle (place of contact) must be divided into two equal and identical slants (e.g. at the angle of 90˚, cut the two adjoining boards to the angle of 45˚) (Photo 18);
- In the next method, cut one boards to fit it to the other, from which we then tear off the aluminium cladding AL along the previously marked line. Apply low-pressure polyurethane foam on the surface (Photo 19 -21).

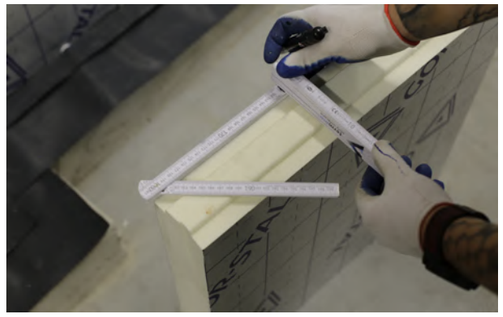


Photo 18

Photo 19

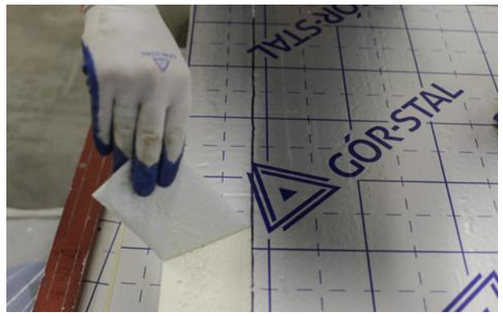


Photo 20

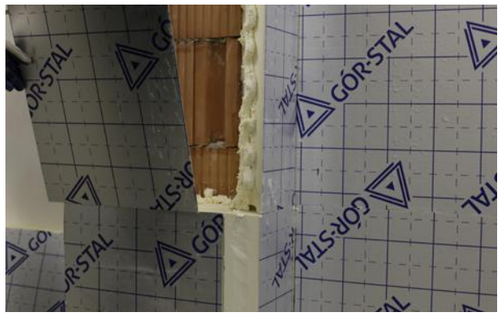


Photo 21

During installation, it is necessary to frequently check the plane of the panels being laid, both vertically and horizontally (Photo 22). Subsequent boards are mounted by pressing them to the previously mounted ones, but connecting them on the lock and resting them on the foundation of the building wall (Photo 23).

Photo 22

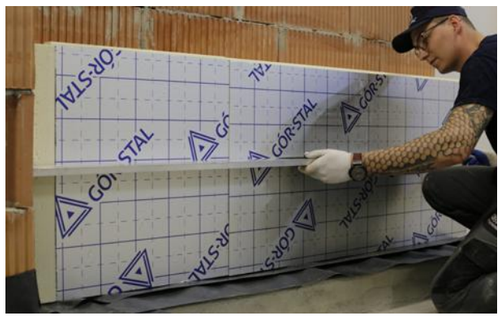


Photo 23

Fill the gaps resulting from inadequate panel fitting with assembly foam (Picture 24-25).

Photo 24

Photo 25

Subsequent layers of insulation are laid with an offset from the first row by about half the length of the boards, following the above mentioned rules. When installing subsequent layers of insulation, pay attention to the foam setting time in order not to break the fresh connection to the load-bearing wall (Photo 26-27).

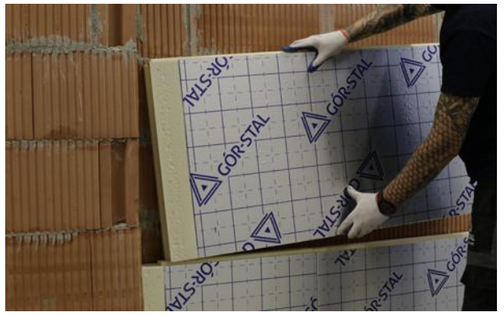


Photo 26

Photo 27

In the internal and external corners, cut off the panel tongues facing upwards to allow the insulation to fit properly and fill any holes that may arise with mounting foam (Photo 28-29).

