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Book of Abstracts

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Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect

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Abstract

Different rendering mortars were prepared by mixing air lime and air lime-pozzolanic nanosilica with TiO_2 and sodium oleate as, respectively, photocatalytic and water repellent agents, added in bulk. The aim of the work was to design and obtain new rendering mortars with improved durability focusing in the reduction of the water absorption of these materials and in their self-cleaning and biocide effect. To achieve a better distribution of the TiO_2 particles, which was expected to enhance their efficiency, different dispersing agents were also incorporated to the fresh mixtures. Four diverse polycarboxylate ethers superplasticizers and a poly-naphthalene-sulfonate were tested. Workability and fluidity of the fresh rendering mortars were determined to guarantee the applicability of the final products. Water contact angle was monitored with the aim of assessing the hydrophobicity of the mortars lent by the water repeller. The biocide effect was studied by means of the culture of a strain of *Pseudomonas fluorescens*. The colonization of the mortars' surface was analyzed by determining the number of colonies forming units (CFU) after several days subjecting the samples to suitable T and RH conditions. At the same time, the surface of the mortars was irradiated with solar light to activate the photocatalyst. Results showed the efficiency of the sodium oleate in reducing the water uptake of the rendering mortars. Good compatibility between the water repellent agent, the pozzolanic additive and some of the polycarboxylate superplasticizers was observed. The presence of the photocatalyst was found to be very effective in preventing microbiological colonization.

Keywords

Lime Superplasticizers; Titania; Biocide

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