

## THERMOSYSTEM PREMIUM

**THERMOSYSTEM PREMIUM** is an external thermal insulation – building renovation system, developed by ISOMAT, applied on existing and new buildings.

The main materials forming **THERMOSYSTEM PREMIUM** are the following:

1. Thermal insulation boards of expanded polystyrene (EPS-minimum thickness 50mm) according to EN 13163.
2. **Collar head anchors** for mounting the thermal insulation boards.
3. **ISOMAT AK-T35**, fiber-reinforced, polymer-modified, cement-based adhesive by ISOMAT for fixing of the thermal insulation boards.
4. **ISOMAT AK-T55**, fiber-reinforced, polymer-modified, cement-based adhesive by ISOMAT as a basecoat.
5. **THERMO SYSTEM RF 149 or 161**, fiberglass mesh 3.5 x 4.5 mm and weight 149 gr/m<sup>2</sup> or 3.5 x 4.0 mm and weight 161 gr/m<sup>2</sup> respectively.
6. Acrylic, pasty renders **MARMOCRYL**, silicone, pasty renders **MARMOCRYL SILICONE** and silicone-silicate, pasty renders **MARMOCRYL SILICONE-SILICATE** by ISOMAT. Available in several colors and two types: **Fine**, for forming a smooth final surface and **Décor**, for forming a coarse-textured, decorative surface.

Technical description of the THERMO SYSTEM PREMIUM External Thermal Insulation System, certified by **EOTA** (European Association of Technical Approvals), according to **ETAG-004** technical guideline.

## Materials

1. Thermal insulation boards of expanded polystyrene, bearing a CE marking according to EN 13163.
2. Fiber-reinforced, cement-based adhesive, reinforced with polymers (resins) **ISOMAT AK-T35**.
3. Anti-alkaline, reinforcing fiberglass mesh **THERMOSYSTEM RF**, 149 or 161 g/m<sup>2</sup>, 100 cm wide with mesh size: 3.5 x 4.5 mm or 3.5 x 4.0 mm respectively.
4. Anti-alkaline mesh of special configuration for reinforcing corners and openings, with mesh size: 3.5 x 4.0 mm.
5. Fiber-reinforced, cement-based adhesive, reinforced with polymers (resins) **ISOMAT AK-T55**.
6. High quality, acrylic water-based primer **FLEX-PRIMER** or silicone-acrylic water-based primer **ML-PRIMER**, or silicone water-based primer **SILICONE PRIMER**.
7. Final coating of acrylic based render **MARMOCRYL**, silicone based render **MARMOCRYL SILICONE** or silicone-silicate based render **MARMOCRYL SILICONE-SILICATE**.
8. Stable corner profiles and corner profiles with an embedded water dripper (made of PVC with fiberglass mesh on both sides), for reinforcing the external corners.
9. Aluminium holding rails with an embedded water dripper.

Apart from the aforementioned materials, the following additional-materials are also included:

- a. Aluminium collar head anchors
- b. Anchors for mechanical mounting of the insulation material
- c. Plastic alignment spacers of the rail
- d. Milling cutters
- e. Sealing mastics and
- f. Polyurethane foam

which are all necessary for the proper completion of the project.

## Substrate preparation

### DISMANTLEMENTS

The first step for the preparation of the substrate, before the application of the thermo-insulation system, is the removal and extension of about 6 to 8 cm (according to the thickness of the applied EPS board) of all the electrical, mechanical, hydraulic etc. installations. It is recommended this job to be done by technicians of the according specialty.

### Surface preparation

Next step is the optical and mechanical control of the existing substrate.

If it is ensured that it is in good condition, it is required only good cleaning, in order any dust to be removed before the application.

In case the substrate is partially eroded, we remove the problematic areas and continue with the reconstruction according to the degree of corrosion. For the reconstruction of the problematic areas we can use ready repairing mortars (e.g. **DUROCRET**, **RAPICRET** etc.)