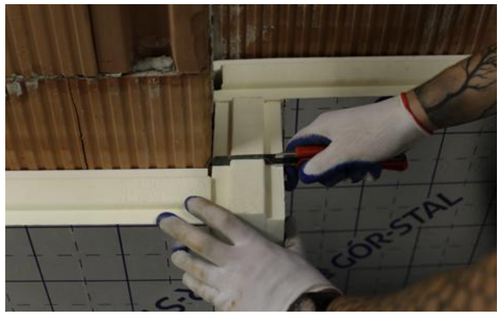


Photo 28

Photo 29

STAGE 3: PROTECTION OF FITTED BOARD WITH ALUMINIUM TAPE

In order to increase the insulating capacity, maintain the parameters and seal the resulting joints, the visible cut edges of the boards and the joints should be protected vertically and horizontally with self-adhesive aluminium tape. Remove dust and dirt from these places, fill the gap holes with foam and cut off the excess. Then, while pressing, stick the aluminium tape in such a way that it (minimum 1 cm) overlaps the edges of the panel on both sides, starting from the horizontal joints. Aluminium tape increases wall insulation (eliminates gas permeability) and absorptivity in places filled with polyurethane foam.

Self-adhesive AL tape is offered by Gór-Stal® in various widths (Photo 30-31).

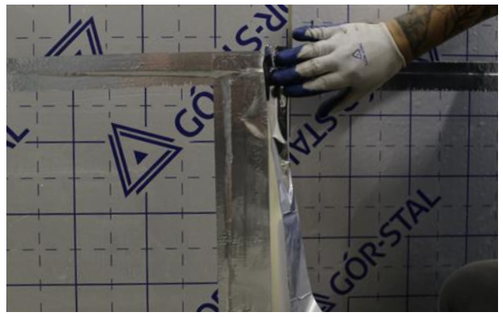


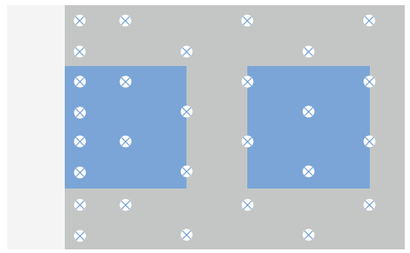
Photo 30

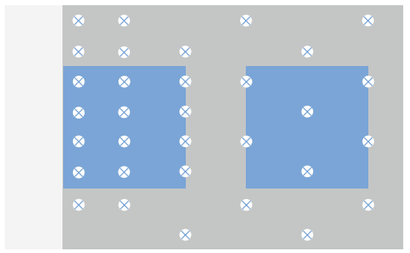
Photo 31

STAGE 4: INSTALLATION OF CONNECTING DOWELS

Correct execution of a three-layer wall as a partition with an outer wall face made of engineering brick requires appropriate support and binding of the façade wall to the load-bearing wall in a way that eliminates thermalbridges and guarantees durability and effectiveness of the structure.
After the insulation boards have been glued according to the recommendation of manufacturers of connecting materials used during the erection of a three-layer wall and recommended technological breaks, it is necessary to proceed with the assembly of mechanical connectors (usually from 24 hours to 48 hours). The system connectors used must be properly selected according to the type of substrate and comply with the technical design of the investment.

The recommended number of connectors should always be calculated for a specific building and all factors that affect the number according to the standards should be taken into account. The minimum number of dowels needed for fixing is 5 pcs/ sqm of a wall in a three-layer system.





When making holes for fixing mechanical connectors to the load-bearing wall, a driller with the same diameter as the dowel diameter should be used, and with a hole depth 10 mm greater than the anchor length of the connector. (Photo 32)

When drilling, pay attention to the fact that the holes in the insulation boards are not reamed out (recalibrating when drilling in the wall = creating thermal bridges).

After the hole has been properly drilled and cleaned, the sleeve anchor is hammered in, and then the anchor is placed in it, which is then adjusted to the grout in the façade wall. The vertical distance between individual anchors should not exceed 500 mm and the horizontal distance should not exceed 750 mm (Photo 33).

