# ACTS FACTS

THE MONTHLY NEWSLETTER FROM

**ARTS, CRAFTS AND THEATER SAFETY (ACTS)**

181 THOMPSON ST., # 23, NEW YORK, NY 10012-2586 PHONE 212/777-0062

**January 2015** **Vol. 29, No. 01**

# ACTS wishes you a healthy, happy 2015.



## NEW YORK IS FIRST STATE TO BAN FRACKING

SOURCE: *NY Times*, Citing Health Risks, Cuomo Bans Fracking in New Yor state, Thomas Kaplan, Dec 17, 2014 http://www.nytimes.com/2014/12/18/nyregion/cuomo-to-ban-fracking-in-new-york-state-citing-health-risks.html?smid=tw-share&_r=1

Let's start the New Year with good news: New York Gov. Andrew M. Cuomo's administration announced that it would ban hydraulic fracturing in the State citing concerns over health risks. The primary source for this decision was th New York State Department of Health's "A Public Health Review of High Volume Hydraulic Fracturing for Shale Gas Development."

**THE REPORT.** Released in December by acting health Commissioner Dr. Howard Zucker, the report is a compilation and evaluation of existing studies of fracking's health and environmental effects. In part, the conclusion states:

> As with most complex human activities in modern societies, absolute scientific certainty regarding the relative contributions of positive and negative impacts of HVHF on public health is unlikely to ever be attained. In this instance, however, the overall weight of the evidence from the cumulative body of information contained in this Public Health Review demonstrates that there are significant uncertainties about the kinds of adverse health outcomes that may be associated with HVHF, the likelihood of the occurrence of adverse health outcomes, and the effectiveness of some of the mitigation measures in reducing or preventing environmental impacts which could adversely affect public health. Until the science provides sufficient information to determine the level of risk to public health from HVHF to all New Yorkers and whether the risks can be adequately managed, DOH recommends that HVHF should not proceed in New York State.

**MAJOR FINDINGS.** The report summarizes its major findings in the following categories:

- Air impacts that could affect respiratory health due to increased levels of particulate matter, diesel exhaust, or volatile organic chemicals.
- Climate change impacts due to methane and other volatile organic chemical releases to the atmosphere.
- Drinking water impacts from underground migration of methane and/or fracking chemicals associated with faulty well construction.
- Surface spills potentially resulting in soil and water contamination.

- Surface-water contamination resulting from inadequate wastewater treatment.
- Earthquakes induced during fracturing.
- Community impacts associated with boom-town economic effects such as increased vehicle traffic, road damage, noise, odor complaints, increased demand for housing and medical care, and stress.

**WATER-QUALITY STUDIES.** The report reviewed studies which have found evidence for underground migration of methane associated with faulty well construction and from surface spills, for inadequate treatment and for disposal of the radioactive wastes that are always associated with such deep shale deposits. An additional Pennsylvania study also "suggests that chemical signals of brine from deep shale formations can potentially be detected in overlying groundwater aquifers."* If salt water has migrated from the fracked oil shale deep in the earth up to shallow aquifers, then it is likely that other components from the shattered shale rock are also free to migrate including gas and crude oil chemicals. Once the rock is fracked (shattered) and the injected sand holds the fissures open, oil and gas may be able to leak in directions other than toward the well. This would mean that fracking creates massive underground gas and oil spills which can migrate to the surface in time.

New York's decision to wait and see is a wise one.

* Warner, N.R., Jackson, R.B., Darrah, T.H., Osborn, S.G., Down, A., Zhao, K., White, A., & Vengosh, A. (2012). Geochemical Evidence for Possible Natural Migration of Marcellus Formation Brine to Shallow Aquifers in Pennsylvania. Proceedings of the National Academy of Sciences (PNAS), 109(30):11961-6.

## IS 2015 THE DEADLINE FOR NEW SAFETY DATA SHEETS & LABELS?

SOURCE: www.RubberNews.com, Miles Moore, December 10, 2014,
http://www.oshatoday.com/?p=5986&post_type=news-digest-item&preview_id=5986&nl=5987

The Occupational Safety and Health Administration (OSHA) set a June 1, 2015 deadline for all suppliers of chemical products to have their new Globally Harmonized System Safety Data Sheets (SDSs) ready to send to users. But like most deadlines, there will be exceptions.

Nine industrial manufacturing associations petitioned OSHA for a stay of the deadline. The author of the petition was the Adhesive and Sealant Council (ASC). Included on the petition were the American Coatings Association, American Composites Manufacturers Association, CropLife America, International Sanitary Supply Association (Worldwide Cleaning Industry Association), National Association of Chemical Distributors, National Association of Manufacturers, Responsible Industry for a Sound Environment and the Society of Chemical Manufacturers and Affiliates.

OSHA rejected the petition's suggestion that OSHA should undertake rulemaking to postpone the SDS and labeling requirements. Instead, OSHA granted the petitioners and exemption from the deadline. That means we can expect to see some old MSDSs and labels on some glues, adhesives, paints and coatings, agricultural products and general chemical supplies.

**REASON FOR EXEMPTION.** The ASC told OSHA Administrator David Michaels that it could be impossible for them to have the new Safety Data Sheets and safety labels ready by the June 1, 2015, deadline because their suppliers may not give them the required information in time to devise the new SDSs and labels. The ASC explained that. "Often this involves a supply chain that is three to five layers deep.

Think about that reason. If the manufacturers can't obtain the required physical and toxicological data from their suppliers and jobbers in a timely fashion, it also means they are now, and probably have been for years, selling products about which they don't know much. No wonder their old MSDSs and labels are so uninformative! They weren't withholding data. They didn't have it!

**GOOD FAITH EFFORT.** OSHA Administrator David Michaels replied in an undated letter that the companies represented by the ASC will not have to fear penalties under the requirements of the Global Harmonization Standard, as long as they can demonstrate good-faith efforts to comply with the GHS. "Our policy allows us to consider barriers to the downstream flow of information that is beyond their control," he wrote. To ensure they aren't assessed penalties, Michaels said, chemical manufacturers and formulators should:

- document all efforts to obtain required information, including all attempts to contact suppliers;
- make reasonable efforts to find suppliers that can provide timely and accurate classifications; and
- make reasonable efforts to find the necessary data themselves.

In his letter to the ASC, Michaels wrote, "OSHA plans to provide guidance to regional and area offices to ensure this policy is uniformly applied to individual situations." In addition, "The agency intends to apply the same approach to distributors that can demonstrate that they have received chemicals labeled under this policy."

Think about that as well. It means that all manufacturers and formulators who can document that they can't get the required information from chemical suppliers do not have to meet the June 1, 2015 deadline. It remains to be seen if some art material manufacturers will take advantage of this option. And ACTS worries that manufacturers will deliberately order raw materials from suppliers who are known not to provide the toxicity data to circumvent requirements for providing accurate SDSs.

## CERAMIC CHEMICAL SPILL PARTIALLY CLOSES SCHOOL

*WMUR News*, Crews Called to Nashua High School for Chemical Spill, December 15, 2014, http://www.wmur.com/news/crews-called-to-nashua-high-school-for-chemical-spill/30239590#ixzz3MArF45pd

Around 11 am on December 15, 2014, a large spill of a white powdered material was found in a bathroom in Nashua North High School in Nashua, NH. The school superintendent shut off the ventilation to keep the fine powder confined to the bathroom area. The Fire Department was called.

The chemical was called Grolleg lump and fire officials decided it was a "silica-based product used on a daily basis in the ceramics classroom." They said it was an irritant to the skin and eyes, but not extremely hazardous to health and everyone exposed was expected to be "OK."

The section of the school where the spill took place was sealed off and students and faculty were moved to other parts of the building. An outside vendor was called in to clean up the area. The incident was not considered "suspicious," but it isn't clear how the substance got into the bathroom.

**COMMENT.** This incident did not require the Fire Department. If proper OSHA-training of the ceramic teacher and custodians had been done, they would have known the product is not a "silica-based" material. The Grolleg lump material safety data sheet indicates it is a much less toxic kaolin clay containing only 0.1 percent free silica. Both kaolin and silica are OSHA-regulated, so a professional crew should clean up the spill. But there was no need to declare it an emergency.

## ACCIDENT CAUSED BY: "TOO MUCH ... LEFT TO BE DONE BY TOO FEW"

SOURCES: https://uk.news.yahoo.com/theatre-fined-managers-fall-140200509.html#7iTMTPU, Press association December 15, 2014 & http://www.theguardian.com/stage/2014/dec/11/stage-manager-compensation-rachael-presdee-soho-theatre, "Stage manager is awarded £3.7m compensation after being left paralysed," *The Guardian*, Caroline Davies, 11 December, 2014

On December 15, 2014, Judge Alistair McCreath fined a charitable (nonprofit) London SoHo theater £20,000 and ordered them to pay £10,000 in costs after admitting their health and safety breaches caused the accident that disabled their Stage Manager, Rachael Presdee. The judge's statement was one theater people around the world can relate to when he said: "As to culpability, it is plain that, in general terms, too much was left to be done by too few."

The fine and costs were on top of the £3.7 million out-of-court compensation settlement, one of the biggest in UK entertainment history. The Equity union funded the legal case for compensation.

**THE ACCIDENT.** On June 9, 2012, Miss Presdee was working on a production of *Boys* for the Headlong theatre company. She arrived at the theater to find the lights off and the auditorium dark. She climbed a spiral staircase looking for a light switch when she found an unmarked and unlocked door. Hidden behind it was a balcony used in *Romeo And Juliet*. She opened the door and plummeted 10 feet (3 meters) to the stage below, suffering spinal injuries that have left her paraplegic.

The balcony and door once had a lock and bar across it to protect people from falling through it, but these had been removed. The door had been identified as a potential safety risk a month earlier, but had not been marked or secured.

**COMMENT.** I have found fall hazards in almost every theater I have inspected. Included are unguarded orchestra and stage pits, back stage elevators, unrailed or improperly railed catwalks, loading docks with the gates up and sets with unguarded platforms. It costs so little to set up proper precautions such as drop-in rails, barriers, signage, good lighting of the area and more. It is no longer enough to put a ghost light in a lowered orchestra pit, turn out the lights and go home. Unforseen access to the theater can occur for so many reasons in a busy season.

But Miss Presdee herself said it best. "The impact of my injury can be seen by the level of compensation required to cover the costs of carers for me, future needs including specially adapted home and equipment, and loss of a lifetime's earning. I ... take this opportunity to urge all theatre operators to please ensure that safety risks, no matter how seemingly big or small, are properly managed so that no other theatre worker has their life so catastrophically altered by something which could have been so easily prevented by simple, cheap and obvious steps."

*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



**CREDIT:** *ACTS FACTS*,
Monona Rossol, Editor
181 Thompson St., #23
New York, NY 10012 - 212-777-0062
ACTSNYC@cs.com - www.artscraftstheatersafety.org


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**February 2015** **Vol. 29, No. 02**

## ANOTHER "ON LOCATION" DEATH ON A RAILROAD TRACK

*Deadline Hollywood*, by David Robb, January 19, 2015, http://deadline.com/2015/01/greg-plitt-death-railroad-stolen-shot-fatality-1201353483/; *AP Wire Service*, by Tami Abdollah, January 20, 2015, http://news.yahoo.com/police-fitness-model-killed-train-running-tracks-233801083.html; *Los Angeles Daily News*,by Brenda Gazzar, http://www.dailynews.com/arts-and-entertainment/20150118/calvin-klein-model-bravo-star-fitness-expert-greg-plitt-killed-by-metrolink-train-in-burbank & *The Wrap*, by Anita Bennet, January 21, 2015 http://news.yahoo.com/claim-bravo-star-greg-plitt-death-crew-unaware-005021202.html.

**IT HAPPENED AGAIN:** A person was killed on a railroad track during filming. This time it was Calvin Klein model and fitness expert Greg Plitt. The train that killed him was the Metrolink in Burbank. The production reportedly was a commercial video to promote a health drink. Plitt and two other people were in the film crew. Videos of the accident reportedly show that Plitt stepped onto the track as the train approached and appeared to be trying to outrun it. Fortunately, Plitt's two companions and none of the approximately 180 people on the rapidly-stopped train were injured.

Like the *Midnight Rider* movie production in Georgia during which camerawoman Sarah Jones was killed, Plitt did not have permission to shoot on the tracks. It is becoming clear that stealing shots on railroad tracks is a common industry practice. "Reliable reports of shot-stealing have become quite numerous," according to Arthur J. Miller, the System Director of Safety and Regulatory Compliance for the Western Group, a consortium of Western railroad companies. Miller says some of the trespass "is spur-of-the-moment," but that "there are a substantial number of instances where the trespass is premeditated and planned."

Miller also says that "Since the Sarah Jones tragedy, the number of reports I've personally received about film crews straying onto railroad properties has roughly quadrupled. This is a particular problem with small- and micro-budget projects."

Filming on an active track requires negotiating with railroad officials, getting a permit and arranging to have a railroad company official present during the shoot to implement track safety protocol. "Railroad filming is quite expensive," Miller said. "Sometimes it can be cost-prohibitive."

**COMMENT.** The reason shooting on active railroad tracks is expensive is it is dangerous. If there are no railroad officials present or if the producers cannot provide a copy of their permit, it is not safe to continue the shoot. It is not acceptable for small producers to risk their own and the lives of others just because they can't afford to do it safely.

## GRAPHIC ART INK COMPANY FIRE INVESTIGATION COMPLETE

http://www.csb.gov/assets/1/19/US_Ink_Case_Study_Draft__Board_Vote_Final_RevI.pdf & CSB Names Poor Design and Failure to Test Dust Collection System Among Causes of U.S. Ink, http://www.csb.gov/csb-names-poor-design-and-failure-to-test-dust-collection-system-among-causes-of-us-ink-new-jersey-flash-fire-that-burned-seven-workers-in-2012-osha-again-urged-to-issue-new-combustible-dust-regulations-/

The U.S. Chemical Safety Board (CSB) has finished the investigation of the 2012 flash fire that burned seven workers, one seriously, at the US Ink company plant in East Rutherford, NJ. It was

determined that the fire resulted from the accumulation of combustible dust inside dust collection system that was so poorly designed that it only took one day to accumulate enough combustible dust and hydrocarbons in the duct work to ignite.

**INK INGREDIENTS.** The accident was at US Ink, a subsidiary of Sun Chemical, a global graphic arts corporation which has some 9,000 employees worldwide. US Ink manufactures black and color-based inks primarily for the print media industry. A key step in the ink production process is mixing fine particulate solids, such as pigments and binders, with liquid oils in agitated tanks. In the report is the list of ingredients of the typical black ink they were manufacturing at the time:

- Petroleum napthenic distillate13 (product name: Raffene® 750K oil)
- An alternative petroleum distillate (product name: mineral seal oil)
- Natural asphalt resin particulate (product name: Gilsonite14) [aka asphaltum]
- Carbon black particulate pigment (product name: Printex 31015)
- Bentonite (aluminum silicate clay) particulate (product name: Bentone 34)
- An alternative aluminum silicate clay (product name: kaolin)
- Tall oil fatty acid, a minor ingredient (additive)

**COMBUSTIBLE OILS.** The first two ingredients are oils with flash points of 360 and 275 degrees Fahrenheit respectively. This means they are not flammable liquids. Instead, the are listed in the National Fire Protection Association's standard (NFPA 30) as Class 111B combustible liquids. This means they are only volatile at the high temperatures achieved during manufacture of the ink. In some cases, US Ink substitutes linseed oil for these oils, but not at the time of the fire.

