

Studies of the Performance of Nanostructured and Other Compatible Consolidation Products for Historical Renders

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Abstract

This work is inserted in a wider project aiming at the conservation and durability of historical renders, through compatibles techniques and materials; in particular the restitution of cohesion of historical renders, turned friable by the loss of binder due to physical or chemical actions, is studied.

Surface consolidation, directed to restore cohesion and stability, is based on the use of materials with aggregating properties. This operation is reached usually through the application of organic or mineral consolidants, but inorganic consolidants (such as calcium hydroxide or ethyl silicate) are preferred due to better compatibility and durability.

Based on the results of previous studies, two mineral compatible products were selected: a commercial suspension of nanoparticles of calcium hydroxide in propanol (Nanorestore); a silicate product, consisting on a limewater dispersion of ethyl silicate.

Consolidation products were then applied on different mortars samples previously prepared, in order to assess their efficacy by determining their physical, mechanical and microstructural properties before and after the consolidation treatment.

Mechanical and physical analyses were performed, such as compression and flexural strength and superficial hardness. Microstructural and chemical analyses of the consolidation product and of the consolidated samples are also reported.

Keywords: Historical renders, Consolidation products, Compatibility