

Surface protection of the Sperone tuff of Villa Mondragone by nanostructured materials in the framework of ADAMO project

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In this contribution the methodological setting of the surface protective testing for the tuff stone of Villa Mondragone will be reported and discussed. The work is included in the framework of the ADAMO project of Technological District of Cultural Heritage funded by Lazio Region, being Villa Mondragone one of the sites chosen for the project development.

Samples of tuff, named Sperone, were taken from the site. From this erratic pieces, 5x5x2,5 cm samples were obtained for laboratory tests.

The first step of the work was devoted to find the most suitable protective products to test, taking into consideration the commercial materials and those most used by conservators and restores. From this preliminary research, it was found that the most used products, for protection of tuffs exposed outside, are polysiloxanes based mixtures together with fluorurate elastomers. So, these two kinds of products were tested in comparison to a new functionalised nanosilica-based formulate, thanks to the collaboration with CTS.

Products were applied on the tuff samples according to the modalities indicated in the technical data sheets. Colour was measured before and after the application with a reflectance spectrophotometer. In order to evaluate the performance of the three tested products, contact angles, penetration depth and peeling test were applied.

In the second step of the work, samples will be aged under artificial conditions in Solar Box climatic chambers in order to evaluate the protective behaviour due to UV and water treatment.

Hyperspectral imaging and reflectance spectrophotometry will be used for evaluating changes in untreated and protective-treated tuff samples as a consequence of ageing.