

Getty Study Validates Artcare Technology

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The Getty Conservation Institute, Los Angeles, California.

The Getty Conservation Institute, (GCI) one of the world's premier conservation research facilities, works internationally to advance the field of conservation and enhance the preservation of visual arts. Preventive conservation approaches have been an important part of the institute's overall research effort to expand conservation practices beyond treatment. The GCI has conducted extensive research on ways to protect objects in display cases or other microenvironments from attack by indoor and outdoor gaseous air pollutants. As part of this research, GCI scientists have studied the capacity of various absorbents to intercept pollutants, thereby reducing the pollutants' damaging effects.

During a recent visit to the Getty Conservation Institute, we met with James Druzik, senior scientist, to discuss his work at the institute and how framers can benefit from its research.

DECOR: How long have you been at the Getty Conservation Institute?

Druzik: "I joined the Getty Conservation Institute in 1985, shortly after its founding, so I have been with the institute since the beginning. Having majored in chemistry, I gravitated to paper conservation as there are 10 times more paper artifacts than any other material in the world. Paper artifacts also offer the most scientifically specific area of conservation."

D: Why are pollutants of interest?

Druzik: "The area of preventive conservation and how to mitigate or prevent air pollution damage has been of particular interest to me for over 20 years. Scientists at the Getty and other institutions have done extensive study on the causes of deterioration to works of art on paper and other materials. We were seeing damage from pollutants occur even in a controlled museum environment.

"Here in the Los Angeles area, outdoor air pollution is an important concern, but we have also discovered

that indoor pollutants—generated by furnishings, paints, wood – are an even bigger problem. While outdoor pollution is monitored and regulated, most indoor pollution is not. Indoor pollutants are present in a much higher concentration than those found outdoors, and can be significantly more harmful to artifacts than typical open-air pollution."

D: What types of pollutants are dangerous to art/artifacts?

Druzik: "Outdoors, pollutants of concern are nitrogen dioxide from automotive exhaust, sulfur dioxide from fossil fuels, acid rain. Indoors, pollutants are generated by furnishings, heating systems, appliances. You will also find residual 'outdoor' air pollution inside buildings.

"One of the most dangerous pollutants to paper is acetic acid, which comes from wood, particularly oak; from some papers themselves; and from some manmade materials like acetates. As the effects of acetic acid build up in a paper artifact, it accelerates degradation. And it's insidious—unlike fading or discoloration, paper deterioration from acetic acid exposure is usually not visible until it is too late."

D: How did your research come about?

Druzik: "At the time I joined the Getty, several institutions were doing research on paper conservation. The National Archives was the first to measure pollutants in archival settings. Since then the Canadian Conservation Institute has also done work that proved the negative effects of acetic acid on paper. The Image Permanence Institute did likewise on photographs. This was becoming a pressing issue. Our goal at the Getty is to create a pristine environment for artifacts, so I initiated a study on pollutant absorbents."

D: What was the objective of your research? What absorbents and gases did you use and why?

Druzik: “My goal was to identify materials that would be most effective at absorbing and retaining acetic acid, and that would be suitable for use in preserving artifacts. I looked at about 18 different materials, including activated carbon, clays, calcium carbonate and several zeolites, which are a common natural product. I was intrigued by zeolites as they are known for their very effective and high-capacity adsorption and are used extensively in other fields.

“My research consisted of exposing the various adsorbent materials to acetic acid gas to determine adsorption capacity, then subjecting the “saturated” materials to a variety of tests to determine how well the gas was held. These tests included heat and exposure to other materials that might possibly displace the acetic acid inside the adsorbent like water vapor and hydrocarbon solvents. I wanted to find the material or materials that would hold the acetic acid, even under the most adverse conditions.”

D: What were the results of the research?

Druzik: “The activated carbon and one of the zeolites – called SPZ, this is the zeolite found in the Artcare technology – performed significantly better than the other physical adsorbents. Although activated carbon has better retention of acetic acid generally, it is, unfortunately, black and sooty, making it unsuitable for most conservation treatments. The SPZ, on the other hand, is white and clean, and performed extremely well. I haven’t yet published the full results, but I can tell you that the SPZ held the adsorbed acetic acid much more tenaciously than carbon during influxes of high humidity. In addition, my preliminary findings seem to indicate that a combination of the SPZ zeolite and calcium carbonate would provide a truly synergistic adsorptive and reactive framework.”

D: What do these results mean to conservators and picture framers?

Druzik: “Based on its adsorption and retention of acetic acid – which can be assumed to inhibit cellulose deterioration – the SPZ zeolite, incorporated in Artcare MicroChamber technology, is a very viable material for preventive conservation applications.”

D: What advice would you offer to picture framers, concerning their conservation efforts?

Druzik: “To always frame to the conservation standard. Any piece of art should always be treated as ‘valuable’. Put as much protection into your framing as is available. Framers should be less conservative with works of art on paper. By this I mean framers should be open to using the latest technology available. Zeolites have been accepted by many museums. Many conservators at the Getty are keen on zeolite paper and boards.”

“I would also encourage framers to label their work with date, materials used, methods applied and a recommendation to have the contents inspected every 20 years. This will ensure that the artwork can be treated to the latest developments in preventive conservation. And, know your media – for example, photographs and some modern materials have specific conservation concerns. The framer should stay abreast of the latest research and standards. After all, the challenge for picture framers is the same as that of the Getty Conservation Institute – to ensure that future generations will be able to share our culturally diverse past.”



In service to conservators and others caring for works of art, scientists at the Getty Conservation Institute provide essential information regarding the causes of deterioration and options for appropriate treatment.