

# FoamLime<sup>™</sup>

## FOAMLIME® ETICS SYSTEM

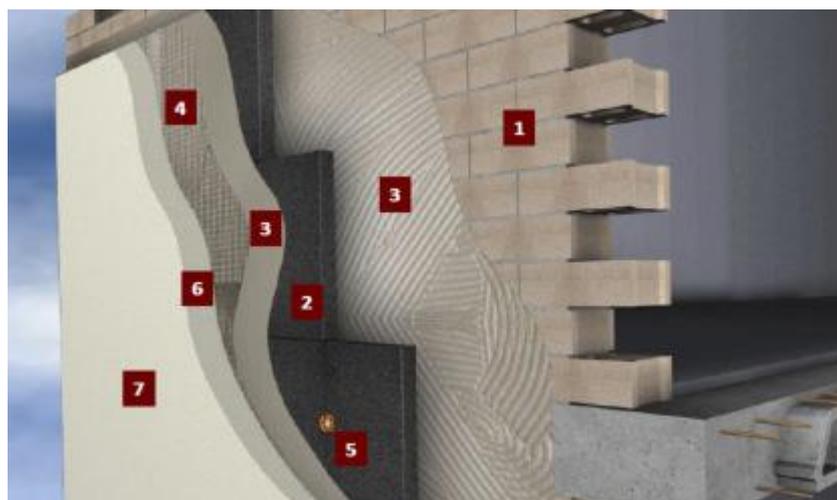
### Technical procedure and application guide

This ETICS specification is applied on normal buildings—with normal or reduced relative humidity, class I, II or III—where the cellular glass insulation is totally adhered by a mineral adhesive over a vertical enclosure—masonry or concrete—with a NHL 5 lime finish and reinforced with fibreglass mesh and additional mechanical fixtures.

FoamLime® system is applied on new or existing—renovated—vertical walls; also, it is installed over non-exposed-to-precipitation horizontal or slanting surfaces.

FoamLime® ETICS system is designed from non-load-bearing elements; it has no direct impact on the stability of the wall over which it is installed, however it provides these with greater durability and a better protection against the effects of climatology.

### FoamLime® system is integrated by the following components:



- Support: external facade/heavy substrate (1).
- Cellular-glass thermal insulation panels (2) adhered with FoamLime® Adhesivo (3).
- FoamLime® Adhesivo base coating (3) with fibreglass reinforcement mesh (4).
- Bolted mechanical fixtures (5).
- FoamLime® Base finishing

coat (6) which can serve as finish.

- Optional finish (7): (a) FoamLime® Silicato mineral silicate paint; (b) FoamLime® Revoco Silicato fine rendering.

### General considerations

- Only qualified installers homologated by Grupo Ibercal for FoamLime® shall execute the system.
- The installation will be carried out following the manufacturer's specifications.
- Building design must comply with the current regulations, especially when it comes to fire resistance and wind loads.

The work project, details included—connections, joints, etc.—will avoid water leakage to the interior of FoamLime® system.

- The surface over which FoamLime® system will be applied will be stable enough and airtight and its rigidity high enough to prevent the FoamLime® system from suffering deformations that could result in damage.

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- All accessories—rainwater pipes, gutters, etc.—will be fixed to the substrate without damaging the integrity of the FoamLime® system.
- The manufacturer's recommendations regarding packaging, transport and storing of the system components will be observed.

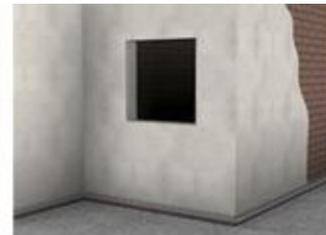
## FoamLime® system stages



Application Substrate



Perimeter start-up profile installation



FoamLime® Adhesivo application



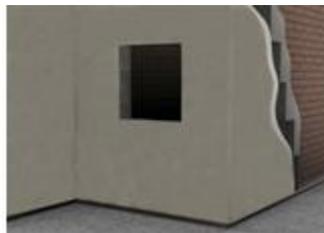
Cellular-glass panels adhesion.