**COMBUSTIBLE DUSTS.** The bentonite is incapable of burning. But both the carbon black and the asphalt resin (asphaltum) can ignite and explode or burn when suspended in air. Combustible dusts are implicated in many industrial fires. The CSB has called repeatedly for OSHA to set a combustible dust standard and says this investigation is further evidence that a standard is needed.

**INADEQUATE TRAINING & EMERGENCY PLAN.** Investigators found that workers did not follow the training they received in emergency response situations because US Ink had not developed and implemented an effective hazard communication and response plan. A fire coordinator was designated to announce a fire on the PA system and pull the alarm box. But he was among the injured and could not perform his duties and there was no back up plan.

**FAILURE TO LEARN FROM PREVIOUS FIRE.** Four years before the 2012 fire, there was a similar incident at the facility in an ink mixing tank containing about 80 percent oil and 20 percent carbon black. According to the East Rutherford Bureau of Fire Safety, the fire occurred because the ingredients in the mixing tank were overheated. The official report said that the ductwork at the top of the tank was consumed by the flames generated during the fire. An employee initially attempted to suppress the fire with a fire extinguisher but, after failing to do so, exited the building and notified the East Rutherford Fire Department.

US Ink did not address any lessons learned from this incident. It did not install temperature indicators and temperature interlocks that would activate when the temperature became too high. It also did not discourage employees from trying to extinguish fires in a work environment in which

there were flammable vapors and combustible dusts. In fact, it was the workers attempts to control the 2012 fire with extinguishers and their remaining in the area even after the first flash fire was seen that led to seven workers being injured when the second flash fire in the equipment occurred.

**LESSONS FOR ART SCHOOLS & PROFESSIONAL STUDIOS.**

**1. AWARENESS.** All artists and teachers must be aware that combustible dust suspended in air can burn or explode under the right conditions. This can include rosin or asphaltum dust in aquatint boxes, wood dusts in cyclone or bag collectors and metal dusts or pigments in containers. Highly flammable metal dusts like aluminum or magnesium are so reactive that they are not appropriate for schools or studios without special training, explosion-proof equipment and an isolated work area.

**2. PROPER SYSTEM DESIGN.** All process ventilation systems must be designed by engineers experienced in the standards of the American Conference of Governmental Industrial Hygienists (ACGIH) *Industrial Ventilation: A Manual of Recommended Practice*. For example, the CSB found that US Ink's flawed system was designed to transport the dusts and volatiles through the ducts at velocities estimated at 1,150 feet/minute. But the ACGIH manual recommends such oily dusts be transported at 4,500 feet/minute. This rapid movement is needed to meet fire standards such as NFPA 91-2010 which says, "All ductwork shall be sized to provide the air volume and air velocity necessary to keep the duct interior clean and free of residual material."

**3. FOLLOW OSHA RULES.** Set up OSHA hazard communication programs and emergency response procedures tailored to the actual chemical products and equipment used in each studio. Schools should develop and institute these programs with the help of safety professionals, refresh training annually and hold drills. Artists working alone should collect the Safety Data Sheets on all materials used in the studio, learn how to read them and understand their hazards, and have a plan for evaluation and fire response based on those materials and the equipment in the studio.

**4. INVESTIGATE ALL ACCIDENTS**. Investigate accidents and near misses in depth to learn precisely what weaknesses in your safety program the incidents are revealing. Art schools need a professional to do the investigation and evaluation.

## ARSENIC IN CERIUM GLASS-POLISHING COMPOUND

Personal correspondence

People often send me very interesting laboratory tests. Usually I'm not at liberty to write about this data. However, in this case, I have permission as long as I identify the source as a county-level hazardous waste management program and that the data is a certified laboratory analysis of a sample of unused cerium polishing compound obtained from a technical school in a West Coast State.

The data is an acid digestion analysis of unused cerium polishing compound. This is a common product used to polish blown glass and some types of jewelry. The analysis shows there are many small amounts of toxic metals contaminating this mineral product. Of these, Table 1 below lists six metals found in the sample in concentrations of concern. The first four metals are regulated under the Resource Conservation and Recovery Act. RCRA regulates metals that are especially damaging to the environment. But all these metals can also be toxic to people using the cerium.

Table 2 lists the levels at which these metals are regulated under RCRA in waste. But these levels are not directly related to the analytical levels because the tests for determining the amounts of these

metals in waste are different than the acid digestion. This test is called the Toxic Characteristic Leaching Procedure (TCLP). This test uses a less concentrated buffered acid to leach the metals (dissolve them out) of the cerium over a period many hours to simulate landfill conditions.

TABLE 1

| **Metal** | **Amounts in micrograms/gram (ug/g) = parts per million (ppm)** |
|---|---|
| Arsenic | 2410. |
| Barium | 144. |
| Chromium | 258. |
| Mercury | 44.9 |
| Antimony | 28.0 |
| Vanadium | 84.8 |

TABLE 2

| **TLCP** | **Regulatory level in ppm = milligrams/liter (mg/L)** |
|---|---|
| Arsenic | 5.0 |
| Barium | 100. |
| Chromium | 5.0 |
| Mercury | 0.2 |
| Antimony | not RCRA regulated |
| Vanadium | not RCRA regulated |

The TCLP test is relevant because this fine powder polishing compound is destined to become part of the wet grinding waste in the shop. The solubility of the arsenic in this form is unknown, but the high level (2410 ppm) makes it highly likely that the 5 ppm regulatory level would be exceeded. The other metals also may exceed RCRA or local regulatory levels in waste or in waste water discharges.

Students and teachers may also be at risk of exposure by inhalation because the powdered cerium and the water used with it also gets airborne as a mist during polishing. The OSHA Inorganic Arsenic Standard may apply to the school. The OSHA action limit for airborne inorganic arsenic is 5 micrograms/cubic meter averaged over 8 hours. Since there are 2410 micrograms of arsenic in each gram of this material, it is conceivable that this 5 microgram level could be exceeded. Personal monitoring may be required for people doing polishing, area clean up and custodial floor cleaning.

**COMMENT.** This analysis demonstrates that we need detailed product ingredient information if we are to comply with EPA and OSHA regulations. The supplier's Safety Data Sheets rarely provide this level of detail. Yet, if the school is cited or charged extra money for waste disposal due to the presence of arsenic in their waste, the supplier is not affected. Perhaps schools and artists need to demand better information or even pay for analysis of products that end up in our waste or studio air.

In addition, if teachers and students were aware that many of the mineral products they use are likely to contain toxic contaminants, they might be more willing to follow precautions and hygiene.

ACTS' financial support is primarily earned income from industrial hygiene services, lectures and courses provided at below market value to schools, art and theater organizations, museums and other art-related entities. Other income is from sale of publications and unsolicited donations. ACTS takes no money from industry or any party having a financial interest in our opinions about art or theater products.



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Monona Rossol, Editor
181 Thompson St., #23
New York, NY 10012 - 212-777-0062
ACTSNYC@cs.com - www.artscraftstheatersafety.org


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## $10.5M JURY AWARD TO FAMILY OF CERAMIC TALC VICTIM

$10.5M jury award in Schenectady called record, *The Timesunion.com*, Robert Gavin, 2-11-2015, http://www.timesunion.com/news/article/Lawyer-10-5M-jury-award-a-record-6075841.php; http://www.kten.com/story/28084967/upstate-ny-asbestos-lawyers-win-historic-verdict-against-talc-company and http://www.levylaw.com/asbestos-lawyers.php

On February 10, 2015, jurors in a New York state Supreme Court awarded Richard Chisholm's family more than $10.5 million after concluding that Richard's death from cancer was a result of exposure to asbestos from talc that was mined and sold by R.T. Vanderbilt Inc. The jury's award is the largest jury verdict in the history of asbestos litigation in upstate New York.

Chisholm, an engineer living in Indiana, was diagnosed in 2010 with mesothelioma. a cancer linked to asbestos exposure. As a teen in the late 1970s, Chisholm worked during summer vacations from high school for Maxfield Ceramics in Cincinnati. The Maxfield factory used Vanderbilt talc in making their ceramic products and supplies. Chisholm died in 2012. He was 52 years old and left behind a wife and three children.

Levy Konigsberg LLP, a law firm based in New York City, appeared for the Chisholm estate. The attorneys successfully argued that tests by Vanderbilt showed its talc was "contaminated with substantial amounts of asbestos fibers" even before Chisholm started working for Maxfield Ceramics. Levy Konigsberg is the same firm that represented Peter Hirsh in the first successful asbestos suit against Vanderbilt in 2006. Hirsh was a potter who had used Vanderbilt talc.

**COMMENT.** Just when it seemed there wouldn't be another jury verdict because the ceramic- and art-related cases were all being settled, this one was reported in the legal news. Old-time potters also may remember Maxfield Ceramics, the factory where the talc was used. Maxfield went out of business in 2006, but Homegrown Creations in Blanchester, OH, purchased the formula for Maxfield Ceramic Casting Slip. It is on the market today. Hopefully, it was not made with Vanderbilt talc.

## TECH DIRECTOR KILLED WHEN LIFT TOPPLES

*Live 5 WCSC* TV, PAC: Technical director died in fall, OSHA investigating, Jan 28, 2015, Updated: Jan 29, 2015, http://www.oshatoday.com/?p=6490&post_type=news-digest-item&preview_id=6490&nl=6496 and http://www.abcnews4.com/story/27968357/employee-in-accident-at-performing-arts-center-say-leaders

According to a North Charleston Police incident report, David Swain, Technical Director of the Performing Arts Center (PAC) in Charleston, was captured on video surveillance at around 4:19 p.m. on January 25, 2015, moving a hydraulic lift by hand from the loading dock towards the stage. Officials said Swain was found laying on the stage near the basket of the toppled mechanical lift just after 5 p.m. He reportedly had a severe head injury and was unresponsive. PAC officials say Swain fell from a height of thirty to forty feet. He was pronounced dead by the Charleston County Coroner's Office.

David Swain was 54 years old and had worked for the PAC since it opened in 1999. News reports carried comments by friends and colleagues expressing their shock and sadness. Dave Holscher, North Charleston Coliseum and Performing Arts Center General Manager said, "Our thoughts and prayers go out to David's family, friends and co-workers."

Officials say the Occupational Safety and Health Administration (OSHA) was notified that night, inspectors were on-site the next day and are currently investigating the accident. An OSHA investigation generally takes six to eight weeks, according to Lesia Kudelka with the South Carolina Department of Labor, Communications Office. S.C. OSHA will look for any violations that may have in any way contributed to the incident, Kudelka said.

**COMMENT:** While the OSHA investigation is not complete, two issues seem obvious. First, this TD was working alone at a height, a seriously flawed practice. Second, it is very unlikely that the lift could topple if the outriggers were in place as they are required to be. The OSHA investigators probably will review written safety programs, training records and the enforcement policies of the PAC to see why this long-time employee would even consider working this way.

## OSHA CHANGES RECORDKEEPING RULE

SOURCES: www.osha.gov & OSHA Region II Labor Liaison, Laura Kenny

**SEVERE INJURY REPORTING.** OSHA has updated their recordkeeping rule. The new rule expands the list of severe work-related injuries that all covered employers must report to OSHA. As of January 1, 2015, employers must report:

- All work-related fatalities within 8 hours
- All work-related inpatient hospitalizations, amputations and losses of an eye within 24 hours

Employers can report to OSHA in one of three ways:

- Calling OSHA's free and confidential number at 1-800-321-OSHA (6742)
- Calling your closest OSHA Area Office during normal business hours
- By electronic submission using the reporting application located on OSHA's public Web site at www.osha.gov (Be sure your Adobe Reader is the latest version.)

**UPDATED RECORDKEEPING EXEMPTION LIST.** While all employers with more than 10 employees will need to keep track of accidents and illnesses as required for workers' compensation, some industries must provide this information in the form of OSHA 300 forms directly to OSHA. These are "high risk" industries such as construction, nursing and residential care facilities, primary metal industries (e.g., foundry and welding), chemical manufacturing and the like.

The new list of exemptions includes a few industries in which the arts are created and/or taught. These are defined by their North American Industry Classification System (NAICS) numbers as:

- 5121 Motion Picture and Video Industries
- 6112 Junior Colleges
- 6113 Colleges, Universities and Professional Schools
- 6115 Technical and Trade Schools
- 6116 other Schools and Instruction

For more information, see the following link: http://www.osha.gov/recordkeeping2014/index.html.

**COMMENT:** ACTS would like to see more collection of accident data from schools. However, we understand that most schools are not high hazard workplaces except for those teaching crafts such as foundry, welding, ceramics or projects using significant amounts of hazardous chemicals.

But ACTS does object to the recordkeeping exclusion for all 5121 NAICS code motion picture and video industries. Under 5121, there are four major classifications with sub classes:

- **51211 - Motion picture and video production**
  512110 - Motion picture and video production
- **51212 - Motion picture and video distribution**
  512120 - Motion picture and video distribution
- **51213 - Motion picture and video exhibition**
  512131 - Motion picture theaters (except drive-ins)
  512132 - Drive-in motion picture theaters
- **51219 - Postproduction services and other motion picture and video industries**
  512191 - Teleproduction and other postproduction services
  512199 - Other motion picture and video industries

While the distribution, exhibition and postproduction services are not particularly hazardous, the production of motion pictures and videos (512110) commonly involves construction sites with hazardous cranes, lifts, on-site welding, painting and woodworking. These construction activities may occur in inherently hazardous indoor locations (e.g., abandoned buildings and armories) and outdoor locations (city streets, railroad tracks, rough rural terrain). The activities at these locations may include stunts, car chases, pyrotechnic explosions and more. ACTS FACTS routinely covers stories of accidents and deaths from these conditions in the entertainment business.

It is also interesting that Canada does not exempt this industry from accident data collection.

## SCIENCE FAIR PROJECT SENDS 21 STUDENTS TO HOSPITAL

SOURCE: 21 Students Hospitalized After Science Experiment Mishap...., by Ewa Kern-Jedrychowska & Aidan Gardiner on February 5, 2015, http://www.dnainfo.com/new-york/20150205/richmond-hill/20-hospitalized-when-chemical-spills-catholic-school-fdny-says

Nearly two dozen children were taken to the hospital for evaluation after a science room filled with a choking substance. It was science fair week at Holy Child Jesus Catholic Academy in Queens when one of the kids' projects went awry.

The Fire Department of New York (FDNY) responded to the scene. Only the science room was evacuated. Officials say 21 students were taken to local hospitals to be evaluated. The victims suffered injuries ranging from breathing difficulties to eye irritation. All were treated and released.

Parents and students said that the incident occurred when the sixth grade students were working on a science project and one of them mixed hydrochloric acid and aluminum. Theoretically, this reaction should only create a white substance called aluminum chloride and odorless hydrogen gas:

$2Al + 6HCL \longrightarrow 2AlCl_3 + 3H_2$

But in the real world, that's not what happens. If you watch the reaction between aluminum foil and hydrochloric acid on the Internet, you will see a rapidly bubbling reaction that creates visible smoky whitish fumes above the container and a dark gray foaming mass in the container. What are these?

