

## Effectiveness, compatibility and durability of consolidants for marble: a review of the last ten year of researches

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The choice of suitable consolidant treatment for cultural stones is one of the main challenging issue for conservation and protection of ancient masonry. Among building materials, marble is one of the most used for building and sculptures. Due to its low porosity, the assessment of suitable treatment for marble consolidation is not trivial; beside, the type of product, treatment methodology (Ferreira Pinto & Delgado Rodrigues, 2012), effectiveness and compatibility investigation (Sassoni et al., 2016a) and durability monitoring (Sassoni et al., 2016b) have to be taken in great account. Recently, researchers have extensively tested and proposed new products for consolidating carbonate stones, including organic and inorganic products (Hansen et al., 2003), nanoparticles (Sierra-Fernandez et al., 2017), biological organisms (De Muynck et al., 2010). Nevertheless, no entirely satisfactory treatment is currently available for marble consolidation. At the same time, no unique evaluation criteria to use as laboratory estimators of consolidating performances have been assessed (Delgado Rodrigues, 2010). The present paper aims to carry out a review of the state of art, based on the last ten years of researches, on consolidants for marble substrate. We summarize the different type of commercial and research products proposed for marble consolidation, by comparing also effectiveness, compatibility and durability of each proposed product, in function of consolidant features (*i.e.*, product concentration, solvent type) and treatment methodology (application process, and contact time).

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