

STUDIO DELL'EFFICACIA DI CONSOLIDANTI A BASE DI DIAMMONIO FOSFATO PER LA CONSERVAZIONE DI DECORAZIONI E FINITURE A BASE DI LEGANTI IDRAULICI E CEMENTIZI

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ABSTRACT

The preservation of lime-cement renders, frequently used in the 19th and 20th-century, architecture repositories of important historical and architectural value, is now a growing research field. The use of diammonium phosphate (DAP) has recently been proposed as inorganic product for the consolidation of limestone matrices. This product has the ability to form calcium phosphate (CAP) inside the pores and the microcracks, it is inexpensive, and with low environmental impact.

This research aims to evaluate the consolidation capability of DAP solutions, once applied to lime-cement mortars, even in presence of soluble salts (sodium chloride). Mixtures of DAP with barium hydroxide, calcium hydroxide, calcium chloride and nanolime were applied on limestone sand and powder in different ambient condition (60% and 95 % relative humidity) to evaluate their behaviour and identify the most promising formulations. Two formulations (DAP + CaCl₂, and DAP + Ba(OH)₂) were then selected and applied on lime-cement render specimens, some of them previously treated with NaCl. The results highlighted the importance of a high relative humidity and of a long reaction time (30 days) on the CAP formation, and the delay in CAP production in presence of NaCl. The behaviour with regards to water slightly changed and a penetration depth higher than 1,5 mm was reached.

Key-words: Diammonium phosphate, Consolidation, Calcium Phosphate, Contemporary Renders, Cement-Lime Mortars