

Authors: Evandro Sacchi, Politecnico di Milano
Chris Muller, Purafil, Inc.

Title: Reactivity Monitoring in Italy's Cultural Heritage Sites

Abstract: In 1995-1996 a "Museum Campaign" using environmental reactivity coupons (ERCs) was begun to assess the air quality in and around a large number of cultural heritage sites throughout Italy. Analysis of the resulting reactivity monitoring database showed that the outdoor air quality does not (generally) meet the specified acceptance criteria for gaseous pollutants. There were also a significant number of locations where the indoor air was deemed as being "not acceptable" for preservation environments.

About the same time a project carried out by the Istituto Centrale per il Restauro (Central Institute for Restoration, ICR), "The Risk Map of Cultural Heritage," was just being completed. It was well known that air pollution and other factors were responsible for bringing about the degradation many items of historical significance. Monitoring was carried out for suspended particulate matter, black smoke, sulphur dioxide, ozone and rain pH to directly define environmental aggressiveness and the rate of deterioration of the various cultural assets. Each single municipality was assigned a danger (risk) value or index with the aim of defining a hierarchy of the various phenomena according to their hypothetical effects. A correlation was observed between those locations with the highest risk factors and those not meeting reactivity monitoring standards.

Since the original Museum Campaign, reactivity monitoring has continued for some of the same sites as well as a number of new sites. These results have shown higher average reactivity levels indicating that, if anything, air pollution levels in Italy are getting worse instead of better. If these trends continue, many cultural treasures may be lost or irreparably damaged.

These monitoring results also showed that when chemical filtration is employed to maintain the concentrations of gaseous pollutants as low as possible, reactivity levels well within general and specific acceptance criteria have been attained. Where the general acceptance criteria is met, with the possible exception of certain metal collections, it is generally accepted that these are environments sufficiently well controlled as to prevent the deterioration of objects and artifacts.

This paper will summarize the most recent set of ERC monitoring results and compare these to the current Risk Map looking toward their use both as a standard gauge of air quality for museums, libraries, and archives as well as a recommendations for their use as a general monitoring tool for the ICR and the Risk Map.