Mechanical fixtures for the panels.



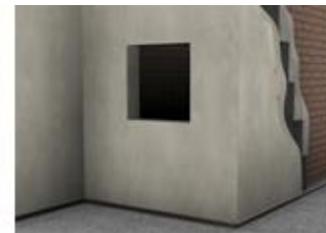
Important point resolution.



FoamLime® Adhesivo application for the installation of the reinforcement mesh.



Reinforcement mesh installation.



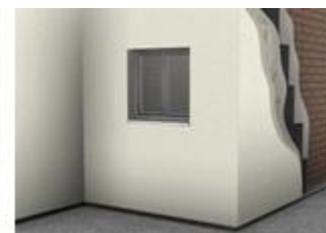
Covering the reinforcement mesh with a second coat of FoamLime®



Windows, window sills, gutters and copings installation.



Application of FoamLime® Base as a protection mortar.



Finishes: paints, lime, silicate or silicone based renders and stuccos.

## 1. Application substrate



- The substrate must be stable and must not present any fissures or structural damage.
- A profile anchorage system must be used when the substrate is not supported strongly enough.
  - Rainwater networks must be uninstalled prior to the application of the system.
  - Dirty, uneven or absorbent substrates first require preparation.
  - The substrate must be free of dust or moisture to help adherence of the panels.
  - In non-screeded supports, the surface to be covered must not have a flatness defect of more than

5mm/m.

- In screeded supports, the surface to be covered must not have a flatness defect of more than 3mm/m.
- The roughness of the substrate is enough to enhance adhesive properties.
- The support must be stable and cured, free of shrinkage.
- The imperfections and hollow spaces must be evened in order to achieve flatness.
- The correct verticality of the parameters is measured by 15mm deviations per 3m of height.
- The perfect moisture prior to application is that at which the surfaces do not present glare or shiny areas by water saturation.
- The system application temperature in the support must be above 5°C and below 35°C.
- In case the support is at temperatures over 30/35°C, the recommendations in the technical application manual should be considered.

## 2. Perimeter starting anchor profile installation



- The starting anchor profiles create a protection area against dampness, impacts, etc. Moreover they allow the installation starting line to be uniform and straight.
  - Starting profiles are arranged horizontally along the inferior limit of the area to be covered before the beginning of the insulation panel installation, leaving a socket to avoid moisture transmission by capillarity.
    - Zinc plated screws and proper attachment plugs are used, depending on the substrate.
    - The fixings are attached at a distance never over 30cm and never under 15cm for joints or vertexes.
    - The distance between anchor profiles must be at

least of 2/3mm in order to prevent contact by expansion.

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## 3. Application of FoamLime® Adhesivo



### Adhesive mortar preparation:

- In order to obtain the adhesive mortar, it is only necessary to mix the product with water.
- The mixture can be carried out manually or mechanically. For mechanical mixing a stirrer rod is recommended instead of a cement mixer due to the stickiness of the product. The stirrer rod must not go over 500rpm to avoid an excess of occluded air inside the adhesive.
- The use of spraying mixers simplifies and streamlines the process.

### Water and mixing time:

- The prescribed dosing must be strictly followed and no other component should be added to the mixture.
- Mixing or stirring time must not be under 5 minutes.
- The resting time of the mixture before application should be observed; it will depend on whether the mixture is carried out manually or mechanically.
- Pot life shall not exceed 30 minutes; it will depend on the weather conditions.

### Mixture preparation:

- Mix the powder product with a ratio of 6,75 L of water per 30Kg bag.
- Knead until a homogeneous and doughy mass is achieved. 5 minutes minimum.
- Let rest for 5 minutes prior to application.

## 4. Cellular-glass panels bonding



### Single bonding method:

- Spread the adhesive over the support and comb it using a notched trowel type U9 (9mm slots).
- Fix the panels by manual pressure with an offset pattern, thus obtaining a perfect juxtaposition for thermal bridge break and insulation continuity.