In case the final coating is fully eroded, we remove it mechanically and stabilize the existing basic layer with the special acrylic primer **FLEX PRIMER**.

Finally, there is also the case that the substrate needs universal leveling with plastering, what can be done with the aforementioned repairing materials.

## External Thermal Insulation System's application

### **1. Surface preparation- Application temperature**

The surface to be covered with boards should be free of dust, grease, loose particles, paints etc. The temperature during application should be between +5°C and +35°C.

### Ground Zone of a Building's thermal insulation

Creation of a highly waterproofed zone at the ground level, at a height of up to 40cm, as well as at the starting points of the system, points strained by humidity (sidewalks).

Application of a waterproofing layer with a two-component, cementitious, brushable slurry **AQUAMAT-FLEX** in two layers, before fixing the thermal insulation boards.

### **2. Installation of the aluminium fixed track system**

The aluminum holding rail should always be placed parallel to the ground and only a few millimeters above it (minimum 5 mm). This space in-between should be sealed with a polyethylene cod (e.g. **CELLUFILL**) and a special sealing mastic (**FLEX PU-40**) for the prevention of water penetration. The aluminum holding rails are directly fastened on the substrate with special collar head anchors. For leveling out facade tolerances, wherever is needed, we put plastic spacers between the wall and the holding rail (spacers' thickness 3-30mm). Among the successive holding rails there should

be left an interspace of about 2-3mm in order to accommodate possible movements from contraction and expansion.

### 3. Fixing of thermal insulation boards with ISOMAT AK-T35

The adhesive is spread on the thermal insulation board as described below:

The surface to be covered with boards should be free of dust, grease, loose particles, paints etc. It is recommended that it is dampened before application. The adhesive has different application in a smooth or an uneven substrate:

On smooth substrates the adhesive is spread on the surface and combed using a notched trowel in order to be uniformly applied on the whole of the surface (Fig.1).

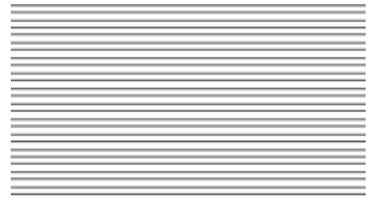


Figure 1

On uneven substrates the adhesive is applied with a trowel around the perimeter of the thermo-insulation board and in selected spots in the center, where the anchors will be fixed. (Fig.2 & 3).

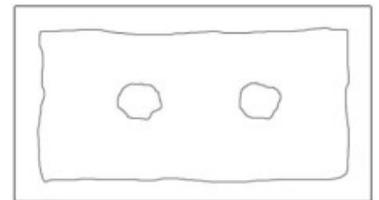


Figure 2

Adhesive consumption is approx. 3-4kg/m<sup>2</sup>, according to the smoothness of the substrate. Thermal insulation boards come in large format blocks and have thin joint systems that speed construction and reduce the effect of thermal bridging. Next, the thermo-insulation boards are fixed by pressing them on the desired position, removing any excess adhesive. Every new layer of boards should be placed in half a board distance from the previous layer in order to form a layout of crossed joints that will prevent cracking of the overlaid plaster. Finally, using a plumb we check the leveling of the fixed boards.

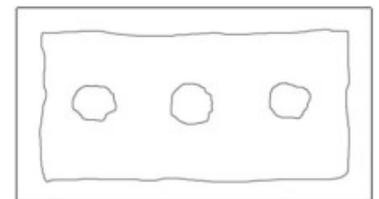


Figure 3

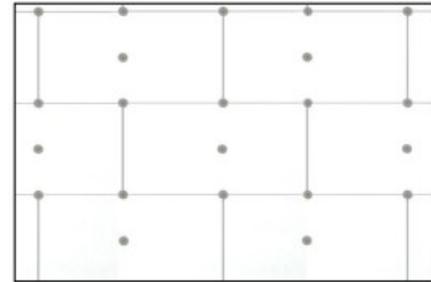
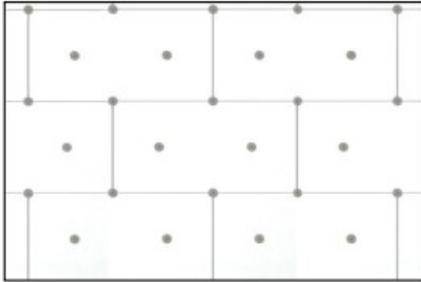
### 4. Mechanical fixing of the thermal insulation boards with collar head anchors

