INSTRUCTIONS FOR INSTALLATION OF **BEKATHERM Standard** White THERMAL INSULATION SYSTEM

01. SUBSTRATE

The substrate on which the thermal insulation system is installed must be firm, clean and dry, without weakly bonded parts, greasy stains, etc. Suitable substrates are all surfaces made of solid and hollow bricks, aerated concrete, blocks, cement-lime plasters (old at least one month), concrete surfaces (at least 2 months old), fiber-cement panels, well-bonded layers of mineral plasters, etc.

Before starting work, it is necessary to check the quality of the substrate. Perform a visual inspection of the substrate, check for dust, efflorescence, moisture, oil residues, grease, weakly bonded layers, etc.

The surfaces must be well dusted, washed and dried before gluing. Wash concrete surfaces with hot water and then dry. Insufficiently bonded layers of decorative plasters and paints must be completely removed. In the case of surfaces infected with algae and molds, it is necessary to carry out cleaning and disinfection. In case of blooming, it is necessary to brush and dust the surface well.

Before starting work, it is necessary to check the flatness of the substrate. The deviation of the facade surface from the vertical plane must be checked before gluing the panels and may amount to max. ± 1 cm per 3 m'. Filling possible gaps and leveling in thicknesses up to max. 10 mm, can be done with glue used to glue insulation panels. In the case of larger gaps, it is necessary to perform preliminary filling with plastering. Thick layers of glue lead to cracking and movement of EPS panels, which can manifest in the form of cracks on the final layer of the thermal insulation system.

Check the bearing capacity of the substrate by scratching, scraping or cutting with a scalpel and then by testing adhesion using adhesive tape. In case of justified doubts about the quality of the substrate, it is necessary to sink a piece of mesh into the layer of glue, so that part of the mesh remains free. After 7 days, withdraw the mesh. If during this there is no separation in the layer of the substrate, nor separation at the contact between the adhesive and the substrate, the substrate is of satisfactory quality and the installation of the system can be continued.

Before installing panels on the building, all wet work inside the building must be completed, installation of carpentry, gutters, all roofing and sheet metal work must be completed, external installations pulled out, joints filled, impurities from formwork removed from concrete surfaces, etc.

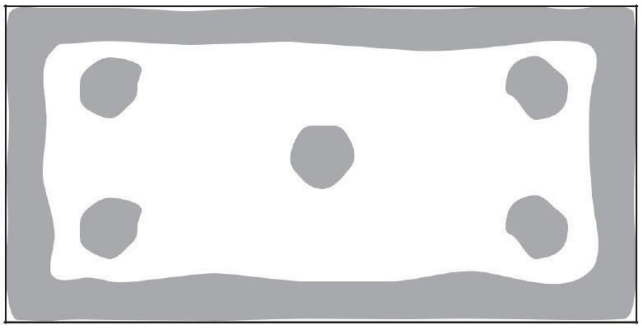
02. GLUING

Bonding of EPS panels within the Bekatherm Standard thermal insulation system is done using BK-StirolFix WDVS, BK-StirolFix Base or BK-StirolFix 1.

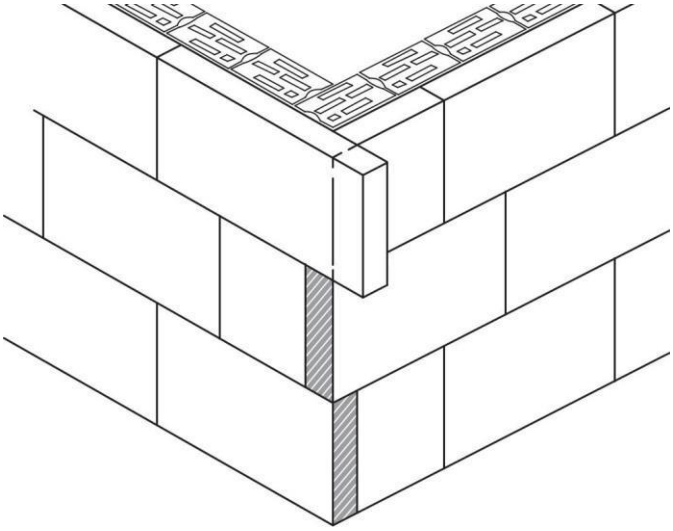
The mass is prepared by slowly adding the powder to about 26-28% water (6.5-7 l of water for 25 kg of powder), with constant mixing with an electric mixer until complete homogenization. Leave the mass to sit for 10 minutes, then mix once more and, if necessary, add water to adjust the appropriate consistency of the glue (no more than 28% in total).