### Observations:

- During the bonding process, do not hit the cellular-glass panels so as to avoid breakage.
- In case of gaps between panels, cut and complete

with cellular glass in order to homogenise the insulation; never fill with adhesive mortar.

## 5. Mechanical fixation of the panels



A mechanical anchorage of the panels to the support is needed in addition to the FoamLime® adhesive. Round-plate plastic plugs with a diameter larger than 50mm will be used and plastic material so as to avoid condensation that could produce stains on the final coating.

- Depending on the substrate, the penetration of the plug shall be about 4cm.
- The installation and placement of the anchoring points shall be decided depending on the project.
- Mechanical anchors must be fitted once the panels have been bonded to the support.

- In vertical joints, one mechanical anchor shall be fitted on each side of the panel.
- In the final termination panels an extra anchor shall be fitted on the centre of the panel.
- Mechanical anchorage must be fastened but not hammered.
- ETA anchors shall be used.
- Hilti SD-FV or EJOT STR-U anchor are recommended for thicknesses over 60mm.

## 6. Special-points resolution



A reinforcement of all special points of the facade is required because work-derived tensions are accumulated and transmitted to this zones and can later produce fissures in the covering.

Special-points description:

- Lintels on openings or doors and windows.
  - Shutter boxes.
  - Wrought.
  - Changes in section of walls and enclosures.
  - Areas near elastic or expansion joints.
- Pillar joints.

The installation of mesh is recommended in order to cover a minimum of 20cm each side of the joint. In angled holes of facades, extra strips of mesh shall be installed with a 45° slope using 20\*20cm pieces.

Lintels and doorjamb: it is necessary to reinforce the lintels and doorjamb of holes in the facade with fibreglass mesh wrapping.

Doors and windows: it is necessary to observe the edges of door or window wells and discontinuities between materials for which special areas shall be reinforced with fibreglass-mesh angle beads, overlapping it over the plastering mesh. Besides, it is necessary to fit corner profile on all edges.

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Eaves and copings: when the system encounters with eaves, cornices and copings, a 5mm elastic joint should be carried out to avoid movement transmission to the panels.

Corner guard fitting: corner guards must be protected using mesh-reinforced metallic profiles to provide resistance, verticality and uniformity when applying mortar. In order to bind the corner guard, the necessary amount of FoamLime<sup>®</sup> Adhesivo is applied first and then the mesh is embedded into the same adhesive.

## 7. FoamLime<sup>®</sup> Adhesivo application—embedding the mesh



Once all insulation panels have been installed, all the anchors attached and all the special points have been reinforced, a thin layer—2/3mm—of FoamLime<sup>®</sup> Adhesivo mortar is applied.

The consistency of this first layer must be more fluid and must cover all the surface and previously reinforced elements completely.

This reinforcement and flattening layer can be spread by trowel or pumping machine and it is the one which provides most part of mechanical features.

Before applying this first layer of FoamLime<sup>®</sup> Adhesivo, we must make sure that the surface and all the reinforced elements are completely dry.

## 8. Reinforcement mesh installation



Once the first FoamLime<sup>®</sup> Adhesivo layer has been applied, we shall proceed with the installation of the fibreglass mesh, from top to bottom, embedding it uniformly.

The mesh must be embedded at the centre of the thickness of the FoamLime<sup>®</sup> Adhesivo mortar for it to remain shallow which could leave it uncovered during the scraped finish step.

If it were necessary, apply a second layer of FoamLime<sup>®</sup> Adhesivo mortar to cover the mesh perfectly and leave it centered inside the final thickness of this phase of the

system.

### Fibreglass-mesh installation:

- In adjacent sections the mesh must be overlapped by 10cm minimum.

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- In edges without corner guards it must go around a minimum of 25cm and must not be cut over the edge.
- Adjacent foils should be overlapped by a minimum of 10cm.

## Objectives of the reinforcement mesh:

- Improve the integrity of the system.
- Absorb impact energy and expansion.
- Decrease the risk of fissures and their propagation.
- Increase the mechanical compression and tensile strength.

