

Atmospheric Plasma: an innovative tool in Cultural Heritage cleaning procedure

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Nowadays, a mandatory requirement for any practice related to the cleaning of Cultural Heritage objects (CH) must be effective without any direct or future detrimental effects on the original materials. Considering this requirement, in 2011 the EU founded PANNA (grant agreement n° 282998) project developed an innovative conservation protocol for cleaning several typology of CH materials. This protocol is based on the atmospheric plasma pressure jet (APPJ) technology that guarantees, with a specific chemical action, an eco-friendly cleaning technique. The major outcome of PANNA is a new APPJ apparatus that offers a safe tool for CH applications. Moreover, the new tool, with its patented design, fully suits the CH requirements. The present communications deals with the dissemination of the results obtained in five years of experimentations. Our attention will be particularly focused on the cleaning of historical stone surfaces, showing the potential of APPJ technology in removing epoxy resins, acryl polymers and *graffiti* dirt. The possibility of switching from oxidative to reductive conditions will be then illustrated, showing the effectiveness in the conversion of corroded metal surface layer and in the cleaning of daguerreotypes.