Photo 32

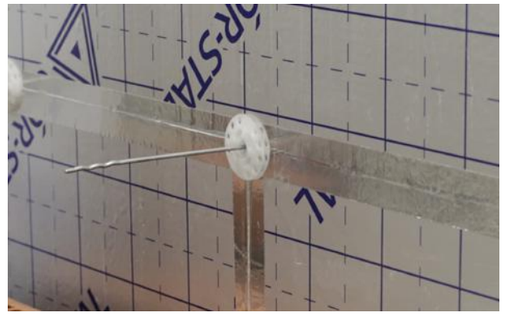


Photo 33

INSTALLATION OF CLINKER BRICK - FACING BRICK

Before laying the first row of clinker bricks, a layer of mortar should be applied and the substrate should be levelled. Mortar for bricklaying the external wall is prepared according to the manufacturer's guidelines (amount of water) taking into account the conditions in which the installation is performed (humidity, temperature, etc.) (Photo 34-36).

Photo 34

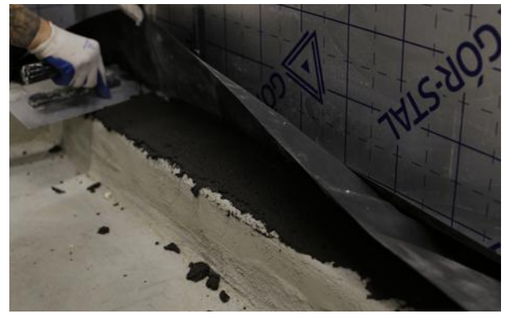


Photo 35

Photo 36

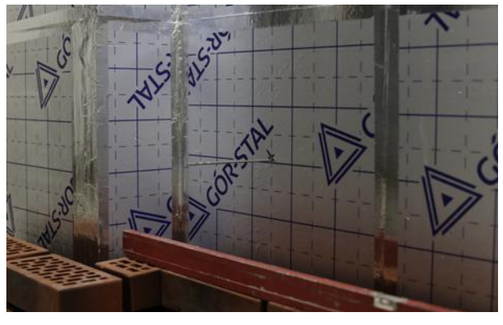


Photo 37

Leave an airway of at least 20 mm between the mounted termPIR® boards and the outside partition.
Check the first layer of bricks with a spirit level and, if necessary, continuously adjust the linearity of subsequent rows vertically and horizontally.

Before starting the masonry work, it is worthwhile to plan the arrangement of bricks in the wall in such a way as to avoid unnecessary brick cutting. In the plinth area, in vertical joints between the bricks, place ventilation boxes instead of mortar. They should be installed every second or fourth brick and additionally around windows, doors, balconies and on top of walls.

The construction of cavity trays guarantees drying of the walls, drainage of condensate and prevents the formation of unwanted salt eorescence and moisture, as well as protects against the inflow of rainwater and the penetration of insects into the interior of the three-layer wall (Photo 38-39).

Photo 38

Photo 39

termPIR® insulating boards are a non-absorbent product (less than 2%), and the additional protection is provided by the previously installed AL tape to prevent moisture from being drawn inside the building. Due to the fact that in partitions of this type, the phenomenon of water vapour condensation occurs, it is necessary to ensure effective ventilation in the space between the insulation and the external wall.

Subsequent layers of staggered engineering bricks are laid alternately with an offset to each other (Photo 40-42).

For grouting, use a trowel (caulking trowel), a rubber hose to make joints from top to bottom (vertical joints first) (Photo 43).

Photo 40

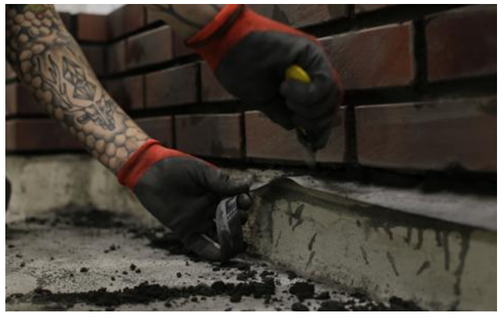


Photo 41

Photo 42

Photo 43

Important:
One of the most important principles of laying engineering bricks is to mix bricks from different pallets, thus avoiding the noticeable phenomenon of differences in shade, colour on the facade wall, and the differences will be invisible. The engineering brick must be protected from soiling and moisture during storage and laying, and at least a week after the bricklaying. During this time the wall should be protected from rainwater and excessive sunlight.

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