Before gluing the panels, an initial aluminum molding is placed on which a certain amount of glue is applied in order to achieve sealing from the bottom side, and then the first row of EPS panels is placed on it. The width of the initial molding corresponds to the thickness of the EPS panels used. The use of the initial skirting ensures adequate positioning of the first row of EPS panels, protection of the panels from mechanical damage, penetration of insects into the system, etc. When installing the initial skirting, it is necessary to provide min. 30 cm distance from ground level to reduce wetting of the thermal insulation system and soiling in the most critical zone.

The adhesive mass is applied around the entire perimeter of the EPS panel with the addition of five application points in the middle of the panel, about 10 cm in diameter, the so-called glue cakes. Strips around the perimeter of the panel should be applied in a width of min. 5 cm and a thickness of 1.5-2.0 cm. The minimum contact surface with the substrate must be min. 35-40%.

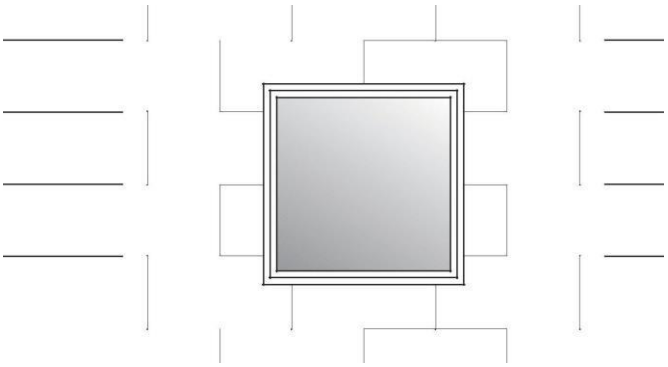


The second row of EPS panels is installed with a shift of at least 30 cm compared to the panels from the first row, the so-called shearing rule (this rule is also observed when gluing all subsequent rows). It is necessary to comply with the rule of toothed connection at the corners of the building (cross-gluing of panels) with an overhang of the panel at the corners of min. 5 cm, over the outer surface of the EPS panel on the adjacent side. The cut pieces of styrofoam intended for fitting must be > 20 cm wide and must not be placed on the corners of the building.



Glue the panels tightly together so that the glue does not reach the contact surfaces between the two EPS panels. Any cracks should be filled with pieces of EPS panel, or with low-expansion pur foam for this purpose, BK-PUR EPS Kleber Gun, and never with glue.

Gluing EPS panels around the opening requires special care. It is necessary to trim the EPS panels in order to avoid matching the opening lines with the panel lines.



Processing time of the prepared material: 1.5-2.0 h depending on ambient conditions.

The drying time of the glue under normal conditions (T=+23-25 °C, relative air humidity=50-60%) is min. 48 hours, after which it is possible to begin doweling, cutting off excess panels at the corners of the building and sanding any unevenness.

The air and substrate temperature during installation should be in the range of +5°C to +30°C. Do not work in direct sunlight, wind and rain. High humidity and low temperatures can prolong the drying time of the glue.