The next day, and if it is necessary, the thermal insulation boards are fixed mechanically with collar head anchors. The collar head anchors should have a length according to the thickness of the thermal insulation boards and the type of the substrate. They are fixed in the special slots created by a plastic fraise on the boards. There are two kinds of collar head anchors: plastic and metallic. The metallic ones are used for concrete substrates and the plastic ones for masonries.

For the selection of the right type and length of the collar head anchor, the following aspects should be taken into consideration:

- The thickness of the thermal insulation board
- The thickness of the applied adhesive
- The thickness of the possible existing layer of plaster and
- The type of the substrate ( masonry or concrete)

The number of the required collar head anchors is at least 6 anchors per m<sup>2</sup>. In case the thermal insulation system is applied in building-blocks, in the highest floors, there are required at least 8 anchors per m<sup>2</sup>, for further anchoring of the boards due to greater pressures on the construction by the wind. The collar head anchors are then being puttied.



## 5. Reinforcing of building corners, doors, windows etc with special parts

For the reinforcement of the building corners, we use firm corner angles of PVC with affixed fiberglass mesh on either side.

Firstly, the substrate is leveled mechanically. Then the adhesive **ISOMAT AK - T35** is applied on the EPS with a notched trowel in the same width as the one of the corner angle. Then the corner angle is placed on the still fresh layer and is anchored through light pressing. Afterwards, the fiberglass mesh is placed also on the still fresh adhesive layer and pressed with the trowel to get fully encased in the adhesive. Finally, the surface is smoothed out and the excess adhesive is removed.

## 6. Application of the basecoat ISOMAT AK-T55 and the fiberglass mesh

Next, the basecoat **ISOMAT AK-T55** is applied universally on the thermal insulation boards using a notched trowel in a thickness of 3mm. The application will be carried out in strips 1.20m wide to proceed with the embedment of the fiberglass mesh. Afterwards, the fiberglass mesh with width 1m is being placed. The procedure is being repeated, with the new layer of fiberglass mesh overlapping the previous one by 10cm. The fiberglass mesh is then pressed on the still fresh layer of the adhesive with a smooth trowel (fresh-on-fresh). Finally, the surface is leveled.

## 7. Application of the final render coat

After the adhesive has fully dried (approximately 3 days in the summer and 7 days in the winter), the surface is coated by the ready-to-use plasters.

**MARMOCRYL Fine**, **MARMOCRYL SILICONE Fine** and **MARMOCRYL SILICONE-SILICATE Fine** form a smooth decorative final surface while **MARMOCRYL Decor**, **MARMOCRYL SILICONE Decor** and **MARMOCRYL SILICONE-SILICATE Decor** form a coarse-textured final surface.

The plasters are ready for use and the only thing required is thorough stirring before application. The substrate must be dry and free of dust, oily or loose materials etc. Priming follows, using the special primer **FLEX-PRIMER**, **ML-PRIMER** or the **SILICONE-PRIMER**. **MARMOCRYL**, **MARMOCRYL SILICONE** and **MARMOCRYL SILICONE-SILICATE** are being applied after the primer has dried by hand, using a smooth stainless metallic smooth trowel, or with a rendering machine. While still fresh (approx. after 15-20 minutes). renders are treated (pressed) by plastic smooth trowel-float, in horizontal, vertical, or circular movements depending on the desirable appearance of the surface. Working time depends on substrate's absorptivity and ambient temperature.