RENDER APPLICATION MANUAL

The purpose of this document is to establish the necessary requirements and considerations for rendering walls using our new renders. The instructions included herein are based on different publications, standards and documents such as the CTE.

TYPES OF SUPPORTS

The supports upon which the render is going to be applied must be chemically and physically compatible with the render. Plaster supports as well as those with a low porosity such as metal surfaces, glazed surfaces, etc., are not suitable.

The supports that can be rendered are:

Over perforated brick

- A prior moistening must be carried out especially if the perforated brick has a high absorption rate or in hot weather.

- If the absorption of the perforated brick is not homogeneous, a prior preparation coat must be applied (splatter).

- If the bricks are glazed or waterproof they must be previously treated with a primer, splattered with mortar modified with resins or the surface must be mechanically roughened to ensure a good bonding is achieved.

Over a prior cement based mortar render

- A prior moistening must be carried out especially if the support has a high absorption rate or in hot weather.

- The surface where the render is going to be applied must be stronger than the strength provided by the rendering and also, it should not be powdery. Otherwise all soft areas must be removed and subsequently the surface must be regularized prior to applying the render.

Over concrete blocks

- A prior moistening must be carried out especially if the support has a high absorption rate or in hot weather.

- If the blocks are waterproof they must be previously treated with a primer, splattered with mortar modified with resins or the surface must be mechanically roughened in order to properly prepare the surface.

- If the blocks are made of light concrete, given its high porosity and absorption, they must be previously moistened and a preparation coat must also be applied, for example using cement based mortar modified with polymers, or a suitable bonding agent.

Over mass, reinforced or pre-stressed concrete

"On site" concrete or prefabricated concrete surfaces cannot be coated with render unless they have been previously prepared.

The surface of this concrete is usually smooth, has remains of stripper, powder, etc., and the surface must be treated or these remains removed to improve the absorption and adherence of the render. The concrete surface must be prepared by applying a suitable bonding agent, by mechanically roughing up the surface or by splattering with mortar modified with resins to ensure a good bonding is achieved.

Over thermo-clay blocks

Since thermo-clay blocks are highly absorbent, they must be previously treated consisting of a prior wet down and the application of an initial coat with the same render.

GENERAL CONSIDERATIONS ABOUT SUPPORTS

Prior to applying the render we must evaluate the condition of the support for the purpose of preventing future damage. In general we must check the following characteristics of the supports:

The support must be strong

In the case of weak surfaces, the weak areas must be removed until a stronger area is reached. If the surface is powdery, a compatible hardening primer must be applied or the powder must be removed using any other method. We must take into account that the render must not be stronger than the support it is applied on to prevent future damage such as cracks or detachments.

The support must be completely clean

Otherwise any remains of wax, oils, paints, powder, strippers, silicone, etc., must be removed.

The support must be flat

The maximum allowed batter is 5mm with a 1 m ruler [(1)]. If the flatness of the support is not suitable, we must first regularize the surface using the same mortar with a rough finish. Also, any protruding joints must be chipped (burrs).

The support must be stable

The surface must not be cladded before sufficient time has elapsed since the joints were built to prevent shrinking, deflections transmitted by structural elements, etc. As a general rule, the estimated time from the construction until the application of the rendering is [(2)]:

- Concrete walls → 6 months
- Concrete block walls → 2 months
- Perforated brick → 1 month

[(1)] *NTE-RPE*

[(2)] *Technical specifications sheet. Single-layer mortars (ANFAPA)*

[(2)] *Technical Manual. Application of floor tiles and ceramic cladding (AZ pub.)*

The surface of the support must be sufficiently absorbent and rough

Hydraulic mortars need the support to be porous and with a certain degree of absorption in order for the cement to penetrate the pores and create anchoring points. Also, the roughness of the surface improves the adherence since it increases the grip.

We must treat the surface to create porosity on low absorbent or low porous supports like for example smooth concrete surfaces. To accomplish this we can follow one or several of the following methods:

- roughing of the surface by chipping, splattering with strong mortar or hydro-demolition.
- use of a bonding agent that is suitable for the indoor or outdoor application of the render.
- installation of a mesh anchored to the support.

On the other hand, a high absorption of the support may result in an excessive absorption of the render mixing water and may not allow it to properly hydrate.

We recommend wetting down the surface, especially in the case of ceramic surfaces and highly absorbent supports and wait for the "gloss" to disappear from the surface prior to rendering. This is very important since this prevents drying of the mortar, which could cause cracking. Another option is to apply an absorption regulating primer.

In the case of surfaces with unequal absorption rates; for example perforated brick that has been cooked at different temperatures, we must apply a preparatory layer (splatter) or a suitable primer to ensure a uniform absorption is achieved.

GENERAL CONSIDERATIONS ABOUT THE APPLICATION

Design

Prior to starting the application, details such as the eaves, edges, weathering, etc., must be completed because if these items are not completed, it may affect the quality of the work.