- The cloud contains the hydrogen generated by the main reaction plus fumed white aluminum chloride particles and unreacted hydrogen chloride acid gas driven off by the heat. Hydrogen chloride and aluminum chloride fumes are probably the irritants that affected the children.

• The foam, theoretically, should be white since aluminum chloride is white. But aluminum foil is only around 99% pure. The other one percent of the foil is usually metals, some of which make darker chlorides and/or oxides such as copper, zinc, iron, nickel, manganese and chromium.

In fact, one of the safety data sheets I found on aluminum ingot marketed for use in food industry foil had the following statement in the regulatory section:

> This product contains trace amounts of lead (Pb) (< 0.01 %). Any process resulting exposure to more than 0.5 mg/m3 of metal dust per day may result in a daily dose of lead of over 0.5 μ g/day, the dose above which the "California Safe Drinking Water and Toxic Enforcement Act" of 1986 requires notification. Refer to the appropriate regulation notification wording guidelines. The dose [in the aluminum] is not considered dangerous for health according to current toxicology studies.

Who knew? But if you are a teacher who allows children access to chemicals, you had better know.

## SAWSTOP INTRODUCES NEW JOBSITE SAW

www.sawstop.com

SawStop, LLC, the world leader in table saw safety, announced the introduction of a new saw: the SawStop Jobsite Saw. This saw is the lightest (108 pounds), most portable and most affordable SawStop and incorporates many features never before seen on portable table saws. Included are the One Turn Elevation (other saws require over 25 turns) and the T-style fence with ErgoLock for easy operation, firm lockdown and improved accuracy.

Just like other SawStop saws, the Jobsite Saw detects contact with skin on the blade and stops and drops the blade in less than five milliseconds. Injuries are dramatically minimized and saw reset takes just a few minutes with a new blade and a new cartridge ($69).

**COMMENT.** When I propose the use of SawStop products, I often get objections from old timers. Recently, one man complained that he can't cut sheet aluminum on a SawStop because it would set off the safety mechanism. Actually this is untrue. The safety feature can be bypassed if necessary. But more importantly, any process that creates sparks, hot metal particles or metallic dusts must not be done anywhere near the dust created in a wood shop. And collection of metal dusts and particles in the same collector in which wood dust is collected creates a fire and explosion hazard.

*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



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ACTSNYC@cs.com - www.artscraftstheatersafety.org


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# ACTS FACTS

THE MONTHLY NEWSLETTER FROM

**ARTS, CRAFTS AND THEATER SAFETY (ACTS)**

181 THOMPSON ST., # 23, NEW YORK, NY 10012-2586 PHONE 212/777-0062

**April 2015** **Vol. 29, No. 04**

## FLUORINATED COMPOUNDS FOUND IN FIREFIGHTERS' BLOOD

SOURCES: *C&EN*, Feb 23, 2015, p. 36 and Novel Fluorinated Surfactants Tentatively Identified in Firefighters Using Liquid Chromatography Quadrupole Time-of-Flight Tandem Mass Spectrometry and a Case-Control Approach, Anna Rotander, et al., *Environ. Sci. Technol.*, 2015, 49 (4), pp 2434–2442

Perfluorinated compounds, such as perfluorooctane sulfonate (PFOS), help firefighting foams rapidly flow over flaming liquids, cooling and quenching fires. Despite environmental and health concerns about these known toxic and persistent class of chemicals, researchers don't know the identity of many of the specific fluorochemicals in the foams on the market. A new study in *Environmental Science and Technology* (see sources above) reports a technique to identify some previously unreported fluorochemicals in foams, using blood samples from firefighters.

María José Gomez Ramos, of the University of Queensland, Australia and colleagues compared blood samples from 20 firefighters with those from 20 students and office workers who had not been exposed to firefighting foams. They analyzed the samples with a special method called quadrupole time-of-flight tandem mass spectrometry (QTOF–MS/MS) and an advanced statistical method which enabled them to extract and identify known and unknown fluorinated chemicals in human serum.

The team identified more than 3,000 organic and fluorinated chemicals in the blood samples. A statistical analysis revealed nine fluorinated compounds occurring either exclusively, or at significantly higher levels, in the firefighters' blood. Four had not been reported previously. These were tentatively identified as previously unknown sulfonic acids analogous to PFOS which almost surely were from the fire retardant foam products.

The paper's abstract concludes that "[t]he application of this strategy has allowed for identification of previously unreported fluorinated chemicals in a timely and cost-efficient way." In further studies, Gomez Romos hopes to study the compounds further to determine their toxicities and persistence in the environment.

**COMMENT.** Do you see what I see in this article? Let's look at some of the statements.

1. "More than 3,000 organic and fluorinated chemicals" were in those blood samples. And we worry about a handful of chemicals like BPA and a couple of phthalates?

2. The study identified "previously unreported fluorinated chemicals." This translates to mean chemicals which the manufacturer did not report as being in the fire retardant products. Do we really have to analyze firefighters' blood to identify trade secret chemicals?

3. The study says the method of analysis was shown to identify the chemicals in a "timely" way. How "timely" is it to find them after they have already been absorbed by people?

4. The author's plan to study the new chemicals' "toxicity and persistence in the environment" means that the manufacturer doesn't provide, or may not even know, how toxic or damaging to the environment they are. Should this research be done by and paid for by a university? What about requiring manufacturers to pay for such studies and do it *before* they use the chemicals?

## BURNING PALLETS SICKEN 15 PEOPLE

SOURCE: Burning pallets make people sick in warren county, *69 News*, March 23, 2015; http://www.wfmz.com/news/news-regional-newjersey/burning-pallets-make-people-sick-in-warren-county/31969326 and *ACTS FACTS*, March 2010

On March 23, 2015, about 15 people complaining of respiratory issues were checked out medically after breathing smoke from burning fork lift pallets. The pallets were at the Warren County communications center in Pennsylvania. The report on the Chanel 69 local news noted that the pallets may have been impregnated with some unidentified chemical that caused the irritation.

**CHEMICALS IN PALLET WOOD.** The last time *ACTS FACTS* covered this issue was in March of 2010. It is time to remind artists and crafts people that pallet wood should not be used for creative projects or for any purpose that involves burning.

Commercial pallet manufacturers often treat the wood with fungicides. The fungicide called 2,4,6-tribromophenol from pallets was revealed after cartons of Tylenol were stored on such pallets and absorbed so much of this fungicide that consumers noticed they could taste it. The Tylenol stored there was recalled in 2010.

Other common additives to pallet wood are pesticides such as propiconazole and various pyrethrins. In addition, imported palletized goods are routinely fumigated with highly toxic pesticides such as ethylene oxide and methyl bromide. And harmful materials or chemicals stored or moved on pallets also may spill on the pallet wood and be absorbed.

Items made from pallet wood certainly may be durable and weather resistant due to the chemical treatments. However, close contact with pallet wood or inhalation of dusts from sanding or sawing will expose crafters to the wood's treatment chemicals and absorbed chemicals from spills. Using pallet wood crafts and furniture can contaminate indoor air. Burning pallet wood would release decomposition products of these chemicals. For these reasons, discarded wooden pallets should not be used for firewood or crafts.

## NITRIC ACID: DON'T MIX IT WITH *ANYTHING*!

*C&EN*, The Safety Zone, February 26, 2015, http://cenblog.org/the-safety-zone/2015/02/waste-explosion-at-texas-tech/

On Feb. 2, in a Texas Tech University teaching laboratory, a student tried to open a glass waste bottle. It exploded injuring three undergraduate students and a graduate teaching assistant. TTU has now posted its investigation results online (see web site above). The explosion occurred because there were some solvents (methanol and dimethylglyocime) in the bottle. However, an explosion could result from mixing nitric acid with any organic solvent and even with some other acids.

The accident is reminder that nitric acid used as a metal etchant in printmaking labs, jewelry departments or in any art studio or classroom must be stored all by itself. It doesn't belong in the flammable storage cabinet or even in an acid cabinet with other acids. Justrite and other cabinet manufacturers have small counter top cabinets that can be used to store a bottle or two of nitric. Even better, get rid of the stuff altogether. There are so many other safer metal etchants.

## WHY "HYPOALLERGENIC" ISN'T A THING (VIDEO)

SOURCE: http://www.acs.org/content/acs/en/pressroom/newsreleases/2015/march/why-hypoallergenic-isnt-a-thing-video.html

The American Chemical Society (ACS) has a "Speaking of Chemistry" video narrated by Sophia Cai explaining why the term "hypoallergenic," by the Food and Drug Administration's own published definition, can mean whatever manufacturers want it to mean. The video is viewable at:

http://youtu.be/lXh8bnqMOZs</a>

The narrator notes that last year, a study of 187 children's personal care products labeled "hypoallergenic," "dermatologist recommended or tested" or "paraben-free" found that 89 percent of the products contained at least one substance known to cause allergy. Eleven percent of the products contained five or more known allergens. And another eleven percent contained a known powerful allergen called methylisothiazolinone

**HYPOALLERGENIC HISTORY.** The video doesn't provide details of how we got to this sad state. It started in 1974 when regulations for the term "hypoallergenic" were first issued by the US Food and Drug Administration. The FDA proposed to permit a cosmetic or skin care product to be labeled "hypoallergenic" only if scientific studies on human subjects showed that it caused a significantly lower rate of adverse skin reactions than similar products. The manufacturers of cosmetics claiming to be "hypoallergenic" were to be responsible for carrying out the required tests.

A number of cosmetic manufacturers complained about the requirement for product comparison tests because these tests would pose an undue economic burden on them. The FDA issued its final regulation on "hypoallergenic" on June 6, 1975 and, in response to the manufacturers' concerns, changed the comparative tests and procedures in ways that would reduce the costs to the manufacturers. This was not enough for Almay and Clinique. They challenged the new regulation in the U.S. District Court for the District of Columbia. The two firms charged that the FDA had no authority to issue the regulation, but the court upheld the FDA.

Almay and Clinique then appealed to the U.S. Court of Appeals for the District of Columbia, which ruled that the regulation was invalid. The appeals court held that the FDA's definition of the term "hypoallergenic" was unreasonable because the Agency had not demonstrated that consumers perceive the term "hypoallergenic" in the way described in the regulation.

As a result, manufacturers may continue to label and advertise their cosmetics as "hypoallergenic" without any supporting evidence. The only thing the FDA could do was to issue unenforceable guidelines that say manufacturers should actually test cosmetics to determine if they will cause allergies in significant numbers of people, but they are not required to do so.

It would be wise for consumers not to put any faith in the "hypoallergenic" label along with similar labels like "safe for sensitive skin" or "allergy tested." If the manufacturers did test these products, what were the protocols? And just *who* did they test them on? It certainly wasn't you.

**PERSONAL NOTE:** The video does not point out that there is one rule that applies to the term"hypoallergenic." It is found in FDA regulation 21 CFR 801.437(h) which states, "Devices that contain natural rubber that contacts humans... shall not contain the term 'hypoallergenic' on their labeling." This rule applies to "devices: such as rubber gloves, tubing and other medical items.

Since cosmetics are not devices, theoretically, cosmetic manufacturers could put natural rubber in cosmetics. Do you think that just couldn't happen? Some types of eyelash adhesives and special effects makeup adhesives and mold compounds used to, and some still might, contain natural rubber. I personally became allergic to natural rubber from these products.

## ACTS NEEDS HELP DETERMINING HAZARDS OF DIBOND DUST

Editorial

I've tried contacting the manufacturer of DiBond and a manufacturer of dust collection systems, Oneida. I've gotten no response from either. Here's the problem.

DiBond is manufactured by 3A Composites of GmbH in Singen, Germany. It is described in GmbH's Safety Data Sheet as a "composite panel consist[ing] of two Aluminum-coversheets and a polyethylen[e] middle layer."

Dibond is a popular product that is commonly cut and shaped by a variety of CNC routers and table saws. These machines are usually connected to wood dust collection systems whose operators manuals' warn against inclusion of metal dusts in the collector. Aluminum dust is a fire and explosion hazard and is reactive with water, making extinguishing of aluminum fires complicated.

The DIBOND Fabrication Manual obtained from a US Kentucky distributor discusses methods of cutting and shaping DiBond on table saws and routers. But not a word could be found in the manual about dust collection. The MSDS that is part of this manual has two environmental notes which say:

> 2. These products are not considered to be a health hazard in the form in which they are sold (sheet, panel). However, if these products are abraded, melted, welded, cut or processed in any manner that causes release of fumes or dusts, hazardous levels of fumes or dust may be generated from these materials or constituents of these materials. Dust from these materials is regulated as particulate, N.O.S.[not otherwise regulated]
>
> 3. [Text the same as above except for the last sentence which is:] Aluminum fumes or dust are subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

**Can anyone out there point me to any research on the potential hazards of collecting dust from this aluminum-polyethylene product in standard wood dust collection systems?**

*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



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**May 2015** **Vol. 29, No. 05**

## EPA WHISTLEBLOWER WINS DECISIVE VICTORY

SOURCES: PEER press release: http://www.peer.org/news/news-releases/2015/04/21/egregious-epa-misconduct-delivers-whistleblower-win/; EPA Whistle-Blower Victory, Bloomberg BNA, April 24, 2015 and 4/15/15 - Decision in Cate Jenkins v. EPA, Office of Administrative Law Judges, Dept. of Labor website: http://www.oalj.dol.gov/Decisions/ALJ/CAA/2011/JENKINS_CATE_PHD_v_US_ENVIRONMENTAL_PRO_2011CAA00003_(APR_15_2015)_141513_CADEC_SD.PDF

On April 24, 2015, an Administrative Law Judge (ALJ) ruled that the Environmental Protection Agency illegally attempted to fire one of their scientists, Cate Jenkins, who has been employed by the agency for over 35 years. The judge ruled that the EPA's dismissal of Jenkins was in retaliation for filing disclosures and allegations that EPA did improper testing and covered up evidence of the toxicity of the dust created by the collapse of the World Trade Center on 9/11. Starting almost immediately after the 2001 disaster, Jenkins began filing these complaints as it is her right to do.

In 2010, EPA sought to fire Jenkins for allegedly making a death threat against a supervisor, Robert Dellinger, director of EPA's Material Recovery and Waste Management Division. When she and her several attorneys attempted to contest these charges, they alleged that the EPA did not comply with their requests for documents and evidence to prove their case.

On April 15, 2015 ALJ Linda S. Chapman ruled that the EPA did indeed engage in a deliberate effort to withhold 900-plus documents, such as e-mails, that should have been turned over to the scientist and her attorneys as they contested the dismissal.

"The scope of the Respondent's [EPA] failure to provide the Complainant with the discovery to which she was entitled is breathtaking, to put it mildly," the judge wrote. And she continued, "I have no doubt that Respondent's repeated failures to fully respond to the Complainant's discovery requests, and to comply with my discovery orders, were deliberate and willful."

