RAMAN SPECTROSCOPY AS A TOOL FOR THE NON-DESTRUCTIVE CHARACTERIZATION OF SLIPS AND GLAZES OF A «SGRAFFITO» RENAISSANCE PRODUCTION

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Starting in the 15th century, a diffused production of «sgraffito» ceramics is attested in a large number of small artisanal furnaces in 15 sites in Tuscany, notably Castelfiorentino, Borgo San Lorenzo and Cafaggiolo. This production had already been investigated in 2004 by analyzing 30 samples, representative of open shapes (dishes, cups, bowls), covered by a white slip («engobe») and in most cases also by a transparent glaze. The chemical composition of both slips and glazes has been determined by means of SEM-EDS, and the mineralogical analysis of the pastes has allowed to hypothesize a firing temperature of about 950°C.

At present, Raman analyses have been carried out on the engobes and glazes of a few of the same samples, in order to verify the possibility to obtain the same or complementary information about raw materials and production technology of the artefacts in a completely non-destructive way. Raman spectroscopy has in fact proved itself to be a valuable tool for the non-destructive characterization of pottery pastes and glazes, as it allows a rapid and fairly straightforward identification of both crystalline and amorphous phases. Additional treatments on the Raman spectra of silicate glasses (such as ceramics glazes) allow to extract valuable information about their composition and firing temperature, which can in turn be related to the production technology of the studied artefact.

Two instruments have been used for Raman analysis: a Dilor XY2 spectrometer in macroscopic configuration, using a 406.7 nm Kr^+ laser and a CCD detector, and a Jobin Yvon Labram Infinity coupled with a 50x microscopic objective, Nd:YAG laser at 532 nm and CCD detector.