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A REPORT ON ARTISTS' MATERIALS

Two scientists from the Smithsonian Institution's Conservation Analytical Laboratory share some of their findings on the effects of relative humidity, temperature, and vibration on paintings.

In conjunction with the cover story on Ross M. Merrill in this issue, we asked two scientists who have researched artists' materials and techniques with him to share some of their findings. Marion F. Mecklenburg and Charles S. Tumosa, who work for the Smithsonian Institution's Conservation Analytical Laboratory in Washington, DC, have made important discoveries about the exhibition, preservation, and restoration of works of art that have been helpful to museum directors, conservators, and practicing artists. In particular, their research on packing and transporting paintings (which resulted in a series of workshops and two comprehensive publications entitled Art in Transit: Studies in the Transport of Paintings and Art in Transit: Handbook for Packing and Transporting Paintings) has yielded valuable information about the effects of relative humidity, temperature, and vibration.

As part of their research, Mecklenburg and Tumosa considered reasons why some paintings crack and deteriorate while others remain as fresh as the day they were created. They considered the effects of environmental conditions on materials such as canvas, rabbit'skin glue, varnishes, and acrylic, oil, and alkyd paints.

Mecklenburg's and Tumosa's tests of alkyd and oil paints are particularly relevant to the article on Merrill since he uses both types of paints in his landscapes. The following interview lays out their findings and should prove helpful to artists working with either or both of these painting mediums. Some of their information is rather technical, but their general conclusion is that alkyds are quality products that offer artists the benefits of quick drying and a durable finish.

American Artist: Could you first summarize the reasons you were testing artists' materials?

Mecklenburg & Tumosa: We were attempting to determine the most important considerations for packing and shipping paintings. In the process, we tested the effects of relative humidity, vibration, temperature, and shock on various types of paints and painting surfaces.

AA: What would you say were the most significant findings that could be helpful to practicing artists?

M&T: It's difficult to summarize this extensive research, but we suspect...
This research shows that alkyds are quality products that offer artists the benefits of quick drying and a durable finish.

A: Because we are featuring the work of Ross M. Merrill in this issue, we are particularly interested in your findings about the alkyd paints he uses. Could you share some of these findings?

M&T: As a medium, alkylds have a number of qualities that should appeal to absorb moisture, they swell, and this can sometimes be a problem.

M&T: The ability of a paint film to respond to changes in RH is dependent upon many factors that affect the hydrophilic or hydrophobic nature of the polymer. Cross-linking, the crosslinking of parallel chains of atoms, enables alkyld paints to be less responsive to moisture than their counterparts. In fact, over a range from 5% RH to 90% RH, alkyld swell about one-fourth (0.8%) as much as acrylics.

All of the environmental considerations, extreme temperatures can have the most damaging effects on paintings.

A: How do temperature and ambient moisture affect alkyld as compared to other paints?

A: We've just said, all the paints we tested performed reasonably well, but we can't say that based on our research artists should abandon traditional oil paints in favor of modern alkylds and acrylics. And now that many manufacturers are reformulating their paints to include lightfast pigments, an artist can buy better paints than were available centuries ago.

One of the traditional materials we would not recommend to use is rabbit skin glue. Any of the refined hide glues that have traditionally been used to seal the surfaces of canvass to or to adhere liners to the back of canvases will remain responsive to environmental conditions. This means that the glue will expand and contract with relative humidity changes so much that it is likely to crack or to cause fissures in the paint applied over it. We found much more satisfactory results when surfaces were prepared with acrylic gesso or medium.

In general, the higher the RH, the higher the air's moisture content. All artists' materials absorb moisture as the RH increases and lose moisture as it decreases. When the material
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W. Guy Pfeiffer

When you focus on watercolor, you focus on the magazine that does the same.

“WATERCOLOR” is the only magazine devoted exclusively to the special needs of watercolorists. Created by the editors of American Artist, WATERCOLOR is a crucial resource for watercolorists of every stripe. In every issue, you’ll meet talented fellow artists across America and examine masterful paintings in watercolor, gouache, acrylic, casein and egg tempera. Through step-by-step demonstrations and frank discussions, you’ll explore the strategies, techniques and working methods of other painters. You’ll understand how they work, and why. You’ll also pick up inspiring new ideas, learn about great watercolor products, and uncover some of today’s best marketing secrets.

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