Judge Chapman's ruling becomes final if EPA does not appeal it to the U.S. Secretary of Labor's Administrative Review Board, but the ruling makes it extremely unlikely for the agency to prevail. This would leave Jenkins more time to continue pursuing her efforts to tighten the corrosive dust standards through litigation. Her purpose is to insure that the tragedy of the dust-exposed 9/11 First Responders never happens again.

Oh, and judge Chapman also found that no death threat was made. A wise concludion since Mr. Dellinger is over 6 feet tall while Jenkins is a petite 5 feet 4 inches tall and physically weak due to a childhood battle with polio.

**COMMENT:** Once in while, the little guy wins one. And Cate Jenkins continues to fight for a dust standard that will protect us all.

# ALOE JUICE & GOLDENSEAL LISTED AS CARCINOGENS

SOURCES: Proposition 65 Notice of Intent to List Chemicals by the Labor Code Mechanism: Aloe Vera, Whole Leaf Extract and Goldenseal Root Powder [04/23/15]

The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) intends to list Aloe vera, whole leaf extract and Goldenseal root powder as known to the state to cause cancer under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). They cite the International Agency for Research on Cancer (IARC) decision to list these two substances as Group 2B carcinogens in 2013 based on "sufficient evidence in experimental animals."

**ALOE TOXICANTS.** Whole aloe juice taken directly from the plant's leaf and its extract contains toxic chemicals called anthraquinones. In a 2-year study of rats whose drinking-water contained this whole leaf extract, both sexes of rats developed cancer. The studies showed an increased incidence of adenoma and carcinoma of the large intestine which are tumors that occur rarely in rats. The researchers surmise that the anthraquinones are converted by intestinal bacteria to a genotoxic chemical which may be the toxic agent. This same pathway is expected to occur in humans as well.

The 2B IARC listing and Prop 65 warnings do not apply to other aloe products such as the aloe gel commonly used in cosmetics, to aloe gel extract or to aloe latex. These products have been "decolorized" by treating them first with activated charcoal which removes the anthraquinones.

**GOLDENSEAL**. This herb is also known as *Hydrastis canadensis*, orangeroot, Indian turmeric, and curcuma. It should not be confused with the spice called turmeric (*Curcuma longa*). Goldenseal root powder is the powdered dried roots and underground stems of goldenseal plants. Goldenseal root powder is a natural constituent of the goldenseal plant and will be listed as a carcinogen as well.

**COMMENT.** Many plants contain natural dyes and pigments that are in a large class of chemicals called "anthraquinones." Anthraquinone itself and five anthraquinones which have additional elements attached to the core anthraquinone structure called "substituted anthraquinones" have been tested in animals. All six have been listed as carcinogens. It also makes no difference whether these anthraquinones are naturally occurring in plants or synthesized by manufacturers.

For example, the madder plant root contains a red dye called "rose madder. Technically rose madder is 1,2-dihydroxyanthraquinone. When this chemical is made synthetically, it is more commonly called alizarin crimson. But the fact is that both are the same chemical and both are carcinogens.

Sadly, whole leaf aloe vera juice and its extract are major ingredients in dietary supplements, weight loss products, and alternative medicines. These aloe products are available in some health food stores and on the Internet. One advertisement even claims that aloe will "reduce harmful toxins."

Ingesting herbs and plant extracts containing listed carcinogens or which have never undergone serious long-term studies is contrary to common sense. And when a plant extract acts like a medicine, it ***is*** a medicine and it has side effects. Only controlled studies can determine these effects. Clinical trials of small numbers of people and glowing testimony from users are not definitive.

A search of the IARC listings for 2015 also shows that drugs such as Tamoxifen from yew trees or Digoxin from the foxglove plant also are IARC listed carcinogens. Other natural substances on the IARC list are ginkgo biloba, betel nut, an herbal tea called maté, bracken fern, kava extract, and safrole from the sassafras plant. Mother Nature also manufactures carcinogens.

## EX-SHOP TEACHER FILES SUIT AGAINST HIGH SCHOOL

SOURCES: Ex-shop teacher sues school, says he was fired after identifying safety violations in woodshop, Associated Press, Pat Eaton-Robb, April 24, 2015 11:28 AM; NBC Connecticut, Ari Mason, http://www.nbcconnecticut.com/news/local/Norwich-Free-Academy-Teacher-Safety-Woodshop-OSHA-Violations-Lawsuit-301245931.html and original complaint at http://civilinquiry.jud.ct.gov/DocumentInquiry/DocumentInquiry.aspx?DocumentNo=8707030

A former shop teacher has sued the high school where he used to work, alleging he was fired only after pointing out safety violations in the wood shop.

Keegan Day was hired in June of 2014 for the 2014-2015 school year to teach woodworking at Norwich Free Academy. According to the complaint filed in Superior Court of Hartford on February 23, 2015, Keegan told other faculty members and administrators that the wood shop was not safe for the students. Among the issues Keegan found in the wood shop were;

* There was no ventilation system to remove the fumes [*sic*, vapors] from the toxic urethane coatings and stains used in wood finishing in the room.
* There was inadequate space around the machines to allow operators to work safely.
* The guards on numerous woodworking machines were missing or were inoperable.
* There was no sterilize procedures or UV cabinet for shared protective eyewear.

According to the complaint, when challenged about his opinions, Keegan suggested the school retain an engineer. At the end of October, 2014, the school hired an independent third party from National Safety Consults, LLC, to perform a mock OSHA audit for the wood shop. Numerous hazards and violations were found and the report concluded that the school was maintaining "an extremely unsafe working/learning environment with a number of very serious safety compliance hazards for both students and employees." It was also determined that the school should cease operating the shop.

The complaint says that the results of this report were not revealed to Keegan. Instead, the school notified him to come to a meeting and bring "his union representative." While Keegan's job evaluations had always been good, the school presented allegedly false job performance issues at two subsequent meetings. They also told Keegan he would be terminated and told him to sign a resignation letter or he would "never work as a teacher again." Keegan signed the letter.

Keegan's attorneys are charging the school with the following counts:

1. Wrongful termination violation of Connecticut General Statute § 31-51q.
2. Wrongful termination in violation of public policy.
3. Violation of the Covenant of Good Faith and Fair Dealing.
4. Negligent Infliction of Emotional Distress.

In counts two and three, the complaint lists a number of regulations and standards including: a). Hazard Communication Standard (29 CFR 1910.1200); b) Personal Protective Equipment standard (1910.132); c) Lockout/tagout (1910.147); d) NFPA fire codes and BOCA/ICC building codes; e) Regulations and state statutes concerning eye protection (CGS 10-214a); f) toxic and Hazardous substances 29 CFR 1910, Subpart Z; g) Bloodborne Pathogen Standard (1910.1030); and h) Occupational exposure to hazardous chemicals in laboratories (1910.1450).

**COMMENT:** Norwich High School's website says it has 2,300 students. If these students graduate thinking that a wood shop like this one is acceptable, the school is doing them a disservice. And if even half of the allegations in the complaint are true, Keegan has been wronged. We wish him well.

## RINGLING BROS INSTITUTES OSHA SETTLEMENT AGREEMENT

SOURCES: yoursugarlandnews.com, Ringling Bros. to enhance safety for all aerial acts after settlement agreement, http://www.yourhoustonnews.com/sugar_land/news/ringling-bros-to-enhance-safety-for-all-aerial-acts-after/article_1affd6e8-d1ed-5596-8bbc-74ecb7456e58.html

Ringling Bros. and Barnum & Bailey Circus, will implement ongoing safety enhancements in aerial acts to protect employees against injuries like those sustained by its aerialists during a performance in Providence, Rhode Island (see *ACTS FACTS*, May 2014). OSHA determined that failure of a single carabiner holding an apparatus 15 feet above the ground caused the injuries of nine employees. Under the settlement, the circus agrees to take the following actions on an ongoing basis:

- All new and existing aerial acts will be reviewed by a registered professional engineer.
- For each act, assemble and provide a technical boob to each circus unit.
- Develop a written checklist for equipment and hardware inspections for each act.
- Each circus unit will conduct an annual safety day that will address employee safety topics.

**COMMENT.** This should be a minimum procedure for all theatrical and arena workplaces in which the production involves equipment in which system failure could result in serious injury or death.

## HIGH SCHOOL STAGE COLLAPSE TO BE INVESTIGATED BY IOSHA

SOURCE: WTHITV10.com State to open new investigation into Westfield stage collapse, Troy Kehoe, 4-27-15, http://www.oshatoday.com/?p=7696&post_type=news-digest-item&preview_id=7696&nl=7701

On April 23, 2015, more than a dozen students were injured when a high school stage collapsed in Westfield, Indiana during a musical. There were no serious injuries, but the Indiana OSHA (IOSHA) determined it has jurisdiction to investigate because employees were involved in building the stage.

Readers may remember that it was IOSHA that investigated the fatal outdoor stage collapse at the Indiana State Fair Grounds in 2011. IOSHA cited the employers, but they also cited the riggers' union, the International Alliance of Theatrical Stage Employees (IATSE), Local 30 (*ACTS FACTS*, March 2012). This is the first OSHA citation of a union. While the union contested the citation, Local 30 signed an IOSHA agreement that makes them responsible for training their members. This is also an unprecedented agreement since it is usually the employer who is charged with training.

For these reasons, we will watch to see if IOSHA has any more surprises in store for us.

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ACTSNYC@cs.com - www.artscraftstheatersafety.org


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**June 2015** **Vol. 29, No. 06**

## FOG, SMOKE & HAZE CHEMICAL AIR QUALITY STANDARDS

Editorial

ACTS has been concerned for some time about the air quality standards used to protect cast and crew from overexposure to the glycols, glycerin and mineral oil chemical mists used in theatrical fog, smoke and haze effects. These air quality limits are found in the American National Standards Institute standards ANSI E1.5* and ANSI E1.23.** The standards were developed and voted on by people with experience in special effects rather than expertise in occupational health. They chose to base their standards primarily on data from a single study.

**THE STUDY.** This study, done by Dr. Jacqueline Moline from Mount Sinai's Department of Community and Preventive Medicine and released in June, 2000*** used the data from medical evaluations of 439 adult actors performing in 16 Broadway musicals. The air-monitoring was done by ENVIRON International Corporation. The study's scope was limited to acute "local irritant effects of the respiratory tract and eyes" and the monitoring data was used to set exposure levels below those at which symptoms were reported. The study concluded:

> ... No significant acute change in voice quality, pulmonary function, or vocal cord appearance was found among Actors exposed to theatrical smoke, haze, or pyrotechnic agents. However, Actors with exposures to elevated or peak levels of glycols reported more symptoms than Actors with less exposure. In addition, some mild chronic effects in Actors with greater exposure to peak levels of glycols and mineral oil were observed. Page ES-3

One of the potential chronic effects found was the following:

> Actors with the highest exposure to mineral oil had a statistically significant decrease in one pulmonary function parameter – forced vital capacity. This finding was surprising, as decreases in forced vital capacity are usually associated with interstitial lung processes or interference with taking a deep breath from external pressures, such as pleural thickening or obesity. While an effect was noted, it is important to note that Actors still have pulmonary function within the normal range. Page EN-5

I'm not sure singers would be happy with any decrease in pulmonary function. And it is unknown whether this change in lung capacity occurring repeatedly over a performing lifetime could cause a permanent chronic condition. Since the study did not intend to look for chronic effects, and yet found some, ACTS was curious about how much hard data there is on these chemicals.

**HOW MUCH DATA EXISTS?** To compile this information, we compared the toxicity data from Sigma-Aldrich Corporation's Safety Data Sheets (SDSs) for each of the chemicals. The tests listed on these SDSs are those required to be reported on the United Nation's version of the Globally Harmonized System SDSs. These SDSs must report either the results of the required tests, or must clearly state that the test have not been done. This information is charted on page 2 of this newsletter.

# COMPILATION OF TOXICITY DATA FROM SIGMA-ALDRICH SDSs ON CHEMICALS USED IN FOG

As of - May 8, 2015

1. TEG - **triethylene glycol** CAS# 112-27-6
2. MPG - **monopropylene glycol** (proplyene glycol; 1,2-propanediol) CAS# 57-55-6
3. DEG - **diethylene glycol** CAS# 111-46-6
4. DPG - **dipropylene glycol(s)** CAS# 25265-71-8, 106-62-7, 110-98-5, 108-61-2
5. 1,2-B- **1,2-butylene glycol** (1,2-butanediol) CAS# 584-03-2
6. 1,3-B- **1,3-butylene glycol** (1,3-butanediol) CAS# 107-88-0
7. GLY - **glycerine** (glycerol; 1,2,3-propanetriol) CAS# 56-81-5
8. MOIL- **white mineral oil**, medicinal or food grade CAS# 8042-47-5

| **Test**[1] | TEG **1** | MPG **2** | DEG **3** | DPG **4** | 1,2-B **5** | 1,3-B **6** | GLY **7** | MOIL **8** |
|---|---|---|---|---|---|---|---|---|
| **Acute ingestion** | rat data category 5[2] | rat data category 5 | human toxic | rat data category 5 | rat data category 5 | rat data category 5 | rat data category 5 | no data |
| **Acute inhalation** | mouse disorder[3] | no data | no data | rat toxic category 2[4] | no data | no data | no data | no data |
| **Respiratory sensitization** | no data | no data | no data | no data | no data | no data | no data | no data |
| **Skin sensitization** | no data | no data | guinea pig negative | guinea pig negative | no data | no data | no data | no data |
| **Germ cell mutagen** | no data | no data | no data | negative | no data | no data | no data | no data |
| **Cancer** | no data | no data | no data | no data | no data | no data | no data | no data |
| **Reproductive** | animals adverse | no data | no data | rat data adverse | no data | no data | no data | no data |
| **Developmental** | rat major adverse | no data | no data | no data | no data | rat adverse wt. gain | no data | no data |
| **STOT[5]-single dose** | no data | no data | no data | no data | no data | no data | no data | no data |
| **STOT[5]-repeated** | no data | no data | human kidney dam. | no data | no data | no data | no data | no data |
| **Aspiration hazard** | no data | no data | no data | no data | no data | no data | no data | human lipoid pneumonia |

1 The SDS acute eye and skin tests are left out and sensitization is divided into skin and respiratory since inhalation is the route of interest.

2. Category 5 is the least toxic category and only requires a label to read "May be harmful if swallowed." Categories 4 to 1 are progressively more toxic and require stronger symbols, signal words and warnings.

3. This disorder refers to a study of triethylene glycol by inhalation which resulted in depressed breathing rates.

4. This could be an error on the SDS since this would make 1,3- butylene glycol a serious respiratory hazard.

5 Specific Target Organ Toxicity

**LACK OF DATA.** The lack of test data on these chemicals is stunning. While all but one of the chemicals have been tested for acute ingestion toxicity (LD50), this test is not useful in determining inhalation hazards. For example, drinking mineral oil only causes a laxative effect, but inhalation or aspiration (see the table) can cause lipoid pneumonia which can be fatal.

ACTS found clinical data on use of propylene glycol in asthma inhalers showing that some patients have allergic or irritant reactions to even these very small, sporadic doses. But the standard SDS tests for respiratory sensitization appear not to have been done on any of the chemicals. Acute respiratory toxicity tests were only reported for two of the chemicals and both showed adverse effects. Reproductive and developmental tests were reported for only three of the chemicals and all three showed adverse effects. Triethylene glycol in particular caused major developmental damage in rats.