## Advice for reinforcement-mesh choice:

- The size mesh must be chosen according to the granulometry of the covering or rendering.
- A mesh size of 12,5mm by 12,5mm is recommended for thick grain rendering because of its high tensile strength.
- A mesh size of 4mm by 5mm is recommended for fine grain rendering.

## 9. Covering and evening of the reinforcement mesh



This second layer of FoamLime® Adhesivo over the surface with the reinforcement mesh already embedded homogenises the application and ensures the mesh is perfectly centered inside the adhesive mortar.

The application can be carried out right away after the first layer—used to bind the reinforcement mesh—has been applied without waiting for this first layer to dry.

Once this phase is finished the surface is ready to receive FoamLime® Base Mortar.

## 10. Structural-elements installation



Structural element installation among which we find:

- Windows.
- Window sills.
- Gutters.
- Copings.
- Other.

## 11. FoamLime® BASE application



### **Preparation of the Substrate:**

- In case more than 5 days since the application of FoamLime® Adhesivo have passed, the surface must be properly dampened to ensure the bond between the two mortars.

### **FoamLime® Base mixing:**

- Mix the product with clean water with a ratio of 5,775L of water per 30Kg bag of product.
- Knead using a stirrer at low rev during 3 to 5

minutes until a perfect homogeneity of the mixture is achieved.

- Avoid kneading at high revs because it produces an excess of occluded air inside the mass and this alters the properties of the product.
- Observe water dosing in all mixtures during the application.
- Pot time: 2 hours approx.

### **FoamLime® Base application:**

- Apply FoamLime® Base manually or by means of mechanical spraying with a nominal thickness of about 8mm to 10mm, flattening it with a trowel.

### **Drying time:**

- The carbonation is slower at low temperatures and high humidity which increases hardening and drying times significantly.

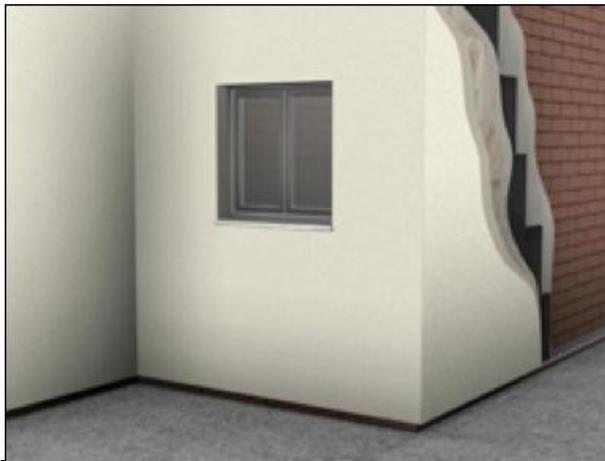
### **Finish:**

- Once the necessary harness is reached, screed until the approved finish is reached (with sponge, flattened, polished, scraped, etc.).
- In case a fine semi-polished finish is required, screed first with a plastic trowel and then set up using a stainless steel trowel.

It allows finishes with lime rendering, rustical, stucco, microcement, ferropolymer rendering and lime-based, silicate-based or siloxane-based paints.

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## 12. FoamLime® system finish



### 12.1. FoamLime®® Silicato paint finish

#### PROPERTIES

- High-adherence matt mineral surface.
- Anti-mold.
- Water vapour breathable and highly permeable to CO<sub>2</sub>.
- Non film-forming.
- It reacts insolubly with the substrate, consolidating it completely by means of micro-silicization.
- Reduced tendency to dirtiness and long lasting.
- Non-thermoplastic, fireproof and anti-static.
- Highly resistant to UV radiation, industrial-gas emissions and acid rain.
- Rain-proof, even after only a few hours after application.
- Ecological due to its properties and composition—no added solvents.
- Applicable over all kinds of mineral supports.

#### PREPARATION OF THE SUPPORT

- The substrate must be dry, healthy, clean and free of any remains of dust and liquids.
- The minimum period of 10 to 15 days should be observed—until a unified tone appearance is achieved, showing no water-retention stains—before applying the silicate-based paint over a new natural-hydraulic-lime finish, depending on the weather conditions.
- The surface is painted by applying two coats of paint.

