

I am pleased to offer two works by others in the *WAAC Newsletter* Health and Safety column.

We have reprinted, with Monona Rossol's permission, the lead article in the May 2007 *Acts Facts* (Vol 21, n. 5). The article is on the listing of our favorite white pigment, titanium dioxide, as a possible carcinogen to humans.

Also, co-opted from *AIC News*, an article by Terry Schaeffer, Conservation Scientist and Safety Officer at LACMA, about new regulations on x-ray usage in the state of California that will have dire consequences to studios that have x-ray imaging equipment.

TITANIUM DIOXIDE LISTED AS A CARCINOGEN

IARC: Titanium dioxide (IARC Group 2B) Summary of reported data, Feb 2006, up dated, March 10, 2006 & MSDSs of many art and industrial materials.

It's been over a year since the International Agency for Research on Cancer (IARC) updated their standards to include titanium dioxide as a 2B carcinogen, that is, possibly carcinogenic to humans. This IARC determination supports the opinion of the National Institute for Occupational Safety and Health. NIOSH listed TiO₂ as a carcinogen in 1988. As yet, no other major agency or governmental organization has listed it.

The change in IARC's listing came about after the agency reevaluated all of the previous studies, concentrating this time on particle size. Essentially, the differences in the size of the TiO₂ particles used in the experiments explained why some studies showed no lung tumors in animals and others did. There was now enough animal data to support its being a carcinogen when inhaled. And by the same causal mechanisms, IARC says it is a possible human carcinogen.

SKIN CONTACT. The good news is that IARC found no evidence that nanoparticle size TiO₂ will absorb through the skin. Instead, studies of sun screens containing ultra fine TiO₂ on healthy skin of human volunteers revealed that the particles only penetrate into the outermost layers of the skin (stratum corneum). This suggests that healthy skin is an effective barrier to titanium dioxide. There are no studies on penetration of TiO₂ on damaged or diseased skin.

MSDSs. All material safety data sheets (MSDSs) for paints, clays, cosmetics, sun screens, and other products containing TiO₂ should be updated by this time to include this new status and information. The Occupational Safety and Health Administration (OSHA) requires manufacturers to up date their MSDSs within 3 months after they become aware of any significant new data (29 CFR 1910.1200(g)(5)).

COMMENT. TiO₂ is a white pigment found in consumer and art paints, inks, cosmetics, and more. The TiO₂ in these products is not hazardous if it does not get airborne. However, artists should be concerned because the titanium white gessoes are likely to be sanded to create a dust. And clays and glazes containing them always create dust in the studio. Airbrushing or spraying of titanium-containing materials would also be another cause for concern.

The new status also should be the final nail in the coffin for air brushing make-ups. The majority of the ingredients in cosmetics are approved by the Food and Drug Administration only for skin contact. Many are not approved for the skin around the eyes or the lips. And none are approved for inhalation. Now one of these common ingredients is also a possible human carcinogen by inhalation. It's time for the airbrush makeup industry to call it a day.

Health and Safety, continued

California Proposes New Regulations that Will Affect Conservation X-Radiography

The state of California Department of Health Services has proposed major changes to their regulations governing the conduct of Industrial Radiography. A cover letter requesting commentary states that the new regulations would not have a significant fiscal impact on business in California, but also adds that small businesses would be affected. The cover letter, summary of proposed changes and reasons, and texts of the changes may be found on the California Office of Regulations website at <http://www.applications.dhs.ca.gov/regulations>. Search for R-25-03. The period for submitting commentary on the proposal has closed.

In both the current and the proposed new regulations, Industrial Radiography is defined as the examination of internal structures of materials other than humans and animals by non-destructive methods using radiation. X-radiography of paintings and 3-dimensional art objects as performed in museums is classified as Industrial Radiography.

The proposed regulations include highly specific qualifications for the Radiation Safety Programs of "businesses" undertaking all Industrial Radiography. They describe in great detail the requirements for persons performing the x-radiography at all levels of experience. These requirements appear to be based on the assumption that the radiographer works full time. For example, 2000 documented hours (equivalent to fifty 40-hour weeks) of hands-on experience operating x-radiography equipment - not counting film development and interpretation - will be required in order to be a trainer or supervisor of an "assistant" who is learning the process. Such an assistant must be personally supervised at all times.

In order to serve as Radiation Safety Officer, an experienced radiographer would need twice as much (4000 hours) relevant experience. Without a Radiation Safety Officer to oversee a Radiation Safety program, no x-radiography would be permitted. It would be highly unusual for a conservator or conservation scientist to be able to document this many hours of performing x-radiography. The applicability of other professional qualifications and institutional safety records are not considered in the regulations.

The proposed California regulations do not provide any exceptions to these requirements. They appear to be based on similar regulations in force in the state of Texas. However, the Texas regulations do include an exemption for shielded room radiography performed under circumstances that arts institutions could meet in most cases. Several California museums with conservation departments have filed commentaries calling attention to the professional qualifications and training of conservation staff and the excellent safety records of conservation x-radiography in arts institutions. They have urged consideration of inclusion of a similar exemption in the new California regulations.

It should be noted that OSHA has recently conducted a series of stakeholder meetings on occupational exposures to ionizing radiation. The agendas included consideration of the uses of ionizing radiation, controls utilized to minimize exposures, available exposure data, and training. Currently OSHA allows Agreement States to set their own regulations for the use of ionizing radiation in industrial processes as long as these regulations require adherence to certain federal standards.

Thanks to Scott Fife, Senior Safety Officer, The J Paul Getty Trust, for his invaluable help in evaluating the proposed regulations and writing commentary.

Terry Schaeffer

Chris Stavroudis is a conservator in private practice.

WAAC Publications

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