**THE DR. MOLINE STANDARDS**. Mt. Sinai and ENVIRON study recommendations are:

- The use of glycols should be such that an Actor's exposure does not exceed 40 milligrams per cubic meter ($mg/m^3$).
- Mineral oil should be used in a manner such that an Actor's exposure does not exceed a peak concentration of 25 $mg/m^3$.
- For chronic exposures to mineral oil, the existing standards established for oil mists (5 $mg/m^3$ as an eight-hour time-weighted average) should also be protective for Actors in theatrical productions.

**OTHER STANDARDS.** The major agency in the U.S. for setting occupational standards is the American Conference of Governmental Industrial Hygienists. The ACGIH has no standards for any of the six glycols and they recently withdrew their standard for glycerin due to insufficient data! Their standard for large particle (inhalable) mineral oil is the same as that of the ANSI E1.23 standard, but mineral oil haze is usually in a smaller (respirable) aerosol, often as small as one micron (μ). The ACGIH default standard for this mist (the "particulates not otherwise specified" or PNOS limit) would be lower and mort protective than the Moline or the ANSI E1.23 limits.

The table below also includes the Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs). These standards are so out of date that OSHA, itself, recommends using better standards.**** OSHA's only oil mist standard is for "Particulates Not Otherwise Regulated" (PNOR) which limits exposure to 5 $mg/m^3$ for respirable aerosols. This PNOR standard also applies to Glycerin. OSHA has no standards for the glycols. The industry standards, ACGIH standards and OSHA standards are compared below:

**VARIOUS STANDARDS FOR FOG, SMOKE AND HAZE CHEMICALS**

| Source | All glycols | glycerine | oil mist (highly refined) |
|---|---|---|---|
| Moline | 40 $mg/m^3$ (peak)<br>5 $mg/m^3$ TWA | no standard set | 25 $mg/m^3$ (peak) |
| ANSI E1.5 | 40 $mg/m^3$ (peak)<br>10 $mg/m^3$ TWA | 50 $mg/m^3$ (peak)<br>10 mg/m3 TWA | |
| ANSI E1.23 | refers to E1.5 | refers to E1.5 | refers to OSHA which is<br>5 $mg/m^3$ PEL-TWA |
| ACGIH | No glycol TLVs | Withdrawn due to lack of data | 5 $mg/m^3$ inhalable (10-100μ*)<br>3 $mg/m^3$ respirable (< 10μ*) |
| OSHA | No glycol PELs | 5 $mg/m^3$ respirable | 5 $mg/m^3$ respirable |

* particle size diameter in microns

In addition to these standards, two of the glycols, diethylene and propylene glycol, have limits set by a division of the American Industrial Hygiene Association (AIHA). These are both 10 mg/m$^3$, 8-hour limits that do not apply to the other glycols. And no AIHA peak limits could be found.

## SUMMARY CONCLUSIONS

1. GLYCOLS

* ACTS finds no sound scientific basis for setting the peak limits for the glycols at 40 mg/m$^3$.

* ACTS only finds the 8-hour (TWA) standard for diethylene and propylene glycols is supported by a proper standard setting agency. The other glycols cannot be assumed to be of equal toxicity.

2. GLYCERIN. ACTS can find no sound scientific basis for the setting either the peak or the 8-hour average exposure limits for glycerine at the levels in the ANSI standards.

3. MINERAL OIL. Since the mineral oil haze is usually in the respirable size or smaller, and since the ACGIH PNOS standard for this particle would be 3 mg/m$^3$, ACTS believes that use of the less protective 5 mg/m$^3$ respirable OSHA PEL in ANSI E1.23 is not best practice.

4. WORKER'S RIGHTS. Theatrical and entertainment workers exposed to any of these chemical effects have a right to know both what is known and what is ***not*** known about them. They should be informed that there is very little acute inhalation data and almost no long term, chronic data on these chemicals. They should be aware that workplace air quality standards are usually set by panels of experts, not by a single doctor in a single study or by special effects people. And all workplace air quality standards are designed to protect most healthy adult workers. By definition, children, the elderly and people with various physical limitations are not covered by these workplace standards.

5. PUBLIC POLICY. Theatergoers also should be informed when chemicals will get into the audience areas and how little is known about their effects.

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* ANSI E1.5 – 2009 (R2014), Entertainment Technology -- Theatrical Fog Made With Aqueous Solutions Of Di- and Trihydric Alcohols

** ANSI E1.23 – 2010 (R2015), Entertainment Technology – Design and Execution of Theatrical Fog Effects

*** Health Effects Evaluation of Theatrical Smoke, Haze and Pyrotechnics. Prepared for: Equity-League Pension and Health Trust Fund, Jacqueline M. Moline, M.D,, M.Sc. And Anne L. Golden, Ph.D., Department of Community and Preventive Medicine, Mount Sinai School of Medicine and Joseph H. Highland, Ph.D., et al., ENVIRON International Corporation, June 6, 2000

**** See https://www.osha.gov/dsg/annotated-pels/

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*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



**CREDIT:** ***ACTS FACTS***,
Monona Rossol, Editor
181 Thompson St., #23
New York, NY 10012 - 212-777-0062
ACTSNYC@cs.com - www.artscraftstheatersafety.org


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# ACTS FACTS

THE MONTHLY NEWSLETTER FROM

**ARTS, CRAFTS AND THEATER SAFETY (ACTS)**

181 THOMPSON ST., # 23, NEW YORK, NY 10012-2586 PHONE 212/777-0062

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## ART MATERIAL CERTIFIERS FIGHT PROP 65 LISTING FOR BPA

http://www.oehha.ca.gov/prop65/public_meetings/May2015DART.html#summary

On May 7, 2015, California's Developmental and Reproductive Toxicant Identification Committee (DARTIC) met to hear testimony on both sides of their recommendation to list bisphenol A (BPA) as a substance requiring a warning label under California's Proposition 65. DARTIC's experts had previously reviewed the animal data and agreed with the National Toxicology Program's (NTP) determination that BPA can cause developmental harm when pregnant animals are exposed to it. The effects were significant enough that NTP thinks it could be a hazard to humans as well.

**WHO TESTIFIED AGAINST LISTING?** Two of the major opponents to listing the BPA plastic chemical combined their opinion into a single power point presentation. These two opponents were:

1. **American Chemistry Council Polycarbonate/BPA Global Group (ACC).** This international group lobbies against any regulation of BPA. For example, they lobbied extensively in a futile attempt to prevent a 2012 U.S. ban on BPA in children's baby bottles and sippy cups.

2. **Art & Creative Materials Institute (ACMI).** This group represents the majority of art material manufacturers and certifies their products as meeting the labeling standards of the American Society of Testing and Materials, ASTM D 4236. Many schools require ACMI's "nontoxic" AP seal products for children.

**THE ACC/ACMI POWERPOINT.** A transcript of meeting is not currently available, but the PowerPoint used by ACC and ACMI is already on website of the Office of Environmental Health Hazard Assessment (OEHHA). The first slide identified the various speakers for the ACC and the ACMI. Ann G. Grimaldi from the Grimaldi Law Offices was the speaker for ACMI.

The speakers' main points were semantic. There were slides showing that the wording of the California statutes requires that the data "shows clearly" that the substance can cause the ill effects. Next, they showed that *Burton's Legal Thesaurus* (2007) says: "show clearly" = "prove."

The text on this slide also included a definition in *Roget's Thesaurus* (2013) which says that to "show clearly" is to "prove" and lists other synonyms to include "confirm," "convince," "demonstrate, "explain," "find," "substantiate," "validate," "verify," "certify," "corroborate," "document," "warrant," "make evident," and "show once and for all."

In other words, ACC and ACMI believe the law requires absolute proof beyond a shadow of a doubt, which means that they believe chemicals, like people, should be deemed innocent until proven guilty. Their next slide, reproduced below, shows their position even more "clearly."

What Does "Clearly Shown" Not Mean?

- ~~"Data *suggest* that . . . ."~~
- ~~"*Likely* to be . . . ."~~
- ~~"I have *concerns* . . . ."~~
- ~~"Err on the side of health or safety"~~
- ~~Precautionary Principle~~

Most telling is their rejection of the Precautionary Principle which states that, in the absence of data, a chemical cannot be assumed to be safe. This principle says that in the absence of data, chemicals cannot be considered "nontoxic." This is the principle underlying the European chemical laws. Instead of proof positive, they look at the weight of evidence in the existing studies.

**TABLES OF DATA.** The PowerPoint showed a table of data from the various studies done between 2009 and 2013. They compared the studies and their control methods in a table form. In the four of the columns they listed whether or not each study used 1) the appropriate number of animals, 2) the right route of administration, 3) appropriate exposure timing and 4) appropriate doses for measuring dose-response. There were other control columns and the last column indicated whether the study was positive or negative for the effect. Of the 26 studies, only five showed female reproductive toxicity. This made it look bad for those that want to list BPA, that is, ***until*** you looked at the first four columns of control criteria. Then the ACC/ACMI argument fell apart.

First, five of the 26 studies were not even relevant. Next, most of the rest of the negative studies were missing important controls. There were only three studies with all four of the first control criteria in place and they all had "clear toxic endpoints" showing female reproductive toxicity. This is clear enough for ACTS. And apparently the California regulators came to the same conclusion.

**As of May 11, 2015, BPA requires warning labels under California's Proposition 65.**

**WHY WAS ACMI AGAINST LISTING BPA?** The PowerPoint and ACMI's alliance with ACC shows that they think that BPA is not hazardous and the public is not entitled to warnings when it is present. It also is reasonable to conclude that there probably are some art materials that now will need BPA warnings. Clearly, ACMI sought to withhold information from artists and teachers about the presence of BPA, a substance that so many people want to avoid. Whose side are they on?

## MINOR INJURY DURING FILMING OF INDIE

Shia LaBeouf Hospitalized After Head Injury on Set of 'American Honey', Variety, by Alex Stedman, June 24, 2015

Indie star, Shia LaBeouf was hospitalized briefly following what was described as a **minor** head injury on the North Dakota set of "American Honey" according to *Variety*. The film producer's statement said "Shia LaBeouf sustained **minimal** injuries....."

The actor was supposed to put his head through a glass window in a scene, but he cut his head and index finger in the attempt. According to TMZ (the celebrity gossip news outlet), the injury resulted in the actor receiving 20 stitches and 13 staples

**COMMENT.** Maybe the distinction between minimal or minor injuries and major ones depends on whether the star is working for an Indie or one of the Majors. Or perhaps whether it is an injury sustained by an actor or a producer.

## TATTOO PIGMENTS MIGRATE IN THE BODY

Case Report: Extensive Tattoos Mimicking Lymphatic Metastasis on Positron Emission Tomography Scan in a Patient With Cervical Cancer, Narine Grove, MD, Ma Zheng, MD, Robert E. Bristow, MD, and Ramez N. Eskander, MD. *Obstetrics & Gynecology*, 2015; April 28, 0:1-4 DOI: 10.1097/AOG.0000000000000701; Metal Toxicity: Tattoos: Safe Symbols?, *Environmental Health Perspectives*, retrieved 19 October 2009 and Poon, Kelvin Weng Chun (2008), In situ chemical analysis of tattooing inks and pigments: modern organic and traditional pigments in ancient mummified remains, University of Western Australia

The journal of *Obstetrics & Gynecology* will be publishing an article about a woman with cervical cancer who had a medical scan (PET/CT fusion scan). This particular scan works by injecting a radioactive tracer that makes tumors appear as bright spots. The scan showed bright spots in most of the woman's pelvic lymph nodes indicating extensive metastasis for which the standard procedure is a complete hysterectomy.

After the radical operation, preliminary examination of the lymph nodes showed no cancer cells. Instead, they were full of migrated carbon particles from her tattoos which also light up on the scan.

**GOOD NEWS.** On further examination, doctors found that she actually had very small cancer cells in her pelvic lymph nodes. This is called "micrometastasis," meaning cells that are too small to show up on a scan. Since these cells can grow, the misdiagnosis and hysterectomy may have saved her life.

**BAD NEWS.** The doctors observing the particles in the woman's lymph nodes assumed they were carbon black. But tattoo pigments also include many toxic metal pigments, glow-in-the-dark pigments, organic black henna which contains para-phenylenediamine and more.

Heavy metals used for colors include mercury (red); lead (yellow, green, white); cadmium (red, orange, yellow); nickel (black); zinc (yellow, white); chromium (green); cobalt (blue); aluminium (green, violet); titanium (white); copper (blue, green); iron (brown, red, black); and barium (white). Metal/organic pigments include the ferro- and ferricyanides (yellow, red, green, blue). Organic chemicals used include azo- and naphtha-chemicals (orange, brown, yellow, green, violet, red).

Deborah Sivas, president of the nonprofit American Environmental Safety Institute (AESI), also believes that inks provide chronic exposure to some metals. Sivas says the ink used for a 3 by 5 inch tattoo can be contaminated with lead at between 1–23 micrograms of lead, versus the 0.5 micrograms per day permitted under Proposition 65. And only in California are tattoo parlors required to warn customers about exposure to chemicals known to cause cancer, reproductive or developmental harm.

Now it appears that the smaller particles of these toxic pigments can also migrate into lymph nodes. And when people tire of their tats and have them removed, the laser simply breaks the large particles down into smaller ones which also can be expected to migrate to the lymph system.

## COFFEE AROMA CAN KILL?

Coffee roasters' health at risk from chemical compound, air samples suggest, by Raquel Rutledge of the Journal Sentinel staff, June 20, 2015 8:00 p.m. seent at http://www.oshatoday.com/?p=8462&post_type=news-digest-item&preview_id=8462&nl=8473

Oh hell. My favorite perfume, roasting coffee beans, has been found to contain significant amounts of diacetyl, the butter-flavor chemical known to have killed and disabled workers in factories that make microwave popcorn. But we shouldn't be surprised. Coffee beans are roasted at around 430 degrees Fahrenheit, a temperature at which degradation of organic matter is occurring. High heating or burning any carbon-based substance produces airborne toxic and/or carcinogenic chemicals. Whether we find the odor pleasant or unrelated to its hazards.

# EDUCATIONAL INSTITUTIONS FLUNK CHEMICAL SPILL TEST

Acute Chemical Incidents Surveillance — Hazardous Substances Emergency Events Surveillance, Nine States, 1999–2008, *Morbidity and Mortality Weekly Report (MMWR)*, CDC, April 10, 2015, **64(SS02);1-9**

An article in the *Morbidity and Mortality Weekly Report* from the Centers for Disease Control looked at data on emergency events reported in various industry. The abstract reads as follows:


**Abstract**

Problem/Condition: Although they are infrequent, acute chemical incidents (i.e., uncontrolled or illegal release or threatened release of hazardous substances lasting <72 hours) with mass casualties or extraordinary levels of damage or disruption severely affecting the population, infrastructure, environment, and economy occur, and thousands of less damaging chemical incidents occur annually. Surveillance data enable public health and safety professionals to better understand the patterns and causes of these incidents, which can improve prevention efforts and preparation for future incidents.