#### APPLICATION

- Stir well before use by means of a mechanical stirrer until perfect homogenization in order to enhance its application and speed of work.
- To prepare the surface, apply a background coat of paint diluted with IBERCAL PRIMER SILICATO and water following the proportion: 1 part of paint, 1 part of water and 1 part of primer. Let dry for at least 12 hours.
- Once this period of time is past, apply a single coat of undiluted silicate paint or diluted with primer to a 5% maximum as a finishing coat.

- Do not apply at temperatures below 8°C or under humidity over 80%.
- Avoid painting over surfaces exposed to heavy sunlight.

## 12.2. Finishing with FOAMLIME® REVOCO mineral silicate covering

### PROPERTIES

- High-adherence matt mineral surface.
- Anti-mold.
- Water vapour breathable and highly permeable to CO<sub>2</sub>.
- It reacts insolubly with the substrate, consolidating it completely by means of micro-silicatization.
- Reduced tendency to dirtiness and long lasting.
- Non-thermoplastic, fireproof and anti-static.
- Highly resistant to UV radiation, industrial-gas emissions and acid rain.
- Rain-proof, even after only a few hours after application.
- Ecological due to its properties and composition—no added solvents.
- Applicable over all kinds of mineral supports.

### PREPARATION OF THE SUPPORT

- The substrate must be dry, healthy, clean and free of any remains of dust and liquids.
- The minimum period of 10 to 15 days should be observed—until a unified tone appearance is achieved, showing no water-retention stains—before applying the silicate-based render over a new natural-hydraulic-lime finish, depending on the weather conditions.
- The surface is covered by applying two coats of render.

### APPLICATION

- Stir well before use by means of a mechanical stirrer until perfect homogenization in order to enhance its application and speed of work.
- Do not apply at temperatures below 8°C or under humidity over 80%.
- Avoid painting over surfaces exposed to heavy sunlight.

### 2 COATS METHOD

- In order to prepare the surface, apply a background coat of IBERCAL PRIMER SILICATO which improves the mechanical strength of the mortar, regulates absorption and enhances adherence and mineral silicatization between the render and the mortar.
- Let dry for at least 12 hours.
- Once done, uniformly apply a coat of IBERCAL SILEX RS-05 render by hand, as a regularising layer to ensure the chromatic uniformity of the following coats.
- Once dry to the touch—between 2 to 5 hours, depending on the weather conditions, apply a second finishing coat using the chosen IBERCAL SILEX RX render.

## 1 COAT METHOD

- When the substrates be new or present a healthy and impeccable appearance, opt for the application of IBERCAL SILEX RX coat in one single layer.
- In order to prepare the surface, apply a background coat of IBERCAL SILEX RS-05 diluted at 50% with IBERCAL PRIMER SILICATO, uniformly and evenly. This coat will cover the support totally, thus ensuring the chromatic uniformity of the next finishing coat.
- Let dry for at least 12 hours.
- Once done, apply a second finishing coat using the chosen IBERCAL SILEX RX render.

## Types of finishes

- Direct finish: spread the material using a trowel directly over the finishing coat achieving the desired texture.
- Sprayed finish: apply the material on the substrate by spray gun. Use different nozzle diameters for different finishes.
- Screeded finish: After 10 to 30 minutes—depending on the weather conditions—spread the material by gently pressing the surface, in a circular motion and always in the same direction.
- Floated finish: After 10 to 30 minutes—depending on the weather conditions—spread the material in a circular motion by using a plastic float.
- Smooth finish: After 10 to 30 minutes—depending on the weather conditions—spread the material and smooth with a flat trowel.
- Scratch finish: After 10 to 30 minutes—depending on the weather conditions—spread the material by gently pressing the surface with a wooden or plastic trowel in a circular or vertical motion, always in the same direction.

## Supporting documentation

1. Product technical data sheet
2. Safety data sheets
3. Colour charts.