

## **SOME METHODOLOGICAL ASPECTS ABOUT THE MORTAR DATING WITH BOTH OPTICALLY STIMULATED LUMINESCENCE (OSL) AND RADIOCARBON ( $^{14}\text{C}$ ) METHODS**

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In this work the results of a dating study on bricks and mortars are shown. The samples came from the outside walls of Certosa di Pavia, located in northern Italy and independently dated (XVII-XVIII century). Thermoluminescence (TL) dating, applied to the bricks using the fine grain technique, allowed to establish that the bricks were manufactured during the XII century, being therefore re-used. The application of both Optically Stimulated Luminescence (OSL) and  $^{14}\text{C}$  to mortar was attempted to investigate the possibility of dating the edification of the wall, instead of the firing of its constituents. Compared to all other datable materials, mortar has in fact the advantage of being purposely made at each stage of construction, not being recyclable (Bøtter-Jensen et al., 2000). The OSL dating application is possible because the quartz crystals contained in the aggregates are exposed to daylight during the mixing and laying of the mortar itself, and could therefore be used as dosimeters, recording the natural dose since the end of the exposure to sunlight, which coincides with the edification. In this work mortar dating by OSL gave severe age overestimation: the results obtained on coarse grain quartz with different analytical methods (SAR technique applied both on multi-grains aliquots and on single grain) were highly dispersed indicating an incomplete bleaching of the quartz grains (Goedicke, 2011).

The radiocarbon dating was made extracting the carbon present in the mortar in form of carbonate salts. One of the major problems in radiocarbon dating of mortars is the possible presence of geogenic calcite, which can modify the correct radiocarbon content in the material. A FTIR analysis allowed the selection of the materials less contaminated (Chu et al, 2008), which were chemically treated to extract the carbon fraction. The carbon isotopes were measured via Accelerator Mass Spectrometry (AMS), and the resulting ages were calibrated using the INTCAL09 calibration curve. The obtained dates are reported together with the luminescence results, compared with the known ages and discussed.

### **References**

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