Water impermeability

Waterproof renders reduce the rain water penetration rate but they are not impermeable or watertight and therefore are not suitable for permanent humidity and should not be applied on:

- Surfaces where the water may stagnate or where the render may become immersed.

- Sloped surfaces directly exposed to rain water.

- Supports where capillary filtrations are expected.

- Joining between horizontal and vertical sections without the protection of a capstone with an impermeable laminate immediately below it.

Also, the start of the cladding must be protected with a skirting and additionally cut the cladding at the height of the top part of the skirting and if a skirting is not used, the render will be applied at a minimum distance of 1.5cm from the floor to prevent capillary filtrations.

Joints

The cladding must be interrupted at the structural joints so that the stresses generated there are not transmitted to the cladding since otherwise, cracks or even detachments could be generated. These joints must meet and have the same degree of freedom as the point where vertical surfaces meet.

In addition to staying clear of structural joints, working joints must be set to facilitate the application and remove splices. The maximum recommended separation between working joints is the following [(3)]:

Å Vertical distance between horizontal joints: 2.5 m

Å Horizontal distance between vertical joints: 7 m

To make the joints, the render is applied in 6 to 10 cm wide sections, over which the moulding is placed. Subsequently apply the rest of the material and regulate. The mouldings may be removed when the material is strong enough to prevent the edges from breaking (plastic or wooden moulds), or may be embedded, in which case they must be protected prior to applying the render (metal moulds).

Discontinuities

Meshes must be placed (for example made of fibre glass with an anti-alkali treatment) in areas such as the unions between different materials, formwork, pillars, window frame seats, shutter boxes, sills and at points where stresses build up such as door and window frame angles, etc.; to prevent cracking. The mesh must cover a minimum of about 20 cm of each side of the union, at the mentioned angles, the mesh will be installed diagonally in 20 x 40 cm sections. The mesh will be placed centred on the thickness of the cladding, not too close to the support and not too close to the surface. It is important to install the mesh half way to the thickness of the mortar in order for it to work properly.

Thicknesses

The optimum thickness of the render must be between 10 and 20 mm and in no case shall it be less than 10 mm. For larger thicknesses, the work must be carried out twice by applying a base rendering and a final rendering, and installing an alkali resistant mesh in the centre of the render thickness but never exceeding 40 mm of total thickness.

On multi-layer renders, the first layer must be weaker than the support and each subsequent layer must be weaker than the one is is laid over. Also the subsequent layers must not be thicker than the previous layer and each layer must be finished in a manner that it provides a good anchor for the next layer.

Finishes

If paints are used for the final rendering, these must be compatible and breathable.

[(3)] Recommendations and Technical specifications for mortar renders (AFAM)

WEATHER CONDITIONS

- The renders shall not be applied below 5ºC nor above 35ºC, as measured over the support.

- The works will be suspended in freezing weather and if the application is carried out outdoors, also in rainy weather, extremely dry and hot weather or on surfaces that have been overheated by the sun.

- Cement based renders must be protected from excessive evaporation when the weather is hot or air currents are present. This protection may require curing of the exposed surfaces during the first hours after the execution for example, by lightly spraying with water. This curing must not be carried out in direct sunlight or when the surface of the render is hot.

- The working times vary according to the weather conditions and the characteristics of the supports. High temperatures and/or low relative humidity reduce the working time of the renders while low temperatures and/or high relative humidity increase it.

- The following table lists the adverse effects that may occur on the rendering under certain weather conditions and the proposed treatments to minimize the effects.

PHASE		TREATMENT	EFFECTS
EVALUATON OF THE SUPPORT	T Ò5ºC or T Ó35ºC	Do not start the works	Loss of adherence
	Under freezing temperatures		
	Under direct rainfall		
DURING APPLICATION	T Ò5ºC or T Ó35ºC	Suspend the execution	Loss of adherence
	Under freezing conditions	Suspend the execution	Setting delays / Change in colour
	Under direct rainfall	Suspend the execution	Efflorescences
	With direct sunlight	Suspend the execution	Cracks / Changes in colour
	%HR low air, High Temp	Moisten the joints	Quick drying / outlines
	With strong wind	Suspend the execution	
DURING CURING	Under freezing conditions	Check that the sections completed the previous day and remove any damaged areas.	Setting delays / Change in colour
	Under direct rainfall	Protect the recently completed sections.	Efflorescences
	With direct sunlight	Protect the recently completed sections and keep the render damp.	Cracks / Changes in colour
	%HR low air, High Temp	Keep the render damp.	Quick drying / cracks
	With strong wind	Protect the recently completed sections.	

OTHER CONSIDERATIONS TO TAKE INTO ACCOUNT

- BIKAIN recommends using its BIKREX 1000 primer as a bonding agent. It is important for this bonding agent to be compatible with the render and the support and suitable for the final exposure conditions of the cladding.

Our technical advice, whether the advice is provided verbally or via tests, is provided according to the best of our knowledge but shall be considered only as a recommendation WITHOUT OBLIGATION. Since we are not involved in the execution of the works, the information is provided for general purposes and is not legally binding for BIKAIN.

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