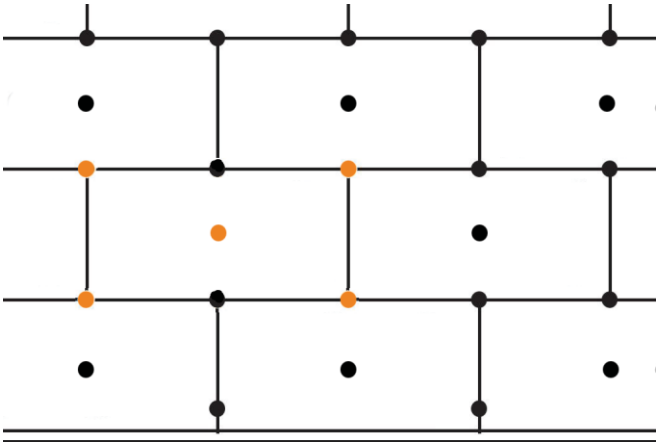
03. DOWELING

At least two days after gluing the EPS panels, you can start cutting off excess panels at the corners of the building, sanding any unevenness and doweling.

Before the start of doweling and reinforcement of the facade surface, it is necessary to sand off unevenness that occurs on the surface of the panels during gluing, due to permitted deviations in the thickness of the EPS panels and the flatness of the substrate. In case of yellowing of EPS panels due to exposure to UV radiation, it is necessary to sand the entire surface. Sanding of surfaces is done with a styrofoam scraper. Doweling provides additional mechanical fastening of the panels. Doweling of panels is necessary on all types of substrates Doweling is done after the glue has hardened, or min. 48 h after installation of EPS panels.

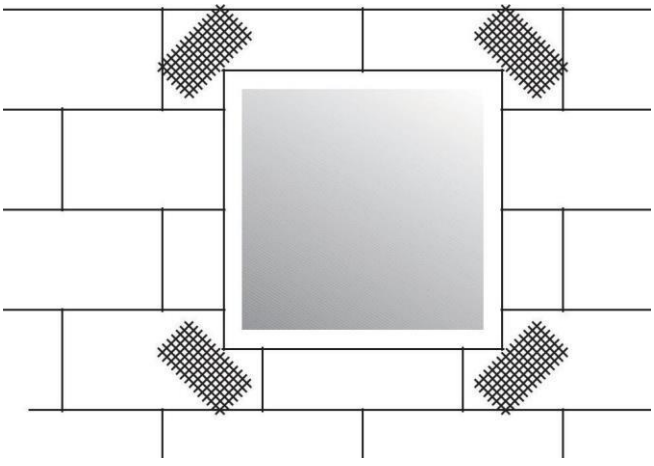
Dowels must always pass through the adhesive layer. When choosing the length of the dowels in order to ensure good resistance to pulling out of the substrate layer, it is necessary to take into account the thickness of the insulation panel and the thickness of the layers of embedded materials. The depth of the holes must be 10-15 mm longer than the length of the dowels used. The optimal number of dowels is 6-10 pieces/m², depending on the number of floors of the building, the exposure of the building to the wind, the quality of the dowels, etc. Doweling is performed according to the scheme shown (for 6 pieces/m²).

At each of the corners of the building, doweling doubles them due to preventive resistance to the influence of wind.



04. ENFORCEMENT

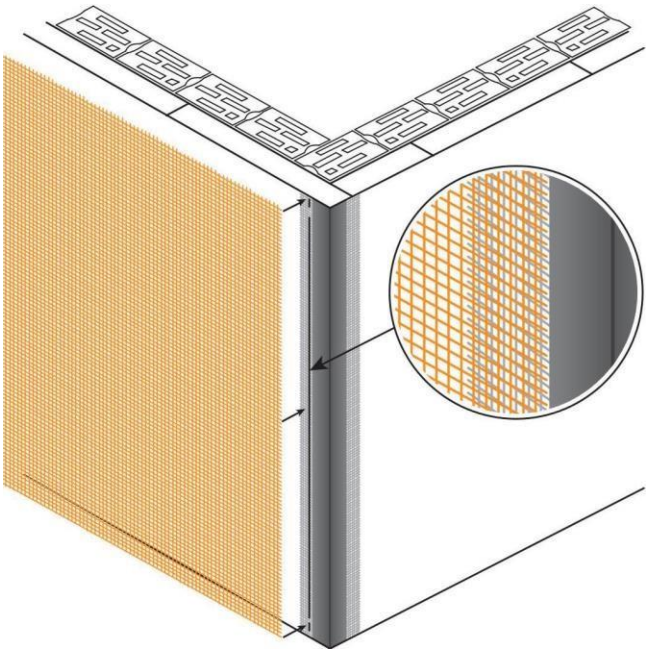
Reinforcement and leveling of the entire facade surface within the framework of the Bekatherm Standard thermal insulation system is carried out using BK-StirolFix 1 or BK-StirolFix White. The mass is prepared by slowly adding the powder to about 26-28% water (6.5-7 l of water for 25 kg of powder), with constant mixing with an electric mixer until complete homogenization. Leave the mass to sit for 10 minutes, then mix once more and, if necessary, add water to adjust the appropriate consistency of the glue.