By shear number of chemical incidents resulting in injury in descending order the highest reporting industries over the last 10 years were: Chemical Manufacturing, Truck Transportation, Petroleum Refining, Utilities, Nondurable Goods Wholesalers, Food Manufacturing, Rail Transport, Oil and Gas Extraction, **Educational Services**, and Crop Production (farming).


**HOLD IT!** What was that second-to-last industry? And not only is the educational industry reporting between 56 and 101 incidents per year, the data showed the numbers of incidents are increasing. This increase is occurring while the numbers of incidents are decreasing in all other industries except for farming. The article says that the "educational services category ... and crop production ... category had a consistently increasing trend."

We are not the only ones shocked. The article's writers note that, "The numerous injuries that occurred in educational institutions were surprising, and the finding is concerning because children are more susceptible to environmental hazards."

Clearly, it is time to beef up the safety training and hazcom/lab standard programs in schools.


*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.

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**CREDIT:** *ACTS FACTS*,
Monona Rossol, Editor
181 Thompson St., #23
New York, NY 10012 - 212-777-0062
ACTSNYC@cs.com - www.artscraftstheatersafety.org




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## COLORED POWDER SPECIAL EFFECTS CAN KILL

SOURCES:
http://www.foxnews.com/world/2015/06/28/more-than-500-injured-in-massive-fire-at-taiwan-water-park-party/, More than 500 injured in massive fire at Taiwan water part party, *Fox News,* June 28, 2015; Graphic video at : http://www.nydailynews.com/news/world/color-party-fire-burns-200-taiwan-water-park-article-1.2273478 *Daily News*, June 27, 2015 and http://www.bostonherald.com/news_opinion/international/asia/2015/06/cigarettes_or_spark_suspected_in_taiwan_fire_that_burned_498, *Boston Herald*, June 28, 2015

On June 27th, 2015, special effects colored powders used at a water park show and party caught fire in the air and sent revelers screaming from the scene. There are many videos of the incident on the net with one of the best at http://www.cnn.com/2015/06/29/asia/taiwan-water-park-explosion/.

CNN reports public health officials in New Taipei City, where the water park was located, as claiming that 494 people sought treatment, 393 people were still in hospitals and 221 patients were in intensive care units. A 20-year-old woman with burns to 90 percent of her body died. Taiwan's Central News Agency said her 12-year-old brother also had burns on 90 percent of his body. Fox News also interviewed the father of an American boy burned over 90 percent of his body.

The various videos reveal that the crowd was dancing on a stage lit with theatrical lights and in a pastel colored haze created by the powdered atmospheric effects. The fire occurred first in the area where the colored powders were expelled from powder cannons. The entire stage area was engulfed in seconds leaving people nowhere to escape.

**COLORED POWDERS.** Even more disturbing than the accident videos were the CNN videos of many earlier parties and celebrations at which these colored powders were used without incident. These videos make it clear that people are completely unaware that any organic (based on carbon) powder suspended in air is flammable. These colored powders, made of starch and dyes, are traditionally used for the Holi festivals in India. They have become popular in the U.S. as well.

An official investigation of the Taiwan incident is attempting to determine the source of ignition, but it is really irrelevant. These explosive fires can start from any ignition source such as a cigarette, a static electric discharge, friction heat or a hot stage light. It is clear that the reports of this event were written by people who did not understand this basic fact.

**OTHER HEALTH ISSUES.** The ACTS FACTS April 2012 issue reported on a death and the illness of over 200 colored powder-exposed people in India at a Holi Festival. In this case, someone used leather dyes instead of vegetable dyes. But no matter what dyes are used, this is a really bad idea. We warned then that there are no dyes or powders that are good to inhale. But we never dreamed that "creative" special effects people would literally fill the air with these powders.

**WARNING FOR COLORED POWDER SELLERS.** Taiwan Premier Mao Chih-kuo banned parties that use flammable colored powder and the accident is being investigated. This should put US distributors on alert that they should not be selling the powders here for similar purposes.

It was determined that three tons of colored starch-based powder was bought by the organizers from Tai Won, a seller in the island's southern county of Yunlin. Chou Hui-fang, a representative of the seller, said the buyer was informed about the risk of fire. "Whether it's corn starch or flour starch, this kind of stuff, no matter how long it's been around, if it's in dense quantities and if it's hot, it can catch fire," Chou said. She said her 4-year-old company has been questioned by police and health officials but was not considered at fault. "We didn't know what the buyers were going to do with it or how much they would use," she said. "It might have been supplies for a whole year."

Taiwan police recommended charges of professional neglect and public endangerment for party organizer Lu Chung-chi, who was arrested but released on bail of one million Taiwan dollars (US $32,000) and restricted from leaving the island, a New Taipei City police spokesman said. Local media photos showed Lu kneeling on the ground to apologize, pledging to take full responsibility.

**WARNING FOR SPECIAL EFFECTS OPERATORS.** Police also recommended charges for the stage hardware technician and the person responsible for shooting off the powder. Each was given bail of 300,000 Taiwan dollars.

**COMMENTS.** Clearly, no one using or selling the powders really appreciates their hazards. For example the seller of the powder says "... if it's in dense quantities and if it's hot, it can catch fire." Actually, it can be freezing cold and, if the powder is dense, any source of ignition can set it off.

It is also clear that the special effects technicians had no intent to hurt people, but they are so technically untrained they thought this was a perfectly acceptable plan. Charging them with a crime is probably necessary, but charging the person who designed the effect and made the decision to use it would be more appropriate. Changing the laws would be even wiser. Special effects that expose audiences, actors and crew to airborne substances should require approval of safety and fire authorities. Audience members should be warned in advance about the type of effects used. This should be standard practice for use of fog, powder, pyrotechnics, water cannons or any other effect.

## ASBESTOS FOUND IN CRAYONS & KIDS' CRIME SCENE KITS

SOURCE: http://www.asbestosnation.org/facts/tests-find-asbestos-in-kids-crayons-crime-scene-kits/
EWG Action Fund// Asbestos Nation, Tests Find Asbestos in Kids' Crayons, Crime Scene Kits

Have you seen this headline before? Try *ACTS FACTS* and many other publications in 1992, 2000, and 2007 and now again in 2015. The fact is that when the hazards of asbestos-contaminated talcs make the news, manufacturers stop using them. But since no one checks products, you can be sure the talcs will be used again soon. Then every 7 or 8 years, someone tests and finds they are back.

This year, the Environmental Working Group (EWG) Action Fund launched its Asbestos Nation campaign to raise awareness about today's asbestos threat. They looked beyond well-known sources such as vehicle brakes and building materials. They said they didn't expect to find asbestos in crayons. Of course, they did. The report can be downloaded from the website listed under the title.

**WHICH PRODUCTS CONTAINED ASBESTOS?** The good news is that only four of the 28 boxes of crayons tested were found to contain asbestos. And only two of the 21 crime scene fingerprint kits were tainted with asbestos. The tainted products were all manufactured in China and were imported and distributed by U.S. companies. The table below list the asbestos-containing products and the results of the two labs used to confirm the results on each.

| Product | Importer/Distributor | Origin | Lab 1 | Lab 2 |
|---|---|---|---|---|
| **Crayons**[1] | | | | |
| Amscan Crayons | Amscan China | Made in | Tremolite | Tremolite, Anthophyllite |
| Disney Mickey Mouse Clubhouse | Greenbrier International, Inc. | Made in China | Chrysotile | Tremolite |
| Nickelodeon Teenage Mutant Ninja Turtle Crayons | MII Inc. | Made in China | Tremolite | Tremolite |
| Saban's Power Rangers Super Megaforce | Greenbrier International, Inc. | Made in China | Tremolite | Tremolite |
| **Crime Lab Kits** | | | | |
| EduScience Deluxe Forensics Lab Kit–black fingerprint powder | Toys "R" Us | Made in China | Tremolite, Chrysotile | Tremolite/ Actinolite, Anthophyllite |
| Inside Intelligence Secret Spy kit – white fingerprint powder | Buy-Rite | Made in China | Tremolite | Tremolite |

1. Product names may be licensed and do not necessarily reflect the name of the manufacturer.
Source: EWG Action Fund, from Transmission Electron Microscopy tests by Scientific

**EXPOSURE OF CHILDREN.** According to the U.K. Committee on Carcinogenicity, a child is 3.5 times more likely to develop mesothelioma (cancer) than a 25-year-old. The powders in the fingerprint kits are the products most likely to be inhaled. Exposure from crayons is considered by the Consumer Product Safety Commission (CPSC) to be extremely low because the fibers are held in the wax even after ingestion. ACTS is not so sure since the white bloom on the surface of older crayons is the talc or other fillers migrating to the surface.

CPSC also promised when asbestos was found in crayons in 2000 that they would "monitor children's crayons to ensure they do not present a hazard,*" but it has not banned or regulated asbestos in crayons, toys or other children's products. Seven years later asbestos was found in the fingerprint powder of a similar crime scene kit. And here we are again. CPSC is not doing the job.

* CPSC 2000. Staff Report on Asbestos in Children's Crayons. U.S. Consumer Product Safety Commission. August, 2000. Available: http://www.cpsc.gov//PageFiles/97593/crayons.pdf

## NAIL SALON WORKER'S BILL PASSES

ACTS congratulates the New York Committee on Occupational Safety and Health (NYCOSH) for their 10 year effort to provide protections for exploited and chemically-exposed nail salon workers.

On July 16, 2015, Bills A. 7630A/S. 05966 were signd into law by governor Andrew Cuomo. They create steady and fair employment for people working in an estimated 3,000 nail salons in the state, through a path to full licensure for currently unlicensed workers and the opportunity for trainees to complete one year of apprenticeship training to become fully licensed. The bill also has provision for better ventilation and personal protective equipment to protect salon workers from the very toxic products used in nail salon work.

**COMMENT.** ACTS provided a small amount of help at various stages of this process and on June 16th I met with NYC Department of Consumer Affairs Commissioner Julie Menin and her staff to discuss their intent to provide additional protections for City salon workers.

# HAZARDS OF SPALTED WOOD

SOURCES: TechLine: Producing Spalted Wood, *Forest Products Laboratory*, issued 03/04 http://www.fpl.fs.fed.us/documnts/techline/producing-spalted-wood.pdf and Sara Robinson, *American Woodturner*, August 2011

You've seen spalted wood. It may have black lines, beautiful colors or bleached areas. These effects are created by infecting the wood with various types of fungi, usually the ones that cause dry rot. The fungal degradation process is halted before the wood is weakened or loses significant mass. If the fungi had a little more time to work, the wood would be called "rotten" wood!

Many woodturners, craftspeople and artists use spalted wood for their more expensive items. And articles in various woodworking publications show there is much debate about how hazardous spalted wood is to work with. The Forest Products Laboratory is most often quoted as saying that although the "fungi responsible for the decorative appearance are not pathogenic (a health problem), there might be some molds associated with the spalting process that could cause allergies in people. It is also possible that some pathogenic molds, such as *Aspergillus fumigatus* (responsible for "farmers lung"), might be present, so it is always a good idea to work in well-ventilated areas."

To translate, both the words "molds" and "fungi" are used. The organisms that cause spalting are usually dry rot "fungi." "Molds" are the type of fungi we usually associated with the fuzzy growths on organic matter. But they are all fungi. "Pathogenic fungi" are those which can infect the body by living in some part of it, such as in the lungs. There are only a handful of fungi that can do this. One of these is *Aspergilllus fumigatus* which can be found in a lot of places in nature and is usually resisted by people with normal immune systems.

Fungi can be thought of as wee plants without chlorophyll. Both real plants and fungi can cause allergies and irritation of eyes and mucous membranes in some people. Some molds are also known to release gases, vapors and spores that can suppress the immune system. And just a few molds and many mushrooms (the fruiting body of fungi) are outright toxic. But we must not forget that wood itself is a "plant" whose dust is well-known to cause respiratory allergies, dermatitis, irritation and even cancer in some people. Wood dust itself requires ventilation or protective gear.

So working with spalted wood exposes one to both wood dust and fungi dust. Both the wood and the fungi are dead, but both retain the ability to affect people's health. Precautions are needed.

*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



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Monona Rossol, Editor
181 Thompson St., #23
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ACTSNYC@cs.com - www.artscraftstheatersafety.org


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THE MONTHLY NEWSLETTER FROM

**ARTS, CRAFTS AND THEATER SAFETY (ACTS)**

181 THOMPSON ST., # 23 NEW YORK, NY 10012-2586 PHONE 212/777-0062

**September 2015** **Vol. 29, No. 09**

## ALL ABOUT WAX DATA SHEET AVAILABLE: AT LAST!

Editorial

After many delays due in part to a rigorous review process, we have a 15 page data sheet that will provide artists with information on the origins and manufacture of many types of wax, their properties and their hazards. It was written for artists who use heated wax (such as encaustic painters, batik/textile dyers, jewelers, sculptors, ceramicists and more), educators (at all levels including college and university professors, arts center instructors, art therapists and teachers of teens and children), arts administrators and facilities managers responsible for creating safe studio facilities and curriculums. Home-crafters, candlemakers, and parents and organizers of after-school, scouting, and summer camp projects may also find the information useful.

The data sheet will explain: 1) what wax is; 2) why heating or burning wax creates toxic airborne substances and what these substances are; and 3) why plant-derived soy waxes are not safer to use than synthetic ones. There will also be information on ventilation and precautions for wax processes.

The precautions are based on knowledge of the chemistry of waxes. As a concession to artists who have no interest in chemistry, it is written so that skipping this technical portion will not impair the reader's understanding of the data sheet's conclusions and the precautions.

**It is available electronically from ACTS by e-mailing a request to actsnyc@cs.com.**

## TRICHLOROETHYLENE: NO LONGER USED IN FIXATIVES

http://www.epa.gov/oppt/exisitingchemicals/pubs/tce.html and a 7-30-15 Press Release

The EPA reached an agreement with PLZ Aeroscience Corporation, of Addison, IL, to voluntarily phase out the use of trichloroethylene (TCE) in its aerosol arts and crafts spray fixative by September 1, 2015. The Agency also issued a new rule* to require notification to the EPA before certain new consumer uses of TCE would begin or resume. The EPA's press release said the following:

> "We are pleased that a company's voluntary efforts to eliminate TCE from their aerosol fixative product used for arts and crafts will soon mean that all consumer products of this type are TCE-free," said Jim Jones, Assistant Administrator for the Office of Chemical Safety and Pollution Prevention. "We are also proposing a rule that will give EPA the opportunity to review and, if necessary, block introduction, including imports, of new TCE spray fixative and other consumer products before re-entry into the marketplace. This will ensure a level playing field for American companies who step up and do the right thing. In addition, we are pursuing regulatory action to reduce the risks from exposure to TCE in other products that are not voluntarily addressed."

The EPA says this product is currently used by artists, picture framers, graphic designers and printers to provide a water repellant and protective finish and that it is the only TCE-containing spray fixative product on the market still used in arts and crafts.

**COMMENT.** There is no reason to use this highly toxic, skin-absorbing, known human carcinogen* as a solvent in any art product. Many other less toxic substitutes for TCE can be used. The fact that it was still being used by artists doesn't say a lot for their label reading skills. Ideally, this product should have been forced out of the market by lack of customers long ago.

It also tells us that it is the EPA that is looking out for artists and consumers instead of the Consumer Product Safety Commission.

