

# **Treatment for rising damp and natural hydrodynamic equilibrium in masonry walls**

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## **ABSTRACT**

The water absorption, in the Historic Heritage Restoration, through porous materials of the different constructive elements, is certainly one of the factors that constitute the basis for most pathologies and degenerative phenomena on plastering and masonry walls. Particularly, the most critical humidity comes from the soil, because it contains salts (chlorides, sulphates, nitrates). Those salts impregnate the masonry and unleash humidity rises up to several meters.

Humidity varies the physical and chemical behaviour of the wall, increasing the thermic conductivity and limiting the isolation power. In addition, due to surface crystallization of the salts, early disintegration of the building materials and rapid destruction of the wall are generated. A wall saturated with water diminishes its isolation power and favours the formation of mould and bacteria, worsening the healthiness of the environments and the well-being of the people who habit them.

In nature, a natural hydrodynamic balance is established between the water absorbed by building materials through capillarity and osmosis, and the water transferred to the atmosphere through evaporation. The constant components within this equilibrium are the absorption of water through capillarity and osmosis of the building materials, and the chemical nature of the aqueous solution absorbed. The variable components are the temperature and relative humidity of the atmosphere. The evaporation surface, composed by masonry mortar, plastering, scraping and painting are the constructive elements on which we might make an intervention.

The traditional constructive systems, exclusively based on using natural lime for the manufacture of masonry mortars and rendering, and on using lime paste for coatings and paints, used to create the natural effects of the breathable hydrodynamic balance of the masonry. The challenge is to reproduce today, on site, a range of natural lime products in order to carry out interventions completely comparable to the original construction techniques. The range of products BIOCALCE, ensures a natural balance between rising damp and surface humidity evacuation, exploits the natural qualities of microporosity and hygroscopicity of the pure natural lime, NHL, and natural pozzolana. The lack of reaction with the salts ensures chemical stability of the rendering and the duration of the entire dehumidifying system.

The aim of the paper is to present various real cases from Spain and Italy. Each case will be explained from the initial study phase to the execution phase and evolution of the system throughout time, including several support types, its simple application and maintenance once in operation.