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ABSTRACT:

Innovation and Sustainability for On-Site Compatible Consolidation Treatments of Natural Stones and Historic Mortars

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Maintenance of the cultural heritage assets can significantly affect the partial or even the complete loss of their values. In case of restoration, the use of appropriate materials and techniques in the renovation process represents one of the pillars to respect the original substrates to operate in according to sustainable practices. Since their introduction in the conservation of historical and decorative surfaces, Ca(OH)2 nanoparticles suspensions, also called nanolimes, pointed the necessity to fulfil the crucial request of compatible consolidation treatments [1]. At the University of L'Aquila, we developed an innovative, sustainable and scalable method to produce new nanolimes dispersions (NANOLAQ) by an ion exchange process, operating in water, at room temperature and ambient pressure, without any organic additives, with low energy consumption and no toxic wastes, (European Paten EP 2880101B1) [2]. The NANOLAQ eco-friendly features are associated to good consolidating efficacies, thanks to the completeness of the carbonatation process and an extraordinary penetration depth, as observed both in laboratory and in situ applications on large surface areas too [3, 4]. In this work, same representative case studies are presented. The effectiveness of NANOLAQ treatments is shown in terms of penetration depth, surface cohesion (STT), mechanical resistance (DRMS) and SEM microscopic studies.

References

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