* A proposed Significant New Use Rule (SNUR) it being filed by the EPA and they are requesting a 60 day comment period that will begin when the Federal Register notice is published. in the Federal Register. It can be found at www.regulations.gov by searching for EPA-HQ-OPPT-2014-0327 (SNUR, 32 pp, 187 kb).

** TCE is listed as a known human carcinogen by the International Agency for Research on Cancer (IARC-1), by EPA (category CaH) and in the German workplace standards (MAK-1). It is also listed by the National Toxicology Program as reasonably anticipated to be a human carcinogen (category R) and by the National Institutes for Occupational Safety and Health as a carcinogen (Ca), and by the American Conference of Governmental Industrial Hyienists as a suspect carcinogen (A2). The EPA notes that TCE is a carcinogen by all routes of exposure.

## DON'T MESS WITH THAT OLD LEAD PAINT!

Correspondence with OSHA sent to me as complainant

Many film and TV shows are shot in old houses, abandoned office and industrial buildings, warehouses, derelict ships, and other run-down facilities. Film location scouts often think these have the right look for certain scenes. But these old and abandoned sites often also have peeling lead paint, friable asbestos, no electrical or plumbing systems, vermin, fall hazards and structural faults. These are the hazards the film crew workers face when they clean up, construct and paint sets, run electrical cable and lights, set up costume shops, dress the sets and more.

Employers, including film producers, who bring workers to a location in a building built before 1980 are required by the Occupational Safety and Health Administration (OSHA) to provide information on the presence of lead paint and asbestos *before* any work occurs on the location. The first day on such a location, the employer must provide workers with any paint- or air-sampling data, copies of the appendixes of the lead regulations, providing the name of the person in charge of keeping such information and more. And not one chip of paint can be removed, and not one tile or bit of insulation can be disturbed until the employer provides the workers with lab analyses indicating that these materials are lead- or asbestos-free.

If the lab analysis show that lead and/or asbestos is present, alteration and clean up involving these materials must be done by Certified Lead Abatement or Certified Asbestos Abatement Contractors. During their work, the crew must either not be present or be protected from dust in the abatement area by plastic enclosures.

After this work is done, there still may be some dust present at below regulatory levels and workers may choose to wear respirators for protection against this small dust. This requires a Voluntary Respiratory Protection Program on the part of the employer which mandates that the respirators along with Appendix D of 1910.134 from the OSHA Respiratory Protection Standard be provided to each employee who chooses to protect themselves.

**EMPLOYER CITED.** Recently, a major film company shooting in New York City did not follow the lead paint rules. Their union representative* couldn't get the producer to comply and called OSHA with a complaint. OSHA arrived too late to cite for violations related to actually disturbing the paint, but the company did receive the following citations:

Citation 1 Item 1, Type of violation: **Serious**
29 CFR 1910.134(c)(2)(i): Respirator users were not provided with the information contained in Appendix D to 29 CFR 1910.134 when the employer determined that any voluntary respirator use was permissible. Proposed Penalty $2700.00

Citation 1 Item 2 Type of Violation: **Serious**
29 CFR 1910.1025(l((1)(i): Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendixes A and B of this regulation. Proposed Penalty $2700.00

Citation 2 Item 1a Type of Violation: **Other-than-Serious**
20 CFR 1910.1020(g)(l)(i): Upon first entering into employment, and/or at least annually thereafter, the employer did not inform current employees of the existence, location, and availability of any records covered by 29 CFR 1910.1020. The employer had available exposure records such as but not limited to bulk and air sample results for lead.... Proposed Penalty $0.00

There were three more "Other-than-Serious" violations which were:

Citation 2 Item 1b Type of Violation: **Other-than-Serious**
29 CFR 1910.1020(g)(1)(ii): The employer did not inform current employees upon their first entering into employment and at least annually thereafter, of the person responsible for maintaining and proving access to records covered by 29 CFR 1910.1020

Citation 2 Item 1c Type of Violation: **Other-than-Serious**
29 CFR 1910.1020(g)(1)(iii): Employees were not informed upon first entering into employment and/or at least annually thereafter of their right to access their medical and/or exposure records.

Citation 2 Item 1d Type of Violation: **Other-than-Serious**
29CFR1910.1020(g)(2): The employer did not keep a copy of 29 CFR.1020 and its appendices at their workplace, and/or, upon request, make copies readily available to employees.

All three of these citations carried the following note from OSHA:

> NOTE: THE EMPLOYER IS REQUIRED TO SUBMIT ABATEMENT CERTIFICATION FOR THIS ITEM, FAILURE TO COMPLY WILL RESULT IN AN ADDITIONAL PENALTY OF $1,000 AS PER cfr 1903.19. (A date for compliance was set.)

**OUTCOME:** The employer abated the violations and had a conference with OSHA at which they got the fine reduced from $5400 to $4050. But the abatement and negotiation took time away from production which is far more costly. And now, if this particular Producer does this again, the company can be cited for "repeat" or "willful" violations which carry much stiffer penalties.

**COMMENT: The laws are on your side. Use them.** No matter what the employer tells you, you can't mess with that paint without breaking laws.

* I was the Safety Officer for the coalition of unions at this location and made the complaint. MR

## WEARING MASKS DURING PREGNANCY

Researchers from the National Institute for Occupational Safety and Health (NIOSH) participated in three studies that provide information on wearing an N95 toxic dust mask during pregnancy (see footnotes). In two studies, 22 healthy non-smoking pregnant women and 22 nonpregnant non-smoking women had physiological and subjective measurements taken with and without wearing an N95 mask during exercise and postural sedentary activities over a one-hour period.

The studies show that the effects of wearing N95 masks are mild (average of one breath-per-minute decrease in the breathing rate, two beats-per-minute increase in heart rate, 1 – 7 mm Hg increase in diastolic blood pressure and 1- 2 mm increase in mean arterial pressure). These measurements were the same for both pregnant and non-pregnant women.

More importantly, wearing an N95 mask for one hour by healthy pregnant women was not found to have an effect on the fetal heart rate. And similar effects would be expected when pregnant women wear medical or surgical masks which usually provide less breathing stress than an N95 mask.

**STUDY LIMITATIONS.** The data is encouraging for women who need to work during pregnancy. But these tests were only an hour in duration, involved a relatively small number of test subjects, the only fetal effect monitored was heart rate and the women were all healthy. The results should not be extrapolated to 8-hour work days or to work involving additional stress factors.

The studies also did not consider the contaminant that woman are using masks to avoid. For example, potential exposure to lead dust at any level is not appropriate for pregnant women. And these masks do not filter out solvent vapors. Exposures to highly toxic chemicals or pathogens that are known to cause reproductive or fetal damage should be avoided as completely as possible during pregnancy. Sometimes this means working with safer materials during pregnancy or ceasing work temporarily. Pregnancy is a time to remove as many risks as possible from daily living.

1. Roberge RJ, Kim J-H, Powell JB. [2014] N95 respirator use during advanced pregnancy. American Journal of Infection Control 42: 1097-1100.

2. Kim J-H, Roberge RJ, Powell JB. [2015]. Effect of External Airflow Resistive Load on Postural and Exercise-associated Cardiovascular and Pulmonary Responses in Pregnancy. BMC Pregnancy and Childbirth 2015;15:45-52.

3. Roberge RJ, Kim J-H, Benson SM. [2012] Absence of consequential changes in physiological, thermal and subjective responses from wearing a surgical mask. Respiratory Physiology & Neurobiology 181: 29-35.

*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



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## TATTOO INKS: THE KEY TO ART PIGMENT TOXICITY INFO?

Editor's review of a *Lancet* publication

**PREFACE.** The toxicity of the pigments and dyes that color art materials are a primary focus of ACTS' concern. Most art colors, especially those based on carbon (organic) have never been studied for any type of human long-term toxicity. But now there is a massive worldwide study underway on these colorants because millions of people are injecting these chemicals under their skin as tattoo inks. Researchers are now determining how these colored substances migrate in the body, how they break down, metabolize or react with sunlight under the skin, and what toxic effects they cause.

For this reason, we are intensely interested in studies of the toxic effects of tattoo inks. It is why our July issue of *ACTS FACTS* covered an article on the migration of tattoo pigment to lymph nodes which caused the nodes to appear to be cancerous when medically scanned. And this is why our October issue will be devoted to a worldwide review of studies of tattoo effects compiled and published in the peer-reviewed portion of *The Lancet* medical journal online. It can be found at:

> A medical-toxicological view of tattooing, Peter Laux, et al., Published online in Lancet, 24, July 2015, http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)60215-X/fulltext.

This review covers both published and unpublished studies. It lists 88 references and 26 contributing authors, most of whom have MD or PhD after their names. The appendix of this review includes a table of the 69 tattoo pigments and dyes (chromophores or colorants) that have been found and identified in tattoo inks used in the past and in the present. The table looks like a list of common art and commercial paint pigments, because that is precisely what the tattoo pigments actually are.

It costs over $30 to download this review from *The Lancet*. As a service to readers, this issue provides a summary of the relevant data. (Note: European spelling is retained in direct quotes.)

**WHAT ARE TATTOO PIGMENTS?** In this discussion, the words "pigment" and "dye" are used interchangeably since the only criteria for tattoo inks it that the color is insoluble or almost insoluble. These color chemicals can be inorganic (metal compounds or minerals) or organic (carbon-based).

*The Lancet* article notes that "modern tattoo inks mostly contain organic pigments," but "heavy metals still feature prominently, be it as colorants, shading additives, or as contaminants." The authors also say that "[a]nalysis of commercial inks shows that titanium, barium, aluminium, and copper are predominantly used as colourants, whereas antimony, arsenic, cadmium, chromium, cobalt, lead, and nickel tend to be contaminants." While the notorious culprits of the early tattoo pigments containing mercury, cadmium, chromium and cobalt have been replaced, "these substances are still detectable" in the new pigments in the range of micrograms (μg) to milligrams (mg) per kilogram (gm) of ink. A "survey from Denmark reported high concentrations for toxic metals such as chromium (31 mg/kg), nickel (18 mg/kg), and lead (10 mg/kg)." [Note: Many art paint pigments are almost surely similarly contaminated.]

**THE BLACK PIGMENTS.** The article says that "[m]ost tattoos are black, with the inks in question being composed of soot-related compounds [e.g., carbon black] mixed with shading additives such as titanium dioxide or iron oxides or with auxillary substances" such as dispersants (detergents) and preservatives. Carbon black is commonly contaminated with cancer-causing impurities, most notably the polycyclic aromatic hydrocarbons (PAHs). On average, 1 milligram of ink is injected per square centimeter of tattoo. As a result, studies have found that large amounts of carbon black and their PAHs "can be found in tattooed skin specimens and regional lymph nodes even years after tattooing." [Note: petroleum-derived black art pigments also will contain PAHs.

**THE INK ADDITIVES.** Preservatives and impurities seem to be regarded as less of a problem in tattoo inks than colors. But the review notes that "in Switzerland preservatives banned for the use in cosmetics were found in up to 14% of some 416 samples tested." Among these banned substances were 1,2-benzisothiazol- 3[2H]-one benzisothiazolinone; 2-octyl-4-isothiazolin-3-one octhilinone; phenol, and formaldehyde which is an allergen and carcinogen. Further, it says that "anecdotal evidence from the USA suggests that preservative issues and impurities cause some of the adverse tattoo reactions that are reported." [Note: Almost nothing is known about the preservatives and other additives in art paints. Maybe these chemicals are some of these additives.]

**ALLERGY.** In addition to the allergenic (sensitizing) preservatives above, other allergens in tattoo inks include nickel contaminants and some textile dyes. Some of these dyes are known to cause reactions in people merely wearing clothing colored with them. In addition, some tattoo dyes break down to release sensitizing chemicals when the skin is exposed to the sun or when bodily fluids break them down. [Note: Some art colors are sensitizers or capable of releasing sensitizers.]

Two special sensitization issues were identified in the review:

1. "Patch testing seems unsuitable to identify the ...tattoo dyes as allergens." A study "concluded that allergic reactions against tattoos develop slowly and are unlikely to be caused by an allergen directly present in the tattoo ink." In other words, testing prior to tattooing will not detect reactions that the patient has yet to develop or show a reaction to the breakdown products of the colorant that have not yet been released. There is no method of predicting reactions to tattoos.

2. Many doctors report a general clinical impression that reactions to red tattoos were predominant. "Apart from nickel as a contaminant, red is among the few colours that frequently tested positive, even though modern inks try to avoid the use of mercury sulphide (cinnabar), which historical case reports identified as a major allergen. Red remains the most frequently used colour in tattoos, and so the recorded allergenic potential is highly relevant but the reason it remains such an issue is not known."

Answering questions about allergy is a pressing need because these reactions are severe and usually require surgical removal and because people sensitized to the tattoo colorants may find that they are also sensitized to many textile dyes. Sensitization to dyed clothing and colored objects can cause permanent lifestyle issues.

**PARTICLE SIZE.** Particle size affects toxicity and the ability of pigments to migrate in the body. It is now known that nanoparticles may be particularly toxic because some appear to be able to penetrate into body cells. According to the authors, the particle size of tattoo pigments "lie within the submicrometer range or can be true nanoparticles (particles smaller than 100 [nanometers])." The article says that some metal oxides such as aluminum oxide and titanium dioxide "are intentionally added as nanoparticles to create special effects, [and] their fate and effects in the human

body remaining uncertain." [Note: This is disturbing because small-sized titanium dioxide particles are known to cause cancer in animals when in contact with lung tissues. It is not known if titanium nanoparticles can cause cancer when in contact with other tissues, but it is reasonable to suspect that they can. It is also known that our art paint pigments are mostly in nanoparticle sizes.]

**CANCER.** The authors note that "[a]n extensive review of the scientific literature reported a seemingly low number of about 50 cases of skin cancer that were possibly related to tattoos." But there is no way to know if cancers in body parts other than the skin have been initiated by migrating or metabolized colorant chemicals. This can only be teased out of cancer data compliled on the millions of tattooed subjects decades from now.

**WHERE DO THEY GO IN THE BODY?** It is understood that a significant portion of the pigments migrate to the lymph nodes almost immediately after tattooing where they may remain indefinitely. This is most succinctly stated in the Appendix where it states "dyes and pigments enter the lymph vessels and consequently accumulate in the local lymph nodes which are therefore often anonymously tattooed together with the skin." The review also noted that "[t]o what extent and which organs besides skin might be affected is unknown."

Some toxicologists think that the body breaks down or metabolizes these colorants. Others "have argued that the low solubility renders the respective pigments to be biologically unavailable; making them basically inert." ACTS thinks that this is the same argument toxicologists used to support the use of insoluble ceramic lead frits until it was proven they release toxic amounts of lead in the body. The persistence of tattoo coloring on the skin indicates that the metabolic breakdown is slow, but the pigments have a lifetime in the body to be acted on by fluids, enzymes and microphages. And if nanoparticle pigments enter cells, powerful intercellular mechanisms can solubilize them.

**INTERFERENCE WITH MEDICAL TESTS.** While technicians make sure MRI (nuclear magnetic resonance) subjects have no metal implants and have removed their metal-containing jewelry, it is not possible for them to know if the patient's tattoo inks contain metals. Metal-containing tattoo pigments can be disturbed during an MRI test causing patients pain during the test and irritation and swelling for a day or two after.