In order to prevent the possible appearance of diagonal cracks at the corners of the opening, before starting the reinforcement of the entire facade surface, it is necessary to carry out preliminary reinforcement at the corners of the opening. Reinforcement is done using a piece of facade mesh with a frame size of min. 30x50 cm that are placed diagonally next to the corner of the opening. The prepared piece of mesh is placed in a layer of fresh glue intended for reinforcement, applied with a notched trowel (tooth size ~ 8-10 mm).

After min. 48 hours after gluing the EPS panels, under normal conditions, you can press the mesh on the entire facade surface. The glue is applied with a notched trowel (tooth depth 8-10 mm) and then the reinforcing mesh is pressed into the freshly applied glue from top to bottom, with a mandatory overlap along the edges of the mesh of min. 10 cm.

Stamping should be done so that the mesh is partially visible and not completely covered with glue. The mesh must not touch the insulating panel during pressing, but a 2 to 3 mm layer of glue must remain between the mesh and the insulating panel. When pressing the mesh, it is necessary to make additional reinforcement of the corners of the object. Reinforcement is done with appropriate corner profiles that have a mesh on them. The profile is placed in a layer of reinforcing plaster so that the thickness of the layer between the profile and the EPS panel remains ~2-3 mm. When pressing the mesh onto the entire surface, place the mesh up to the corners, so that it overlaps with the mesh on the corner profiles.



After 24 hours of drying, apply the final layer of glue on the hardened glue applied in this way, which is used for the final smoothing of the facade surface. After straightening, the mesh must not be visible. The position of the mesh in the finished reinforcing layer should be about 1/3 of the thickness of the layer on the side of the upper surface. The total thickness of the entire reinforcement-finish layer of glue should be 3-4 mm.

The air and substrate temperature during installation should be in the range of +5 °C to +30 °C. Do not work in direct sunlight, wind and rain. High humidity and low temperatures can prolong the drying time of the glue.

05. APPLICATION OF THE PRIMARY COATING

When choosing the material, it is necessary to follow the instructions and choose the corresponding type of substrate depending on the selected type of finishing plaster.

BK-Grund Universal is a universal structural primer intended for coating the substrate before applying BK-Plast, BK-Sil and BK-Briv Special finishing facade plasters.

Before use, it is necessary to first mix the mass and then dilute it with about 15-20% water. The substrate is most often applied with a long-haired roller on a dry and clean substrate, in one layer.

It is mandatory that the toning of BK-Grund Universal is the same shade as the final facade plaster. The drying time under normal conditions (T=+23-25 °C, relative air humidity=50-60%), before applying the plaster, is min. 12 h.

The air and substrate temperature during installation should be in the range of +5 °C to +30 °C. Do not work in direct sunlight, wind and rain. High humidity and low temperatures can significantly extend the drying time.

BK-Grund Silicat is a silicate-based structural substrate, intended for coating the substrate before applying BK-S Plast and BK-Sil Si&Si finishing facade plasters.

Before use, it is necessary to mix the mass first and then dilute it with about 15% water. The substrate is most often applied with a long-haired roller on a dry and clean substrate, in one layer.

It is recommended that the toning of BK-Grund Silicat be in the same shade as the finishing plaster. The drying time under normal conditions (T=+23-25 °C, relative air humidity=50-60%), before applying the plaster, is min. 12 h. The air and substrate temperature during installation should be in the range from +15 °C to +30 °C, relative humidity not higher than 70%. Do not work in direct sunlight, wind and rain. High humidity and low temperatures can significantly extend the drying time.

6. INSTALLATION OF FINAL FACADE PLASTER

Before installing the decorative plaster, it is necessary to observe the prescribed drying time of the previous layers in order to avoid defects on the final plaster. In case of non-compliance with the manufacturer's recommendations regarding drying, cracks, stains and other irregularities may appear on the final plaster, and in the last case, the layer may crack and bubbles may form.

Before using the pasty plaster, it is necessary to mix it well with a manual electric mixer and then, if necessary, dilute it with a small amount of water up to 1% (up to 250 ml/25 kg), in order to adjust the consistency of the plaster. Before installation, it is mandatory to check the shade and then equalize 4-5 buckets in the corresponding larger container, in order to eliminate any differences between individual buckets. When a quarter of the mixture is used, it is necessary to add the contents of the next bucket of plaster, mix and continue with the mentioned procedure until the entire amount of material is used.

When using mineral finishing plaster BK-Briv Special, prepare the plaster by adding the powder to about 25-26% of water, with intensive mixing until complete homogenization.

Leave the mass to sit for 10 minutes, then mix once more and, if necessary, add a little more water to adjust the appropriate consistency.
The prepared plaster is applied by hand with a metal trowel in the thickness of the coarsest grain. A few minutes after application, begin processing the plaster using a hard plastic trowel. With the Rajb structure, raking can be done in circular, vertical or horizontal movements, until the surface is evenly furrowed. With the Ful structure, processing is done in circular motions.

It is necessary to work evenly and without interruption on continuous wall surfaces, in order to avoid unevenness caused by the joining of surfaces, uneven drying, etc. It is necessary to provide a sufficient number of workers so that the joining of works on different levels of the scaffolding is carried out according to the principle of "wet on wet'' and in this way ensured the most uniform structure and color of the final plaster.

The air and substrate temperature during installation should be in the range from +5 °C to +30 °C in the case of BK-Plast, BK-Sil, BK-Sil Si&Si, BK-Briv Special. In case of installation of BK-S Plast, the air and substrate temperature should be in the range of +15 °C to +30 °C, relative humidity not higher than 70%.

Do not work in direct sunlight, wind and rain. High humidity and low temperatures can significantly extend the setting time of the plaster.

It is mandatory to use protective curtains, i.e. canvas.

07. MAINTENANCE

Bekament finishing facade plasters have good resistance to soiling and do not require special maintenance. Possible impurities can be removed by washing with warm water and some universal household cleaning agent (eg washing detergent). Washing with abrasive agents and tools, as well as aggressive cleaning chemicals, is not allowed.

Repainting the facade surface is part of regular maintenance, and depending on the exposure of facade surfaces to external influences, it is performed every 5-10 years. Repainting has an aesthetic as well as a protective role, because in this way the water absorption of the facade plaster is reduced and thus prolongs the durability of the final layers of the system.

Regular maintenance of facade surfaces also reduces the risk of algae and fungi. The appearance of microorganisms is characteristic of thermal insulation systems, most often on buildings near trees, rivers, lakes, in valleys, in areas with frequent fogs and a higher concentration of moisture in the air, etc. Buildings that are in direct contact with moisture saturated soil or dries more slowly are also at risk, buildings with small overhangs in the roof structure, as well as buildings with poorly executed details around openings, etc The western and northern sides of the building are the most heavily loaded. One of the reasons for the development of microorganisms can be the short construction time of the building, where the drying time is reduced in certain construction phases and the share of residual moisture in the walls increases.

Some of the measures to suppress/reduce the risk of the development of microorganisms are: regular cleaning of facade surfaces, removal of surface water around the building, cleaning of snow, regular control of drainage around the building and cleaning of roof gutters, etc. When renovating infected surfaces, the treatment must be applied to the entire facade surface, not only on the parts where microorganisms are visible. Perform the treatment in accordance with the instructions given in the technical sheet for BK-Sani Cid. After the removal of microorganisms, it is necessary to repaint the treated surfaces with facade paint with the addition of a biocidal agent for the protection of dry film. For more detailed instructions related to the rehabilitation of infected surfaces, contact the technical service.