*The Lancet* review also referred to the issue of lymph nodes containing tattoo pigment giving false positive results for cancer on a medical scan (covered in the July issue of *ACTS FACTS*). And common sense indicates that some metal- or mineral-containing inks may reduce the visibility of underlying structures on x-rays as well.

**INFECTIONS.** Infections have been extensively covered in medical literature and are dependant primarily on the conditions under which the tattooing is done. Bacterial infections are the most common with hard-to-treat fungal and viral infections being quite rare. And only rarely have any tattoo infections been life-threatening.

But the article says that "inks have been underestimated as a source of bacterial contamination. Investigators have reported that up to 20% of sampled inks are contaminated with bacterial counts as high as $10^8$ [100 million] colony forming units per mL [milliliter], including inks labelled as sterile. Contaminations can either originate from poor manufacturing practice or are the result of the use of tap water as an unsterile diluent." The four studies cited for this reference are from the Centers for Disease Control (2006), the *New England Journal of Medicine* (2012), the *Journal of the American Academy of Dermatology* (2010), and a European journal (2013). So this is clearly

a problem in this country now. [Note: Art paints are not made in sterile environments are expected to contain a few bacteria and organisms. Good hygiene can prevent infections from this source.]

**TATTOO REMOVAL** Surgical removal of the skin, cauterization, acids, salts and wire brushes have been used in the past but are no longer recommended. These methods can lead to complications and scarring. Laser removal is preferred—but only in the absence of sensitization reactions since lasers only breaks up the pigment into smaller particles that can more easily migrate to other parts of the body. Two studies cited in the review reported on three individuals who previously were not sensitized to their tattoo pigments, but developed serious allergic reactions during laser treatment.

**ENCAPSULATION.** According to the review, "[m]icroencapsulation is discussed as one option to provide dyes and pigments with defined toxicological properties and predictable biokinetics. ... [E]ncapsulated soluble dyes would lead to dye stability as well as an unproblematic clearance after laser treatment." There are two problems with this plan. First, most dyes have only been tested by ingestion. Acute and chronic tests on tattoo dyes by intradermal release are in order. Second, after laser treatment, all those inert plastic or silica ruptured spheres looking like tiny torn tennis balls under the microscope* are still buried under the skin. The fate of these inert particles needs study.

**EDITOR'S COMMENT.** Tattooed people are part of a worldwide experiment. They can't opt out of this test since the inks are under their skin, in their lymph nodes and who knows where else. Laser removal only spreads them around increasing the risk of becoming allergic to them.

Some people managed to live long lives even with the old carcinogenic and toxic cadmium and mercury pigments under their skins. I expect that most tattooed people today will also survive to old age. But an unknown percentage of tattooed people will end up in the medical literature because they will suffer from one or more of the many complications covered in this article. As long as no country has regulations requiring chronic testing of the tattoo inks, there is nothing to stop millions more from volunteering to be the lab rats. To all those who already have tats, I say: "Thank you, dear crazy people. Thank you for committing the rest of your lives to being in a data base of human subjects exposed intradermally to untested artist's colorants."

But to all people who are planning to get their first tat I say: **"What the hell are you thinking?"**

* According to the article, a plastic surgeon named Bruce Klitzman at Duke University first "developed encapsulated tattoo inks with a capsule that could be disrupted through application of a specific exogenous energy pulse [laser]." A group of Duke scientists is working on this product. A photo of the broken capsule is on Klitzman's website.

*ACTS FACTS* sources: the *Federal Register* (*FR*), the *Mortality and Morbidity Weekly Report* (*MMWR*), *Environmental Health Perspectives* (*EHP*), and many other publications. Call for further information on sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: Kathy Frost, John Fairlie, OES.



**CREDIT:** *ACTS FACTS*,
Monona Rossol, Editor
181 Thompson St., #23
New York, NY 10012 - 212-777-0062
ACTSNYC@cs.com - www.artscraftstheatersafety.org


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# ACTS FACTS

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**ARTS, CRAFTS AND THEATER SAFETY (ACTS)**

181 THOMPSON ST., # 23 NEW YORK, NY 10012-2586 PHONE 212/777-0062

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## WHAT SHOULD BE IN A GOOD CHEMICAL SAFETY BILL?

Editorial

There are two bills being prepared in Washington, DC: Senate and House versions of the Safe Chemicals Act (CSA). The first such bill was proposed in 2010 and every year since, the bill has come up again. Each of the current bills has provisions for chemical testing. Rather than comparing these two bills, I will outline the chemical testing issues and the best ways to address these issues.

**1. ANIMAL CHRONIC TOXICITY AND SENSITIVITY TESTS. The bill must not allow replacement of major animal toxicity tests (*in vivo*) with human cell tests (*in vitro*) or computer modeling tests.** *In vitro* (Latin for "within the glass") refers to the technique of performing a given procedure in a controlled environment outside of a living organism. One of the weaknesses of these *in vitro* toxicity tests is that they fail to replicate the conditions of a living organism. Test animals such as rats and mice are not exact models for predicting human exposure either, but they are vastly better than a Petri dish of isolated human cells or bacteria.

To explain, consider the ingestion exposure route. After ingestion by the test animal, the chemical is acted on by many substances that try to dissolve or break it down' such as saliva; acid gastric juices; alkali intestinal juices; the many different types of enzymes and strains of bacteria that live in the stomach, the small intestine and the bowel; and so on. Often, the test chemical itself is not toxic, but one of its many breakdown products (metabolites) is toxic or causes an allergic reaction as it contacts literally hundreds of different cells in different environments in the body.

The animal gut is lined with different types and structures of cell walls from one end of the gut to the other. If the test substance absorbs or penetrates through one or more of these gut surfaces, it is then taken up by cells or the blood or lymph systems where they encounter intercellular mechanisms, micro- and macrophages, and other forces. Then as the body attempts to eliminate or use the test substance, it is processed in the liver or kidneys and possibly the substance and/or its metabolites are present in urine, feces or sweat (mouse sweat glands are in their feet).

When animals are used in chronic toxicity tests, the animal must be kept alive and healthy for years after exposure to see if the substance can cause cancer, reproductive damage or birth defects. The *in vitro* cell tests, by contrast, are of short duration and gut metabolites are not created.

Computer modeling, called "*in silico*" (latin for "in silicon") testing, is not currently able predict all the possible metabolic pathways and interactions with all types of body fluids and cells. Researchers are still being surprised by discoveries of new metabolic pathways and chemical interactions.

There are similar complex scenarios when animals are exposed by other routes of entry. Toxicity by ingestion, inhalation and skin-absorption, simply cannot be predicted with accuracy in a Petri dish with human cells or by a computer. And this is especially true with long-term or chronic tests. Animal tests are the gold standard at present and we must demand they be used.

**2. ACUTE SKIN & EYE CORROSION OR IRRITATION TESTS. These tests could be replaced by *in vitro* tests.** These tests measure the amount of damage on contact. It is usually clear when substances can dissolve, damage or irritate skin or eye cells. There only are a few issues that would be missed by in *vitro tests*. An example is corneal damage when the substance penetrates without corrosive damage and clouds the cornea or lens. But this effect is rare and it can be corrected surgically. If we must limit animal testing, these acute eye and skin tests are candidates.

**3. GERM CELL MUTAGENICITY AND ENDOCRINE DISRUPTION. These tests are usually done *in vitro* and should continue to be done this way.** In these tests, bacteria and human cells can be used effectively. But consumers should know that a negative mutagen or endocrine disruption test is not proof that one or more of the metabolites of the test chemical cannot cause mutations or endocrine disruption. To know for sure, *in vivo* chronic testing is needed.

**4. THE NUMBER OF CHEMICALS THAT WILL BE TESTED.** The Safe Chemicals Act must not be limited to the small lists of chemicals recommended for testing. It currently has provisions for a list of 25 chemicals that should be tested with in 5 years. The problem is bigger than this.

The U.S. keeps no records of the number of chemicals we are exposed to in consumer products. But the European Union does. It enacted a program called REACH (registration, evaluation, restriction and authorization of chemical substances) which required manufacturers to register the chemicals they intend to use in E.U. products if these chemicals are manufactured in amounts over a ton a year (chemicals produced in smaller amounts are not counted). When registration closed in 2008, the list contained 143,000 chemicals. Around 30,000 of these were untested high-production-volume chemicals, that is, manufactured in amounts over 1,000 tons per year! REACH gave industry ten years to test these 30,000 chemicals. In 2018, they intend to institute a "no data, no market" policy which bans the untested high volume production ingredients from products sold in the E.U.

These same 30,000 common high production volume chemicals are clearly also used in the U.S. For this reason, I've been watching the news about the both the Chemical Safety Act (CSA) and the Transatlantic Trade and Investment Partnership (TTIP) negotiations. It appears that instead of providing the required testing, U.S. manufacturers are touting the less effective in vitro tests for the CSA and pressuring our negotiators to use the TTIP to force the E.U. to accept our untested chemical products. As I write, the TTIP delegates are trying to harmonize their safety testing requirements. The U.S. is backing a "regulatory convergency" policy which requires the U.S. and E.U. each to allow the sale of goods which conformed to the requirements of the other's regulatory system. That's great for U.S. manufacturers since we, currently, have no requirement to the test chemicals in our products for chronic effects at all! And under this policy, the E.U. would have to accept them.

Instead, we must demand testing of all high-production-volume chemicals with proper tests.

**5. DO NOT PROHIBIT STATES FROM ENACTING ADDITIONAL TESTING OR LABELING REQUIREMENTS.** The House version of the CSA prohibits states from enacting better regulations and overrides any state regulations currently in existence. Yet these state rules provide additional consumer protections and serve as pilot programs to see if the rules can work.

The best of these state rules is California's Proposition 65, which doesn't ban chemicals but provides consumers with a label that indicates the presence of any substance that is on a list of chemicals

"known to the State of California" to cause developmental or reproductive damage or cause birth defects. Prop 65 is also a grand experiment in using a citizen's enforcement clause.

The Prop 65 citizen's enforcement clause works like a charm because it has a list of penalties in dollar amounts for breaking this law and allows qualified attorneys to develop the evidence that a product is in violation (usually by laboratory analysis). When this evidence is provided to the California Attorney General's Office (AG), the state can file suit and the qualified attorney, or the organization employing the attorney, is provided with a portion of the settlement. Or, if the AG doesn't pursue the case, the attorney can file suit and obtain the whole settlement.

California taxpayers provide little or no tax dollars to enforce this rule. The cost of investigating the products and developing the evidence is borne by lawyers and/or their activist organization employers. This legislative format should be considered by the U.S. public as a way to obtain good enforcement of many consumer regulations, without relying on tax-supported government agencies.

**FINAL COMMENT.** In ACTS' opinion, both the Senate and the House bills are disasters. Both rely on inadequate *in vitro* and *in silico* tests. Even worse are the number of chemicals that would be tested. The Senate bill requires that "as soon as practicable and not later than 5 years after the date of enactment" additional high-priority substances are added to the list "sufficient to ensure that at least a total of 25 high-priority substances have undergone or are undergoing" testing.

After 5 years only 25 substances might be tested? How will this address the 30,000 untested high production volume chemicals in commerce now? Or address the 143,000 chemicals registered for consumer use in the E.U., most of which also are untested. The answer is to join the E.U.'s effort to require testing. After all, it was the E.U. REACH regulation that forced the U.S. to adopt the new Globally Harmonized System Safety Data Sheets (SDS). Now the U.S. cannot export to the E.U. or to about 160 other countries unless we provide these documents. The E.U. version of the SDS also lists the 10 standard toxicity tests they require–the very tests our own manufacturers should use.

It's not too much to ask industry to do this testing. Assuming testing costs approximately $200,000 per chemical, that means about $6 billion is needed to test all 30,000. Two cents per ton of the 1,000 tons/year sold over these past 10 years would pay for the testing. Actually it costs far less per ton since many of these chemicals actually are manufactured in amounts over 10,000 tons/year.

Maybe we should lobby to kill the TTIP. If the TTIP treaty fails to be adopted, the problem will fix itself. Then Europe's 450 million consumers will be off limits in 2018 to those of our products that contain these untested high-production-volume chemicals.

The alternative is for us to continue to let manufactures test these chemicals on us.

## ANIMAL RIGHTS

Consumers should be aware that industry's endorsement of the animal rights organizations is a cynical move to obtain support for cheaper, short-term, inadequate *in vitro* and *in silico* tests for their chemicals; that is, if they ever actually have to test at all. Animal rights advocates mean well and want very much to believe industry's assertions that these tests are also effective. They are not.

I suggest that we consider the rights of all animals. The U.S. Department of Agriculture estimated in 2012 that the average American ate 71.2 pounds of red meat (beef, veal, pork and lamb) and 54.1 pounds of poultry (chicken and turkey). That translates to somewhere in the neighborhood of 9

billion chickens and 150 million cattle, pigs and sheep annually. While it is harder to find an estimate for the number of experimental animals, it appears the total used each year is in the range of 26 million. We probably eat about 340 chickens for each animal used in a research facility.

Experimental animals help us find cures for disease and provide toxicity data. But the animal activists would have us continue to allow untested chemicals in our consumer and workplace products which make all of us, and our children, lab rats in a massive uncontrolled toxicity experiment. Have a heart, guys. We are animals, too.

Editor's note: I have been a lacto-ovo vegetarian since about 1960.

## CADMIUM PIGMENTS OK'D IN EUROPEAN ART MATERIALS

*The Art Newspaper*, http://theartnewspaper.com/news/news/160515/ , "European artists free to paint the town red (and yellow and orange)," by Anny Shaw, October 29, 2015

After meeting with artists and printmakers, European politicians announced they will not enforce a Europe-wide ban on cadmium art pigments. "While we discussed the technical case for cadmium pigments, many artists were passionately able to stress the economic and artistic importance of cadmiums as they uniquely bring warmth, light, strength and colour to paintings to stand the test of time," says Rachel Volpé of Spectrum Paints, a British paint-maker that campaigned against the ban.

This is consistent with the use of art materials around the world. Most countries, including the U.S., exempt art materials from other consumer safety bans. The U.S. Toxic Substance Control Act restrictions on lead, cadmium, and many other toxic substances do not apply to artists materials.

The EU considered a restriction on cadmium following pressure from Sweden, which argued that artists pollute the food chain when they rinse their brushes in the sink. Cadmium ends up in sewage sludge and is then spread on agricultural land, according to a report submitted by Sweden to the European Chemical Agency (ECHA) last year. Clearly, this is a valid concern.

Michael Craine, the managing director of Spectrum Paints, says the real problem is nickel cadmium batteries. While this is a bigger source of cadmium pollution, it doesn't change the fact that tons of cadmium art pigments are also entering the waste stream worldwide. Artists who care about the environment will follow the U.S. Environmental Protection Agency (EPA) rules for proper disposal of paint waste and collection and disposal of pigment-containing liquid and solid waste. For guidance, see www.ehs.neu/general_safety/art_safety/documents/EHSinthearts.pdf. Or search www.epa.gov for "EHS in the arts" and it's about #3 on the list.

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