It should be emphasized that the appearance of microorganisms cannot be completely prevented, but only slowed down. Regardless of the adequate function of the biocide, it cannot be guaranteed that microorganisms will not appear after some time. The effect of the biocide in the final layer decreases over time, so objects that are in conditions susceptible to the development of microorganisms need to be regularly maintained and periodically repainted in the manner already described.

On the surfaces of thermal insulation systems, the occurrence of spiders and other types of insects that represent soiling is common. The aforementioned regular maintenance is a preventive measure in this case as well.

Finally, it should be pointed out that the appearance of microorganisms, spiders, insects, etc., on facade surfaces depends to a large extent on climatic conditions and as such cannot be the basis for a complaint about the quality of the thermal insulation system.

08. GENERAL NOTES

It is not allowed to arbitrarily add additives to the components of the thermal insulation system, nor to mix the components of the system with each other.

During the entire process of installing the thermal insulation system, in order to protect the material from the effects of the weather, the use of protective curtains during the installation of BK-S Plast and BK-Sil Si&Si finishing facade plasters is mandatory.

The color tone chart of the finishing plasters is made on paper, so when applying the product to different surfaces, minor deviations of shades from the tone chart can be expected, which cannot be the subject of complaints. Certain deviations of the shade of the plaster in relation to the corresponding shade in the tone chart are possible due to the use of natural mineral fillers. The non-uniformity of the shade of the installed plaster can be a consequence of inappropriate conditions during installation, incomplete equalization, different absorbency and roughness of the substrate, as well as unevenly installed final structure of the facade.

BK-Briv Special is produced exclusively in white and is not intended for tinting with Bekament tinting agents. Due to the high pH value of the mineral plaster, in the case of its tinting, there may be unevenness on the facade surface which manifests itself in the form of variegation and pronounced and/or irregular fading of the plaster over time. The subsequent coloring of the mineral plaster can be done by painting it with acrylic or silicate-based dispersion paints, in a limited selection of shades. For more detailed instructions on repainting mineral surfaces, contact the technical service.

The total amount of plaster for one building must be ordered at once. It is necessary to equalize the material intended for continuous facade surfaces, in order to avoid uneven shade. Banja Komerc Bekament DOO does not guarantee the complete matching of plaster from different batches, deviations in tone cannot be the subject of complaints.

Assessment of the quality of the finishing plaster in terms of shade and structure is performed after the material has dried. The assessment is done visually, from a distance of min. 2 m from the estimated surface and perpendicular to it. Comparison with a possible, previously made sample on the basis of which the selection of shade/structure was made, can only be indicative, because certain deviations are allowed due to various factors during installation (weather conditions, installation technique, substrate, etc.).

If the contractor notices some aesthetic or practical defect during the installation of the plaster, he/she is obliged to stop the work and inform the manufacturer about it, who will start considering the complaint as soon as possible. Complaints sent to the manufacturer after the installation of a large part or the entire amount of material, and regarding aesthetic characteristics, cannot be the subject of a complaint.

When choosing shades for installation in the thermal insulation system, it is necessary to choose shades with values of light intensity Y above 30. The value Y indicates the degree of reflection of solar radiation. The lower the value, the darker the shade, the higher the absorbed radiation, which causes significantly greater heating of the facade surface. In the case of thermal insulation systems, due to the presence of insulating material, heat transfer further towards the wall is reduced to a minimum. As a result, a large amount of energy is retained in a thin layer of reinforcing and decorative plaster, which are thus exposed to high stresses that lead to cracking over time. In the case of BK-Plast acrylic plaster, the shades of the plaster, which are obtained using organic pigments, have a lower resistance to washing off due to rainfall, as well as long-term color stability. Changes to facade surfaces that occur as a result of external influences, and which concern the aesthetics of the final plaster, cannot be the subject of a complaint.